

TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS



WATSONVILLE/PAJARO  
to  
SANTA CRUZ



# Transit Corridor Alternatives Analysis & Rail Network Integration Study

*Watsonville to Santa Cruz*

**FINAL DRAFT**  
**January 2021**



**FINAL DRAFT**

**TRANSIT CORRIDOR ALTERNATIVES ANALYSIS AND  
RAIL NETWORK INTEGRATION STUDY  
WATSONVILLE TO SANTA CRUZ**

**SANTA CRUZ COUNTY REGIONAL TRANSPORTATION  
COMMISSION  
IN COLLABORATION WITH**

**SANTA CRUZ METROPOLITAN TRANSIT DISTRICT (METRO)  
CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)**



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## LIST OF ACRONYMS

|          |  |          |  |
|----------|--|----------|--|
| BAC      | RTC Bicycle Advisory Committee                             | O&M      | Operations & Maintenance   |
| CALTRANS | California Department of Transportation                    | P3       | Public-Private Partnership   |
| CEQA     | California Environmental Quality Act                       | PRT      | Personal Rapid Transit   |
| CFR      | Code of Federal Regulations                                | PTC      | Positive Train Control   |
| CPUC     | California Public Utilities Commission                     | RNIS     | Rail Network Integration Study                                     |
| CSRP     | 2018 California State Rail Plan                            | ROW      | Right-of-Way   |
| CTPP     | Census Transportation Planning Package                     | RTC      | Santa Cruz County Regional Transportation Commission (also SCCRTC) |
| CWR      | Continuously Welded Rail                                   | RTP      | Regional Transportation Plan                                       |
| DMU      | Diesel Multiple Unit                                       | SCBRL    | Santa Cruz Branch Rail Line  |
| E&DTAC   | RTC Elderly and Disabled Transportation Advisory Committee | SC       | Santa Cruz   |
| EMU      | Electric Multiple Unit                                     | SCCModel | Santa Cruz County Travel Demand Model                              |
| EPA      | Environmental Protection Agency                            | SCCRTC   | Santa Cruz County Regional Transportation Commission (also RTC)    |
| FRA      | Federal Railroad Administration                            | SMART    | Sonoma-Marin Area Rail Transit                                     |
| FRR      | Farebox Recovery Rate                                      | TAMC     | Transportation Agency for Monterey County                          |
| FTA      | Federal Transit Administration                             | TIGER    | Transportation Investment Generating Economic Recovery             |
| ITAC     | RTC Interagency Technical Advisory Committee               | TOD      | Transit Oriented Development                                       |
| LRT      | Light Rail Transit   | TBLA     | Triple Bottom Line Approach  |
| MBSST    | Monterey Bay Sanctuary Scenic Trail                        | UCS      | Unified Corridor Investment Study                                  |
| METRO    | Santa Cruz Metropolitan Transit District                   | UCSC     | University of California, Santa Cruz                               |
| MTIS     | Major Transportation Investment Study                      | UPRR     | Union Pacific Railroad   |
| NCTD     | North County Transit District                              | VMT      | Vehicle Miles Traveled   |
| NTD      | National Transit Database                                  | WES      | TriMet Westside Express Service                                    |



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### COMMUNITY MEMBERS AND GROUPS

Members of the public provided extensive input throughout development of this study. The community's thoughtful participation in discussions about the transit alternative for the Santa Cruz Branch Line that provides the greatest benefit to the Santa Cruz County community demonstrates the immense value of public participation in the transportation planning process.





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City of Scotts Valley Public Works and Planning  
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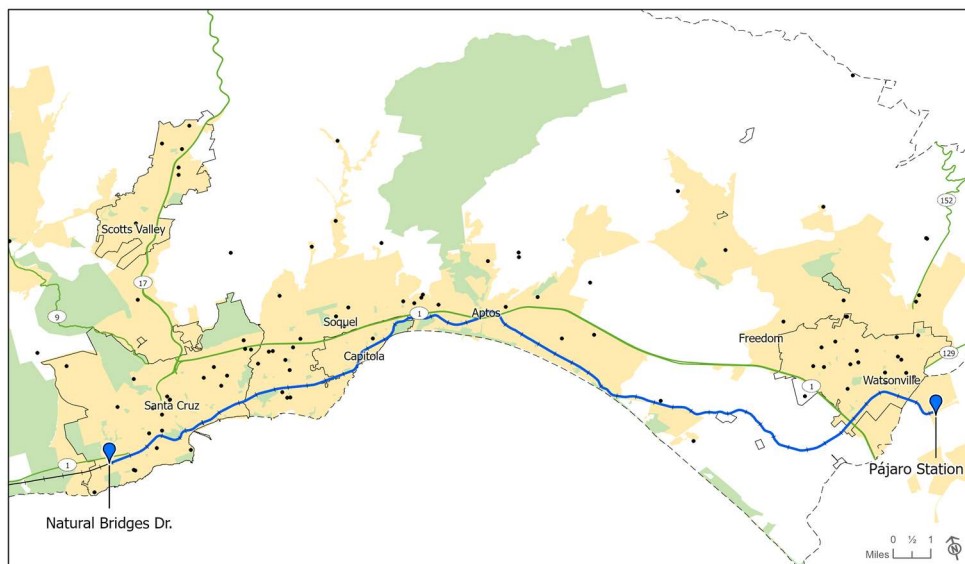


# EXECUTIVE SUMMARY

## ES.1 INTRODUCTION

The Transit Corridor Alternatives Analysis and Rail Network Integration Study (TCAA/RNIS) was prepared to evaluate high-capacity transit investment options and identify a locally preferred transit system that utilizes all or part of the length of the Santa Cruz Branch Rail Line Rail Right-of-Way (SCBRL ROW). The TCAA/RNIS analyzed various transit alternatives to identify a locally preferred alternative that provides the greatest benefit to Santa Cruz County residents, businesses and visitors in terms of the triple bottom line goals of improving economy, equity, and the environment. The area of the study includes the most populous locations and congested transportation infrastructure sections of Santa Cruz County – from the western edge of the city of Santa Cruz through Watsonville to Pajaro Junction in Monterey County. The TCAA/RNIS also considered the integration of the locally preferred alternative with future intercounty and interregional rail connections to Monterey, Gilroy, the Bay Area and beyond.

Figure ES.1: TCAA/RNIS Study Area



- TCAA Project Limits: Pajaro to Natural Bridges Dr.
- Project Area
  - Santa Cruz Branch Rail Line
  - Highways
  - Schools
  - Urban Areas
  - Parks/ Open Space
  - City Limits
  - Santa Cruz County Boundary





## STUDY AREA

The Santa Cruz Branch Rail Line (SCBRL) is a continuous transportation corridor that spans approximately 32 miles of Santa Cruz County's coast from Watsonville/Pajaro in South County to Davenport on the north coast. As shown in **Figure ES.1**, the TCAA/RNIS Study Area includes the SCBRL ROW from Pajaro to Natural Bridges Drive on the west side of Santa Cruz. The SCBRL runs parallel to the often-congested Highway 1 and connects to regional and state rail lines in Pajaro in Monterey County.

## TRANSIT ON DEDICATED FACILITY

High-capacity transit on the SCBRL ROW can advance state and other legislative priorities for more sustainable transportation and provide significant transportation improvements for Santa Cruz County. High-capacity transit is characterized by the ability to carry a large volume of passengers, frequent service, and often traveling on a dedicated guideway with fewer stops to offer faster travel times. Transportation benefits offered by a dedicated transit facility include the following:

- **Improve equitable multimodal options.** Transit on the SCBRL ROW expands travel choices and can move people more efficiently and sustainably.
- **Expanded transit service and increased ridership.** Transit on a dedicated facility will expand transit service, increasing transit ridership within the County and with other regions. The coastal rail trail can serve as first and last mile of travel to/from transit.
- **Environmental justice and social equity.** Increasing transportation opportunities for all segments of the population at all income levels, can strengthen communities, create pathways to education/jobs, and improve quality of life for individuals and communities.
- **Advance environmental and public health.** A dedicated transit facility on SCBRL complemented by local transit and bike and pedestrian facilities will provide an end-to-end service that will allow for a reduction in vehicle miles traveled to reduce GHG emissions, combat climate change, and improve air quality and public health.
- **Improve transit travel time and travel time reliability.** Transit, operating on a dedicated guideway, provides improved travel times and greater reliability to help travelers accurately plan their trips.
- **Safety.** Transit provides relatively lower collision rates per unit of travel in comparison to automobile travel.
- **Connecting Watsonville and Santa Cruz.** Improving connections between the two largest/fastest growing cities in the County will expand access to jobs, educational opportunities, and housing.
- **Regional Connections.** Providing connections at Pajaro Station with planned rail service to the San Francisco Bay Area, Monterey County, and points north and south, will improve transit access to future high-speed rail in Gilroy and create viable opportunities for car-free travel throughout the state.





- **Transit-oriented development/compact sustainable communities.** Providing transit-oriented development opportunities will significantly reduce number of trips taken by auto, increase transit use, decrease sprawl, and promote healthier lifestyles and compact, sustainable communities.
- **Funding landscape is changing.** California has experienced major transportation funding policy changes, providing opportunities to increase funding for dedicated transit systems that serve disadvantaged communities and promote transit-oriented development.

### **PURPOSE OF STUDY**

The TCAA/RNIS was prepared to identify a locally preferred transit alternative to serve the most populous and congested sections of Santa Cruz County – from the western edge of the City of Santa Cruz through Watsonville to Pajaro on the SCBRL ROW. The purpose of the TCAA/RNIS is to:

- Identify, evaluate and compare a range of high-capacity public transit service options that can coexist with a bicycle and pedestrian trail along the SCBRL ROW
- Plan an integrated transit network for the County utilizing all or part of the SCBRL ROW as a dedicated continuous transit facility
- Provide governance options for transit service
- Involve the community, partner agencies, RTC, and METRO in the decision-making process
- Identify opportunities to enhance high-capacity transit investment and improve quality of life via strategically located transit-oriented land development in urbanized areas
- Develop a strategic business plan for the selected alternative, including a prototypical cash flow analysis of environmental clearance, right-of-way, design, construction, operations, and maintenance
- Ensure the rail corridor enhances public access to the Monterey Bay National Marine Sanctuary at several key locations consistent with the CA Coastal Act objectives

### **TRIPLE BOTTOM LINE APPROACH AND PERFORMANCE BASED PLANNING**

The analysis framework designed and applied in the TCAA/RNIS is based on the Triple Bottom Line Approach (TBLA), a performance-based planning approach utilizing the sustainability principles of economy, equity, and the environment used to evaluate future investment decisions (**Figure ES.2**). The TBLA is a consistent tool applied by the RTC in previous countywide studies such as the Unified Corridor Investment Study (UCS) and the 2040 Santa Cruz County Regional Transportation Plan (RTP). The TCAA/RNIS analysis was performed using this TBLA framework to support three project analysis Milestones.

There are numerous advantages to adopting a performance-based planning approach including:

- Identifying clear goals of the project based on open discussions with stakeholders
- Evaluation of several alternatives or strategies for achieving the project goals
- Providing a detailed, data-driven analysis for decision-making





- The need to strategically focus investments due to greater competition for limited funding
- Providing the public greater transparency and opportunities for input for how transportation dollars are spent
- Demonstrating the link between transportation projects and their benefits to environment, economy, and equity

A comparison of alternative strategies using a performance-based planning approach with a basis on the sustainability principles of economy, equity, and the environment is recommended by federal and state agencies. The TCAA/RNIS was performed using this TBLA framework to evaluate high-capacity public transit options on the SCBRL ROW that will advance the goals of the project.

**Figure ES.2: Triple Bottom Line Approach Framework**



#### **PLANNING AND OUTREACH APPROACH FOR THE TCAA/RNIS**

##### ***MILESTONE 1 – DEVELOPMENT OF GOALS, SCREENING CRITERIA, PERFORMANCE MEASURES, AND UNIVERSE OF ALTERNATIVES***

The goals, screening criteria, performance measures, and universe of alternatives were developed in Milestone 1 to provide the foundation for the TBLA and critical inputs in the analysis of later Milestones (**Table ES.1**).





**Table ES.1: Milestone 1 Approach for Goals, Criteria, Measures, and Alternatives**

|  |
|--|
| <b>Milestone 1: Goals, Evaluation Criteria, and Performance Measures</b>   |
| Develop clear goals as the foundation for a successful planning effort   |
| Determine how goals can be evaluated qualitatively through developing screening criteria and quantitatively through performance measures to assess whether the various alternatives being evaluated are advancing the goals of the project |
| Gather input on the goals, criteria and measures from the public and stakeholders  |
| Seek approval from the RTC   |
| <b>Milestone 1: Universe of Alternatives</b>   |
| Develop a full-range of high-capacity transit alternatives for a high-capacity public transit that utilize all or part of the SCBRL ROW  |
| Gather input from the public/stakeholders on initial list of alternatives and potential station locations  |
| Seek approval from the RTC   |

**MILESTONE 2 – SCREEN THE INITIAL LIST OF ALTERNATIVES INTO A SHORT-LIST**

**Table ES.2** summarizes the application of the Milestone 2 High Level Screening conducted to winnow or screen the universe of alternatives to move forward into detailed performance analysis to be conducted in Milestone 3.

**Table ES.2: Initial High-Level Screening Approach**

|   |
|---|
| <b>Milestone 2: Initial High-Level Screening Approach</b>   |
| High-level screening criteria to narrow initial list of alternatives to a short list for detailed analysis  |
| Present screening process and results and gather input from public and stakeholders on short list of transit alternatives to be considered for further analysis |
| Seek approval from the RTC  |

**MILESTONE 3 – VALUE ENGINEERING ON SHORT OF LIST OF ALTERNATIVES AND PERFORMANCE MEASURES ANALYSIS AND LOCALLY PREFERRED ALTERNATIVE**

Milestone 3 included a value engineering analysis of multiple possible system options for each of the alternatives that moved forward from screening, and then a detailed performance







analysis of the system designs that rose to the top during value engineering to identify the locally preferred alternative (**Table ES.3**)

**Table ES.3: Value Engineering and Detailed Performance Analysis Approach**

|  |
|--|
| <b>Milestone 3: Value Engineering</b>  |
| Perform value engineering to determine detailed service description (alignment, station locations and service frequency) for each of short-listed alternative      |
| Evaluate 2 to 4 service descriptions for each alternative and determine the optimal service scenario for each alternative based on cost, ridership and travel time |
| One option for each alternative moves forward into the performance measure analysis  |
| Seek approval from the RTC   |
| <b>Milestone 3: Detailed Performance Analysis and Locally Preferred Alternative</b>  |
| Perform a more detailed quantitative analysis of the short-listed alternatives from value engineering using performance measures identified in Milestone 1         |
| Compare the results of the performance measure analysis to identify locally preferred alternative  |
| Present performance measure results and seek input from public and stakeholders on proposed locally preferred alternative  |
| Seek approval from the RTC on the locally preferred alternative  |

## ES.2 STAKEHOLDER ENGAGEMENT

Throughout the entire TCAA/RNIS schedule, identified stakeholders were proactively engaged through presentations and discussions at established and project-specific hosted meetings, regional media and other digital engagement activities. This engagement continued through each milestone to support education and seek valuable input on the preferred alternative for the corridor. Stakeholders and their roles included:

- Regional Transportation Commission
- METRO Board of Directors
- Ad Hoc Committee: Composed of representatives from the RTC board
- Agency Partners: Key transportation and planning partner agencies including, but not limited to: Planning and Public Works Departments, Association of Monterey Bay Area Governments (AMBAG), County of Santa Cruz, City of Watsonville, City of Capitola, City of Santa Cruz, City of Scotts Valley, University of California Santa Cruz Transportation and Parking Services (UCSC TAPS), Caltrans, California Coastal Commission, and Santa Cruz County Parks







- RTC Advisory Committees: RTC Bicycle Advisory Committee (BAC), RTC Elderly and Disabled Transportation Advisory Committee (E&DTAC), and the RTC Interagency Technical Advisory Committee (ITAC)
- Community Focus Groups: Two targeted and diverse focus groups were established at the onset of the planning effort to proactively reach into the many facets of a community through community-based organizations.

### **PUBLIC ENGAGEMENT**

The Engagement Program also included a dynamic plan to target and reach the general public through mass media communications, electronic and hard copy notices, as well as conducting large public participation forums. Key activities included:

- SCCRTC Project Webpage – with regular updates at every key milestone
- Collateral Material Distribution (Frequently Asked Questions, fact sheet, maps, presentations, boards, surveys)
- Electronic notices, invitations
- Media and Social Media Campaign
- Public Open Houses (In-person and virtual)
- Live Chat virtual discussions with the project team
- Public hearings at RTC board meetings for each milestone

### **ES.3 GOALS, EVALUATION METRICS, SCREENING CRITERIA, AND PERFORMANCE MEASURES**

Goals were initially developed to address key desired outcomes from the transportation project alternatives under evaluation and were developed based on a vision of the future that is informed by public and stakeholder input as well as the need to meet legislative requirements. Once the goals were identified, metrics were developed that provide a way to measure whether the goals will be advanced. An alternatives analysis to evaluate the costs and benefits of a number of alternatives utilized the metrics for determining the most beneficial alternative for the SCBRL ROW.

The evaluation metrics developed for the study were twofold: qualitative screening criteria used in Milestone 2 to qualitatively reduce the initial list of transit alternatives to a short list of alternatives, and more quantitative performance measures used in Milestone 3 to determine a locally preferred alternative. Screening criteria and performance measures were defined to support and link to each of the goals of the TCAA/RNIS. The goals and evaluation metrics are presented in **Tables ES.4 to ES.7** for each of the TBLA elements, including economy, social equity, environment, and other project-specific goals. For tables that include the screening criteria and performance measures, refer to Chapter 3.





**Table ES.4: Goals and Evaluation Metrics – Economy**

| Goals   | Evaluation Metric                                    | Description   |
|---|--|---|
| Fiscally feasible   | Capital cost   | How does capital cost compare to other projects?  |
|   | O&M costs  | Is project relatively more expensive to maintain and operate?   |
|   | Funding  | How much funding will likely be available?  |
| Results in a well-integrated transportation system supporting economic vitality | Transit Oriented Development                         | Will the project increase development along the corridor?   |
|   | Jobs   | Will project support job growth – near term through construction, longer term through O&M activity?   |
|   | Freight and other rail businesses                    | What is the impact on freight rail operators, shippers and other rail businesses including Santa Cruz Big Trees and Pacific Railway?                |
|   | Transportation corridor utilization and preservation | What is the level of risk that the corridor will not remain continuous?<br>Will alternative best utilize rail corridor and preserve future options? |





**Table ES.5: Goals and Evaluation Metrics – Social Equity**

| Goals  | Evaluation Metric     | Description  |
|--|-----------------------|--|
| Promotes active Transportation   | Active transportation | Does project include features that support active transportation and promote health? |
| Supports safer transportation for all modes  | Safety                | Does project support public safety?  |
| Provides accessible and equitable transportation system that is responsive to the needs of all users | Access                | Does project provide universal access to all ages and abilities?                     |
| Offers reliable and efficient transportation choices that serve the most people                      | Travel time           | Does project improve transportation travel time during peak periods?                 |
|  | Reliability           | Does project improve transportation reliability?                                     |

**Table ES.6: Goals and Evaluation Metrics – Environment**

| Goal                             | Evaluation Metric                        | Description  |
|----------------------------------|--|--|
| Promotes a healthier environment | Transit ridership                        | Will project substantially increase transit ridership for commute and recreational trips and for students, residents and visitors? |
|                                  | Emissions reduction                      | Does project support the goal of reduced emissions? How long will the project take to implement?                                   |
|                                  | Climate adaptation                       | Can the project resiliently adapt to climate change?   |
|                                  | Biological, visual, noise, and vibration | Are there effects of the project on biological resources, visual, noise and vibration?   |
|                                  | Energy usage                             | Does project support the goal of reduced energy usage?   |





**Table ES.7: Goals and Evaluation Metrics – Other**

| Goal                                | Evaluation Metric                       | Description   |
|-------------------------------------|---|---|
| Addresses project-specific concerns | Technical feasibility                   | Is project technically feasible?  |
|                                     | Consistent with other planning Efforts  | Is project consistent with other local, state and federal planning efforts?   |
|                                     | Consistent with regulatory requirements | Is project consistent with local, state, and federal regulatory requirements? |
|                                     | Integration                             | Does project integrate into existing transportation infrastructure?           |
|                                     | Ability to Adapt to New Technology      | Does the project have ability to adapt to future technology?                  |
|                                     | Right-of-way                            | How easily can project be integrated into existing right-of-way?              |

**ES.4 UNIVERSE OF ALTERNATIVES**

The universe of transit alternatives for the SCBRL ROW was identified in Milestone 1. These transit service options could utilize the SCBRL ROW for the majority of its available length. The universe of alternatives included:

- **Bus Options** - Local Bus and ROW Bus, Commuter Express Bus, Arterial and ROW Bus Rapid Transit (BRT), Autonomous Road Train, Dual Rail and Bus Vehicles, Micro-shuttles, and Shuttle (Light Duty, Van, Electric Vehicle)
- **Rail Options** - Intercity Rail, Commuter Rail, Light Rail/Electric Multiple Unit, Light Rail/Diesel Multiple Unit, Monorail/Automated People Mover, Tram/Trolley/Streetcar
- **Other Transit Types** - Personal Rapid Transit (PRT), Inverted PRT, Gondola, String Rail, and Hyperloop

**ES.5 HIGH-LEVEL SCREENING**

The initial list of alternatives was evaluated using the TBLA framework of economy, social equity, environment, and other goals. The screening criteria identified in Milestone 1 for each metric was used to narrow down the Universe of Alternatives into a short list of alternatives for more detailed evaluation in Milestone 2. A, B, and C ratings screened the universe of alternatives as either “most desirable,” “moderately desirable,” or “least desirable” for each





evaluation metric. Data was collected from best available information including national data sets on the various alternatives as well as information from previous local studies. The high-level, screening identified four alternatives that moved forward into a short list of alternatives for further evaluation. These four alternatives are described below.

### ***BUS RAPID TRANSIT (BRT)***

BRT is a fixed-route bus system that could operate on the SCBRL ROW, as well as on Highway 1 bus-on-shoulders/auxiliary lanes and the local roadway network. These systems have defined passenger stations, short headways, separate branding and operate for a substantial part of weekdays and weekend days. Agencies typically use off-board fare collection as well to reduce travel times. BRT operations on the SCBRL ROW could be a combination of two-lanes and one-lane with signaling for two-way travel.

### ***COMMUTER RAIL TRANSIT***

Commuter rail transit (CRT) can be described as passenger rail service operating on fixed rails with multiple individually propelled cars, typically providing an interurban or regional service. Commuter rail usually has a higher passenger capacity per trainset and relatively longer distances between station stops when compared to light rail. Operations on a single track with sidings allows for two-way travel.

### ***LIGHT RAIL TRANSIT***

Light Rail Transit can be described as passenger rail service operating on fixed rails with single or multiple individually propelled cars, typically providing an urban or interurban service with a lower passenger capacity per trainset compared to commuter rail. Operations on a single track with sidings allows for two-way travel.

### ***AUTONOMOUS ROAD "TRAIN"***

An autonomous road "train" is an emerging transit mode that combines the benefits of BRT and light rail transit with autonomous driving features. The system uses rubber-tired vehicles running on pavement within a dedicated running way. The vehicles tend to visually resemble LRT vehicles, with a similar passenger capacity. The system would use similar infrastructure to a BRT system, including permanent stations, transit signal priority, and offering frequent service. This alternative will run solely on the SCBRL ROW, operating on a single lane with sidings allowing two-way travel.

## **ES.6 VALUE ENGINEERING AND DETAILED PERFORMANCE EVALUATION**

### ***VALUE ENGINEERING***

The Value Engineering component of the TCAA/RNIS was designed to evaluate a number of different alignments, station locations and service plans to determine the optimal option for





each alternative. Alignments/service plans for the four alternatives analyzed in Value Engineering included:

1. Bus Rapid Transit - four options with two different alignments/stops (given potential for travel on roadway network as well as on the SCBRL ROW) and two different service frequencies
2. Commuter Rail Transit - two options with similar alignment but different station locations and service frequency
3. Light Rail Transit - two options with similar alignment but different service frequency
4. Autonomous Road “Train” - two options with same alignment but different service frequency

The following analysis criteria were applied in the Value Engineering analysis to identify the best performing options to move forward into detailed performance evaluation:

- Estimated Length of the SCBRL ROW Corridor Used
- Average Weekday Ridership Estimates
- Average Travel Times and Typical Travel Speeds
- Interface with Freight Rail Service
- Conceptual Capital and Operations and Maintenance Cost Estimates

The resulting best performing option for each of the four alternatives in this analysis was moved forward into the detailed performance measure evaluations.

### ***DETAILED PERFORMANCE EVALUATION***

A detailed analysis of the performance of each of the four alternatives was evaluated and results were used to compare their advantages and disadvantages and to identify the proposed locally preferred alternative. Data from numerous federal, state and local sources was obtained for this analysis. The advantages and disadvantages of the four alternatives as determined from the performance measure analysis are presented below.

**Bus Rapid Transit** - a fixed-route bus system that could operate on the Santa Cruz Branch Rail Line as a dedicated right-of-way, as well as on Highway 1 bus-on-shoulders/auxiliary lanes and the local roadway network (**Table ES.8**).







**Table ES.8: BRT Performance Evaluation Results**

| KEY BENEFITS:  | DISADVANTAGES:   |
|--|--|
| <ul style="list-style-type: none"> <li>• Strong transit ridership potential</li> <li>• Integrates easily with overall transportation system</li> <li>• Ability to adapt to new technologies</li> <li>• Lowest costs (capital, operations &amp; maintenance)</li> <li>• No impact to Roaring Camp for access to boardwalk</li> <li>• Greater number of stops</li> <li>• Greater flexibility/resiliency to climate change</li> </ul> | <ul style="list-style-type: none"> <li>• Longer travel times and least reliability</li> <li>• Utilizes less than 7 miles of SCBRL ROW</li> <li>• Incompatible with freight where BRT is on ROW</li> <li>• Eliminates Roaring Camp connection to regional rail network</li> <li>• Level boarding platforms less likely for stops on road network</li> <li>• Limited capacity for bicycles &amp; mobility devices</li> <li>• Requires transfer to regional rail network</li> <li>• Limited Transit Oriented Development potential</li> </ul> |

**Commuter Rail Transit** - passenger rail service operating on fixed rails with multiple individually propelled cars, typically providing an interurban or regional service. Commuter rail usually has a higher volume ridership capacity and relatively longer distances between stops when compared to light rail (**Table ES.9**).





**Table ES.9: CRT Performance Evaluation Results**

| KEY BENEFITS  | DISADVANTAGES:  |
|---|---|
| <ul style="list-style-type: none"> <li>• Faster, more reliable travel times</li> <li>• Greater reduction in vehicle miles traveled &amp; greenhouse gas emissions</li> <li>• Strong transit ridership potential</li> <li>• Operates with freight and recreational rail in shared-use corridor</li> <li>• Supports Transit Oriented Development</li> <li>• Shortest implementation time</li> <li>• Best existing rail network integration (potential one-seat ride to Monterey &amp; cross-platform transfers at Pajaro)</li> <li>• Assures continuous transportation corridor</li> <li>• More funding potential</li> <li>• 91% of stations are within disadvantaged communities</li> <li>• Flexible designs for seats, bicycles &amp; mobility devices based on need</li> <li>• Level boarding platforms at all stations</li> <li>• More energy efficient per passenger mile</li> </ul> | <ul style="list-style-type: none"> <li>• Higher costs (capital, operations &amp; maintenance)</li> <li>• Lower ridership estimates than BRT and LRT</li> <li>• Less resilience to climate change impacts</li> </ul> |

**Light Rail Transit** - passenger rail service operating on fixed rails with single or multiple individually propelled cars, typically providing an urban or interurban service with a lighter volume ridership capacity per trainset compared to commuter rail (**Table ES.10**).





**Table ES.10: LRT Performance Evaluation Results**

| KEY BENEFITS  | DISADVANTAGES:  |
|---|---|
| <ul style="list-style-type: none"> <li>• Faster, more reliable travel times</li> <li>• Greatest reduction in vehicle miles traveled &amp; greenhouse gas emissions</li> <li>• Strong transit ridership potential</li> <li>• Operates with freight in shared-use corridor (may need temporal separation)</li> <li>• Supports Transit Oriented Development</li> <li>• Shortest implementation time</li> <li>• Assures continuous transportation corridor</li> <li>• 92% of stations are within disadvantaged communities</li> <li>• Does not impede other rail use within corridor (current or future)</li> <li>• Flexible design for seats, bicycles &amp; mobility devices based on need</li> <li>• Level boarding platforms at all stations</li> <li>• More energy efficient per passenger mile</li> </ul> | <ul style="list-style-type: none"> <li>• Higher costs (capital, operations &amp; maintenance)</li> <li>• Lower ridership estimates than BRT</li> <li>• Less resilience to climate change impacts</li> <li>• May require transfer to connect with regional rail network</li> </ul> |

**Autonomous Road “Train”** - an emerging transit mode that combines the benefits of bus rapid transit and light rail with advanced autonomous driving features, providing an urban or interurban service. The system uses rubber tires running on pavement within a dedicated running way. The vehicles tend to visually resemble light rail vehicles, with a similar passenger capacity (**Table ES.11**).

**Table ES.11: ART Performance Evaluation Results**

| KEY BENEFITS  | DISADVANTAGES:  |
|---|---|
| <ul style="list-style-type: none"> <li>• Strong transit ridership potential</li> <li>• Supports greenhouse gas emission reduction goals</li> <li>• Greater ability to adapt to new technologies</li> <li>• Supports Transit Oriented Development</li> <li>• 92% of stations are within disadvantaged communities</li> <li>• Flexible design for seats, bicycles &amp; mobility devices based on need</li> <li>• Level boarding platforms at all stations</li> </ul> | <ul style="list-style-type: none"> <li>• Capital cost is highest – 50% more than rail transit</li> <li>• Incompatible with freight rail</li> <li>• To preserve freight in Watsonville, transfer to local bus at Lee Rd. is required to access downtown Watsonville &amp; Pajaro</li> <li>• Longer travel time</li> <li>• Less flexibility/resiliency to climate change</li> </ul> |





## ES.7 LOCALLY PREFERRED ALTERNATIVE

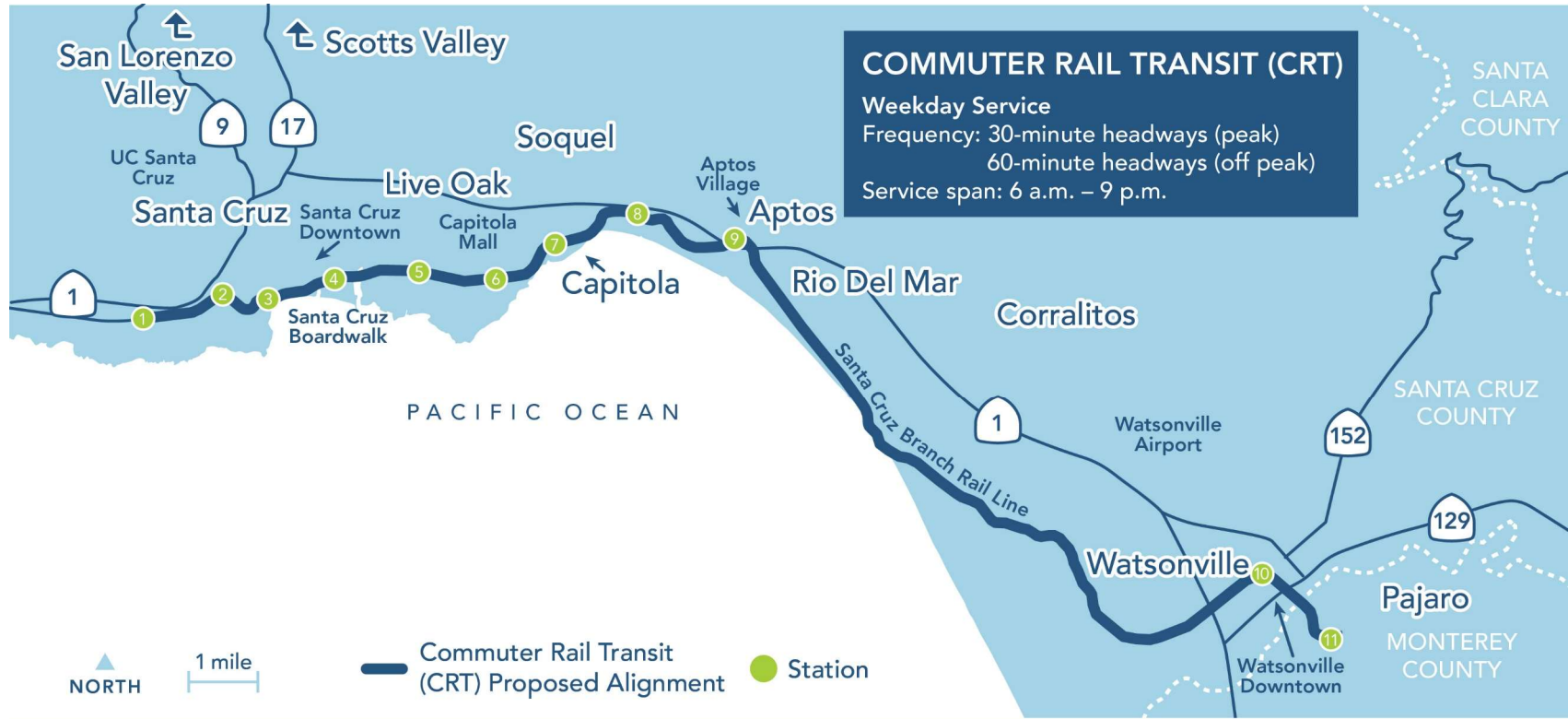
The proposed locally preferred alternative (LPA) is Electric Passenger Rail. The performance measure analysis, as well as input received-to-date from RTC, RTC advisory committees, partner agencies, community organizations, stakeholders, and members of the public, have guided this proposed locally preferred alternative. Input received from public and stakeholder engagement during Milestone 3 will be fully considered by the project team and RTC in making its final decision of a locally preferred alternative.

A decision on whether the rail option will be electric commuter rail (CRT) or electric light rail (LRT) is not recommended as part of this planning study. The infrastructure needed for either CRT or LRT is similar. Deferring this decision will maintain flexibility for future decisions on the rail vehicle type, while clean energy rail technologies advance. A decision on different electric rail vehicle types and sizes would therefore be better studied in the preliminary engineering and environmental analysis phase of delivery. **Figures ES.3** and **ES.4** show the respective alignments, station locations, and service plans for CRT and LRT that were evaluated in this study.





**Figure ES.3: Commuter Rail Transit**



| Station # | Name                                  | Station # | Name                         |
|-----------|---------------------------------------|-----------|------------------------------|
| 1         | Natural Bridges Station               | 9         | Aptos Village Station        |
| 2         | Bay Street Station                    | 10        | Downtown Watsonville Station |
| 3         | Downtown Santa Cruz/Boardwalk Station | 11        | Pajaro Station               |
| 4         | Seabright Station                     |           |                              |
| 5         | 17th Avenue Station                   |           |                              |
| 6         | 41st Avenue Station                   |           |                              |
| 7         | Capitola Village Station              |           |                              |
| 8         | Cabrillo College Station              |           |                              |







Figure ES.4: Light Rail Transit



| Station # | Name                                   | Station # | Name                              |
|-----------|--|-----------|-----------------------------------|
| 1         | Natural Bridges Station                | 9         | Capitola Village Station          |
| 2         | Fair /Almar Avenue Station             | 10        | Park Avenue/Cabrillo Station      |
| 3         | Bay Street Station                     | 11        | Aptos Village Station             |
| 4         | Downtown Santa Cruz Depot Park Station | 12        | La Selva Beach Station (seasonal) |
| 5         | Boardwalk Station (seasonal)           | 13        | Ohlone Parkway Station            |
| 6         | Seabright Station                      | 14        | Downtown Watsonville Station      |
| 7         | 17th Avenue Station                    | 15        | Pajaro Station                    |
| 8         | 41st Avenue Station                    |           |                                   |







### **CHARACTERISTICS OF THE PROPOSED PASSENGER RAIL LPA**

The proposed Electric Passenger Rail LPA will consider services operating on the SCBRL ROW with single or multiple individually propelled electric cars. There would not be an overhead catenary system (poles and wires). Operations will be structured on a single track within the SCBRL ROW with periodic sidings allowing for two-way travel. The characteristics of the recommended Passenger Rail LPA include:

- **Vehicles** will be capable of traveling from 30 to 60 mph
- The number of **Stations** is expected to range from 11 to 13 stations. This could also include seasonal stations to better accommodate tourist and seasonal activity along the corridor. Although the TCAA/RNIS considered the number and location of station options, a more detailed study during preliminary engineering and environmental review may consider others.
- The use of **FRA compliant or non-FRA compliant vehicles** will be determined in the next phase of the analysis. If non-FRA compliant vehicles are identified for use, then the system could be configured to operate with freight rail in this shared-use corridor only if temporally separated (i.e., freight rail and passenger rail operations will operate at different times of the day). If FRA compliant vehicles are implemented, then the passenger rail vehicles could comingle with freight rail in this shared-use corridor, and Positive Train Control (PTC) would be required.
- **Frequency of service** would be established in a future phase of project development and could increase over time as ridership increases. Higher frequency of service for major stops and lower frequency for minor stops could provide the best tradeoff of travel time versus ridership and is a common practice among rail systems.
- **Daily span of service** would be established in a future phase of project development and will likely increase over time as ridership increases. Weekday span evaluated in the TCAA/RNIS was from 6AM to 9PM and 7AM to 10PM for weekends.
- **Level platform boarding** is a feature at each station, no matter the station size in order to provide universal access for all ages and abilities and ease of boarding for travelers with bicycles.
- **Alternative fuel technologies** including hydrogen fuel cell, battery or other future clean, or non-fossil fuel technologies would be utilized. Alternative fuel technologies are advancing rapidly, along with trainsets. Within the next decade, options for clean fuel trainsets will likely expand significantly compared to what is available today.

### **BENEFITS OF THE ELECTRIC PASSENGER RAIL FOR THE LOCALLY PREFERRED ALTERNATIVE**

The benefits of electric passenger rail for the locally preferred alternative would include:

- Provides faster travel times and greater travel time reliability
- Reduces auto vehicle miles traveled and greenhouse gas emissions
- Serves a high percentage of disadvantaged populations in Santa Cruz County
- Provides regional rail network compatibility





- Provides the shortest length of time to implement
- Assures continuous corridor for transit and trail
- Provides greatest opportunities for Transit-Oriented Development
- Utilizes the full SCBRL ROW between Pajaro and Westside Santa Cruz
- Provides more funding including from sources only available for passenger rail
- Will not impede existing or potential future freight and recreational rail from using the corridor
- Provides greater flexibility to allocate space for seats, bicycles, and mobility devices based on need
- Provides ability to have level boarding at all stations
- Assures energy efficiency per passenger capacity mile
- Integrates well with regional METRO services and first and last mile connectors

## ES.8 PREVIEW OF PLAN CHAPTERS

### Chapter 1: Background

The background information presented in Chapter 1 includes the benefits of transit on the SCBRL ROW, history of the SCBRL ROW, a review of relevant transit related studies, and the purpose of this study.

### Chapter 2: Public and Stakeholder Outreach

This Chapter presents the extensive public stakeholder outreach conducted during the TCAA/RNIS for each milestone.

### Chapter 3: Milestone 1 Outcomes

This Chapter presents the TCAA/RNIS outcomes for Milestone 1 including identifying goals, evaluations metrics, screening criteria, and performance measures, designed to support the overall triple bottom line planning process and identifying the universe of transit alternatives for evaluation.

### Chapter 4: Milestone 2 Outcomes

This Chapter presents the TCAA/RNIS outcomes for Milestone 2 including the application of the high-level screening criteria used to narrow the universe of alternatives to the short list moving forward for more detailed analysis.

### Chapter 5: Milestone 3 Outcomes

This Chapter presents the TCAA/RNIS outcomes for Milestone 3 including both the value engineering and detailed performance evaluation.





## Chapter 6: Locally Preferred Alternative

This Chapter presents the proposed TCAA/RNIS locally preferred alternative (LPA).





## CHAPTER 1 - INTRODUCTION

The Transit Corridors Alternatives Analysis and Rail Network Integration Study (TCAA/RNIS) evaluates high-capacity transit investment options that utilize all or part of the length of the Santa Cruz Branch Rail Line. Alternatives are compared to identify a locally preferred transit project. The Study measures the performance of alternatives to identify the greatest benefit to Santa Cruz County residents, businesses and visitors in terms of economy, equity, and the environment. The location of the study includes the most populous and congested sections of Santa Cruz County – from the western edge of the city of Santa Cruz through Watsonville to Pajaro Junction in Monterey County. The study considers the integration of the locally preferred alternative with future intercounty and inter-regional rail connections to the Monterey, Gilroy, the Bay Area and beyond.

### 1.1 STUDY AREA

The Santa Cruz Branch Rail Line (SCBRL) is a continuous transportation corridor that spans approximately 32 miles of Santa Cruz County’s coast from Watsonville/Pajaro in South County to Davenport on the north coast (Figure 1.1). The SCBRL runs parallel to the often-congested Highway 1 and connects to regional and state rail lines in Pajaro. In October 2012, the Santa Cruz County Regional Transportation Commission purchased this transportation corridor on behalf of the community to provide transportation options that support a sustainable transportation system through a triple bottom line framework of economic vitality, social equity, and environmental health. This underutilized transportation corridor offers tremendous potential for new mobility options for residents, businesses and visitors alike including freight rail, high-capacity public transit service, and bicycle and pedestrian facilities.

The SCBRL is within one mile of more than 92 parks, 42 schools, and approximately half of the county’s residents. It links major activity centers starting at Pajaro junction and traversing downtown Watsonville, Aptos Village, Capitola Village, Live Oak, the Santa Cruz Boardwalk area, West side of Santa Cruz and the University of California Santa Cruz Coastal Campus. The right-of-way is generally 50 to 60 feet wide with 37 bridges and trestles, including major crossings of the Pajaro River, Highway 1, Soquel Creek, the Santa Cruz Yacht Harbor and the San Lorenzo River.

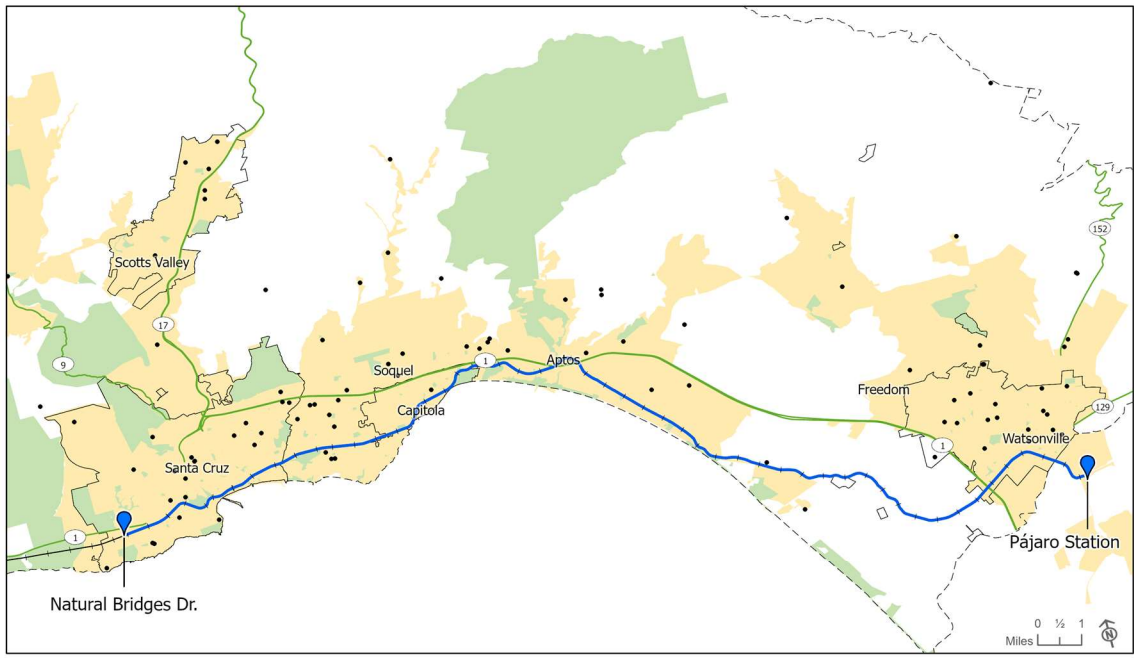
Adjacent land uses include residential, commercial, industrial, agricultural, and park land/open space. The many parks and recreational facilities along the rail line attracting tourists from around the globe include Watsonville Sloughs, Manresa State Beach, Seacliff State Beach, New Brighton State Park, Capitola Village and Beach, Simpkins Swim Center, Santa Cruz Yacht





Harbor, Santa Cruz Beach and Boardwalk, Cowell’s Beach, Natural Bridges State Park, Wilder Ranch State Park and Cotini-Coast Dairies National Monument.

**Figure 1.1: TCAA/RNIS Study Area**



- TCAA Project Limits: Pájaro to Natural Bridges Dr.**
- Project Area
  - Santa Cruz Branch Rail Line
  - Highways
  - Schools
  - Urban Areas
  - Parks/ Open Space
  - City Limits
  - Santa Cruz County Boundary



Although Santa Cruz County is not considered a major metropolitan area, the topography of the area concentrates development between the ocean and the mountains with approximately 90,000 people living within one-half mile of the rail line. The number of people per square mile in the City of Santa Cruz is approximately 5,100; City of Capitola is approximately 6,300; Live Oak ranges from 5,300 to 7,100 people/square mile, and the City of Watsonville has over 8,000 people/square mile.<sup>1</sup> These population densities are comparable to population densities in cities along the San Francisco Bay Peninsula. Population density along the SCBRL will likely increase over time, as the cities and county prioritize infill development close to existing services and destinations as part of the Sustainable Communities Strategy for the region.

<sup>1</sup> U.S. Census Bureau Quick Facts, <https://www.census.gov/quickfacts/fact/table/US/PST045219>







## 1.2 TRANSIT ON A DEDICATED FACILITY

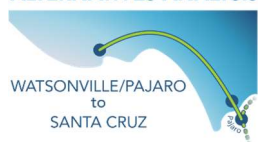
The RTC endeavors to work toward a sustainable transportation system that addresses the many challenges that face Santa Cruz County now and in the future. The current state of Santa Cruz County’s transportation infrastructure is strained and unable to effectively serve the community. Improvements in the transportation network are essential for a stronger local economy, improved environmental and public health, and a better quality of life. Commuters, youth, seniors, low-income individuals, people with disabilities, businesses, and visitors have a diverse set of transportation needs.

A transit facility utilizing the SCBRL as a dedicated guideway would greatly advance sustainable transportation goals for Santa Cruz County and would also advance state and federal transportation planning policies, guidelines and requirements. Here’s how transit on the SCBRL can advance state and other legislative priorities for more sustainable transportation and provide significant transportation improvements for Santa Cruz County.

- **Improve equitable multimodal options.** Providing transit on the SCBRL expands travel choices and can move people more efficiently and sustainably. Local roads and highways are increasingly congested; our population continues to grow; state mandates require reductions in how much people drive, particularly alone; and, many people in our community cannot drive, or do not have the income needed to own a vehicle.
- **Expanded transit service and increased ridership.** Construction of transit on a dedicated facility with feeder bus services will expand service, improve transit connectivity and increase transit ridership. Transit and the coastal rail trail work together with bicycle and pedestrian modes of travel often serving as the first and last mile of travel to/from transit.
- **Environmental justice and social equity.** Providing more transportation and mobility choices such as expanded transit facilities, increases opportunities for all segments of the population at all income levels. Infrastructure choices can strengthen communities, create pathways to education and jobs, and improve the quality of life for individuals and communities. People with disabilities including the deaf, blind and those that need mobility devices may rely on public transit to travel independently. Federal regulation and state law require agencies to plan for and implement transportation system improvements that provide a fair share of benefits to all residents, regardless of race, ethnicity or income level. A guiding environmental justice principle of the U.S. Department of Transportation is “to prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority or low-income populations.” The Americans with Disabilities Act prohibits discrimination against people with disabilities in several areas including transportation. A dedicated transit facility between Watsonville and Santa Cruz could serve all Santa Cruz County residents including people with disabilities and the low-income and minority populations in Watsonville, Santa Cruz and Live Oak. Senate Bill 35 and Assembly Bill 1550 require that certain state funds available for transportation must be spent on projects that not only reduce greenhouse gas emissions but also assure meaningful benefits to disadvantaged







communities. Frequent all day weekday and weekend transit service provides a greater level of access to travel for all users for all types of trips.

- **Advance environmental and public health.** The transportation sector is one of the largest contributors to greenhouse gas emissions (GHG) accounting for approximately 40% of emissions statewide. The California Sustainable Communities and Climate Protection Act of 2008 (SB 375) requires the establishment of regional greenhouse gas emission targets and the 2016 California Senate Bill 32 requires the reduction of greenhouse gas emissions by 40% below 1990 levels by 2030. Both rail and bus transit facilities are becoming electrified to meet air quality and GHG emission reduction targets. By 2040, the public bus fleet in California is regulated to be transitioned to all electric. A dedicated transit facility on SCBRL complemented by local transit and bike and pedestrian facilities will provide an end-to-end service that will allow for a reduction in vehicle miles traveled, shifting drive trips to transit, bike, and walk, in order to reduce GHG emissions, combat climate change, and improve air quality and public health.
- **Improve transit travel time and travel time reliability.** The federal Fixing America’s Surface Transportation Act (FAST Act) requires the Association of Monterey Bay Area Governments (AMBAG) to measure and show progress toward travel time reliability performance of the transportation network in the Santa Cruz, Monterey, and San Benito Counties region. Congested roadways make it difficult to predict how long it will take to get places whether traveling by car or a bus in mixed use traffic. Transit, operating on a dedicated guideway, provides improved travel times and greater reliability to help travelers accurately plan their trips. Transit riders are also able to relax, read, work, and avoid traffic.
- **Safety.** Public transit has relatively low collision rates per unit of travel in comparison to automobile travel. Specific measures can also be put in place for improving safety for both users and non-users of the transit service including crossing protection at railroad crossings and safety elements at the stations.
- **Connecting Watsonville and Santa Cruz.** Transit on a dedicated guideway could improve connections between the two largest and fastest growing cities in Santa Cruz County, expanding access to jobs, educational opportunities, and housing. The morning commute from Watsonville to Santa Cruz and the evening commute from Santa Cruz to Watsonville takes more than 2-3 times the off-peak travel times. Improved transit service connecting these communities would provide a viable option for travel.
- **Regional Connections.** Transit would provide a new option for travel not only within Santa Cruz County, but would also connect at Pajaro Station with planned rail service to the San Francisco Bay Area, Monterey County, Sacramento, and south along the California Coast. Pajaro Station is about 20 miles from the planned high-speed rail station in Gilroy. Improved transit access to the future high-speed rail line in Gilroy would create a viable alternative for county residents to access the Bay Area and the entire state of California and for tourists to visit Santa Cruz County without need for a car.





- **Transit-oriented development/compact sustainable communities.** Transit oriented development provides opportunities for significantly reducing number of trips taken by car. Linking housing to a transportation network through this type of development increases transit use, promoting healthier lifestyles and sustainable communities. Public transportation investments lead to more walkable neighborhoods, with essential services and jobs near transit stops. Compact development in turn provides a host of environmental and social benefits, helping to reduce vehicle miles traveled (VMT), fuel use, and greenhouse gas (GHG) emissions. Compact development also makes the most of existing infrastructure (water, roads, utilities, schools, etc.) while minimizing sprawl into open spaces.
- **Funding landscape is changing.** California has made major policy changes that minimize the amount of funding for projects that increase highway capacity and increase the funding for transit projects, particularly for dedicated systems that serve disadvantaged communities and promote transit-oriented development.

High-capacity transit service could also contribute to or support many existing policies and goals of local government, environmental groups and local business organizations. As part of an integrated transit network, transit on the SCBRL would be integrated with the fixed route bus service and the bicycle and pedestrian network. Transit on the SCBRL could provide a very strong supporting role in the future development of healthy sustainable communities in Santa Cruz County.

### 1.3 HISTORICAL PERSPECTIVE

The Santa Cruz to Watsonville rail line (Davenport to Pajaro) was completed in 1876 connecting at Pajaro to the Southern Pacific Line and then on to the western end of the Transcontinental Railroad in Oakland. The rail line, purchased by Southern Pacific in 1881, has primarily served freight operations during the last century and a half. Freight trains on the rail line have hauled out from Santa Cruz County agricultural products, timber, lumber and cement.

Freight trains have also brought into Santa Cruz County coal, lumber, and building materials. In 2009, the closure of a cement plant located in Davenport at the end of the rail line reduced freight tonnage on the rail line by over 90 percent. Currently freight service is only operating in the Watsonville area and consists of lumber, fuels, building materials, food products, and agricultural equipment and products.

There has also been passenger service on the SCBRL. The Suntan Special from San Jose around the mountain through Pajaro and to Santa Cruz ran on the rail line from 1946 to 1959 and Santa Cruz Big Trees and Pacific Railway has operated a passenger excursion train between Felton in





the San Lorenzo Valley and the beach/Boardwalk area in City of Santa Cruz starting in 1985 and is still operational today.

In 1990, California and Santa Cruz County voters approved Proposition 116 to expand passenger rail transportation, making funding available to buy the rail line. In the early 1990s, the RTC worked with then owner Southern Pacific to discuss the possibility of purchasing the rail line right-of-way or a portion thereof in order to institute passenger rail service. Before the appraisals and analysis were completed Southern Pacific was acquired by Union Pacific (UP) in 1996. In 1998, the Major Transportation Investment Study (MTIS) for the Watsonville to Santa Cruz Corridor was completed. Based on the results of the MTIS, the RTC selected a program of projects for the corridor which included acquisition of the Santa Cruz Branch Rail Line for future transportation purposes, including passenger and freight rail and a bicycle and pedestrian path (Coastal Rail Trail).

The RTC began negotiations with Union Pacific in 2001 to acquire the line for a broader range of transportation uses. Senate Bill 465 was approved by the state legislature in 2001 giving RTC the authority necessary to develop transportation projects on the SCBRL. In 2004, the RTC unanimously approved a letter of intent with UP to purchase the rail line right-of-way. In 2010, the RTC voted unanimously to enter into a purchase and sale agreement with Union Pacific for the Santa Cruz Branch Rail Line that included commitments to continue freight service and initiate recreational passenger rail service.

In 2011, the California Transportation Commission approved acquisition of the Santa Cruz Branch Rail Line for public ownership; and, on October 12, 2012, the RTC successfully completed the acquisition deal with Union Pacific thereby transferring ownership of the Santa Cruz Branch line from the private sector to the people of Santa Cruz County. RTC holds an administrative, coordination and license agreement with an operator for freight and recreational rail service.

### 1.4 COVID-19

In 2020, during the course of the TCAA project, the transit environment was temporarily fundamentally altered, by the global Covid-19 pandemic. Some transit systems shut down entirely. Many other systems drastically cut their service and had to rework their vehicle interiors and reduce capacity to promote safety, and physical distancing of a minimum of 6 feet between passengers. Covid-19 protocols that currently exist to reduce the likelihood of spreading the virus include:

- Enhanced sanitization of vehicles





- Installation of protective barriers between vehicle operators and customers
- Limited vehicle capacity to support physical distancing
- Deploying extra service frequencies on capacity constrained routes
- Mask requirements and distribution of Personal Protective Equipment (PPE)
- Contactless payment and boarding
- Service adjustments to ensure routes serve essential jobs and services

Many of these service components, particularly contactless payment, will likely continue to trend even as the pandemic subsides. New transit systems may have to plan and design for the possibility of future large-scale pandemics.

Ridership of transit fell precipitously during the beginning of the Covid-19 pandemic, and though it did rebound after the initial shelter in place order, ridership is not likely to regain its former levels until after vaccines are successfully distributed to a herd immunity level of the population and the economy returns to normal.

For some sectors of the economy, there will be a new normal. Before the Covid-19 pandemic, approximately 43% of office workers capable of working remotely worked from home at least one day per week, but only 3.6% did so half-time or more. Current research shows that 16-30% of those capable of fully remote work (56% of the American labor force) may continue doing so multiple days per week after the end of the pandemic.<sup>2</sup> This shift may alter the demand intensity for traditional commute hours, and instead diffuse ridership to travel throughout the workday, as office workers come in as needed for in-person work. Transit ridership could decrease, however without the need to commute to work five days a week, some in the workforce may shift to taking transit as owning a personal car becomes an unnecessary expense. Transit ridership estimations for 2040 in the TCAA/RNIS are based on pre-Covid-19 conditions given the likelihood that in twenty years, there will be widespread immunity.

### 1.5 REVIEW OF PREVIOUS PLANS SUPPORTING THE TCAA/RNIS

Since the acquisition of the SCBRL ROW in 2012, RTC and other state and local agencies have conducted studies involving the SCBRL ROW. These plans were reviewed with relevant information from each used to support the development of the TCAA/RNIS. The summaries of selected studies are documented below with a more comprehensive list of the studies reviewed

<sup>2</sup> [Global Workplace Analytics](https://globalworkplaceanalytics.com/work-at-home-after-covid-19-our-forecast), December 18, 2020, <https://globalworkplaceanalytics.com/work-at-home-after-covid-19-our-forecast>; [Harvard Business School](https://hbswk.hbs.edu/item/how-much-will-remote-work-continue-after-the-pandemic) research, December 18, 2020, <https://hbswk.hbs.edu/item/how-much-will-remote-work-continue-after-the-pandemic>





provided in **Appendix A** with **Appendix B** presenting a summary table of comparable transit systems.

### ***2013 MONTEREY BAY SANCTUARY SCENIC TRAIL MASTER PLAN***

The Monterey Bay Sanctuary Scenic Trail (MBSST) is a planned 50-mile network of bicycle and pedestrian paths along the coast of Santa Cruz County, from the San Mateo County line in the north to the Monterey County line at Pajaro. The spine of the MBSST will follow the existing 32-mile rail corridor, adjacent to the rail tracks and is often referred to as the “coastal rail trail”. Consistent with the RTC’s goal to expand transportation use of the rail corridor, the RTC adopted an MBSST Master Plan in November 2013 and a revised version in February 2014. The MBSST Master Plan was developed through a multiyear comprehensive planning process involving extensive input from members of the public, local jurisdictions, and resource agencies.

The Master Plan defines the trail alignment and describes design features for this network of bicycle and pedestrian trails that will serve transportation and recreation uses. The Master Plan also identifies planning considerations associated with trail construction and proposes policies and options related to design, implementation, operation, maintenance and liability. Detailed design is being done as sections of the trail are funded and implemented. The TCAA/RNIS considers the construction of a multiuse bicycle and pedestrian trail along the rail line property, parallel to the public transit facility. As of December 2020, over 18 miles of trail along the rail right-of-way are or in some phase of development. The MBSST Master Plan can be found on the RTC website (<https://sccrtc.org/projects/multi-modal/monterey-bay-sanctuary-scenic-trail/mbsst-master-plan/>).

Key Considerations of the MBSST used to support the TCAA/RNIS included:

- Preserve integrity of the MBSST by focusing on the development of a cohesive Coastal Rail Trail
- The Coastal Rail Trail is being developed so that future transit service along the corridor is not precluded
- The Coastal Rail Trail provides safe and direct active transportation links to transit stations as part of a first and last mile solution for end-to-end travel
- Provide bikeshare and other active transportation options at transit station locations for commuter or recreational use on the Coastal Rail Trail.

### ***2015 SANTA CRUZ BRANCH RAIL LINE RAIL TRANSIT FEASIBILITY STUDY***

RTC completed the Rail Transit Feasibility Study (RTFS) in 2015 to analyze potential rail transit service scenarios on the rail right-of-way between west side of Santa Cruz and Watsonville and to identify potential station locations that could serve Santa Cruz County. The study included a







detailed analysis of the Santa Cruz Branch Rail Line corridor and discussed how different rail transit service options could improve mobility and accessibility for communities along the corridor. Input was solicited from the public and other stakeholders on the goals, objectives, and performance measures following a triple bottom line framework of economy, equity and the environment. Data on potential ridership, capital and operation/maintenance costs, and travel times and other performance measures were used to evaluate the various service scenarios.

The RTFS laid the groundwork for future planning and analysis pertaining to the identification, evaluation and comparison of high-capacity public transit service options for the TCAA/RNIS. The Rail Transit Feasibility Study can be found on the RTC website (<https://sccrtc.org/projects/rail/passenger-rail/>).

Key considerations of the Rail Transit Feasibility Study used to support the TCAA/RNIS included:

- The 32-mile SCBRL ROW offers a continuous corridor to provide short- and long-distance travel needs. Adding new mobility options that expand travel choices would help address mobility needs within and between the most heavily populated parts of the County
- Transit service would have the potential to improve connectivity between communities within the County and connect with other rail services to adjoining counties, Bay Area, and Southern California
- For those commuting between Watsonville and Santa Cruz, transit service would provide a reliable and cost-effective alternative to commuting along congested Highway 1 offering emission, and energy reductions and position the community to be more competitive for transportation funding that is increasingly requiring GHG reduction strategies
- The RTFS laid the groundwork for discussions on type of service, station locations and vehicle types. Community input received included the following:
  - Provide a transit service that includes Watsonville and regional connections at Pajaro
  - Interest in lighter, smaller, quieter, more efficient, low or zero emission vehicles
  - Input on frequency of service was variable from provide frequent service to concerns about too many trains a day impacting neighborhoods
  - Capacity for vehicles to accommodate bikes
  - Input on station locations include; consider Depot Park station for the Santa Cruz station; consider the Westside Santa Cruz station near Natural Bridges to be the primary UCSC station instead of Bay St





- Requests for affordable fares; requests that fares cover a higher percentage of the operations and maintenance costs; and requests for a unified fare card that works on local buses
- Opposition to any type of rail service focused on the number of daily trains and impacts to neighborhoods, cost, low ridership projections, horn noise and impacts to rail trail
- The summary of public comments from the Rail Transit Feasibility Study can be found in Appendix A of the Rail Transit Feasibility Study
- The RTFS provided rail transit service information on capital costs, operational and maintenance costs, potential funding sources, ridership estimates, travel times, governance options, implementation activities and timeframe.

**2019 UNIFIED CORRIDOR INVESTMENT STUDY**

The Unified Corridor Investment Study was developed by the RTC to identify multimodal transportation investments that could provide the most-effective use of the three primary cross-county corridors of Highway 1, Soquel Ave/Soquel Dr/Freedom Blvd, and the Santa Cruz Branch Rail Line (SCBRL) right-of-way with the goal to better serve the community’s transportation needs. In November 2016, a sales tax measure (Measure D) was passed that provided funds for transportation projects in Santa Cruz County and directed RTC to evaluate future transportation uses of the SCBRL.

The UCS utilized a performance-based planning and scenario analysis utilizing a triple bottom line framework of economy, equity and the environment. The Unified Corridor Investment Study provided an analysis of options for the rail right-of-way as required by Measure D by evaluating SCBRL corridor scenarios that included rail transit and trail, bus rapid transit and trail, and a trail only scenario, each combined with a package of other projects on Highway 1 and Soquel/Freedom.

The Preferred Scenario emphasized regional projects that included Highway 1 and Soquel/Freedom improvements. For the SCBRL, the Regional Transportation Commission directed RTC staff to protect the rail right-of-way for a high-capacity public transit service and facilities next to a bicycle and pedestrian trail and continue to consider passenger rail service options on the rail right-of-way consistent with Prop 116 requirements; and work jointly with the Santa Cruz Metropolitan Transit District to develop a scope of work for additional analysis of high-capacity public transit alternatives on the SCBRL including their cost, operations, and funding plans and a plan to protect METRO’s current funding sources.

This Transit Corridor Alternatives Analysis study meets the directive of the RTC to perform an alternatives analysis of high-capacity public transit on the SCBRL. The Unified Corridor





Investment Study can be found on the RTC website (<https://scrtc.org/projects/multi-modal/unified-corridor-study/>).

Key considerations of the Unified Corridor Investment Study used to support the TCAA/RNIS included:

- Continue to utilize the triple bottom line sustainability framework of economy, equity, and environment for decision making in developing the goals, objectives and performance measures for the TCAA/RNIS
- Where feasible, utilize a quantitative performance-based planning analysis for evaluation of alternatives
- Provide capital and operations and maintenance costs for the transit alternatives evaluated
- Develop a funding plan for the locally preferred alternative
- Protect the Rail corridor for high-capacity public transit use and an adjacent bicycle and pedestrian facility, by maintaining the railway tracks and allowing freight and excursion (non-commuter) passenger service on the railway
- Continue the development of the coastal rail trail along the rail right-of-way
- Continue to consider passenger rail service options on the rail right-of-way consistent with Prop 116 requirements, with consideration of other high-capacity public transit options
- Collaborate with the Santa Cruz Metropolitan Transit District (METRO) to develop a proposal to evaluate transit alternatives on the Santa Cruz Branch Rail Line
- Support development of an integrated transit network, which includes a dedicated transit facility on the rail right-of-way that incorporates the latest technologies.

### **2018 CALIFORNIA STATE RAIL PLAN**

The 2018 California State Rail Plan (Rail Plan) developed by Caltrans Division of Rail & Mass Transportation (DRMT) provides a new framework for investing in California’s integrated rail network and sets the stage for new and better rail and community connections throughout the State. The plan outlines a strategy for developing a state-of-the-art rail system that will help Californians achieve greenhouse gas and air quality goals while boosting economic growth and helping to create more livable communities. The Rail Plan vision describes an integrated network that provides a faster, more frequent and connected service for moving both people and goods. A statewide rail system offers a viable alternative to driving for both local and long-distance trips for all California residents and visitors, including those who lack access to or cannot afford automobiles, and for people who choose not to drive.

The Rail Plan vision provides a framework for realizing the full potential of our existing rail network while helping to reduce highway congestion. The Santa Cruz Branch Rail Line links to





existing and proposed new passenger rail services on the state rail network – extending from San Diego to past the northern boundary of California (**Figure 1.2**). The near-term regional goals of the Rail Plan include a station at Pajaro/Watsonville and an analysis of opportunities to improve connections between Santa Cruz, Monterey and the State network including High-Speed Rail at Gilroy. The mid-term goals include implementation planning for connecting Santa Cruz and Monterey to the statewide rail network at Gilroy and establishment of hourly service by 2040. Caltrans is in the process of updating the 2022 State Rail Plan and initial service development includes these key connections in the region and to the broader statewide network. Rail service along the SCBRL, or other integrated transit service, will continue to be an important feature for connecting the Santa Cruz region to the statewide network.

As part of the State rail implementation planning efforts, Caltrans has been refining the rail network integration through partnership with local planning agencies throughout the state. To advance implementation, Caltrans awarded Network Integration funding to agencies across the state, including the RTC and TAMC, to refine service goals, analyze alternatives, and advance the development of the mid-and long-term service goals identified in the State Rail Plan. This funding and State direction have been an integral part of the TCAA/RNIS. Results of the TCAA/RNIS on the locally preferred transit alternative will determine the type of transit service that would connect Santa Cruz County at Pajaro to the future statewide rail network. Depending on the chosen alternative, the results of the TCAA/RNIS also impact how the regional service connects with statewide service and thus how the inputs will be included for the Rail Plan update.

Key considerations of the California State Rail Plan used to support the TCAA/RNIS included:

- Connect and update the transportation system built on rail networks and highways from the 19th and 20th centuries. The status quo is not enough to support this growing economy and meet its robust economic and environmental future needs.
- The Rail Plan facilitates networkwide coordination through scheduled, or “pulsed,” transfers between systems and transit types. Pulse scheduling enables connecting services at hubs to be linked together to allow optimal onward travel consistently throughout the day with minimal transfer times.
- The Rail Plan emphasizes universal accessibility, competitive travel time and service frequencies, integration at stations with first/last mile solutions, and a clean and energy efficient transportation system.
- The Rail Plan prioritizes zero and near-zero emissions technologies, including battery electric or fuel cell train sets that can deliver clean service with limited community impacts from noise, emissions, and view obstructions.





- The Santa Cruz Branch Rail Line is identified in the Rail Plan as part of the Central Coast geographic service area between San Jose in the north and Santa Barbara/Goleta in the south, including the Union Pacific Coast Route and Santa Cruz/Monterey Branch Lines.
- The 2040 vision supports establishment of a regional rail network connecting Central Coast communities to each other and feeding into the high-speed rail at Gilroy providing access to and from Northern and Southern California.
- Establish a hub station at Pajaro/Watsonville that provides hourly connections to Santa Cruz.
- The plan assesses a changing funding landscape, including the influence of newly funded Senate Bill 1 (SB1) transportation package and California’s Cap-and-Trade Program for reducing GHG emissions.

**Figure 1.2: California State Rail Plan, Northern California Service – 2040 Vision**







## 1.6 RAIL NETWORK INTEGRATION STUDIES

### MONTEREY COUNTY

The Transportation Agency for Monterey County (TAMC) is actively pursuing bringing rail service to Monterey County that includes local commuter service as well as greater regional access. The Monterey County Rail Extension project extends passenger rail service between San Francisco and Gilroy, south to the downtown Salinas station. The service will start with two round trips between Salinas and San Francisco and expand as demand warrants. Future phases of the project include a new station at Pajaro/Watsonville for connection to the Santa Cruz Branch Rail Line and a new station in Castroville for connection to the Monterey branch line (see above in **Figure 1.2**).

TAMC is also currently working on a Monterey Bay Area Rail Network Integration Study (RNIS) funded by Caltrans for assessing intercity rail service between Monterey County and Santa Clara County and connecting to southern California along the Coast Rail Corridor. The Monterey Bay RNIS is also evaluating regional rail service between the Cities of Monterey and Santa Cruz. Optimal service frequencies, equipment needs, governance, and community benefits are being evaluated.

### SANTA CRUZ COUNTY

The Santa Cruz County Rail Network Integration Study is an integral part of the TCAA/RNIS for assessing how best Santa Cruz County can connect to the regional rail network at Pajaro. All alternatives that are evaluated in the TCAA/RNIS will provide transit service to Pajaro to determine the best option for a high-capacity transit service both within Santa Cruz County and integrated with the regional rail network. This study will include considerations for operations, governance, ridership and community benefits for service in Santa Cruz County and regional connectivity at Pajaro to Monterey, the San Francisco Bay Area and the Coast Rail Corridor. RTC and TAMC are collaborating on these studies to assure regional connectivity and consistency between studies.

The objectives of the collaborative Rail Network Integration Studies are to:

- Build on previous work of the RTC to evaluate transit options for the SCBRL
- Assess station locations, service frequency and connectivity to local transit service
- Integration with service planning in Monterey County
- Evaluate governance options
- Assess ridership, vehicle miles traveled and greenhouse gas emission reductions
- Evaluate benefit to transportation disadvantaged communities





## 1.7 PURPOSE OF TCAA/RNIS

This study focuses on identifying a preferred transit alternative to serve the most populous and congested sections of Santa Cruz County – from the western edge of the city of Santa Cruz through Watsonville and to Pajaro. Overall objectives of the study include:

- Identify, evaluate and compare a range of high-capacity public transit service options for the Santa Cruz Branch Rail Line for a future year of 2040 that can coexist with a bicycle and pedestrian trail within the rail right-of-way
- Plan an integrated transit network for Santa Cruz County utilizing all or parts of the SCBRL as a dedicated continuous transit facility
- Utilize a performance-based alternatives analysis for identifying various options for achieving a set of goals and objectives to facilitate decision-making
- Provide information on alternatives considered including ridership forecasts, travel time, benefits to transportation disadvantaged populations, capital and operating/maintenance costs, revenue projections and funding/financing options as well as other performance measures that advance the triple bottom line of sustainability in terms of economy, equity, and the environment
- Estimate ridership based on how to serve existing and attract new transit users with service along the SCBRL between Watsonville/Pajaro and Santa Cruz
- Evaluate proposed future interregional connections to the San Francisco Bay Area, Monterey, Gilroy and beyond via Pajaro Station in Monterey County
- Provide information on station/boarding locations, passing sidings/lanes and maintenance facilities for transit vehicles
- Evaluate system controls and safety, including positive train control for rail and other systems that would be needed for other services, especially with respect to at-grade crossings, and the coexistence of a bicycle and pedestrian trail within close proximity of transit vehicles
- Provide governance options for transit service
- Involve the community, partner agencies, the RTC and METRO in the decision-making process to identify a preferred alternative and next steps to implement the preferred transit alternative
- Identify opportunities to enhance high-capacity transit investment and improve quality of life via strategically located transit-oriented land development in urbanized areas
- Develop a strategic business plan for the selected alternative, including a prototypical cash flow analysis of environmental clearance, right-of-way, design, construction, operations, and maintenance
- Ensure the rail corridor enhances public access to the Monterey Bay National Marine Sanctuary at several key locations consistent with the CA Coastal Act objectives.





### 1.8 TRIPLE BOTTOM LINE AND PERFORMANCE BASED PLANNING

The analysis framework designed and applied in the TCAA/RNIS is based on the Triple Bottom Line Approach (TBLA), a performance-based planning approach utilizing the sustainability principles of environment, economy and equity used to evaluate future investment decisions (Figure 1.3). The TBLA is a consistent tool applied by the RTC in previous countywide studies such as the Unified Corridor Investment Study (UCS) and the 2040 Santa Cruz County Regional Transportation Plan. There are numerous advantages to adopting a performance-based planning approach including:

- Identifying clear goals of the project based on open discussions with stakeholders
- Evaluation of several alternatives or strategies for achieving the project goals
- Providing a detailed, data-driven analysis for decision-making
- The need to strategically focus investments due to greater competition for limited funding
- Provide the public greater transparency and opportunities for input for how transportation dollars are spent
- Demonstrating the link between transportation projects and their benefits to environment, economy and equity.

Figure 1.3: Triple Bottom Line Approach to the TCAA/RNIS



A comparison of alternative strategies using a performance based planning approach with a basis on the sustainability principles of environment, economy and equity is recommended by





federal and state agencies.<sup>3,4</sup> The TCAA/RNIS alternatives analysis was performed using this TBLA framework to evaluate high-capacity public transit options on the rail right-of-way that will advance the goals of the project.

The culmination of the analysis is the identification of the Locally Preferred Alternative that best meets the sustainability principles of economy, equity, and environment. The Transit Corridor Alternatives Analysis meets the directive of the RTC to perform an alternatives analysis of high-capacity public transit on the SCBRL. The TCAA/RNIS project team consists of RTC staff, METRO staff, and consultants from HDR and Fehr & Peers Inc.

RTC staff and METRO staff have worked together on every aspect of the project together with the consultant team. The key milestones of the project are outlined below and presented in **Figure 1.4**. Outreach to stakeholders was performed for every key milestone to ensure awareness, education, and input is sought at the right time in the process. The results of the analysis and stakeholder input are presented in Chapters 3 and 4.

The following section presents the TCAA/RNIS analysis framework designed to evaluate the performance benefits of the alternatives in this planning process.

### **MILESTONE 1**

- ✓ Development of Goals, Screening Criteria, and Performance Measures
  - Develop clear goals as the foundation for a successful planning effort. The transportation planning process begins with development of goals recognizing that there are diverse travel needs and that transportation is intertwined with environmental, economic and equity concerns
  - Determine how goals can be evaluated qualitatively through developing screening criteria and quantitatively through performance measures to assess whether the various alternatives being evaluated are advancing the goals of the project. The screening criteria are used to reduce the initial list of alternatives to a short list of alternatives. The performance measures are used to evaluate the short list of alternatives to determine a locally preferred alternative

<sup>3</sup> Performance Based Planning and Programming Guidebook, U.S. Department of Transportation, Federal Highway Administration, September 2013, [https://www.transit.dot.gov/sites/fta.dot.gov/files/Performance\\_Based\\_Planning\\_and\\_Programming\\_Guidebook.pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/Performance_Based_Planning_and_Programming_Guidebook.pdf)

<sup>4</sup> Smart Mobility 2010, A Call to Action for the New Decade, Caltrans, February 2010, <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/office-of-smart-mobility-and-climate-change/smf-handbook-062210-a-a11y.pdf>





- Gather input on the goals, criteria and measures from the public and stakeholders. Important to seek input and obtain buy-in and understanding of screening criteria and performance measures early so that as alternatives are narrowed down, the public and stakeholders are a part of the process
- Seek approval from the RTC.

✓ Initial List of Transit Alternatives

- Develop a full-range of alternatives for a high-capacity public transit that utilize all or part of the rail right-of-way
- Gather input from the public and stakeholders on the initial list of transit alternatives to be considered and potential transit station locations
- Seek approval from the RTC.

**MILESTONE 2**

✓ Screen the Initial List of Alternatives into a Short List of Alternatives

- High-level screening using screening criteria to narrow the initial list of alternatives to a short list of alternatives for detailed analysis
- Present screening process and results that led to short list of transit alternatives and gather input from public and stakeholders on short list of transit alternatives to be considered for further analysis
- Seek approval from the RTC.

**MILESTONE 3**

✓ Value Engineering on Short List of Alternatives

- Perform value engineering to determine the detailed service description (project alignment, station locations and service frequency) for each of the alternatives on the short list
- Evaluate 2 to 4 service descriptions for each alternative and determine the optimal service scenario for each alternative based on cost, ridership and travel time
- One option for each alternative will move forward into the performance measure analysis.

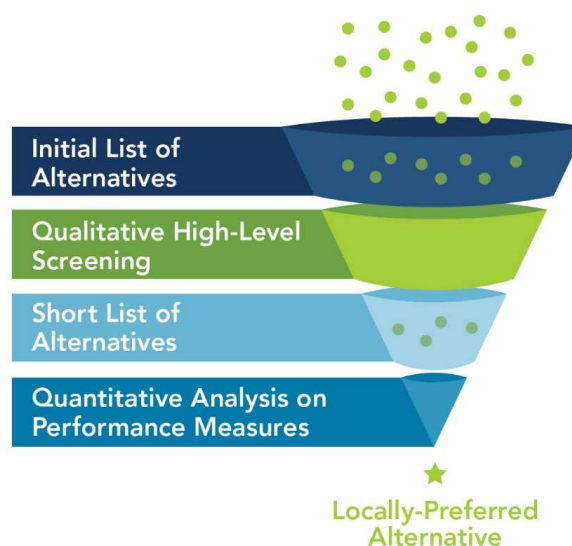






- ✓ Performance Measure Analysis and Locally Preferred Alternative
  - Perform a more detailed quantitative data analysis on the short list of alternatives with the detailed service descriptions from value engineering using performance measures identified in Milestone 1
  - Compare the results of the performance measure analysis to support the identification of the locally preferred alternative
  - Present performance measure results on the short list of alternatives and seek input from public and stakeholders on identified locally preferred alternative
  - Seek approval from the RTC on the locally preferred alternative.

**Figure 1.4: TCAA/RNIS Framework**



### 1.9 FUNDING

The Santa Cruz County Regional Transportation Commission (RTC) received a planning grant from the California Department of Transportation (Caltrans) to develop a Santa Cruz Branch Rail Line Network Integration Study as part of the Transit Corridor Alternatives Analysis. Funding for the TCAA/RNIS was also provided by local voter-approved Measure D funds. In November 2019, the RTC hired a team of consultants, led by HDR Inc., with extensive transit planning experience, to conduct this study. The TCAA/RNIS project team consists of RTC staff, METRO staff, and consultants from HDR and Fehr & Peers Inc.





## CHAPTER 2 - PUBLIC AND STAKEHOLDER OUTREACH

Engagement of diverse audiences during the Transit Corridor Alternatives Analysis was critical in determining a high-capacity public transit alternative that will meet regional needs and be supported by the local and regional communities that the future transit service would serve. The TCAA/RNIS engagement program incorporated a variety of grass roots, in-person tactics, blended with innovative digital tools for providing input online during the Covid-19 pandemic that occurred during the latter part of the project. The engagement program was developed to reach the highly diverse audiences in Santa Cruz County. The main goal for the program was to initiate early and active communications and engagement to include targeted and timely opportunities for seeking input into the analysis process.

### 2.1 STAKEHOLDER ENGAGEMENT

A critical component of the engagement program was the ongoing participation of a diverse stakeholder group and public that serve as a direct conduit to the larger community of constituents. These stakeholders, as key liaisons to RTC and Metro, assisted with sharing information and flagging concerns for timely address. Identified stakeholders were proactively engaged through presentations at established and project-specific hosted meetings, regional media and other digital engagement activities. This engagement of the various stakeholders and public at large continued through each milestone of technical work to support education and seek valuable input on the preferred alternative for the corridor.

**AD HOC COMMITTEE:** To assist in driving decisions that meet the needs of both RTC and METRO, an Ad Hoc Committee was identified early to coordinate with the TCAA/RNIS Project Team throughout the planning process. The TCAA/RNIS team met with the Ad Hoc Committee first to share information and seek guidance to refine all technical components of the TCAA/RNIS before bringing analysis results for each milestone to agency partners, the public, RTC Advisory Committees and the RTC Commission. Members included:

- Andy Schiffrin – Ad Hoc Committee Chair (alternate for Ryan Coonerty, SCCRTC)
- Trina Coffman-Gomez (SCCRTC & METRO)
- John Leopold (SCCRTC & METRO)
- Mike Rotkin (SCCRTC & METRO)
- Ed Bottorff (SCCRTC & METRO)
- Gine Johnson (alternate for Bruce McPherson, SCCRTC & METRO)

**Regional Transportation Commission:** As key decision-makers regarding the ultimate locally preferred alternative of the TCAA/RNIS, extensive coordination with the Commission was





initiated from the beginning of the study. This coordination included soliciting input on the scope of the project and four presentations on results of each of the key milestones of the project. At these commission presentations, the staff reports provided the public and stakeholder comments prior to the RTC providing the TCAA/RNIS project team with direction and approval.

**METRO Board:** Input was solicited at every key milestone from the METRO board in order to ensure all METRO board members had an opportunity to comment on the project. This coordination included soliciting input on the scope of the project and three staff reports on the results of the key milestones of the project.

**Agency Partners:** Key partner agencies coordinated closely with the TCAA/RNIS project team including, but not limited to:

- Planning and Public Works Departments
- Association of Monterey Bay Area Governments (AMBAG)
- County of Santa Cruz
- City of Watsonville
- City of Capitola
- City of Santa Cruz
- City of Scotts Valley
- Santa Cruz Metro
- University of California, Santa Cruz Transportation and Parking Services (UCSC TAPS)
- Caltrans
- California Coastal Commission
- Santa Cruz County Parks

**RTC Advisory Committees:**

- RTC Bicycle Advisory Committee (BAC)
- RTC Elderly and Disabled Transportation Advisory Committee (E&DTAC)
- RTC Interagency Technical Advisory Committee (ITAC)

**Community Focus Groups:** Targeted and diverse focus groups were established at the onset of the planning effort to proactively reach into the many facets of a community through community-based organizations and/or trusted community leaders. The purpose of the focus groups is to act as a conduit into the community to share information at critical milestones. Due to the length of the corridor, the number of community organizations, and general diversity including Limited English Proficiency, non-English speaking, and transportation disadvantaged populations of constituents, two separate focus groups were established to provide opportunity for proactive connection, including:





### Community Focus Group 1

- Business Associations/Chamber of Commerce/Major Employers
- Community Leaders
- Neighborhood Groups
- Youth Groups
- Senior Groups
- Educational and Healthcare Institutions
- Transportation Advocacy Groups
- Environmental Community Groups
- Education Leaders

### Community Focus Group 2 – Watsonville Specific

- Business Associations/Chamber of Commerce/Major Employers
- Spanish Speaking Advocacy Groups
- Educational and Healthcare Organizations
- Environmental Community Organizations
- Human Services Organizations
- Youth and Student Groups
- Women’s Organizations
- Neighborhood Groups
- Faith Based Organizations

**Public Engagement:** The Engagement Program also included a dynamic plan to target and reach the general public through mass media communications, electronic and hard copy notices, as well as conducting large public participation forums. Key activities included:

- SCCRTC Project Webpage – with regular updates at every key milestone
- Collateral Material Distribution (Frequently Asked Questions, fact sheet, maps, presentations, boards, surveys)
- Electronic notices, invitations
- Media and Social Media Campaign
- Public Open Houses (In-person and virtual)

The full Communications and Stakeholder Involvement Plan can be found in **Appendix C**.

## 2.2 TCAA/RNIS OUTREACH

While communication and engagement occurred regularly throughout the entire TCAA/RNIS planning process, three key technical milestones (described in more detail below) were





established to trigger a proactive reach to each of the identified audiences to ensure that education, building awareness, and seeking input at the right time occurred in the TCAA/RNIS planning process. At each technical milestone, when it was time to inform and seek input, the project team engaged, listened, learned, and considered the input received from each of the identified audiences through this communications program. The schedule of outreach events and examples of promotional materials can be found in **Appendix D**.

### **MILESTONE 1**

Milestone 1 focused on development of and seeking input on the draft TCAA/RNIS Goals, Screening Criteria, and Performance Measures, as well as the creation and refinement of a Universe of Alternatives of all possible transit options that could utilize the Branch Line Corridor. The outreach included development of initial tools for education, and activities to build awareness about the TCAA/RNIS planning effort while also seeking input on the key measures that would be the basis for narrowing down to a locally preferred alternative. During this milestone, it was critical to build awareness, understanding and support for the analysis process so that audiences and participants understood how alternatives were screened down to a short list of alternatives for detailed performance analysis and then to the locally preferred alternative. The outreach approach to this milestone is presented in **Table 2.1**.







**Table 2.1: Approach to Milestone 1**

| AUDIENCE  | FORMAT  |
|---|---|
| <b>Agency Partners:</b><br>Ad Hoc Committee<br>RTC Advisory Committees<br><b>Partner Agencies – Planning and Public Works</b> | <ul style="list-style-type: none"> <li>• Presentations at scheduled meetings</li> </ul>   |
| <b>Stakeholder Groups:</b><br>Community Focus Group 1<br>Community Focus Group 2  | <ul style="list-style-type: none"> <li>• Community focus group meetings</li> </ul>  |
| <b>General Public:</b>  | <ul style="list-style-type: none"> <li>• Collateral Material development and distribution</li> <li>• Webpage development</li> <li>• In-person public open houses (2 total)</li> <li>• Survey</li> <li>• Social media and media communications (press release/newspaper ads/radio ads)</li> <li>• Email and hard copy notices</li> </ul> |
| <b>RTC &amp; METRO:</b><br>Commission and Board   | <ul style="list-style-type: none"> <li>• METRO Board meetings to receive input</li> <li>• RTC meetings to obtain approval</li> </ul>  |

**PROMOTIONAL SUPPORT MATERIALS**

To build awareness about the TCAA/RNIS and to support Milestone 1, several promotional tactics were deployed. Utilizing the RTC’s established website and social media platforms, the TCAA/RNIS team posted key information on the RTC site and Facebook page to promote project activities and milestones. Along with these established tools, the team promoted Milestone 1 of the TCAA/RNIS in the following ways:

**POSTCARD MAILERS:**

Electronic and hard copy bi-lingual mailer invitations were distributed to promote participation opportunities for Milestone 1. The contact database included 4,059 property and business owners, along with corridor-wide stakeholder representatives.





### NEWS RELEASE:

A News Releases was sent to over 150 media contacts in surrounding areas of Santa Cruz County.

- Press Release for Milestone 1 outreach sent on Jan. 21, 2020

### ADVERTISEMENTS:

Advertisements were also prepared and placed in the following:

- Good Times Ad Feb. 5, 2020 issue
- Pajaronian Ad Feb. 7, 2020 issue
- Sentinel Ad Feb. 9, 2020 issue

### RADIO ADVERTISEMENTS:

Radio advertisements were also prepared and conducted for the following:

- Preciosa Radio Ads (Spanish) 38 spots from Feb. 2-9, 2020
- KSCO Radio Ads 12 spots from Feb. 3-10, 2020
- KSCO Radio Interview on Rosie Chalmers Morning Show with Shannon Munz on Feb. 10, 2020
- KSCO Radio Interview with reporter Josh Stephens and Luis Mendez on Feb. 14, 2020
- Sentinel story ran on Feb. 12, 2020

<https://www.santacruzsentinel.com/2020/02/12/rtc-and-metro-initiate-transit-search/>

### STAKEHOLDER E-BLASTS:

Four e-blasts were sent to 350 identified stakeholders and over 3,000 interested community members providing an update of the TCAA/RNIS and notification of the public open houses held in Santa Cruz and Watsonville in support of Milestone 1.

- Community Focus Group 1 Meeting Invite E-blast sent on Jan. 17, 2020
- Community Focus Group 2 Meeting Invite E-blast sent on Jan. 17, 2020
- Public Open House Meeting Invite E-blast sent on Feb. 4, 2020 (English and Spanish)
- Thank you for participating E-blast sent on February 4, 2020

### SOCIAL MEDIA:

Ten social media posts and two open house event pages were developed and placed on the RTC's Facebook page relating to the Santa Cruz and Watsonville Public Open Houses and Survey.

### **MILESTONE 1 – PUBLIC OPEN HOUSES**

During Milestone 1, two in-person, informational Public Open Houses were hosted by RTC and METRO in Santa Cruz and Watsonville to create an opportunity for the public to review





information and talk with project team members directly. The interactive meetings included several activities at the meeting along with display boards and collateral handouts. Attendees had the opportunity to provide input in multiple ways at the Milestone 1 open houses as they viewed information at their own pace including three activity stations, a survey, and comment cards.

## STATIONS

Five stations were set up during the Milestone 1 open houses:

- **Station One:** Welcome station hosted with an optional sign-in sheet and project materials and handouts
- **Station Two:** Evaluations Framework station designed to share information and gather input on the draft screening evaluation metrics to identify which goals were most important to the public. This station displayed four separate charts that allowed members of the public to write in their feedback and questions
- **Station Three:** Initial List of the Universe of Alternatives station designed to share information and gather input on the potential transit services considered in the TCAA/RNIS. The public was able to provide feedback on each of the 21 alternatives displayed
- **Station Four:** Potential Transit Station Locations station displayed on a large regional map with the public able to record feedback and place it on a specified area of the map for consideration
- **Station Five:** Hosted the optional online survey and provided printed and blank comment cards for the public to provide input and submit it through a comments card collector

## MILESTONE 1 – OPEN HOUSE PARTICIPATION

Participation in the Milestone 1 Open Houses included:

- Roughly 300 public members attended
- 154 total comments submitted via email during Milestone 1
- 75 comment cards were received





**Milestone 2**

The valuable input from the previous Milestone 1 efforts helped refine the draft Goals and Screening Criteria prior to evaluating the Universal List of Alternatives through a qualitative screening process in Milestone 2. This screening narrowed down the large universe of alternatives to a short list of four potential transit alternatives for further analysis. The approach to this milestone is shown in **Table 2.2**. The public and key stakeholders were asked to provide input on the short list of alternatives and highlight any further concerns prior to Commission approval of the short list for further performance-based analysis.

**Table 2.2. Approach to Milestone 2**

| AUDIENCE  | FORMAT   |
|---|--|
| <b>Agency Partners:</b><br>Ad Hoc Committee<br>RTC Advisory Committees<br><b>Partner Agencies – Planning and Public Works</b> | <ul style="list-style-type: none"> <li>• Presentations at scheduled meetings</li> </ul>  |
| <b>Stakeholder Groups:</b> Community Focus Group 1 Community Focus Group 2  | <ul style="list-style-type: none"> <li>• Online outreach via Email and Social Media</li> </ul>   |
| <b>General Public:</b>  | <ul style="list-style-type: none"> <li>• Online Virtual Public Meeting</li> <li>• Survey</li> <li>• Public Hearing at RTC meeting</li> <li>• Digital Engagement: Social media, website</li> <li>• Media communications (press release/newspaper ads/radio ads)</li> <li>• Email and hard copy notices</li> <li>• Collateral Material distribution</li> </ul> |
| <b>RTC &amp; METRO:</b><br>Commission and Board   | <ul style="list-style-type: none"> <li>• METRO Board meetings to receive input</li> <li>• RTC meetings to obtain approval</li> </ul>   |





### **PROMOTIONAL SUPPORT MATERIALS**

The TCAA/RNIS Project Team promoted Milestone 2 of the TCAA/RNIS in the following ways:

#### **POSTCARD MAILERS:**

Electronic and hard copy bi-lingual mailer invitations were distributed to promote participation opportunities for Milestone 1. The contact database included 4,059 property and business owners, along with corridor wide stakeholder representatives.

#### **NEWS RELEASE:**

A News Release was sent to over 150 media contacts in surrounding areas of Santa Cruz County.

- Press Release for Milestone 2 outreach sent on April 13, 2020

#### **ADVERTISEMENTS:**

- Advertisements were also prepared and summarized in the following. Pajaronian Online Ad ran May 4-10, 2020
- Sentinel Online Ad ran May 4-10, 2020
- Sentinel Ad May 24, 2020 issue

#### **RADIO ADVERTISEMENTS:**

Radio advertisements were also prepared and conducted for the following:

- Preciosa Radio Ads (Spanish) 38 spots from May 1-18, 2020
- KSCO Radio Ads 12 spots from April 27-May 3, 2020
- Sentinel story ran on June 4, 2020  
<https://www.santacruzsentinel.com/2020/06/04/santa-cruz-county-agency-makes-short-list-for-rail-trail-transit-options/>

#### **STAKEHOLDER E-BLASTS:**

Three e-blasts were sent to 350 identified stakeholders and over 3,000 interested community members providing an update of the TCAA/RNIS and notification of the online open house held in support of Milestone 2.

- Community Focus Groups Online Open House Invite E-blast sent on April 13, 2020
- Public Online Open House Meeting Invite E-blast sent on April 13, 2020 (English and Spanish)
- Public Online Open House Meeting Reminder E-blast sent on May 8, 2020 (English and Spanish)







### SOCIAL MEDIA:

Social media posts and an open house event page were developed and placed on the RTC's Facebook page relating to the Virtual Open House and Survey.

### **MILESTONE 2 – ONLINE OPEN HOUSE**

In an effort to reach the larger public in a convenient way, RTC had already planned to engage the public with project information related to Milestone 2 using a Virtual Online meeting format. This decision was especially advantageous after the beginning of the shelter in place order for Santa Cruz County, issued on March 16, 2020 to help slow the spread of the Covid-19 pandemic locally. The project team could seamlessly continue with planned TCAA/RNIS outreach that aligned with the guidelines of the order against large public gatherings. This Milestone 2 online open house was open to the public from April 13 to May 11, 2020.

### STATIONS

The online open house took the public through three stations:

1. Station 1 - Status and progress of the TCAA/RNIS, including project goals, timeline, and details on outreach efforts
2. Station 2 - Outcomes of the alternatives screening phase, including reviewing the triple bottom line approach, screening results, and highlighting top ranked alternatives
3. Station 3 – More details on the short-listed alternatives screened and moving forward into more detailed evaluations, including typical characteristics and benefits

The public could provide their input on Milestone 2 through a survey, open-ended comments online or via email sent to RTC.

### **MILESTONE 2 – ONLINE OPEN HOUSE PARTICIPATION**

Participation in the Milestone 2 Online Open Houses included:

- 1,973 users visited the online open house website
- 860 total users participated in the online open house
- 209 public members opted to take the online survey
- Over 230 total comments were submitted via email during the Milestone 2 outreach, from April 13, 2020, to May 11, 2020

### **Milestone 3**

Milestone 3 marked the opportunity to conduct and highlight the quantitative Performance-Based analysis process of the short list of alternatives identified through Milestone 2, share the analysis results, and seek input on the locally preferred alternative. **Table 2.3** shows the overall outreach approach to Milestone 3.





**Table 2.3. Approach to Milestone 3**

| AUDIENCE  | FORMAT  |
|---|---|
| <b>Agency Partners:</b><br>Ad Hoc Committee<br>RTC Advisory Committees<br><b>Partner Agencies – Planning and Public Works</b> | <ul style="list-style-type: none"> <li>• Presentations at scheduled meetings</li> </ul>   |
| <b>Stakeholder Groups:</b><br>Community Focus Group 1<br>Community Focus Group 2  | <ul style="list-style-type: none"> <li>• Online outreach via Email and Social Media</li> </ul>  |
| <b>General Public:</b>  | <ul style="list-style-type: none"> <li>• Online Virtual Open House</li> <li>• Survey</li> <li>• Live Online Chat</li> <li>• Digital Engagement: Social media, website</li> <li>• Media communications (press release/newspaper ads/radio ads)</li> <li>• Collateral Material distribution</li> <li>• Email and hard copy Notices</li> </ul> |
| <b>RTC &amp; METRO:</b><br>Commission and Board   | <ul style="list-style-type: none"> <li>• METRO Board meetings to receive input</li> <li>• RTC meetings to obtain approval</li> </ul>  |

**PROMOTIONAL SUPPORT MATERIALS**

The TCAA/RNIS Project Team promoted the TCAA/RNIS in the following ways:

**POSTCARD MAILERS:**

Electronic and hard copy bi-lingual mailer invitations were distributed to promote participation opportunities for the TCAA/RNIS. The contact database included 4,059 property and business owners, along with corridor wide stakeholder representatives.

**NEWS RELEASE:**

- Two News Releases were sent to over 150 media contacts in surrounding areas of Santa Cruz County to promote the Milestone 3 Virtual Open House, Live Chat and Survey. Press Release for Milestone 3 Virtual Open House sent on Nov. 6, 2020
- Press Release for Milestone 3 Online Live Chat Sessions sent on Nov. 10, 2020





### ADVERTISEMENTS:

Advertisements were also prepared and placed in the following:

- Pajaronian Online Ad ran Nov. 9-16, 2020
- Pajaronian Ad ran in the Nov. 13 issue
- Sentinel Online Ad ran Nov. 9-16, 2020
- Good Times Ad ran in the Nov. 11 issue

### RADIO ADVERTISEMENTS:

Radio advertisements were also prepared and conducted for the following:

- Preciosa Radio Ads (Spanish) 38 spots from Nov. 9-16, 2020
- KSCO Radio Ads 12 spots from Nov. 9-16, 2020
- KSCO Radio Interview on Rosie Chalmers Morning Show with Shannon Munz on Nov. 10, 2020
- Santa Cruz Local story ran on Sept. 7, 2020  
(<https://santacruzlocal.org/2020/09/07/santa-cruz-county-rail-corridor-transit-options-to-be-narrowed/>)

### STAKEHOLDER E-BLASTS:

Three e-blasts were sent to 350 identified stakeholders and over 3,000 interested community members providing an update of the TCAA/RNIS and notification of the public open houses held in Santa Cruz and Watsonville in support of Milestone 1 and 2.

- Community Focus Group Meeting Invite E-blast sent in January 2020.
- Online Open House Meeting Invite E-blast sent in February 2020 (English and Spanish)
- Thank you for participating E-blast sent in May 2020

### SOCIAL MEDIA:

Ten social media posts and an open house event page were developed and placed on the RTC's Facebook page relating to the Online Open House, Online Live Chat Sessions and Survey (all conducted in Milestone 3).

### MILESTONE 3 – ONLINE OPEN HOUSE

In an effort to reach the larger public as the prohibition of large gatherings was still in place for Santa Cruz County due to the Covid-19 pandemic, Milestone 3 Open Houses were also delivered virtually. This Milestone 3 online open house was open to the public from Nov. 6 to Nov. 27, 2020.

### STATIONS

The online open house took the public through four stations:

- Station 1 – TCAA/RNIS progress overview, including project objectives, triple bottom





- line framework and a recap of Milestones 1 & 2.
- Station 2 – Short list alternative alignments & stations, including summary characteristics and summary of performance measure results
- Station 3 – Performance measure results of four alternatives on short list
- Station 4 – Proposed locally preferred alternative (LPA), including a summary of the proposed LPA, map of the proposed LPA and survey questions & comment slide.

The public could provide their input on Milestone 3 through a survey, open-ended comments online or via email sent to RTC. A Chat room was also available for participants to call in at two different times to ask questions directly of the TCAA/RNIS Project Team through a chat box that would be responded to in real time.

### ***MILESTONE 3 – ONLINE OPEN HOUSE PARTICIPATION***

Participation in the Milestone 3 Online Open House included:

- 800 users visited the online open house website
- 797 total users participated in the online open house
- 26 total users participated in the online chat session
- 1,002 public members opted to take the online survey
- Over 280 total comments were submitted via email during the Milestone 3 Outreach, from November 6, 2020, to November 27, 2020





## CHAPTER 3 - MILESTONE 1 OUTCOMES

This section presents the TCAA/RNIS outcomes for Milestone 1 including:

- Identify Goals, Evaluations Metrics, Screening Criteria, and Performance Measures, designed to support the overall TBLA planning process
- Identify the Universe of Transit Alternatives for Evaluation

### 3.1 GOALS, EVALUATION METRICS, SCREENING CRITERIA, AND PERFORMANCE MEASURES

The development of goals is the first step in the transportation planning process where an alternatives analysis is being performed. Goals address key desired outcomes from the transportation project(s) under evaluation and are developed based on a vision of the future that is informed by public and stakeholder input as well as the need to meet legislative requirements.

Once the goals are identified, metrics are developed that provide a way to measure whether the goals will be advanced. An alternatives analysis, a process for evaluating the costs and benefits of a number of strategies, utilizes metrics for determining the most beneficial high-capacity public transit for the Santa Cruz Branch Line. The evaluation metrics developed for the TCAA/RNIS are twofold: screening criteria that is used to qualitatively reduce the initial list of transit alternatives to a short list of alternatives in Milestone 2 and performance measures that are used to quantitatively evaluate the short list of alternatives to determine a locally preferred alternative in Milestone 3. Screening criteria and performance measures were defined to support and link to each of the goals of the TCAA/RNIS.

In developing the goals and metrics for the TCAA/RNIS, a variety of studies were reviewed, along with best practices from around the country and guidance related to transportation performance measurement. Studies reviewed include the 2040 Santa Cruz County Regional Transportation Plan and Unified Corridor Investment Study (See **Chapter 1** and **Appendix A**). Federal guidance, best practices and experience in developing similar programs also informed the identification of goals and metrics for use in the TCAA/RNIS. In addition, the definition of goals and metrics was supplemented with input obtained from stakeholders and the public.

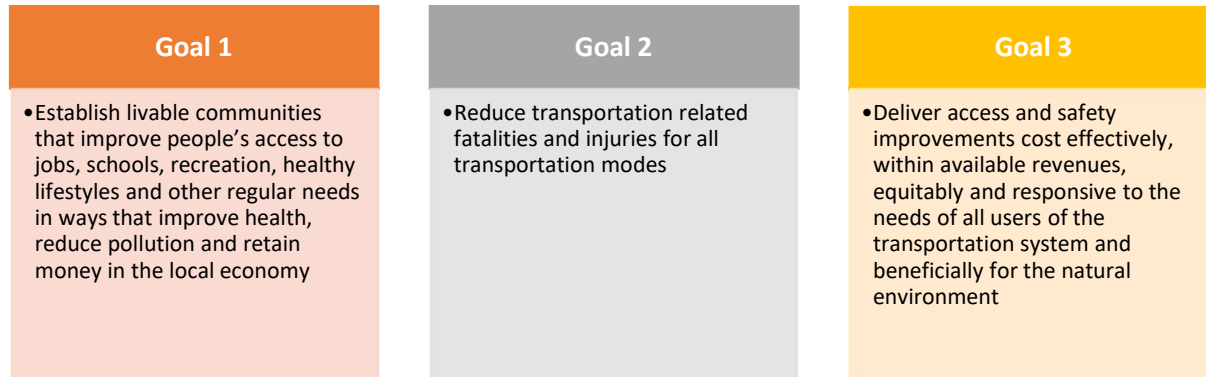
As presented in **Figure 3.1**, all three goals identified in the 2040 Santa Cruz County Regional Transportation Plan were used to support the TCAA/RNIS analysis framework with each RTP goal touching one of the three TBLA “legs” of economy, environment, and social equity.







**Figure 3.1: Regional Transportation Plan (RTP) Goals**



The TCAA/RNIS goals and evaluation metrics for each of the TBLA legs for economy, social equity, environmental, and other are presented below.

**GOALS AND EVALUATION METRICS – ECONOMY**

Table 3.1 shows the goals, evaluation metrics, screening criteria and performance measures for economy. Fiscal feasibility is one of the primary goals to support the economic leg of the triple bottom line. Metrics associated with the economy goal that informed whether an alternative is fiscally feasible included:

- Capital costs
- Annual operations and maintenance (O&M) costs
- Available funding sources for both capital and O&M

In addition to fiscal feasibility, metrics supporting the economic goal considered the support of economic growth and vitality for the Santa Cruz County region. Supporting criteria to this goal included:

- New short-term jobs as a result of construction expenditures associated with the transportation investment
- Longer term operations and maintenance jobs generated by a new transportation alternative (e.g., increased opportunities for bus drivers due to a new BRT service, maintenance positions)
- Jobs generated by economic development in and around improved transportation stations
- Impacts on Freight Operations and other rail businesses including Santa Cruz Big Trees and Pacific Railway
- Utilization of an existing transportation corridor with unused capacity





### GOALS AND METRICS - SOCIAL EQUITY

**Table 3.2** shows the goals, metrics, screening criteria and performance measures for social equity. Transportation investments analyzed in the TCAA/RNIS are expected to support equity goals using several criteria, including:

- Promotes active transportation and health by making it easier to utilize transit with a bicycle
- Public safety enhancements through improved transit services to encourage reductions in vehicle miles traveled on the region’s roadways/highways
- Improved affordable access for disadvantaged communities,
- Improved transit facilities, increased service, and improved transit travel time reliability for residents who rely heavily on transit, and do not own their own vehicles

### GOALS AND METRICS - ENVIRONMENT

**Table 3.3** shows the goals and evaluation metrics in support of the environmental analysis of the TCAA/RNIS. Transportation investments analyzed in the TCAA/RNIS are expected to support environment goals using several criteria, including:

- Mode shift from autos to transit to reduce congestion and reduce emissions
- GHG reduction to reduce the impacts of climate change
- Resiliency to climate change due to sea level rise and increased erosion.
- Impacts to neighborhoods
- Total energy usage

### GOALS AND EVALUATION METRICS - OTHER

Goals and evaluation metrics were also identified to represent important characteristics of the TCAA/RNIS analysis framework that were not addressed with the economy, social equity, and environmental goals of the Triple Bottom Line. These other goals provided context to reflect region-specific factors, such as:

- The ability of alternatives to integrate easily into Santa Cruz County’s existing and potential future transportation system infrastructure
- How well each transit alternative aligned with local, regional, and state plans and regulations.
- Ability to adapt to new technology
- Need for additional right-of-way

**Table 3.4** shows the other goals and evaluation metrics used in the TCAA/RNIS analysis.





**Table 3.1. Goals and Evaluation Metrics – Economy**  
(A=Most Desirable, B=Moderately Desirable, C =Least Desirable)

| Goals | Evaluation Metric | Description   | Milestone 2<br>High-Level Screening<br>Criteria | Milestone 3<br>Detailed Analysis<br>Performance Measures                       |
|-------|-------------------|---|---|--|
|       | Capital cost      | How does capital cost compare to other projects?              | A, B, C   | Capital Cost<br>Capital Cost/Rider<br>Capital Cost/Passenger Mile              |
|       | O&M costs         | Is project relatively more expensive to maintain and operate? | A, B, C   | O&M Costs<br>O&M Cost/Rider<br>O&M Cost/Passenger Mile                         |
|       | Funding           | How much funding will likely be available?                    | A, B, C   | % funding likely from existing sources<br>% funding likely from future sources |



**Table 3.1 (continued). Goals and Evaluation Metrics – Economy  
(A=Most Desirable, B=Moderately Desirable, C=Least Desirable)**

| Goals   | Evaluation Metric                                    | Description  | Milestone 2<br>High-Level Screening<br>Criteria | Milestone 3<br>Detailed Analysis<br>Performance Measures |
|---|--|--|---|--|
| Results in a well-integrated transportation system supporting economic vitality | Transit Oriented Development                         | Will the project increase development along the corridor?  | A, B, C   | A, B, C  |
|   | Jobs   | Will project support job growth – near term through construction, longer term through O&M activity?  | A, B, C   | A, B, C  |
|   | Freight and other rail businesses                    | What is the impact on freight rail operators, shippers and other rail businesses including Santa Cruz Big Trees and Pacific Railway?             | A, B, C   | Freight Rail Volume<br>A, B, C                           |
|   | Transportation corridor utilization and preservation | What is the level of risk that the corridor will not remain continuous? Will alternative best utilize rail corridor and preserve future options? | A, B, C   | Risk Level<br>A, B, C                                    |



**Table 3.2. Goals and Evaluation Metrics – Social Equity**  
(A=Most Desirable, B=Moderately Desirable, C=Least Desirable)

| Goals                                       | Evaluation Metric     | Description   | Milestone 2<br>High-Level<br>Screening Criteria | Milestone 3<br>Detailed Analysis Performance Measures   |
|---|-----------------------|---|---|---|
| Promotes active Transportation              | Active transportation | Does project include features that support active transportation and promotes health? | A, B, C   | <ul style="list-style-type: none"> <li>- Bicycle capacity on transit/every 30 minutes during peak period</li> <li>-Ability for level boarding for bicyclists</li> <li>- Effects on Rail Trail and California Coastal Trail</li> </ul> |
| Supports safer transportation for all modes | Safety                | Does project support public safety?   | A, B, C   | <ul style="list-style-type: none"> <li>-Annual Collisions by mode</li> <li>-Total Annual Collisions</li> <li>-Annual Cost of Collisions</li> </ul>  |







**Table 3.2 (continued). Goals and Evaluation Metrics – Social Equity**  
(A=Most Desirable, B=Moderately Desirable, C=Least Desirable)

| Goals  | Evaluation Metric | Description  | Milestone 2 High-Level Screening Criteria | Milestone 3 Detailed Analysis Performance Measures   |
|--|-------------------|--|---|--|
| Provides accessible and equitable transportation system that is responsive to the needs of all users | Access            | Does project provide universal access to all ages and abilities?     | A, B, C                                   | <ul style="list-style-type: none"> <li>- Location relative to transportation disadvantaged populations</li> <li>- Transit passenger capacity miles traveled</li> <li>- Transit Fare</li> <li>- Mobility device capacity on transit every 30 minutes during peak period</li> <li>-Independent accessibility for all ages and</li> </ul> |
| Offers reliable and efficient transportation choices that serve the most people                      | Travel time       | Does project improve transportation travel time during peak periods? | A, B, C                                   | <ul style="list-style-type: none"> <li>- Transit travel time during peak periods</li> <li>- Auto travel time on Hwy 1</li> <li>- Impacts at grade crossings</li> <li>- Regional connectivity</li> </ul>  |
|  | Reliability       | Does project improve transportation reliability?                     | A, B, C                                   | Travel time reliability during peak periods  |





**Table 3.3. Goals and Evaluation Metrics – Environment  
(A=Most Desirable, B=Moderately Desirable ,C=Least Desirable)**

| Goal                             | Evaluation Metric   | Description  | Milestone 2<br>High-Level<br>Screening<br>Criteria | Milestone 3<br>Detailed Analysis Performance Measures  |
|----------------------------------|---------------------|--|--|--|
| Promotes a healthier environment | Transit ridership   | Will project substantially increase transit ridership for commute and recreational trips and for students, residents and visitors? | A, B, C  | <ul style="list-style-type: none"> <li>- Transit ridership (local, regional, weekday, weekend, corridor, countywide)</li> <li>- Transit capacity/peak period</li> </ul>  |
|                                  | Emissions reduction | Does project support the goal of reduced emissions? How long will the project take to implement?                                   | A, B, C  | <ul style="list-style-type: none"> <li>- Auto vehicle miles traveled</li> <li>- Greenhouse gas emissions (total and per passenger mile)</li> <li>- Length of time to implement</li> <li>- Criteria pollutants</li> </ul> |





**Table 3.3 (continued) Goals and Evaluation Metrics – Environment  
(A=Most Desirable, B=Moderately Desirable, C=Least Desirable)**

| Goal                             | Evaluation Metric                        | Description  | Milestone 2 High-Level Screening Criteria | Milestone 3 Detailed Analysis Performance Measures |
|----------------------------------|--|--|---|--|
| Promotes a healthier environment | Climate adaptation                       | Can the project resiliently adapt to climate change?                                   | A, B, C                                   | A, B, C  |
|                                  | Biological, visual, noise, and vibration | Are there effects of the project on biological resources, visual, noise and vibration? | A, B, C                                   | A, B, C  |
|                                  | Energy usage                             | Does project support the goal of reduced energy usage?                                 | A, B, C                                   | A, B, C  |

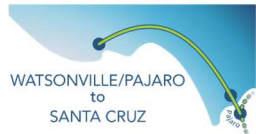




**Table 3.4. Goals and Evaluation Metrics – Other  
(A=Most Desirable, B=Moderately Desirable, C=Least Desirable)**

| Goal                                | Evaluation Metric                       | Description   | Milestone 2 High-Level Screening Criteria | Milestone 3 Detailed Analysis Performance Measures |
|-------------------------------------|---|---|---|--|
| Addresses project-specific concerns | Technical feasibility                   | Is project technically feasible?  | Yes/No                                    |  |
|                                     | Consistent with other planning Efforts  | Is project consistent with other local, state and federal planning efforts?   | A, B, C                                   | A, B, C  |
|                                     | Consistent with regulatory requirements | Is project consistent with local, state, and federal regulatory requirements? | A, B, C                                   | A, B, C  |





**Table 3.4 (continued). Goals and Evaluation Metrics – Other**  
(A=Most Desirable, B=Moderately Desirable, C=Least Desirable)

| Goal                                | Evaluation Metric                  | Description   | Milestone 2 High-Level Screening Criteria | Milestone 3 Detailed Analysis Performance Measures      |
|-------------------------------------|------------------------------------|---|---|---|
| Addresses project-specific concerns | Integration                        | Does project integrate into existing transportation infrastructure? | A, B, C                                   | A, B, C   |
|                                     | Ability to Adapt to New Technology | Does the project have ability to adapt to future technology?        | A, B, C                                   | A, B, C   |
|                                     | Right-of-way                       | How easily can project be integrated into existing right-of-way?    | A, B, C                                   | % of corridor where additional right of way is required |







### 3.2 UNIVERSE OF ALTERNATIVES

The universe of transit alternatives for the SCBRL ROW were identified in Milestone 1. This list was categorized by core transit services designed to utilize the Santa Cruz Branch Line ROW for the majority of its available length and to its fullest extent possible. Core services, characterized as high capacity transit options for the rail right-of-way, are strategies that could leverage the characteristics of the dedicated corridor. These core services were evaluated as a key component of an integrated transportation network in Santa Cruz County that runs between the west side of Santa Cruz at Natural Bridges Drive to Watsonville/Pajaro Station, connecting to the planned intercity and regional rail network at Pajaro Station.

#### CORE SERVICE ALTERNATIVES: BUS SERVICES



**Local Bus & ROW Bus\*** – Large vehicles designed to carry passengers, usually along a fixed route according to a schedule. Local bus routes make frequent stops, linking neighborhoods with urban centers and providing connections within and between communities.



**Commuter Express Bus\*** – Fixed route bus, usually operating for longer distance trips with limited stops during peak commuting periods, operating on local streets and arterials and may operate on dedicated rights of way.



**Arterial & ROW BRT\*** – A high-quality bus-based transit system that delivers fast and efficient service that may include some combination of dedicated lanes, traffic signal priority, off-board fare collection, elevated platforms, and enhanced stations. BRT often uses dedicated busways, guideways, or other exclusive ROWs to operate faster and more efficiently than traditional bus systems.

\* Per California Air Resources Board mandate, all transit agencies must have 100% zero-emission fleets by 2040. The core bus services shown above will consider electric propulsion in the TCAA/RNIS.





**Autonomous Road Train\*** – An emerging vehicle technology that combines the capacity and form-factor of a traditional streetcar with rubber-tire on pavement operation. Manufacturers are planning for the incorporation of advanced autonomous and connected technology, essentially providing a rail-type service, without the cost associated with rail infrastructure.



**Dual Rail and Bus Vehicles\*** – An emerging technology that provides the versatility of a bus and the speed of light rail with vehicles that operate on both roadways and fixed guideways.



**Micro-shuttles\*** – Smaller passenger autonomous vehicles (12-15 persons operating at low speed and fixed routes. Manufacturers have been developing fully autonomous versions, with several deployed in the United States and California.



**Shuttle (Light Duty, Van, Electric Vehicle)** – A small public or private bus that travels back and forth over a particular route, especially a short-route or one that provides connections between transportation systems, employment centers, and other locations.



### CORE SERVICE ALTERNATIVES: RAIL SERVICES



**Intercity Rail** – Train systems, typically locomotives hauling multiple rail cars that travel between many cities, regions of a county, sometimes cross several counties or states, and are compatible with freight rail.



**Commuter Rail** – Passenger train operations (includes Electric Multiple Unit -EMU or Diesel Multiple Unit -DMU) between a central city, its suburbs and/or another central city. It is characterized by multi-trip tickets, specific station-to-station fares, with usually only one or two stations in the central business district and is compatible with freight rail.



**Light Rail / Electric Multiple Unit** – Light Rail/EMUs are popular on commuter and suburban rail networks around the world due to their fast acceleration and pollution-free operation. Being quieter than diesel multiple units or locomotive hauled trains, EMUs require no separate locomotive, as electric traction motors are incorporated within one or a number of the carriages, and may only be compatible with freight rail if temporally separated. Light rail transit (LRT) usually relies on overhead wires for power.



**Light Rail / Diesel Multiple Unit** – A rail transit line that can operate in a variety of settings including dedicated ROW or mixed on-street traffic. Light rail transit (LRT) is designed for heavily traveled corridors where the stop frequency does not support heavy rail transit and may only be compatible with freight rail if temporally separated.



**Monorail / Automated People Mover (APM)** – An electric railway that is suspended from or straddles a guided roadway formed by a single beam or rail and are not compatible with freight rail.



**Tram / Trolley / Streetcar** – Typically an electric railway with a “light volume” traffic capacity compared to heavier rail. The system may use an exclusive ROW or operate in mixed on-street traffic, high or low platform loading, and multi-car trains or single cars, and are not compatible with freight rail.

**CORE SERVICE ALTERNATIVES: OTHER SERVICES**



**Personal Rapid Transit (PRT)** – Personal Rapid Transit (PRT) are systems of small vehicles on a fixed guideway, typically rails, that operate on a demand-responsive basis, and work to move travelers directly from origin to destination along a fixed route. Several systems have been built, with the most notable in Morgantown, WV.



**Inverted (or Elevated) PRT** – Similar in concept to traditional PRTs but using an inverted rail and smaller cars. This system is generally sold as a solution in urban areas, with space at a premium in which the system can be built over the top of an existing right of way.



**Gondola** – Also known as aerial tramways, these systems are a type of cable car pioneered for ski resorts but have been deployed in urbanized areas to avoid the issues related to surface infrastructure. Passenger capacity can range from four passengers up to 100 per car, and the systems will typically have only a few stops.



**String Rail** – A future concept using rigid overhead rails to transport passenger pods of various sizes. Unlike PRT, these systems would operate similar to traditional transit, and board at every stop. No functioning system has yet to be fully deployed for commercial or public use at this time.





**Hyperloop** – Started as a concept released by Elon Musk, a Hyperloop is a future transport system that uses evacuated tubes to move multi-passenger vehicles at speeds up to 700 mph. Several companies are currently developing prototypes, and planning has been started to deploy the systems in routes in several key markets within the U.S.

### 3.3 SUMMARY OF STAKEHOLDER INPUT ON MILESTONE 1

Extensive outreach to stakeholders, committees, focus groups, and the general public was conducted in January and February 2020 for Milestone 1, as described in Chapter 2: Public and Stakeholder Outreach. As a result of these outreach efforts, the goals, criteria, and performance measures used to screen and analyze transit options, as well as the definitions of the initial universe of alternatives, were clarified, modified, and refined by the TCAA team before seeking approval from the RTC board. This section briefly highlights just some of the ideas and concerns brought up by stakeholders or the public during the outreach process that resulted in changes to the project. Additional information on project input captured, including survey results, are presented in **Appendix E**.

#### **MILESTONE 1 OUTREACH RESULTS SUMMARY – ECONOMY**

- Performance measures for capital and operating and maintenance (O&M) costs per passenger mile added – Focus group participants, the bicycle advisory committee, and public transit advocacy groups all suggested analyzing costs on a per passenger mile basis, as cost per user more accurately reflects a balance of costs and benefits.
- Likely funding available metric modified to include potential future funding sources – Focus groups and public comments pointed out that state and federal funding priorities change over time, and forecasting of such impending changes should be included.
- Tax Revenues metric changed to Transit Oriented Development metric – focus groups did not find this metric meaningful, and partner agencies and bicycle advisory committee discussions both stressed the importance of high-capacity transit supporting transit-oriented development around stations, and the capacity of this development to spur economic growth.
- Impact on Freight Rail metric modified to include other rail businesses such as the Big Trees and Pacific Railway train to the Boardwalk – Focus groups, as well as comments from the public and from the RTC board stressed the need to consider rail businesses other than existing freight, including local recreational rail.



### **MILESTONE 1 OUTREACH RESULTS SUMMARY – EQUITY**

- Active Transportation metric modified to analyze bicycle capacity every 30 minutes, as well as the addition of a level boarding metric – Feedback from focus groups and members of the public, but particularly the bicycle advisory committee, resulted in more robust performance measures for active transportation. Advocates felt the number of bicycles per 30-minute transit consist, rather than an entire day, more accurately reflected the ability of bicyclists to easily utilize transit, and not need to wait for the next vehicle if bicycle capacity was full. Level boarding for ease of entering/exiting with a bicycle was also seen as a key component of promoting the use of bicycles to access the different transit alternatives.
- Access metric modified to stress universal access for transit users of all ages and abilities – Partner Agencies and focus groups, but particularly the elderly and disabled transportation advisory committee (E&DTAC) stressed the need to make sure metrics and performance measures regarding equitable access analyzed universal independent access to the transit system, including level boarding and the capacity for multiple mobility devices on each transit vehicle.

### **MILESTONE 1 OUTREACH RESULTS SUMMARY – ENVIRONMENT**

- Transit Ridership metric added capacity during peak periods to performance measures – Focus groups, partner agencies, and advisory committees pointed to the need to analyze how well each alternative could expand capacity during peak periods to maximize ridership during commute hours.
- Length of time to implement added to emissions reduction metric – Comments from the focus groups as well as the general public pointed out that there would be great variation in the length of time required to implement the various transit systems. A system that could be constructed faster could start reducing emissions and aiding to slow climate change sooner.
- Climate adaptation metric modified to reflect the concept of climate change resiliency – The California Coastal Commission wrote to the RTC requesting the climate adaptation metric reflect how well a transit alternative could be planned and designed to resiliently adapt to climate change, particularly sea level rise.

### **MILESTONE 1 OUTREACH RESULTS SUMMARY – UNIVERSE OF ALTERNATIVES**

Key takeaways from each outreach effort are summarized below.

**Advisory Committees** – Connector services to popular destinations such as UCSC would be needed. Passenger maximums identified for some alternatives could be much higher, such as







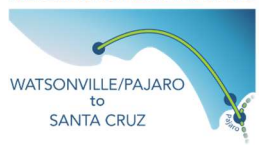
for long trainsets. High bicycle and mobility device capacity per vehicle/consist is of utmost importance, as is barrier free level boarding onto the vehicle.

**Partner Agencies** – The Rail Network Integration Study (RNIS) component of the TCAA project should carefully consider how each alternative would connect into the larger statewide transit system in the State Rail Plan at Pajaro Station. All alternative definitions should allow for adaptation to changing technologies, particularly developments in propulsion technology.

**Focus Groups** – All alternatives should be designed and defined to maximize the width of the rail trail. Focus on alternatives that can or could provide clean power options, including harnessing solar arrays at stations. Consider how each alternative could connect to regional transit at Pajaro Station.

**Open House/Public Comments** – Rubber wheeled options running on pavement on the ROW could have higher capital and O&M costs per mile of ROW utilized. The BRT option would need to be a “true” BRT, with dedicated lanes on streets and level boarding, to be successful. Rubber wheeled options on pavement, including BRT and shuttles, provide the most flexibility for a variety of transportation uses. Rail options could be more expensive than options running on pavement. All alternatives should focus on electric-propelled options. Alternative selection should focus on using the infrastructure we already have. All alternatives should be designed to be as quiet as possible. A streetcar would be quiet and cheaper but likely too slow. PRT could connect well to UCSC, but such a system might take longer to implement. Elevated options would be too visually impactful.





## CHAPTER 4 – MILESTONE 2 OUTCOMES

This section presents the TCAA/RNIS outcomes for Milestone 2 including applying high-level screening criteria to narrow the universe of alternatives to a short list of alternatives moving forward for more detailed analysis.

### 4.1 MILESTONE 2: HIGH-LEVEL SCREENING OF THE UNIVERSE OF ALTERNATIVES

The initial list of alternatives was evaluated using the TBLA framework of economy, social equity, environment, and other goals. The screening criteria identified in Milestone 1 for each metric was used to narrow down the Universe of Alternatives into a short list of alternatives for more detailed evaluation to be conducted in Milestone 3. **Table 4.1 – 4.4** presents the A, B, and C rating results based on screening the universe of alternatives as “most desirable,” “moderately desirable,” or “least desirable” for each evaluation metric. Each Table is shown at the end of this Chapter. Data was collected from best available information including national data sets on the various alternatives as well as information from previous local studies.

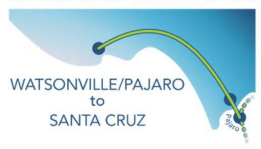
#### **ALTERNATIVES ADVANCING TO MILESTONE 3: VALUE ENGINEERING**

The high-level, criteria-based screening identified seven alternatives that ranked significantly higher than the other alternatives according to the A/B/C rubric. Of these alternatives, the four listed first below moved forward into the TCAA/RNIS next phase, Milestone 3 - Value Engineering:

- **(Electric) Commuter Rail Transit**
- **(Electric) Light Rail Transit**
- **Arterial & Right-of-Way Bus Rapid Transit (BRT)**
- **Autonomous Road “Train” (on pavement with rubber tires)**
- Intercity Rail
- Light Rail Transit/Diesel Multiple Unit
- Tram/Trolley/Streetcar

The following logic was used to identify the four alternatives (out of the seven) to advance to the next milestone of the analysis:

- Clean and green/sustainable alternatives were considered for the TCAA/RNIS planning process and fossil fuel options were eliminated and thus Diesel Light Rail was dropped from further analysis.



- Commuter Rail has similar benefits to Intercity Rail, but Commuter Rail is better suited for frequent, all-day service with multiple stations and thus Intercity Rail was dropped from further analysis.
- Tram/Trolley/Streetcar alternatives implemented in many urban areas typically run on city roadways shared with private vehicles rather than dedicated corridors similar to the Santa Cruz Branch Rail Line. In addition, this alternative typically runs at a slower speed and provides less transit capacity than other alternatives. The Electric Light Rail alternative could accommodate “streetcar” style vehicles as long as the speeds and capacity meet the other requirements of the Light Rail alternative and thus Tram/Trolley/Streetcar was dropped from further analysis.

The characteristics of the four alternatives recommended to move forward into Milestone 3 for further evaluation are described below.

### **BUS RAPID TRANSIT (BRT)**

BRT can be described by a fixed-route bus system that could operate on the Santa Cruz Branch Rail Line as a dedicated right-of-way, as well as on Highway 1 bus on shoulders/auxiliary lanes and the local roadway network. BRT systems typically provide an urban or interurban service. These systems also have defined passenger stations, short headway bidirectional services for a substantial part of weekdays and weekend days, and separate branding of the service. Agencies typically use off-board fare collection as well to reduce travel times. BRT operations on the Santa Cruz Branch Rail Line could be a combination of two-way and one-way routes with reverse direction on parallel local streets.

### **TYPICAL CHARACTERISTICS**

- Vehicle speeds up to 65 mph maximum
- BRT is incompatible with freight on the same corridor, but BRT could be moved off corridor to preserve freight in Watsonville
- Transit signal priority at roadway crossings
- Frequency of peak period service
  - 8 – 20 minute headways
- Level-platform boarding along rail right-of-way and non-level boarding at on-street stops
- Propulsion type
  - Electric – hydrogen fuel cell, battery

### **BENEFITS**

- Capital costs relatively lower than other modes





- Level boarding can be a component of system allowing independent accessibility for people with mobility devices and bicycles
- Ability to easily integrate with overall transportation system
- Greater ability to adapt to new technologies
- Depending on permanence of design, could support Transit Oriented Development

### **AUTONOMOUS ROAD “TRAIN”**

An autonomous road “train” is an emerging transit mode that combines the benefits of bus rapid transit and light rail with advanced autonomous driving features, providing an urban or interurban service. The system uses rubber tires running on pavement within a dedicated running way. The vehicles tend to visually resemble light rail vehicles, with a similar passenger capacity. The system would use similar infrastructure to a BRT system, including permanent stations, transit signal priority, and offering frequent service. The autonomous road “train” will run solely on the Santa Cruz Branch Rail Line. Operations on a single lane with sidings allows for two-way travel. An autonomous road “train” system has recently been deployed in the city of Yibin, China.

### **TYPICAL CHARACTERISTICS**

- Vehicle speeds capable of 40 to 45 mph maximum
- System runs on pavement and thus is incompatible with freight on the same corridor
- Transit signal priority at roadway crossings
- Frequency of peak period service
  - 10 – 30 minute headways
- Level or non-level platform boarding
- Propulsion type
  - Electric – Overhead, hydrogen fuel cell, battery

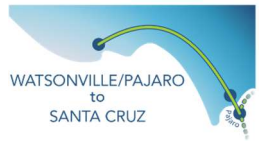
### **BENEFITS**

- Strong transit ridership potential
- Level boarding is a typical component of system allowing independent accessibility for people with mobility devices and more space for bicycles
- Supportive of greenhouse gas emission reduction goals
- Travel time is likely to be more reliable
- Supports Transit Oriented Development

### **LIGHT RAIL TRANSIT**

Light rail options can be described as passenger rail service operating on fixed rails with single or multiple individually-propelled cars, typically providing an urban or interurban service with a





lighter volume ridership capacity per consist compared to commuter rail. Operations on a single track with sidings allows for two-way travel.

### TYPICAL CHARACTERISTICS

- Vehicle speeds capable of 30 to 60 mph maximum
- Vehicle can operate with freight in shared-use corridors if FRA compliant, or if non-FRA compliant, only if temporally separated
- Positive train control is required if vehicle is FRA-compliant
- Centralized Traffic Control (CTC) or similar signal system only if light rail is temporally separated from freight operations
- Frequency of peak period service
  - 10 – 30 minute headways
- Level or non-level platform boarding
- Propulsion type
  - Electric – Overhead, hydrogen fuel cell, battery

### BENEFITS

- Strong transit ridership potential
- Travel time is likely to be more reliable
- Corridor has least risk of losing continuity of corridor from loss of easements
- Level boarding is typical component of system allowing independent accessibility for people with mobility devices and more space for bicycles
- Compatible with freight rail
- Supportive of greenhouse gas emission reduction goals
- Supports Transit Oriented Development

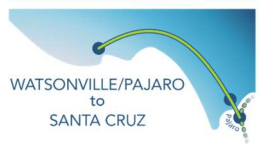
### COMMUTER RAIL TRANSIT

Commuter rail options can be described as passenger rail service operating on fixed rails with multiple individually-propelled cars, typically providing an interurban or regional service. Commuter rail usually has a higher volume ridership capacity and relatively longer distances between stops when compared to light rail. Operations on a single track with sidings allows for two-way travel.

### TYPICAL CHARACTERISTICS

- Vehicle speeds capable of 30 to 60 mph maximum
- Vehicles can comeingle with freight in shared-use corridors
- Centralized Traffic Control (CTC) and Positive Train Control (PTC) is required
- Frequency of peak period service





- 20 – 30 minute headways
- Level or non-level platform boarding
- Propulsion type
  - Electric – Overhead, hydrogen fuel cell, battery

### BENEFITS

- Faster and more reliable travel times
- Strong transit ridership potential
- Vehicles can come along with freight in shared-use corridor
- Corridor has least risk of losing continuity of corridor from loss of easements
- Level boarding is typical component of system allowing independent accessibility for people with mobility devices and more space for bicycles
- Supportive of greenhouse gas emission reduction goals
- Supports Transit Oriented Development

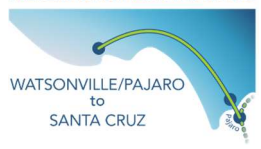
## 4.2 SUMMARY OF STAKEHOLDER INPUT ON MILESTONE 2

Extensive outreach to stakeholders, committees, focus groups, and the general public was conducted in April and May 2020 for Milestone 2, as described in Chapter 2: Public and Stakeholder Outreach. Due to the Santa Cruz County shelter in place order for the Covid-19 pandemic, all meetings were conducted virtually. As a result of these outreach efforts the TCAA team gained meaningful understanding of the community’s interest in and concerns with the four screened alternatives moving forward into the next phase of quantitative analysis in Milestone 3. This section briefly highlights just some of the ideas and concerns brought up by stakeholders or the public during the outreach process that resulted in changes to the project. Additional information on project input captured, including survey results, are presented in **Appendix E**.

### **MILESTONE 2 OUTREACH RESULTS SUMMARY – ADVISORY COMMITTEES**

After the TCAA/RNIS team presented the results of the high-level screening and the four screened alternatives to move forward into the next level of analysis, the RTC Bicycle Committee passed a motion to express the Committee’s preference for the light rail and commuter rail options, due to their potentially greater bicycle capacity and shorter travel times (8 in favor, 3 abstained). Shortly thereafter, the RTC Elderly and Disabled Transportation Advisory Committee passed a motion to express preference for the rail alternatives (9 in favor, 1 against) due to these alternatives providing more consistent level boarding, as well as a higher potential capacity for mobility devices.





### **MILESTONE 2 OUTREACH RESULTS SUMMARY – PARTNER AGENCIES**

Representatives from an array of local jurisdictions provided valuable input on the screen alternatives and the process moving forward, including:

- Accounting for specific corridor characteristics such as number of crossings along the ROW, upgrades to bridge structures, etc.
- Considering whether more weight could be given to freight alternatives, in light of shipping demand due to the pandemic, as well as if it would be prudent to ensure public interpretation of this mode is accurate (akin to “goods movement”).
- Analyzing the time periods/schedule considered for “temporal separation” of services.
- Evaluating how the ROW corridor’s constraints factor into overall feasibility, especially given that BRT service is typically a two-way system.

### **MILESTONE 2 OUTREACH RESULTS SUMMARY – PUBLIC PARTICIPATION**

The community was invited to provide feedback on the screening results and the 4 screened alternatives using an online open house, which included a survey component as well as opportunities to provide additional feedback via comment submissions. For full survey results and public comments, see **Appendix E**.

The survey connected to the online open house showed a strong pattern among community members regarding their view of or preference for some of the screened alternatives. Generally, the public’s ranking of how well the 4 screened alternatives performed under the defined screening criteria were:

1. Light Rail Transit
2. Commuter Rail Transit
3. Bus Rapid Transit
4. Autonomous Road “Train”

The survey also allowed community members to express preference for alternatives that were screened out during the screening process. Popular alternatives that did not pass through the screening for more detailed performance analysis included: tram/trolley/streetcar, shuttles, intercity rail, Personal Rapid Transit (PRT), and commuter express bus. Comments submitted that reflected the views of many members of the public are provided below.

- Benefits of rail transit are that it is more comfortable, quieter, can be implemented sooner, has greater ridership potential than other options
- Rail transit has easiest access and more room for mobility devices and bicycles
- Consider additional transit stops at 30th Avenue, 7th Avenue, Almar Avenue
- Why consider the Autonomous Road “Train” in the short list? What is the advantage over other rail alternatives?
- Any use other than rail options is a fatal flaw given the risks of not implementing rail





- A heavier commuter rail option is not necessary for Santa Cruz County.
- Freight and Roaring Camp can be accommodated with light rail through temporal separation.
- Include Personal Rapid Transit on the short list of alternatives to evaluate in Phase 2 quantitative analysis as the screening results are not representative of PRT
- In Phase 2, evaluate how the alternatives impact the trail.
- Analyze how alternatives perform in a pandemic
- Concern expressed about continuity of the corridor if pursue options other than rail
- Interest in no transit on the ROW and a bicycle and walking trail only
- Concerns expressed about the cost of the transit system and its impact on neighborhoods
- Concern expressed about how the trail will be accommodated at the rail bridges
- How will the transit system affect traffic at the roadway crossings?
- Will the transit system separate neighborhoods, eliminate access to beaches and other destinations?
- The number of station stops in a typical commuter rail system would not be enough for Santa Cruz County
- Include in evaluation how to connect to UCSC

Table 4.1. TCAA/RNIS Milestone 2: Initial High-Level Screening Results - Economy

| ECONOMY   |  |  |  |   |   |  |  |
|---|--|--|--|---|---|--|--|
| Goal:   | Is Fiscally Feasible   |  |  | Results in a well-integrated transportation system that supports economic vitality                                    |   |  |  |
| Metric:   | CAPITAL COSTS  | OPERATIONS & MAINTENANCE COSTS             | FUNDING  | TRANSIT ORIENTED DEVELOPMENT (TOD)  | JOBS  | FREIGHT & OTHER RAIL BUSINESSES  | TRANSPORTATION CORRIDOR UTILIZATION & PRESERVATION   |
| A = Most Desirable                                    | Capital cost/mile less than \$20M/mile.                                | O&M less than \$1/passenger mile.          | Funding readily available to support these alternatives.   | Transit service with fixed infrastructure or infrastructure that suggests permanence.                                 | High capital expenditures and a high likelihood of TOD. | Co-mingling with freight allowed.  | Rail has least risk of losing continuity of corridor from loss of rail easements.                    |
| B = Moderately Desirable                              | Capital cost/mile - \$20M/mile to \$40M/mile.                          | O&M is \$1.01-\$2.00/passenger mile.       | Traditional transit core services implemented nationally in numerous communities. Funding available through variety of public and private sources.     | Transit service that may or may not be designed to suggest permanence.  | Moderate capital expenditures and/or likelihood of TOD. | Temporal separation from freight allowed. Elevated alternative, may be compatible with freight rail but will be dependent upon design. | Alternative uses entire corridor but is not rail.  |
| C = Least Desirable                                   | Capital cost/mile greater than \$40M/mile and/or technology uncertain. | O&M is greater than \$2.00/passenger mile. | Non-traditional core services not implemented nationally in variety of communities. Funding may or may not be available to support these alternatives. | Transit service with non-fixed infrastructure that does not suggest permanence or alternatives with limited capacity. | Low capital expenditures and low likelihood of TOD.     | Incompatible with freight.   | Alternative other than rail and uses less of the right-of-way as is likely with bus/shuttle options. |
| Local Bus & Right-of-Way Bus                          | A  | B  | B  | C   | B   | C  | C  |
| Arterial & Right-of-Way Bus Rapid Transit             | A  | B  | B  | B   | A/B   | C  | C  |
| Dual Rail & Bus Vehicles                              | B/C  | B/C  | B/C  | A/B   | A/B   | C  | B  |
| Commuter Express Bus                                  | A  | A  | B  | C   | B   | C  | C  |
| Autonomous Road "Train" (on pavement w/ rubber tires) | B  | C  | B/C  | A   | A/B   | C  | B  |
| Micro-shuttles  | A  | B  | B  | C   | B   | C  | C  |
| Shuttles (Light Duty, Van, Electric Vehicle)          | A  | A  | B  | C   | B   | C  | C  |
| Intercity Rail  | C  | A  | B  | A   | B   | A  | A  |
| Light Rail/Electric Multiple Unit                     | B  | A  | B  | A   | A/B   | B  | A  |
| Monorail/Automated People Mover                       | C  | C  | C  | B   | B/C   | B  | A  |
| Commuter Rail/Electric Multiple Unit                  | B  | A  | B  | A   | A/B   | A  | A  |
| Light Rail/Diesel Multiple Unit                       | B  | A  | B  | A   | A/B   | B  | A  |
| Tram/Trolley/Streetcar                                | B  | B  | B  | A   | A/B   | B  | A  |
| Personal Rapid Transit                                | C  | C  | C  | C   | C   | C  | B  |
| Inverted/Elevated Personal Rapid Transit              | C  | C  | C  | C   | C   | B  | B  |
| Hyperloop   | C  | C  | C  | C   | C   | C  | B  |
| Gondola   | B  | C  | C  | C   | B/C   | B  | B  |
| String Rail   | C  | C  | C  | C   | C   | B  | B  |



Table 4.2. TCAA/RNIS Milestone 2: Initial High-Level Screening Results – Social Equity

| EQUITY   |  |  |   |   |  |
|--|--|--|---|---|--|
| Goal:  | Promotes active transportation   | Supports safer transportation for all modes  | Provides accessible and equitable transportation system that is responsive to needs of all users          | Offers reliable and efficient transportation choices that serve the most people | Offers reliable and efficient transportation choices that serve the most people  |
| Metric:  | ACTIVE TRANSPORTATION  | SAFETY   | ACCESS  | TRAVEL TIME   | RELIABILITY  |
| A = Most Desirable                                       | Alternative can transport relatively more bicycles.  | National statistics report fatalities and inquiries per 100 million miles traveled with collision costs of < \$100 million.            | Level boarding is typically a component of system allowing independent accessibility for most users.      | Less than 45 minutes in travel time between Pajaro and Westside Santa Cruz.     | Alternative primarily remains on rail corridor as a dedicated facility for greater reliability.                          |
| B = Moderately Desirable                                 | Can transport a minimal number of bicycles, depending on space.  | National statistics report fatalities and inquiries per 100 million miles traveled with collision costs between \$100 - \$200 million. | Level boarding is typically a component of system but access point is elevated requiring use of elevator. | Between 45-70 minutes in travel time between Pajaro and Westside Santa Cruz.    | Alternative remains on only a portion of the rail corridor as a dedicated facility for relatively less reliability.      |
| C = Least Desirable                                      | Bicycles cannot be transported on vehicle and/or vehicle is relatively small. Elevated systems are less desirable as access requires elevator. | National statistics report fatalities and injuries per 100 million miles traveled with collision costs greater than \$200 million.     | Level boarding is not typically a component of system and not likely to have independent accessibility.   | Greater than 70 minutes in travel time between Pajaro and Westside Santa Cruz.  | Alternative is not on a significant portion of the rail corridor as a dedicated facility and thus is the least reliable. |
| Local Bus & Right-of-Way Bus                             | B  | A  | C   | C   | B  |
| Arterial & Right-of-Way Bus Rapid Transit                | A/B  | A  | A   | B   | B  |
| Dual Rail & Bus Vehicles                                 | B  | A  | C   | B   | B  |
| Commuter Express Bus                                     | B  | A  | C   | B   | B  |
| Autonomous Road "Train"<br>(on pavement w/ rubber tires) | A  | A/B  | A   | B   | A  |
| Micro-shuttles   | C  | A/B  | C   | C   | B  |
| Shuttles (Light Duty, Van, Electric Vehicle)             | C  | A  | C   | C   | B  |
| Intercity Rail   | A  | A  | A   | A   | A  |
| Light Rail/Electric Multiple Unit                        | A  | B  | A   | B   | A  |
| Monorail/Automated People Mover                          | B/C  | A  | B   | B   | A  |
| Commuter Rail/Electric Multiple Unit                     | A  | A  | A   | A   | A  |
| Light Rail/Diesel Multiple Unit                          | A  | B  | A   | B   | A  |
| Tram/Trolley/Streetcar                                   | A/B  | B  | A   | C   | A  |
| Personal Rapid Transit                                   | C  | A  | A   | A   | A  |
| Inverted/Elevated Personal Rapid Transit                 | C  | A  | B   | A   | A  |
| Hyperloop  | C  | A  | B   | A   | A  |
| Gondola  | C  | A  | B   | C   | B  |
| String Rail  | C  | A  | B   | A   | A  |





Table 4.3. TCAA/RNIS Milestone 2: Initial High-Level Screening Results – Environment

| ENVIRONMENT   |  |  |  |  |  |
|---|--|--|--|--|--|
| Goal:   | Promotes A Healthier Environment               |  |  |  |  |
| Metric:   | TRANSIT RIDERSHIP                              | EMISSIONS REDUCTION  | CLIMATE ADAPTATION   | BIOLOGICAL, VISUAL, NOISE, AND VIBRATION   | ENERGY USAGE   |
| A = Most Desirable                                    | Estimated daily ridership relatively high.     | Significant ability to reduce GHG emissions because alternative is expected to divert drivers from automobiles.          | Alternative is elevated and not prone to sea level rise/climate impacts.   | Not elevated so not visually obstructive, least noisy, least likely to cause vibration.                              | BTUs/passenger-mile less than 1,500.   |
| B = Moderately Desirable                              | Estimated daily ridership relatively moderate. | Moderately able to reduce GHG emissions because alternative is expected to divert drivers from automobiles.              | Alternative may use flood-prone right-of-way but can divert. Travel time would increase but alternative can adapt to flooding (bus).           | Alternative may be elevated and visually obstructive, may be relatively noisy or cause vibration, but not all three. | BTUs/passenger-mile <1,500 and <= 3,500 or alternative is rail-like but energy usage is uncertain. |
| C = Least Desirable                                   | Estimated daily ridership relatively low.      | Least able to reduce GHG emissions because alternative is not expected to significantly divert drivers from automobiles. | Alternative is at ground-level and fixed and without adapting design may be prone to sea level rise/climate impacts with no ability to divert. | Alternative is elevated and visually obstructive, is noisy and causes relatively greater vibration than other modes. | BTUs/passenger - mile > 3,500.   |
| Local Bus & Right-of-Way Bus                          | C  | C  | B  | B  | B  |
| Arterial & Right-of-Way Bus Rapid Transit             | B  | B  | B  | B  | B  |
| Dual Rail & Bus Vehicles                              | C  | C  | B  | B  | B  |
| Commuter Express Bus                                  | C  | C  | B  | B  | A  |
| Autonomous Road "Train" (on pavement w/ rubber tires) | A  | A  | C  | B  | B  |
| Micro-shuttles  | C  | C  | B/C  | A  | B  |
| Shuttles (Light Duty, Van, Electric Vehicle)          | C  | C  | B  | A  | A  |
| Intercity Rail  | C  | C  | C  | B/C  | B  |
| Light Rail/Electric Multiple Unit                     | A  | A  | C  | A/B  | B  |
| Monorail/Automated People Mover                       | A  | A  | A  | B/C  | B  |
| Commuter Rail/Electric Multiple Unit                  | A  | A  | C  | B/C  | B  |
| Light Rail/Diesel Multiple Unit                       | A  | A  | C  | B/C  | B/C  |
| Tram/Trolley/Streetcar                                | B  | B  | C  | A/B  | A  |
| Personal Rapid Transit                                | B  | C  | C  | A/B  | B  |
| Inverted/Elevated Personal Rapid Transit              | B  | C  | A  | B  | B  |
| Hyperloop   | C  | C  | C  | A  | B  |
| Gondola   | C  | C  | A  | B/C  | B  |
| String Rail   | B  | A  | A  | B/C  | B  |



Table 4.4. TCAA/RNIS Milestone 2: Initial High-Level Screening Results – Other

| OTHER GOALS   |   |  |  |   |  |   |
|---|---|--|--|---|--|---|
| Goal:   | Technical Feasibility   | Consistent with Other Planning Efforts   | Consistent with Regulatory Requirements  | Integration   | Ability to Adapt to New Technology   | Right-Of-Way  |
| <b>A = Most Desirable</b>                             | Tested technology, traditional and technically feasible.  | Consistent with greatest number of plans, including SCCRTC Regional Transportation Plan, AMBAG Metropolitan Transportation Plan/Sustainable Communities Strategy, METRO Plans, Unified Corridor Study, CA State Rail Plan. | Consistent with regulations, including GHG emissions, Coastal Commission, Proposition 116. | Traditional bus or rail transit that has shown to easily integrate into the overall transportation system.                  | More flexible infrastructure and lower vehicle purchase cost/shorter useful life therefore more flexibility to adapt to new technologies.                      | Right-of-way supports two-way service with single lane and sidings or one-way travel in the right-of-way with reverse on parallel local road network. |
| <b>B = Moderately Desirable</b>                       | Infrastructure exists and has been tested but is not a traditional transit option and may be less technically feasible/is more uncertain. | Consistent with some plans, including those listed above.  | Consistent with some regulations, listed above.  | Elevated alternative/non-traditional which may be integrated into the overall transportation system but few examples exist. | Infrastructure is less flexible and vehicles are relatively more costly/relatively longer useful life therefore less flexibility to adapt to new technologies. | Elevated systems may accommodate two-way transit travel on the right-of-way.  |
| <b>C = Least Desirable</b>                            | Alternative has either not been build or there are limited examples for distances of 20 miles.  | Not consistent with any plans listed.  | Not consistent with any regulations, listed above.   | Uncertain how alternative will interact with overall transportation system.   | Infrastructure and vehicles are often proprietary therefore least flexible to adapt to new technologies.   | Accommodating two-way travel on right-of-way may be problematic.  |
| Local Bus & Right-of-Way Bus                          | A   | A  | C  | A   | A  | A/B   |
| Arterial & Right-of-Way Bus Rapid Transit             | A   | A  | C  | A   | A  | A/B   |
| Dual Rail & Bus Vehicles                              | B   | C  | B  | A   | B/C  | A/B   |
| Commuter Express Bus                                  | A   | A  | B  | A   | A  | A/B   |
| Autonomous Road "Train" (on pavement w/ rubber tires) | B   | B  | B  | A   | B  | A   |
| Micro-shuttles  | B   | C  | B  | A   | A  | A/B   |
| Shuttles (Light Duty, Van, Electric Vehicle)          | A   | C  | B  | A   | A  | A/B   |
| Intercity Rail  | A   | C  | A  | A   | B  | A   |
| Light Rail/Electric Multiple Unit                     | A   | A  | A  | A   | B  | A   |
| Monorail/Automated People Mover                       | B   | C  | B  | B   | C  | B   |
| Commuter Rail/Electric Multiple Unit                  | A   | A  | A  | A   | B  | A   |
| Light Rail/Diesel Multiple Unit                       | A   | A  | B  | A   | B  | A   |
| Tram/Trolley/Streetcar                                | A   | C  | A  | A   | B  | A/B   |
| Personal Rapid Transit                                | C   | C  | A  | C   | C  | C   |
| Inverted/Elevated Personal Rapid Transit              | C   | C  | B  | B   | C  | B   |
| Hyperloop   | C   | C  | C  | C   | C  | C   |
| Gondola   | B/C   | C  | C  | B   | C  | B   |
| String Rail   | C   | C  | B  | B   | C  | B   |







## CHAPTER 5 – MILESTONE 3 OUTCOMES

This section presents the TCAA/RNIS outcomes for Milestone 3 including:

- **Value Engineering:** Analysis of a variety of potential alignments, station locations and service plans for each of the four alternatives based on cost, ridership, and travel time to determine the best performing option for each alternative for moving forward into the more detailed performance measure analysis.
- **Detailed Performance Evaluation:** Applied a detailed, data-driven analysis to compare and differentiate the performance benefits of the four alternatives and to identify the Locally preferred alternative.

### 5.1 VALUE ENGINEERING

The Value Engineering component of the TCAA/RNIS was designed to evaluate a number of different alignments, station locations and service plans to determine the optimal option based on the cost, ridership, and travel time estimates for each of the four alternatives that are being evaluated in more detail in the performance measure evaluation. Alignments/service plans for the four alternatives analyzed in Value Engineering included:

1. **Bus Rapid Transit** - four options evaluated with two different alignments/stops (given potential for travel on roadway network as well as on the rail right-of-way) and two different service frequencies for each alignment
2. **Commuter Rail Transit** - two options evaluated with same alignment but different station locations and service frequency
3. **Light Rail Transit** - two options evaluated with same alignment but different station locations for downtown Santa Cruz and different service frequency
4. **Autonomous Road "Train"** - two options evaluated with same alignment but different station locations for downtown Santa Cruz and different service frequency

The resulting best performing option for each of the four alternatives in this analysis was moved forward into the detailed performance evaluations (See Section 5.2 below).

#### *EVALUATION OF ALIGNMENT/SERVICE PLANS BY ALTERNATIVE*

##### **BUS RAPID TRANSIT (BRT)**

Four alignment options were identified and evaluated for BRT in Value Engineering. These included the following alignments and service plans:

- **BRT Options 1A and 1B:**
  - **Alignments for Options 1A and 1B (Figure 5.1).** Both Options depart from Pajaro Station heading towards Watsonville Transit Center via Salinas/Main,





continuing onto Rodriguez to Main, then onto Highway 1 from Watsonville to the Rio Del Mar exit, Soquel Ave to Cabrillo College, continuing onto Soquel to Park Ave and entry into the SCBRL ROW at Park Ave/Coronado. Options follow the SCBRL ROW until exiting at Seabright/Murray to serve Pacific Station via San Lorenzo and Laurel, continuing to Natural Bridges via the SCBRL ROW entry at Chestnut (a few blocks west of Pacific Station) and operating along a farther stretch of the SCBRL ROW to the western terminus.

- **Service Plans for Options 1A and 1B.**
    - Option 1A Weekdays: 10 minutes peak period frequencies and 20 minute midday/off-peak period frequencies from 5 a.m. to Midnight.
    - Option 1B Weekdays: 15 minutes peak, midday, and off-peak period frequencies from 5 a.m. to Midnight.
    - Options 1A and 1B Weekends: 20 minutes peak, midday, and off-peak period frequencies from approximately 6 a.m. to Midnight.
  - **Stations for Option 1A and 1B.** 23 total – 9 stations along SCBRL ROW, 14 stations/stops along arterial network.
  - **Other Characteristics for Options 1A and 1B.** 60-foot BRT style rubber tired buses. Service from Pajaro Station to West Santa Cruz (Natural Bridges Drive) will consist of one main guideway, operations in both directions (either single bi-directional lane with sidings/signals or two lanes, one for each direction), with some operations on existing arterial/freeway.
- **BRT Options 2A and 2B**
    - **Alignments for Options 2A and 2B (Figure 5.2).** Both Options depart from Pajaro Station heading towards Watsonville Transit Center via Salinas/Main, continuing onto Rodriguez to Main, then onto Highway 1 from Watsonville to the Rio Del Mar exit, Soquel Ave to Cabrillo College, continuing onto Soquel to 41<sup>st</sup> to the SCBRL ROW. Then both Options exit the SCBRL ROW at Seabright/Murray, serving Pacific Station via San Lorenzo and Laurel, and continuing to Natural Bridges via Laurel St. Mission and Almar, and re-entering the SCBRL ROW to Natural Bridges.
    - **Service Plans for Options 2A and 2B.**
      - Option 2A Weekdays: 10 minutes peak period frequencies and 20 minute midday/off-peak period frequencies from 5 a.m. to Midnight.
      - Option 2B Weekdays: 15 minutes peak, midday, and off-peak period frequencies from approximately 5 a.m. to Midnight.
      - Options 2A and 2B Weekends: 20 minutes peak, midday, and off-peak period frequencies from approximately 6 a.m. to Midnight.
    - **Stations for Option 2A and 2B.** 25 total – 6 stations along the SCBRL ROW, 19 stations/stops along the arterial network. **See Figure 5.2**





- **Other Characteristics for Options 1A and 1B.** 60-foot BRT style rubber tired buses. Service from Pajaro Station to West Santa Cruz (Natural Bridges Road) will consist of one main guideway, operations in both directions (either single bi-directional lane with sidings/signals or two lanes, one for each direction), with some operations on existing arterial/freeway.







Figure 5.1: Bus Rapid Transit Alignment for 1A and 1B Evaluated in Value Engineering

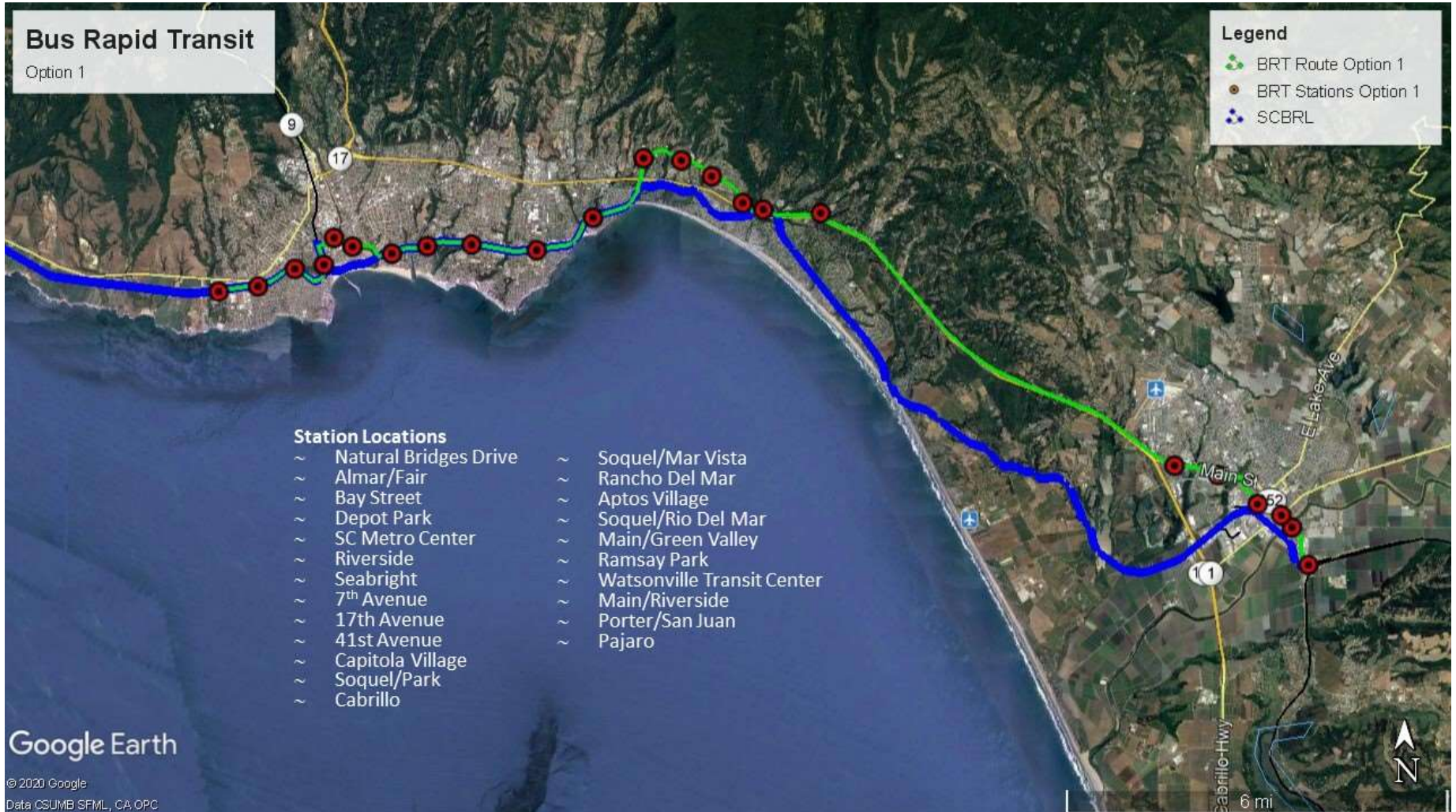
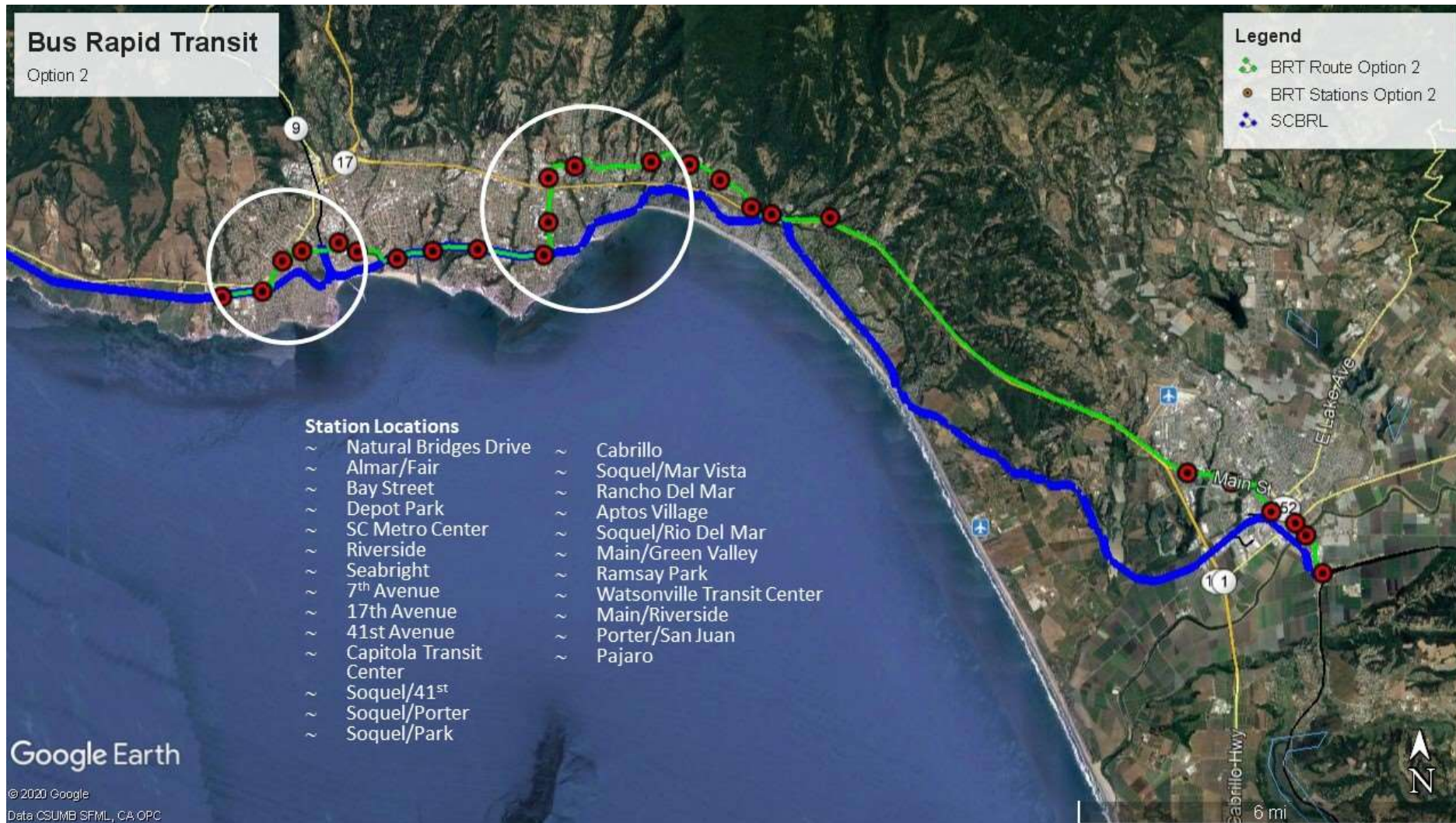






Figure 5.2: Bus Rapid Transit Alignment for 2A and 2B Evaluated in Value Engineering



### COMMUTER RAIL TRANSIT

The two commuter rail options were defined to include different station plans with similar service plans using the SCBRL ROW between Pajaro Station and West Santa Cruz.

- **Service Plans for both Commuter Rail Transit Options 1 and 2.** Weekdays – 30 minute peak period frequencies and 60 minute off-peak from approximately 6 a.m. to 9 p.m. Weekends – 60 minute peak period, midday, off-peak period frequencies from approximately 7 a.m. to 10 p.m.
- **Stations for Commuter Rail Transit Option 1 (Figure 5.3).** Six total stations – all platforms provide level boarding with Pajaro Station (large size), Downtown Watsonville Station (medium size), Aptos Station (medium size), 41<sup>st</sup> Avenue Station (large size), Downtown Santa Cruz / Boardwalk Station (small size), and West Santa Cruz / Natural Bridges Station (large size).
  - **Meet-Pass Locations for Commuter Rail Transit Option 1.** 4 total – station tracks and sidings assumed only for meeting/staging commuter rail trains with freight rail operations temporally separated. These locations include Pajaro Station One Through Main Track and One Stub-Ended Station Track, Renaissance Siding, Capitola Siding and West Santa Cruz One Through Main Track and One Stub-Ended Station Track.
- **Station for Commuter Rail Transit Option 2 (Figure 5.4).** Eleven total stations – all platforms provide level boarding with Pajaro Station (large size), Downtown Watsonville Station (medium size), Aptos Station (medium size), Cabrillo Station (small size), Capitola Station (small size), 41<sup>st</sup> Avenue Station (large size), 17<sup>th</sup> Avenue Station (medium size), Seabright Station (small size), Downtown Santa Cruz / Boardwalk Station (small size), Bay Street Station (small size), and West Santa Cruz / Natural Bridges Station (large size)
  - **Meet-Pass Locations for Commuter Rail Transit Option 2.** Five total station tracks and sidings assumed only for meeting/staging commuter rail trains with freight rail operations temporally separated. These locations include Pajaro Station One Through Main Track and One Stub-Ended Station Trac, Renaissance Siding, Capitola Siding, Seabright Siding, and West Santa Cruz One Through Main Track and One Stub-Ended Station Track.



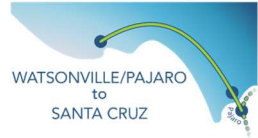


Figure 5.3: Commuter Rail Transit Option 1 Evaluated in Value Engineering

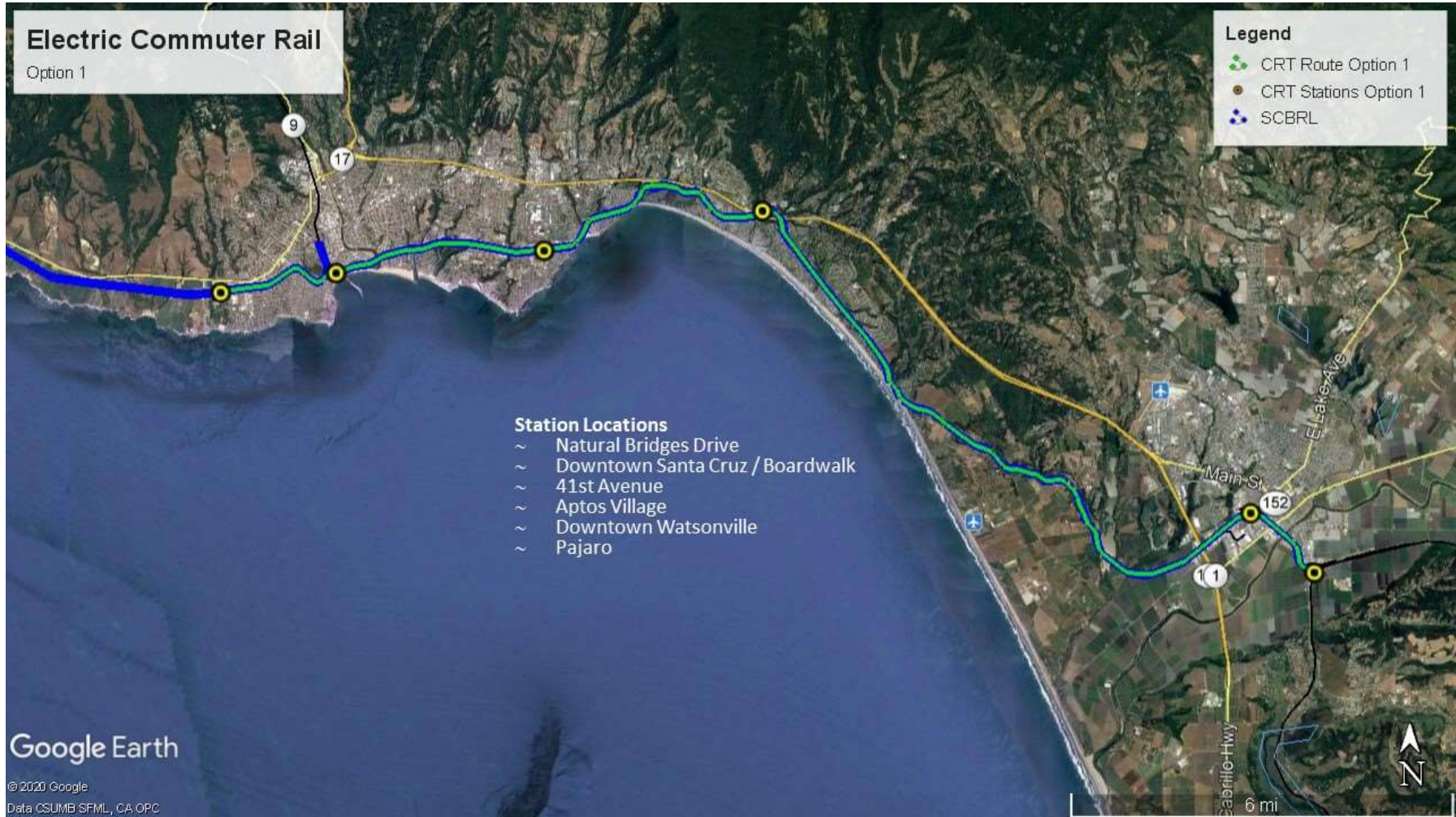
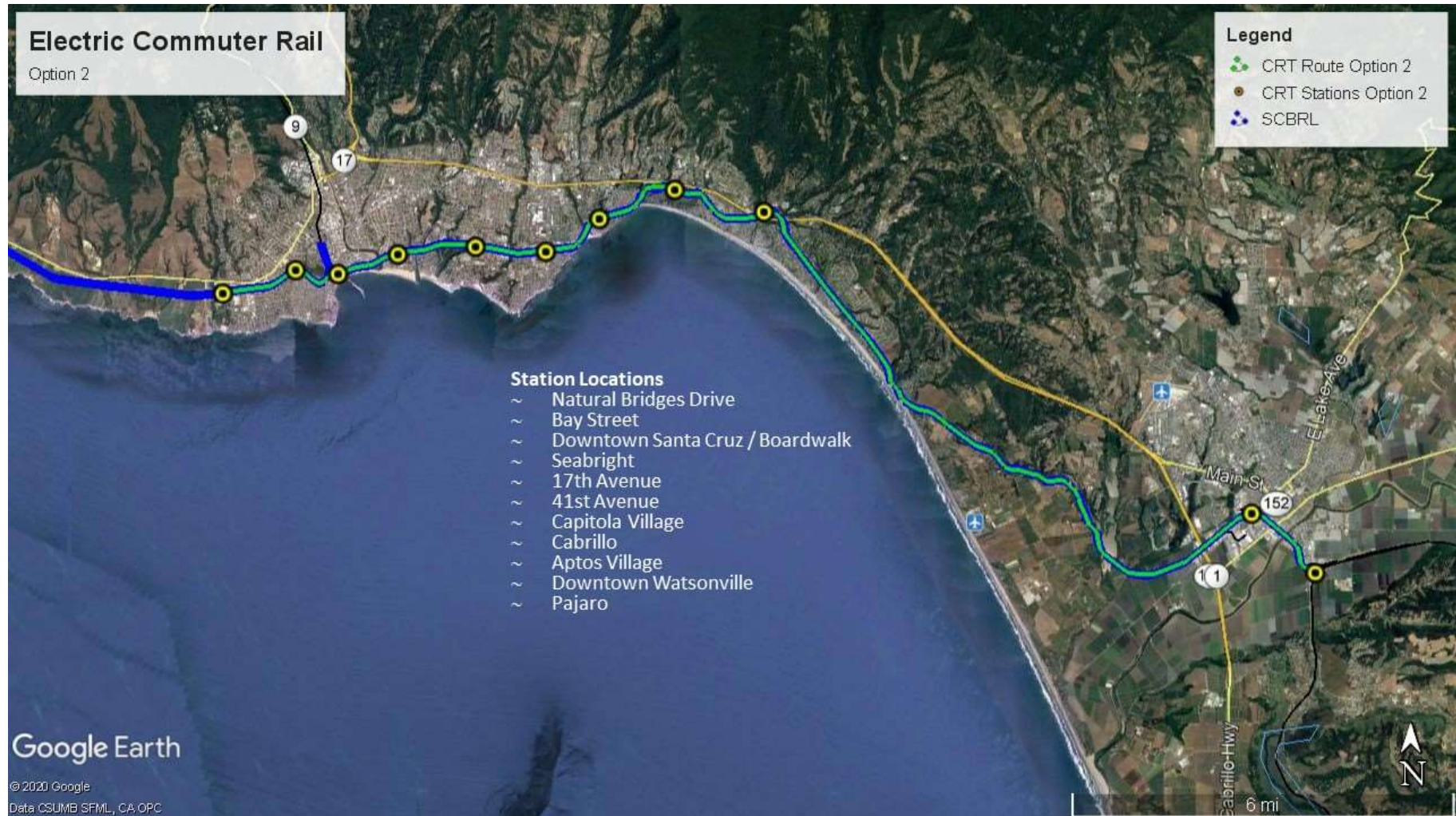






Figure 5.4: Commuter Rail Transit Option 1 Evaluated in Value Engineering



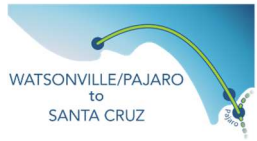


### LIGHT RAIL TRANSIT

Light Rail Transit is expected to use the full length of the SCBRL ROW from Pajaro Station in Watsonville to Natural Bridges Drive in Santa Cruz. The following service plans for each option evaluated in Value Engineering are presented below.

- **Light Rail Transit Option 1 (Figure 5.5).** Light Rail Transit for Option 1 will use the SCBRL ROW between Pajaro and West Santa Cruz with a station stop for Downtown Santa Cruz/Boardwalk (Pacific Ave near the wharf roundabout) to allow for a direct run through the Wye.
  - **Service Plan for Option 1.** Weekdays – 30 minute peak period and 60 minute off-peak period frequencies from approximately 6 a.m. to 9 p.m. Weekends – 30 minute frequencies all day with every 60 minute express (stops at West Santa Cruz, Downtown Santa Cruz / Boardwalk, 41<sup>st</sup> Avenue, Aptos, Downtown Watsonville, and Pajaro only) and every 60 minutes for all stops from approximately 7 a.m. to 10 p.m.
  - **Stations Option 1.** 15 total stations (2 of which are seasonal) with all platforms providing level boarding at Pajaro Station (large size), Downtown Watsonville Station (medium size), Ohlone Parkway Station (large size), LaSelva Beach Station (seasonal/weekends only - small size), Aptos Station (medium size), State Beach Station (small size), Capitola Station (small size), 38<sup>th</sup> Avenue-41<sup>st</sup> Avenue Station (large size), 17<sup>th</sup> Avenue Station (medium size), Seabright Station (small size), Boardwalk Station (seasonal/weekends only – small size), Downtown Santa Cruz Station/Boardwalk (small or medium size), Bay Street Station (small size), Fair Avenue-Almar Avenue Station (small size), and West Santa Cruz / Natural Bridges Station (large size).
  - **Meet-Pass Locations for Option 1.** Seven total station tracks and sidings assumed only for meeting light rail trains and providing excess capacity for service recovery and variability of weekend express services with freight rail operations temporally separated. These include Pajaro Station One Through Main Track and One Stub-Ended Station Track, Renaissance Siding, Aptos Siding, Capitola Siding, 17<sup>th</sup> Avenue Siding, Boardwalk Area Siding, and West Santa Cruz One Through Main Track and One Stub-Ended Station Track.
- **Light Rail Transit Option 2 (Figure 5.6).** Light Rail Transit Option 2 will use the SCBRL ROW between Pajaro and West Santa Cruz, with a short divergence to the top end of the Santa Cruz Wye for the Santa Cruz Depot Park Station (stub-ended operation requiring changing ends)
  - **Service Plan for Option 2.** Weekdays – 30 minute peak period and 60 minute off-peak period frequencies from approximately 6 a.m. to 9 p.m. Weekends – 30 minute frequencies all day with every 60 minute express (stops at West Santa Cruz, Santa Cruz Depot Park, Downtown Santa Cruz / Boardwalk, 41<sup>st</sup> Avenue, Aptos, Downtown Watsonville, and Pajaro only) and every 60 minutes for all stops from approximately 7 a.m. to 10 p.m.





- **Stations Option 2.** 15 total stations with all platforms providing level boarding at Pajaro Station (large size), Downtown Watsonville Station (medium size), Ohlone Parkway Station (large size), LaSelva Beach Station (seasonal/weekends only - small size), Aptos Station (medium size), State Beach Station (small size), Capitola Station (small size), 38<sup>th</sup> Avenue-41<sup>st</sup> Avenue Station (large size), 17<sup>th</sup> Avenue Station (medium size), Seabright Station (small size), Boardwalk Station (seasonal/weekends only – small size), Downtown Santa Cruz Depot Park Station (medium size), Bay Street Station (small size), Fair Avenue-Almar Avenue Station (small size), and West Santa Cruz / Natural Bridges Station (large size).
- **Meet-Pass Locations for Option 2 (same as Option 1).** 7 total – station tracks and sidings assumed only for meeting light rail trains and providing excess capacity for service recovery and variability of weekend express services with freight rail operations temporally separated. These include Pajaro Station One Through Main Track and One Stub-Ended Station Track, Renaissance Siding, Aptos Siding, Capitola Siding, 17<sup>th</sup> Avenue Siding, Boardwalk Area Siding, and West Santa Cruz One Through Main Track and One Stub-Ended Station Track.





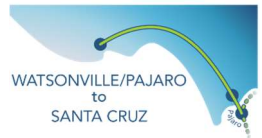


Figure 5.5: Light Rail Transit Option 1 Evaluated in Value Engineering

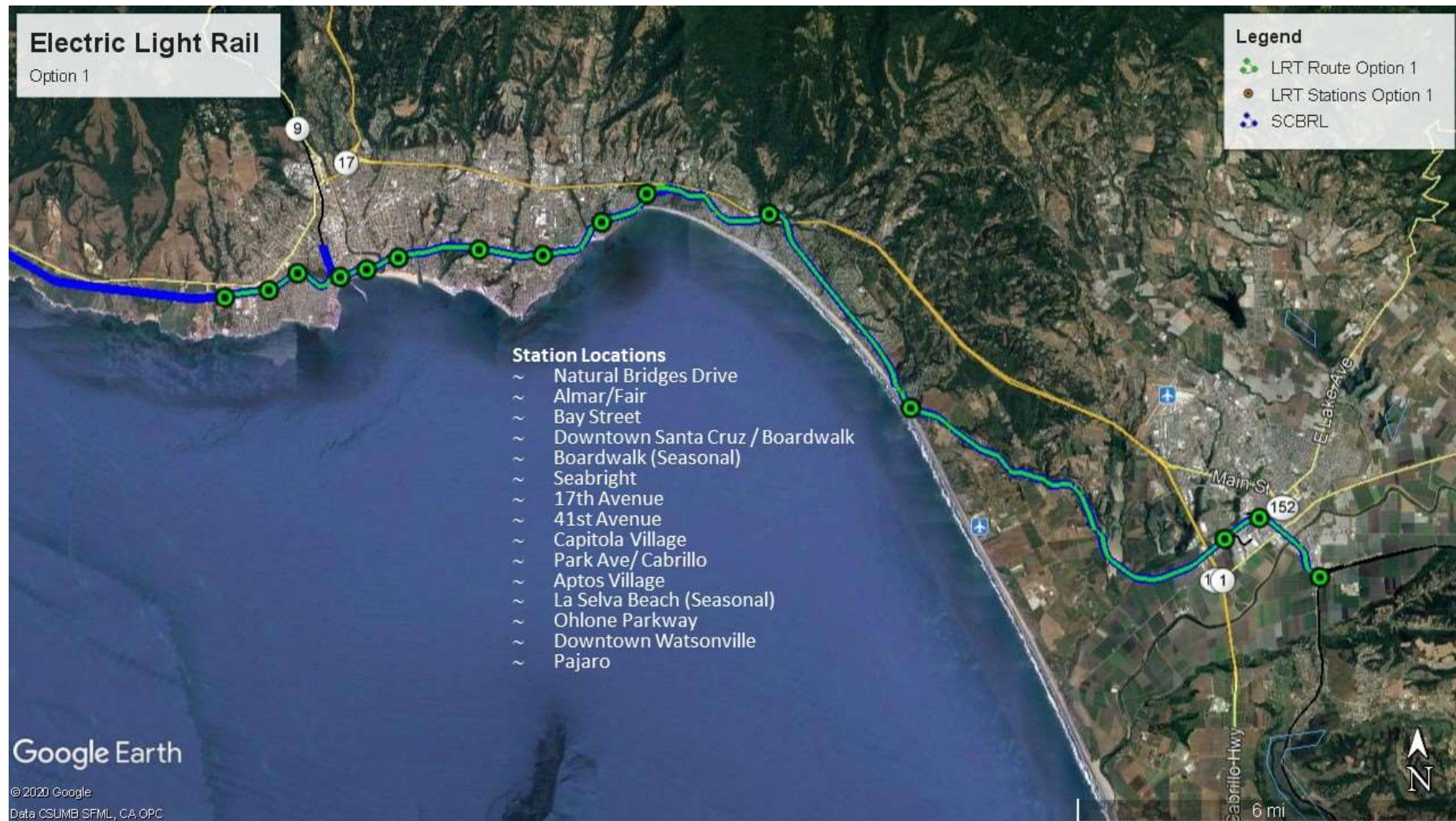
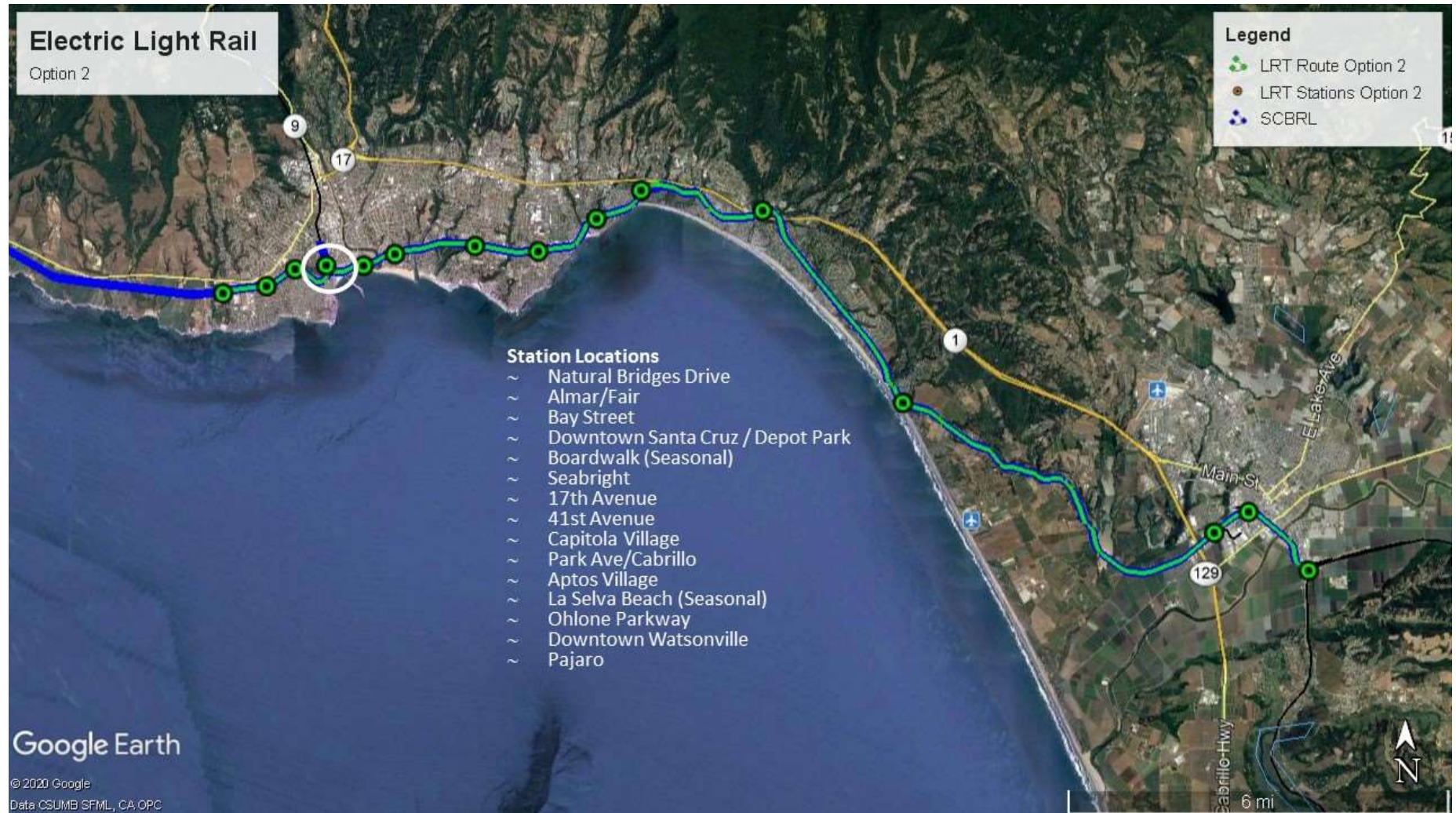


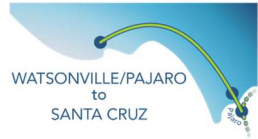




Figure 5.6: Light Rail Transit Option 2 Evaluated in Value Engineering





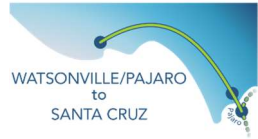


### AUTONOMOUS ROAD “TRAIN”

The Autonomous Road Train alternative included two options, each of which included use of the SCBRL ROW starting at Lee Road, with a local bus connector service between Lee Road and Pajaro Station with a stop at the Watsonville Transit Center. This alternative started at Lee Road because the Autonomous Road Train will be incompatible with freight rail operations in the SCBRL ROW between Pajaro Station and Lee Road. It was determined that developing a separate ROW to accommodate the Autonomous Road Train (i.e., a new parallel roadway) parallel to the SCBRL ROW was not feasible due to lack of alternative routes that would not displace prime agricultural land. The station locations and frequency of service were the primary differences between the two options as presented below:

- **Autonomous Road “Train” Operations Option 1 (Figure 5.7).** Autonomous Road “Train” run in the SCBRL ROW between Watsonville at Lee Road to Natural Bridges Drive in West Santa Cruz. This option assumed bus connector services between Lee Road in Watsonville) and Pajaro Station with a stop at the Watsonville Transit Center.
  - **Service Plan Option 1.** Weekdays – 30 minutes peak period and 60 minutes off-peak period frequencies from approximately 6 a.m. to 9 p.m. Weekends – 30 minutes frequencies all day with every 60 minutes express (stops at West Santa Cruz, Downtown Santa Cruz, 41<sup>st</sup> Avenue, Aptos, and Watsonville-Lee Road only) and 60 minute frequencies at all stops from approximately 7 a.m. to 10 p.m.
  - **Station Locations Option 1.** 13 total stations – all platforms provided level boarding at Watsonville-Lee Road Station (large size), LaSelva Beach Station (seasonal/weekends only - small size), Aptos (medium size), State Beach Station (small size), Capitola Station (small size), 38<sup>th</sup> Avenue-41<sup>st</sup> Avenue Station (large size), 17<sup>th</sup> Avenue Station (medium size), Seabright Station (small size), Boardwalk Station (small size - seasonal/weekends only), Downtown Santa Cruz Station/Boardwalk (medium size), Bay Street Station (small size), Fair Avenue-Almar Avenue Station (small size), and West Santa Cruz / Natural Bridges Station (large size). See **Figure 5.7** for station locations.
  - **Meet-Pass Locations for Option 1.** Seven total station guideways and sidings assume only for meeting autonomous road trains and providing excess capacity for service recovery and variability of weekend express services. Locations include Pajaro Station Two Stub-Ended Station Guideways, Renaissance Siding, Aptos Siding, Capitola Siding, 17<sup>th</sup> Avenue Siding, Boardwalk Area Siding, and West Santa Cruz Two Stub-Ended Station Guideways.
- **Autonomous Road Train Operations Option 2 (Figure 5.8).** The SCBRL ROW included operations between Watsonville at Lee Rd and West Santa Cruz, with a short divergence to the top-end of the Santa Cruz Wye for the Santa Cruz Depot Park Station (i.e., stub-ended operation requiring changing ends). This option also assumed transit connector services from Lee Road (Watsonville) to Pajaro Station.
  - **Service Plan for Option 2.** Weekdays – 30 minutes peak period and 60 minutes off-peak period frequencies from approximately 6 a.m. to 9 p.m. Weekends – 30 minutes frequencies all day with every 60 minutes express (stops at West Santa





- Cruz, Santa Cruz Depot Park, Downtown Santa Cruz, 41<sup>st</sup> Avenue, Aptos, and Watsonville-Lee Road only) and 60 minute frequencies at all stops from approximately 7 a.m. to 10 p.m.
- **Station Locations Option 2.** 13 total stations – all platforms provided level boarding at Watsonville-Lee Road Station (large size), LaSelva Beach Station (seasonal/weekends only - small size), Aptos (medium size), State Beach Station (small size), Capitola Station (small size), 38<sup>th</sup> Avenue-41<sup>st</sup> Avenue Station (large size), 17<sup>th</sup> Avenue Station (medium size), Seabright Station (small size), Boardwalk Station (small size - seasonal/weekends only), Santa Cruz Depot Park Station (medium size), Bay Street Station (small size), Fair Avenue-Almar Avenue Station (small size), and West Santa Cruz / Natural Bridges Station (large size). See **Figure 5.8** for station locations.
  - **Meet-Pass Locations for Option 2 (same as Option 1).** 7 total – station guideways and sidings assume only for meeting autonomous road trains and providing excess capacity for service recovery and variability of weekend express services. Locations include Pajaro Station Two Stub-Ended Station Guideways, Renaissance Siding, Aptos Siding, Capitola Siding, 17<sup>th</sup> Avenue Siding, Boardwalk Area Siding, and West Santa Cruz Two Stub-Ended Station Guideways.



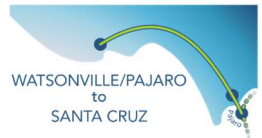


Figure 5.7: Autonomous Road Train Option 1 Evaluated in Value Engineering

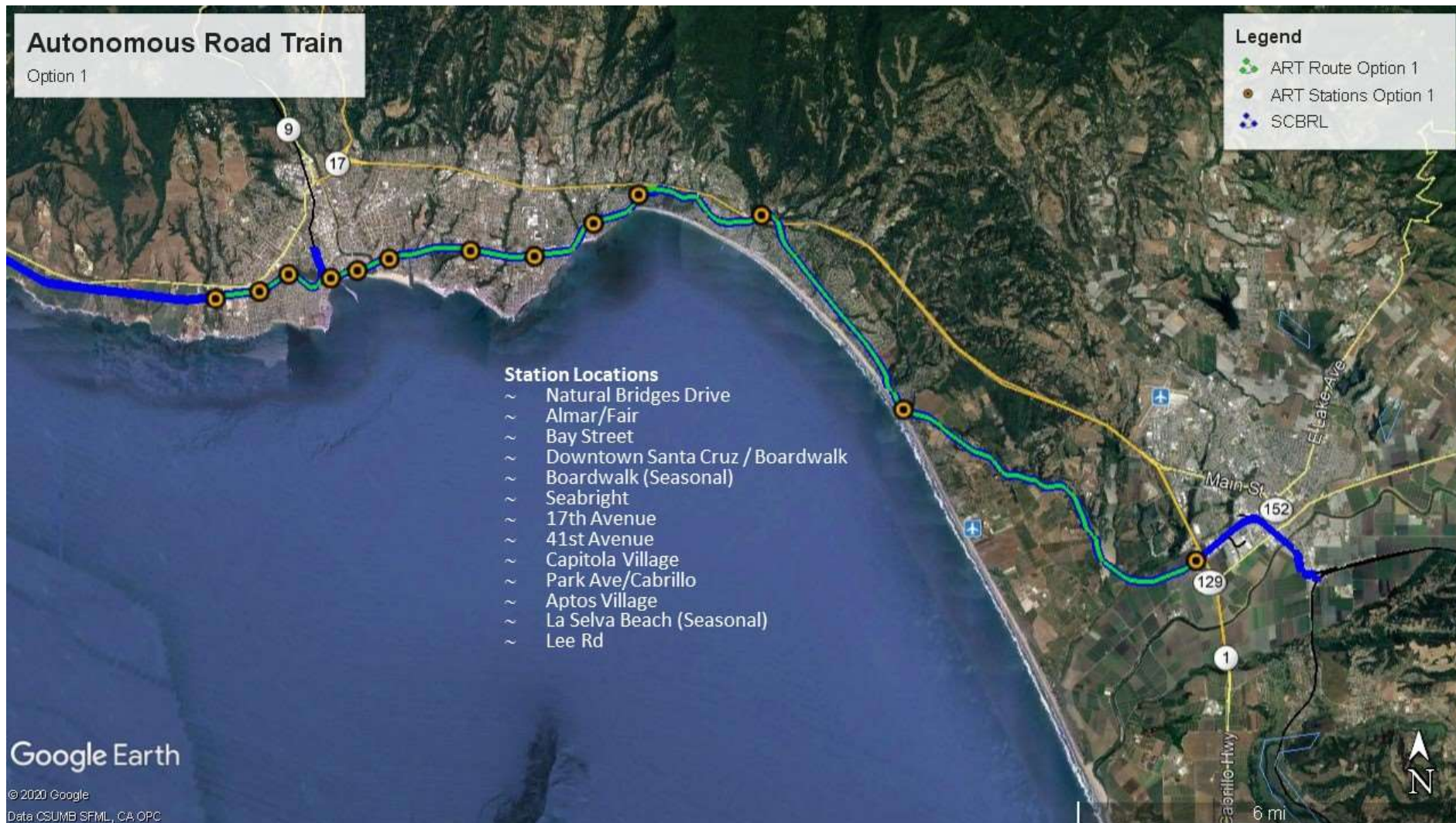
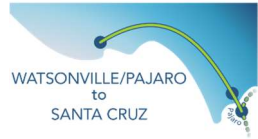






Figure 5.8: Autonomous Road Train Option 2 Evaluated in Value Engineering





## 5.2 VALUE ENGINEERING RESULTS

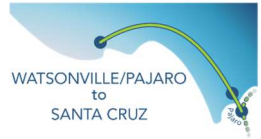
For each of the four alternatives and associated options described above, the following analysis criteria were applied and considered in the Value Engineering analysis. The analysis criteria were classified into the following Value Engineering categories:

- Estimated Length of the SCBRL ROW Corridor Used
- Average Weekday Ridership Estimates
- Average Travel Times and Typical Travel Speeds (i.e., service plans, number of stations)
- Estimated Peak Service Vehicles
- Interface with Freight Rail Service
- Safety at Public Interfaces (Intersection, Roadway Crossings)
- Conceptual Risk Assessment
- Financial Analysis
- Conceptual Cost Estimates
- Modal Integration and Connectivity

This analysis criteria identified above were developed and applied to identify the best operating option by alternative to move forward into the next analysis element, Milestone 3: Detailed Performance Evaluations, with higher emphasis on the Average Weekday Ridership, Average Travel Times, and Probable Capital Cost and Operating and Maintenance (O&M) Cost Estimates. **Table 5.1** presents a summary of the Value Engineering results for the options of each of the four alternatives. Ridership refers to the number of passenger boardings or one way trips. One passenger round trip equals two trips or two boardings.







**Table 5.1: Value Engineering Results by Alternative and Option**

|  | BRT<br>1A     | BRT<br>1B     | BRT<br>2A     | BRT<br>2B     | CRT<br>1  | CRT<br>2      | LRT<br>1  | LRT<br>2  | ART<br>1  | ART<br>2 |
|--|---------------|---------------|---------------|---------------|---|---------------|---|-----------|---|----------|
| Estimated Total Length of SCBRL ROW Corridor Used                  | 6.7 mi        |               | 3.22 mi       |               | 22.2 mi   |               | 22.2 mi   | 22.6 mi   | 19.4 mi   | 19.8 mi  |
| Weekday Headway - Peak/Off-Peak (minutes)                          | 10/20         | 15/15         | 10/20         | 15/15         | 30/60   |               | 30/60   |           | 30/60   |          |
| Weekday Span of Service  | 5 am-12 am    |               | 5 am-12 am    |               | 6 am – 9 pm                                       |               | 6 am – 9 pm                                       |           | 6 am – 9 pm                                       |          |
| Average Weekday Ridership (Boardings)                              | 3,000 – 5,000 | 3,500 – 5,500 | 3,000 – 5,000 | 3,500 – 5,500 | 3,000 – 4,500                                     | 3,000 – 5,000 | 4,000 – 6,000                                     |           | 4,000 – 6,000                                     |          |
| Average Travel Time (Includes Station Dwell)                       | 80 min        |               | 88 min        |               | 40-45 min   |               | 45-50 min   | 50-55 min | 45-55 min   |          |
| Estimated Peak Vehicle Requirement (with 20% Spares)               | 23            | 16            | 26            | 17            | Potentially 5-6 trainsets (in service and spares) |               | Potentially 5-6 trainsets (in service and spares) |           | Potentially 5-6 trainsets (in service and spares) |          |
| Capital Construction Cost (including Rolling Stock) (2020 Dollars) | \$388 M       | \$379 M       | \$237 M       | \$226 M       | \$452 M   | \$471 M       | \$450 M   | \$458 M   | \$670 M   | \$681 M  |
| Annual Operations and Maintenance Cost (2020 Dollars)              | \$20 M/yr     | \$19.5 M/yr   | \$22 M/yr     | \$21 M/yr     | \$23-25 M/yr                                      |               | \$23-25 M/yr                                      |           | \$23-25 M/yr                                      |          |

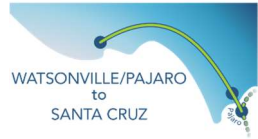
The following sections present summaries of the technical analysis conducted to support the TCAA/RNIS Value Engineering.

**AVERAGE WEEKDAY RIDERSHIP AND AVERAGE TRAVEL TIMES**

Travel demand modeling and market assessment tools were used to estimate ranges of potential ridership for each of the options by the four alternatives (**Appendix F**). Estimates for both ridership and travel times are presented in **Table 5.1**. The analysis considered application of the following models and tools:

- Streetlight Data/Travel Market Analysis. Streetlight data was obtained for Santa Cruz County that represented a robust dataset of origin and destination travel demand patterns within Santa Cruz County as well as travel connecting to and traveling through Santa Cruz County. Streetlight origin and destination data are developed from cell phones for regions across the U.S. RTC has used this data for previous planning studies and transportation agencies are using this data more often to supplement traditional





methods to augment travel demand analysis for planning studies. Streetlight was used to:

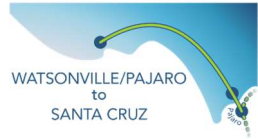
- Determine intra/inter-county travel patterns impacting the Santa Cruz transportation network
- Determine peak and off-peak travel demand activity impacting the Santa Cruz transportation network
- Validate and augment the travel pattern results maintained in the Santa Cruz County Regional Travel Demand Model (SCC Model)
- SCC Model/Post-Processing. The SCC Model was used to provide an initial model run with the TCAA/RNIS alternatives to provide an estimation of ridership and travel time impacts associated with the proposed service plan, frequencies, and proposed station locations. SCC Model Post-Processing was conducted to provide a comparison with the Streetlight Data and used to adjust results using both the SCC Model and Streetlight Data with travel market analysis findings. Transit Cooperative Research Program (TCRP) has documented procedures to assess transit ridership using elasticity analysis based on existing ridership, frequency, speed, and reliability of the services. These procedures were utilized as an additional post-processing step to determine ridership.

Travel times were estimated using a similar set of models and analysis tools and included the following methods:

- Streetlight Data/Travel Market Analysis. Streetlight was also used to develop travel times for each alternative using the estimated roadway travel times from the origin and destination travel pattern data. The SCC Model was used to validate the travel times from the Streetlight data.
- SCC Model was run for the BRT alternative options using the proposed stop locations and headways to generate roadway network travel speeds while accounting for different congestion levels and speeds by time of day. Estimated SCBRL ROW for the other three alternatives by option were used to estimate travel times based on average speeds, station dwell times, and frequencies. BRT analysis also included an analysis of the mix of roadway and ROW travel speeds, while Commuter Rail, Light Rail, and Autonomous Road Train included SCBRL ROW travel speeds.

The Bus Rapid Transit ridership estimates ranged from 3,000 to 5,000 boardings for Options 1A and 2A and slightly higher for Options 1B and 2B at 3,500 to 5,500 boardings. The number of stop/station densities in key areas and higher frequencies in the peak and off-peak periods contributed to the ridership estimates. While lengthier travel times suppressed long-distance trips between Watsonville and Santa Cruz, higher frequencies induced greater levels of shorter distance trips, particularly during the off-peak period. The ridership ranges for the Options assumed a refined METRO network to reduce route duplication and feed the BRT network,





particularly in Mid-County. Travel times for the Bus Rapid Transit ranged from 70-80 minutes and 75-90 minutes depending on the option.

Light Rail Transit and Autonomous Road Train considered the same estimated ridership, higher than BRT ridership, provided a balance of speed and station/stop locations, with higher speeds compared to BRT, but more stations than the commuter rail options to provide high ridership estimates. LRT ridership ranged from 4,000 to 6,000 boardings for each Option, the highest range of the four alternatives evaluated in Value Engineering. Relatively infrequent off-peak period service frequencies suppressed shorter trip making, particularly through Santa Cruz and Mid-County. Travel times for the Light Rail Transit and Autonomous Road Train ranged from 45-50 minutes and 50-55 minutes depending on the option.

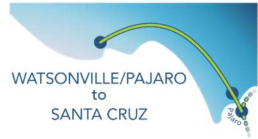
Commuter Rail Transit ridership ranges were slightly lower than Light Rail Transit, primarily due to fewer number of stations, even though it provided a faster travel time. In addition, long-distance travel markets for the stations on the SCBRL ROW were not as strong as the mid-to-short travel market. Option 1 ridership ranged from 3,000-4,500 boardings lower than Option 2 ridership estimates from 3,000-5,000 boardings. Travel times for the Commuter Rail Transit were faster than Light Rail Transit, ranging from 40-45 minutes for both options.

#### **CAPITAL AND OPERATING & MAINTENANCE COST ESTIMATES**

Cost estimates were developed differently for the alternatives based on the need for a roadway structure on the SCBRL ROW to accommodate the rubber tire alternatives (Bus Rapid Transit and Autonomous Road Train) and rail structure to accommodate Light Rail Transit and Commuter Rail Transit. **Table 5.1** shows the estimated capital and operating and maintenance costs by option for the four alternatives.

Bus Rapid Transit Capital and O&M costs estimates were based on analysis recently completed in the SCBRL ROW, including the UCS and recent transit industry experience encompassing each of the four alternatives. The Caltrans 11-page Cost Estimate Format were used to support the Bus Rapid Transit cost estimates. Assumptions built into this detailed analysis included the need to convert the SCBRL ROW to a paved 2 lane BRT guideway, with costs associated with improved structures – bridges and retaining (and associated earthwork) walls, fencing, new traffic signals required for the at-grade crossings with the SCBRL ROW, operation signals, Transit Signal Priority at existing arterial signals, fiber. Stations and BRT vehicle costs were also integrated into the analysis with percentage of calculated allowances and contingencies added to the costs. Option 1a and 2a were estimated to cost from \$379 to \$388M while Option 2 was estimated at costs ranging from \$226 to \$237m. Option 1A and 2A costs were higher than Option 1B/2B primarily because Bus Rapid Transit will use up to 7 miles of the SCBRL ROW compared to half of this mileage for Option 2A/2B. O&M cost estimates were the same for the BRT options, ranged from \$19.5m-\$21m (**Table 5.1**).





Commuter Rail Transit and Light Rail Transit Capital and O&M cost estimates used a different method than Bus Rapid Transit. Cost estimates were based on previous work on the Rail Transit Feasibility Study and the Unified Corridor Investment Study and revised based on current TCAA/RNIS study and recent rail/transit industry experience. The primary conceptual cost categories used to estimate these costs for the rail alternatives included Track and Civil, Structures – Bridges, Signals and Train Control, Stations and Maintenance Facility, Rail Vehicles, and percentage calculated for allowances and contingencies. Commuter rail capital cost estimates ranged from \$447m-452m, slightly lower than Light Rail Transit ranging from \$450m-\$458m. O&M cost estimates were the same for both rail alternatives and options, ranging from \$23m-\$25m (**Table 5.1**).

Capital and O&M cost estimates for Autonomous Road Train considered a similar analysis as conducted above for Bus Rapid Transit, with the primary difference the Autonomous Road Train using about 20 miles of the SCBRL ROW and not using local roadway network. Cost estimates were based on the UCS and current TCAA/RNIS study options, recent transit industry experience including limited implementation strategies of this alternative in China, and a combination of analysis from the previous alternatives analyzed. As with Bus Rapid Transit, the Caltrans 11-page Estimate Format was utilized for estimating capital costs. Assumptions were used to convert 19 miles of the SCBRL ROW to paved Autonomous Road Train guideway, Structures – bridges and retaining (earthwork), walls, fencing, new traffic signals for at-grade crossings, operations signals, fiber, stations, operations & maintenance facility, and vehicles, and percentage calculated for allowances and contingencies. Costs for each option were considerably higher than the other alternatives, ranging from \$670m-\$681m, with O&M costs the same range as Light rail Transit in the \$23m-\$25m (**Table 5.1**).

### 5.3 OPTIONS MOVING FORWARD TO MILESTONE 3: DETAILED PERFORMANCE ANALYSIS

Upon synthesizing the data and conclusions resulting from Milestone 3: Value Engineering, including review, counsel, and input from the Ad Hoc Committee, the following options by each of the four alternatives were moved forward into the next analysis element of the TCAA:

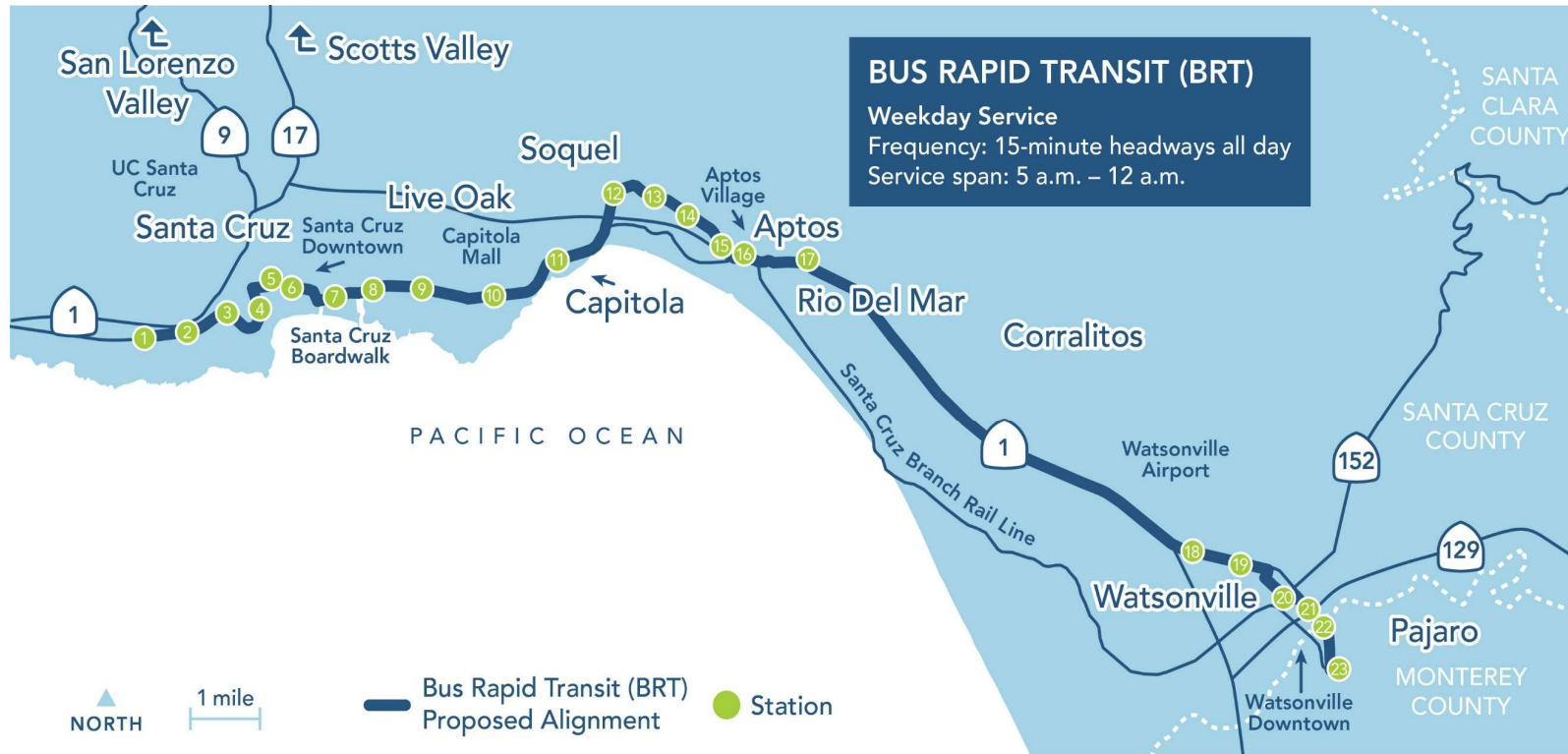
- Bus Rapid Transit Option 1B (**Figure 5.9**)
- Commuter Rail Transit Option 2 (**Figure 5.10**)
- Light Rail Transit Option 2 but with increased frequency to 30 minute headways all day (**Figure 5.11**)
- Autonomous Road Train Option 2 (**Figure 5.12**)







**Figure 5.9: Bus Rapid Transit Alignment Moving to Detailed Performance Evaluation**



| Station # | Name                            | Station # | Name                          | Station # | Name                               |
|-----------|---------------------------------|-----------|-------------------------------|-----------|------------------------------------|
| 1         | Natural Bridges Station         | 9         | 17th Avenue Station           | 17        | Rio Del Mar/Soquel Station         |
| 2         | Fair/Almar Avenue Station       | 10        | 41st Avenue Station           | 18        | Main/Green Valley Station          |
| 3         | Bay Street Station              | 11        | Capitola Village              | 19        | Ramsay Park Station                |
| 4         | Depot Park Station              | 12        | Soquel/Park Station           | 20        | Watsonville Transit Center Station |
| 5         | SC Metro Transit Center Station | 13        | Cabrillo College Station      | 21        | Main/Riverside Station             |
| 6         | Riverside/San Lorenzo Station   | 14        | Soquel/Mar Vista Station      | 22        | Porter/San Juan Station            |
| 7         | Seabright/Murray Station        | 15        | Rancho Del Mar Center Station | 23        | Pajaro Station                     |
| 8         | 7th Avenue Station              | 16        | Aptos Village Station         |           |                                    |





Figure 5.10: Commuter Rail Transit Alignment Moving to Detailed Performance Evaluation



| Station # | Name                                  | Station # | Name                         |
|-----------|---------------------------------------|-----------|------------------------------|
| 1         | Natural Bridges Station               | 9         | Aptos Village Station        |
| 2         | Bay Street Station                    | 10        | Downtown Watsonville Station |
| 3         | Downtown Santa Cruz/Boardwalk Station | 11        | Pajaro Station               |
| 4         | Seabright Station                     |           |                              |
| 5         | 17th Avenue Station                   |           |                              |
| 6         | 41st Avenue Station                   |           |                              |
| 7         | Capitola Village Station              |           |                              |
| 8         | Cabrillo College Station              |           |                              |





Figure 5.11: Light Rail Transit Alignment Moving to Detailed Performance Evaluation

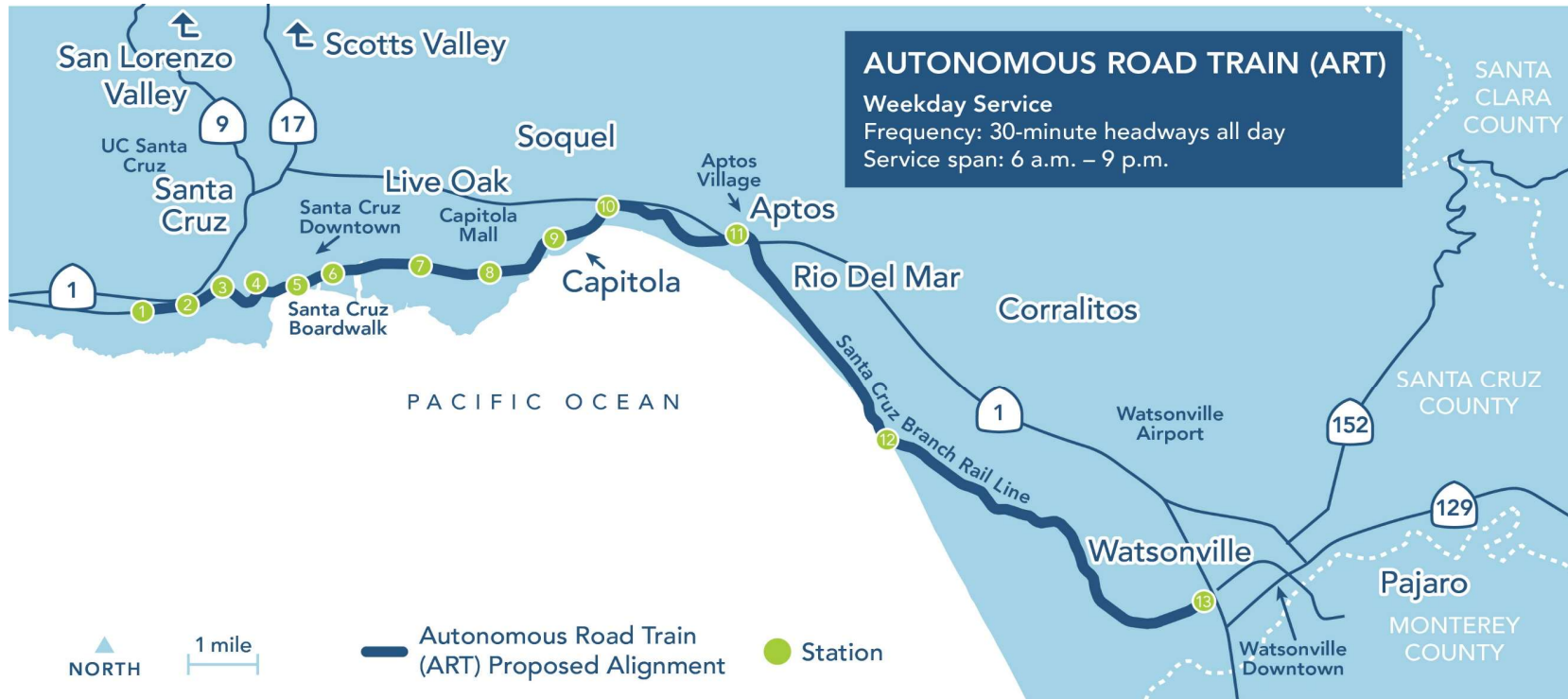


| Station # | Name                                   | Station # | Name                              |
|-----------|--|-----------|-----------------------------------|
| 1         | Natural Bridges Station                | 9         | Capitola Village Station          |
| 2         | Fair /Almar Avenue Station             | 10        | Park Avenue/Cabrillo Station      |
| 3         | Bay Street Station                     | 11        | Aptos Village Station             |
| 4         | Downtown Santa Cruz Depot Park Station | 12        | La Selva Beach Station (seasonal) |
| 5         | Boardwalk Station (seasonal)           | 13        | Ohlone Parkway Station            |
| 6         | Seabright Station                      | 14        | Downtown Watsonville Station      |
| 7         | 17th Avenue Station                    | 15        | Pajaro Station                    |
| 8         | 41st Avenue Station                    |           |                                   |





Figure 5.12: Autonomous Road Train Alignment Moving to Detailed Performance Evaluation



| Station # | Name                                   | Station # | Name                              |
|-----------|--|-----------|-----------------------------------|
| 1         | Natural Bridges Station                | 9         | Capitola Village Station          |
| 2         | Fair/Almar Avenue Station              | 10        | Park Avenue/Cabrillo Station      |
| 3         | Bay Street Station                     | 11        | Aptos Village Station             |
| 4         | Downtown Santa Cruz Depot Park Station | 12        | La Selva Beach Station (seasonal) |
| 5         | Boardwalk Station (seasonal)           | 13        | Lee Road Station                  |
| 6         | Seabright Station                      |           |                                   |
| 7         | 17th Avenue Station                    |           |                                   |
| 8         | 41st Avenue Station                    |           |                                   |





## 5.4 MILESTONE 3: DETAILED PERFORMANCE EVALUATION

This section presents the detailed performance evaluation of the best performing alignment and service plan options of the four alternatives for the Santa Cruz Branch Rail Line Right-of-Way (ROW) moving forward from Milestone 3- Value Engineering (as shown above in Section 5.2). Separate sections are presented below for the detailed performance measure evaluations for each of the Triple Bottom Line Approach (TBLA) goals of economy, social equity, environment, and other. See also **Appendix G** for a Table of the Milestone 3 Performance Measure Analysis results.

### *ECONOMY*

The detailed evaluations for the performance measures are presented below for each of the 4 alternatives for the Economy goal of the TCAA/RNIS.

### **FISCAL FEASIBILITY**

Fiscal feasibility considers how the alternatives address capital and operating and maintenance costs and the potential to finance each of the alternatives. The goal of “Fiscal Feasibility” was evaluated by assessing the following performance measures:

- Capital Cost by
  - Capital Cost/Mile
  - Capital Cost/Rider/30 years
  - Capital Cost/Passenger Mile/30 years
- Operations & Maintenance (O&M) Costs/Year
  - O&M Costs/Mile/Year
  - O&M Costs/Rider
  - O&M Costs/Passenger Mile
- % of Funding Likely from Existing Sources
- % of Funding Likely from Potential Future Sources

### **CAPITAL AND OPERATIONS & MAINTENANCE COSTS**

Capital costs for bus rapid transit (BRT) and autonomous road train (ART) were estimated using Caltrans’ 11-page cost estimating template which is a standard planning level cost estimating tool. BRT operating costs were estimated based on Santa Cruz Metropolitan Transit District (METRO) hourly operating costs and number of operating hours. Commuter Rail Transit (CRT) and Light Rail Transit (LRT) capital and operations & maintenance (O&M) costs were informed by the costs developed for the Santa Cruz Branch Rail Transit Feasibility Study, the Unified Corridor Investment Study (UCS), recent bridge and track inspection reports, and updated using best practices and rail experts. Project costs were calculated to represent 2020 dollars.





The capital and operations & maintenance costs for each of the transit alternatives were estimated based on best practices for regional, state, and national planning studies. A contingency of 50% was included in the cost estimates for all 4 alternatives to account for the unknowns at this early stage of project development. Project costs included in the TCAA/RNIS are for the purpose of this planning study and alternatives analysis. No engineering was performed to support the estimated costs. Cost estimates will be refined if the project moves through project development, including undergoing increased levels of design to reflect the market conditions (i.e., cost of labor, equipment and materials) in the year the project is expected to be implemented. **Table 5.2** shows the capital and O&M cost estimates by alternative, in current year dollars, with **Appendix H** providing detailed summaries of costs.

In 2012, RTC secured \$11 Million in Proposition 116 funding and \$10 million in State Transportation Improvement (STIP) Public Transportation Account (PTA) funding from the California Transportation Commission (CTC) with conditions, to purchase the Santa Cruz Branch Rail Line right-of-way (SCBRL ROW) from Union Pacific (UP) and do some rail infrastructure rehabilitation. The proposition 116 funds are restricted to rail projects which facilitate recreational, commuter, intercity and intercounty travel. If RTC does not use the rail line for the approved purpose as the funding application was submitted, RTC is responsible for reimbursing the CTC for this funding. The CRT and LRT alternatives meet the Proposition 116 funding requirements, whereas the BRT and ART options do not meet this requirement for the portion of the line where the railway will be converted to a paved guideway. The cost estimates for BRT and ART include pro-rated reimbursements of the \$11 Million in Proposition 116 funds and \$10 Million in State Transportation Improvement Program PTA funds used to buy and repair (as approved by CTC) the SCBRL ROW.

The LRT cost estimates assume that the trainsets are not FRA-compliant, and that Positive Train Control is not needed. Costs for infrastructure improvements for CRT and LRT assume that freight rail will continue, and freight loads need to be accommodated. Capital and operational and maintenance costs for local bus connector services at the stations were not included for any of the alternatives.





**Table 5.2: Fiscal Feasibility Performance Measures (2020 dollars)**

|   | PERFORMANCE MEASURE                  | BRT     | CRT     | LRT     | ART     |
|---|--------------------------------------|---------|---------|---------|---------|
| How does capital cost compare to other projects?                  | Capital Costs                        | \$410M  | \$478M  | \$465M  | \$720M  |
|   | Capital Cost/Mile                    | \$18M   | \$22M   | \$21M   | \$31M   |
|   | Capital Cost/Rider/30 Years          | \$6.40  | \$9.70  | \$8.90  | \$14.60 |
|   | Capital Cost/Passenger Mile/30 Years | \$1.40  | \$1.20  | \$1.00  | \$1.70  |
| Is the project relatively more expensive to maintain and operate? | O&M Costs/Year                       | \$19.5M | \$25M   | \$25M   | \$28M   |
|   | O&M Costs/Mile/Year                  | \$0.88M | \$1.13M | \$1.11M | \$1.22M |
|   | O&M Cost/Rider                       | \$9.20  | \$15.20 | \$14.30 | \$17.00 |
|   | O&M Cost/Passenger Mile              | \$1.20  | \$2.10  | \$1.90  | \$2.20  |

**PERCENT FUNDING LIKELY EXISTING AND FUTURE SOURCES**

**Existing Funding Sources and Revenues.** The TCAA/RNIS funding assessment identified how much funding will likely be available for each alternative based on existing potential revenues and each alternative’s estimated capital, operation and maintenance needs through 2045. Federal, state and local revenues were considered. The TCAA/RNIS funding assessment considered funding eligibility requirements which often restrict revenues to specific transportation investment types. It also considered Santa Cruz County’s likely share of statewide grants and grant award minimums and maximums.

The TCAA/RNIS funding assessment considered the following sources for revenue generation: Funding sources including grant programs potentially available for each of the four alternatives on a fixed guideway were assumed as potential revenues for eligible transit services.

- Funding identified in the Financial Element of the 2040 Regional Transportation Plan (RTP), which could potentially be directed to transit, were assumed as potential revenues to fund TCAA/RNIS alternatives. Funds from grant programs for which projects would be strong candidates were also assumed as potential revenues to fund TCAA/RNIS alternatives. Allocating these funds to transit on the SCBRL ROW may require





shifting funds identified for other projects in the RTP action element to potentially fund TCAA/RNIS alternatives. However, funding for METRO's ongoing capital and operations and maintenance was not assumed to be available for any of the four transit alternatives evaluated in the TCAA/RNIS.

- New funds identified as a result of updates to the 2040 Santa Cruz County RTP revenue projections were assumed as potential revenues. These include but were not limited to new SB1 programs and federal BUILD (formerly TIGER) grant program funds and other potential grant awards.
- For the purpose of estimating transit revenues, fares for CRT, LRT, and ART assumed an average fare of \$4.50 and BRT assumed an average fare of \$3.50 since the average distance traveled by BRT is estimated to be less than other alternatives. This was based on examples of a zone fare structure, which charge a lower fare for shorter distance travel and higher fare for longer distance travel, with fares likely ranging from \$3.00 to \$6.00 per trip, depending on the distance traveled.
- The 2018 California State Rail Plan (CSRP) identified the Santa Cruz Branch Rail Line as part of the California's future state rail system, which will likely provide the RTC with the potential eligibility for future state rail funding. The funding sources identified in the CSRP for transit programs were included in the list of revenue sources.
- Total revenues assumed 25 years of revenues (2020-2045) reported in 2020 dollars.

**Future Funding and Revenue Sources.** While difficult to predict the potential for identifying future funding sources for BRT, Governor Newsom's recent Executive Order (EO N-79-20) directs state agencies to "Build towards an integrated, statewide rail and transit network, consistent with the California State Rail Plan, to provide seamless, affordable multimodal travel options for all." Future funding for transit will likely increase for all the alternatives evaluated in the TCAA/RNIS. An additional state, federal and/or local source of funds will be needed to fund a shortfall from what is reasonably expected from existing fund sources. A local source of funds could be a dedicated sales tax measure, which requires a 2/3 super majority of county voters similar to Measure D that was passed in November 2016 to fund various transportation projects. **Table 5.3** shows the percent of funding likely expected from existing sources by alternative and the potential for future funds. **Appendix I** presents a summary of the existing funding sources evaluated in the TCAA/RNIS.







**Table 5.3: Funding Performance Measures**

| PERFORMANCE MEASURE  | BRT   | CRT   | LRT   | ART   |
|--|---|---|---|---|
| <b>% Funding likely from <u>existing</u> sources</b>         | <b>Capital<br/>64%</b><br><br><b>O&amp;M<br/>50% Likely</b>   | <b>Capital<br/>59%</b><br><br><b>O&amp;M<br/>45% Likely</b>   | <b>Capital<br/>61%</b><br><br><b>O&amp;M<br/>46% Likely</b>   | <b>Capital<br/>36%</b><br><br><b>O&amp;M<br/>36%</b>  |
| <b>% Funding likely from <u>potential</u> future sources</b> | Funding is likely to increase in the future for BRT but unknown to what extent. An additional source of funds (local, state or federal) of \$390M is needed to provide the extra capital funds and 25 years of operations and maintenance funds once the facility has been constructed to fully fund the project. | Funding is likely to increase in the future for CRT but unknown to what extent. An additional source of funds (local, state or federal) of \$540M is needed to provide the extra capital funds and 25 years of operations and maintenance funds once the facility has been constructed to fully fund the project. | Funding is likely to increase in the future for LRT but unknown to what extent. An additional source of funds (local, state or federal) of \$520M is needed to provide the extra capital funds and 25 years of operations and maintenance funds once the facility has been constructed to fully fund the project. | Funding is likely to increase in the future for ART type systems but unknown to what extent. An additional source of funds (local, state or federal) of \$910M is needed to provide the extra capital funds and 25 years of operations and maintenance funds once the project is constructed to fully fund the project. |

**RESULTS IN A WELL-INTEGRATED TRANSPORTATION SYSTEM SUPPORTING ECONOMIC VITALITY**

A “Well-Integrated Transportation System Supporting Economic Vitality” was evaluated by assessing the following measures which are presented below:

- Transit Oriented Development
- Job Growth
- Impacts on Freight Rail
- Impacts on Roaring Camp’s Santa Cruz Big Trees and Pacific Railway (SCBG)
- Impacts on Existing and Future Freight Rail Businesses.





### TRANSIT-ORIENTED DEVELOPMENT (TOD)

A large body of research conducted over the past several decades has identified that fixed guideway transit investments help attract and enable new, higher-density development. Developers are more likely to invest in communities with permanent transit systems or those including features suggesting permanency.<sup>5</sup> Property owners and renters are willing to pay a premium to locate where they can take advantage of improved accessibility and other benefits provided by transit improvements, especially when combined with bicycle and pedestrian infrastructure improvements.

A recent series of studies on property values near San Diego's rail transit stations found that all else being equal, a condominium located within a quarter-mile of a rail station was worth 16 percent more than a condominium located a mile away from a station.<sup>6</sup> In general, transit improvements appear to have the greatest impact on new development when the corridor or system significantly improves residents' access to employment and other destinations; provides frequent, high-quality, regional service; and is combined with local zoning and land use regulations to facilitate transit-oriented development (TOD), especially in walkable, mixed-use neighborhoods.<sup>7</sup>

The predominant hypothesis in the TOD literature suggests that the more permanent-seeming the transit service, the greater the certainty of the return on investment for TOD. An alternative with an exclusive guideway is more likely to generate TOD opportunities compared to a route that provides less permanence. A recent study of new BRT lines in Cleveland, Ohio, Eugene, Oregon, and Kansas City, Missouri, concluded that BRT projects with exclusive lanes and other substantial physical infrastructure can serve as focal points for attracting new development, particularly if located near major institutions and/or employment centers and paired with supportive land use policies and development incentives.<sup>8</sup> A comparative study of 21 North American light rail and bus rapid transit lines also found that transit lines located adjacent to downtowns or other major destinations had the strongest impact on development.

<sup>5</sup> United States Government Accountability Office, "BRT: Projects Improve Transit Service and Can Contribute to Economic Development," 2012.

<sup>6</sup> Duncan, "Comparing Rail Transit Capitalization Benefits for Single-Family and Condominium Units in San Diego, California," December 2008.

<sup>7</sup> Wardrip, "Public Transit's Impact on Housing Costs: A Review of the Literature," 2011; Fogarty and Austin, "Rails to Real Estate: Development Patterns along Three New Transit Lines," 2011; Fogarty et al., "Downtowns, Greenfields, and Places in Between: Promoting Development Near Transit," 2013.

<sup>8</sup> United States Government Accountability Office, "BRT: Projects Improve Transit Service and Can Contribute to Economic Development," 2012.





Since commuter rail and light rail transit are on exclusive guideways as evaluated in the TCAA/RNIS, these services are more likely to generate TOD development opportunities than a route that is less permanent. Since the length of BRT alternative on the SCBRL ROW is only 7 miles, BRT will likely only increase TOD development opportunities in those 7 miles. ART uses most of the SCBRL ROW, but not within the Watsonville city limits, which could offer high quality TOD development. LRT and CRT use the entire SCBRL ROW and offers the maximum TOD potential. **Table 5.4** shows the TOD performance measures by alternative.

**Table 5.4: Transit-Oriented Development Performance Measures**

| PERFORMANCE MEASURE                               | BRT   | CRT   | LRT   | ART  |
|---|---|---|---|--|
| Will the project increase TOD along the corridor? | BRT will likely increase TOD in the segments along the ROW where the BRT guideway is built but less likely in areas where the BRT runs along the roadway network. | CRT is more likely to generate TOD on the entire route. | LRT is more likely to generate TOD on the entire route. | ART is more likely to generate TOD on the majority of the route. |

**JOB CREATION**

The implementation of transit along the SCBRL ROW will create jobs during construction as well as longer term jobs for operations and maintenance. Economic impact analyses are often used to estimate jobs associated with infrastructure investment, generally assuming that projects with significantly greater capital and O&M expenditures generate more jobs.

Economic impact analyses were also used to estimate total jobs for each alternative. This included calculating direct jobs, which are those directly associated with the infrastructure





construction, operation or maintenance of the alternatives, as well as indirect and induced jobs. These latter categories reflect a spending “multiplier effect.” For example, if a construction worker takes his family out to dinner, this generates economic activity and is considered an induced effect. When a construction company purchases supplies, this is considered an indirect effect. It is the combination of these effects that were calculated to result in total jobs impact estimates for each alternative.

The economic multipliers for estimating jobs from transportation infrastructure investments were based on Caltrans 2018 Executive Fact Book, which used 11 jobs per \$1 million invested to estimate total jobs (i.e., direct, indirect, and induced), calculated using the IMPLAN input/output model. Total jobs associated with each of the four alternatives are presented in **Table 5.5**. The construction jobs and operations and maintenance jobs are good paying, carrier-oriented opportunities, which provide benefits for a region currently over-dependent on tourist-oriented service industry jobs.

**Table 5.5: Job Creation Performance Measures**

| PERFORMANCE MEASURE  | BRT   | CRT   | LRT   | ART   |
|--|-------|-------|-------|-------|
| Total number of jobs (direct and indirect) generated through construction in the near term | 4,100 | 5,100 | 4,900 | 7,400 |
| Total number of jobs (direct and indirect) generated longer term through O&M activity      | 210   | 270   | 270   | 300   |

Note: Jobs estimates based on CALTRANS, Capital Allocations, Division of Transportation Programming, “State Transportation Construction Capital Allocations (in Millions) and Jobs Created table.

**IMPACTS ON FREIGHT RAIL OPERATIONS**

**Bus Rapid Transit** assumes freight rail can only be accommodated between Pajaro to Park Avenue at Coronado Street in Capitola. The BRT alternative converts the railway to a paved guideway between Park Avenue in Capitola and Natural Bridges Drive. Freight would need to be abandoned north of Park Avenue.

**Commuter Rail Transit** with positive train control will allow freight and passenger rail to comeing on the ROW. The frequency of commuter rail services will make it more challenging to







run freight rail at the same time, but freight rail can be accommodated. Optionally, freight rail can run outside of commuter rail service hours.

**Light Rail Transit** could either run with an FRA-compliant vehicle or non-FRA-compliant vehicle. If FRA-compliant vehicles are used, then the impact on freight rail operations will be the same as identified above for CRT. If non-FRA-compliant vehicles are used, then freight rail cannot comingle with light rail and the freight rail will require temporal separation with the passenger rail services. For the purpose of this study, it was assumed that all infrastructure, such as bridges, would be engineered to accommodate freight rail loads. Cost savings could be realized if these structures were engineered to only accommodate the lighter LRT loads. Since this would significantly impact freight rail, cost estimates were prepared assuming freight loads keeping the freight impacts between CRT and LRT nearly identical.

**Autonomous Road Train** accommodates existing freight rail operations within Watsonville, ending at Lee Road. The autonomous road train alternative converts the railway to a paved guideway between Lee Road in Watsonville to Natural Bridges Drive in Santa Cruz Freight rail would need to be abandoned north of Lee Road.

#### IMPACTS ON SANTA CRUZ BIG TREES AND PACIFIC RAILWAY

**Bus Rapid Transit** is expected to bypass the boardwalk area via San Lorenzo Blvd and Laurel St to access the Pacific Ave Metro Transit Center allowing SCBG to continue to access the boardwalk via the east leg of the Wye. BRT would be utilizing the west leg of the Wye and thus alternatives would be needed for SCBG to turn their trains. BRT would eliminate access for SCBG to bring rail cars in or out of the greater rail network via Pajaro.

**Commuter Rail Transit** can share the same set of tracks with SCBG if scheduling allows, since the vehicles are both FRA compliant. A siding may be beneficial for SCBG in the boardwalk area to allow commuter rail to pass SCBG while boarding/alighting. Alternatively, if there are scheduling challenges for SCBG with high frequency commuter rail and freight rail equipment, SCBG could benefit from a separate set of tracks from the east leg of the Wye to the boardwalk area. The expense and the right of way needed to accommodate an additional set of tracks along Beach Street may make this option infeasible. Another potential option is for SCBG boarding/alighting to occur at Depot Park station although this option is not of interest to SCBG given the potential significant impact on their business. CRT would allow Big Trees and Pacific Railway to bring rail cars in or out via Pajaro as long as there is proper coordination with passenger and freight rail services.





**Light Rail Transit** with an FRA compliant vehicle has the same impact on SCBG as Commuter Rail Transit – see explanation under CRT. If LRT is not FRA-compliant, SCBG and LRT can share the same set of tracks if there is temporal separation between the vehicles. The length of time needed for temporal separation may be short enough to allow SCBG and LRT to readily share the same set of tracks, but this option would need to be investigated further. Technological changes in rail signaling may also reduce the time needed for temporal separation even further. Alternatively, if the need for temporal separation is too limiting or if there are scheduling challenges between SCBG with high frequency light rail, SCBG could benefit from a separate set of tracks from the east leg of the Wye to the boardwalk area. The expense and the right-of-way needed to accommodate an additional set of tracks along Beach Street may make this option infeasible. Another potential option is for SCBG boarding/alighting to occur at Depot Park station although this option is not of interest to SCBG given the potential significant impact on their business. LRT with a non-FRA compliant vehicle would allow SCBG to bring rail cars in or out via Pajaro as long as there is proper coordination with passenger and freight rail service.

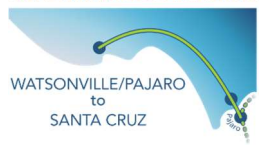
**Autonomous Road Train** requires a paved dedicated guideway that would continue through the boardwalk area, along Beach St and up to Depot Park Station. SCBG’s existing route could be served with a set of tracks parallel to the ART guideway from the east leg of the Wye to the boardwalk area. Beach Street would need to accommodate the ART guideway, one set of tracks, a cycle track for bicycles, a minimum of one lane for vehicles and a sidewalk on both sides, which may be infeasible. A set of tracks and the ART guideway crossing through the roundabout at the Wharf will be challenging. Alternatively, SCBG boarding/alighting could occur at Depot Park station although this option is not of interest to SCBG given the potential significant impact on their business. Alternative configurations would be needed for Big Trees to reverse their trains as they currently use the entire Wye for this purpose. ART would eliminate access for SCBG to bring rail cars or locomotives in or out of the greater rail network via Pajaro.

### IMPACTS ON EXISTING AND FUTURE FREIGHT RAIL BUSINESSES

**Bus Rapid Transit** is not compatible with freight rail north of Park Avenue near Highway 1. Increased freight rail volumes are limited in the area between Park Avenue near Highway 1 and Lee Road in Watsonville, with the exception of Buena Vista Landfill that could benefit from freight rail. Potential freight customers include Buena Vista Landfill, as well as existing and future customers in Watsonville, including agricultural, fuel, lumber, and food products. Freight rail in this area could operate without the need to schedule around a passenger rail service.

**Commuter Rail Transit** would mean existing and future potential freight rail customers could be served along the entire length of the SCBRL ROW from Pajaro Station to Davenport. Potential





freight rail customers include construction materials, agricultural, lumber, fuel and food products, and material from Buena Vista Landfill. Freight rail volumes in Watsonville and Pajaro could increase for both existing and potential future freight rail customers including additional agricultural, fuel, lumber and food products. A transload site for transferring goods to/from rail could potentially increase freight rail volumes with a potential site location in Watsonville. Freight Rail may need to run outside of CRT service hours, due to scheduling conflicts.

**Light Rail Transit** would mean existing and future freight rail customers could be served along the entire length of the ROW from Pajaro Station to Davenport. Potential freight rail customers include construction materials, agricultural, lumber, fuel and food products, and material from Buena Vista Landfill. Freight rail volumes in Watsonville and Pajaro could increase for existing and future customers, including additional agricultural, fuel, lumber and food products. A transload site for transferring goods to/from rail could potentially increase the freight volumes with a site location in Watsonville. Freight Rail may need to run outside of LRT service hours if non-FRA compliant vehicles are used or due to scheduling conflicts.

**Autonomous Road Train** would limit freight rail opportunities to potential customers between Lee Road in Watsonville to Pajaro Station. Freight rail volumes in Watsonville and Pajaro could increase in both existing and potential future customers, including additional agricultural, fuel, lumber and food carloads. A transload site for transferring goods to/from rail could potentially increase freight rail volumes with a potential site location in Watsonville. Freight rail in this area could operate without the need to schedule around a passenger rail service.

#### CONTINUITY AND UTILIZATION OF CORRIDOR

There could be a risk to an alternative’s feasibility, if the alternative requires tracks to be removed for a paved guideway and the STB requires continuation of freight rail service. Since both BRT and ART require removal of tracks, these alternatives would require abandonment (or railbanking) of freight rail beyond the southerly most point from which the railway is converted to a guideway. To abandon (or railbank) freight, the common carrier operator would need to petition the Surface Transportation Board (STB) for abandonment. Saint Paul and Pacific (SPP) Railway has been designated the freight common carrier by the STB and entered a 10-year Administrative, Coordination and License (ACL) agreement with RTC in 2018, which provides a license to SPP for both freight and recreational rail service. SPP has indicated that they would like to terminate the ACL, so it may be possible to have them petition the STB to abandon rail freight on all or a portion of the line. Although another party could make an offer of financial assistance to preserve freight on the line, RTC should be able to retrain control of the corridor by continuing freight, if required by the STB. If so, these two alternatives would become infeasible.





There are property risks associated with alternatives that convert rail to paved guideway. Although RTC owns most of the SCBRL ROW in fee, there are some easements that the underlying property owners could claim are extinguished if the RTC no longer uses those easements for rail purposes. RTC could acquire those rights, like any other property right needed for a project; however, there would be a process and cost associated with acquiring those rights. Alternatively, RTC could protect those rights by using the railbanking provision of the freight abandonment procedure established under the Rails to Trails Act. RTC could consider railbanking regardless of the type of transit selected for the line, including passenger rail service. The railbanking provision of the Rails to Trails Act stops short of complete abandonment by preserving the continuity of the corridor for freight in the future and is designed to prevent an interest in a railroad right-of-way from reverting under state law to an underlying fee owner when the right-of-way is used as an alternate transportation facility after a freight railroad discontinues service. Railbanking could also help prevent lawsuits against RTC for building a trail that may be considered a recreational facility adjacent to rail, as underlying property owners could sue the RTC for expanding an easement that was designated for rail purposes. Any taking claims by property owners related to expansion of the railroad easement would then be against the Federal Government as the entity granting the right to railbank. A discussion of mitigating the risk that the SCBRL ROW will not remain continuous based on implementation of each of the four alternatives is discussed below.

**Bus Rapid Transit** proposes to convert 6.7 miles of the ROW from a railway to a paved guideway. Implementation of a BRT alternative would require petitioning the STB for abandonment of freight rail service, north of Park Street. The petition could include a request to railbank, which would stop short of complete abandonment and preserve a continuous corridor.

**Commuter Rail Transit** would utilize all 22.2 miles of the ROW from Pajaro Station to Natural Bridges Drive. Implementing a commuter rail transit alternative on the rail line that allows freight rail service to continue has no risk of losing the continuity of the ROW.

**Light Rail Transit** will utilize all 22.6 miles of the ROW from Pajaro Station to Natural Bridges Drive including accessing Depot Park Station. Implementing a light rail transit alternative on the ROW that allows freight service to continue has no risk of losing the continuity of the rail corridor.

**Autonomous Road Train** proposes to convert 19.8 miles of the ROW from railway to paved guideway. Implementation of an ART alternative would require petitioning the STB for







abandonment, north of Lee Road. The petition could include a request to railbank, which would stop short of complete abandonment and preserve a continuous corridor.

### **SOCIAL EQUITY**

The detailed evaluations for the criteria and performance measures are presented below by alternative for the social equity goal of the TCAA/RNIS.

### **PROMOTES ACTIVE TRANSPORTATION**

Active Transportation considers the ability of the alternatives to meet the pedestrian and bicycle interactions of the proposed services in the SCBRL ROW. The goal of “Promoting Active Transportation” was evaluated by assessing the following performance measures presented below:

- On-board Bicycle Capacity Every 30 Minutes
- Level Boarding at Transit Stations and Stops
- Impacts of Transit Alternative on Rail Trail/California Coastal Trail

### **BICYCLE CAPACITY EVERY 30 MINUTES**

Providing bicycle storage space on transit vehicles will be an attractive amenity to many passengers because it provides them with a multi-modal transportation option that includes ease of using active transportation for the first and last mile of their trip. Regardless of the type of transit service, vehicles for each of the four alternatives can be designed to accommodate a variety of uses. The actual design of the number of passenger seats, amount of space for bicycles and mobility devices, luggage or other items, will be flexible and considered at a later stage of the project development.

Typically, bus systems have bicycle racks on the outside of the vehicles with a limit of 3 bicycles per bus (see example bike racks on transit vehicles below).

Typical rail vehicles accommodate 2 to 4 bicycles, but this is highly variable. Recognizing the rise in transit passengers commuting with their bicycles, many transit systems are implementing bicycles-on-board programs and retrofitting or purchasing vehicles with space for bicycle storage. The configuration of how bicycles can be accommodated on transit cars can vary. Below are samples of a few possible configurations. **Table 5.6** presents the results of the bicycle capacity performance measures for the four alternatives for every 30 minutes during the peak period.





**Table 5.6: Bicycle Capacity Performance Measures**

| PERFORMANCE MEASURE   | BRT  | CRT  | LRT  | ART  |
|---|--|--|--|--|
| Bicycle capacity on transit/every 30 minutes during peak period | Standard storage is 2-4 bicycles per articulated BRT; Two BRT every 30 minutes would accommodate 8 bicycles every 30 minutes. The design of the number of seats, the amount of space for bicycles, and mobility devices is flexible. | Standard storage is 2-4 bicycles per car. SMART in Marin has space for 12 bicycles per car; A three car train set could accommodate 36 bicycles every 30 minutes; The design of the number of seats, the amount of space for bicycles, and mobility devices is flexible. | Standard storage is 2-4 bicycles per car. Siemens S70 standard design has storage for 24 bikes/3 car trainset every 30 minutes; The design of the number of seats, the amount of space for bicycles, and mobility devices is flexible. | Assume seating, amount of space for bicycles and mobility devices is flexible. |

**LEVEL BOARDING AT TRANSIT STATIONS AND STOPS**

“Level-Boarding” refers to transit vehicle interiors (from entrance/exit doors) that are level with station and/or stop platforms, allowing easy passenger access and egress from vehicles without requiring passengers to climb steps to board/alight the train. This allows people with bicycles, mobility devices, strollers, etc. to board trains quickly and easily without any special assistance. It also speeds up boarding for all passengers by eliminating steps, which tends to slow passenger movements. Faster boarding also will reduce “dwell times” at stations. Dwell times represent how long a vehicle needs to be stationary at a stop. Level boarding reduces the overall travel time. **Table 5.7** provides the analysis of the four alternatives ability to provide level boarding.





**Table 5.7: Level Boarding at Transit Stations/Stops Performance Measure**

| PERFORMANCE MEASURE                       | BRT  | CRT  | LRT  | ART  |
|---|--|--|--|--|
| Ability for level boarding for bicyclists | BRT can provide platforms for level boarding at all stations along the ROW. Stops along the roadway alignment may not accommodate level boarding due to space limitations. | CRT can provide platforms for level boarding at all stations | LRT can provide platforms for level boarding at all stations | ART can provide platforms for level boarding at stations between Natural Bridges Drive and Lee Rd Station. Connection from ART station at Lee Rd to downtown Watsonville and Pajaro Station are via local bus and would not have level boarding. |

**EFFECTS OF TRANSIT ALTERNATIVE ON RAIL TRAIL/CALIFORNIA COAST TRAIL**

The Monterey Bay Sanctuary Scenic Trail is a planned 50-mile network of bicycle and pedestrian paths along the coast of Santa Cruz County, from the San Mateo County line in the north to the Monterey County line at Pajaro. Segments of the Monterey Bay Sanctuary Scenic Trail (MBSST) also serve as the California Coastal Trail. The spine of the MBSST is planned to follow the existing 32-mile rail corridor, adjacent to the area proposed for transit. It is often referred to as the coastal rail trail.

The MBSST Master Plan was developed through a multiyear comprehensive planning process involving extensive input from members of the public, local jurisdictions, and resource agencies. The Trail Master Plan defines the trail alignment and describes design features for bicyclists and pedestrians that serve transportation and recreation uses. Detailed design is being done as sections of the trail are funded and implemented. An additional 18 miles of the MBSST Network consists of on-road facilities, other trails, and natural surface paths that connect to schools, shopping centers and coastal access areas. A transit service that connects





Santa Cruz and Watsonville, with a network of bicycle and pedestrian facilities connecting at the transit stations including the trail along the SCBRL ROW, provides a safe, sustainable and integrated transportation network for the Santa Cruz County community. The width of the trail along the entire corridor that could be built alongside each of the transit alternatives is too detailed of an analysis for this study. The width of the trail is best determined during design of the trail project given the many factors that contribute to this determination. A discussion of the continuity of the corridor from each alternative is located in the performance measure discussion above under “Continuity and Utilization of the Corridor”. The effects of the four transit alternatives on the ability of the transit alternative to accommodate the trail/California Coastal Trail within the SCBRL ROW is described below.

The **Bus Rapid Transit** alternative would not require a change in the location of the coastal rail trail as planned in the Monterey Bay Sanctuary Scenic Trail Master Plan, except there could be minor adjustments at station locations. In two narrow sections of the ROW (California Street to Laurel Street, 30th Avenue to 47th Avenue), BRT is expected to consist of a single guideway with two-way signaled operations, so that both transit and the trail can coexist. Sidings would be provided at stations for BRT vehicles to meet and pass.

The **Commuter Rail Transit** alternative would not require a change in the location of the coastal rail trail as planned in the Monterey Bay Sanctuary Scenic Trail Master Plan, except for possible adjustments at siding and station locations. A few potential locations were identified for passing sidings. At these locations, the coastal rail trail may need to be shifted to the immediately adjacent public way and could be physically separated from traffic.

**Light Rail Transit** will not require a change in the location of the coastal rail trail as planned in the Monterey Bay Sanctuary Scenic Trail Master Plan, with the exception of station for possible adjustments at siding and station locations. A few potential locations were identified for passing sidings. At these locations, the coastal rail trail may be shifted to the immediately adjacent public way and could be physically separated from traffic.

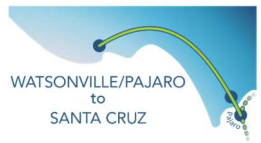
**Autonomous Road Train** will not require a change in the location of the coastal rail trail as planned in the Monterey Bay Sanctuary Scenic Trail Master Plan, except for possible adjustments at station and siding locations. Two potential locations were identified for passing sidings. At these locations, the coastal rail trail may need to be shifted to the immediately adjacent public way and could be physically separated from traffic.

#### SAFER TRANSPORTATION FOR ALL MODES

The goal of “Safe Transportation for All Modes” was evaluated by assessing the following performance measure: fatal and injury collisions per year.







### SAFETY – FATAL AND INJURY COLLISIONS

In 2013, the Rails to Trails Conservancy published a report titled “America’s Rail with Trails” where they evaluated the characteristics of 88 existing rails-with-trails in 33 states. Their research on safety of these 88 facilities found that only one fatality and two injuries occurred over a 20-year period that involved a rail-with-trail user and a train.<sup>9</sup> This data suggests that well-designed rail-with-trail facilities can reduce fatalities and injuries by providing safer ways to guide the movement of people alongside and across rail corridors and reduces the incentive to use the tracks as a shortcut. Fencing between the trail and the active transit facility and well-designed intersections with other modes will add to the safety of these facilities and would be considered in implementation of all of the alternatives. The contribution of rails-with-trails in making rail corridors safer places for people to travel supports more equitable transportation options. Rail-with-trail provides a solution to the challenge of keeping people safe while also optimizing the use of rail corridors to accommodate the mobility needs of all residents. The findings of the 2013 report demonstrate the high level of safety for rails-with-trails.

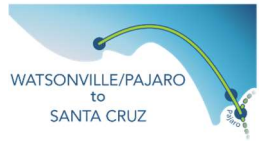
The four alternatives were evaluated to assess the change in the number of fatalities and injuries by shifting from auto travel to the transit alternative. The assessment in the 2013 report suggests that a trail alongside transit on a SCBRL ROW will improve safety relative to rail facilities without a trail by reducing the incentive to use tracks as a shortcut. As a result, this analysis may overestimate the number of fatalities and injuries likely to occur due to implementation of each of the four transit alternatives.

The California Life-Cycle Benefit Cost Model (version 7.2) provided the accident rates by severity for highway, bus transit, commuter rail transit and light rail transit. These accident rates were developed using data on (California) statewide accident rates compiled through the Traffic Accident Surveillance and Analysis System (TASAS). In this analysis, the accident information was combined with vehicle-miles traveled (VMT) information from the California Public Road Data, which was derived from the latest California (Caltrans) Highway Performance Monitoring System (HPMS).

The collision rate data is presented in **Table 5.8** with the safety and associated cost analysis evaluated for the four transit alternatives presented in **Table 5.9**. The ART safety performance analysis utilized the collision rates for light rail as data for ART is not available as there are no ART systems operating within the U.S. A positive number represents an increase in the number of collisions or an increase in cost and a negative number represents a decrease in the number

<sup>9</sup> Rails to Trails Conservancy, “America’s Rails-with-Trails, A Resource for Planners, Agencies and Advocates on Trails Along Active Railroad Corridors,” September 2013.





of collisions or a decrease in cost. For CRT, LRT and ART, a decrease in injury and fatal collisions translates into a decrease in the cost associated with the collisions. For BRT, although there is an estimated increase in the total number of injury and fatal collisions relative to driving in an automobile, there is a net reduction in the number of fatal collisions which causes an overall reduction in the cost of fatal and injury collisions.

**Table 5.8: Collision Rates by Severity and Transportation Mode**

| Event    | Highway Auto<br>(events/million veh-mi) | Bus<br>(events/million veh-mi) | Commuter Rail<br>(events/million veh-mi) | Light Rail<br>(events/million veh-mi) | ART<br>(events/million veh-mi) |
|----------|---|--------------------------------|--|---------------------------------------|--------------------------------|
| Fatality | 0.006                                   | 0.0349                         | 0.0555                                   | 0.248                                 | Not available                  |
| Injury   | 0.29                                    | 3.6535                         | 0.2519                                   | 3.9469                                | Not available                  |

**Table 5.9: Safety Performance Measures**

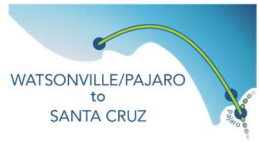
| PERFORMANCE MEASURE   | BRT         | CRT          | LRT         | ART         |
|---|-------------|--------------|-------------|-------------|
| Estimated Annual Fatal and Injury Collisions per transit alternative per year                 | 2.00        | 0.05         | 0.91        | 0.80        |
| Change in Total Annual Fatal and Injury Collisions per year (considering reduced auto travel) | +0.46       | -1.89        | -1.18       | -1.16       |
| Annual Change in Cost of Fatal and Injury Collisions  | - \$ 62,700 | - \$ 612,800 | - \$ 52,100 | - \$ 92,600 |

**ACCESSIBLE AND EQUITABLE TRANSPORTATION SYSTEM**

The goal of “An accessible and equitable transportation system that is responsive to the needs of all users” was evaluated by assessing the following performance measures:

- Location Relative to Transportation Disadvantaged Population
- Universal Access/Transit Passenger Capacity Miles Traveled
- Transit Fares
- Mobility Device Capacity





- Level Boarding for Independent Accessibility

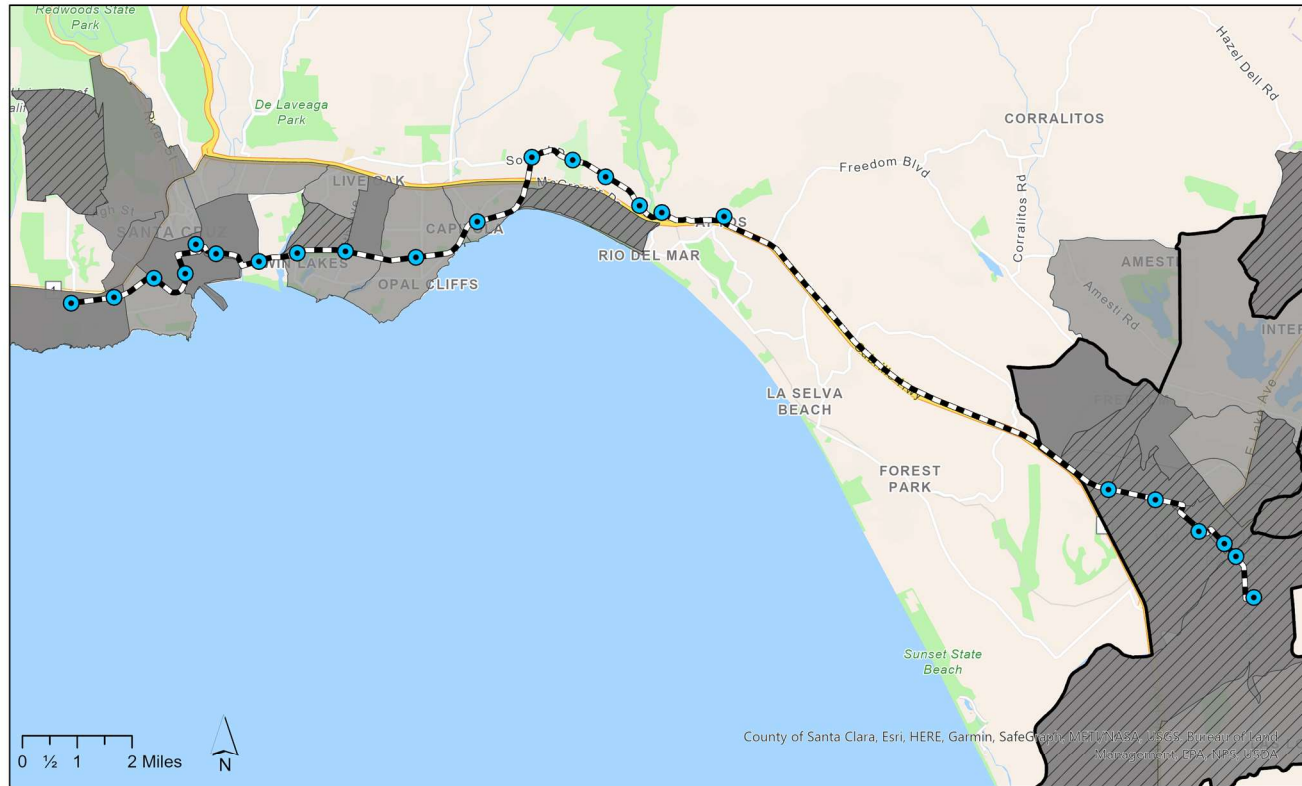
#### LOCATION RELATIVE TO TRANSPORTATION DISADVANTAGED POPULATION

The benefits of the four alternatives to transportation disadvantaged populations were evaluated by determining the location of the proposed stations and stops relative to these communities. The 2040 Santa Cruz County Regional Transportation Plan defined transportation disadvantaged communities as census tracts with greater than 65 percent of the total population designated as non-white, 65 percent of households designated as low income, or greater than 20 percent of households designated in poverty.

Low income areas were also defined by California Department of Housing and Community Development's income limits under AB 1550. **Figures 5.13 to 5.16** show the locations of the transit stations relative to the transportation disadvantaged populations for each of the four alternatives respectively. **Table 5.10** provides the number and percentage of stations/stops located within or within one half mile of census tracts considered transportation disadvantaged.



Figure 5.13: Bus Rapid Transit Stations/Stops Near Disadvantaged Communities



Proposed Transit Stations Near Disadvantaged Communities

Bus Rapid Transit (BRT)

- Proposed Station
- Proposed Route
- Minority
- Poverty
- Low Income
- AB1550 Low Income

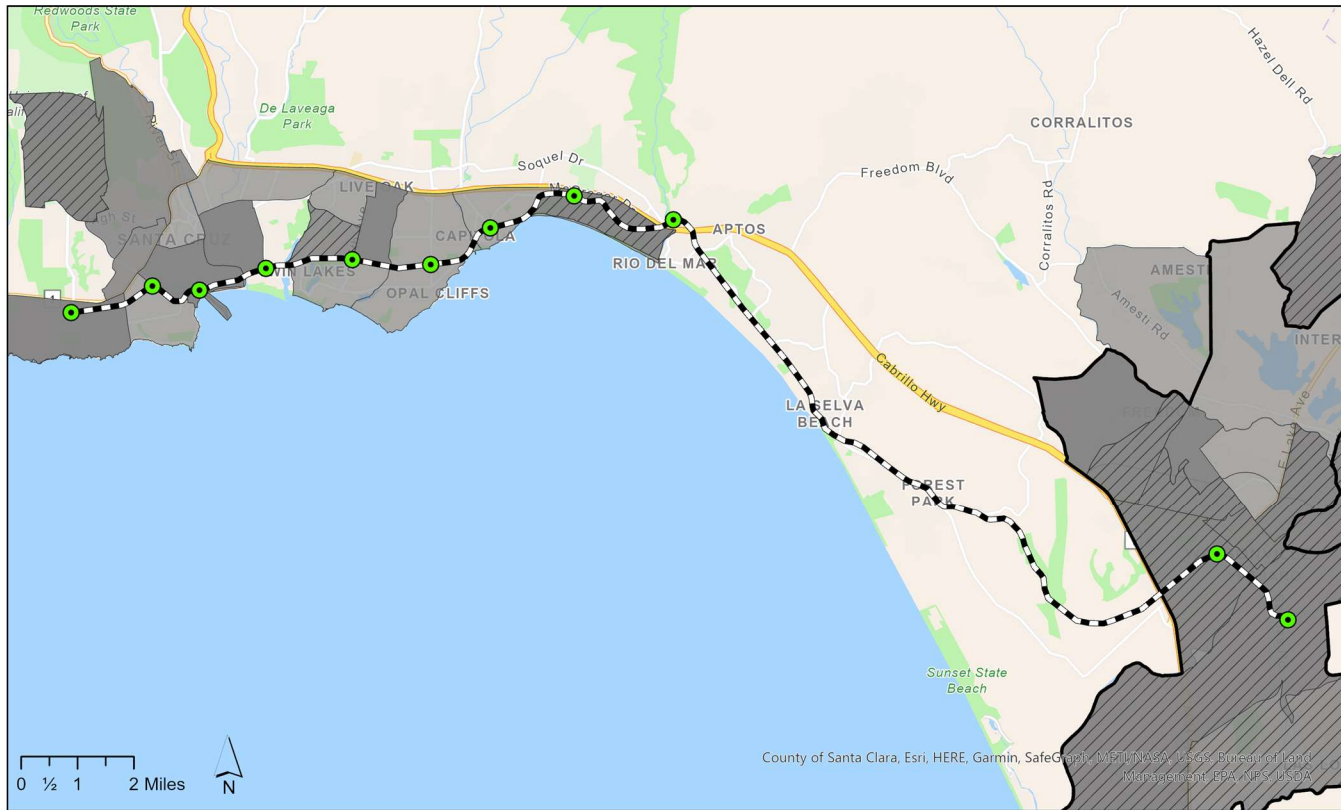
Santa Cruz County's regional definition of Disadvantaged Communities are defined as census tracts where greater than 65% of the population is non-white, 65% of the households are low income, or 20% of the households are in poverty. Low income areas are also defined by CA Department of Housing and Community Development's income limits under AB 1550.







Figure 5.14: Commuter Rail Transit Stations/Stops Near Disadvantaged Communities



### Proposed Transit Stations Near Disadvantaged Communities

#### Commuter Rail (CRT)

- Proposed Station
- Proposed Route
- Minority
- Poverty
- Low Income
- AB1550 Low Income

Santa Cruz County's regional definition of Disadvantaged Communities are defined as census tracts where greater than 65% of the population is non-white, 65% of the households are low income, or 20% of the households are in poverty. Low income areas are also defined by CA Department of Housing and Community Development's income limits under AB 1550.



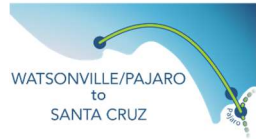


Figure 5.15: Light Rail Transit Stations/Stops Near Disadvantaged Communities



Proposed Transit Stations Near Disadvantaged Communities

Light Rail (LRT)

- Proposed Station
- Minority
- Low Income
- Proposed Route
- Poverty
- AB1550 Low Income

Santa Cruz County's regional definition of Disadvantaged Communities is defined as census tracts where greater than 65% of the population is non-white, 65% of the households are low income, or 20% of the households are in poverty. Low income areas are also defined by CA Department of Housing and Community Development's income limits under AB 1550.



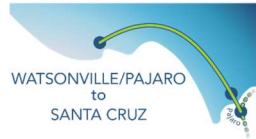
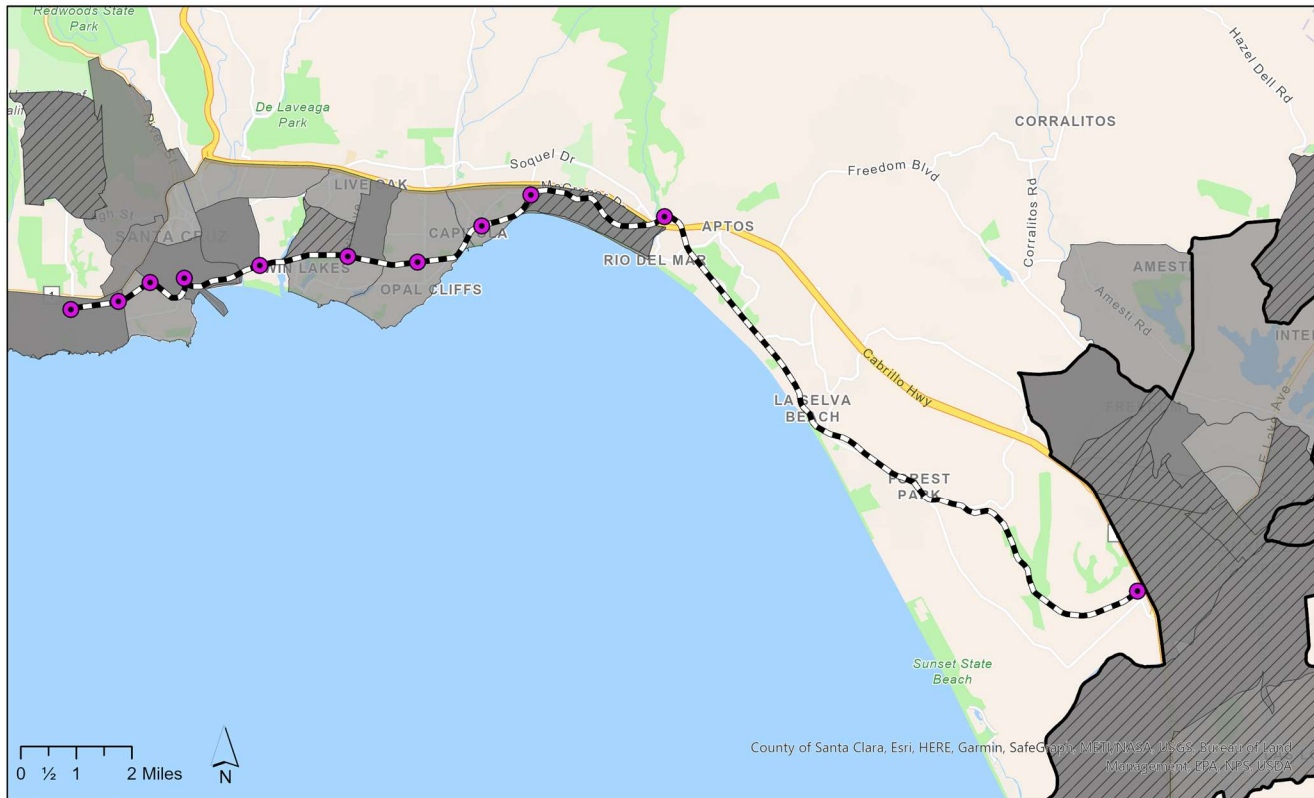


Figure 5.16: Autonomous Road Train Stations/Stops Near Disadvantaged Communities



Proposed Transit Stations Near Disadvantaged Communities  
Autonomous Road "Train" (ART)

- Proposed Station
- Proposed Route
- Minority
- Low Income
- Poverty
- AB1550 Low Income

Santa Cruz County's regional definition of Disadvantaged Communities are defined as census tracts where greater than 65% of the population is non-white, 65% of the households are low income, or 20% of the households are in poverty. Low income areas are also defined by CA Department of Housing and Community Development's income limits under AB 1550.





**Table 5.10: Transportation Disadvantaged Populations’ Performance Measures**

| PERFORMANCE MEASURE  | BRT        | CRT         | LRT         | ART         |
|--|------------|-------------|-------------|-------------|
| <b>Total Number of Stations/ Stops</b>   | <b>23</b>  | <b>11</b>   | <b>13</b>   | <b>11</b>   |
| <b>Number of Stations/Stops within Disadvantaged Census Tracts</b>             | <b>17</b>  | <b>10</b>   | <b>12</b>   | <b>10</b>   |
| <b>% of Stations/Stops within Disadvantaged Census Tracts</b>                  | <b>74%</b> | <b>91%</b>  | <b>92%</b>  | <b>91%</b>  |
| <b>Number of Stations/Stops within 1/2 mile of Disadvantaged Census Tracts</b> | <b>22</b>  | <b>11</b>   | <b>13</b>   | <b>11</b>   |
| <b>% of Stations/Stops within 1/2 mile of Disadvantaged Census Tracts</b>      | <b>96%</b> | <b>100%</b> | <b>100%</b> | <b>100%</b> |

**UNIVERSAL ACCESS/TRANSIT PASSENGER CAPACITY MILES TRAVELED**

Several performance measures were evaluated to assess how well each transit alternative provides universal access to all ages, abilities, and incomes, while also minimizing the cost to the riders. **Table 5.11** provides information for assessing the transit passenger capacity miles traveled. This measure aggregates the frequency, coverage and capacity of the transit service into a transit passenger capacity mile traveled to assess how available this system is for the users.

**Table 5.11: Universal Access Performance Measures**

| PERFORMANCE MEASURE  | BRT            | CRT            | LRT            | ART            |
|--|----------------|----------------|----------------|----------------|
| <b>Max Passenger Capacity every 30 mins</b>  | <b>240</b>     | <b>450</b>     | <b>441</b>     | <b>441</b>     |
| <b>Transit passenger capacity per vehicle set</b>  | <b>120</b>     | <b>450</b>     | <b>441</b>     | <b>441</b>     |
| <b>Transit frequency (# per hour) peak</b>   | <b>4</b>       | <b>2</b>       | <b>2</b>       | <b>2</b>       |
| <b>Transit frequency (# per hour) off peak</b>   | <b>4</b>       | <b>1</b>       | <b>2</b>       | <b>2</b>       |
| <b>Hours of service per day</b>  | <b>19</b>      | <b>15</b>      | <b>15</b>      | <b>15</b>      |
| <b>Transit passenger capacity miles traveled: (= Transit frequency per hour, transit capacity per vehicle (bus/train), and hours of service per day)</b> | <b>204,000</b> | <b>209,800</b> | <b>299,000</b> | <b>262,000</b> |







### TRANSIT FARE

Successful implementation of a transit system requires a balance between fare affordability and farebox recovery that covers a significant percentage of the operations and maintenance costs of the service. The role of public transit is critical in providing an equitable transportation system to serve both disadvantaged and underserved communities. An integrated, affordable transit system offers a viable alternative to driving for both local and long-distance trips for all populations, including those who lack access to or cannot afford automobiles, and for people who choose not to drive.

Transit fares can be estimated using a target farebox recovery rate, or ratio (percent of O&M cost covered by fare revenue) and using an achievable target “market” fare. The variation in recovery rates can be due to many factors, including but not limited to system size, system age, local labor costs, local transit mode share and ridership. Farebox recovery (percentages) are often low in the early years of a system’s operation, particularly for new services. The vast majority of rail systems in the United States experience farebox recovery rates (FRR) of between 20 percent and 40 percent when mature. Data for bus systems show farebox recovery can range substantially with more typical rates between 15 percent to 40 percent. Ultimately, farebox recovery goals need to consider the impacts of higher fares on ridership and affordability especially for disadvantaged and underserved communities as well as the impact of lower fares on the need for a greater amount of local funds that would likely be needed through a tax measure. An achievable target “market” fare can be determined by assessing current fares charged by similar transit systems. Example transit systems throughout the U.S. and their operational characteristics including fare revenues are provided in **Appendix B**.

The statewide vision for an integrated transit system, as presented in the 2018 California State Rail Plan, will include a coordinated fare collection system that streamlines the methods of payment across different services over the course of a potential journey. Statewide integrated ticketing will allow a passenger to use one ticket that works across all modes, rather than having multiple cards, mobile apps, and tickets. Additional features of an integrated fare collection system could include passes that work with combined ticket types, benefits to frequent travelers and specialized fare packages for events and tourist attractions that all increase the affordability and ease of using transit.

Fares for the four transit alternatives are challenging to assess prior to implementation of a service. Fares will be determined based on the available operations and maintenance funding and policy decisions by the governing board. Current fares by similar types of transit operators are provided in **Table 5.12**.





**Table 5.12: Transit Fare Performance Measures**

| PERFORMANCE MEASURE | BRT   | CRT   | LRT  | ART   |
|---------------------|---|---|--|---|
| Transit Fare        | <p>A typical fare for services similar to the options evaluated here is \$2 - \$5 per one-way trip, based on an average of Santa Cruz METRO and 5 San Francisco Bay Area transit agencies.</p> <p>Average fare per trip=\$3.50 for estimating funding revenues.</p> | <p>A typical fare for services similar to the options evaluated here is \$2.75 - \$5.75 per one-way trip, based on an average of 7 California commuter rail systems.</p> <p>Average fare per trip=\$4.50 for estimating funding revenues.</p> | <p>A typical fare for services similar to the options evaluated here is \$1.75 - \$3.25 per one-way trip, based on a survey of 5 California light rail systems and 2 Pacific Northwest systems.</p> <p>Average fare per trip=\$4.50 for estimating funding revenues.</p> | <p>No data is available for an ART system so LRT fares are assumed to be representative of a fare for ART.</p> <p>Average fare per trip=\$4.50 for estimating funding revenues.</p> |





**MOBILITY DEVICE CAPACITY**

Providing space on transit vehicles for people with mobility devices is not only crucial for social equity but is required by the Americans with Disabilities Act (ADA). Like determining bicycle capacity for the alternatives earlier, all transit vehicles can be designed to accommodate a variety of uses. The actual design of the number of seats, amount of space for bicycles and mobility devices, luggage or other items is flexible. The typical number of ADA-accessible seats for each alternative is presented in **Table 5.13**. The configuration of how mobility devices can be accommodated on transit cars can vary. Below are samples of possible configurations.

**Table 5.13: Mobility Device Capacity Every 30 Minutes During Peak Periods Performance Measures**

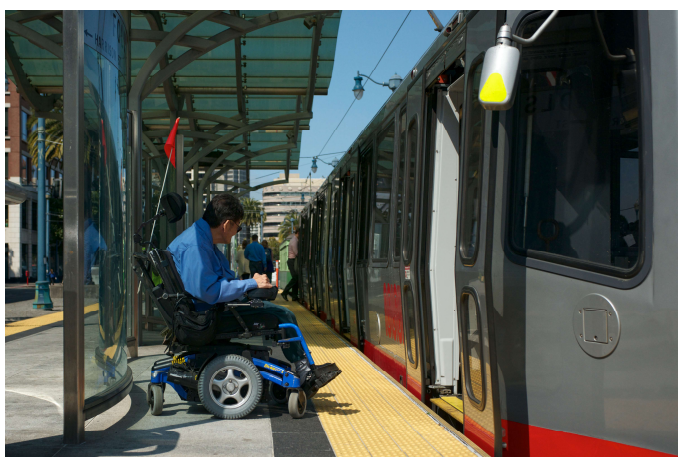
| PERFORMANCE MEASURE   | BRT   | CRT  | LRT   | ART   |
|---|---|--|---|---|
| Mobility device capacity on transit every 30 minutes during peak period | BRT typical capacity is 2 ADA accessible seats per articulated BRT; Two BRT every 30 minutes would accommodate 4 ADA accessible seats every 30 minute. The design of the number of seats, the amount of space for bicycles, and mobility devices is flexible. | CRT typical capacity is 2 ADA accessible seats per car; 6 ADA accessible seats for each 3 car trainset for every 30 minute. The design of the number of seats, the amount of space for bicycles, and mobility devices is flexible. | LRT typical capacity is 4 ADA accessible seats per car; 12 ADA accessible seats for each 3 car trainset for every 30 minute. The design of the number of seats, the amount of space for bicycles, and mobility devices is flexible. | ART typical capacity is 4 ADA accessible seats per car; 12 ADA accessible seats for each 3 car trainset for every 30 minute. The design of the number of seats, the amount of space for bicycles, and mobility devices is flexible. |



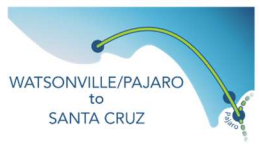
### LEVEL BOARDING FOR INDEPENDENT ACCESSIBILITY

Level boarding on transit systems is highly preferable to provide independent accessibility for passengers of all ages and abilities (**Figures 5.17 and 5.18**). A passenger's ability to board transit vehicles quickly and easily without any special assistance, eliminating the need for lifts, steps, or ramps for mobility devices. Level boarding also speeds up boarding for all passengers, reducing the "dwell time" at stations. Dwell time is the amount of time a vehicle is stopped at a station. Level boarding, regardless of the type of transit service, is preferable for all passengers. **Table 5.14** provides the analysis of the four alternatives for ability to provide level boarding.

**Figure 5.17 Rail Level Boarding** (credit: SFMTA) **Figure 5.18 BRT Level Boarding** (credit: MBTA)







**Table 5.14: Level Boarding Performance Measure**

| PERFORMANCE MEASURE   | BRT  | CRT  | LRT  | ART  |
|---|--|--|--|--|
| Independent accessibility for all ages and abilities including level boarding | BRT can provide platforms for level boarding at all stations along the SCBRL ROW. Stops along the roadway alignment may not accommodate level boarding due to space limitations. | CRT can provide platforms for level boarding at all stations | LRT can provide platforms for level boarding at all stations | ART can provide platforms for level boarding at stations between Natural Bridges Drive and Lee Rd Station. Connection from ART station at Lee Rd to downtown Watsonville and Pajaro Station are via local bus and would not have level boarding. |

**RELIABLE AND EFFICIENT TRANSPORTATION CHOICE**

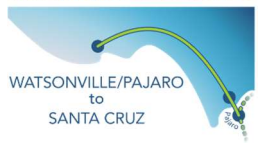
The goal of “Reliable and efficient transportation choices that serve the most people” was evaluated by assessing the following performance measures:

- Transit Travel Time
- Auto Travel Time on Highway 1
- Impacts at Grade Crossings
- Regional Connectivity
- Travel Time Reliability

**TRANSIT TRAVEL TIME AND AUTO TRAVEL TIME**

Travel times in Santa Cruz County, especially during peak periods, have become longer and increasingly unreliable as congestion affects not only highways, but also arterials and local streets. Increased travel times translate into a loss of productivity and increased costs paid by residents and visitors. Trips taken on transit on a dedicated facility (or ROW) will provide an alternative to traveling in autos on congested roadways, which will free up capacity on roadways, and afford transit users time to be productive, read, or relax during the commute





periods. Because transit trips on a dedicated facility will not be impacted by congestion, they provide improved travel times and a greater degree of travel time reliability. Travel times estimated for the four transit alternatives were based on detailed travel demand modeling and analysis (see **Appendix F**). The results of the travel time analysis for the four alternatives are provided in **Table 5.15**. The traffic volumes or travel times on Highway 1 are not forecasted to change as a result of implementation of transit on the SCBRL ROW because of the latent demand on the corridor. Any potential reduction in congestion will likely move vehicles off the arterials and onto Highway 1. A comparison of auto travel time on Highway 1 (between 0.4 miles south of Larkin Valley Rd and 0.3 miles north of Morrissey Blvd) with implementation of the four alternatives can be found in **Table 5.16**.

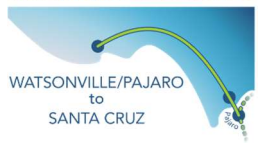
**Table 5.15: Transit Travel Time (Pajaro Station to Natural Bridges Station)**

| PERFORMANCE MEASURE  | BRT | CRT | LRT | ART |
|--|-----|-----|-----|-----|
| Average End-to-End Travel Time (includes station dwell time, in minutes) | 90  | 45  | 55  | 62  |

**Table 5.16: Auto Travel Time**

| PERFORMANCE MEASURE                         | BRT | CRT | LRT | ART |
|---|-----|-----|-----|-----|
| Auto travel time on Hwy 1 NB AM Peak (mins) | 60  | 60  | 60  | 60  |
| Auto travel time on Hwy 1 SB AM Peak (mins) | 30  | 30  | 30  | 30  |
| Auto travel time on Hwy 1 NB PM Peak (mins) | 35  | 35  | 35  | 35  |
| Auto travel time on Hwy 1 SB PM Peak (mins) | 61  | 61  | 61  | 61  |



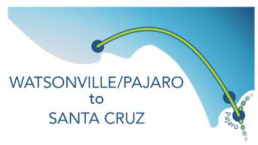


### IMPACTS AT GRADE CROSSINGS

By far, the majority of roadway crossings of the SCBRL ROW are currently at-grade. There are 41 public grade crossings and 29 private grade crossings between Pajaro Station and Natural Bridges Drive. This performance measure evaluates the impact of the transit service on the ROW at these crossings assuming transit priority will be established at each crossing. The California Public Utilities Commission (CPUC) regulates safety at grade crossings of railways. These safety measures will be typically identified using a diagnostic process, which will include collaboration with CPUC, RTC (rail corridor owner), passenger and freight rail operators and the crossing owner (private or local jurisdiction). This analysis will consider the unique physical and operating characteristics and interface between roadway and rail line and conducted in later stages of project development. Grade crossings may be designed differently for each of the alternatives.

The amount of auto delay per hour during peak period was calculated for each alternative based on vehicle weights, speeds, grade crossing treatments (traffic signal prioritization for BRT vs. gates for others). Delay time ranged from an estimated 60 to 120 seconds for each public crossing, with lower auto delay times for BRT, and somewhat higher delay times for LRT and ART, and the highest auto delay times for CRT. The longest delay on CRT was based on heavier equipment and weights of the trains, as well as the speeds of the trains. The level of auto delay will also be dictated by traffic volumes at each grade crossing. Overall auto traffic volumes may decrease due to less reliance on the automobile as a result of the transit alternative. Also, measures, such as signal timing, may help mitigate some auto delay. The true traffic impacts are beyond the scope of this analysis. **Table 5.17** presents the results of a summary of the average potential impacts for the four alternatives.





**Table 5.17 Impacts at Grade Crossings Performance Measures**

| PERFORMANCE MEASURE   | BRT   | CRT  | LRT  | ART   |
|---|---|--|--|---|
| Number of at-grade crossings and mitigation measures                      | BRT impacts 34 grade crossings – 26 public/8 private. BRT assumes appropriate active warning devices, traffic signal interconnects, and improved sight distances. | CRT impacts 70 grade crossings – 41 public/29 private. CRT assumes appropriate active warning devices, traffic signal interconnects, quiet zones, and improved sight distances | LRT impacts 70 grade crossings – 41 public/29 private. LRT assumes appropriate active warning devices, traffic signal interconnects, quiet zones, and improved sight distances | ART impacts 62 grade crossings – 35 public/27 private. ART assumes appropriate active warning devices, traffic signal interconnects, quiet zones, and improved sight distances. |
| Impacts at Grade Crossings - Estimated signal gate down time (in seconds) | 60-90   | 90-120   | 75-120   | 75-120  |

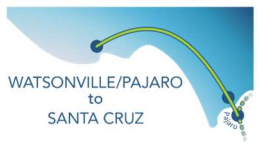
**REGIONAL CONNECTIVITY**

The 2018 California State Rail Plan established a statewide vision of an integrated statewide rail and transit network that provides a comprehensive and coordinated service to passengers through more frequent service and convenient transfers between rail services and transit. This integrated system focused on facilitating network wide coordination through scheduled or “pulsed” transfers. A “pulsed” system is a transportation network that operates on coordinated schedules that repeat regularly and are usually offered at the same time every hour (or even half-hour) throughout the day. For passengers, this integrated system means a faster, convenient and reliable door-to-door travel experience using transit.

The cyclical nature will enable connecting services at hubs to be linked together easily and efficiently to allow optimal onward passenger transit travel consistently throughout the day, with minimal transfer times. Governor Newsom, in his Executive Order N-79-20 on climate change signed in September 2020, reinforced the vision of the California State Rail Plan by







directing agencies to build towards an integrated, statewide rail and transit network, consistent with the California State Rail Plan.

As shown in **Figure 5.19**, Northern California is developing an expanding network of passenger rail transit service. The Santa Cruz Branch Rail Line is a 32-mile spur off the main coastal rail line that stretches from San Diego to San Jose and beyond. The Santa Cruz Branch Rail Line extends between Davenport, a coastal community on the north end of Santa Cruz County, and the Pajaro/Watsonville Junction, just over the Santa Cruz County line in Monterey County.

This Pajaro/Watsonville Junction links the Santa Cruz Branch Rail Line to other regional and state passenger rail services. These include the proposed extension from San Jose to Salinas (under development), the existing Starlight from Seattle to San Diego, the proposed Coast Daylight from San Francisco to Los Angeles, the proposed California High Speed Rail system in Gilroy (under development), and a potential regional rail service “around the bay” between Santa Cruz and the Monterey Peninsula (under consideration).



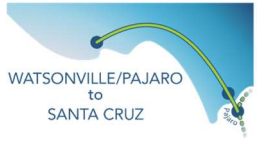
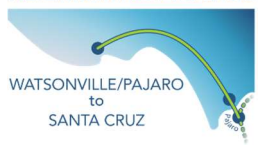


Figure 5.19: 2018 California State Rail Plan, 2040 Vision for Northern California



The Transportation Agency for Monterey County (TAMC) is currently leading efforts to extend rail service to the Monterey Bay area. The Monterey County Rail Extension project extends passenger rail service between San Francisco, San Jose and Gilroy, south to the downtown Salinas station. The extended service would add two round trips between San Francisco and Salinas and expand as demand warrants. This extension project has completed preliminary design and environmental review. The first phase of the project is currently underway with Salinas Station parking station/parking lot expansion under construction. The second phase of the project is the Pajaro/Watsonville multimodal station, envisioned to be a bus and rail transit hub. Grant funds are being sought for the Pajaro/Watsonville station. This station would be the transfer station for future rail transit service on the Santa Cruz Branch Line.



A new state-sponsored intercity rail Amtrak service is proposed along the Coast Route with one train daily in each direction between Los Angeles and San Jose or San Francisco called the Coast Daylight. The Coast Daylight is proposed by the Coast Rail Coordinating Council, led by SLOCOG, as a new state-supported intercity rail service, which would extend the Pacific Surfliner service from San Luis Obispo to either San Jose or San Francisco. This train will follow US 101 and the coastline, serving San Jose, Gilroy, Pajaro, Salinas, San Luis Obispo, Santa Barbara and Los Angeles. This new service will include a stop at the Pajaro/Watsonville Junction expanding local, regional and interregional travel options for Santa Cruz County residents and visitors. The new Coast Daylight rail transit service will complement the existing Amtrak Coast Starlight service, which operates between southern California and the Pacific Northwest and includes stops in San Jose and Salinas.

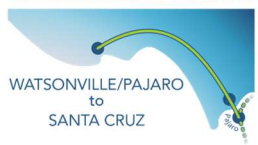
California High Speed Rail efforts are underway to construct high speed train service from the San Francisco Bay Area to the Los Angeles basin, and will eventually extend to Sacramento and San Diego with speeds of over 200 miles an hour. The nearest station to Santa Cruz County will be in Gilroy, approximately 20 rail miles from the Pajaro station. The integration with regional and statewide rail for the four alternatives is discussed below.

**Bus Rapid Transit** would connect to the planned regional and intercity rail service at Pajaro Station via a transfer from BRT to rail for access to Gilroy and the planned high speed rail line and to Salinas and points south. The longer travel time for BRT to access Pajaro Station for regional trips is less time efficient than the other alternatives.

**Commuter Rail Transit** would connect to the proposed regional and intercity rail service at Pajaro Station via a cross-platform transfer for access to Gilroy and the planned high speed rail line and to Salinas and points south. An FRA-compliant vehicle would allow a "one-seat" ride between Santa Cruz and Monterey with no transfer if this regional service is pursued. The potential for implementation of this alternative within, across, or adjacent to Union Pacific Railroad [UP] property at Pajaro Station, and any related requirements and mitigations, will need to be confirmed through future coordination between UP, SCCRTC, and other state and local public agencies.

**Light Rail Transit** would connect to the proposed intercity rail service at Pajaro via a cross-platform transfer for access to Gilroy and the planned high speed rail line and to Salinas and points south. A non-FRA compliant vehicle would require a separate set of tracks into Pajaro station and a cross platform transfer to regional service to Monterey. If LRT was an FRA-compliant vehicle, the connection would be same as CRT. The potential for implementation of this alternative within, across, or adjacent to UP property at this location, and any related requirements and mitigations, will need to be confirmed through future coordination between UP, SCCRTC, and other state and local public agencies.





**Autonomous Road Train** on the Santa Cruz Branch Rail Line would need a transfer to local bus service at Lee Road and a transfer from bus to regional and intercity rail service at Pajaro Station (minimum 3-seat ride).

### TRAVEL TIME RELIABILITY

Travel time reliability is a measure of the variability of the travel time from day to day during the same time period. The larger the variability in travel time, the more unreliable the trip becomes. For multi-segment trips that require connections, unreliability can create even longer trip times when travelers miss connections. For all four alternatives, the travel time reliability for their entire trip could be impacted by the reliability of their chosen first mile/last mile connector. Reliability drives customer satisfaction and, in-turn, ridership. Travel time reliability for the four alternatives is discussed below with the performance results presented in **Table 5.18**.

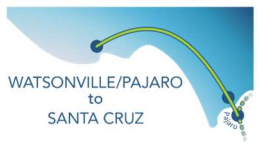
**Bus Rapid Transit** will have the lowest travel time reliability, due to traveling on mixed traffic roadways subject to congestion for 70 percent of the route. BRT will only utilize a dedicated guideway on the SCBRL ROW for 6.7 miles. For approximately 7 miles, the BRT will operate in mixed traffic on Highway 1 between Airport Blvd and Rio Del Mar Blvd. For a one-mile section of Highway 1, BRT will travel in the Bus on Shoulders/Auxiliary Lane (proposed future service under design and implementation) between Freedom Blvd and Rio Del Mar Blvd. BRT will also use the local roadway system in Watsonville, Aptos, and downtown Santa Cruz. Bus priority systems such as transit queue jumps and transit signal priority are included for key intersections on the approximately 9 miles of local roads used, providing some travel time reliability benefits. One travel time reliability benefit of BRT is that if a BRT vehicle breaks down in front of subsequent BRT vehicles on the SCBRL ROW, the BRT vehicle behind could possibly pass the stalled BRT vehicle in the two-way segments.

**Commuter Rail Transit** provides a reliable system, due to traveling nearly exclusively on the dedicated SCBRL ROW. However, any areas where the ROW is shared use with autos such as on Walker St in Watsonville and Beach St in Santa Cruz, CRT could experience some delay if CRT is not separated into a dedicated facility. Reliability will also be impacted by potential mechanical issues causing trains to come off-line, as rail vehicles cannot go around a stopped rail vehicle in front of them. This factor was built into the reliability analysis.

**Light Rail Transit** will have strong travel time reliability, due to traveling nearly exclusively on a dedicated facility. However, any areas where the ROW is shared use with autos such as on Walker St in Watsonville and Beach St in Santa Cruz, LRT could experience some delay if LRT is not separated into a dedicated facility. As with CRT above, reliability will also be impacted by







potential mechanical issues causing trains to come off-line, as rail vehicles cannot go around a stopped rail vehicle in front of them. This factor was built into the reliability analysis.

**Autonomous Road Train** will have strong travel time reliability between Santa Cruz and Lee Road, due to traveling exclusively on a dedicated facility. However, travelers using the bus connector service from the Lee Road Station to downtown Watsonville and Pajaro Station could experience delays, as the bus connector service will be operating in mixed traffic. Bus priority systems such as transit queue jumps and transit signal priority could be designed into many intersections on the 3.2 miles of local roads used, providing some travel time reliability benefits. As with the rail alternatives, reliability will be impacted primarily by potential mechanical issues causing some potential for trains coming off-line, as ART vehicles cannot go around a stopped ART vehicle in front of them.

**Table 5.18 Travel Time Reliability Performance Measure**

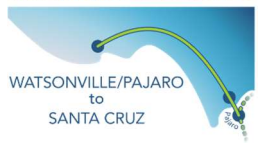
| PERFORMANCE MEASURE  | BRT        | CRT          | LRT          | ART         |
|--|------------|--------------|--------------|-------------|
| <b>Travel time reliability during peak periods</b>   |            |              |              |             |
| <b>The 95th percentile planning reliability time (in mins) in 2040 conditions, estimated using reliability factors presented in Highway Capacity Manual.</b> | <b>132</b> | <b>56.25</b> | <b>68.75</b> | <b>77.5</b> |

**ENVIRONMENT**

The environmental goals of the TCAA/RNIS analysis defined how each alternative “Promotes a Healthy Environment.” The following performance measures were evaluated:

- Weekday Ridership
- Weekend Ridership
- Countywide Transit Ridership
- Transit Passenger Capacity during 3-hour Peak Periods
- Reduction in Auto Vehicle Miles Traveled
- Reduction in greenhouse gas and criteria pollutant emissions
- Length of Time to Implement
- Climate Change Resiliency
- Biological, Visual, Noise, and Vibration Effects
- Reduced Energy Usage





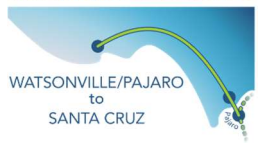
## RIDERSHIP

Transit ridership for the four transit alternatives was forecasted for 2040 using a combination of data sources and tools, including the Santa Cruz County travel demand model (SCCModel), StreetLight Data (cellphone location-based service data), land use growth data, and existing transit data and transit trip patterns from Santa Cruz Metropolitan Transit District (METRO). The transit network (denoted by wider colored lines) and roadway network in the Santa Cruz County Travel Demand Model is presented in **Figure 5.20**. Transit ridership estimations for 2040 in the TCAA/RNIS are based on pre-Covid-19 conditions given the likelihood that in twenty years, there will be widespread immunity.

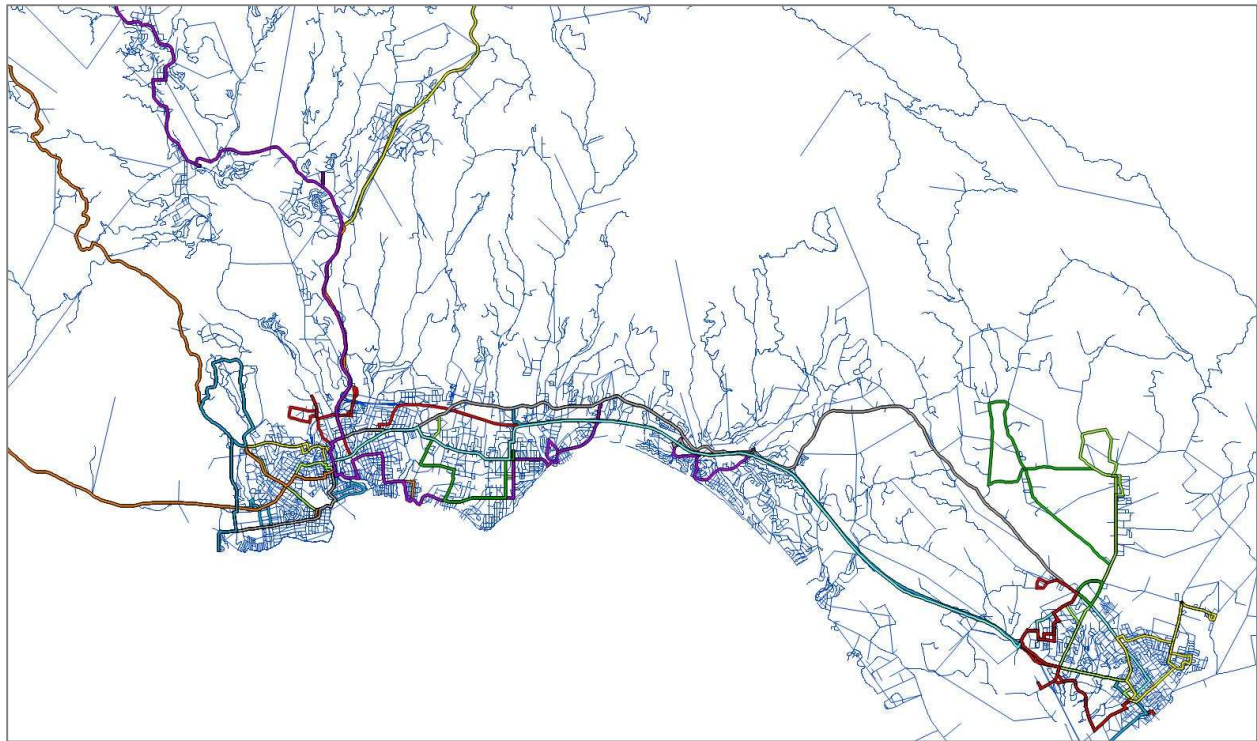
A market analysis was first conducted using origin-destination (OD) travel flow data from Streetlight Data and existing transit ridership data from METRO to understand existing travel patterns within Santa Cruz County and regional travel demand in/out of the County. This information was combined with land use growth data to develop ridership ranges for the project alternatives and to validate the base year OD data in the Santa Cruz County travel demand model (SCCModel).

Next, the operating parameters, including stops, headways, and routes of the four project alternatives were coded into the SCCModel to develop base ridership projections for 2040 conditions. Raw model ridership forecasts were compared with ridership ranges developed from the market analysis. They were further refined to reduce model noise across different alternatives, reflect better first and last mile connector services, and account for additional regional connections that were not included in the SCCModel network.



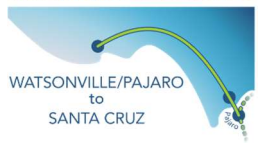


**Figure 5.20: Santa Cruz County Travel Demand Model Roadway and Transit Network**



The ridership analysis projected 2040 transit ridership for each of the alternatives as presented in **Table 5.19**. The CRT alternative operates at 30-minute and 60-minute headways during the peak and off-peak, respectively, and serves 11 stops along the rail corridor. The LRT and ART alternatives operate at 30-minute headways all-day and serve 11 to 13 stops along the rail corridor. The BRT alternative operates at 15-minute headways all day and serves a total of 23 stops. Local bus connections to cross-county destinations such as Cabrillo College and downtown Santa Cruz from the station stops are assumed in the ridership estimates.

As the BRT alternative diverts from the rail corridor to travel along Soquel Drive in mid-county and Main Street in Watsonville, it provides a robust and easily accessible travel option for mid-County travelers, but results in longer travel times for long-distance travelers, as compared to the rail options. Because of significant differences in routing, stop densities, headways and travel times between the BRT and the other alternatives, the BRT alternative serves a different transit market and provides challenges when trying to compare them on an equal footing. The rail alternatives will provide a more direct and reliable connection between Santa Cruz and Watsonville/Pajaro, whereas the BRT alternative will offer a more convenient service for short-medium distance travelers with its expected frequent all-day service and stop density.

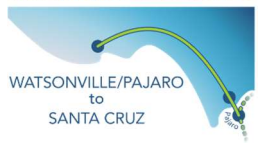


The BRT alternative is estimated to have the highest daily ridership amongst all alternatives for the base 2040 conditions. However, as future transit-oriented developments will occur along the rail corridor, ridership for the rail options is anticipated to increase more significantly due to better alignment between the land use growth patterns and the operating characteristics of the rail alternatives (e.g. stop locations and faster end-to-end travel times since there tends to be more potential for residential growth in Watsonville and employment growth in Santa Cruz). Additionally, headways could be reduced to increase the frequency of service, which would also increase ridership. Additional infrastructure, such as passing locations, and advanced control systems may be needed to ensure the rail line has the capacity to decrease the headway.

This study also provides operating characteristics for rail transit and bus rapid transit systems throughout the U.S. in **Appendix B** providing comparisons of dedicated guideway transit systems to those proposed for Santa Cruz County. The type of transit system, population density, length of system, service frequency and span, ridership, capital and operations and maintenance costs are presented for each system. Ridership for transit systems in other communities provide a reasonableness check on the ridership estimated in this study through modeling. Systems of similar size and population densities can be used for comparison and systems in larger cities provide an upper bound with the understanding that the estimated ridership in the TCAA/RNIS are forecasted for 2040, whereas the ridership for transit systems presented in **Appendix B** are existing.







**Table 5.19 Transit Ridership Performance Measures**

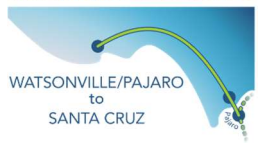
|   | PERFORMANCE MEASURE  | BRT    | CRT    | LRT    | ART    |
|---|--|--------|--------|--------|--------|
| <b>Will project substantially increase transit ridership?</b> | 2040 Weekday transit ridership in corridor (daily boardings)   | 6,650  | 5,150  | 5,450  | 5,150  |
|   | 2040 Weekday transit ridership in corridor - considering future general plan updates (daily boardings)   | 7,650  | 7,150  | 7,300  | 7,000  |
|   | 2040 Weekday transit ridership in corridor - assume 10% additional ridership due to Transit Oriented Developments once transit facility is operational (daily boardings) | 8,400  | 7,900  | 8,000  | 7,700  |
|   | 2040 Weekend transit ridership in corridor - local/regional trips (daily boardings)  | 3,400  | 2,800  | 3,000  | 2,800  |
|   | Countywide transit ridership (daily boardings)   | 37,500 | 34,500 | 34,300 | 34,100 |
|   | Transit passenger capacity/3 hour peak period  | 1,440  | 2,700  | 2,650  | 2,650  |

**REDUCTION OF AUTO VEHICLE MILES TRAVELED**

Vehicle miles traveled (VMT) represents the total number of miles traveled by automobiles in one day within Santa Cruz County. As transit ridership increases, auto vehicle miles traveled decrease. VMT was evaluated for each of the transit alternatives using the Santa Cruz County travel demand model (SCC Model). The VMT from the model output was adjusted based on matching the field estimate of baseline 2018 total VMT from the Caltrans Highway Performance Monitoring System (HPMS) and the 2019 SCCModel output.

Despite the lower projected ridership for the non-BRT alternatives, each alternative is expected to result in higher VMT reduction than the BRT alternative due to the longer average trip





distance. The rail alternatives will be more attractive to long-distance travelers because of the higher speed, shorter travel time, and stronger reliability. Therefore, the non-BRT alternatives will displace more long-distance vehicle trips and result in higher VMT reduction. The reduction in VMT for each transit alternative is presented in **Table 5.20**.

**Table 5.20: Reduction in Auto VMT Performance Measures**

| PERFORMANCE MEASURE                     | BRT     | CRT     | LRT     | ART     |
|---|---------|---------|---------|---------|
| Auto vehicle miles traveled reduced/day | -16,280 | -20,490 | -22,020 | -20,650 |

**REDUCTION IN GREENHOUSE GAS AND CRITERIA POLLUTANT EMISSIONS**

Greenhouse gas (GHG) and criteria pollutants were forecasted for 2040 using the vehicle miles traveled data output that was derived from the Santa Cruz County travel demand model and California HPMS. The California Air Resource Board (CARB) Emissions Factor Model 2017 (EMFAC) was used to estimate the amount of GHG and criteria pollutant emissions associated with the VMT for each transit alternative. The EMFAC model used data inputs from the California Department of Motor Vehicles to estimate the fleet mix of vehicles traveling on Santa Cruz County roadways for future years. An estimate of the reduction in GHG and criteria pollutant emissions is presented in **Table 5.21**. California is moving towards electrification for all modes of transportation including automobiles, bus transit and rail.

**Table 5.21: Greenhouse Gas and Criteria Pollutants' Performance Measures**

| PERFORMANCE MEASURE  | BRT  | CRT  | LRT  | ART  |
|--|------|------|------|------|
| Reduction in Greenhouse gas emissions - In Annual Metric Tons in year 2040 | 1096 | 1379 | 1482 | 1389 |
| Criteria pollutants - In Annual Metric Tons in year 2040                   | 2.54 | 3.20 | 3.44 | 3.22 |





**LENGTH OF TIME TO IMPLEMENT**

The length of time to implement the four transit alternatives is presented in **Table 5.22** below followed with a description of the performance of each alternative.

The time it would take to initiate a **Bus Rapid Transit**, or an **Autonomous Road Train** service will depend on the completion of the following:

- Discussions with California Transportation Commission (CTC) to reach agreement on return of restricted rail funding granted for purchase of the Santa Cruz Branch Rail Line and the rail infrastructure improvements
- Secure funds for repayment to CTC
- Apply for abandonment of freight rail with Surface Transportation Board
- Address any legal challenges for removal of rail/freight rail
- Environmental Review
- Environmental Permitting
- Hazardous Assessment and Mitigation
- Survey Property and Remove Encroachments
- Secure funding via grants and local revenue source
- Final design, construction, system testing

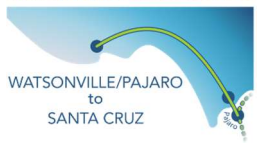
The time it would take to initiate a **Commuter Rail Transit**, or a **Light Rail Transit** service will depend on the completion of the following:

- Environmental Review
- Environmental Permitting
- Survey Property and Remove Encroachments
- Secure funding via grants and local revenue source
- Final design, construction, system testing

**Table 5.22: Length of Time to Implement**

| PERFORMANCE MEASURE   | BRT   | CRT   | LRT   | ART   |
|---|-------|-------|-------|-------|
| Length of time to implement (in years)  |       |       |       |       |
| High level planning estimates without details for the final design, funding plan, construction schedules etc. | 15-17 | 11-13 | 11-13 | 20-24 |





**CLIMATE CHANGE RESILIENCY**

Climate change will impact the Santa Cruz Branch Rail Line primarily through increased coastal erosion due to sea level rise accompanied by storm surge. Coastal erosion due to a sea level rise of three feet and a 100-year storm surge was evaluated for each of the alternatives. Forecasts for the amount of time it will take for sea level to rise by three feet vary from a time horizon of approximately 2060 to 2100.

The locations along the Santa Cruz Branch Rail Line expected to have the greatest potential of increased erosion due to sea level rise impacting the SCBRL ROW will include La Selva Bluffs, New Brighton Bluffs, Cliff Drive west of Capitola Trestle, and along the Santa Cruz Boardwalk.<sup>10</sup> **Table 5.23** presents the length of the alignment in miles with potential for future coastal erosion impacts likely to require retaining walls or other protection to adapt to climate change. Costs were included for protective measures for each of the alternatives as needed in areas of concern. A sea level rise of three feet will not cause increased flooding of Harkins Slough area in the vicinity of the SCBRL.<sup>11</sup>

**Table 5.23: Climate Change Resiliency Performance Measure**

|                                       | PERFORMANCE MEASURE  | BRT  | CRT  | LRT  | ART  |
|---------------------------------------|--|------|------|------|------|
| Will project adapt to climate change? | Climate change resiliency  |      |      |      |      |
|                                       | Length of alignment with potential for coastal erosion impacts due to 88 cm sea level rise with 100 year storm event (miles) | 0.57 | 1.85 | 1.85 | 1.85 |

**BIOLOGICAL, VISUAL, NOISE, AND VIBRATION EFFECTS**

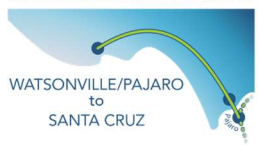
Impacts to neighborhoods and environmentally sensitive areas due to noise, visual, and vibration are discussed below for each alternative. The performance of each alternative is presented below.

**Bus Rapid Transit** powered by electric motors are quieter than a typical diesel powered bus. It is anticipated that noise generated by BRT will be less than anticipated for CRT and LRT

<sup>10</sup> Nature Conservancy Coastal Resilience Mapping Portal, <https://maps.coastalresilience.org/>

<sup>11</sup> National Oceanic and Atmospheric Administration, Our Coast Our Future Interactive Map, <https://data.pointblue.org/apps/ocof/cms/index.php?page=flood-map>





alternatives but may include some level of noise due to BRT operations at roadway crossings (potential horn or bell warnings, flashing lights/gates). BRT would not be visually obstructive and is least likely to cause vibration, although there may be some vibration impacts to land uses within 100 feet of the right-of-way. BRT has the least impact on environmentally sensitive areas as those areas are primarily in the vicinity of the sloughs in Watsonville, an area of the corridor that would not be utilized by the BRT alternative.

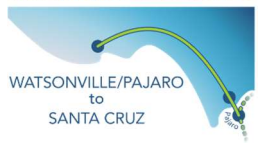
**Commuter Rail Transit** is noisier than other alternatives due to the typically heavier weight of the vehicles. It is anticipated that CRT, even with electric propulsion, will be noisier than the rubber tire alternatives of BRT and ART. CRT noise may be caused by steel wheels on standard rail tracks, tight turning radii/curves, and travel through switch tracks, special tracks, or track siding locations. Noises can also occur from CRT operations at roadway crossings (potential horn or bell warnings, flashing lights/gates). Quiet zones could be pursued that would eliminate the need for sounding horns at roadway crossings and are included in the cost estimates for CRT. CRT would not be visually obstructive. CRT would have moderate level of vibration as there may be some vibration impacts to land uses within 100 feet of the right-of-way. Increased rail service along the ROW could impact environmentally sensitive areas including biological resources as CRT utilizes ROW in the vicinity of the sloughs to the west of Watsonville.

**Light Rail Transit** would have moderate level of noise relative to commuter rail, owing to the typically lighter vehicles. It is anticipated that LRT noise will be louder than BRT or ART, caused by steel wheels on standard rail tracks, tight turning radii/curves, and travel through switch tracks, special tracks, or track siding locations. Noises can also occur from LRT operations at roadway crossings (potential horn or bell warnings, flashing lights/gates). Quiet zones could be pursued that would eliminate the need for sounding horns at roadway crossings and are included in the cost estimates for LRT. LRT would not be visually obstructive. LRT would have moderate level of vibration as there may be some vibration impacts to land uses within 100 feet of the right-of-way. Increased rail service along the ROW could impact environmentally sensitive areas including biological resources as LRT utilizes ROW in the vicinity of the sloughs to the west of Watsonville.

**Autonomous Road Train** noise levels of ART are unknown. ART would not need to sound horns at roadway crossings since it is a rubber wheel option. Although, it is anticipated that noise generated by the ART will be similar to BRT, and less than anticipated for the CRT and LRT alternatives. As with all of the alternatives there may be some level of noise due to ART operations at roadway crossings (potential horn or bell warnings, flashing lights/gates). ART would not be visually obstructive and would be least likely to cause vibration although there may be some ART vibration impacts to land uses within 100 feet of the right-of-way. Increased rail service along the ROW could impact environmentally sensitive areas including biological resources as ART utilizes ROW in the vicinity of the sloughs to the west of Watsonville.







### REDUCED ENERGY USAGE

Regardless of whether the vehicles for each alternative are propelled by electricity, fossil fuel, or other sources of energy, these resources will be finite commodities. Data on the amount of energy used per passenger-mile for the four alternatives, based on existing technology, is presented in **Table 5.24**. The potential to improve energy efficiency in transportation and reduce energy needs with advanced technologies will be potentially enormous in the future. Only a fraction of the energy currently used for transportation is converted into useful energy that propels vehicles. The rest of the energy is lost to engine and driveline inefficiencies. As technology advances for all types of transit alternatives, so will the options for delivering a greater energy efficient solution.

**Table 5.24: Energy Usage Performance Measures**

|  | PERFORMANCE MEASURE  | BRT   | CRT   | LRT   | ART         |
|--|--|-------|-------|-------|-------------|
| Does project support the goal of reduced energy usage? | Reduction of energy/fuel consumption based on auto mode shifts to the alts. (Average BTU/Passenger Mile) | 1,957 | 1,528 | 1,500 | 1,500-1,957 |

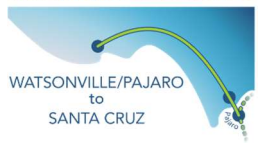
### OTHER/ADDRESS PROJECT SPECIFIC CONCERNS

The performance measures for the other goals of the TCAA/RNIS analysis were conducted to address project specific concerns not assessed in economy, social equity, and environment are presented below.

### TECHNICALLY FEASIBLE

An evaluation of the technical feasibility of implementing the four alternative’s transportation solutions will hinge on whether the proposed technology is proven or fi the associated risks can be properly managed into the future. **Table 5.25** presents the technical feasibility of the four alternatives.





**Table 5.25: Technical Feasibility Performance Measures**

| PERFORMANCE MEASURE              | BRT  | CRT  | LRT  | ART   |
|----------------------------------|--|--|--|---|
| Is project technically feasible? | BRT system is traditional, has tested technology and is technically feasible | CRT system is traditional, has tested technology and is technically feasible | LRT system is traditional, has tested technology and is technically feasible | ART infrastructure exists and has been tested but ART is not a traditional transit option and introduces new technological risks. |

**CONSISTENT WITH LOCAL, STATE, AND FEDERAL PLANNING EFFORTS**

In order to determine which alternative best serves the community in the future, public participation played an important role in the TCAA/RNIS transportation planning process. The solicitation of input from various stakeholders, including the public, elected officials, community organizations, and partner agencies was an important element of the TCAA/RNIS’s robust planning process. Previous- analysis (i.e., the Rail Transit Feasibility Study, UCS, SCC RTP, other) were included in the public outreach and discussions related to each of the four alternatives being evaluated in the TCAA/RNIS. This input provided a measure for how well the transit alternatives were vetted by stakeholders. **Table 5.26** discusses the alternatives and their consistency with local, state and federal planning efforts.





**Table 5.26: Consistency with Local, State and Federal Planning Efforts’ Performance Measure**

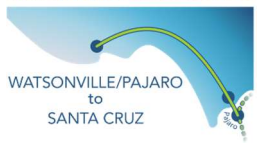
| PERFORMANCE MEASURE   | BRT   | CRT   | LRT   | ART  |
|---|---|---|---|--|
| Is project consistent with other local, state and federal planning efforts? | <p>BRT is consistent with:</p> <ul style="list-style-type: none"> <li>• SCC Regional Trans Plan</li> <li>• Unified Corridor Study</li> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul> | <p>CRT is consistent with:</p> <ul style="list-style-type: none"> <li>• SCC Regional Trans Plan</li> <li>• Unified Corridor Study</li> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul> | <p>LRT is consistent with:</p> <ul style="list-style-type: none"> <li>• SCC Regional Trans Plan</li> <li>• Unified Corridor Study</li> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul> | <p>ART is consistent with:</p> <ul style="list-style-type: none"> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul> |

**CONSISTENT WITH LOCAL, STATE AND FEDERAL REGULATORY REQUIREMENTS**

There were a number of local, state, and federal policies and regulations that relate to the implementation of the transit alternatives for the SCBRL ROW. For example, these included: state requirements to reduce greenhouse gas emissions through SB 375; Governor Newsom’s recent executive order to build towards an integrated, statewide rail and transit network; the Coastal Commission’s policies to improve access to the coast and plan for climate resiliency; and Proposition 116 requirements to utilize these funds for passenger rail capital projects.

**Table 5.27** discusses the four alternative’s consistency with local, state and federal regulatory requirements.





**Table 5.27: Consistency with Local, State and Federal Regulatory Requirements’ Performance Measure**

|   | PERFORMANCE MEASURE  | BRT  | CRT   | LRT   | ART  |
|---|--|--|---|---|--|
| Is project consistent with local, state, and federal regulatory requirements? | Consistent with: <ul style="list-style-type: none"> <li>• SB 375, other GHG legislation,</li> <li>• CA state rail plan guidelines</li> <li>• Caltrans - active transportation</li> </ul> | BRT is consistent with SB375/other GHG regulations, Coastal Commission | CRT is consistent with SB375/other GHG regulations, Coastal Commission, Prop 116, FAST Act (travel time reliability), | LRT is consistent with SB375/other GHG regulations, Coastal Commission, Prop 116, FAST Act (travel time reliability), | ART is consistent with SB375/other GHG regulations, Coastal Commission, FAST Act (travel time reliability) |

**INTEGRATION WITH EXISTING MULTIMODAL TRANSPORTATION INFRASTRUCTURE**

**Multimodal integration** should encompass the seamless connectivity between different modes to maximize the impact of transit and enable sustainable mobility. All four alternatives are expected to be user-friendly with connections to the local bus transit system and other feeder services such as car-sharing, bike-sharing, walking and bicycling, all of which help provide first- and last-mile connectivity. The coastal rail trail along-side transit for all the alternatives will provide a separated bicycle and pedestrian facility for even greater connectivity. The ability of the four alternatives to integrate with the existing multimodal transportation infrastructure is discussed below.

**Bus Rapid Transit** would connect with local bus service at Santa Cruz Metro Center and Watsonville Transit Center. Existing local bus service connects at 4 future BRT stations along the SCBRL ROW, existing local bus service connects with all the stops along Soquel Drive between Park Ave and Rio Del Mar Blvd and local bus service could be provided to/from all future stations.

**Commuter Rail Transit** connects with local bus service at 7 future CRT stations (Watsonville Downtown, Aptos Village, 41st Ave, 17th Ave, Seabright Ave, Downtown Boardwalk, Natural Bridges Drive Stations and local bus service could be provided to/from all future stations.





**Light Rail Transit** connects with local bus service at 8 future LRT stations (Watsonville Downtown, Ohlone Parkway, Aptos Village, 41st Ave, 17th Ave, Seabright Ave, Downtown Boardwalk, Natural Bridges Drive Stations and local bus service could be provided to/from all future stations.

**Autonomous Road Train** connects with local bus service at 6 future ART stations (Aptos village, 41st Ave, 17th Ave, Seabright Ave, Downtown Boardwalk, Natural Bridges Drive Stations and local bus service could be provided to/from all future stations. The local bus connector service from the ART station at Lee Rd to Pajaro would also connect to Watsonville Downtown Transit Center.

#### ABILITY TO ADAPT TO FUTURE TECHNOLOGY

Innovations in transportation have increased substantially in the last decade and will continue to progress at a rapid rate. Electrification, automation, connected vehicles, alternative fuels, on-road communications, and traffic analytics are all new technologies that will affect the future of transit. The ability of the four alternatives to adapt to future technology is discussed below.

**Bus Rapid Transit** systems will have more flexible infrastructure, lower vehicle purchase costs, and a shorter useful vehicle life than the other alternatives. These attributes suggest BRT offers significant flexibility to adapt to new technologies, after initial implementation.

**Commuter Rail Transit** infrastructure will be less flexible to retrofit to new, emerging technologies due to its fixed route requirements and longer vehicle lifespans. As a result, vehicles will be replaced less frequently and result in longer gaps between upgrading with new vehicle technologies.

**Light Rail Transit** infrastructure will be less flexible due to its fixed route requirement, longer vehicle lifespans. As a result, LRT will be less flexible when adapting to new technologies as vehicles will be replaced less frequently and result in longer gaps between upgrading with new vehicle technologies.

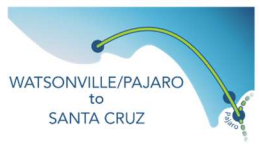
**Autonomous Road Train** will be more flexible to retrofit to future technologies in the ROW due to its use of pavement. However, ART vehicles will be relatively more costly and have a relatively longer useful life. As a result, ART will provide moderate flexibility when adapting to new technologies.

#### ADDITIONAL RIGHT OF WAY REQUIREMENTS

Implementation of future transportation projects often requires additional ROW in order to construct. Public agencies must assure fair and equitable treatment in acquiring private property for public purposes, and Federal and/or State requirements must be met. The ability







of the four alternatives to be integrated into existing right-of-way and any potential additional ROW requirements are presented below.

### **Bus Rapid Transit**

No significant right-of-way is expected to be needed to construct a BRT facility on the ROW. However, additional right-of-way could be required at larger stations that include parking or other amenities that require more space.

### **Commuter Rail Transit**

No significant right-of-way is expected to be needed to construct a CRT facility on the ROW. However, additional right-of-way could be required at larger stations that include parking or other amenities that require more space.

### **Light Rail Transit**

No significant right-of-way is expected to be needed to construct an LRT facility on the ROW. However, additional right-of-way could be required at larger stations that include parking or other amenities that require more space.

### **Autonomous Road Train**

No significant right-of-way is expected to be needed to construct an ART facility on the ROW. However, additional right-of-way could be required at larger stations that include parking or other amenities that require more space.

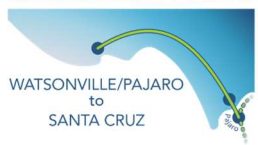
## **5.5 SUMMARY OF STAKEHOLDER INPUT ON MILESTONE 3**

Extensive outreach to stakeholders, committees, focus groups, and the general public was conducted in November 2020 for Milestone 3, as described in Chapter 2: Public and Stakeholder Outreach. Due to the Santa Cruz County shelter in place order for the Covid-19 pandemic, all meetings were conducted virtually. As a result of these outreach efforts the TCAA project team gained meaningful understanding of the community's interest in and concerns regarding the detailed performance analysis process and results, as well as their level of support of the draft locally preferred alternative. This section briefly highlights the ideas and concerns provided by stakeholders and the public during the outreach process that resulted in changes to the draft report. Additional information on project input captured, including survey results, are presented in **Appendix E**.

### ***MILESTONE 3 OUTREACH RESULTS SUMMARY – ADVISORY COMMITTEES***

The TCAA/RNIS project team presented the results of the detailed performance measure analysis and the proposed locally preferred alternative to the three RTC Advisory Committees.





The RTC Bicycle Committee passed a motion to express the Committee’s support for electric passenger rail, with a focus on providing service adjacent to a trail on SCBRL ROW where at all possible, providing an adequate usable trail width, adequate onboard bike capacity, and level boarding (9 in favor, 1 against).

The RTC Elderly and Disabled Transportation Advisory Committee passed a motion to express support for electric passenger rail as the locally preferred alternative, with a focus on utilizing clean fuel vehicles and having a flexible design which will support the maximum number of riders using mobility devices (8 in favor, 0 against).

The Interagency Technical Advisory Committee passed a motion to support electric passenger rail as the locally preferred alternative (11 in favor, 0 against, 2 abstaining).

### ***MILESTONE 3 OUTREACH RESULTS SUMMARY – PARTNER AGENCIES***

Representatives from partner agencies attended a virtual meeting to discuss the TCAA/RNIS draft report, performance measure results and the proposed locally preferred alternative and provide input. Letters of support for rail as the locally preferred alternative were provided by Caltrans, City of Santa Cruz, City of Watsonville, and the Transportation Agency for Monterey County.

### ***MILESTONE 3 OUTREACH RESULTS SUMMARY – PUBLIC PARTICIPATION***

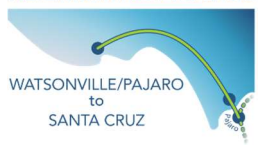
The community was invited to provide feedback on the draft report and the draft locally preferred alternative using an online open house, which included a survey component as well as opportunities to provide additional feedback via comment submissions. For full survey results and public comments, see **Appendix E** and the TCAA/RNIS webpage (<https://sccrtc.org/projects/multi-modal/transitcorridora/>).

Support for rail as the locally preferred alternative was expressed by a majority of the email comments and the survey results received by November 27, 2020. In all, 1,002 members of the public chose to take the online survey, and while this survey does not necessarily constitute a representative sample, 74.5% of survey respondents agreed with the project team on electric passenger rail for the locally preferred alternative. Some comments received through email and the survey expressed support for no rail or for trail only for the SCBRL, but approximately 80% of emails were supportive of rail.

The following is a list of some of the changes that were made to the draft report as a result of stakeholder comments:

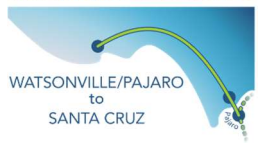
- Correct GHG and criteria pollutants to reflect an annual amount reduced





- Revise the Transit in Similar Communities table in **Appendix B** to include additional transit systems and refer to this information in the section on the ridership performance measure for a comparison
- Clarify in the discussion on funding needs that the total funds estimated are for Capital costs and 25 years of operation & maintenance once the system was constructed
- Improve the resolution of maps and tables in the document
- Clarify the performance measure on the impact of transit alternatives on the trail, and refer to the performance measure on the risk of continuity of the corridor for each alternative
- Add discussion to **Appendix A** on Capitola's Measure L
- Add more discussion of the Major Transportation Investment Study and its recommendations
- Clarify information from the Around the Bay Study on ridership and fares
- Discuss transit issues regarding the Covid-19 pandemic and its effect on transit in the future
- Add discussion of access to Cabrillo College and downtown Santa Cruz through local transit connections
- Add definition of high capacity transit
- Specify costs in 2020 dollars
- Separate the funding source table into two tables; a table for METRO funds and a table for potential fund sources for the transit alternatives evaluated in the TCAA/RNIS
- Revise the delay caused by transit crossings at public roadways to consider more realistic gate down times
- Provided more detail on travel time reliability of first/last mile connections and for vehicle malfunctions of fixed guideway vs. rubber wheeled transit alternatives
- Add information to the cost estimates in **Appendix H** to clarify costs for quiet zones, assumptions for rail and tie replacement, and assumptions for number of vehicles assumed for all alternatives
- Provide more explanation on the noise impacts from each alternative





## CHAPTER 6 - LOCALLY PREFERRED ALTERNATIVE

This Chapter presents the proposed TCAA/RNIS Locally Preferred Alternative (LPA). The performance measure analysis presented in Chapter 5, as well as input from RTC, RTC advisory committees, partner agencies, community organizations, stakeholders, and members of the public, have guided this recommendation and will be fully considered by the RTC in making its final decision of a locally preferred alternate.

### 6.1 SUMMARY OF EVALUATION RESULTS

In Milestone 3, the pros and cons for each of the four alternatives evaluated in the TCAA/RNIS are shown in **Figures 6.1, 6.2, 6.3, and 6.4** respectively.





**Figure 6.1: Bus Rapid Transit Advantages and Disadvantages**

## Arterial & Right-of-Way Bus Rapid Transit (BRT)



### CHARACTERISTICS:

- ❖ Fixed-route bus with propulsion type (electric-hydrogen fuel cell, battery)
- ❖ Operating primarily on:
  - Santa Cruz Branch Line as a dedicated right-of-way (ROW)
  - Highway 1 & local roadway network on shoulders/auxiliary lanes
- ❖ Defined stations with transit signal priority & off-board fare collection to reduce travel times
- ❖ Frequent, bi-directional service for substantial part of weekdays & weekends

### PROS

- ❖ Strong transit ridership potential
- ❖ Integrates easily with overall transportation system
- ❖ Ability to adapt to new technologies
- ❖ Lowest costs (capital, operations & maintenance)
- ❖ No impact to Roaring Camp for access to boardwalk
- ❖ Greater number of stops
- ❖ Greater flexibility/resiliency to climate change

### CONS

- ❖ Least reliable & longer travel times
- ❖ Utilizes less than 7 miles of rail ROW
- ❖ Incompatible with freight where BRT is on ROW
- ❖ Eliminates Roaring Camp connection to regional rail network
- ❖ Level boarding platforms less likely for stops on road network
- ❖ Limited capacity for bicycle & mobility devices
- ❖ Requires transfer to regional rail network
- ❖ Limited Transit-oriented Development potential





**Figure 6.2: Commuter Rail Transit Advantages and Disadvantages**

## Electric Commuter Rail (CRT)



### CHARACTERISTICS:

- ❖ Passenger rail service with electric propulsion (hydrogen fuel cell, battery)
- ❖ Operating on fixed rails with multiple individually-propelled cars
- ❖ Higher ridership capacity & longer distance between stops
- ❖ Operates on single track with rail sidings for two-way travel up to 30-60 mph
- ❖ Potential Positive Train Control and Centralized Traffic Control or similar signal system

### PROS

- ❖ Faster, more reliable travel times
- ❖ Greater reduction in vehicle miles traveled & greenhouse gas emissions
- ❖ Strong transit ridership potential
- ❖ Operates with freight and recreational rail in shared-use corridor
- ❖ Supports transit-oriented development
- ❖ Shortest implementation time
- ❖ Best existing rail network integration (potential one-seat ride to Monterey & cross-platform transfers at Pajaro)
- ❖ Assures continuous transportation corridor
- ❖ More funding potential
- ❖ 91% of stations are within disadvantaged communities
- ❖ Flexible designs for seats, bicycles & mobility devices based on need
- ❖ Level boarding platforms at all stations
- ❖ More energy efficient per passenger mile

### CONS

- ❖ Higher costs (capital, operations & maintenance)
- ❖ Lower ridership estimates than BRT and LRT
- ❖ Less resilience to climate change impacts



**Figure 6.3: Light Rail Transit Advantages and Disadvantages**

## Electric Light Rail (LRT)



### CHARACTERISTICS:

- ❖ Passenger rail service with electric propulsion (hydrogen fuel cell, battery)
- ❖ Operating on fixed rails with single or multiple individually-propelled cars
- ❖ Less ridership capacity
- ❖ Operates on single track with rail sidings for two-way travel up to 30-60 mph
- ❖ Potential Centralized Traffic Control or similar signal system

### PROS

- ❖ Faster, more reliable travel times
- ❖ Greatest reduction in vehicle miles traveled & greenhouse gas emissions
- ❖ Strong transit ridership potential
- ❖ Operates with freight in shared-use corridor (may need temporal separation)
- ❖ Supports transit-oriented development
- ❖ Shortest implementation time
- ❖ Assures continuous transportation corridor
- ❖ 92% of stations are within disadvantaged communities
- ❖ Does not impede other rail use within corridor (current or future)
- ❖ Flexible design for seats, bicycles & mobility devices based on need
- ❖ Level boarding platforms at all stations
- ❖ More energy efficient per passenger mile

### CONS

- ❖ Higher costs (capital, operations & maintenance)
- ❖ Lower ridership estimates than BRT
- ❖ Less resilience to climate change impacts
- ❖ May require transfer to connect with regional rail network



Figure 6.4: Autonomous Road Train Advantages and Disadvantages

## Autonomous Road “Train” (ART)



### CHARACTERISTICS:

- ❖ Emerging transit mode with electric propulsion (hydrogen fuel cell, battery) combining benefits of BRT & LRT with autonomous driving features
- ❖ Rubber tires within dedicated pavement alignment
- ❖ Resembles LRT vehicles with similar passenger capacity
- ❖ Similar infrastructure to BRT including permanent stations, transit signal priority & frequent service
- ❖ Operates on single lane within Santa Cruz Branch Line ROW up to 40-45 mph (includes sidings for two-way travel)

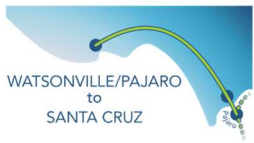
*ART system recently deployed in City of Yibin, China*

### PROS

- ❖ Strong transit ridership potential
- ❖ Supports greenhouse gas emission reduction goals
- ❖ Greater ability to adapt to new technologies
- ❖ Supports transit-oriented development
- ❖ 92% of stations are within disadvantaged communities
- ❖ Flexible design for seats, bicycles & mobility devices based on need
- ❖ Level boarding platforms at all stations

### CONS

- ❖ Capital cost is highest – 50% more than rail transit
- ❖ Incompatible with freight rail
- ❖ To preserve freight in Watsonville, must transfer to local bus at Lee Rd. to access downtown Watsonville & Pajaro
- ❖ Longer travel time
- ❖ Less flexibility/resiliency to climate change



## 6.2 LOCALLY PREFERRED ALTERNATIVE

The proposed Locally Preferred Alternative (LPA) is **Electric Passenger Rail**. A decision on whether the rail option will be electric commuter rail (CRT) or electric light rail (LRT) is not recommended as part of this planning study. The infrastructure needed for either CRT or LRT is similar. Deferring this decision will maintain flexibility for future decisions on the rail vehicle type, while clean energy rail technologies advance. A decision on different electric rail vehicle types and sizes would therefore be better studied in the preliminary engineering and environmental analysis phase of delivery. **Figure 6.5** and **Figure 6.6** show the respective alignments for CRT and LRT. Both the CRT and LRT alternatives provide similar performance benefits as outlined below.







Figure 6.5: CRT Proposed Alignment and Stations



| Station # | Name                                  | Station # | Name                         |
|-----------|---------------------------------------|-----------|------------------------------|
| 1         | Natural Bridges Station               | 9         | Aptos Village Station        |
| 2         | Bay Street Station                    | 10        | Downtown Watsonville Station |
| 3         | Downtown Santa Cruz/Boardwalk Station | 11        | Pajaro Station               |
| 4         | Seabright Station                     |           |                              |
| 5         | 17th Avenue Station                   |           |                              |
| 6         | 41st Avenue Station                   |           |                              |
| 7         | Capitola Village Station              |           |                              |
| 8         | Cabrillo College Station              |           |                              |





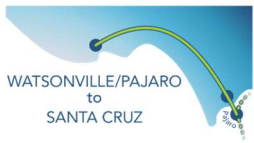


Figure 6.6: LRT Proposed Alignment and Stations



| Station # | Name                                   | Station # | Name                              |
|-----------|--|-----------|-----------------------------------|
| 1         | Natural Bridges Station                | 9         | Capitola Village Station          |
| 2         | Fair /Almar Avenue Station             | 10        | Park Avenue/Cabrillo Station      |
| 3         | Bay Street Station                     | 11        | Aptos Village Station             |
| 4         | Downtown Santa Cruz Depot Park Station | 12        | La Selva Beach Station (seasonal) |
| 5         | Boardwalk Station (seasonal)           | 13        | Ohlone Parkway Station            |
| 6         | Seabright Station                      | 14        | Downtown Watsonville Station      |
| 7         | 17th Avenue Station                    | 15        | Pajaro Station                    |
| 8         | 41st Avenue Station                    |           |                                   |





### **CHARACTERISTICS OF THE PROPOSED PASSENGER RAIL LPA**

The proposed Electric Passenger Rail LPA will consider services operating on the SCBRL ROW with single or multiple individually-propelled electric cars. There would not be an overhead catenary system (polls and wires). Operations will be structured on a single track within the SCBRL ROW with periodic sidings allowing for two-way travel. The characteristics of the recommended Passenger Rail LPA include:

- **Vehicle Speeds** will be capable of traveling from 30 to 60 mph in the SCBRL ROW, with both CRT and LRT traveling at similar average and maximum travel speeds in the corridor.
- The number of **Stations** is expected to range from 11 to 13 stations on the SCBRL ROW, with the CRT configuration having the lower number of stations and LRT having the higher number of stations. This analysis was based on traditional station spacing and interactions for each passenger rail service. Both CRT and LRT could also include seasonal stations in the SCBRL ROW to better accommodate tourist and seasonal activity in the corridor. Although this study considered the number and location of station alternatives, a more detailed study during preliminary engineering and environmental review may consider different alternatives.
- The use of **FRA compliant or non-FRA compliant vehicles** will be determined in the next phase of the analysis. If non-FRA compliant vehicles are identified for use, then both CRT and LRT could be configured to operate with freight rail in this shared-use corridor only if temporally separated (i.e., freight rail and passenger rail operations will operate at different times of the day). This will require the implementation of Centralized Traffic Control (CTC) or similar signal systems. If FRA compliant vehicles are implemented, then the passenger rail (both CRT and LRT) vehicles can comingle with freight rail in this shared-use corridor and both Centralized Traffic Control (CTC) and Positive Train Control (PTC) would be required.
- **Frequency of service** would be established in a future phase of project development and could increase over time as ridership increases. Headway is the number of minutes between each train. Higher frequency (lower headways) for major stops and lower frequency for minor stops could provide the best tradeoff of travel time versus ridership and is a common practice among rail systems. Both CRT and LRT in the TCAA/RNIS analysis considered 30 minute headways during peak periods. CRT had a 60 minute headway for off-peak and LRT continued with a 30 minute frequency all day. The ridership analysis showed that a higher frequency service of 30 minute headways during mid-day served a demand that is not served by 60 minute headways mid-day.
- **Daily span of service** would be established in a future phase of project development and will likely increase over time as ridership increases. Weekday span evaluated in the TCAA/RNIS was from 6AM to 9PM and 7AM to 10PM for weekend for both CRT and LRT.





- **Level platform boarding** is a common feature in both CRT and LRT services at each station, no matter the station size in order to provide universal access for all ages and abilities and ease of boarding for travelers with bicycles.
- The CRT and LRT alternatives assume **alternative fuel technologies** including hydrogen fuel cell, battery or other future clean, or non-fossil fuel technologies. Alternative fuel technologies are advancing rapidly, along with trainsets. Within the next decade, options for clean fuel trainsets will likely expand significantly compared to what is available today.

### ***BENEFITS OF THE ELECTRIC PASSENGER RAIL FOR THE LOCALLY PREFERRED ALTERNATIVE***

The benefits of electric passenger rail for the locally preferred alternative, including both CRT and LRT, are provided below.

- **Provides Faster Travel Times and Greater Travel Time Reliability.** Passenger rail with CRT and LRT by utilizing a dedicated guideway for the entire distance between Santa Cruz and Pajaro provides the fastest travel times and greatest level of travel time reliability compared to the other alternatives.
- **Reduces Auto Vehicle Miles Traveled and Greenhouse Gas Emissions.** As transit ridership increases, auto vehicle miles traveled will decrease. Rail ridership combined with the longer average trip distances on rail transit, provide the greatest reduction in vehicle miles traveled and associated greenhouse gas emissions and criteria pollutants.
- **Serves a High Percentage of Disadvantaged Populations in Santa Cruz County.** The passenger rail LPA, with both CRT and LRT, includes 91% of its rail station stops within census tracts identified as transportation disadvantaged populations in the county.
- **Provides Regional Rail Network Compatibility.** The passenger rail LPA is expected to provide the best regional network integration potential and compatibility with the California State Rail Plan and neighboring Monterey County -regional rail project plans for connecting at the future Pajaro Station with shorter travel times and only a cross platform transfer to the state rail network. An FRA compliant vehicle provides the potential for a one-seat ride between Santa Cruz and Monterey.
- **Provides the Shortest Length of Time to Implement.** The schedule for implementing the passenger rail LPA, for both CRT and LRT, will require less time than the other alternatives.
- **Assures Continuous Corridor for Transit and Trail.** The LPA ensures continuous use of the SCBRL ROW for its intended purpose, which creates more certainty on preserving the corridor for all uses.
- **Provides Greatest Opportunities for Transit-Oriented Development.** Fixed-guideway passenger rail services such as those provided by CRT and LRT provide the best opportunities for Transit-Oriented Development (TOD) and future demand for transit ridership compared to the other alternatives.





- **Utilizes the Full SCBRL ROW between Pajaro Station and Westside Santa Cruz.** The LPA utilizes the full length of the SCBRL ROW as a dedicated transit facility that currently has unused capacity.
- **Provides More Potential Funding Sources Available for Passenger Rail.** As presented in Chapter 5, CRT and LRT offer more opportunities to obtain existing and potential future funding than the other alternatives. The State has established a vision of a major expansion of the rail network throughout California as provided in the 2040 California State Rail Plan. The State has committed to provide funding to implement rail projects. Governor Newsom's recent Executive Order (EO N-79-20) directing state agencies to "Build towards an integrated, statewide rail and transit network, consistent with the California State Rail Plan, to provide seamless, affordable multimodal travel options for all" continues with this commitment.
- **Will not Impede Existing or Potential Future Freight and Recreational Rail from Using the Corridor.** The passenger rail LPA provides the least impact to existing and potential future freight rail operations on the SCBRL ROW. Freight rail and passenger rail can share the same set of tracks but may require temporal separation if the vehicles are not FRA-compliant. Both CRT and LRT can best accommodate SCBG recreational rail operations to the Boardwalk.
- **Provides Greater Flexibility to Allocate Space for Seats, Bicycles, and Mobility Devices based on Need.** CRT and LRT have greater capacity to tailor the rail vehicles to meet local needs for seating, bicycle storage and mobility devices. Vehicle design that can be flexible to accommodate a range of seating, bicycle capacity and mobility devices will provide the greatest benefit.
- **Provides Ability to Have Level Boarding at all Stations.** Both CRT and LRT can accommodate level boarding at all stations providing universal access for all ages and abilities.
- **Assures Energy Efficiency per Passenger Capacity Mile.** As technology advances for each of the four alternatives, the options for delivering greater energy efficient solutions will be explored and further defined. The passenger rail LPA provides similar energy efficiencies per passenger mile as the other alternatives. As electrification of rail vehicles advance, there will be more options for zero-emission trainsets.

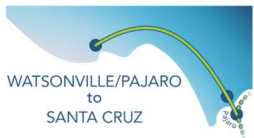
## 6.3 SYSTEM INTEGRATION

### *LOCAL LEVEL INTEGRATION WITH THE SANTA CRUZ METRO TRANSIT NETWORK*

Current Metro bus service in Santa Cruz County serves a variety of needs. Most routes begin at the Santa Cruz Metro Center on Pacific Avenue in downtown Santa Cruz. Some routes serve as local bus service, connecting neighborhoods to nearby schools or commercial centers, but many routes serve as cross-county connectors, spanning the distance from Santa Cruz to Capitola or Watsonville via Soquel Drive or Highway 1. With the implementation of passenger rail on the branch line ROW, a new high-quality transit connection with all the benefits







described in the previous section could drive some modifications to the overall structure of the METRO system of bus routes.

With a fast, reliable new transit connection between Watsonville, Capitola, Santa Cruz, and neighboring communities, the bus system could expand to also provide a feeder system. As most identified station locations are situated adjacent to principal arteries of the Santa Cruz County street network, many are already served by METRO bus routes. Such routes could be modified to connect rail stations with destinations they already serve. In particular, Soquel Drive/Ave is the primary corridor of the METRO system as well as being the location of many destinations, so feeder service could be highly beneficial if it effectively linked Soquel Drive/Ave to the new transportation corridor of passenger rail service and the Monterey Bay Sanctuary Scenic Trail (MBSST) on the ROW. However, additional funding for local transit would need to be secured in order to provide feeder service to stations where there is currently no service, and to increase service to match the 30-minute frequency of the preferred alternative, since most local routes that cross the transit corridor currently operate with a 60-minute frequency.



#### **LOCAL LEVEL INTEGRATION USING FIRST MILE AND LAST MILE CONNECTIONS**

A key component of a successful high-capacity transit system is an integrated network of “first mile/last mile” connections that allow transit system users to complete their journey from the transit station closest to their destination, to their destination itself. As transit-oriented development is established near stations, many destination types may be accessible very close to stations, but there will always be a demand for high-quality connector options. Station planning and design will require consideration for the many types of connector services that could be utilized in the future. This section lays out some such options.

#### **WALKING AND BICYCLE NETWORK IMPROVEMENTS**

For final destinations that are less than a mile away, walking or bicycling are quick and easy options for transit users to complete their trips. To encourage use of these methods of



alternative transportation, sidewalk and bicycle facility networks, particularly from stations to major destinations, could be improved. Wider sidewalks, with shade trees, benches, and other amenities, encourage walking by making the experience feel safer and more comfortable. Bike facilities, including green bike lanes, protected bike lanes, cycle tracks, and separated paths, create safer space for bicyclists to be seen and avoided by motorists. Improved crosswalks,

with amenities such as curb extensions, “bulb-outs”, pedestrian/bicycle priority, and/or center refuge islands make crossing busy streets safer for both pedestrians and bicyclists. A network of bicycle and pedestrian facilities that connect to potential station locations is envisioned including the “rail trail” as described in **Chapter 1**.







## BIKESHARE

Bikeshare, as well as other micro-mobility options, has grown in popularity in recent years and continues to receive more widespread adoption. This service allows users to rent bikes for a short period of time using an app on mobile devices and travel shorter distances around cities, often to or from another mode of transportation. Utilizing bikeshare as part of a transit trip would mean the transit user would avoid the need to bring their own bicycle on board the train, as well as avoid the need for secure bicycle parking. The Jump Bike system, launched in the City of Santa Cruz in May 2018, achieved one of the highest rates of daily use in the country. In the spring of 2020, in response to COVID-19, Jump Bike's owner, Uber, decided to suspend operations, and then subsequently sold JUMP Bikes to Lime, which had not reinstated bike share in Santa Cruz at time of publication. The bicycles used in the system included pedal assist, aiding riders in climbing hills and arriving to their destination without being out of breath. The City of Santa Cruz has previously expressed interest in expanding their system, and other jurisdictions have also expressed interest in implementing new bikeshare systems. Bikeshare stations at transit stations on the ROW would allow quick transfers between passenger rail and bikes.



## RIDE-HAILING AND TAXIS

For longer first mile/last mile connections, or for trips during bad weather or with luggage, automobiles organized by a ride-hailing or taxi service may also be a good option. Ride-hailing and taxi services both take passengers in vehicles driven by an employed driver to their destination for a fee based on distance or time. In addition to bus stations and bike share stations, passenger rail station design should include pick up/drop off areas for ride-hailing and taxis, which could also be utilized by family and friends of transit passengers dropping them off at the station in personal vehicles.



## SHUTTLES

Shuttles can be public or private small buses or vans that travel either a fixed route back and forth to a major destination such as a hotel, shopping destination, or employment center, or a demand responsive service that drops off passengers at their requested location. Shuttles could become autonomous as the technology develops. In Santa Cruz County, shuttles could be run by private employers, business districts, or accommodations, or they could be organized by a public entity such as the transit district, the University of California Santa Cruz, Cabrillo College, or other publicly owned destinations. Connection to UCSC might benefit from some type of shuttle service to and from transit stations, and a connection hub could be built into the stations at Natural Bridges Drive, Bay Avenue, and/or Depot Park Station.





### **REGIONAL LEVEL INTEGRATION WITH MONTEREY AT PAJARO STATION**

Passenger rail service on the Santa Cruz Branch Rail Line would provide the greatest connectivity at Pajaro to the planned regional rail service. The Transportation Agency for Monterey County (TAMC) is actively pursuing bringing rail service to Monterey County that includes local commuter service as well as greater regional access. The Monterey County Rail Extension project extends passenger rail service between San Francisco, San Jose and Gilroy, south to the downtown Salinas station. Future phases of the project include a new station at Pajaro/Watsonville for connection to the Santa Cruz Branch Rail Line and a new station in Castroville for connection to the Monterey branch line (**Figure 6.7**).

TAMC is also currently working on a Monterey Bay Area Rail Network Integration Study (RNIS) funded by Caltrans for planning intercity rail service between Monterey County and Santa Clara County and connecting to southern California along the Coast Rail Corridor. The Monterey Bay RNIS is also evaluating a new regional passenger rail service between the Cities of Monterey and Santa Cruz with connectivity at Pajaro and Castroville to intercity service to Gilroy and points north, and Salinas and points south (**Figure 6.7**). The regional transit service would travel on the Monterey Branch Rail Line in Monterey and utilize the Santa Cruz Branch Rail Line in Santa Cruz County, and the Union Pacific Coast Mainline tracks between Castroville and Pajaro.

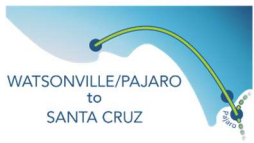
The service vision seeks to maximize rider benefit, minimize travel time and transfer times, minimize capital and operations costs, shorten implementation time, minimize risk and create a scalable service network. The future vision service is currently considering an hourly regional rail service between Cities of Monterey and Santa Cruz with station stops at Capitola, Aptos, Watsonville, Pajaro, Castroville, Marina, and Seaside with timed connections to/from intercity rail service at hub stations in Pajaro and Castroville. A passenger rail service with an FRA compliant vehicle would allow for a one-seat ride between Santa Cruz and Monterey.

### **INTEGRATION WITH PLANNED CALIFORNIA RAIL NETWORK**

As discussed in Chapter 1, the 2018 California State Rail Plan (Rail Plan) developed by Caltrans Division of Rail & Mass Transportation provides a new vision for California’s rail network that proposes a major expansion of intercity, regional and freight rail services throughout California. Passenger rail on the Santa Cruz Branch Rail Line would provide the greatest connectivity for Santa Cruz County residents to the future statewide rail network. A state-of-the-art rail system throughout California will help achieve greenhouse gas reduction and air quality goals while boosting economic growth and helping to create more livable communities.

The 2040 vision describes a future integrated rail system that provides a faster, more frequent and connected service for moving both people and goods with minimal transfer times. The Rail Plan emphasizes universal accessibility, competitive travel time and service frequencies, integration at stations with first/last mile solutions and a clean and energy efficient transportation system. A statewide rail system offers a viable alternative to driving for both





local and long-distance trips for all California residents and visitors, including those who lack access to or cannot afford automobiles, and for people who choose not to drive.

The Santa Cruz Branch Rail Line links to existing and proposed new passenger rail services on the state rail corridor – extending from San Diego to past the northern boundary of California. The 2022 regional goals of the plan include a station at Pajaro/Watsonville and an analysis of opportunities to improve connections between Santa Cruz, Monterey and the High-Speed Rail Line at Gilroy. The mid-term 2027 goals include implementation planning for connecting Santa Cruz and Monterey to the statewide rail network at Gilroy and establishment of hourly service by 2040, if such service is recommended by the 2022 study.

The decision to implement passenger rail on the Santa Cruz Branch Rail Line will advance the transportation system in Santa Cruz County in sync with the rest of the state. The funding landscape for transportation is moving increasingly towards transit. Governor Newsom's recent Executive Order (EO N-79-20) directing state agencies to "Build towards an integrated, statewide rail and transit network, consistent with the California State Rail Plan (**Figure 6.7**), to provide seamless, affordable multimodal travel options for all" will increase passenger rail funding opportunities to a greater extent.



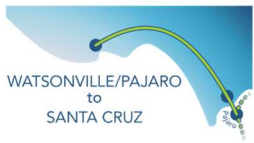


Figure 6.7: California State Rail Plan, Northern California Service – 2040 Vision



### 6.4 BUSINESS PLAN

A Business Plan with a horizon year of 2045 will be developed for the locally preferred alternative once approved by the RTC. The Business Plan will outline the funding and implementation strategy including a cash-flow analysis of environmental clearance, right-of-way, design, construction, operations, and maintenance. The governance options, inter-agency agreements, and lists of policies and programs that may be necessary to implement the project in the short-, mid-, and long range timeframes will be presented. Phased delivery will be considered to match the capital, operational, and maintenance costs and funding required for the locally preferred alternative, with cashflow analysis incorporating potential funding sources identified in Milestone 3.



## **APPENDIX A – Previous Studies Relevant to Project**



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## **SUMMARIES AND KEY FINDINGS**

In an effort to understand the history of transportation planning and policy framework within Santa Cruz County to support the development of the TCAA, this document presents a summary of reviewed relevant and available plans, studies, and funding program guidelines. This report presents summaries and findings of each plan/study with particular consideration regarding how they inform various aspects of the TCAA.

### **AROUND THE BAY RAIL STUDY (1998)**

The Around the Bay Rail Study explored the integration of Santa Cruz and Monterey passenger rail efforts and if they would yield financial and efficiency benefits; and, whether an additional service that joined the two cities could attract significant ridership to justify its costs and have an impact on regional mobility. Santa Cruz County analyzed seasonal weekend passenger rail service (two morning and two evening trips on each weekend day for about 26 weeks), and Monterey County analyzed year-round extended weekend service (one morning and one evening trip on four days including weekends year-round), both linked to the San Francisco Bay Area by direct service from Caltrain's San Francisco station.

In addition, the analysis focused on the possible use of Diesel Multiple Unit (self-propelled) passenger rail cars instead of traditional locomotive-hauled cars, to provide greater operating flexibility. The study developed operating plans, documented capital and operating costs, suggested a financing scheme and proposed institutional arrangements to carry out the proposed program. The study recommended the two counties should advance as one, participating in all negotiations and approvals related to either county's progress as a united front, preferably under a formal agreement such as a Joint Powers Authority.

<http://sccrtc.org/wp-content/uploads/2011/07/980700-AroundTheBayRailStudy.pdf>

Key findings of the study relevant to the TCAA were:

- the rolling stock analysis found a small cost advantage to the DMU rolling stock if DMUs are employed in place of conventional passenger train equipment and both counties operate separate programs.
- Service plans of Santa Cruz and Monterey counties are recommended to be integrated, as well as governance through a joint powers authority.
- Weekend ridership for leisure and tourism would be high, but very sensitive to fares. Study surveys showed that a doubling of fares resulted in an 80% decrease in choosing to take transit.

### **WATSONVILLE JUNCTION/SANTA CRUZ/UCSC CORRIDOR MAJOR TRANSPORTATION INVESTMENT STUDY (1998)**

In 1994, the Santa Cruz County Regional Transportation Commission initiated a Major Transportation Investment Study or MTIS to evaluate rail and other transportation options in the most heavily traveled corridor within the county: between Watsonville and Santa Cruz,

including the University of California, Santa Cruz (UCSC) campus. Eight options were analyzed in detail, including bus and rail transit, additional carpool lane on Highway 1 and low cost strategies such as the promotion of telecommuting and flextime. The final report was available in late 1998 and a series of open houses were held to solicit input and share the information with the public. For the Santa Cruz Branch Rail Line, the consultant team recommended a two phased approach. In the near term, Phase 1 would implement an Intercity Recreational Weekend service that would test market the viability of the service for the long term. In the medium term, Phase 2 would construct a two-directional busway between Natural Bridges in Santa Cruz and Park Ave in Aptos along the rail right of way in addition to the tracks (**Figure A-1**) that would provide the flexibility to also serve the UCSC ridership via Bay Street. In areas where the corridor is constrained, the tracks would be within the pavement in the same lane as the busway.

Over the course of ten months after the completion of the MTIS, the RTC held a variety of public meetings and discussions to help determine whether to implement the recommendations of the MTIS. Based on the results of the MTIS and the public input, the Regional Transportation Commission approved a set of transportation options to pursue for the Watsonville/Santa Cruz/ UCSC corridor. The options approved by the RTC related to the rail right-of-way include 1) acquisition of the Union Pacific branch rail line between Watsonville and Santa Cruz/Davenport as a future transportation resource for the community and 2) partially fund a bike/pedestrian path to, not in place of, the rail line. Existing freight train operations would continue, and the pathway would be designed to not preclude future bus or rail transit options within the right-of-way. The RTC decided to not pursue the busway within the rail right-of-way. The complete list of projects approved by the RTC for the Watsonville/Santa Cruz/UCSC corridor in September 1999 are listed below.

- BUS SERVICE IMPROVEMENTS - Fund a 15-year growth plan at an increase of approximately 4% per year for new bus service, new equipment and upgraded maintenance/ operation facilities.
- LOCAL ROAD IMPROVEMENTS - Fund improvements to local streets and roads, including rehabilitation, maintenance, and selected widening improvements.
- ADDING HIGH OCCUPANCY TOLL LANES TO HIGHWAY 1 - Partially fund an additional lane in each direction of Highway 1 between Morrissey Blvd. and State Park Drive.
- RAIL RIGHT-OF-WAY ACQUISITION - Fund the purchase of the Union Pacific branch rail line between Watsonville and Santa Cruz/ Davenport as a future transportation resource for the community.
- BIKE/PEDESTRIAN PATH ON THE RAIL RIGHT-OF-WAY Partially fund a bike/ pedestrian path adjacent to, not in place of, the rail line. Existing freight train operations would continue and the pathway would be designed to not preclude future bus or rail transit options within the right-of-way.
- LOCAL BICYCLE PROJECTS - Fund high priority bicycle projects in the cities and the county, including around local schools.

- ELECTRIC BICYCLES - Allow for the discounted distribution and/ or sale of electric bicycles to people who commit to driving less.

<https://sccrtc.org/major-transportation-investment-study/#eight>

**Figure A-1.** Photo simulation from MTIS of busway, tracks and bike lanes along the rail right-of-way



### **CAPITOLA TO APTOS RECREATIONAL RAIL SERVICE WITH EXTENSION TO SEASCAPE (2005) – REVISED DRAFT ENVIRONMENTAL IMPACT REPORT**

As part of its effort to purchase the Santa Cruz Branch Rail Line, the RTC initiated an environmental impact report process for recreational rail service to meet requirements of the funding proposed to be used for purchase of the rail line. As part of this process, in 2005, a draft revised Environmental Impact Report was published that contained an analysis of the potential environmental impacts of a proposed Recreational Rail Service Project in Santa Cruz County. Service would run between Capitola and Aptos villages with a proposed extension to Seascap. The length of the rail service would be approximately 6 miles. Six passenger platforms would be located along the rail line, as well as two siding locations for train storage and to allow freight train passage. Station/platform locations considered were Cliff Drive, Capitola Village, New Brighton State Beach, Seacliff State Beach, Aptos Village and Seascap. The proposed recreational rail service was proposed to be in addition to the freight rail service that was running between Davenport and Watsonville. The study anticipated the use of two-car, self-propelled rail vehicles operating at relatively slow speeds up to a maximum of 15 mph unless the tracks were upgraded allowing for up to 25 mph. The recreational service would operate during the primary tourist season. Alternatives evaluated included between 4 to 9 round trips per day with days of service from Friday, Saturday, Sunday and Monday to no restriction.

As the RTC was working on the final environmental impact report for the project analysis by both the RTC and California Transportation Commission (CTC) determined that a passenger rail service plan was not necessary to use Proposition 116 funds for purchase of the rail line right-of-way for preservation. Therefore, the RTC decided to proceed with the rail line right-of-way purchase without a passenger rail component and work on the potential for passenger rail service after the rail line was purchased.

<https://sccrtc.org/projects/rail/rail-service-studies/>

**CITY OF WATSONVILLE GENERAL PLAN (2005)**

The City of Watsonville developed its general plan in 2005 to provide a policy framework for development in Watsonville over the next 20 years. The vision of Watsonville was to build a livable city and enhance the quality of life of all residents. The Santa Cruz Branch Rail Line passes through Watsonville. Watsonville is a major employment center for the Pajaro Valley, and it is experiencing an increase in affordable housing and mobility demand, so it is important to understand how the proposed future high capacity transit service can support the City’s development goals.

Goals, visions and principles identified in the general plan are:

|         |   |
|---------|---|
| Visions | The center of the agricultural support base of the Pajaro Valley;<br>A provider of affordable living, particularly in comparison to that of the County and the region;<br>A place with historic commitment to protection and management of wetlands, open space, and other environmental resources;<br>The evolving cultural center for the County’s Hispanic population; and<br>An employment center for the Pajaro Valley |
| Goals   | Development of a healthy economy that will provide living wage employment;<br>Provision of a housing supply to meet the needs of all people in the Watsonville community;<br>Conservation and preservation of natural resources;<br>Improvement of the quality of life for the City’s children and youth;<br>Increasing the availability of education; and<br>Increasing space for parks and open space                     |

<https://www.cityofwatsonville.org/160/2005-General-Plan>

Key findings of the study relevant to the TCAA were:

The mobility policies of the general plan relevant to the TCAA emphasize the following areas:

- *Transit* – The Watsonville Transit Center is currently located at Rodriguez Street and West Beach Street. A new transit center is to be located at that location, one block from the central business district. That facility will include a 400-square foot structure. Bicycle



and vehicle parking areas and covered loading platforms are also proposed. The land use pattern in Watsonville 2005 include high-density residential development in expansion areas and high job-generation densities largely in the southwest quadrant of the City. The land use distribution policies result in improved opportunities to utilize transit. Major employers will be encouraged to make transit incentives a cornerstone of their transportation system management programs

- *Rail* – Watsonville is provided with rail freight service by the main line owned now by Union Pacific between San Francisco and Los Angeles. This is a vital freight link between population centers and the food processing plants located in Watsonville and northern Monterey County.

### **ALTERNATIVES ANALYSIS FOR THE MONTEREY PENINSULA FIXED GUIDEWAY CORRIDOR STUDY (2011)**

The Transportation Agency for Monterey County (TAMC) developed the study in 2011 (revised findings in 2012) to identify transportation issues and problems along the Monterey Peninsula corridor and to assist in decision-making for major investments in regional transit infrastructure. Goals identified in the study were to improve the balance of transportation facilities and services in the Monterey Peninsula and to accommodate travel for residents and visitors to Monterey County. The study provided an example of addressing regional transportation problems and congestion issues by transforming the rail line ROW (previously owned by Union Pacific Rail Road) to high capacity transit service. An alternatives analysis was performed that evaluated 1) enhanced bus alternative, 2) bus rapid transit along a fixed guideway, 3) light rail transit along a fixed guideway. The TCAA screening criteria and performance measures are consistent with the measures utilized in this study for evaluating high capacity transit alternatives and the selection of a locally preferred alternative. The performance measures for the study include constructability, compatibility with land use and demographics, environmental impacts, ridership forecasts, capital and operational and maintenance costs, and financial analysis. . Another lesson learned from this study is the importance of having supportive land use and development policies for transit in cities along the corridor.

[https://www.tamcmonterey.org/wp-content/uploads/2015/09/TAMC\\_MLB\\_AltAnalysis\\_ExecSummary.pdf](https://www.tamcmonterey.org/wp-content/uploads/2015/09/TAMC_MLB_AltAnalysis_ExecSummary.pdf)

Key findings of the study relevant to the TCAA were:

- The decision to adopt a two-phase light rail transit project as the locally preferred alternative was based on the proposed project’s ability to provide superior transportation service in the long-term which would result in fewer single occupant vehicles on roadways, reduced greenhouse gases, and promote transit-related development while best meeting the vision and future plans for each of affected cities. Justification for this decision included:
  - Light rail transit was deemed a superior long-term investment strategy

- By preserving the tracks on this corridor, intercity rail may one day run from San Francisco to Monterey
- Light rail vehicles would hold more riders than bus rapid transit vehicles and have the ability to add train cars as ridership increases in the future
- Light rail would be better for persons with disabilities, with easy on and off boarding for passengers in wheelchairs, without requiring any driver assistance. Trains would also remain on schedule since assistance would not be needed by the vehicle driver to board and alight
- Light rail vehicles are more conducive for use by bicyclists as compared to buses
- Public input: the choice rider would be more supportive of a light-rail alternative
- The marginally higher operating cost associated with full LRT implementation would be anticipated to be offset through a greater capture of choice riders and higher ridership with a LRT system as compared to a BRT system.

### **CITY OF WATSONVILLE TRANSIT PLANNING STUDY (2012)**

METRO developed the study in 2012 to assess the efficiency of transit services provided within the City of Watsonville and to optimize its service within a framework of immediate and near-term budget realities. Watsonville is a major community along the Santa Cruz Branch Rail Line, Development and evaluation of alternatives for the TCAA should consider the demand at Watsonville. The Atkinson Lane Specific Plan and Manabe-Ow Business Park Specific Plan were projected to result in a substantial increase in residents and jobs within Watsonville, which would lead to an increase in transportation demand.

<https://www.scmttd.com/en/agency-info/planning>

Key findings of the study relevant to the TCAA were:

- Route 71 functioned as the “backbone” of transit service to and from Watsonville, accounting for the majority of riders and fare revenue
- The primary transfer point between local, inter-city, and regional transit services operating in Watsonville was the Watsonville Transit Center located at West Lake Boulevard and Rodriguez Street
- The primary transportation corridor through Watsonville was Highway 1
- The most significant issue in terms of on-time performance was the incidence of late departures during the PM day-parts (
- 38.7 percent of respondents stated they live in a household with an annual income of less than \$35,000, which suggests potential sensitivity to fare increases.

Key recommendations identified in the study relevant to the TCAA included:

- Bicycle capacity should be a consideration when procuring new service vehicles
- Extend Route 91X service span into the early evening by adding another outbound trip to Watsonville

### **CALIFORNIA HOUSEHOLD TRAVEL SURVEY (2012)**

The 2010-2012 California Household Travel Survey (CHTS) was a multi-modal study of the demographic and travel behavior characteristics of California residents. It was the largest regional household travel survey ever conducted in the United States. Detailed travel behavior information was obtained from more than 42,500 households using multiple data collection methods. Details of personal travel behavior within region of residence, and inter-regionally within the State, as well as adjoining states and Mexico, were gathered.

The main objective of the survey was to be able to use the data for baseline information to develop/update travel demand forecasting models to meet federal and state statutory requirements. Other objectives included gathering data from a considerably larger sample; representing all travel modes; using tolled facilities data; properly targeting long distance travel; and accurately representing weekday and weekend travel. To support advanced model development, more detailed data on vehicle acquisition decisions, parking choices, work schedules and flexibility, use of toll lanes/priced facilities, and walk and bicycle trips was collected. The socioeconomic and travel behavior data collected in the CHTS within Santa Cruz County was used to develop the Santa Cruz County travel demand model which was one of the tools used to forecast ridership in the TCAA.

<https://cal.streetsblog.org/wp-content/uploads/sites/13/2015/04/FinalReport.pdf>

### **CITY OF SANTA CRUZ 2030 GENERAL PLAN (2013)**

The City of Santa Cruz developed its general plan in 2013 to provide a foundation and guidance for conservation, land use, and community development for the next 20-25 years. The plan serves as a comprehensive and everyday guide for making decisions about the nature and location of economic and urban development, and transportation improvements. Development of transit systems, such as the selection of alignments and station locations, brings people and jobs to communities and can facilitate economic and urban developments. The Santa Cruz Branch Rail Line connects key urban centers, employment centers, and urban development areas in the City of Santa Cruz. Therefore, it is very important to ensure that Santa Cruz maintain supportive land use and development policies which allow for transit-oriented developments and identified transportation improvements, which ultimately enhance the multimodal transportation network.

Goals, visions and guiding principles identified in the plan include:

|                                    |  |
|------------------------------------|--|
| Natural Resources                  | Protect Santa Cruz’s unique setting, natural and established open space  |
| Neighborhood Integrity and Housing | Maintain the identity and vitality of the neighborhoods, actively pursuing affordable housing for a diversity of households and promoting compatible livability and high quality design in new buildings, major additions, and redevelopment |
| Mobility                           | Provide an accessible, comprehensive, and effective transportation system that integrates automobile use with  |

|                      |   |
|----------------------|---|
|                      | sustainable and innovative transportation options—including enhanced public transit, bicycle, and pedestrian networks throughout the community  |
| Prosperity for All   | Ensure a sustainable economy for the community, actively encouraging the development of employment opportunities for residents of all levels and ages, and actively protecting from elimination current and potential sources of sustainable employment |
| A Balanced Community | Maintain the community’s longstanding commitment to shared social and environmental responsibility, fostering a balance between employment, housing affordable to persons of all income levels, transportation, and natural resources                   |

<https://www.cityofsantacruz.com/home/showdocument?id=71130>

Key findings of the study relevant to the TCAA were:

- *Activity Centers* – Activity centers are walkable, mixed-used, transit-oriented areas in which the City’s economic, educational, recreational, cultural, and social life is concentrated. The six major activity centers in Santa Cruz are Downtown, the Beach Area, UCSC, the Harvey West industrial area, the Mission Street commercial area, and the Soquel Avenue Eastside business district
- *Livable Streets* – An interconnected system of pedestrian paths and bikeways will provide safety and security; and with transit-oriented design elements, it will encourage cycling. The Downtown and other activity and employment centers will become more accessible
- *Sustainable Transportation Systems* – The system intends to manage traffic demand, reduce auto use and promote alternative transportation to reduce traffic congestion. Essential elements of the sustainable system excellent transit system, ridesharing, flextime, and telecommuting, reasonable housing density and street connectivity, bike lanes and sidewalks, a regional carpool system, taxicabs, and car sharing.

**SANTA CRUZ METRO SHORT RANGE TRANSIT PLAN (2013)**

METRO developed the plan in 2013 to provide a capital investment roadmap for the next five years (2013 to 2018). The plan included an analysis of existing transit services, development of transit performance standards, service alternatives and recommendations, and a capital and financial plan. It provided a good overview of the existing and near-term transit services in Santa Cruz which should be considered as a baseline for the TCAA. Recommendations in policy and practice, fixed-route, and marketing chapters provided guidance on many aspects of the project, including alternatives development, station and operation recommendations, public outreach and community involvement. In addition, the plan included a set of performance

measures and criteria for evaluating BRT, regular bus transit and paratransit service, and acts as a good reference to consider in evaluating and comparing BRT alternatives.

Goals identified in the plan were:

- Improve people’s access to jobs, schools, health care and other regular needs in ways that improve health, reduce pollution and retain money in the local economy
- Reduce transportation related fatalities and injuries for all transportation modes
- Deliver access and safety improvements cost effectively, within available resources, equitably and responsive to the needs of all users of the transportation system and beneficially for the natural environment.

[https://www.scmted.com/images/department/planning/SRTP\\_Final\\_Draft.pdf](https://www.scmted.com/images/department/planning/SRTP_Final_Draft.pdf)

Key findings of the study relevant to the TCAA were:

- Policy and Practice: stop spacing, pull-out stops, and bicycle accommodation are recommended. “Transit-emphasis” or “transit-priority” corridors and related policies are recommended. These corridors are a street segment in which high-quality transit service is provided and physical improvements for transit are prioritized.
- Marketing: electronic information tools, printed materials, branding, fare media, signage and facilities and coordinated marketing are recommended.

**CITY OF CAPITOLA GENERAL PLAN (2014)**

The City of Capitola developed its general plan in 2014 to guide conservation, growth and enhancement in Capitola over the next 20 to 30 years. The plan provided a fundamental basis for the City’s land use and development policy, and it addressed all aspects of development including land use, environmental management and sustainability, traffic and circulation, housing, parks and recreation, and other relevant topics. The Santa Cruz Branch Rail Line runs through the City of Capitola and the proposed high capacity transit system will connect Capitola to other communities in the region and provide greater accessibility to the City. Similar to the City of Santa Cruz, it is very important to ensure that Capitola’s land use and development policies can support high capacity transit development and the proposed future transit service to aid in enhancing the City’s long-term goals and visions.

Goals, visions, and guiding principles identified in the general plan include:

|                           |  |
|---------------------------|--|
| Community Connections     | Ensure that all neighborhoods enjoy access to high quality community events, services, and amenities that foster community connections   |
| Neighborhoods and Housing | Strive for neighborhood improvements that foster identity and build stability, inclusiveness, and interaction. Minimize impacts to neighborhoods — such as noise, cut-through traffic, and overflow parking. Ensure that infill development and neighborhood |



|                         |  |
|-------------------------|--|
|                         | improvements are designed with careful attention to scale, minimized impacts, and community benefits   |
| Environmental Resources | Embrace environmental sustainability as a foundation for Capitola’s way of life. Reduce greenhouse gas emissions and prepare for the effects of global climate change, including increased flooding and coastal erosion caused by sea-level rise   |
| Economy                 | Support a local economy that is vibrant, diverse, and dynamic. Support all local businesses, “green” businesses, and employers that provide jobs for Capitola residents  |
| Mobility                | Provide a balanced transportation system that accommodates the needs of automobiles, pedestrians, and bicycles. Reduce dependence on the automobile with a complete network of sidewalks, trails, and pathways, and support development patterns that encourage the use of public transportation. Promote transportation options that are safe and convenient for all residents, including youth, seniors, and persons with disabilities |

[https://www.cityofcapitola.org/sites/default/files/fileattachments/page//general\\_plan\\_-\\_update\\_2019.pdf](https://www.cityofcapitola.org/sites/default/files/fileattachments/page//general_plan_-_update_2019.pdf)

Key findings of the study relevant to the TCAA were:

- *Transit Service* – Bus transit service and paratransit service for people with disabilities in Capitola is provided by Santa Cruz Metropolitan Transit District (METRO). There are ten METRO transit lines that service Capitola. Arterial routes that also serve as transit routes include 41st Avenue, Capitola Road, Capitola Avenue, and Bay Avenue
- *Bicycle Network* – According to Capitola’s Bicycle Transportation Plan (BTP), all of the trips within Capitola are achievable on a bicycle in less than one hour. In addition, a multi-use trail for bicycles and pedestrians is planned along the Santa Cruz Branch Rail Line corridor. The long-term plan is for the multi-use trail to cross Soquel Creek along the trestle. This is consistent with [Measure L](#), which was approved by Capitola voters in 2018.
- *Pedestrian Circulation* – Capitola has about 26 miles of roadways, of which about 50 percent have sidewalks. There are many areas throughout Capitola that do not have adequate or complete sidewalk facilities.
- *Freight Network* – The City of Capitola does not have an ordinance that establishes designated truck routes, but City ordinance requires trucks to only drive on truck-designated streets.
- *Rail Corridor* – The Santa Cruz Branch Rail Line extends east to west through Capitola. Within Capitola there are four at-grade crossings, including a major crossing over Soquel Creek. The right-of-way is generally 50 to 60 feet wide. In 2013, the RTC adopted plans for a new multi-use bicycle and pedestrian trail parallel to the rail tracks as part of a master plan for the Monterey Bay Sanctuary Scenic Trail Network.

## **METRO EVALUATION OF ZERO EMISSION BUSES (2016)**

METRO was awarded a 2016 Federal Transit Administration (FTA) Low-No Emissions grant for its first three electric buses for use on the Highway 17 Express service. The purpose of the document was to identify an implementation road map for a Zero Emission Bus (ZEB) charging infrastructure.

Goals:

- Achieve a fully zero-emission fleet by 2040 and to support a fleet management plan which phases out the purchase of Compressed Natural Gas (CNG) buses by 2030
- Use its FY19 Low Carbon Transit Operations Program (LCTOP) allocation of \$646,496 to fund the implementation of initial charging ports for up to ten buses at the Judy K. Souza Operations Facility (JKS)
- Starting in 2026, small transit agencies must purchase ZEBs for 25% of all bus purchases, and 100% of all bus purchases must be ZEBs starting in 2029 (Innovative Clean Transit Regulation).

<http://scmttd.com/images/department/board/archive/agendas/2019/2019-06-28-Agenda-BOD.pdf> (item 9-12)

Findings from the Electric Bus Implementation Strategy relevant to the TCAA were:

- Cost savings could be achieved in two ways: 1) make the initial bus purchases with battery leasing from manufacturer; and 2) retrofit an existing bus with electric propulsion motors
- A critical step in the electric bus implementation plan was to make the most effective charging scheme i.e., in-route or overnight, with the PG&E rate structure to produce the overall lowest electricity cost per mile
- Operators must be trained to be an active participant to optimize energy consumption.

## **2040 SANTA CRUZ COUNTY REGIONAL TRANSPORTATION PLAN (2018)**

The RTC developed the Regional Transportation Plan (RTP) in 2018 to guide transportation policies and projects through 2040 in Santa Cruz County. The plan provided the framework and guidelines for determining goals and performance measures for the County. Project goals support the regional visions identified in the RTP and performance measures align with the sustainability framework/triple bottom line principles. The RTP included analysis to develop and evaluate alternatives.

The plan utilized the Sustainable Transportation Analysis Rating System (STARS), an integrated set of performance measures to support development of a sustainable transportation plan. Goals were measured by specific sustainability targets and potential impacts on people, prosperity and the planet. Goals and targets identified in the plan relevant to the TCAA included:

Goal 1: Establish livable communities that improve people’s access to jobs, schools, recreation, healthy lifestyles and other regular needs in ways that improve health, reduce pollution and retain money in the local economy.

- Increase the percentage of people that can travel to key destinations within a 30-minute walk, bike or transit trip by 20% by 2020 and 47% by 2040
- Reduce per capita fuel consumption and greenhouse gas emissions by 1% by 2020, 5% by 2035, and 6% by 2040 through a reduction in vehicle miles traveled and improved speed consistency
- Reduce total greenhouse gas emissions from transportation by 1% by 2020 and 60% by 2040 through electric vehicle use, other emerging technologies, reduction in vehicle miles traveled and improved speed consistency
- Improve travel time reliability for vehicle trips
- Improve multimodal network quality for walk and bicycle trips to and within key destinations
- Decrease single occupancy mode share by 4% by 2020 and 9% by 2040
- Increase active transportation trips by 5% of total trips by 2020 and 18% of total trips by 2040

Goal 2: Reduce transportation related fatalities and injuries for all transportation modes.

- Reduce injury and fatal collisions by mode by 20% by 2020 and by 60% by 2040
- Reduce total number of high collision locations

Goal 3: Deliver access and safety improvements cost effectively, within available revenues, equitable and responsive to the needs of all users of the transportation system and beneficially for the natural environment.

- Increase the average local road pavement index to 57 by 2020 and 72 by 2040
- Reduce number of transportation facilities in "distressed" condition by 3% by 2020 and 5% by 2040
- Reduce travel times and increase travel options for people who are transportation disadvantaged due to income, age, race, disability or limited English proficiency by increasing the percentage that are within a 30-minute walk, bike or transit trip to key destinations by 20% by 2020 and 47% by 2040
- Maximize participation from diverse members of the public in RTC planning and project implementation activities.

<https://sccrtc.org/wp-content/uploads/2018/04/2040RTP/FinalDraft2040RTP.pdf>

Key findings of the plan relevant to the TCAA included:

- Multimodal transportation network would be crucial to meeting the travel needs of all county residents, including drivers, non-drivers and commercial traffic
- Prioritizing projects that will reduce greenhouse gas (GHG) emissions, primarily from a reduction in vehicle miles traveled (VMT), would be the focus. Proposal to expand transit service for high ridership routes to serve University of California Santa Cruz (UCSC), south county and San Jose commuters
- Construction of the MBSST
- Local bicycle and pedestrian projects and programs designed to increase bicycle commuting, and provide safe bicycle and pedestrian routes to schools
- Expansion of specialized transport services for projected increases in senior and disabled populations

### **CITY OF CAPITOLA MEASURE L (2018)**

The City of Capitola passed an ordinance in 2018 to add a chapter to the City of Capitola Municipal Code related to the Santa Cruz Branch Rail Line. The code includes the following.

A. The city of Capitola, through its constituent departments, shall take all steps necessary to preserve and utilize the Corridor and Trestle for active transportation and recreation.

B. No city of Capitola department, agency or employee shall expend any funds or resources related to the construction, reconstruction, operation, maintenance, financing, marketing, or signage for a detour of the Trail onto Capitola streets or sidewalks. (Ord. 1026 § 1 (part), 2018)

<https://www.codepublishing.com/CA/Capitola/#!/Capitola08/Capitola0872.html#8.72>

### **2020 TRANSIT AND INTERCITY RAIL CAPITAL PROGRAM (2019)**

California State Transportation Agency (CalSTA) issued the 2020 Transit and InterCity Rail Capital Program in 2019 to fund transformative capital improvements that would modernize California’s intercity rail, bus (including feeder buses to intercity rail services, as well as vanpool services which would be eligible to report as public transit to the Federal Transit Administration), ferry, and rail transit systems. The program guideline was reviewed to assure the performance measures for the TCAA would be consistent with funding program requirements. It provided a fundamental framework for identifying project goals and determining performance measures.

Project Evaluation Criteria included:

|                                   |  |
|-----------------------------------|--|
| Primary<br>Evaluation<br>Criteria | Reduce greenhouse gas (GHG) emissions  |
|                                   | Increase ridership through expanded and improved rail and transit service, including connectivity through improved feeder bus services |
|                                   | Integrate the services of the state’s various rail and transit operations, including integration with the high-speed rail system       |
|                                   | Improve safety   |

|                               |  |
|-------------------------------|--|
| Secondary Evaluation Criteria | Contribution to the implementation of sustainable communities strategies and the reduction of vehicle miles traveled and GHGs <ul style="list-style-type: none"> <li>○ Reducing vehicles miles traveled from automobiles and the number of automobile trips through growth in transit ridership;</li> <li>○ Coordinating with local governments to facilitate the location of additional employment and housing in the transit stop or station area;</li> <li>○ Expanding existing rail and public transit systems;</li> <li>○ Enhancing the connectivity, integration, and coordination of regional and local transit systems and the high-speed rail system;</li> <li>○ Investing in clean vehicle technology;</li> <li>○ Promoting active transportation that will increase the proportion of trips accomplished by biking and walking;</li> <li>○ Improving public health, and</li> <li>○ Disadvantaged and/or low-income communities</li> </ul> |
|                               | Benefit to priority populations <ul style="list-style-type: none"> <li>○ Level of participation in the planning and design process;</li> <li>○ Special consideration such as community workforce agreement or labor agreements with union, CBOs and etc.</li> </ul>  |
|                               | Geographic equity to address underserved communities   |
|                               | Consistency with Sustainable Communities Strategies  |
|                               | Benefits to freight movement, consistent with the Sustainable Freight Action Plan and the California Freight Mobility Plan   |
|                               | The extent to which a project has supplemental funding committed to it from non-state sources, with an emphasis on projects that leverage funding from private, federal, local or regional sources that are discretionary  |

<https://calsta.ca.gov/-/media/calsta-media/documents/tircp-2020-final-guidelines.pdf>

Key findings of the study relevant to the TCAA were:

- Reduce emissions of greenhouse gases
- Expand and improve transit service to increase ridership
- Integrate the rail service of the state’s various rail operations, including integration with the high-speed rail system
- Improve transit safety.

**SANTA CRUZ METRO ON-BOARD TRANSIT RIDERSHIP SURVEY AND RIDE CHECK (2019)**

METRO designed and conducted the survey and prepared the report in 2019 to gather information regarding travel patterns, customer demographics, and overall satisfaction among METRO riders, as well as to assess program strengths and weaknesses while developing strategies for enhancing service. The survey reviewed boarding and alighting for all routes and



provided a comprehensive overview of the existing bus transit service level, top origins and destinations, and top boarding and alighting locations in the Santa Cruz region. The findings are useful in understanding how high capacity transit service along the Santa Cruz Branch Rail Line can support key public transit demand points and supplement the existing service.

[https://www.scmttd.com/images/Onboard Transit Ridership Survey and Ride Check Report - FINAL.pdf](https://www.scmttd.com/images/Onboard_Transit_Ridership_Survey_and_Ride_Check_Report_-_FINAL.pdf)

Key findings of the study relevant to the TCAA were:

- Top origin locations were: UC Santa Cruz, Cabrillo College, Capitola Mall, Santa Cruz Metro Center and San Jose State University
- Top destination locations were: Cabrillo College, Capitola Mall, UC Santa Cruz, San Jose State University, Santa Cruz Metro Center and Dominican Hospital
- Top origin and destination pairs for METRO bus service were: Cabrillo College and Freedom Blvd & Stanford Blvd; Cathcart St & Pacific Ave and Daubenbiss Ave & Soquel Dr (Soquel HS); Clifford Dr & Main St; and Loma Linda Ct & Whispering Pines Dr and San Jose State University
- Top boarding locations were: Metro Center, Watsonville Transit Center, Cabrillo College, Capitola Mall, San Jose Diridon Station, Cavallaro Scotts Valley Transit Center, Aptos Library, Soquel High School, Green Valley & Main, Santa Cruz Governmental Center, Freedom Centre, 30th & Portola, San Jose State University, Watsonville High School, King's Valley Shopping Center and Harbor High School
- Top alighting locations were: Metro Center, Cabrillo College, Capitola Mall, San Jose Diridon Station, Watsonville Transit Center, Santa Cruz Governmental Center, Cavallaro Scotts Valley Transit Center, San Jose State University, Main & Green, 41st & Soquel, Felton Fair, Soquel & Front, and Scotts Village Shopping Center

### **METRO STRATEGIC BUSINESS AND IMPLEMENTATION PLAN (2019)**

The METRO Board adopted this 10-year Strategic Business Plan (Fiscal Year 2020-29), along with a 5-year Implementation Plan in 2019. The Strategic Business Plan identified strategic priorities and the Implementation Plan identified key tactical initiatives. The purpose of these two documents was to prioritize the use of METRO's financial and staff resources in the coming years. The plan was still under development at the time of this memo's completion.

The stated mission in the plan was to provide a public transportation service that enhances personal mobility and creates a sustainable transportation option in Santa Cruz County through a cost-effective, reliable, accessible, safe, clean and courteous transit service.

<http://scmttd.com/images/department/board/archive/agendas/2019/2019-06-28-Agenda-BOD.pdf> (item 9-13 attachment B)

Goals identified in the plan relevant to the TCAA included:

- Forecasting a period of relative consolidation or maintaining of service levels while reinvesting in the “bricks of the business”
- Improve the quality, promotion and public awareness of the current services prior to growing the system significantly
- Move beyond this “fix” stage and towards a “build” phase with a focus on its mission and core business initiatives.

Key initiatives included in the plan relevant to the TCAA were:

- Routes 66 and/or 68 - Improved frequency and/or span of service in the Live Oak corridor between Capitola Mall and downtown Santa Cruz, an area with strong transit-oriented demographics.

Key findings identified relevant to the TCAA were:

- METRO’s Service Standards were reflective of industry standards for similar types of service and urban/rural profiles
- In most cases, particularly since the 2016 major service reduction, METRO was not able to fully achieve these Service Standards due to financial difficulties, such as the required increase in bus operator resources

### **METRO STRATEGIC PLAN 5 YEAR OUTLOOK (2019)**

The Strategic Plan 5 Year Outlook covered initiatives in safety-first culture; financial responsibility: stability, stewardship, and accountability; service quality and delivery; internal and external technology; employee engagement: attraction, retention, and development; state of good repair; strategic alliances and community outreach; and legislation.

<http://scmt.d.com/images/department/board/archive/agendas/2019/2019-06-28-Agenda-BOD.pdf> (item 9-13 attachment C)

Key findings of the study relevant to the TCAA were:

- The 5-year implementation plan includes projects that will increase future operating budgets by \$40,000 in FY 2020, \$865,000 in FY21, \$1,115,000 in FY22, \$1,240,000 in FY23, and \$1,240,000 in FY 2024. The increase is due to associated operating costs on service quality and delivery, such as increasing service levels on existing routes including span and frequency, increasing the Highway 17 Express service level, pursuing initiatives which contribute to general community mobility rather than exclusively mass transit solutions and increasing the percentage of extra board operators in support of scheduled shift assignments
- The 5-year implementation plan includes projects that will increase future capital budgets by \$5,025,000 in FY 2020, \$16,125,000 in FY21, \$6,225,000 in FY22, \$3,200,000 in FY23, and \$3,200,000 in FY 2024. Higher capital costs in FY 2020 resulted from a

couple of key initiatives, including completing the installation of surveillance equipment on the remainder of the fleet, Automatic Passenger Counting (APC), designing and constructing the yard zero emission bus (ZEB) recharging infrastructure before the first ZEBs arrive in the second quarter of 2019. Other considered major capital investments included the implementation of an account based fare payment system (\$1,500,000) in FY 2022 (pending the effectiveness of the mobile ticketing pilot project) and the METRO-owned ParaCruz facility (\$12,000,000) in FY 2021. Assuming a fare-restructuring project took place in FY20 total revenue increases were projected to be within the range of \$500,000 to \$1M per year from FY 2020 to FY 2024.

### **METRO BUS REPLACEMENT PLAN (2019)**

The plan assumed \$3M annually to METRO from STA/SGR and measure D allocations to fund bus replacements through 2040. The remaining balance for bus replacement ranged from \$1,880,000 in FY 22 to \$7,160,000 in FY 41. The METRO fleet size ranged from 94 to 98 and the yearly replacement bus needs varied from 0 to 62 through FY 2040. The highest replacement need balance was projected to be in FY17 with an amount of 62 and the lowest was in FY 2023 with no replacement need. The plan identified that 25% of new bus purchases would be Zero Emission Buses (ZEBs) in FY 2026 and 100% of new bus purchases would be ZEBs beginning in FY 2029. Additional buses in METRO's fleet that are in good standing today would start becoming obsolete in FY 2025 and buses bought since 2018 would begin to become obsolete in FY 2033.

<http://scmtd.com/images/department/board/archive/agendas/2019/2019-04-26-Agenda-BOD.pdf> (item 16 attachment A.1 and A.2)

Key findings of the study relevant to the TCAA were:

METRO has a long-term capital need to replace obsolete buses in its fleet using STA/SGR and measure D funds.

### **CITY OF WATSONVILLE DOWNTOWN SPECIFIC PLAN (2019-PRESENT)**

The City of Watsonville is also currently developing a Downtown Specific Plan (<https://www.cityofwatsonville.org/1626/Downtown-Specific-Plan>). Objectives for the Specific Plan include the development of multi-story mixed use buildings through both new construction and adaptive reuse of historic buildings with market rate residential housing and commercial retail on the first floor. The Plan will encourage compact development near transit to decrease automobile dependency, reduce both local and regional traffic congestion and related greenhouse gas emissions, and provide additional guidance and plans to increase multimodal access to and from the historic Downtown area. The specific plan proposes considerable increases in both jobs and housing units in the downtown core of Watsonville, which could lead to a significant increase in transit ridership for transit systems that serve the area.

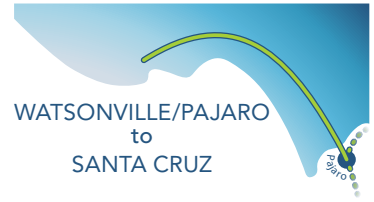
## **APPENDIX B – Table of Similar Systems**

| System                                  | ROW length (miles) | Service Span                                 | Typical Headways                           | Daily Weekday Ridership (pre-covid) | Fares (one way adult)           | Annual O&M Costs per system mile | Farebox Recovery Rate           | Total O&M Cost per boarding     | Cost per Vehicle Revenue Hour   | Capital Costs                  | Population & area served by transit district                                | Transit district population per square mile |
|---|--------------------|--|--|-------------------------------------|---------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|---|---|
| <b>BUS RAPID TRANSIT</b>                |                    |  |  |                                     |                                 |                                  |                                 |                                 |                                 |                                |   |   |
| CTfastrak (Hartford, CT)                | 19.6               | 4:30am-11:30pm                               | 7.5 min peak, 12-20 min off peak           | 5,500                               | \$1.75                          | \$459.1K                         | 11.8%                           | \$5.72                          | \$221                           | \$570M                         | 851K served, 664 sq. mi.  | 1,282                                       |
| Emerald Express (Eugene, OR)            | 28                 | 6:00am - 11:30pm                             | 10-15 min peak; 15-30 min off peak         | 12,300                              | \$1.75                          | \$414.3K                         | 23.8%                           | \$3.07                          | \$191                           | \$162M                         | 302K served, 482 sq.mi.   | 627   |
| VelociRFTA (Aspen, CO)                  | 42                 | 4:30 am - 8:00pm                             | 10-12 min peak; 15-30 min off peak         | 3,100                               | \$1.00-\$10.00                  | \$242.9K                         | 21.4%                           | \$9.87                          | \$139                           | \$46M                          | Rural transportation agency population and size information hard to obtain. | low   |
| LA Metro Busway (Los Angeles, CA)       | 35.4               | 24 hours                                     | 4-60 min                                   | 21,800                              | \$2.50                          | \$726.0K                         | 19.5%                           | \$3.74                          | \$232                           | \$305M                         | 8.6M served, 1,459 sq mi  | 5,869                                       |
| TransFort MAX (Fort Collins, CO)        | 9.8                | 5am - 12am weekdays, 8am - 7pm weekends      | 10-15 min Monday - Saturday, 30 min Sunday | 4,900                               | \$1.25                          | \$346.9K                         | 25.0%                           | \$2.35                          | \$111                           | \$87M                          | 164K served, 54 sq. mi.   | 3,404                                       |
| <b>DIESEL MULTIPLE UNITS</b>            |                    |  |  |                                     |                                 |                                  |                                 |                                 |                                 |                                |   |   |
| SMART (Sonoma-Marin, CA)                | 85.8               | 5-10am, 12-9pm                               | 30 -60 min                                 | 2,420                               | \$3.50-\$11.50                  | \$320.5K                         | 14.9%                           | \$38.35                         | \$836                           | \$500M total, currently \$428M | 764K served, 2,596 sq mi  | 294   |
| WES Commuter Rail (Portland, OR)        | 29.2               | 5:30am-9:30am, 3:30pm-7:30pm weekdays        | 30 min peak, 6 hour gap midday             | 1,365                               | \$2.50                          | \$232.9K                         | 8.0%                            | \$16.00                         | \$918                           | \$166M                         | 1.6M served, 383 sq mi  | 4,086                                       |
| <b>LIGHT DIESEL MULTIPLE UNITS</b>      |                    |  |  |                                     |                                 |                                  |                                 |                                 |                                 |                                |   |   |
| Sprinter (Oceanside-Escondido, CA)      | 44                 | 4am-9pm                                      | 30 min                                     | 7,865                               | \$2.00                          | \$488.6K                         | 12.5%                           | \$8.94                          | \$679                           | \$477M                         | 1M served, 340 sq mi  | 3,065                                       |
| A-Train (Denton County, TX)             | 42.6               | 4:30am-11pm                                  | 20-40 min peak, 60-80 min off peak         | 1,556                               | \$3.00                          | \$361.5K                         | 4.8%                            | \$25.00                         | \$561                           | \$325M                         | 609K served, 284 sq mi  | 2,143                                       |
| NJ Transit Light Rail (New Jersey)      | 69.7               | 5:30am-9:30pm weekdays, 5:30am-12am weekends | 15 min peak, 30 min off peak               | 8,687                               | \$1.50                          | \$496.4K                         | 16.8%                           | \$5.76                          | \$695                           | \$1.1B                         | 10.6M served, 5,325 sq mi   | 1,989                                       |
| <b>HYDROGEN ELECTRIC MULTIPLE UNITS</b> |                    |  |  |                                     |                                 |                                  |                                 |                                 |                                 |                                |   |   |
| Redlands-San Bernardino (RPRP)          | 9                  | 6am-7pm                                      | 30 mins peak, 60 min off peak              | N.A. project under construction     | N.A. project under construction | \$888.9K - \$1.1M                | N.A. project under construction | N.A. project under construction | N.A. project under construction | \$250M                         | 250,000 (corridor population)   | NA  |
| <b>ELECTRIC CATENARY LIGHT RAIL</b>     |                    |  |  |                                     |                                 |                                  |                                 |                                 |                                 |                                |   |   |
| SacRT Light Rail (Sacramento, CA)       | 84.9               | 4am-12am weekdays, 4am-10:30pm weekends      | 15 min weekdays, 30 min nights/weekends    | 37,500                              | \$2.50                          | \$898.7K                         | 16.0%                           | \$6.83                          | \$314                           | \$176M                         | 1.06M served, 223 sq mi   | 4,740                                       |
| TRAX Light Rail (Salt Lake City, UT)    | 93.9               | 4:30am-11:30pm weekdays, 5am-12am weekends   | 15 min weekdays, 20 min weekends           | 67,300                              | \$2.50                          | \$758.3K                         | 25.0%                           | \$4.00                          | \$195                           | \$300M                         | 1.88M served, 737 sq mi   | 2,555                                       |
| VTA Light Rail (San Jose, CA)           | 81                 | 5am-1am                                      | 15 min weekdays, 20 min weekends           | 26,700                              | \$2.50                          | \$1.6M                           | 7.0%                            | \$15.12                         | \$573                           | \$1.6B                         | 1.96M served, 346 sq mi   | 5,648                                       |
| MetroLink (St Louis, MO)                | 91.1               | 4am-1:30am weekdays, 5am-1am weekends        | 12-20 min                                  | 41,500                              | \$2.50                          | \$938.5K                         | 16.0%                           | \$6.51                          | \$328                           | \$465M                         | 1.57M served, 558 sq mi   | 2,806                                       |



## **APPENDIX C – Communications and Stakeholder Involvement Plan**

TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS



TRANSIT  
CORRIDOR  
ALTERNATIVES  
ANALYSIS

COMMUNICATIONS  
AND STAKEHOLDER  
INVOLVEMENT PLAN



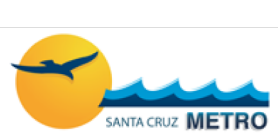
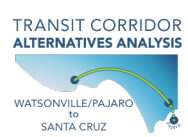
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**TRANSIT CORRIDOR ALTERNATIVES ANALYSIS  
COMMUNICATIONS AND STAKEHOLDER INVOLVEMENT PLAN**



**FINAL DRAFT**



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# INTRODUCTION TO COMMUNICATIONS & STAKEHOLDER INVOLVEMENT PLAN

## PROJECT BACKGROUND

There are three parallel routes that link the communities along the Santa Cruz County Coast from Davenport through Watsonville:

- Highway 1
- Soquel Avenue/Soquel Drive/Freedom Boulevard
- The Santa Cruz Branch Rail Line

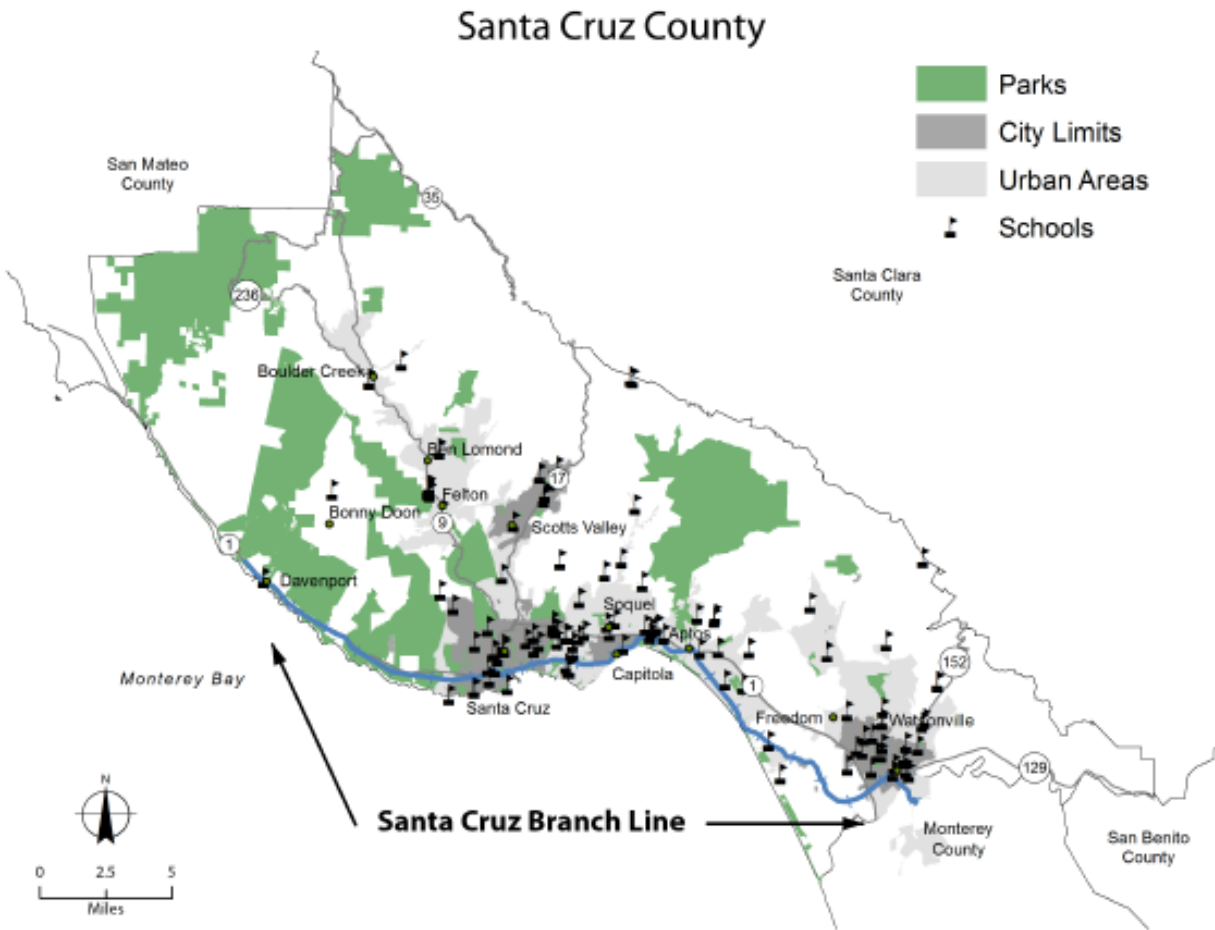
Highway 1 and Soquel/Freedom are heavily traveled, often congested, and emphasize automobile travel. The 2012 acquisition of the rail right-of-way provides a parallel transportation facility along this corridor that has unused capacity. The Santa Cruz County Regional Transportation Commission (RTC) conducted a Unified Corridor Investment Study (UCS) that was completed in 2019. One of the outcomes of the study is to protect the rail right-of-way for high-capacity public transit use adjacent to a bicycle and pedestrian trail.

In November 2019, RTC in partnership with METRO, began work to identify high-capacity transit options along the Santa Cruz Branch Rail Line (SCBRL) through a performance-based planning alternatives analysis process. The analysis will evaluate public transit investment options for a future integrated transit network connecting Santa Cruz in the north to Watsonville and future transit links at Pajaro Station for an alternative mode of travel. The Alternatives Analysis will identify use of all or part of the rail right-of-way, between Pajaro Station and Shaffer Road, as a dedicated transit facility, adjacent to the Monterey Bay Sanctuary Scenic Trail (MBSST) that is being developed. During the analysis, transit alternatives will be compared to define a viable project that will provide the greatest benefit to Santa Cruz County residents, businesses and traveling visitors.

This Communications and Stakeholder Involvement Plan (Plan) identifies the proposed target audiences, outreach objectives, strategies and tactics to be implemented as an integrated part of the Transit Corridor Alternatives Analysis in an effort to build awareness, educate, engage and seek informed input that will help guide the identification of a high-capacity transit service between Santa Cruz and Watsonville. The Plan is intended to act as a roadmap for communication and outreach activities through the duration of the project.



*Santa Cruz County Area Map*



## COMMUNICATIONS APPROACH

Technology and culture have drastically changed the way people seek information and communicate. Introduction of personal smart devices and generational shifts in focus towards social media results in the need for use of both traditional high-touch means for communication blended with digital engagement to reach all desired audiences within a medium that they prefer. With individual mobile devices in most households (including low income, diverse communities), easy access to information and a desire to “share” everything, the public requires transparency and a voice. That’s why translating information into meaningful dialogue with all members of the public is more critical than ever.

Therefore, it is critical to develop a strategic communications program that is a seamless extension of the technical work and offers the public clear and concise opportunities to participate. The project communication tools and tactics created must address the diversity of stakeholders, and their needs, as well as combine traditional media with newer technologies to ensure a broad reach. Public education, engagement and communications will be a critical component of the overall project planning process and will remain a focal point moving forward throughout each project phase.

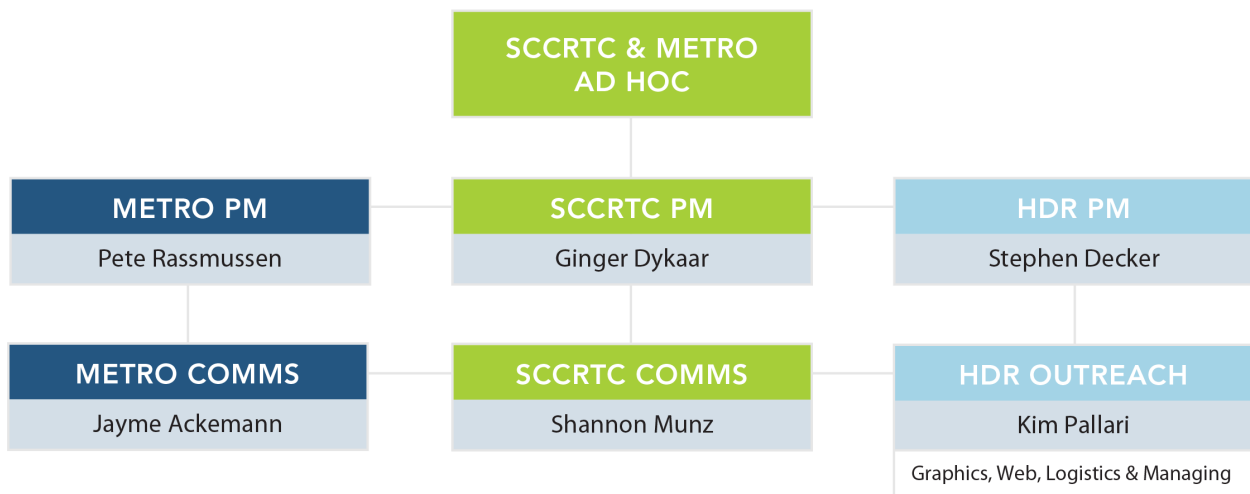
The overarching Plan aims to achieve the following objectives:

- Maintain an open and transparent planning process
- Provide regular, consistent, accurate and timely communication
- Inform and educate
- Build and maintain relationships
- Foster understanding and awareness
- Promptly address concerns as they arise
- Seek informed input

## INTERNAL PROJECT TEAM COMMUNICATIONS PROTOCOL

Internal communications and collaboration will be critical to the project’s success. The project team responsible for developing the Alternatives Analysis consists of RTC, METRO and HDR. Regular coordination, collaboration and ongoing communications will ensure the project team works effectively and stays on schedule. To drive the stakeholder outreach program, representatives from RTC, METRO and HDR will provide review and direction on all project key messaging, outreach activities and materials directed to the stakeholders.

The communications organization chart below identifies the key players that will not only lead development of the outreach program, but will also be responsible for providing the stakeholder and public input received to the larger project team.



The Plan is organized to identify the following components:

### 1. IDENTIFICATION OF TARGET AUDIENCES

Engagement of diverse audiences during the Alternatives Analysis phase is critical in determining an alternative that will meet the needs and be supported by the communities that the future transit system will serve. To engage audiences effectively we must understand who they are and how best to reach them. For the Transit Corridor Alternatives Analysis, a tactical stakeholder engagement approach will allow the project team to proactively keep identified audiences informed, address concerns in a timely manner and minimize surprises while maximizing project awareness and understanding. Identified stakeholders will be proactively engaged via presentations at established and project-specific hosted meetings, regional media, and social media campaigns or other digital engagement.

The targeted groups will be requested to partner with SCCRTC and METRO to share project information to their peers, colleagues and neighbors, while also bringing valuable and informed input from their constituents for consideration from the project team.

**AGENCY PARTNERS:** Ensures key partner agencies are in the loop, updated and prepared throughout all project stages for potential public inquiries.

- RTC/METRO Alternatives Analysis Ad Hoc Committee
- Partner Agencies – Planning and Public Works Departments
- RTC Bicycle Advisory Committee (BAC)
- RTC Elderly and Disabled Transportation Advisory Committee (E&DTAC)
- RTC Interagency Technical Advisory Committee (ITAC)

**STAKEHOLDER GROUPS:** Allows RTC and METRO to proactively reach into the many facets of a community through targeted focus groups of key representatives.

**Community Focus Group 1** – Provides opportunity to proactively connect with non-English speaking and transportation-disadvantaged populations to share information, listen and respond. The project team will connect with key representatives from organizations within the non-English speaking and transportation-disadvantaged communities to ensure these community members receive information on the project and have the opportunity to provide feedback. Representatives may include:

- Spanish Speaking Advocacy
- Faith Based Organizations
- Human Services Organizations
- Low-Income and Minority Organizations

**Community Focus Group 2** – Provides opportunity to bring diverse representatives of the community together to discuss the project and seek information while allowing attendees to understand the larger impacts to each unique group. Representatives may include:

- Business Associations / Chamber of Commerce / Major Employers
- Advocacy Groups (Bike/Pedestrian/Youth/Elderly/Disabled/Environmental)
- Educational and Healthcare Institutions
- Neighborhood Groups

**GENERAL PUBLIC:** RTC and METRO will engage the general public through multiple communication mediums established specifically for the project.

**RTC & METRO BOARDS:** Allows the project team to seek input from METRO Board and approval from RTC Board at the three key milestones. After receiving input from stakeholders, including the METRO Board, the project team will consider this input and submit a

recommendation to the RTC Board for approval of every key milestone at a regularly scheduled RTC meeting.

## 2. STAKEHOLDER ENGAGEMENT MILESTONES

While regular and ongoing communication will occur throughout the planning effort, there are three key technical milestones shown below that will trigger a proactive reach to each of the identified audiences to ensure we are educating, building awareness and seeking input at the right time in the process. At each technical milestone when it is time to inform and seek valuable input, the project team through the communication program will engage, listen, learn and consider the input received from the identified audiences.

### MILESTONE 1: Goals/Screening Criteria/Performance Measures & Initial Alternatives

**Purpose:** Gather initial input on universe of alternatives, draft screening criteria and performance measures. It is critical to obtain buy-in to the alternatives analysis process so that audiences understand how alternatives are narrowed down.

| AUDIENCE   | FORMAT  |
|--|---|
| <b>Agency Partners:</b><br>Ad Hoc Committee<br>RTC Advisory Committees<br>Partner Agencies – Planning and Public Works | <ul style="list-style-type: none"> <li>• Presentations at scheduled meetings</li> </ul>   |
| <b>Stakeholder Groups:</b><br>Community Focus Group 1<br>Community Focus Group 2                                       | <ul style="list-style-type: none"> <li>• Project hosted Community focus group meetings</li> </ul>   |
| <b>General Public:</b>   | <ul style="list-style-type: none"> <li>• Project hosted open houses</li> <li>• Online outreach (social media, email, website)</li> <li>• Other outlets (newspaper/bus/radio ads, flyers, fact sheet)</li> </ul> |
| <b>RTC &amp; METRO:</b><br>Commission and Board  | <ul style="list-style-type: none"> <li>• METRO Board meetings to receive input</li> <li>• RTC meetings to obtain approval</li> </ul>  |



**MILESTONE 2: Screened Alternatives**

**Purpose:** Share alternative screening process results and highlight narrowed down alternatives. Gather input on short list of alternatives to be considered.

| AUDIENCE   | FORMAT  |
|--|---|
| <b>Agency Partners:</b><br>Ad Hoc Committee<br>RTC Advisory Committees<br>Partner Agencies – Planning and Public Works | <ul style="list-style-type: none"> <li>• Presentations at scheduled meetings</li> </ul>   |
| <b>Stakeholder Groups:</b><br>Community Focus Group 1<br>Community Focus Group 2                                       | <ul style="list-style-type: none"> <li>• Online outreach (social media, email, website)</li> </ul>  |
| <b>General Public:</b>   | <ul style="list-style-type: none"> <li>• Public Hearing at RTC meeting</li> <li>• Online outreach (social media, email, website)</li> <li>• Other outlets (newspaper/bus/radio ads, flyers, fact sheets)</li> </ul> |
| <b>RTC &amp; METRO:</b><br>Commission and Board  | <ul style="list-style-type: none"> <li>• METRO Board meetings to receive input</li> <li>• RTC meetings to obtain approval</li> </ul>  |

**MILESTONE 3: Preferred Analysis Results & Locally Preferred Alternative**

**Purpose:** Highlight analysis process on short list of alternatives, share performance measure results and seek input on locally preferred alternative.

| AUDIENCE   | FORMAT   |
|--|--|
| <b>Agency Partners:</b><br>Ad Hoc Committee<br>RTC Advisory Committees<br>Partner Agencies – Planning and Public Works | <ul style="list-style-type: none"> <li>• Presentations at scheduled meetings</li> </ul>  |
| <b>Stakeholder Groups:</b><br>Community Focus Group 1<br>Community Focus Group 2                                       | <ul style="list-style-type: none"> <li>• Online outreach (email)</li> </ul>  |
| <b>General Public:</b>   | <ul style="list-style-type: none"> <li>• Project hosted open houses</li> <li>• Online outreach (social media, email, website)</li> <li>• Other outlets (newspaper/bus/radio ads, flyers, fact sheets)</li> </ul> |
| <b>RTC &amp; METRO:</b><br>Commission and Board  | <ul style="list-style-type: none"> <li>• METRO Board meetings to receive input</li> <li>• RTC meetings to obtain approval</li> </ul>   |

### 3. DEVELOPMENT OF PROJECT BRAND

In order to maintain a consistent look and feel that will be recognizable and directly tied to Santa Cruz RTC and METRO, a project-specific brand will be developed that may include name, slogan and logo. HDR will work closely with the project team to develop brand options that can be narrowed down to an approved brand. Initial concepts will be provided for review and consideration. Once established, the new project brand will be carried on the project website and throughout all materials. The brand must catch the diverse audience attention in order to garner notice as well as memory and recognition.

### 4. CREATION OF TOOLS AND IMPLEMENTATION TACTICS

Communication tools and tactics will be designed to capture the broadest audience combining a wide range of traditional mediums such as public workshops, focus group meetings, collateral materials and media relations with digital engagement tools such as a website, social media, email communication, and more. The goal will be to provide convenient and meaningful opportunities for interaction and sharing of information.

#### ***Project Contact Database***

Central to the Plan is identification and maintenance of a database that contains a diverse group of regional and local stakeholders, organizations, project partners and property owners who may be interested, impacted and influential.

The combined contacts will not only receive information about the project, but also will be asked to disseminate valuable and correct information. The project contacts will continue to be communicated with through a variety of tools such as in-person discussions, presentations, distribution of media alerts or electronic information blasts as well as other project related materials. As the word spreads about the project, it is anticipated that the list of stakeholders may continue to expand.

#### ***Project-Specific Website***

As communication technologies continue to improve, flexibility and innovation are critical in engaging hard to reach audiences directly. A user-friendly project webpage will play a vital role in the project's communication program. The team will prepare materials to post on the RTC website and establish a protocol for review, maintenance and postings. Interested individuals will be able to sign-up to receive project-related electronic notifications to stay informed.

The project-specific website will be housed on RTC's website ([www.sccrtc.org](http://www.sccrtc.org)) and a short URL will be established by RTC for easy recognition. Specific information that will be housed on the project website includes:

- Project Overview
- Project Schedule & Key Milestones
- Project Map
- Project News and Events
- Contact Information
- Online Comment Form

### ***Informational Toolkit***

Collateral materials will be critical tools in educating the public about the project and keeping them updated through each key project milestone. Materials will include approved key messages to ensure a consistent and effective communications is delivered. Materials will be distributed in hard copy and electronically via e-blasts, the project website and social media. In addition, as determined necessary, materials will be translated into Spanish in order to reach the diverse population, and ensure an open, transparent communications process.

Collateral informational materials may include:

- Frequently Asked Questions (FAQ)
- Project Fact Sheet
- E-newsletter
- PowerPoint presentations
- Display boards
- Comment cards & sign-in sheets
- Static maps

### ***Public Open Houses***

At two key points in the Alternatives Analysis process, RTC and METRO will host informational Public Open Houses to create an opportunity for the public to review information and talk one-on-one with key staff members. The open houses will provide information via collateral material handouts and information stations that will include display boards and staff to address questions. Attendees will have the opportunity to provide input in multiple ways at the open houses as they view information at their own pace.

- **Public Open House 1 (Early 2020)** – Project kick-off to gather initial input, learn about the planning process, meet the team and provide feedback on goals, universe of alternatives and screening criteria. A public open house will be held in Watsonville and in Live Oak/Santa Cruz.
- **Public Open House 2 (Mid 2020)** – As alternatives are narrowed down through the screening process, the public will be asked again to provide feedback on the analysis that will identify a locally preferred alternative. A public open house will be held in Watsonville and in Live Oak/Santa Cruz.

### ***RTC Public Meetings***

RTC holds regular monthly meetings, which are typically the first Thursday of the month. The schedule and location can be found on the RTC website ([www.sccrtc.org](http://www.sccrtc.org)). At the beginning of every meeting there is time allocated for “Oral Communications” when the public can speak about any topic that is not on the agenda. If there is an item on the agenda related to the Transit Corridor Alternatives Analysis then members of the public will also be able to speak about the project at that time.

### ***Media Relations***

Even as the world of communications continues to move towards a paperless environment, the print and broadcast media continue to be vitally useful and credible outlets for dissemination of information. Whether local and regional media utilize electronic formats and/or hard copy newspapers, creating the opportunity for a special article or announcement within community and minority papers is an important communications tool.

In order to promote key project elements as well as manage the correct and consistent flow of information to the general public during each Alternatives Analysis phase, the project team will develop and disseminate media releases as needed to communicate project information. All media information will be posted on the website and emailed to key stakeholder groups for further dissemination.

### ***Social Media***

Social media networks provide another opportunity to effectively push and pull information directly to or from a larger cross-section audience to engage the local communities and decision makers in an open dialogue in real time. A social media strategy will be developed to display project key milestones, updates, and all in-person and online public workshops. Social media will drive the timely reach of various audiences to not only educate about the project, but also promote public involvement opportunities in an interesting, visual way in order to capture attention.

Additionally, RTC and METRO will partner with local and regional agencies and municipalities to leverage resources and maximize outreach. The project team will work closely with RTC and METRO's Communications staff to develop approved content for distribution through agency established social media channels.

## **5. SUMMARY OF STAKEHOLDER INPUT REPORT**

A summary of stakeholder input at each of the three key milestones will capture the communications and stakeholder outreach efforts, activities, materials and input received. This information will be provided on the Alternatives Analysis website.

## **APPENDIX D – Schedule of Outreach Events**





**Table D.1: TCAA/RNIS Outreach Summary**

**Outreach Milestone 1: Goals/Screening Criteria/Performance Measures & Initial Alternatives**

**Purpose:** Gather initial input on goals, screening criteria, performance measures and initial list of alternatives.

|  | RTC              |                     |               | Metro Board Meeting | Partner Agencies | Community Focus Groups | Public           |
|--|------------------|---------------------|---------------|---------------------|------------------|------------------------|------------------|
|  | Ad Hoc Committee | Advisory Committees | Board Meeting |                     |                  |                        |                  |
| Seek input on screening criteria, performance measures, and universe of alternatives               | Jan. 16, 2020    | February, 2020      |               | Jan. 24, 2020       | Feb. 4, 2020     | Feb. 5, 2020           |                  |
| Survey   |                  |                     |               |                     |                  |                        | Feb. 10-28, 2020 |
| Public open house (Santa Cruz)   |                  |                     |               |                     |                  |                        | Feb. 11, 2020    |
| Public open house (Watsonville)  |                  |                     |               |                     |                  |                        | Feb. 12, 2020    |
| RTC Meeting Oral Communications  |                  |                     |               |                     |                  |                        | Mar. 5, 2020     |
| Seek input and approval of screening criteria, performance measures, and universe of alternatives. |                  |                     | Mar. 5, 2020  |                     |                  |                        |                  |

**Outreach Milestone 2: Screened Alternatives**

**Purpose:** Share alternative screening process results and highlight narrowed down alternatives. Gather input on short list of alternatives to be considered.

|  | RTC              |                     |               | Metro Board Meeting | Partner Agencies | Community Focus Groups | Public              |
|--|------------------|---------------------|---------------|---------------------|------------------|------------------------|---------------------|
|  | Ad Hoc Committee | Advisory Committees | Board Meeting |                     |                  |                        |                     |
| Seek input on screening and short list of alternatives to be evaluated further | Mar 19, 2020     | Apr/May, 2020       |               | May 15, 2020        | Apr 29, 2020     | thru online open house |                     |
| Online open house  |                  |                     |               |                     |                  |                        | Apr 13-May 11, 2020 |
| Survey   |                  |                     |               |                     |                  |                        | Apr 13-May 11, 2020 |
| Public hearing   |                  |                     |               |                     |                  |                        | June 4, 2020        |
| Seek input and approval of short list of alternatives to be evaluated further  |                  |                     | June 4, 2020  |                     |                  |                        |                     |

**Outreach Milestone 3: Preferred Analysis Results & Locally Preferred Alternative**

**Purpose:** Highlight analysis process on short list of alternatives, share performance measure results and seek input on locally preferred alternative and draft report. Seek acceptance of Final Draft Report including the locally preferred alternative from the RTC.

|  | RTC              |                     |               | Metro Board Meeting | Partner Agencies | Community Focus Groups | Public         |
|--|------------------|---------------------|---------------|---------------------|------------------|------------------------|----------------|
|  | Ad Hoc Committee | Advisory Committees | Board Meeting |                     |                  |                        |                |
| Seek input on draft report including performance measure results and locally preferred alternative       | Oct 14, 2020     | Nov/Dec, 2020       |               | Nov 20, 2020        | Nov, 2020        | thru online open house |                |
| Online open house  |                  |                     |               |                     |                  |                        | Nov 6-27, 2020 |
| Survey   |                  |                     |               |                     |                  |                        | Nov 6-27, 2020 |
| Seek input on Final Draft report including performance measure results and locally preferred alternative |                  |                     | Jan 14, 2021  |                     |                  |                        |                |
| Seek acceptance of Final Draft Report including the locally preferred alternative                        |                  |                     | Feb 4, 2021   |                     |                  |                        |                |





**Table D.2: Transit Corridor Alternatives Analysis Project Participants**

|                         |  |   |
|-------------------------|--|---|
| <b>Project Team</b>     | Santa Cruz County Regional Transportation Commission (RTC) - Executive Director, Deputy Director, Senior Planners, Communications Specialist | Santa Cruz Metropolitan Transit District (Metro) - General Manager, Planners                  |
|                         | HDR Consultant Team  |   |
| <b>Ad Hoc Committee</b> | Andy Schiffrin, Committee Chair (alternate for Ryan Coonerty, SCCRTC)  | Mike Rotkin (SCCRTC & METRO)  |
|                         | Trina Coffman-Gomez (SCCRTC & METRO)   | Ed Bottorff (SCCRTC & METRO)  |
|                         | John Leopold (SCCRTC & METRO)  | Gine Johnson (alternate for Bruce McPherson, SCCRTC & METRO)                                  |
| <b>Partner Agencies</b> | Association of Monterey Bay Area Governments (AMBAG) - Planning  | City of Santa Cruz - Climate Action Coordinator, Economic Development, Planning, Public Works |
|                         | Cabrillo College   | City of Scotts Valley - Planning, Public Works  |
|                         | California Coastal Commission  | City of Watsonville - Economic Development, Planning, Public Works                            |
|                         | California Coastal Conservancy   | County of Santa Cruz - Economic Development, Planning, Public Works                           |
|                         | California Highway Patrol  | Monterey Bay Air Pollution Control District   |
|                         | California State Parks   | Santa Cruz County Parks   |
|                         | Caltrans   | University of CA, Santa Cruz (UCSC) - Transportation Planning                                 |
|                         | City of Capitola - Community Development   |   |
|                         |  |   |
|                         |  |   |





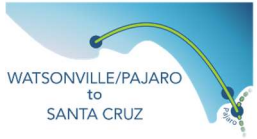
| <b>Stakeholder Groups<br/>(invited to participate)</b> | <b>Santa Cruz</b>                                   | <b>Watsonville</b>                                |
|--|---|---|
|  | Aptos Chamber of Commerce                           | Action Pajaro Valley                              |
|  | Area Agency on Aging                                | Agricultural History Project (AHP) Museum         |
|  | Barry Swenson Builders                              | All Saints Episcopal Church                       |
|  | Bike Santa Cruz County                              | Assemblymember Robert Rivas Office                |
|  | Boys & Girls Club of Santa Cruz                     | Bay Village Homeowners Association                |
|  | Business Council for Santa Cruz County              | Bethel Tabernacle                                 |
|  | Campaign for Sustainable Transportation             | Calvary Chapel                                    |
|  | Capitola-Aptos Rotary                               | Cesar Chavez Middle School                        |
|  | Capitola-Soquel Chamber of Commerce                 | Ceiba Charter School                              |
|  | Central Coast Center for Independent Living         | Community Action Board of Santa Cruz County, Inc. |
|  | Central Coast Wetlands                              | Community Bridges                                 |
|  | Coastal Rail Santa Cruz                             | Corralitos Women's Club                           |
|  | Community Foundation                                | Digital Nest                                      |
|  | Conference & Visitors Council for Santa Cruz County | Driscoll's  |
|  | Davenport North Coast Association                   | E.A. Hall Middle School                           |
|  | Dominican Hospital                                  | Encompass Community Services                      |
|  | Downtown (Santa Cruz) Business Association          | First United Methodist                            |
|  | Ecology Action                                      | Freedom Lions Club                                |
|  | Encompass Community Services                        | Freedom Rotary                                    |
|  | Envision Housing                                    | Grace Works Bible Church                          |
|  | Farm Bureau of Santa Cruz County                    | Green Valley Church                               |





|  |  |   |
|--|--|---|
|  | Friends of the Rail & Trail (FORT)                   | Jovenes Sanos                                   |
|  | Friends of Santa Cruz County State Parks             | Lakeview Middle School                          |
| <b>Stakeholder Groups (invited to participate)</b> | <b>Santa Cruz</b>                                    | <b>Watsonville</b>                              |
|  | Granite Rock   | Leo's Haven                                     |
|  | Happy Valley Union Elementary School District Office | Martinelli's                                    |
|  | Kaiser   | Monterey Bay Central Labor Council              |
|  | Land Trust of Santa Cruz                             | Our Lady Help of Christians                     |
|  | La Selva Beach Improvement Association               | Ow Properties                                   |
|  | League of Women Voters                               | Pajaro Dunes Association                        |
|  | Live Oak Neighbors                                   | Pajaro Valley Arts                              |
|  | Live Oak School District                             | Pajaro Valley Chamber                           |
|  | Lomak Property Group                                 | Pajaro Valley High School                       |
|  | MidPen Housing                                       | Pajaro Valley Prevention and Student Assistance |
|  | Mission Pedestrian                                   | Pajaro Valley Unified School District           |
|  | Monterey Bay Economic Partnership                    | Pajaro Valley Water                             |
|  | Monterey Bay Labor Council                           | Pajaro Village Homeowners Association           |
|  | Office of Education for Santa Cruz County            | Rolling Hills Middle School                     |
|  | Ow Properties  | Rotary Club of Watsonville                      |
|  | Pacific Elementary School District Office            | Santa Cruz County Farm Bureau                   |
|  | Pleasure Point Business Association                  | Soroptimist International of Watsonville        |
|  | Red Tree Properties                                  | St. Francis High School                         |
|  | Resource Conservation District                       | St. Patrick's Parish                            |





|  |  |                                |
|--|--|--------------------------------|
|  | Rio Del Mar Homeowners Association             | Watsonville Adulsted           |
|  | San Lorenzo Rotary                             | Watsonville Day Worker Center  |
|  | San Lorenzo Valley Unified School District     | Watsonville High School        |
|  | Santa Cruz Beach Boardwalk/Seaside Company     | Watsonville Historical Society |
| <b>Stakeholder Groups (invited to participate)</b> | <b>Santa Cruz</b>                              | <b>Watsonville</b>             |
|  | Santa Cruz City Schools                        | Watsonville Rotary             |
|  | Santa Cruz County Business Council             | Watsonville Woman's Club       |
|  | Santa Cruz County Chamber of Commerce          | Westview Presbyterian          |
|  | Santa Cruz County Cycling Club                 | Wetlands Watch                 |
|  | Santa Cruz County Greenway                     | YMCA                           |
|  | Santa Cruz County Office of Education          |                                |
|  | Santa Cruz Neighbors                           |                                |
|  | Santa Cruz Nexties                             |                                |
|  | Santa Cruz Personal Rapid Transit              |                                |
|  | Santa Cruz Rotary                              |                                |
|  | Scotts Valley Unified School District Office   |                                |
|  | Seacliff Improvement Association               |                                |
|  | Seascape Resort                                |                                |
|  | Sierra Club of Santa Cruz County               |                                |
|  | Soquel Union Elementary School District Office |                                |
|  | Sumner Woods Homeowners Association            |                                |
|  | Sutter/PAMF                                    |                                |
|  | Trail Now                                      |                                |







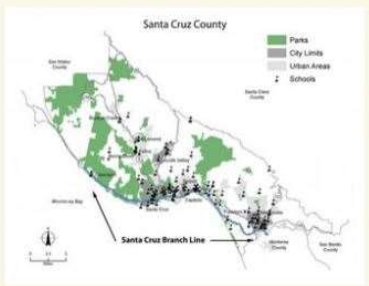
Figure D.1: Project Webpage ([sccrtc.org/transitcorridora](http://sccrtc.org/transitcorridora))





- Operating Agreement
- Passenger Rail
- Rail Service Studies
- Rail Line Purchase
- Due Diligence
- Trails
  - Monterey Bay Sanctuary Scenic Trail
  - MBSST Master Plan
  - Final Environmental Impact Report
  - City of Santa Cruz Coastal Rail Trail Project
  - North Coast Rail Trail
- Bus Projects
- Multi-Modal
  - Alternatives Analysis
  - Unified Corridor Study
  - Visualizing Sustainable Transportation
  - Santa Cruz County Complete Streets
  - Monterey Bay Area Complete Streets Guidebook
- STARS
  - Watsonville – Santa Cruz Multimodal Program
- Legislative Activities

define a locally-preferred alternative that offers the greatest benefit to Santa Cruz County in terms of equity, environment, and economy. Proposed future intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.



**Alternatives Analysis Process**

During the TCAA planning process, project goals, screening criteria and performance measures will be established to screen and then evaluate the performance of each potential alternative quantitatively. Potential transit alternatives will consider mode types such as rail, bus and other innovative services. Potential connector services will also be evaluated. The analysis will identify potential infrastructure, vehicle type and right-of-way needs as well as other potential transit features.

Agency partners, local and regional stakeholders and the general public will have the opportunity to provide valuable input into the alternatives and evaluation criteria to aid in narrowing down to a feasible transit solution. The ultimate goal of the TCAA is to identify one locally-preferred transit alternative that meets the needs of the diverse community for which it will serve.

**Alternatives Analysis Highlights:**

- The rail right of way passes within 1 mile of half of the County's population and can provide access to 44 schools and 92 parks.
- Involves the community, partner agencies, the RTC and METRO in the decision-making process to identify a preferred alternative and next steps.
- Utilizes a performance-based planning approach with a triple bottom line framework of equity, environment, and economy.
- Develops a strategic business plan for the selected alternative, including a cash flow analysis of





- environment, and economy.
- Develops a strategic business plan for the selected alternative, including a cash flow analysis of environmental clearance, right-of-way, design, construction, operations, and maintenance.
- A Rail Network Integration Study funded by Caltrans will be performed as part of the Alternatives Analysis.

**Project Resources**

**Stakeholder Input**

Milestone 1

- RTC Advisory Committees
- Partner Agency
- Focus Groups
- Public Open Houses
- Public comments received via email by Feb. 24, 2020 at 12 p.m.
- Public comments received via email after Feb. 24 at 12 p.m. until March 4 at 12 p.m. Comments will be added as received

Milestone 2

- Transit Alternatives Short List
- Milestone 2 Online Open House Survey Results
- Partner Agency/RTC Advisory Committees
- Public comments received via email by May 11, 2020
- Public comments received via email after May 11 until June 3 at 12 p.m. Comments will be added as received.

**Informational Materials**

- Milestone 2 Online Open House
- Fact Sheet
- Fact Sheet (Spanish)
- FAQs
- FAQs (Spanish)
- Final Initial List of Alternatives
- Final Goals/Screening Criteria/Performance Measures
- Communications and Stakeholder Involvement Plan

**Planning Reports**

- Unified Corridor Investment Study
- Rail Transit Feasibility Study
- Monterey Bay Sanctuary Scenic Trail Master Plan
- 2040 Santa Cruz County Regional Transportation Plan
- 2040 AMBAG Metropolitan Transportation Plan/Sustainable Communities Strategy

**Public Participation**

RTC and METRO are committed to engaging the public and regional stakeholders throughout the TCAA process. The outreach program includes multiple opportunities to share information, listen to stakeholders and address concerns as well as seek valuable input to help identify a preferred transit alternative to construct and operate.





S

Milestone 2

- [Transit Alternatives Short List](#)
- [Milestone 2 Online Open House Survey Results](#)
- [Partner Agency/RTC Advisory Committees](#)
- [Public comments received via email by May 11, 2020](#)
- [Public comments received via email after May 11 until June 3 at 12 p.m. Comments will be added as received.](#)

Informational Materials

- [Milestone 2 Online Open House](#)
- [Fact Sheet](#)
- [Fact Sheet \(Spanish\)](#)
- [FAQs](#)
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Planning Reports

- [Unified Corridor Investment Study](#)
- [Rail Transit Feasibility Study](#)
- [Monterey Bay Sanctuary Scenic Trail Master Plan](#)
- [2040 Santa Cruz County Regional Transportation Plan](#)
- [2040 AMBAG Metropolitan Transportation Plan/Sustainable Communities Strategy](#)

Public Participation

RTC and METRO are committed to engaging the public and regional stakeholders throughout the TCAA process. The outreach program includes multiple opportunities to share information, listen to stakeholders and address concerns as well as seek valuable input to help identify a preferred transit alternative to serve and connect our communities.

New information will be distributed electronically through the website, social media and email blasts along with in-person distribution at meetings. If you would like to receive email updates on the TCAA, please complete the [e-Subscriptions form](#).

Contact

For additional project information, please contact:  
Ginger Dykaar  
Senior Transportation Planner  
[transitcorridoraa@scrtc.org](mailto:transitcorridoraa@scrtc.org)  
(831) 460-3200







**Figure D.2: Project Fact Sheet (English)**



**TRANSIT CORRIDOR ALTERNATIVES ANALYSIS**

In late 2019, the Santa Cruz County Regional Transportation Commission (RTC), in partnership with Santa Cruz Metropolitan Transit District (METRO), initiated the next phase of planning for a transit corridor along the existing rail right-of-way that will provide additional travel options, and enhanced access and connectivity for residents, businesses and visitors. One of the outcomes of the Unified Corridor Investment Study, completed in January 2019, was to reserve the Santa Cruz Branch Rail Line (SCBRL) for high-capacity public transit adjacent to a bicycle and pedestrian trail. The Transit Corridor Alternatives Analysis (TCAA) will evaluate public transit investment options that

provide an integrated transit network for Santa Cruz County utilizing all or part of the length of the rail right-of-way as a dedicated transit facility. A performance-based planning approach based on a triple bottom line sustainability framework will be utilized to assess various public transit options for the rail right-of-way. Transit alternatives will be compared to define a locally-preferred alternative that offers the greatest benefit to Santa Cruz County in terms of equity, environment, and economy. Proposed future intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.












## ALTERNATIVES ANALYSIS PROCESS

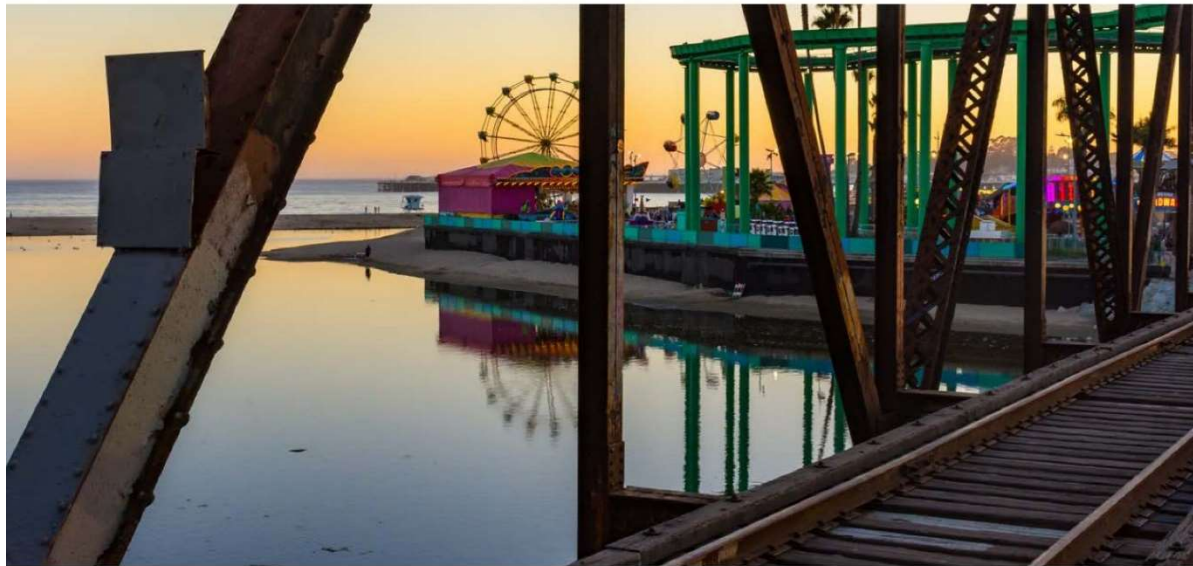
During the TCAA planning process, project goals, screening criteria and performance measures will be established to screen and then evaluate the performance of each potential alternative quantitatively. Potential transit alternatives will consider mode types such as rail, bus and other innovative services. Potential connector services will also be evaluated. The analysis will identify potential infrastructure, vehicle type and right-of-way needs as well as other potential transit features.

Agency partners, local and regional stakeholders and the general public will have the opportunity to provide valuable input into the alternatives and evaluation criteria to aid in narrowing down to a feasible transit solution. The ultimate goal of the TCAA is to identify one locally-preferred transit alternative that meets the needs of the diverse community for which it will serve.

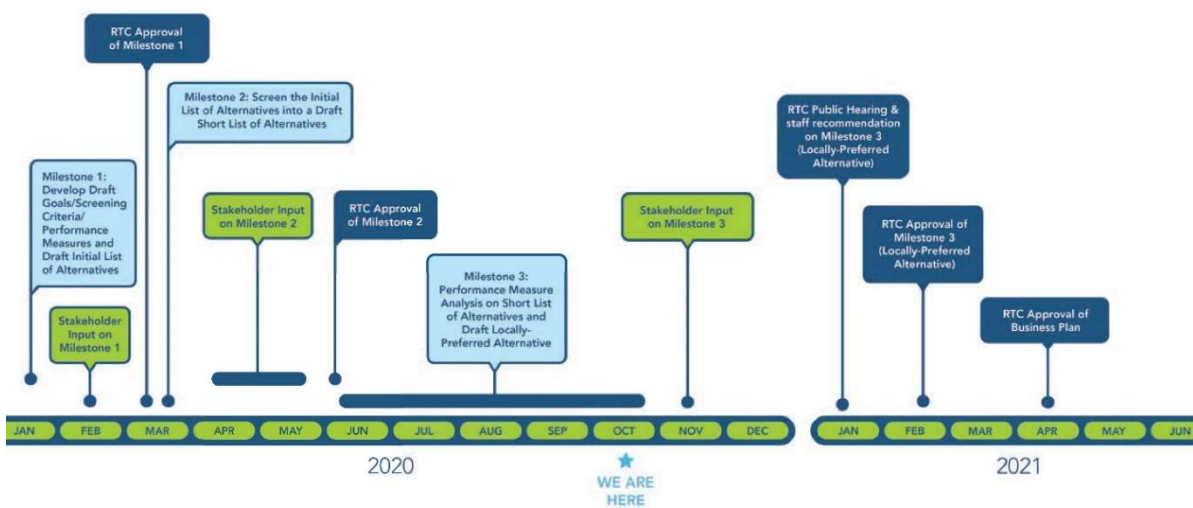
## TCAA HIGHLIGHTS

|  |   |   |
|--|---|---|
|  <p>Rail right-of-way passes within one mile of half of the county's population and can provide access to 44 schools and 92 parks.</p> |  <p>Involves the community, partner agencies, RTC and METRO in the decision-making process to identify a preferred alternative and next steps.</p> |  <p>Develops a strategic business plan for the selected alternative, including a cash flow analysis of environmental clearance, right-of-way, design, construction, operations and maintenance.</p> |
|  <p>Rail Network Integration Study funded by Caltrans will be performed as part of the Alternatives Analysis.</p>                     |  <p>Utilizes a performance-based planning approach with a triple-bottom line framework of equity, environment and economy.</p>                     |   |





### KEY MILESTONES







### STAY INFORMED

RTC and our METRO partner are committed to engaging the public and regional stakeholders throughout the TCAA process. The outreach program will include multiple opportunities to share information, listen and address concerns as well as seek valuable input to help identify a preferred

transit alternative to serve and connect our communities. To stay informed, visit the project website to be added to the contact list. New information will be distributed electronically through the website, social media and email blasts along with in-person distribution at meetings.

|   |  |   |                                 |
|---|--|---|---------------------------------|
|  | <b>WEBSITE</b><br><a href="http://sccrtc.org/transitcorridoraa">sccrtc.org/transitcorridoraa</a>               |  | <b>INSTAGRAM</b><br>@sccrtc     |
|  | <b>PHONE</b><br>831.460.3200   |  | <b>FACEBOOK</b><br>@sccrtc      |
|  | <b>E-MAIL</b><br><a href="mailto:transitcorridoraa@sccrtc.org">transitcorridoraa@sccrtc.org</a>                |  | <b>TWITTER</b><br>@santacruzrtc |
|  | <b>E-SUBSCRIPTIONS</b><br><a href="http://sccrtc.org/about/esubscriptions">sccrtc.org/about/esubscriptions</a> |   |                                 |







Figure D.3: Project Fact Sheet (Spanish)

TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS

WATSONVILLE/PAJARO  
to  
SANTA CRUZ

# FICHA INFORMATIVA

## FEBRERO DE 2020

### ANÁLISIS DE ALTERNATIVAS DEL CORREDOR DE TRÁNSITO

A fines de 2019, la Comisión Regional de Transporte del Condado de Santa Cruz (RTC) en conjunto con el Distrito de Tránsito Metropolitano de Santa Cruz (METRO) inició la fase siguiente de la planificación para un corredor de tránsito a lo largo del derecho de paso ferroviario existente que proporcionará opciones de viaje adicionales, y acceso y conectividad mejorados para residentes, empresas y visitantes. Uno de los resultados del Estudio de **Inversión del Corredor Unificado, completado en** enero de 2019, fue reservar la Línea Ferroviaria de la Rama de Santa Cruz (SCBRL) para el transporte público de alta capacidad adyacente a un sendero para bicicletas y peatones.

El Análisis de alternativas del corredor de tránsito (TCAA) evaluará las opciones de inversión en

transporte público que puedan proporcionar una red de tránsito integrada para el condado de Santa Cruz en la que se utilice toda o parte de la longitud del derecho de paso ferroviario como instalación de tránsito dedicada. Se aplicará un enfoque de **planificación basado en el rendimiento y en un** marco de sostenibilidad de triple cuenta de resultado para evaluar las diversas opciones de transporte público para el derecho de paso ferroviario. Se compararán las alternativas de tránsito **para definir la alternativa preferida a nivel local que ofrezca el mayor beneficio al condado de Santa Cruz** en lo que respecta a la equidad, medio ambiente y economía. Se considerará la propuesta de futuras conexiones intercondados e interregionales con Monterrey, Gilroy, la zona de la bahía de San Francisco y más allá.




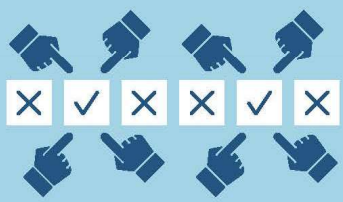





## PROCESO DE ANÁLISIS DE LAS ALTERNATIVAS

Durante el proceso de planificación del TCAA, se definirán los objetivos del proyecto, los criterios de evaluación y las medidas de rendimiento que serán examinadas y, luego, se evaluará de forma cuantitativa el rendimiento de cada posible alternativa. Dentro de las posibles alternativas de tránsito, se tendrán en cuenta los tipos de modos de transporte, como el ferrocarril, el autobús y otros servicios innovadores. También se evaluarán los posibles servicios de conexión. En el análisis se determinarán la infraestructura potencial, el tipo de vehículo y las necesidades de derecho de paso, así como otras posibles características del tránsito.

Los socios de las agencias, la partes interesadas locales y regionales y el público en general tendrán la oportunidad de hacer valiosas aportaciones sobre las alternativas y los criterios de evaluación para encontrar una solución de tránsito viable. El objetivo final del TCAA es identificar una alternativa de tránsito preferida a nivel local que satisfaga las necesidades de la comunidad diversa a la que servirá.

## ASPECTOS DESTACADOS DEL TCAA

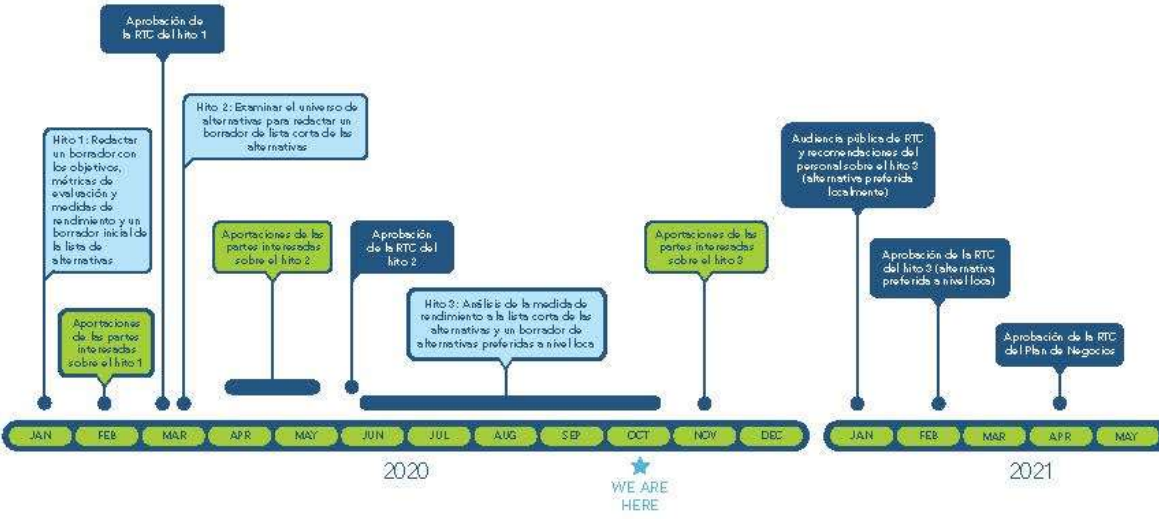
|   |   |   |
|---|---|---|
|  <p>El derecho de paso ferroviario se encuentra a una milla de la mitad de la población del condado y puede proporcionar acceso a 44 escuelas y 92 parques.</p> |  <p>En el proceso de toma de decisiones para identificar una alternativa preferida y los próximos pasos participan la comunidad, agencias asociadas, la RTC y METRO.</p> |  <p>Desarrolla un plan de negocios estratégico para la alternativa seleccionada, lo que incluye un análisis del flujo de efectivo para la autorización ambiental, derecho de paso, diseño, construcción, operaciones y mantenimiento.</p> |
|  <p>El Estudio de integración de redes ferroviarias financiado por Caltrans se llevará a cabo como parte del Análisis de alternativas.</p>                     |  <p>Se utiliza un enfoque de planificación basado en el rendimiento con un marco de triple cuenta de resultados de equidad, medio ambiente y economía.</p>               |   |







HITOS CLAVE





### MANTÉNGASE INFORMADO

La RTC y nuestro socio, METRO, están comprometidos a involucrar al público y a las partes interesadas a nivel regional en todo el proceso del TCAA. El programa de compromiso con la comunidad incluirá múltiples oportunidades para compartir información, escuchar y resolver inquietudes, así como buscar aportaciones valiosas **para ayudar a identificar una alternativa de tránsito** preferida para servir y conectar nuestras comunidades.

Para mantenerse informado, visite el sitio web del proyecto para sumarse a la lista de contactos. Se divulgará la información actualizada de forma electrónica a través del sitio web, las redes sociales y las campañas de correo electrónico, y también se compartirá en persona durante las reuniones.

|   |   |   |                                 |
|---|---|---|---------------------------------|
|  | <b>SITO WEB</b><br><a href="http://scrtc.org/transitcorridoraa">scrtc.org/transitcorridoraa</a>                         |  | <b>INSTAGRAM</b><br>@scrtc      |
|  | <b>TELÉFONO</b><br>831.460.3200   |  | <b>FACEBOOK</b><br>@scrtc       |
|  | <b>CORREO ELECTRÓNICO</b><br><a href="mailto:transitcorridoraa@scrtc.org">transitcorridoraa@scrtc.org</a>               |  | <b>TWITTER</b><br>@santacruzrtc |
|  | <b>SUSCRIPCIONES ELECTRÓNICAS</b><br><a href="http://scrtc.org/about/esubscriptions">scrtc.org/about/esubscriptions</a> |   |                                 |





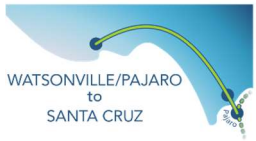


Figure D.4: Project Flyers



Please join RTC and METRO to learn more about the Transit Corridor Alternatives Analysis (TCAA). The TCAA will evaluate public transit investment options that provide an integrated transit network for Santa Cruz County utilizing all or part of the length of the rail right-of-way as a dedicated transit facility. Intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.

**Attend one of the below meetings** to provide valuable input on transit alternatives and the evaluation process that will narrow down to a locally-preferred alternative that will best serve and connect our communities. Participants will have the opportunity to review displays, talk one-on-one with project team members and provide input.

|   |  |
|---|--|
| <p><b>Tuesday, Feb. 11, 2020</b><br/> <b>6–7:30 p.m.</b><br/>                 Live Oak Grange<br/>                 1900 17th Ave., Santa Cruz, CA 95062</p> | <p><b>Wednesday, Feb. 12, 2020</b><br/> <b>6–7:30 p.m.</b><br/>                 Watsonville Library Community Room<br/>                 275 Main St., 2nd floor, Watsonville, CA 95076</p> |
| <p><b>If you are unable to attend the Public Open House meetings, you can still provide input by visiting the project webpage.</b></p>                      |  |

**STAY INFORMED**

RTC and METRO are committed to engaging the public and regional stakeholders throughout the TCAA process. To stay informed and actively participate in future meetings, visit the project website. You can also sign up to be added to the project database to receive all project notices via email.

|   |  |
|---|--|
| <p><b>WEBSITE</b><br/> <a href="http://sccrtc.org/transitcorridoraa">sccrtc.org/transitcorridoraa</a></p>               | <p><b>Instagram</b><br/>                 @sccrtc</p>     |
| <p><b>PHONE</b><br/>                 831.460.3200</p>   | <p><b>Facebook</b><br/>                 @sccrtc</p>      |
| <p><b>E-MAIL</b><br/> <a href="mailto:transitcorridoraa@sccrtc.org">transitcorridoraa@sccrtc.org</a></p>                | <p><b>Twitter</b><br/>                 @santacruzrtc</p> |
| <p><b>E-SUBSCRIPTIONS</b><br/> <a href="http://sccrtc.org/about/esubscriptions">sccrtc.org/about/esubscriptions</a></p> |  |





TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS



Venga a acompañar a RTC y METRO para aprender más sobre el Análisis de Alternativas del Corredor de Tránsito (TCAA). La TCAA evaluará las opciones de inversión en transporte público que proporcionan una red integrada de tránsito para el Condado de Santa Cruz utilizando todo u parte del derecho de vía ferroviaria como una instalación de tránsito. Las conexiones entre los condados y las regiones a Monterey, Gilroy, el área de la Bahía y son algunas de las conexiones que serán consideradas.

**Asista a una de las siguientes reuniones** para opinar sobre las alternativas de tránsito y el proceso de evaluación que ayudará a elegir una alternativa preferida que sirva y conecte mejor a nuestras comunidades. Los participantes tendrán la oportunidad de revisar exhibiciones, hablar uno a uno con los miembros del proyecto y dar su opinión.

**Martes, el 11 de febrero, 2020**  
**6–7:30 p.m.**  
Live Oak Grange  
1900 17th Ave., Santa Cruz, CA 95062

**Miércoles, el 12 de febrero, 2020**  
**6–7:30 p.m.**  
Watsonville Library Community Room  
275 Main St., 2nd floor, Watsonville, CA 95076

**Si no puede asistir a las reuniones comunitarias, aún puede compartir su opinión visitando la página web del proyecto.**

**MANTÉNGASE INFORMADO**

RTC y METRO se comprometen a involucrar a los interesados públicos y regionales en todo el proceso de TCAA. Para mantenerse informado y participar activamente en futuras reuniones, visite el sitio web del proyecto. También puede registrarse para recibir todos los avisos del proyecto por correo electrónico.

|   |   |   |                                 |
|---|---|---|---------------------------------|
|  | <b>SITIO WEB</b><br>sccrtc.org/transitcorridoraa                      |  | <b>Instagram</b><br>@sccrtc     |
|  | <b>TELÉFONO</b><br>831.460.3200                                       |  | <b>Facebook</b><br>@sccrtc      |
|  | <b>E-MAIL</b><br>transitcorridoraa@sccrtc.org                         |  | <b>Twitter</b><br>@santacruzrtc |
|  | <b>SUBSCRIPCIONES ELECTRÓNICAS</b><br>sccrtc.org/about/esubscriptions |   |                                 |







Figure D.5: Example eNews and Facebook Notices



**PUBLIC OPEN HOUSE**  
YOU'RE INVITED!

Please join RTC and METRO to learn more about the Transit Corridor Alternatives Analysis (TCAA). The TCAA will evaluate public transit investment options that provide an integrated transit network for Santa Cruz County utilizing all or part of the length of the rail right-of-way as a dedicated transit facility. Intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.

Attend one of the below meetings to provide valuable input on transit alternatives and the evaluation process that will narrow down to a locally-preferred alternative that will best serve and connect our communities. Participants will have the opportunity to review displays, talk one-on-one with project team members and provide input.



**REUNIÓN COMUNITARIA**  
¡ESTÁ INVITADO!

Venga a acompañar a RTC y METRO para aprender más sobre el Análisis de Alternativas del Corredor de Tránsito (TCAA). La TCAA evaluará las opciones de inversión en transporte público que proporcionan una red integrada de tránsito para el Condado de Santa Cruz utilizando todo u parte del derecho de vía ferroviaria como una instalación de tránsito. Las conexiones entre los condados y las regiones a Monterey, Gilroy, el área de la Bahía y son algunas de las conexiones que serán consideradas.

Asista a una de las siguientes reuniones para opinar sobre las alternativas de tránsito y el proceso de evaluación que ayudará a elegir una alternativa preferida que sirva y conecte mejor a nuestras comunidades. Los participantes tendrán la oportunidad de revisar exhibiciones, hablar uno a uno con los miembros del proyecto y dar su opinión.

|   |  |
|---|--|
| <p><b>Tuesday, Feb. 11, 2020</b><br/>6–7:30 p.m.<br/>Live Oak Grange<br/>1900 17th Ave., Santa Cruz, CA 95062</p>               | <p><b>Wednesday, Feb. 12, 2020</b><br/>6–7:30 p.m.<br/>Watsonville Library Community Room<br/>275 Main St., 2nd floor, Watsonville, CA 95076</p> |
| <p>If you are unable to attend the Public Open House meetings, you can still provide input by visiting the project webpage.</p> |  |

|   |   |
|---|---|
| <p><b>Martes, el 11 de febrero, 2020</b><br/>6–7:30 p.m.<br/>Live Oak Grange<br/>1900 17th Ave., Santa Cruz, CA 95062</p>     | <p><b>Miércoles, el 12 de febrero, 2020</b><br/>6–7:30 p.m.<br/>Watsonville Library Community Room<br/>275 Main St., 2nd floor, Watsonville, CA 95076</p> |
| <p>Si no puede asistir a las reuniones comunitarias, aún puede compartir su opinión visitando la página web del proyecto.</p> |   |

**STAY INFORMED**

RTC and METRO are committed to engaging the public and regional stakeholders throughout the TCAA process. To stay informed and actively participate in future meetings, visit the project website. You can also sign up to be added to the project database to receive all project notices via email.

**WEBSITE**  
scrtc.org/transitcorridora

**PHONE**  
831.460.3200

**E-MAIL**  
transitcorridora@scrtc.org

**E-SUBSCRIPTIONS**  
scrtc.org/about/esubscriptions

**Instagram**  
@scrtc

**Facebook**  
@scrtc

**Twitter**  
@santacruzrtc




**MANTÉNGASE INFORMADO**

RTC y METRO se comprometen a involucrar a los interesados públicos y regionales en todo el proceso de TCAA. Para mantenerse informado y participar activamente en futuras reuniones, visite el sitio web del proyecto. También puede registrarse para recibir todos los avisos del proyecto por correo electrónico.

**SITIO WEB**  
scrtc.org/transitcorridora

**TELEFONO**  
831.460.3200

**E-MAIL**  
transitcorridora@scrtc.org

**SUBSCRIPCIONES ELECTRONICAS**  
scrtc.org/about/esubscriptions

**Instagram**  
@scrtc

**Facebook**  
@scrtc

**Twitter**  
@santacruzrtc










Since June, RTC and the Transit Corridor Alternative Analysis (TCAA) team have been working hard to evaluate the narrowed down short list of alternatives through a performance analysis. **The results are in and we would like to share them with you.** The TCAA is a planning effort that aims to identify a future integrated transit network for Santa Cruz County utilizing all, or part of the Santa Cruz Branch Rail Line right-of-way.

To maintain engagement on this important project and offer convenient participation in a safe environment while social distancing, RTC and METRO are hosting two **live chat sessions** that will allow you additional opportunities to interact directly with the TCAA team.

Desde junio, RTC y el equipo de Análisis de Alternativas del Eje Vial (TCAA) han estado trabajando arduamente en —por medio de un análisis de rendimiento— evaluar la ya reducida lista de alternativas. **Ya contamos con los resultados y queremos compartirlos con usted.** La TCAA es una iniciativa de planificación cuyo objetivo es dilucidar una futura red de transporte masivo integrada para el condado de Santa Cruz utilizando todo o parte del derecho de paso de la línea del Ramal Ferroviario Santa Cruz.

Para continuar la integración ciudadana en este importante proyecto y ofrecer participación conveniente, en un entorno seguro, y manteniendo distanciamiento social, RTC y METRO están programando dos foros de conversación interactiva (chat) en tiempo real, que son opciones adicionales de intercambiar ideas directamente con el equipo de TCAA.

**CHAT LIVE WITH US**

Chat live with us anytime during the scheduled sessions to get your questions answered. Look for the chat icon in the bottom right corner of the online open house.

|  |   |
|--|---|
| <b>WHEN:</b><br>Thursday, Nov. 12, 2020   12 - 1:30 p.m.<br>Wednesday, Nov. 18, 2020   6 - 7:30 p.m. | <b>WHERE:</b><br>Visit <a href="http://sccrtc.org/transitcorridoraa">sccrtc.org/transitcorridoraa</a> to access the online open house |
|--|---|

**CONVERSE EN DIRECTO (CHAT) CON NOSOTROS**

Interacté con nosotros durante las sesiones en tiempo real —en cualquier momento— para obtener respuesta a sus preguntas. Busque el icono de "chat" en la esquina inferior-derecha de la página de Jornada Virtual Abierta al Público.

|  |   |
|--|---|
| <b>CUANDO:</b><br>Jueves, 12 de noviembre de 2020   12 - 1:30 p.m.<br>Miércoles, 18 de noviembre de 2020   6 - 7:30 p.m. | <b>DÓNDE:</b><br>Visita <a href="http://sccrtc.org/transitcorridoraa">sccrtc.org/transitcorridoraa</a> para ingresar a la Jornada Virtual Abierta al Público. |
|--|---|

**DON'T FORGET!**

Our online public open house will remain open through Friday, Nov. 27, 2020 for you to review project information and submit comments.  
[sccrtc.org/transitcorridoraa](http://sccrtc.org/transitcorridoraa)

**¡NO LO OLVIDE!**

Nuestra Jornada Virtual Abierta al Público permanecerá abierta hasta el viernes 27 de noviembre del 2020 para que analice la información del proyecto y remita sus comentarios.  
[sccrtc.org/transitcorridoraa](http://sccrtc.org/transitcorridoraa)

*We hope that you and your family have remained healthy and safe as our community continues to face challenging times during the fires and COVID-19 pandemic.*

*Esperamos que usted y su familia hayan seguido sanos y seguros durante estos difíciles tiempos cuando nuestra comunidad continúa enfrentando la pandemia de COVID-19 e incendios en California.*

**STAY INFORMED**

|  |                                 |
|--|---------------------------------|
| <b>WEBSITE</b><br><a href="http://sccrtc.org/transitcorridoraa">sccrtc.org/transitcorridoraa</a>               | <b>Instagram</b><br>@sccrtc     |
| <b>PHONE</b><br>831.460.3200   | <b>Facebook</b><br>@sccrtc      |
| <b>E-MAIL</b><br><a href="mailto:transitcorridoraa@sccrtc.org">transitcorridoraa@sccrtc.org</a>                | <b>Twitter</b><br>@santacruzrtc |
| <b>E-SUBSCRIPTIONS</b><br><a href="http://sccrtc.org/about/esubscriptions">sccrtc.org/about/esubscriptions</a> |                                 |



**MANTÉNGASE INFORMADO**

|  |                                 |
|--|---------------------------------|
| <b>SITIO WEB</b><br><a href="http://sccrtc.org/transitcorridoraa">sccrtc.org/transitcorridoraa</a>                         | <b>Instagram</b><br>@sccrtc     |
| <b>TELEFONO</b><br>831.460.3200  | <b>Facebook</b><br>@sccrtc      |
| <b>E-MAIL</b><br><a href="mailto:transitcorridoraa@sccrtc.org">transitcorridoraa@sccrtc.org</a>                            | <b>Twitter</b><br>@santacruzrtc |
| <b>SUBSCRIPCIONES ELECTRONICAS</b><br><a href="http://sccrtc.org/about/esubscriptions">sccrtc.org/about/esubscriptions</a> |                                 |





### Transit Corridor Alternatives Analysis Online Open House Now Open



Regional Transportation Commission <info@scrtc.ccsend.com> on behalf of Regional To Shannon Munz

Reply Reply All Forward Mon 4/13/2020 8:17 PM

You forwarded this message on 4/14/2020 12:50 PM. The actual sender of this message is different than the normal sender. Click here to learn more.



#### Transit Corridor Alternatives Analysis Online Open House Now Open

The RTC is now seeking public input for Milestone 2 of the Transit Corridor Alternatives Analysis (TCAA) through an online open house.

The TCAA is a year-long study that will evaluate high-capacity public transit alternatives that provide an integrated transit network for Santa Cruz County utilizing all or part of the length of the Santa Cruz Branch Rail Line as a dedicated transit facility. Intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.

Since March, RTC staff and their Project Team have been working to screen the initial list of alternatives to narrow them down to a draft short list of alternatives that will be evaluated more quantitatively. The online open house provides an update on the TCAA planning effort and an opportunity to provide comments on the draft short list of alternatives as a result of the initial screening.

Public input will be sought through the online open house from April 13 – May 11. To view the online open house and provide your valuable input, visit www.scrtc-tcaa.com. For more information on the TCAA, visit www.scrtc.org/transitcorridorag.

www.scrtc.org

Santa Cruz County Regional Transportation Commission email: info[at]scrtc.org

### Visit the Transit Corridor Alternatives Analysis Online Open House Through May 11



Regional Transportation Commission <info@scrtc.ccsend.com> on behalf of Regional To Shannon Munz

Reply Reply All Forward Wed 5/6/2020 11:53 AM

The actual sender of this message is different than the normal sender. Click here to learn more.

#### TRANSIT CORRIDOR ALTERNATIVES ANALYSIS



#### Help Shape the Transportation Future of Santa Cruz County!

##### Transit Corridor Alternatives Analysis Online Open House Open Through May 11

The RTC is seeking public input for Milestone 2 of the Transit Corridor Alternatives Analysis (TCAA) through an online open house.

The TCAA is a year-long study that will evaluate high-capacity public transit alternatives that provide an integrated transit network for Santa Cruz County utilizing all or part of the length of the Santa Cruz Branch Rail Line as a dedicated transit facility. Intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.

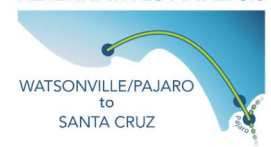
Since March, RTC staff and their Project Team have been working to screen the initial list of alternatives to narrow them down to a draft short list of alternatives that will be evaluated more quantitatively. The online open house provides an update on the TCAA planning effort and an opportunity to provide comments on the draft short list of alternatives as a result of the initial screening.

Public input will be sought through the online open house until May 11. To view the online open house and provide your valuable input, visit www.scrtc-tcaa.com. For more information on the TCAA, visit www.scrtc.org/transitcorridorag.

www.scrtc.org







**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · January 18 ·

The RTC has begun the Transit Corridor Alternatives Analysis process to identify high-capacity public transit options on the Santa Cruz Branch Rail Line. Public input is now being sought on the draft goals/screening criteria/performance measures and on the draft list of initial alternatives. Join us for an upcoming open house to learn more and provide your input.



Please join RTC and METRO to learn more about the Transit Corridor Alternatives Analysis (TCAA). The TCAA will evaluate public transit investment options that provide an integrated transit network for Santa Cruz County utilizing all or part of the length of the rail right-of-way as a dedicated transit facility. Intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.

Attend one of the below meetings to provide valuable input on transit alternatives and the evaluation process that will narrow down to a locally-preferred alternative that will best serve and connect our communities. Participants will have the opportunity to review displays, talk one-on-one with project team members and provide input.

- |   |  |
|---|--|
| <p><b>Tuesday, Feb. 11, 2020</b><br/>6-7:30 p.m.<br/>Live Oak Grange<br/>1900 17th Ave., Santa Cruz, CA 95062</p> | <p><b>Wednesday, Feb. 12, 2020</b><br/>6-7:30 p.m.<br/>Watsonville Library Community Room<br/>225 Main St., 2nd floor, Watsonville, CA 95076</p> |
|---|--|

If you are unable to attend the Public Open House meetings, you can still provide input by visiting the project webpage.

**STAY INFORMED**

RTC and METRO are committed to engaging the public and regional stakeholders throughout the TCAA process. To stay informed and actively participate in future meetings, visit the project website. You can also sign up to be added to the project database to receive all project notices via email.

**WEBSITE**  
sccrtc.org/transitcorridora

**PHONE**  
531.438.2222

**Instagram**  
@sccrtc

**Facebook**



**Santa Cruz County Regional Transportation Commission (RTC)** added an event.  
January 21 ·



**TUE, FEB 11**  
Transit Corridor Alternatives Analysis Public Open House  
Santa Cruz  
16 Went · 55 Interested

210 People Reached    25 Engagements    Boost Unavailable

3 Likes    Comment    Share

Comment as Santa Cruz County Regional...

**Santa Cruz County Regional Transportation Commission (RTC)** added an event.  
January 21 ·



**WED, FEB 12**  
Transit Corridor Alternatives Analysis Public Open House  
Watsonville  
13 Went · 33 Interested

138 People Reached    9 Engagements    Boost Unavailable

6 Likes    Comment    Share

Comment as Santa Cruz County Regional...







**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · February 10 ·

The Alternatives Analysis to evaluate transit on the rail corridor is underway. We will be holding two public open house meetings this week. Please join us to learn more about the project and provide your valuable input on the transportation future of our county.

Feb. 11, 6-7:30 p.m.  
Live Oak Grange  
1900 17th Ave., Santa Cruz... [See More](#)

163 People Reached    7 Engagements    [Boost Post](#)

1 Like    1 Share

Like    Comment    Share

Comment as Santa Cruz County Regional...

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · February 12 ·

We had a great turn out at last night's open house to discuss transit options on the rail corridor. Join us tonight in Watsonville and provide your input.

Feb. 12, 6-7:30 p.m.  
Watsonville Library Community Room  
275 Main St., 2nd floor, Watsonville

177 People Reached    52 Engagements    [Boost Post](#)

4 Likes    1 Comment

Like    Comment    Share

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · February 11 ·

Join us this evening for an open house meeting on transit on the rail corridor. Your valuable input into this important project is needed!

<https://www.facebook.com/events/631848537585347/>

TUE, FEB 11  
Transit Corridor Alternatives Analysis Public Open House  
Santa Cruz  
16 Went · 55 Interested

52 People Reached    7 Engagements    [Boost Unavailable](#)

1 Like

Like    Comment    Share







**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · February 12 ·

Join us in Watsonville tonight and provide your valuable input on transit on the rail corridor.  
<https://www.facebook.com/events/596788454438621/>

WED, FEB 12  
**Transit Corridor Alternatives Analysis Public Open House**  
Watsonville  
13 Went · 33 Interested

38 People Reached    3 Engagements    **Boost Unavailable**

1 Like    Comment    Share

Comment as Santa Cruz County Regional...

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · February 26 ·

The RTC is continuing to seek public input on transit on the rail corridor. Take our survey and help us understand how you use or would use transit and what is important to you when it comes to transit.  
[https://www.surveymonkey.com/r/SCCRTC\\_TCAA](https://www.surveymonkey.com/r/SCCRTC_TCAA)

191 People Reached    40 Engagements    **Boost Post**

8 Likes    1 Comment    1 Share

Like    Comment    Share

Most Relevant

Comment as Santa Cruz County Regional...

View 1 comment

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · April 14 ·

Online Open House Now Open! The RTC is seeking public input on the draft short list of transportation alternatives for the Transit Corridor Alternatives Analysis. Visit the online open house until May 11 to get more information and provide your input.  
<https://scrtc.org/transit-corridor-alternatives.../>

SCCRTC.ORG  
**Transit Corridor Alternatives Analysis Online Open House Now Open**

198 People Reached    12 Engagements    **Boost Post**

4 Likes    1 Share

Like    Comment    Share

Comment as Santa Cruz County Regional...

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · April 22 ·

Have you visited the Transit Corridor Alternatives Analysis (TCAA) online open house yet? Visit the meeting until May 11 for an update on the TCAA planning effort and an opportunity to provide comments on the draft short list of alternatives as a result of the initial screening.  
<https://scrtc-tcaa.com/>

131 People Reached    11 Engagements    **Boost Post**

You and 3 others

Like    Comment    Share







WATSONVILLE/PAJARO to SANTA CRUZ

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · March 5 ·

What is important to you when it comes to public transit? We are seeking input on transit on the rail corridor and want to know how you use or would use transit on this corridor. Take our short survey and let us know. The deadline to fill out the survey is midnight on March 9.

[https://www.surveymonkey.com/r/SCCRTC\\_TCAA](https://www.surveymonkey.com/r/SCCRTC_TCAA)

SURVEYMONKEY.COM  
**Transit Corridor Alternatives Analysis Survey**  
Take this survey powered by surveymonkey.com. Create your o...

95 People Reached    7 Engagements    **Boost Post**

2

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · April 10 ·

We will soon be seeking public input on the next milestone of the Transit Corridor Alternatives Analysis through an online open house format. The meeting link will be available on Monday, April 13.

<https://sccrtc.org/transit-corridor-alternatives.../>

SCCRTC.ORG  
**Transit Corridor Alternatives Analysis Online Open House Coming Soon!**

312 People Reached    30 Engagements    **Boost Post**

1    2 Comments    1 Share

Like    Comment    Share

Comment as Santa Cruz County Regional...

View comments

**Santa Cruz County Regional Transportation Commission (RTC)**  
Published by Shannon Munz · May 6 ·

Help shape the transportation future of Santa Cruz County! Visit the online open house for the Transit Corridor Alternatives Analysis through May 11 and provide your input on the type of transit you would like to see on the Santa Cruz Branch Rail Line.

<https://sccrtc-tcaa.com/>

**TRANSIT CORRIDOR ALTERNATIVES ANALYSIS**

WATSONVILLE/PAJARO to SANTA CRUZ





Figure D.6: Example Newspaper Display Ads - Print (Santa Cruz Sentinel)



TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS



WATSONVILLE/PAJARO  
to  
SANTA CRUZ



## Notice of Public Open House Meetings

### Transit Corridor Alternatives Analysis

Join the Santa Cruz County Regional Transportation Commission and METRO to learn about the Transit Corridor Alternatives Analysis, a study that will evaluate public transit options for Santa Cruz County utilizing all or part of the Santa Cruz Branch Rail Line.

Attend a public open house meeting and provide input on the list of transit alternatives to be considered and on the evaluation process that will narrow down the transit alternatives to one locally-preferred alternative that will best serve and connect our communities. Meeting attendees will have the opportunity to review displays, talk one-on-one with project team members and provide input.

**Public Open House Meetings**

|   |  |
|---|--|
| <p>Tuesday, Feb. 11, 6-7:30 p.m.<br/>Live Oak Grange<br/>1900 17th Ave., Santa Cruz</p> | <p>Wednesday, Feb. 12, 6-7:30 p.m.<br/>Watsonville Library Community Room<br/>275 Main St., 2nd floor, Watsonville</p> |
|---|--|

If you are unable to attend the public open house meetings, you can still provide input by visiting, [www.sccrtc.org/transitcorridora](http://www.sccrtc.org/transitcorridora).

**Stay Informed**

RTC and METRO are committed to engaging the public throughout the process. To stay informed and actively participate in future meetings, visit the project website ([sccrtc.org/transitcorridora](http://sccrtc.org/transitcorridora)), or sign up to be added to the project database to receive all project notices via email ([sccrtc.org/about/esubscriptions](http://sccrtc.org/about/esubscriptions)).

*The Santa Cruz County Regional Transportation Commission is responsible for delivering a full range of convenient, reliable, and efficient transportation choices for the community.*

**RTC, 1523 Pacific Ave., Santa Cruz, 95060**  
[www.sccrtc.org](http://www.sccrtc.org), [info@sccrtc.org](mailto:info@sccrtc.org), (831)460-3200





TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS



## **Notice of Public Online Open House Meeting** **Transit Corridor Alternatives Analysis**

### **Help Shape the Transportation Future of Santa Cruz County!**

The Santa Cruz County Regional Transportation Commission and METRO invite the public to provide input for Milestone 3 of the Transit Corridor Alternatives Analysis (TCAA). The TCAA is a year-long study that evaluates high-capacity public transit alternatives utilizing all or part of the length of the Santa Cruz Branch Rail Line as a dedicated transit facility.

Visit the open house at [sccrtc.org/transitcorridora](http://sccrtc.org/transitcorridora) through Nov. 27 for an update on the planning effort and to provide your feedback.

#### **Stay Informed**

RTC and METRO are committed to engaging the public throughout the process. To stay informed and actively participate in future meetings, visit the project website ([sccrtc.org/transitcorridora](http://sccrtc.org/transitcorridora)), or sign up to be added to the project database to receive all project notices via email ([sccrtc.org/about/esubscriptions](http://sccrtc.org/about/esubscriptions)).

*The Santa Cruz County Regional Transportation Commission is responsible for delivering a full range of convenient, reliable, and efficient transportation choices for the community.*

**RTC, 1523 Pacific Ave., Santa Cruz, 95060**  
[www.sccrtc.org](http://www.sccrtc.org), [info@sccrtc.org](mailto:info@sccrtc.org), (831)460-3200







Figure D.6 (continued): Example Newspaper Display Ads - Print (Good Times)

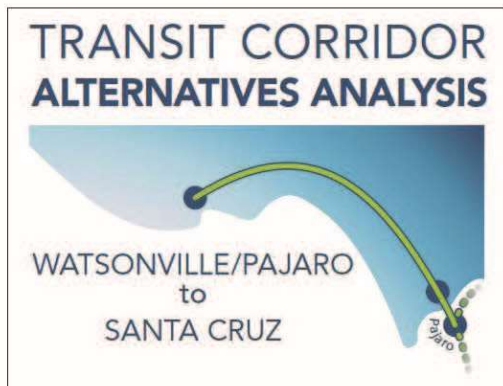



# NOTICE OF PUBLIC OPEN HOUSE MEETING

### Transit Corridor Alternatives Analysis

Join the Santa Cruz County Regional Transportation Commission and METRO to learn about the Transit Corridor Alternatives Analysis, a study that will evaluate public transit options for Santa Cruz County utilizing all or part of the Santa Cruz Branch Rail Line.

Attend a public open house meeting and provide input on the list of transit alternatives to be considered and on the evaluation process that will narrow down the transit alternatives to one locally-preferred alternative that will best serve and connect our communities. Meeting attendees will have the opportunity to review displays, talk one on-one with project team members and provide input.



### PUBLIC -OPEN HOUSE MEETINGS

**Tuesday, Feb. 11, 6-7:30 p.m.**

Live Oak Grange  
1900 17th Ave., Santa Cruz

**Wednesday, Feb. 12, 6-7:30 p.m.**

Watsonville Library Community Room  
275 Main St., 2nd floor, Watsonville

If you are unable to attend the public open house meetings, you can still provide input by visiting, [www.sccrtc.org/transitcorridora](http://www.sccrtc.org/transitcorridora).

### Stay Informed

RTC and METRO are committed to engaging the public throughout the process. To stay informed and actively participate in future meetings, visit the project website ([sccrtc.org/transitcorridora](http://sccrtc.org/transitcorridora)), or sign up to be added to the project database to receive all project notices via email ([sccrtc.org/about/esubscriptions](http://sccrtc.org/about/esubscriptions)).

### **The Santa Cruz County Regional Transportation Commission (RTC)**

*is responsible for delivering a full range of convenient, reliable, and efficient transportation choices for the community.*

**RTC, 1523 Pacific Ave., Santa Cruz, 95060**  
**[www.sccrtc.org](http://www.sccrtc.org), [info@sccrtc.org](mailto:info@sccrtc.org), 831.460.3200**





Figure D.6 (continued): Example Newspaper Display Ads - Print (*The Pajaronian*)

**Notice of Public Open House Meetings  
Transit Corridor Alternatives Analysis**

Join the Santa Cruz County Regional Transportation Commission and METRO to learn about the Transit Corridor Alternatives Analysis, a study that will evaluate public transit options for Santa Cruz County utilizing all or part of the Santa Cruz Branch Rail Line.

Attend a public open house meeting and provide input on the list of transit alternatives to be considered and on the evaluation process that will narrow down the transit alternatives to one locally-preferred alternative that will best serve and connect our communities. Meeting attendees will have the opportunity to review displays, talk one-on-one with project team members and provide input.

**Public Open House Meetings**  
Tuesday, Feb. 11, 6-7:30 p.m.  
Live Oak Grange  
1900 17th Ave., Santa Cruz

Wednesday, Feb. 12, 6-7:30 p.m.  
Watsonville Library Community Room  
275 Main St., 2nd floor, Watsonville

If you are unable to attend the public open house meetings, you can still provide input by visiting, [www.sccrtc.org/transitcorridoraa](http://www.sccrtc.org/transitcorridoraa).

**Stay Informed**  
RTC and METRO are committed to engaging the public throughout the process. To stay informed and actively participate in future meetings, visit the project website ([sccrtc.org/transitcorridoraa](http://sccrtc.org/transitcorridoraa)), or sign up to be added to the project database to receive all project notices via email ([sccrtc.org/about/esubscriptions](mailto:sccrtc.org/about/esubscriptions)).

*The Santa Cruz County Regional Transportation Commission is responsible for delivering a full range of convenient, reliable, and efficient transportation choices for the community.*

**RTC, 1523 Pacific Ave., Santa Cruz, 95060**  
[www.sccrtc.org](http://www.sccrtc.org), [info@sccrtc.org](mailto:info@sccrtc.org), (831)460-3200







Figure D.7: Example Newspaper Display Ads - Digital

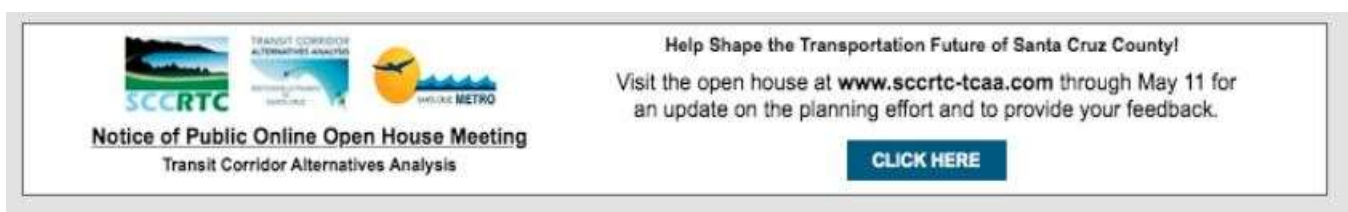


Figure D.8: Example Press Releases

TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS

Nov. 4, 2020  
FOR IMMEDIATE RELEASE

Contacts: Ginger Dykaar  
Senior Transportation Planner  
[transitcorridoraa@sccrtc.org](mailto:transitcorridoraa@sccrtc.org)  
(831) 460-3200

**SANTA CRUZ RTC TO HOST ONLINE OPEN HOUSE FOR  
TRANSIT CORRIDOR ALTERNATIVES ANALYSIS**

***Your Input Matters!***

The Santa Cruz County Regional Transportation Commission (RTC) invites the public to provide input for Milestone 3 of the Transit Corridor Alternatives Analysis (TCAA) through an online public open house that will be available from Nov. 6 through Nov. 27, 2020.

The TCAA is a year-long study that evaluates high-capacity public transit alternatives to provide an integrated transit network for Santa Cruz County utilizing all or part of the length of the Santa Cruz Branch Rail Line as a dedicated transit facility. Intercounty and interregional connections to Monterey, Gilroy, the San Francisco Bay Area and beyond will be considered.

Since June, RTC has been working to evaluate the narrowed down short list of alternatives through a performance analysis. The results are now in and ready to be shared publicly. To maintain engagement and offer convenient participation in a safe environment while social distancing, RTC is hosting the online public open house to allow the public to review information and submit comments on the TCAA process. In addition, more opportunities to interact directly with the TCAA team will be available during two scheduled live chat sessions on Thursday, Nov. 12 from 12-1:30 p.m. and Wednesday, Nov. 18 from 6-7:30 p.m.

Public input will be sought through the online open house until Nov. 27, 2020. To view details about the online public open house and live chat, visit [www.sccrtc.org/transitcorridoraa](http://www.sccrtc.org/transitcorridoraa).

RTC welcomes and encourages public input on transportation issues. RTC is responsible for regional transportation planning, policy, and funding, and strives to serve the needs of its constituents. For more information about the Santa Cruz County RTC, call (831) 460-3200 or visit [www.sccrtc.org](http://www.sccrtc.org).

###





Figure D.9: Example Mailers

TRANSIT CORRIDOR  
ALTERNATIVES ANALYSIS

WATSONVILLE/PAJARO  
to  
SANTA CRUZ

**ONLINE  
PUBLIC OPEN HOUSE**  
YOUR INPUT MATTERS!

Since June, RTC and the Transit Corridor Alternative Analysis (TCAA) team have been working hard to evaluate the narrowed down short list of alternatives through a performance analysis. **The results are in and we would like to share them with you.** The TCAA is a planning effort that aims to identify a future integrated transit network for Santa Cruz County utilizing all, or part of the Santa Cruz Branch Rail Line right-of-way.

To maintain engagement on this important project and offer convenient participation in a safe environment while social distancing, RTC and METRO are hosting an **online public open house** that will be available for viewing from **Nov. 6 to Nov. 27, 2020.**

In addition, we are offering more opportunities to interact directly with the TCAA team during two scheduled **live chat sessions** for you to ask questions and provide comments.

**ONLINE PUBLIC OPEN HOUSE**  
Nov. 6 to Nov. 27, 2020

Visit the online public open house to review information and submit comments.

**Visit the project website to access the online public open house & live chat sessions!**  
[sccrtc.org/transitcorridora](http://sccrtc.org/transitcorridora)

**LIVE CHAT SESSIONS**  
Nov. 12, 2020 | 12 - 1:30 p.m.  
Nov. 18, 2020 | 6 - 7:30 p.m.

Chat live with us anytime during the scheduled sessions to get your questions answered. Look for the chat icon in the bottom right corner of the online public open house.

Desde junio, RTC y el equipo de Análisis de Alternativas del Eje Vial (TCAA) han estado trabajando arduamente en — por medio de un análisis de rendimiento—evaluar la ya reducida lista de alternativas. **Ya contamos con los resultados y queremos compartirlos con usted.** La TCAA es una iniciativa de planificación cuyo objetivo es dilucidar una futura red de transporte masivo integrada para el condado de Santa Cruz utilizando todo o parte del derecho de paso de la línea del Ramal Ferroviario Santa Cruz.

Para continuar la integración ciudadana en este importante proyecto y ofrecer participación conveniente, en un entorno seguro, y manteniendo distanciamiento social, RTC y METRO están programando una jornada a puertas abiertas en línea, misma que estará disponible para su visualización entre el 6 de noviembre y el 27 de noviembre, 2020.

Además, ofrecemos más opciones para interactuar directamente con el equipo de TCAA mediante dos sesiones de conversación textual en tiempo real (“chat”) programadas cuyo objeto es recibir comentarios y contestar preguntas.

**JORNADA VIRTUAL A PUERTAS ABIERTAS**  
6 de noviembre al 27 de noviembre de 2020

Visite la Jornada Virtual Abierta al Público para inspeccionar la información y someter comentarios.

**Para ingresar a esta Jornada a Puertas Abiertas y su foro interactivo visite el portal virtual del proyecto!**  
[sccrtc.org/transitcorridora](http://sccrtc.org/transitcorridora)

**SESIONES INTERACTIVAS (CHAT) EN TIEMPO REAL**  
12 de noviembre de 2020 | 12 - 1:30 p.m.  
18 de noviembre de 2020 | 6 - 7:30 p.m.

Interactúe con nosotros durante las sesiones en tiempo real —en cualquier momento— para obtener respuesta a sus preguntas. Busque el icono de “chat” en la esquina inferior-derecha de la página de Jornada Virtual Abierta al Público.

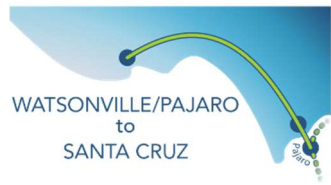


## APPENDIX E – Outreach Results

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## TCAA OUTREACH RESULTS SUMMARIES

Engagement of diverse audiences during the Transit Corridor Alternatives Analysis was critical in determining a high-capacity public transit alternative that will meet regional needs and be supported by the local and regional communities that the future transit service would serve.

The TCAA engagement program incorporated a variety of grass roots, in-person tactics, blended with innovative digital tools for providing input online during the Covid-19 pandemic that occurred during the latter part of the project. The engagement program was developed to reach the highly diverse audiences in Santa Cruz County. More information on the engagement process can be found in **Chapter 2: Public and Stakeholder Outreach** and **Appendix C: Communications and Stakeholder Involvement Plan**. summaries of public and stakeholder input, and how it contributed to the TCAA process, can be found in **Chapter 3: Milestone 1 Outcomes**, **Chapter 4: Milestone 2 Outcomes**, and **Chapter 5: Milestone 3 Outcomes**

Full documents capturing output of this engagement process are housed on the TCAA website:

<https://sccrtc.org/transitcorridora/>

From here you can access:

- RTC Advisory Committee input,
- Partner Agency input,
- Focus Groups activity summaries and input,
- Public Open House activity summaries and submitted comments,
- Comment letters from local jurisdictions, advocacy groups, and the public;
- and more

## TCAA ONLINE SURVEY RESPONSES

### ONLINE SURVEY MILESTONE 1

Survey open February 10 through February 28, 2020

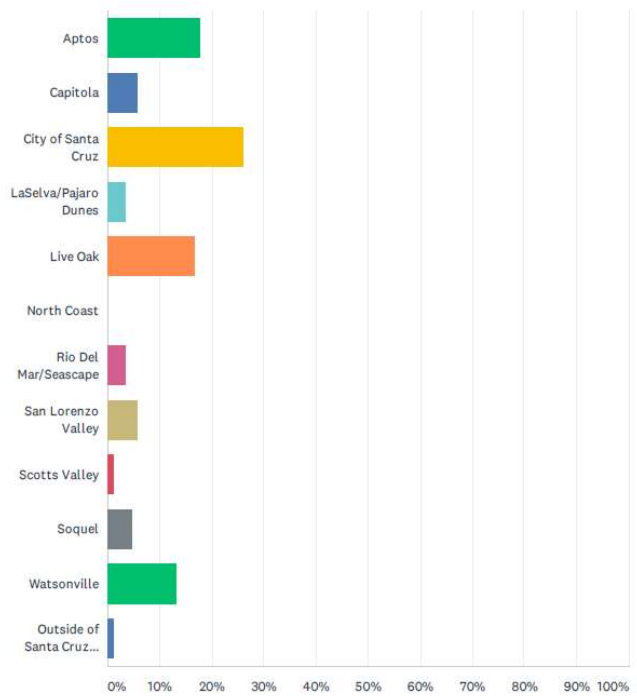
84 total responses





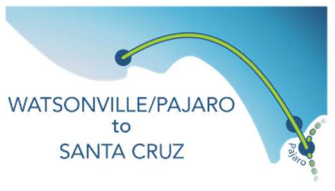
**Q1 What is the closest city/town to where you live?**

Answered: 84 Skipped: 0



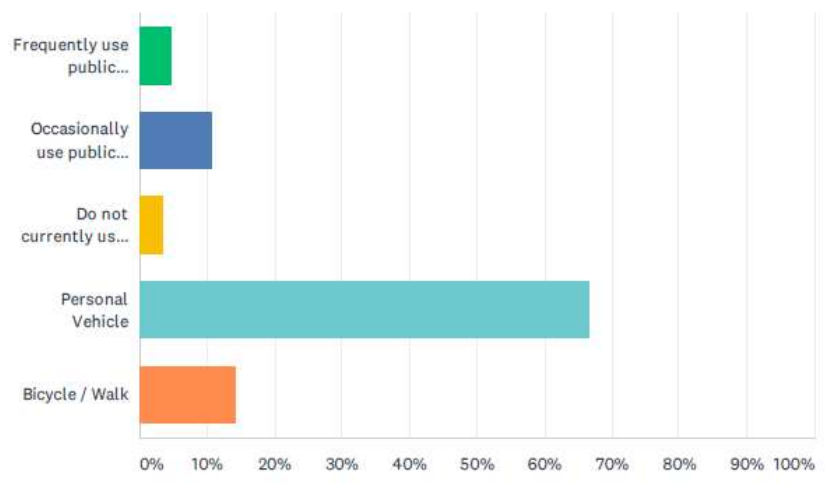
| ANSWER CHOICES               | RESPONSES |           |
|------------------------------|-----------|-----------|
| Aptos                        | 17.86%    | 15        |
| Capitola                     | 5.95%     | 5         |
| City of Santa Cruz           | 26.19%    | 22        |
| LaSelva/Pajaro Dunes         | 3.57%     | 3         |
| Live Oak                     | 16.67%    | 14        |
| North Coast                  | 0.00%     | 0         |
| Rio Del Mar/Seascape         | 3.57%     | 3         |
| San Lorenzo Valley           | 5.95%     | 5         |
| Scotts Valley                | 1.19%     | 1         |
| Soquel                       | 4.76%     | 4         |
| Watsonville                  | 13.10%    | 11        |
| Outside of Santa Cruz County | 1.19%     | 1         |
| <b>TOTAL</b>                 |           | <b>84</b> |





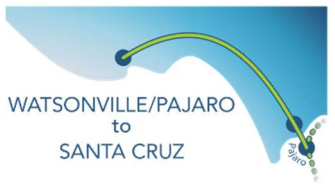
Q2 How do you typically travel?

Answered: 84 Skipped: 0



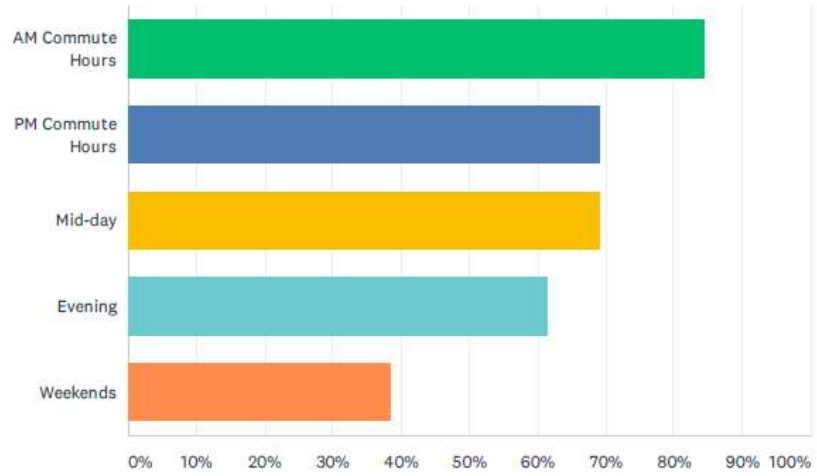
| ANSWER CHOICES                             | RESPONSES |
|--|-----------|
| Frequently use public transportation       | 4.76% 4   |
| Occasionally use public transportation     | 10.71% 9  |
| Do not currently use public transportation | 3.57% 3   |
| Personal Vehicle                           | 66.67% 56 |
| Bicycle / Walk                             | 14.29% 12 |
| TOTAL                                      | 84        |





### Q3 What time of day do you typically use public transportation? Check all that apply.

Answered: 13 Skipped: 71



| ANSWER CHOICES        | RESPONSES |
|-----------------------|-----------|
| AM Commute Hours      | 84.62% 11 |
| PM Commute Hours      | 69.23% 9  |
| Mid-day               | 69.23% 9  |
| Evening               | 61.54% 8  |
| Weekends              | 38.46% 5  |
| Total Respondents: 13 |           |

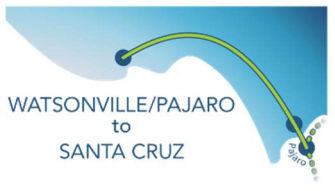
### Q4 Why don't you use public transportation?

Answered: 3 Skipped: 81

| # | RESPONSES   | DATE               |
|---|---|--------------------|
| 1 | Public transportation is not available in Corralitos, where I live.                       | 2/13/2020 2:56 PM  |
| 2 | Not enough of it to be convenient to be competitive with personal vehicle, bike, walking. | 2/13/2020 10:17 AM |
| 3 | not convenient from where I live (Sunset Beach)   | 2/12/2020 6:01 PM  |

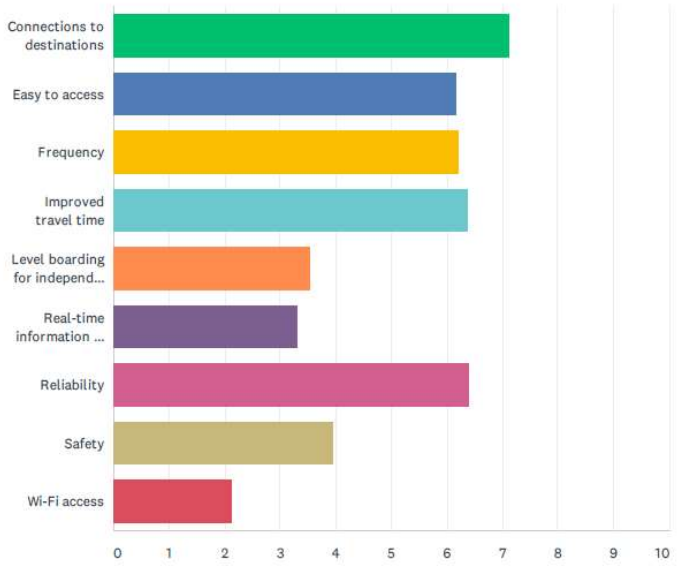






**Q5 What are the most important features of public transportation? Please prioritize order of importance (1 being most important)**

Answered: 77 Skipped: 7



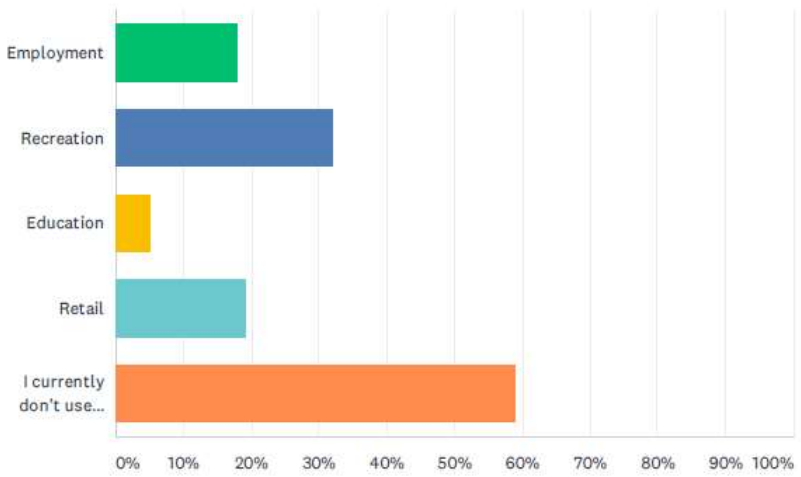
|  | 1            | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | TOTAL | SCORE |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------|-------|
| Connections to destinations                  | 36.36%<br>28 | 18.18%<br>14 | 12.99%<br>10 | 10.39%<br>8  | 7.79%<br>6   | 9.09%<br>7   | 2.60%<br>2   | 0.00%<br>0   | 2.60%<br>2   | 77    | 7.12  |
| Easy to access                               | 9.09%<br>7   | 24.68%<br>19 | 14.29%<br>11 | 15.58%<br>12 | 16.88%<br>13 | 9.09%<br>7   | 5.19%<br>4   | 3.90%<br>3   | 1.30%<br>1   | 77    | 6.18  |
| Frequency                                    | 5.26%<br>4   | 22.37%<br>17 | 22.37%<br>17 | 14.47%<br>11 | 21.05%<br>16 | 6.58%<br>5   | 5.26%<br>4   | 1.32%<br>1   | 1.32%<br>1   | 76    | 6.21  |
| Improved travel time                         | 20.27%<br>15 | 12.16%<br>9  | 18.92%<br>14 | 22.97%<br>17 | 8.11%<br>6   | 5.41%<br>4   | 5.41%<br>4   | 4.05%<br>3   | 2.70%<br>2   | 74    | 6.39  |
| Level boarding for independent accessibility | 4.17%<br>3   | 2.78%<br>2   | 5.56%<br>4   | 5.56%<br>4   | 5.56%<br>4   | 16.67%<br>12 | 23.61%<br>17 | 19.44%<br>14 | 16.67%<br>12 | 72    | 3.53  |
| Real-time information at stop or on phone    | 1.33%<br>1   | 1.33%<br>1   | 2.67%<br>2   | 9.33%<br>7   | 6.67%<br>5   | 13.33%<br>10 | 26.67%<br>20 | 28.00%<br>21 | 10.67%<br>8  | 75    | 3.31  |
| Reliability                                  | 18.42%<br>14 | 13.16%<br>10 | 18.42%<br>14 | 11.84%<br>9  | 22.37%<br>17 | 11.84%<br>9  | 2.63%<br>2   | 1.32%<br>1   | 0.00%<br>0   | 76    | 6.41  |
| Safety                                       | 4.05%<br>3   | 5.41%<br>4   | 2.70%<br>2   | 10.81%<br>8  | 8.11%<br>6   | 21.62%<br>16 | 18.92%<br>14 | 18.92%<br>14 | 9.46%<br>7   | 74    | 3.95  |
| Wi-Fi access                                 | 1.37%<br>1   | 1.37%<br>1   | 4.11%<br>3   | 0.00%<br>0   | 2.74%<br>2   | 5.48%<br>4   | 9.59%<br>7   | 21.92%<br>16 | 53.42%<br>39 | 73    | 2.14  |





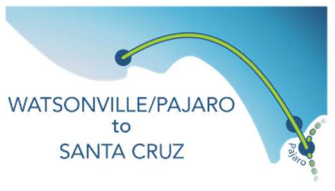
Q6 Do you currently utilize public transit to access any of the following?  
Check all that apply.

Answered: 78 Skipped: 6



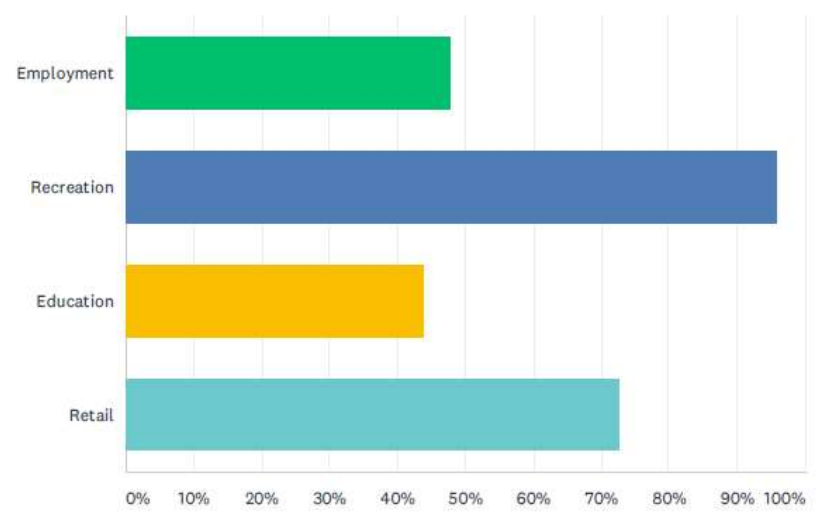
| ANSWER CHOICES                       | RESPONSES |    |
|--------------------------------------|-----------|----|
| Employment                           | 17.95%    | 14 |
| Recreation                           | 32.05%    | 25 |
| Education                            | 5.13%     | 4  |
| Retail                               | 19.23%    | 15 |
| I currently don't use public transit | 58.97%    | 46 |
| Total Respondents: 78                |           |    |





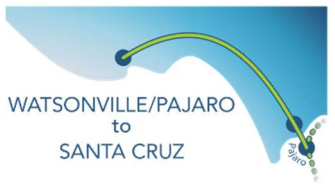
**Q7 Would you utilize the proposed future Transit Corridor to access any of the following? Check all that apply.**

Answered: 73 Skipped: 11



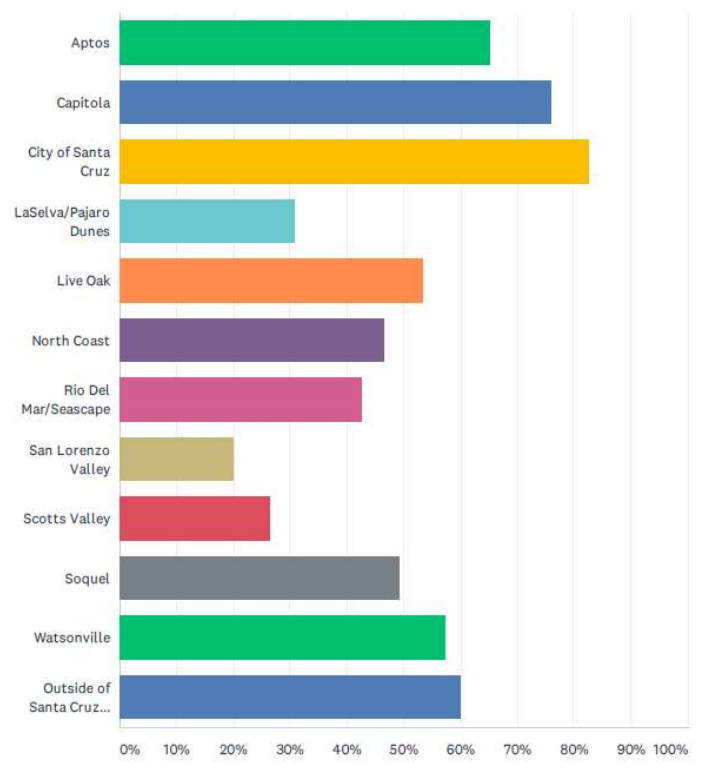
| ANSWER CHOICES        | RESPONSES |    |
|-----------------------|-----------|----|
| Employment            | 47.95%    | 35 |
| Recreation            | 95.89%    | 70 |
| Education             | 43.84%    | 32 |
| Retail                | 72.60%    | 53 |
| Total Respondents: 73 |           |    |



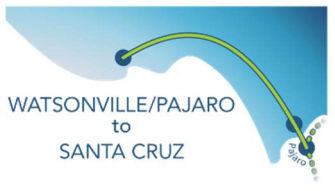


Q8 Which of the following destinations would you use the Transit Corridor to travel to? Check all that apply.

Answered: 75 Skipped: 9







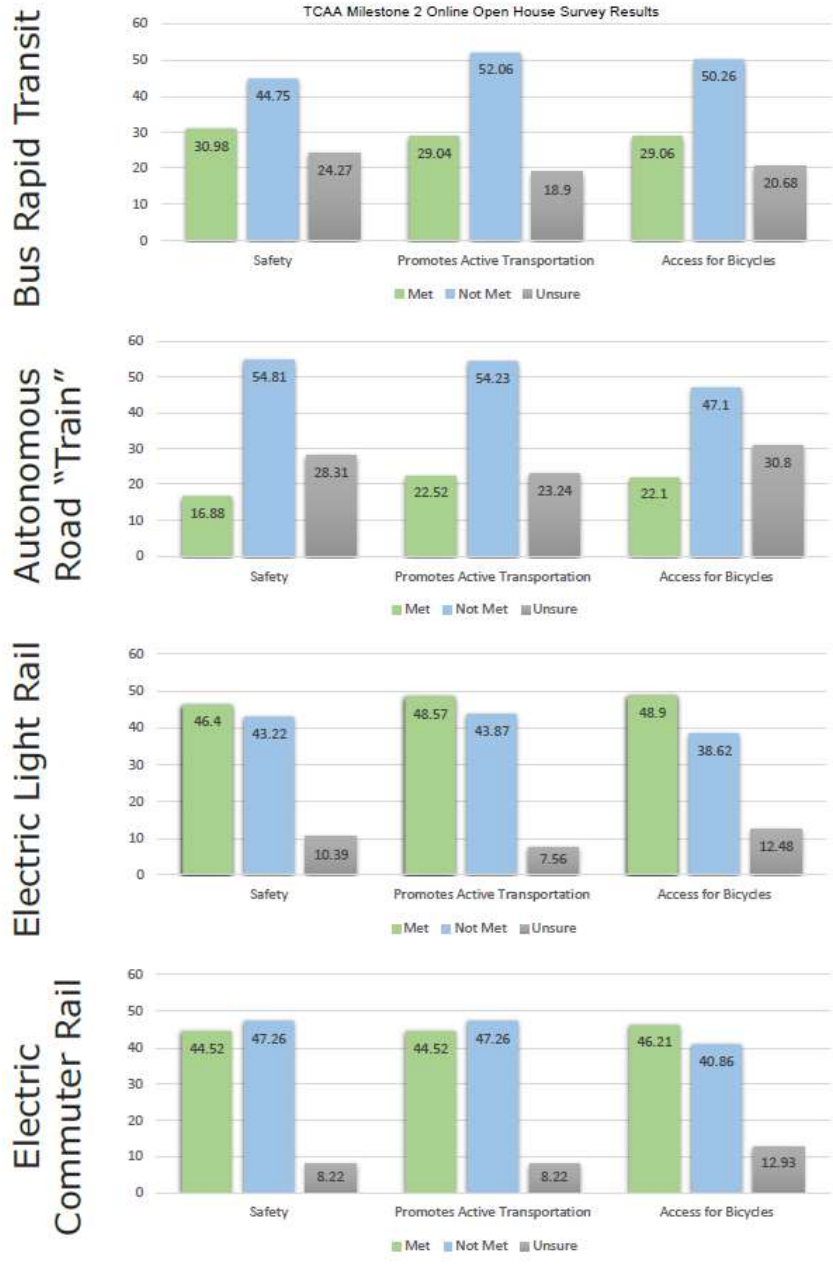
| ANSWER CHOICES               | RESPONSES |    |
|------------------------------|-----------|----|
| Aptos                        | 65.33%    | 49 |
| Capitola                     | 76.00%    | 57 |
| City of Santa Cruz           | 82.67%    | 62 |
| LaSelva/Pajaro Dunes         | 30.67%    | 23 |
| Live Oak                     | 53.33%    | 40 |
| North Coast                  | 46.67%    | 35 |
| Rio Del Mar/Seascape         | 42.67%    | 32 |
| San Lorenzo Valley           | 20.00%    | 15 |
| Scotts Valley                | 26.67%    | 20 |
| Soquel                       | 49.33%    | 37 |
| Watsonville                  | 57.33%    | 43 |
| Outside of Santa Cruz County | 60.00%    | 45 |
| Total Respondents: 75        |           |    |

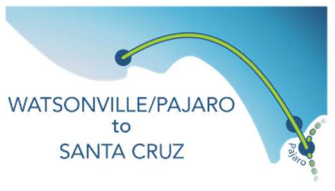
**ONLINE SURVEY MILESTONE 2**  
 Survey open April 13 through May 11, 2020  
 659 total responses





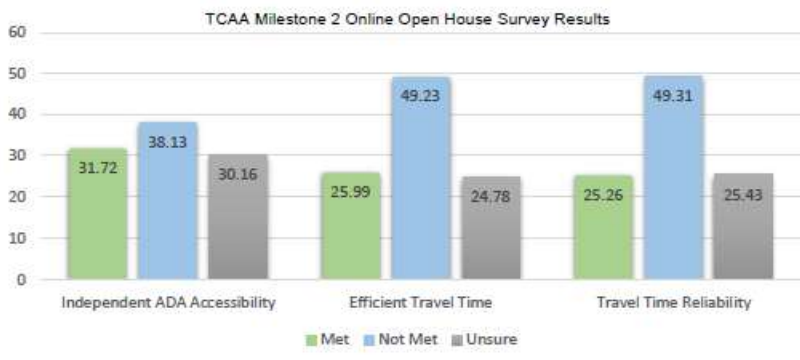
Q1-4 Would your transportation needs be met by any of the four short list alternatives on the Santa Cruz Branch Line? Please indicate which of your travel needs would be met.



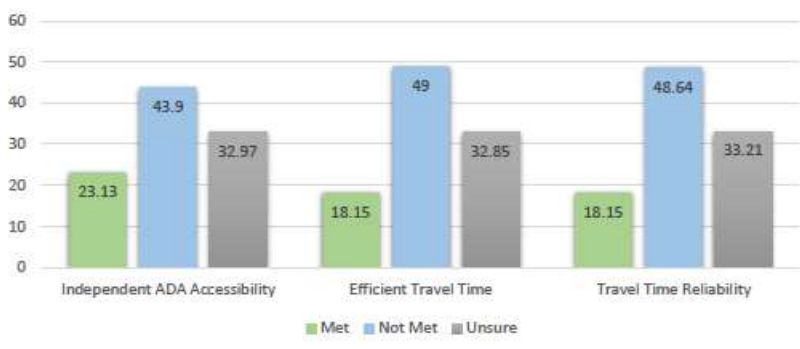


Q1-4 Would your transportation needs be met by any of the four short list alternatives on the Santa Cruz Branch Line? Please indicate which of your travel needs would be met.

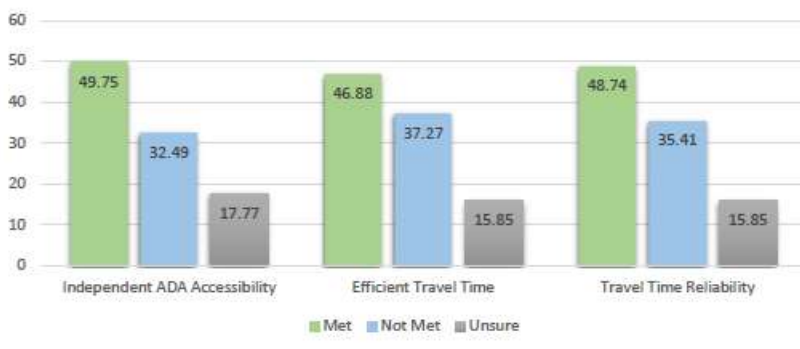
Bus Rapid Transit



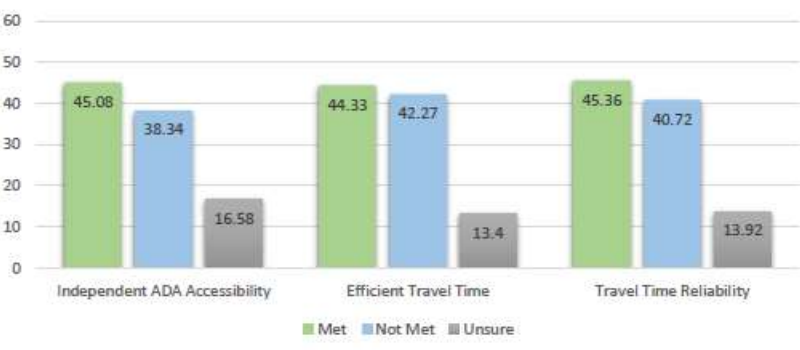
Autonomous  
Road "Train"

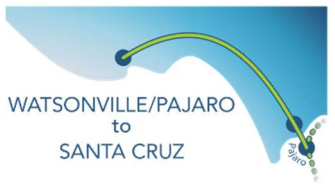


Electric Light Rail



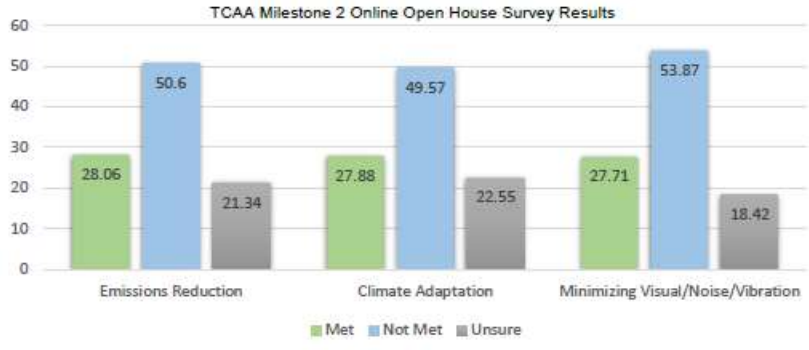
Electric  
Commuter Rail



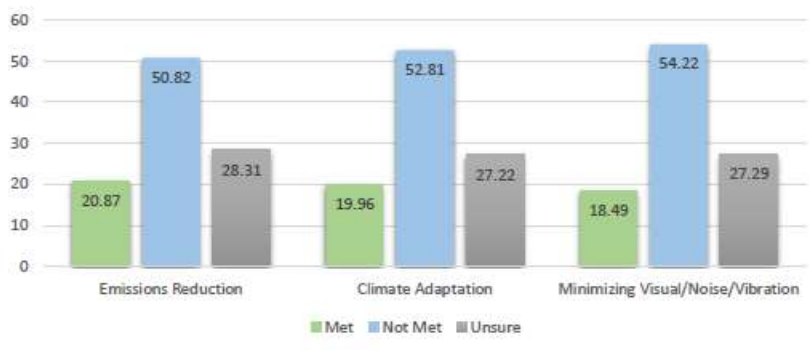


Q1-4 Would your transportation needs be met by any of the four short list alternatives on the Santa Cruz Branch Line? Please indicate which of your travel needs would be met.

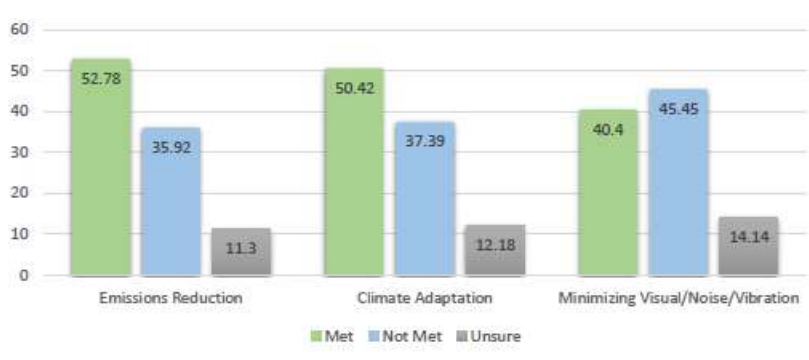
Bus Rapid Transit



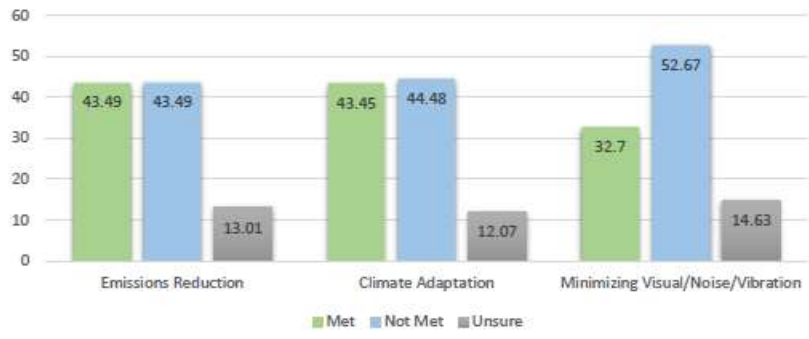
Autonomous  
Road "Train"



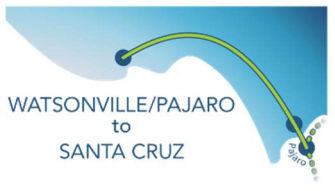
Electric Light Rail



Electric  
Commuter Rail

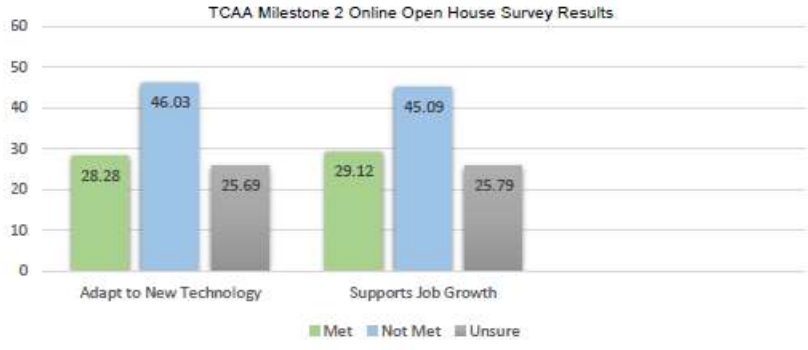




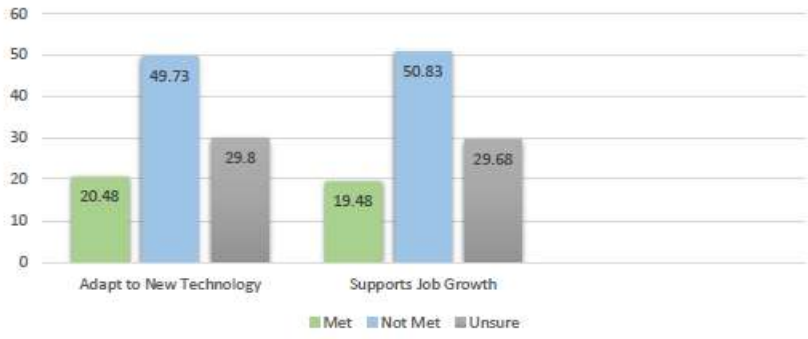


Q1-4 Would your transportation needs be met by any of the four short list alternatives on the Santa Cruz Branch Line? Please indicate which of your travel needs would be met.

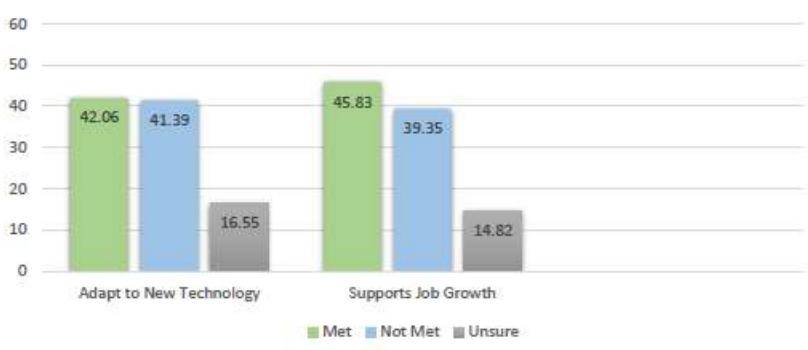
Bus Rapid Transit



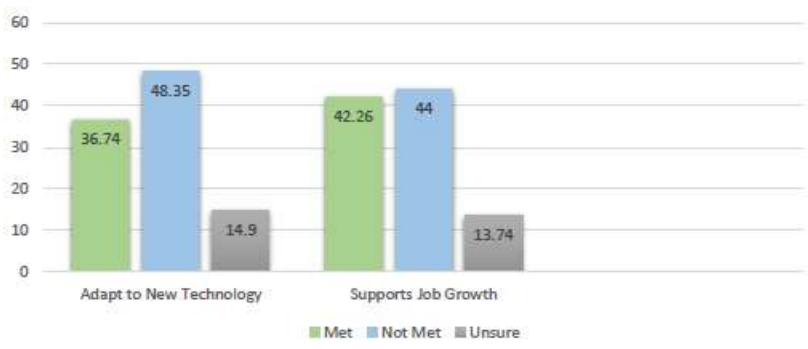
Autonomous  
Road "Train"



Electric Light Rail

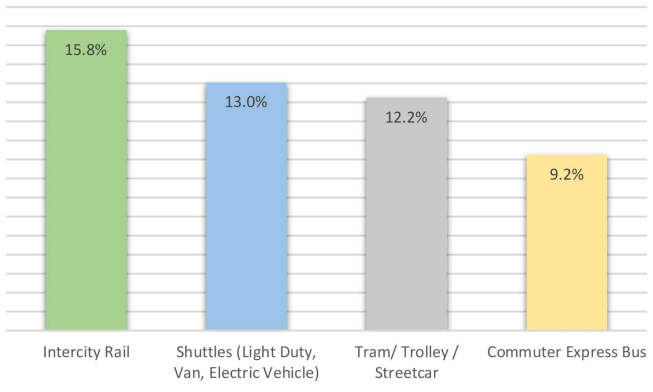


Electric  
Commuter Rail

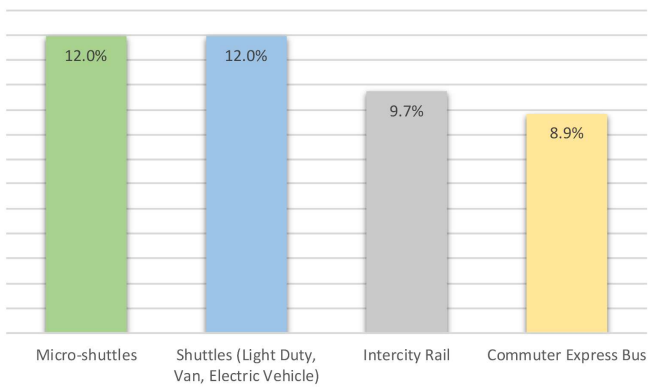




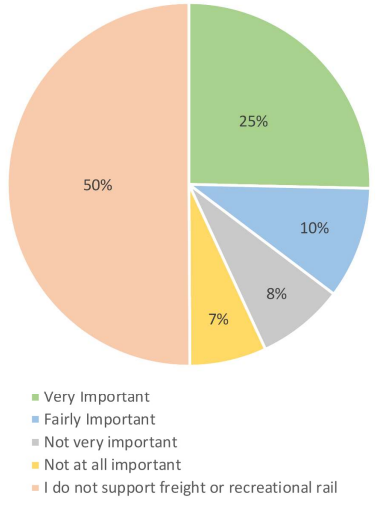
**Q5** Is there another transit alternative not on the short list that would meet your transportation needs? Please select one of the following alternatives and indicate which of your travel needs would be met.  
[top 4 responses]

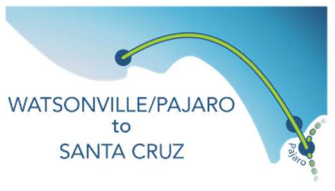


**Q7** Is there a second transit alternative not on the short list that would meet your transportation needs? Please select another one of the following alternatives and indicate which of your travel needs would be met.  
[top 4 responses]

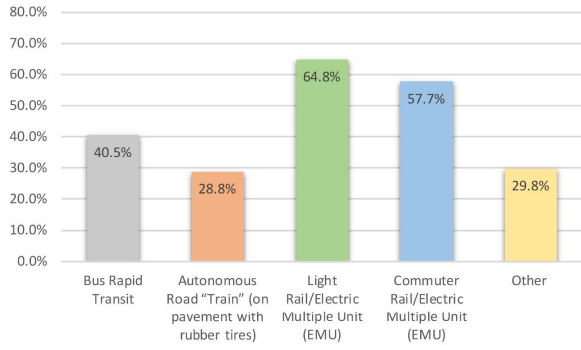


**Q13** How important is it to you that freight and other rail businesses such as recreational trains are continued on the Santa Cruz Branch Line north of the City of Watsonville?

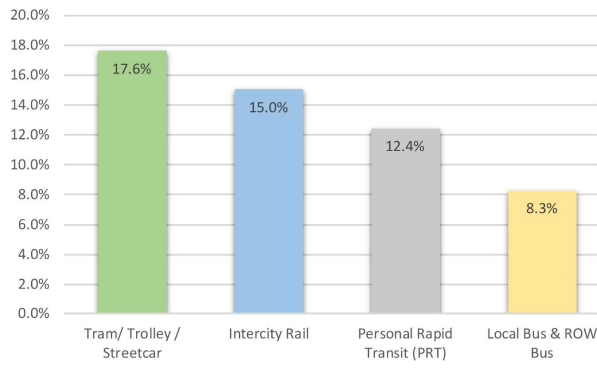




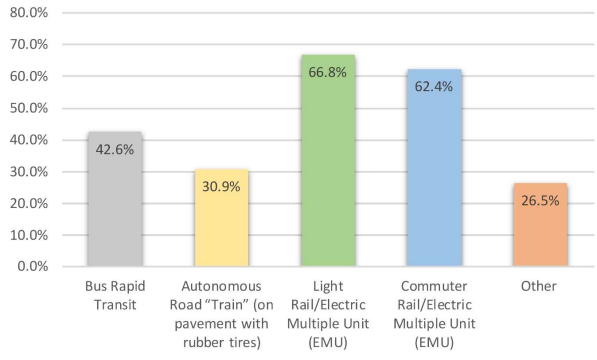
**Q9** Would you choose to live in a residential area or transit-oriented development that is within a half mile of a station for these transit alternatives? Please select all that apply.



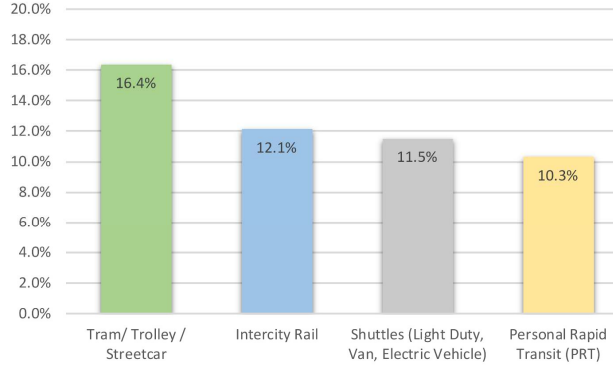
**Q10** "Other" alternatives respondents would live near

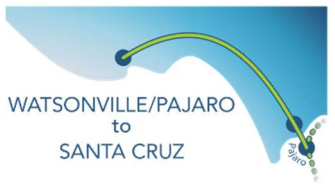


**Q11** Would you choose to work in a transit oriented development that is within a half mile of a transit station for these transit alternatives? Please select all that apply.

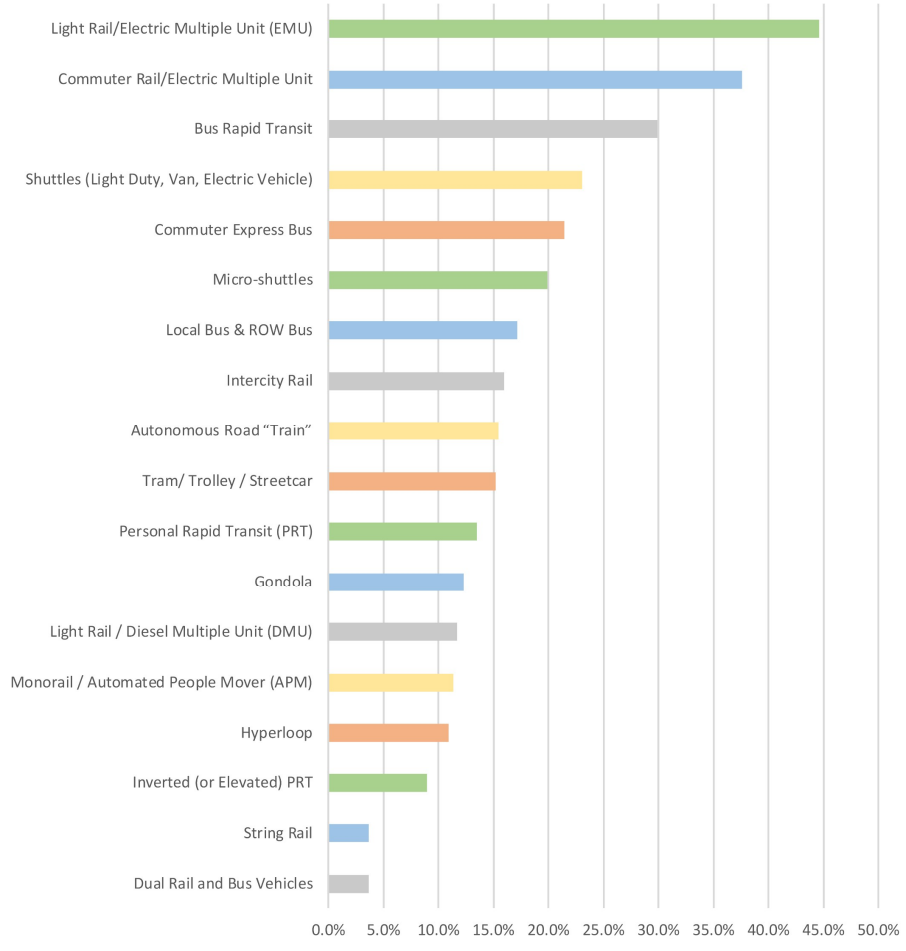


**Q12** "Other" alternatives respondents would work near

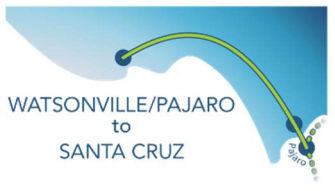




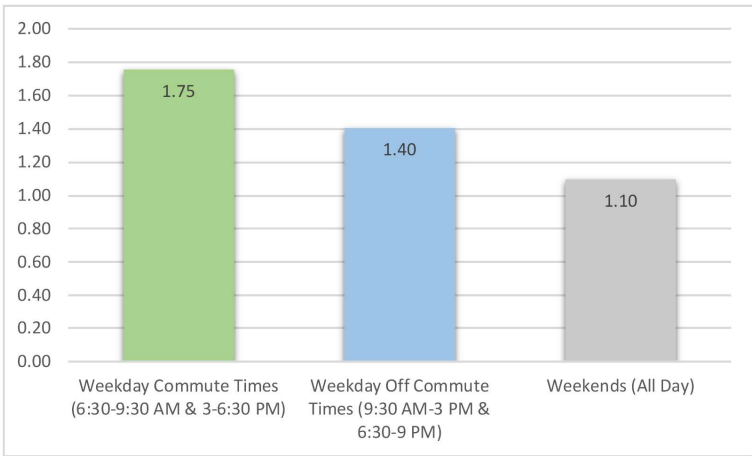
Q16 What four alternatives would you recommend moving forward onto the Short List of Alternatives for a quantitative analysis?

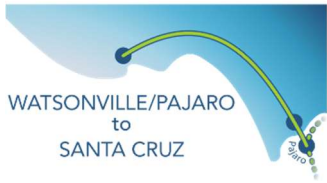






Q14 How many times per week would you take transit on the Santa Cruz Branch Line during these times? Please indicate your number of round trips (from your origin to destination and back) where a round trip is equal to 1.



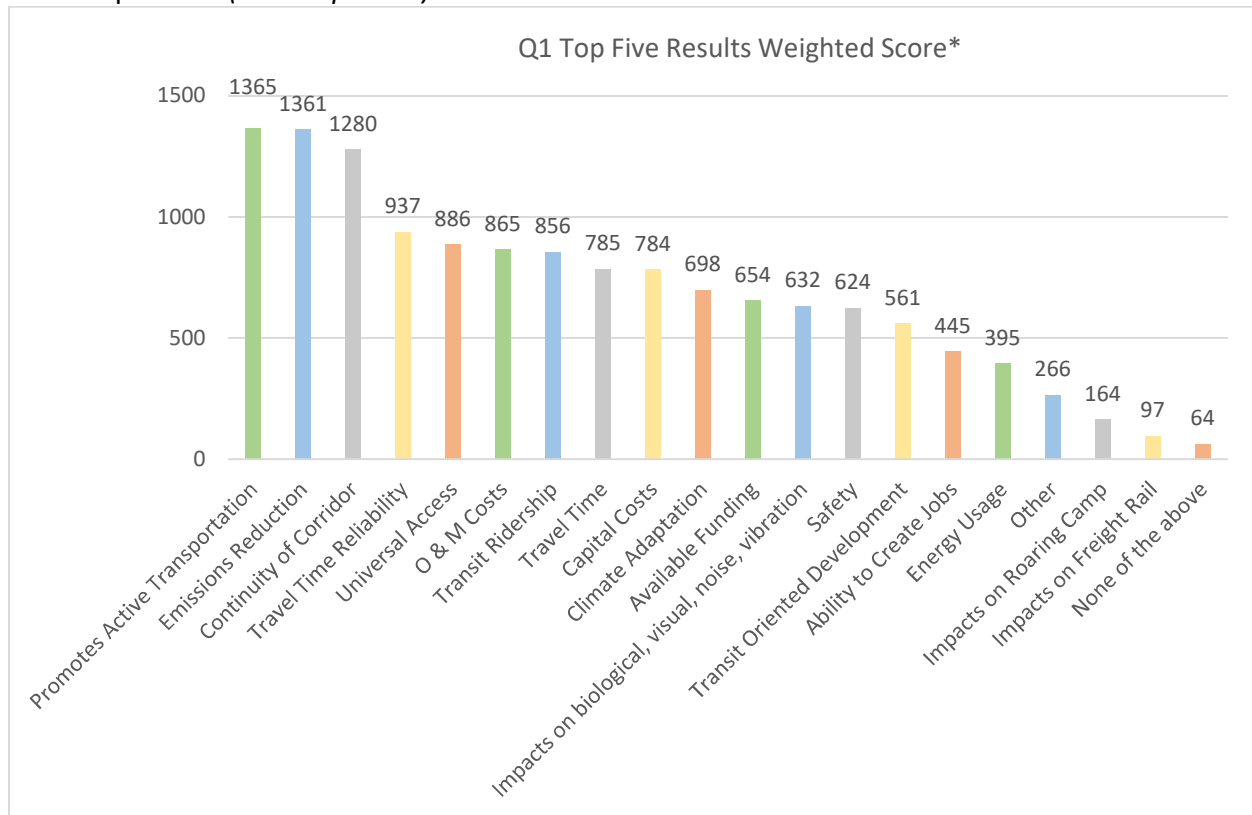


**ONLINE SURVEY MILESTONE 3**

Survey open November 6 through November 27, 2020

1,002 total responses

**Q1.** Please rank the top five performance analysis results that you think should be considered most carefully when selecting the ultimate locally preferred alternative, with one being the most important. *(961 responses)*



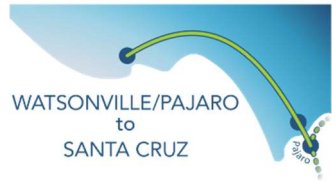
\*Weighted Score = Survey respondents were asked to pick their top 5 elements. Each person's response for #1 received 5 points, #2 got 4 points, #3 got 3 points, #4 got 2 points, and #5 got 1 point. These weighted values were then added up for the totals shown in the graph.

**Q2.** If one of the answers was "Other", please specify. *(92 responses)*

Summary of "Other" open ended responses:

- Number of people who will walk and bike compared to ride transit
- Rail corridor should be for walkers and bikers only/no train
- Benefit/Cost analysis
- Impacts to neighborhood with audio, visual, crime, non-residents, trash
- Access to natural places
- Ability to provide for social distancing
- Ability to implement trail quickly
- Ability for students and workers to get to destinations



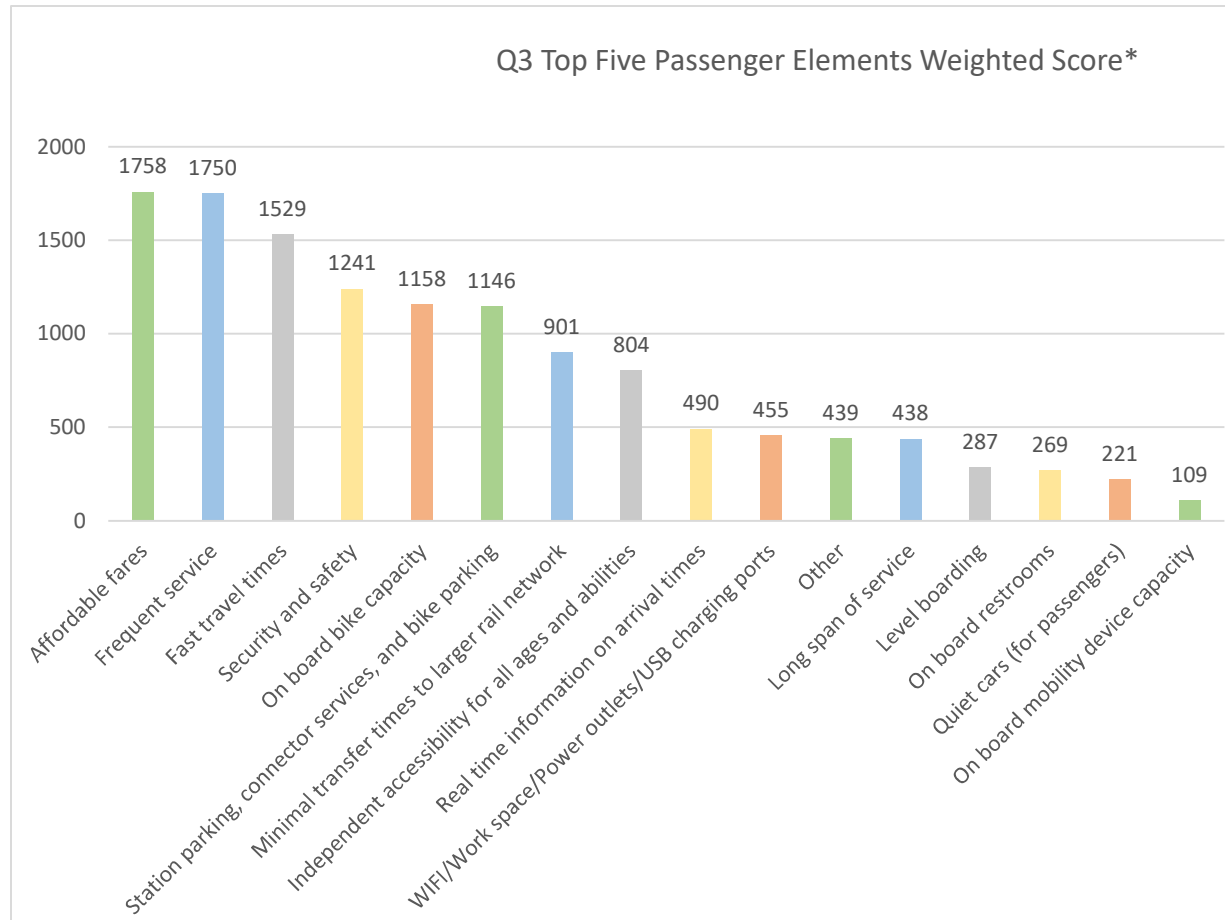


- Ability to keep transit clean, maintained and safe/secure
- Ability to improve quality of life
- Ability to minimize traffic delay at roadway crossings
- Ability to allow for e-bikes
- Ability to connect to Pajaro for regional connection
- Aesthetics of facility
- Ability to increase capacity
- Length of time to implement
- Bicycle capacity
- Lost opportunity for other alternatives





**Q3.** Please rank the top five elements of high-capacity transit on the branch line ROW that would most effectively meet your needs and mitigate your concerns as a passenger, with one being the most important. (942 responses)



\*Weighted Score = Survey respondents were asked to pick their top 5 elements. Each person's response for #1 received 5 points, #2 got 4 points, #3 got 3 points, #4 got 2 points, and #5 got 1 point. These weighted values were then added up for the totals shown in the graph.

**Q4.** If chose "other" explain here. (105 responses)

Summary of "Other" open ended responses:

- Safe, convenient walk and bike connections
- Separated walk and bike paths with separation from walls and fencing
- I will not ride transit regardless of the options as it will not serve my needs.
- Ability to social distance
- A dedicated funding source other than fares
- Ability to bring beach gear such as surfboards onto transit
- Clean, safe and secure ride
- Connections to many origins/destinations

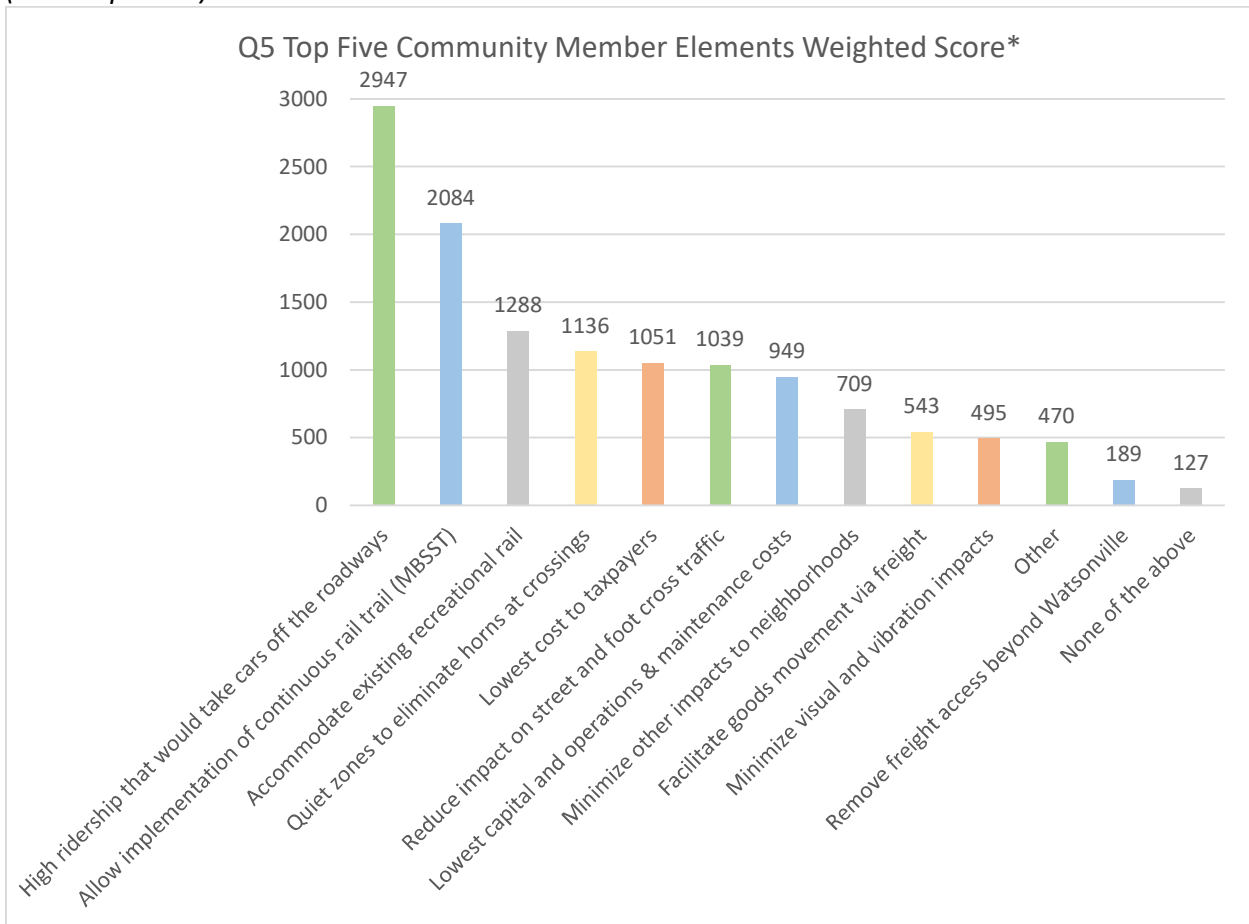






- Rail transit will not meet my needs
- Reliable service
- Provide a station at La Selva
- Fare integration with buses

**Q5.** Please rank the top five elements of high-capacity transit on the branch line ROW that would most effectively meet your needs and mitigate your concerns as a community member. (958 responses)



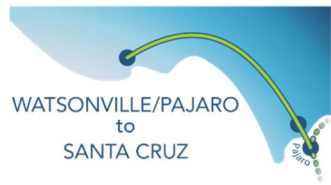
\*Weighted Score = Survey respondents were asked to pick their top 5 elements. Each person’s response for #1 received 5 points, #2 got 4 points, #3 got 3 points, #4 got 2 points, and #5 got 1 point. These weighted values were then added up for the totals shown in the graph.

**Q6.** If you chose “other”, please specify. (155 responses)

Summary of “Other” open ended responses:

- Minimize damage to local ecosystems and risk to wildlife
- Fastest time to implement
- Maximize the number of jobs

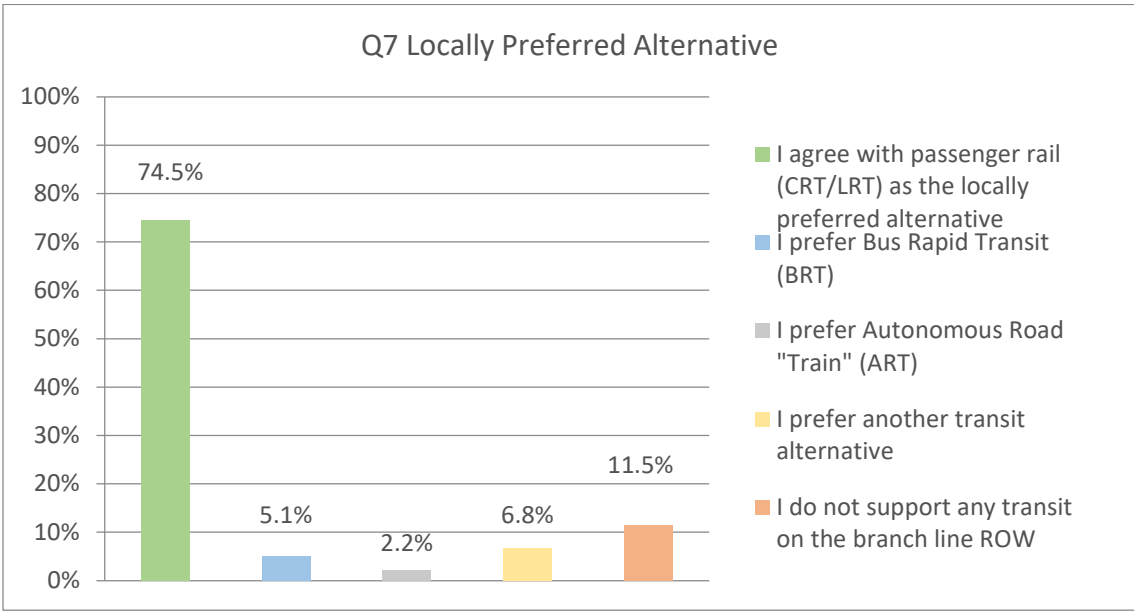
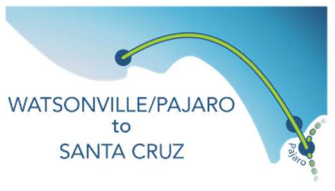




- Impact to a premium trail only
- Importance of utilizing existing infrastructure
- Eliminate impacts not just minimize
- Ability to provide for social distancing and other considerations for pandemic situations
- Reduction of noise and vibrations using sound walls and sound dampening of wheels
- Fastest travel time during rush hour
- Lowest cost to taxpayers for operations and maintenance
- Maintain easements without concern for lawsuits
- Reliable connections
- Expansion of bike network that connects to rail stations
- Start phasing in rail on parts of the rail line
- Rail would not meet my needs regardless of how it is implemented
- Just want the trail only now without any transit
- Use the newest technology
- Use electricity for power
- Main concern is noise and safety for neighborhoods
- Get funds from state to implement
- Create revenue from tourist travel
- Provide equitable transportation using an existing resource
- Find a way to have highway users help pay since they benefit from reduced congestion
- Offer low fares to motivate people to use transit in place of driving
- Interconnectedness to region and rest of state
- Maximize operational flexibility/efficiency for Santa Cruz Big Trees
- Minimize impact at roadway crossings
- Serve recreational and sight-seeing needs, definitely a stop at La Selva Beach

**Q7.** Please share your opinions regarding the proposed options for a Locally Preferred Alternative. (976 responses)

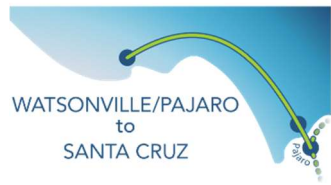




**Summary of "Other" responses:**

- Paved bike and pedestrian trail/greenway
- Trail/pathway for personal electric mobility devices including ebikes, mopeds
- Robust network of electric buses and vans
- Personal Rapid Transit
- Electric/solar gondolas or people movers
- Wide trail with separation between pedestrians and rubber wheeled users
- Widen the highway and assume cars are electric so pollution not an issue
- Bikes that can use the rail
- More bus service throughout the county and Bus Rapid Transit on Highway 1
- Smaller rubber wheeled vehicles in corridor with max speed 20 mph
- Bus on shoulder on Highway 1
- Micro-electric buses shared with bikes and pedestrians
- Magnetic train/hyperloop paid by Musk as a demonstration of viability



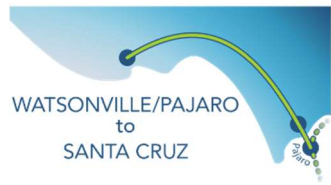


**Q8.** Please briefly explain the reason for your opinion regarding the proposed options for a locally preferred alternative. (565 responses)

Summary of responses:

- Reasons to have rail
  - Need alternatives to driving
  - Will have low cost, low impact and high usage once established
  - Need to plan for future
  - Universal access, equitable for differently abled and people who don't own vehicle
  - Addresses climate concerns, cleanest option for decreasing emissions, environmentally friendly
  - Set up rail now so available for the future as region is growing
  - The tracks exist already, fortunate to have tracks to build from and not have to start from beginning
  - More attractive than buses, bus rides are rough and uncomfortable
  - Decrease traffic and congestion on Highway 1, and reduce driving
  - Best option for largest group of people
  - Safe, reliable, convenient, economical, accessible, and senior friendly
  - Supports greatest bike capacity for first and last mile
  - More use of existing infrastructure than a bike trail
  - No need for highway widening
  - Will have higher ridership, work well with bike/ped trail and advances the State Rail Plan
  - Part of vision for an integrated low carbon transportation system
  - More room for mobility devices
  - Provides level boarding
  - Equity for south county residents that commute to north county
  - For rail that includes greatest reduction in noise/vibration for neighbors/wildlife
  - Support train but must be economically feasible
  - Step toward a comprehensive rail mass transit system in California
  - Connect Santa Cruz to the regional and statewide rail network
  - Scalable as ridership increases
  - More enjoyable to get around on rail than other options
  - Will transform the transit system in Santa Cruz County leading to an improved quality of life and more prosperous community
  - Rail transit that should be free, fast and energy efficient





- Reasons to have rail (continued)
  - Important to use corridor for rail given the dense, affordable housing that is planned for the county
  - Viable all-weather transportation solution
  - Easier to travel to destinations where parking is difficult
  - Desperately need an alternative route across our county and we already have the tracks for rail transit and combined with the trail you have the most efficient system
  - Will serve commuters and visitors
  - Transit of the present and future
  - Can provide the “backbone” of a transit system
  - Using Rail corridor for passenger rail, freight, and a trail protects our community into the future
  - There are places we would like to go for fun without sitting in traffic
  - Would visit downtown Santa Cruz and Capitola more often with rail option so could avoid traffic
  - Uses the full width of the transportation corridor
  - Buses get stuck in traffic on the roads
  - Only option that will provide for needs of today and room to grow in the future
  - Rail would provide a way for people to travel car free for those who cannot walk many miles or ride a bike
  - It is problematic to rely on Highway 1
  - Better connection to Cabrillo College campuses in both Aptos and Watsonville
  - Consistent with getting serious about global warming
  - Preserves the easements on the right of way
  - Would improve quality of life in Santa Cruz County by providing another option for commuting
  - Santa Cruz does not currently have rapid transit and it would benefit everyone
  - Allows for future possibility for freight
  - Puts less vehicles on the road
  - Transit option that can accommodate residents and tourist travel
  - Rail is the reason that the county purchased the line, decision to have rail and trail has been 20 years in the making
  - Will extend distance people can travel in combination with bicycle
  - Will reduce energy needs
  - Modernize infrastructure, cars and highways are not sustainable
  - Connect with METRO for single payment app and real time information
  
- Reasons to have rail (continued)







- Could market to out of towners as a fun outing including rail to bring in revenue, may be most beautiful rail route in state
  - People like rail travel better than buses
  - Has highest capacity
  - Restore regional rail connectivity and statewide rail system and create future connection to high-speed rail
  - Use the right-of-way for the greatest number of uses
  - If consider the real cost of people driving their own cars with few passengers, trains can be cheaper when consider the community-wide expense.
  - Light rail will offer more access and have less impacts to businesses and neighborhoods
  - Provide low income people an affordable means of transportation
  - Will facilitate transit-oriented development unlike buses that can keep changing routes
  - Need more transit options
  - A system that does not rely on our busy roads is necessary
  - Will be quiet, comfortable and serve many Watsonville residents currently stuck in Highway 1 traffic
  - Rail limits the amount of asphalt paved areas
  - Trail/light rail will serve as a backbone of a systemwide mobility solution to reduce auto use, reduce carbon emissions, and enhance lifestyle
  - Rail is most efficient way of moving large quantities of people and goods
  - Safe, efficient option for kids to travel without adults
  - BRT has little benefit for the investment
  - Rail is the most compatible with biking
  - Rail with 15-minute frequencies allow for riders to limit the amount of planning that would be needed if have 30 minute or longer headways
  - Commuter rail with less stops makes more sense than light rail with more stops and thus longer travel times
- Reasons to not have rail
    - The cost of repair of existing line, maintenance and operations will never be cost effective
    - Rail does not serve areas of high-density housing, job centers or other major destinations
    - No one will ride a train and have to take a second travel option to get to their destination





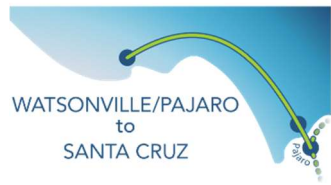
- Reasons to not have rail (continued)
  - Trains are not successful in places with a larger population let alone Santa Cruz County, examples include SMART in Marin and Sonoma that is not self-supporting
  - Will harm county finances and community well-being
  - Transit needs to be point-to-point like a car in order to compete with cars
  - Not flexible enough, rail is heavy and fixed
  - Do not want to pay more taxes
  - Rail will not divert many cars off the road
  - Most of the traffic on Highway 1 are commuters that go over the hill for jobs and rail will not get people there
  - Waste of taxpayer money which can be used more effectively to expand Highway 1
  - The speeds being suggested will not support low noise and safety
  - Concerned about the Monarch butterfly habitat along Park Ave
  - Train would not be equitable, will lead to gentrification of Watsonville, regressive taxes, and industrialization of the corridor. Social justice would be better addressed by bringing affordable housing near job centers.
  - Bus on shoulder of Highway 1 would be much more cost effective and could be built in a shorter amount of time
  - Do not want it in my backyard
  - Expensive upgrades to mass transit seem ill-considered in light of Covid-19, existing infrastructure is more adaptable to whatever the future holds
  - Neighborhoods will not have noisy trains impacting them
  - Taxpayers will not approve a new tax for rail operations, why continue pursuing a plan that cannot be financed?
  - Rail would not be operational for decades
  
- Reasons for trail only
  - Too expensive to have rail
  - Least impact on the environment
  - Will get people out of their cars
  - Rail will not be built in your lifetime
  - People want to bike, e-bike, e-skateboard, rail is 19<sup>th</sup> century
  - A wide, smooth, well-lit, safe path is most effective plan
  - Invest in transit on Highway 1 in bus on shoulder and high occupancy vehicle lanes
  - There are no dedicated county-wide active transportation routes





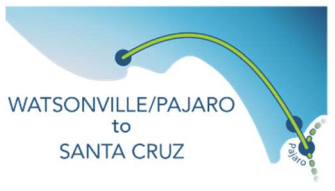
- Reasons for trail only (continued)
  - Coast is precious and want an environmentally friendly solution
  - Support trail that allows e-bikes as need individual transport, minimizes environmental and neighborhood impact, less cost and need for eminent domain, subsidize e-bikes
  - Build trail now but keep tracks for possible future development
  - Spend money on low income housing and not rail
  - Rail would only benefit a small percentage of the population, but trail only benefits everyone with no noise, no pollution
  - Not enough transit ridership to justify the capital investment
  - Corridor does not go where people work and I don't want a tourist train
  - Trail will benefit an active lifestyle
  - Potential for the most amazing biking/walking trails in the world, implemented quickly and without a great cost
  - Train should be on the highway near established commuter parking
  - Follow lead of Monterey and rip up the tracks for a nice wide bike trail
  - Corridor is too narrow for rail and trail, rail is outdated and not the right fit for our county, put transit on Highway 1 and Soquel/Mission
  - Safe bike paths for families and kids
  - Many communities have converted rail corridors to dedicated bike/e-bike, trains are floundering and creating an economic disaster
  - Rail corridor was built for freight and cannot scale to 21<sup>st</sup> century transportation needs
  - Use right of way for express cycling
  - Train will be loud, dangerous, and block surface traffic
  - Can bike all year round and community values exercise, trail is long overdue
  - Conserve Measure D funds for transportation improvements not a rail plan with no funding for operational costs
  
- Reasons for BRT
  - More flexible, lower costs, more riders, more frequent
  - Won't divide neighborhoods
  - Least impact on neighborhoods
  - METRO already has natural gas buses and could implement electric
  - Ability to phase implementation as sections are built
  - Existing rail will need to be replaced and rail stops are not where people want to go
  - Simpler to share the right-of-way with bus and trail rather than rail and trail



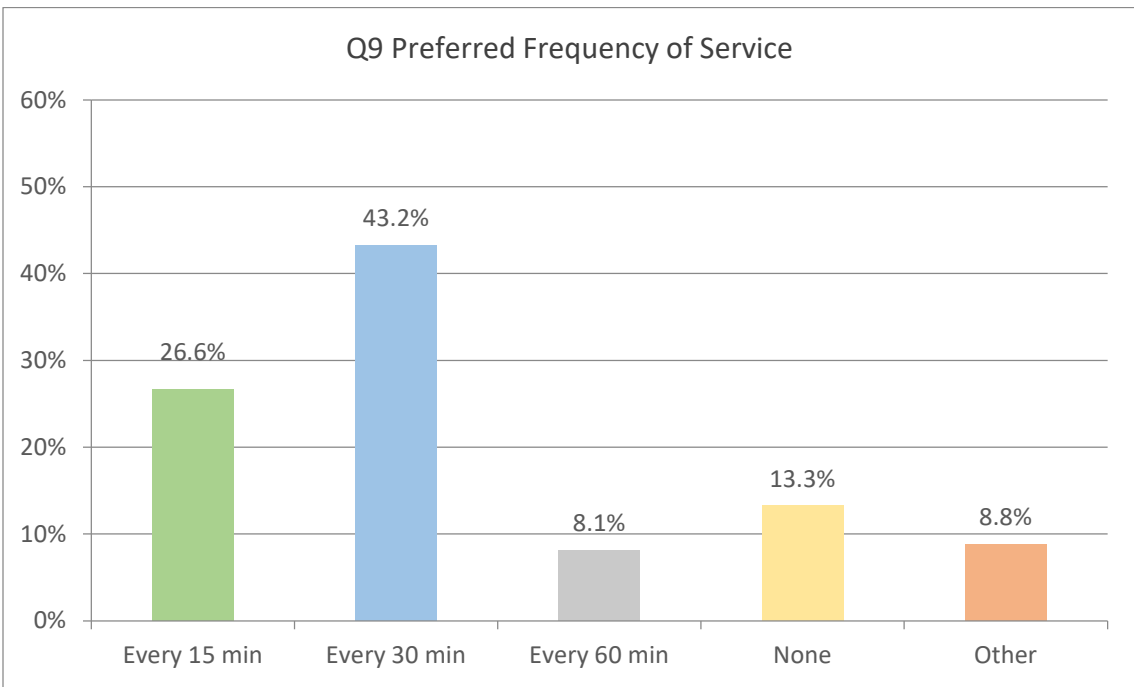


- Reasons for BRT (continued)
  - Buses are safer
  - Provides more access points
  - It can be implemented quicker
  - Take advantage of existing infrastructure, make bus direction one way with return direction on Highway 1
  - Bus service already exists and is therefore easier to expand
  - Less expensive and thus would allow more frequent service which is most critical
  
- Reasons for Personal Rapid Transit (PRT)
  - Could provide benefit and mitigate problems of other options
  - Fast on-demand service, convenient, less energy use compared to rail
  - Could add branches over time to expand coverage
  - Safer during Covid-19
  - Elevated PRT allows for wider, safer trail
  - Can be implemented in phases
  
- Other
  - Railbanking is not likely to ever allow rail to be brought back so do not remove rails now
  - Utilize rail bikes while waiting for electric train
  - A gondola system is best solution and would be cheap once ski resorts close due to global warming, would be two way and attract tourists with spectacular views and leave space for trail





**Q9.** What is your preferred frequency of service? (965 responses)

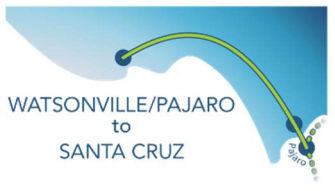


Summary of “Other” open ended responses:

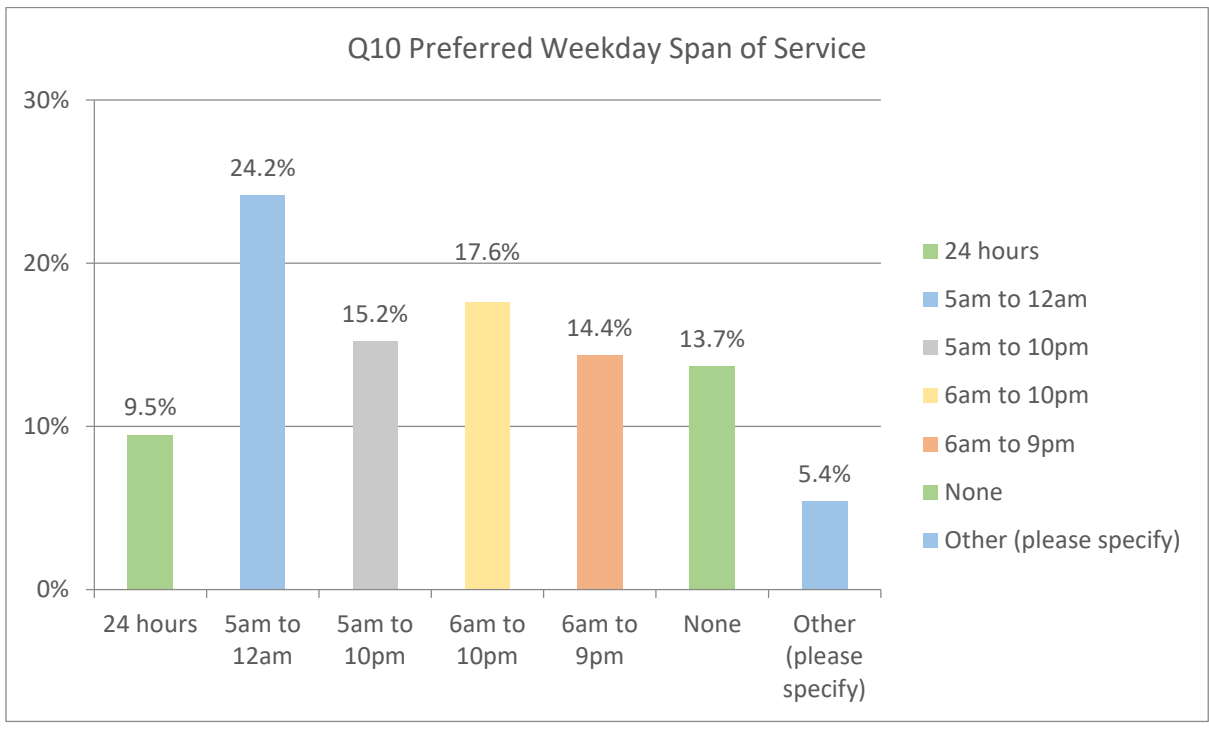
- No mass transit on corridor
- Bikes/ebikes allow your own timing and time of day
- No preference
- 15 minute peak, 30-60 minute off peak
- 30 minute peak, 60 minute off peak
- Base frequency on trials
- As needed for connections
- Base frequency on ridership
- 20 minutes peak, 40 minutes off peak
- Grant programs for transit-oriented development prefer 15 min headways
- Frequency should depend on the station location
- 10-15 minutes peak, 20-30 minute near peak, and 30-45 off peak
- As frequent as possible
- On demand
- At least 4 departures daily in each direction
- Depends on day/time
- Similar to current bus system







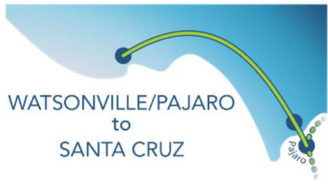
**Q10.** What is your preferred weekday span of service? (959 responses)



Summary of "Other" open ended responses:

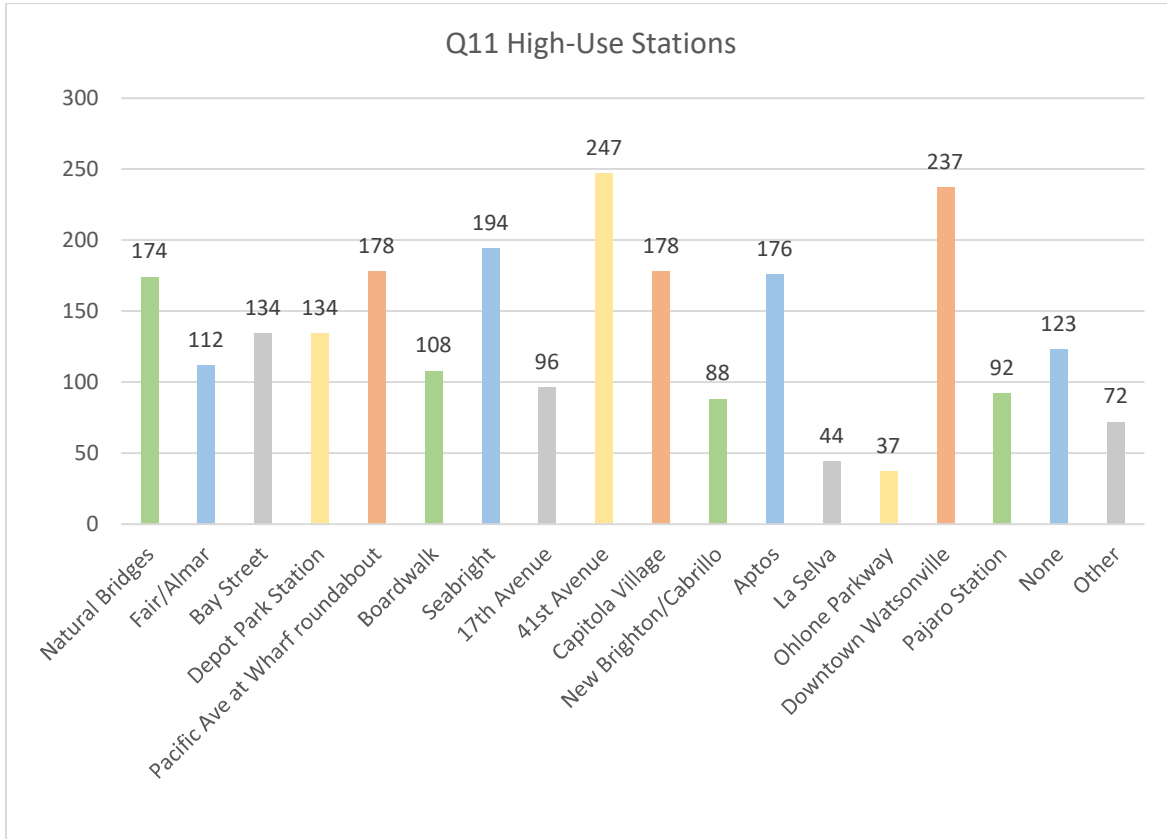
- 6AM to 11PM
- No preference
- 7AM to 8PM
- Base on trials
- Make affordable initially and then increase hours
- Base on ridership demand
- 7AM to 10:30PM
- To be determined by users
- 6-9AM and 4-7PM
- 7AM to 11PM
- 7AM to 10PM
- Late hours on Friday and Saturday to reduce drunk driving
- Seasonal
- 1 hour before dawn to midnight
- 6AM to 12AM
- Later in the evening so can go out at night and take home
- Bike trail would have 24/7 flexibility
- No train





- 8AM to 2AM

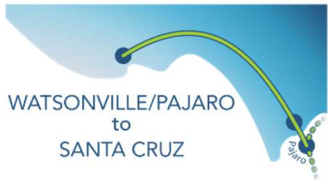
**Q11.** What stations would you primarily use? Please select up to three. (1002 responses)



Summary of “Other” open ended responses:

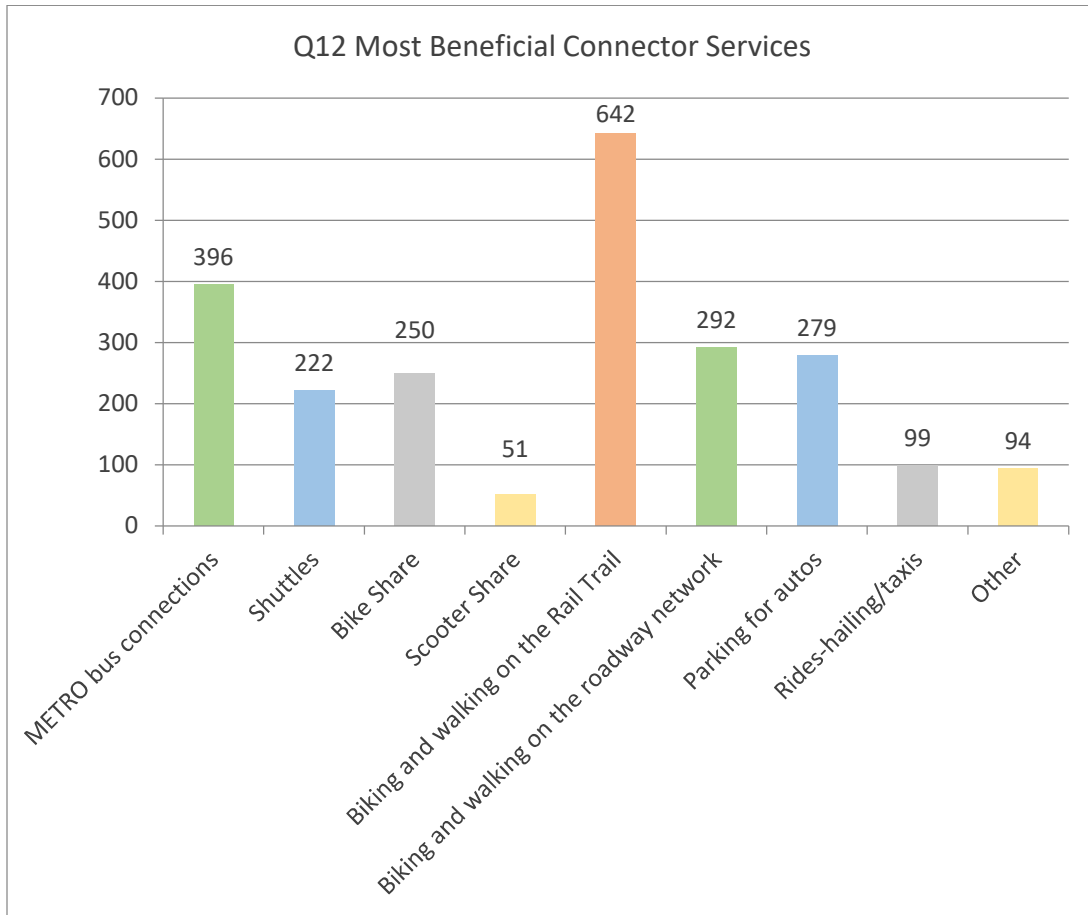
- 7<sup>th</sup> Ave
- Main Street
- Downtown SC
- UCSC
- Roaring Camp Station in Felton
- Jade Street Park
- Davenport
- San Lorenzo Valley
- Near Westside Safeway
- Scotts Valley
- Midtown
- Seacliff
- Closer to downtown





- Seascape Resort
- River St
- Park & Balboa
- Freedom
- Airport Blvd
- Green Valley Rd
- Seacliff at State Park and Searidge
- Monterey/Salinas
- No train

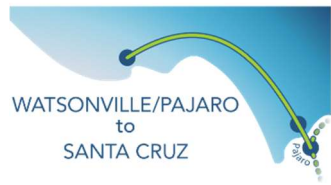
**Q12.** What connector services would benefit you most? Please select up to three. (1002 responses)



Summary of “Other” open ended responses:

- Monterey Salinas Transit
- No train





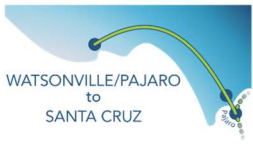
- Trail Only
- None
- Free park and ride
- AMTRAK
- Capital Corridor
- Caltrain and Monterey train
- Personal Rapid Transit
- Cable propelled transit to UCSC, Cabrillo, Soquel Drive Medical area
- BART
- Guideway loops
- Connection to San Jose
- Connection over 17 and to San Francisco
- BRT that goes to destinations
- Connection to San Lorenzo Valley without taking a bus
- Connections to national rail network
- Highway 17 Express
- Safe bike lockers at station
- Connections to Cabrillo
- Connect to high speed rail



## **APPENDIX F – Travel Modeling Approach**

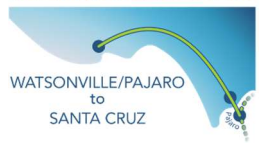


## **APPENDIX F – Travel Modeling Approach**



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## INTRODUCTION

The Santa Cruz County Regional Transportation Commission (RTC), in cooperation with the Santa Cruz Metropolitan Transit District (METRO), is preparing the Transit Corridor Alternatives Analysis (TCAA) study for high capacity public transit on the existing rail right of way. RTC acquired the Santa Cruz Branch Rail Line (SCBRL) in 2012, providing an opportunity for Santa Cruz County to consider a dedicated transit facility that runs and serves the length of the County, as well as proposing potential inter-county and interregional connections to the Bay Area, Monterey, Gilroy, and beyond. The TCAA will focus on the evaluation of public transit investment options that provide an integrated transit network for the County, utilizing all or part of the length of the rail right of way, between Pajaro Station (Watsonville) and Shaffer Road (Santa Cruz).

To complement the transit expansion alternatives analysis, the region is also evaluating ways to improve access to transit, including non-motorized connections and the potential for future technologies to aid in transit access. Recent transit projects and expansions of existing transit lines in the County have incorporated non-motorized facilities that provide recreational and commuting options along exclusive transit corridors. Bicycle and pedestrian paths are supplementing traditional transit modes, as well as the potential for Bus Rapid Transit (BRT), commuter rail, light rail, and busways. In addition, new forms of alternative transportation modes are emerging, combining new vehicle technologies with non-motorized travel. The TCAA presents an exciting opportunity to potentially incorporate one or more of these modes into a progressive and versatile transportation system that utilizes the SCBRL corridor to meet the needs of Santa Cruz County.

A performance-based planning approach, based on the triple bottom line goals of economy, environment and social equity, is being utilized to assess various transit alternatives in the TCAA. A phased analysis transit ridership and market analysis approach is being used to support the TCAA:

1. Initial demand assessment to support initial alternatives screening
2. Transit market analysis to support value engineering and alternatives refinement
3. Ridership modeling to evaluate final project alternatives



## DATA FOR RIDERSHIP ANALYSIS

### SANTA CRUZ COUNTY TRAVEL DEMAND MODEL

The Santa Cruz County Travel Demand Model (SCC Model) is a 4-step travel demand model using the TransCAD software platform designed to forecast future travel patterns on both roadway and transit routes throughout Santa Cruz County (SCC). The SCC Model is being used to assess how changes in population, employment, demographics and transportation infrastructure affect travel patterns within the County. Data built into the SCC Model comes from a multitude of sources including the 2010 Census, 2012 American Community Survey, and the inputs/assumptions from the Association of Monterey Bay Area Governments (AMBAG) travel demand model. Data used for estimation, calibration, and validation of the SCC Model includes the 2012 California Household Travel Survey (CHTS), the 2012 Transit On-Board Survey, and traffic count data collected by Caltrans and others.

The SCC Model is being utilized to support all three transit ridership and market analysis phases of the alternatives analysis. In the initial screening and market assessment phases, the SCC Model is being used to provide the vehicle/person trip origin-destination and land use data; in the last phase, detailed alternatives analysis, it is being used as the primary tool for ridership forecasting and travel time evaluation.

The SCC Model was made available to support the TCAA via the Santa Cruz County Regional Transportation Commission. It was last applied as part of the Unified Corridor Investment Study (UCS) that was completed in 2019. The SCC Model was updated again by the County of Santa Cruz and its consultant in early 2020 to reflect a 2019 base year and a 2040 horizon year scenario. The latest SCC Model files are being used to support all three modeling phases of the TCAA, including:

- Land use / demographic data for baseline and horizon year
- Network files for roadways and transit routes
- Model scripts and supporting files to conduct model runs (for all 4-Steps of the Modeling Process)
- Model documentation.

### ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS REGIONAL TRAVEL MODEL

The Association of Monterey Bay Area Governments (AMBAG) regional travel model has a similar structure as the SCC Model. It is also a 4-step travel demand model using the TransCAD software platform. The model covers streets and highways within the greater Monterey Bay



Area, including Santa Cruz County, San Benito County, Monterey County, and external gateways that connect to other neighboring counties.

The AMBAG Model was last updated in 2018 and has a base year of 2015 and a horizon year of 2040. The AMBAG Model was used to develop the region's 2040 Metropolitan Transportation Plan (MTP). Origin/Destination (O/D) travel flows for both Baseline (2015) and 2040 Conditions from the AMBAG Model are being utilized in the TCAA modeling process to provide an estimate of inter-county travel flows between Santa Cruz County and neighboring counties during various time periods of the day. This information is being used to adjust the station weights and cross-county flows in the SCC Model as part of the market analysis and ridership modeling for the detail alternatives (e.g., phase 3 of this modeling approach). The AMBAG Model is available for use in the TCAA via AMBAG. Model files being used to support the TCAA include:

- Land use / demographic data for baseline and horizon year
- Network files for roadways and transit routes
- Model scripts and supporting files to conduct model runs (for all 4-Steps of the Modeling Process)
- Model documentation

### STREETLIGHT DATA

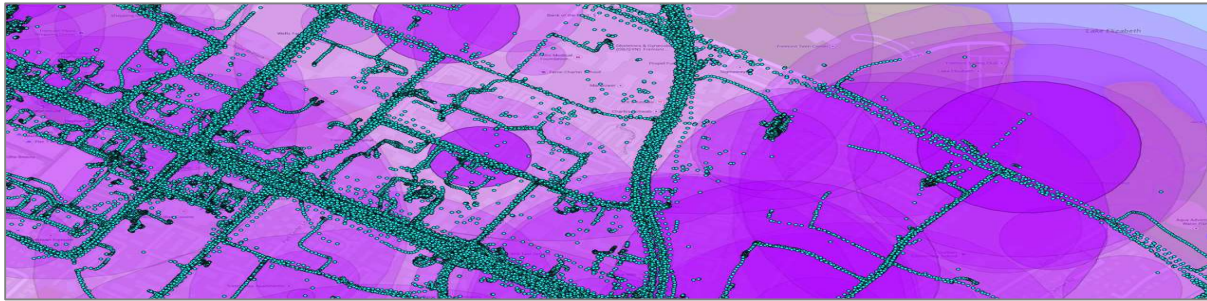
StreetLight Data is a third-party vendor that aggregates anonymous location-based service (LBS) and GPS data, and develops a table of "origin-destination (OD) points" for each mobile device. LBS data is generated by mobile applications and is best suited for measuring people's traveling activities over a given period of time, including times when their device is at rest, which complements the GPS-based data that only measures when a device is in motion. LBS allows StreetLight to ascertain complex activity-based metrics such as classifying devices into residents, workers, and visitors to a geographic area, travel origins and destinations, and the determination of each device's home and work location as well as the purpose of their trips.

**Figure F.1** shows an example of the concentrations of origin and destination flows available from StreetLight.





**Figure F.1: Example of GPS data traces showing the location of devices over time and concentrations of origins and destinations**

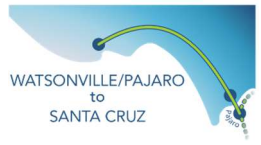


StreetLight data is being used to supplement travel models in the initial screening of the alternatives in the TCAA (e.g., Phase 1 of the transit ridership and market analysis approach). Even though the SCC Model was recently updated in the Unified Corridor Investment Study, most of the model inputs were developed based on data collected for the original 2010 Baseline model. StreetLight data provides a more recent view of travel patterns within and in/out of Santa Cruz County. It is being used to augment and refine elements of the SCC Model, offering a more robust and comprehensive understanding of the travel markets. Additionally, StreetLight analysis is also being used separately for weekends to capture recreational activities to/from and within the county. This weekend/recreational data is being used to identify potential transit markets that would otherwise be missed by the SCC Model.

StreetLight OD data is available on their web portal from January 2016 to January 2020. Data can be downloaded for select months of the year, day of week, and time of day, in a spreadsheet format. For the purposes of the TCAA, data from 2018 to 2020 is being used to ensure the data reflects the most recent travel patterns. Two sets of data are identified to account for the seasonal variations: 1) months of April to October to capture summer activities in Santa Cruz County, and 2) months of October to March to reflect the peak school enrollment (UCSC and K-12) period.

For the initial screening of alternatives, seven analysis zones were identified within Santa Cruz County, including:

1. North County
2. North Coast
3. University of California, Santa Cruz
4. City of Santa Cruz
5. Capitola / Soquel
6. Mid-County / Aptos
7. South County / Watsonville

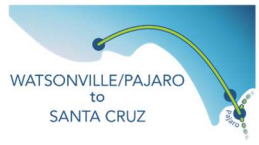


**Figure F.2** below presents a map of the initial screening zones. For the market analysis used to refine the service plans for the different transit alternatives, the zone structure in Santa Cruz County will be further disaggregated to represent smaller travelsheds (neighborhoods) with varying demographics and level accessibility to transit. The seven zones listed above will be disaggregated to approximately 50 to 60 zones to ensure adequate resolution to support the refinement of stop locations and routing.

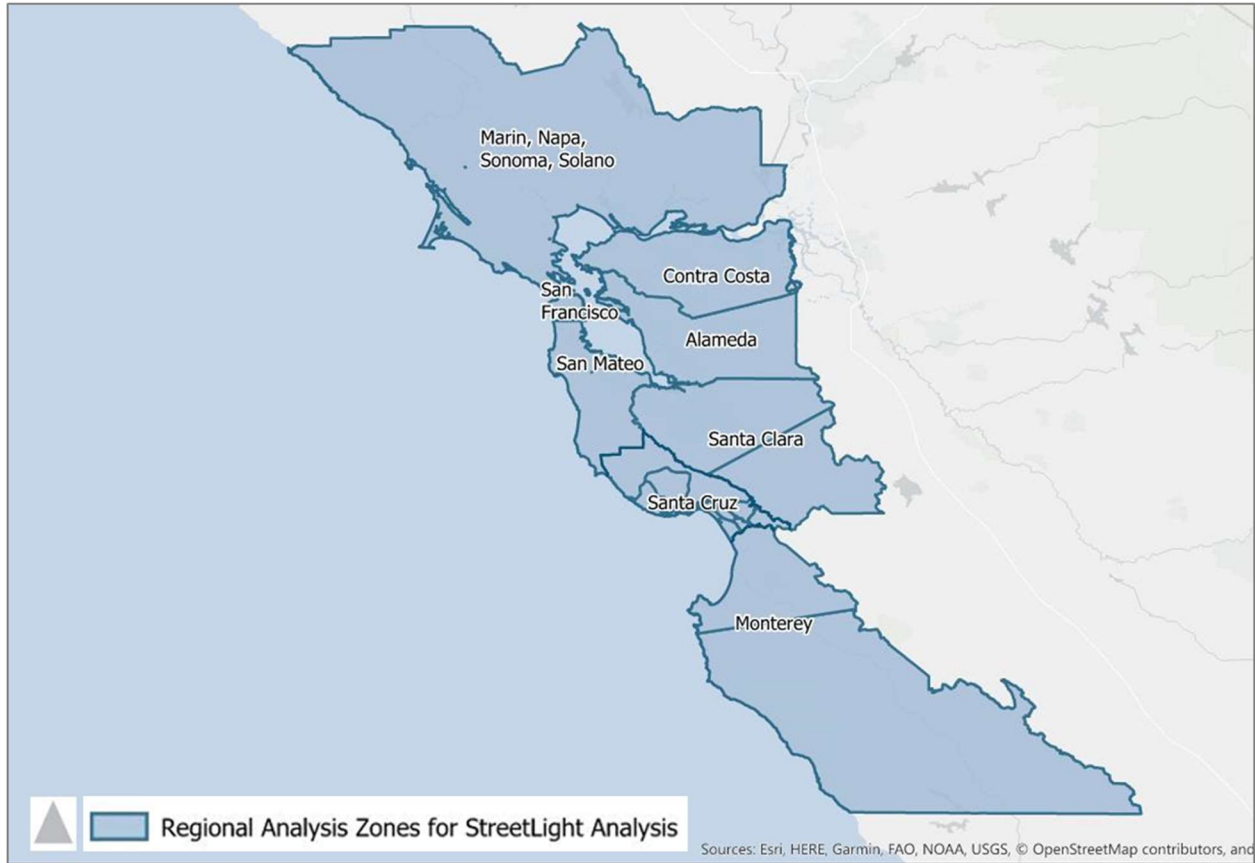
**Figure F.2: Analysis Zones for Initial Assessment**



Regional zones (outside of Santa Cruz County) are also included as analysis zones to show travel from Santa Cruz to other counties, such as San Francisco, Santa Clara, Monterey, and San Mateo (**Figure G.3**).



**Figure F.3: Regional Analysis Zones for Streetlight Origin/Destination Assessment**

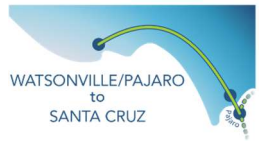


### DATA TIME PERIODS

The StreetLight analysis time periods were determined collaboratively with the project team based on the following:

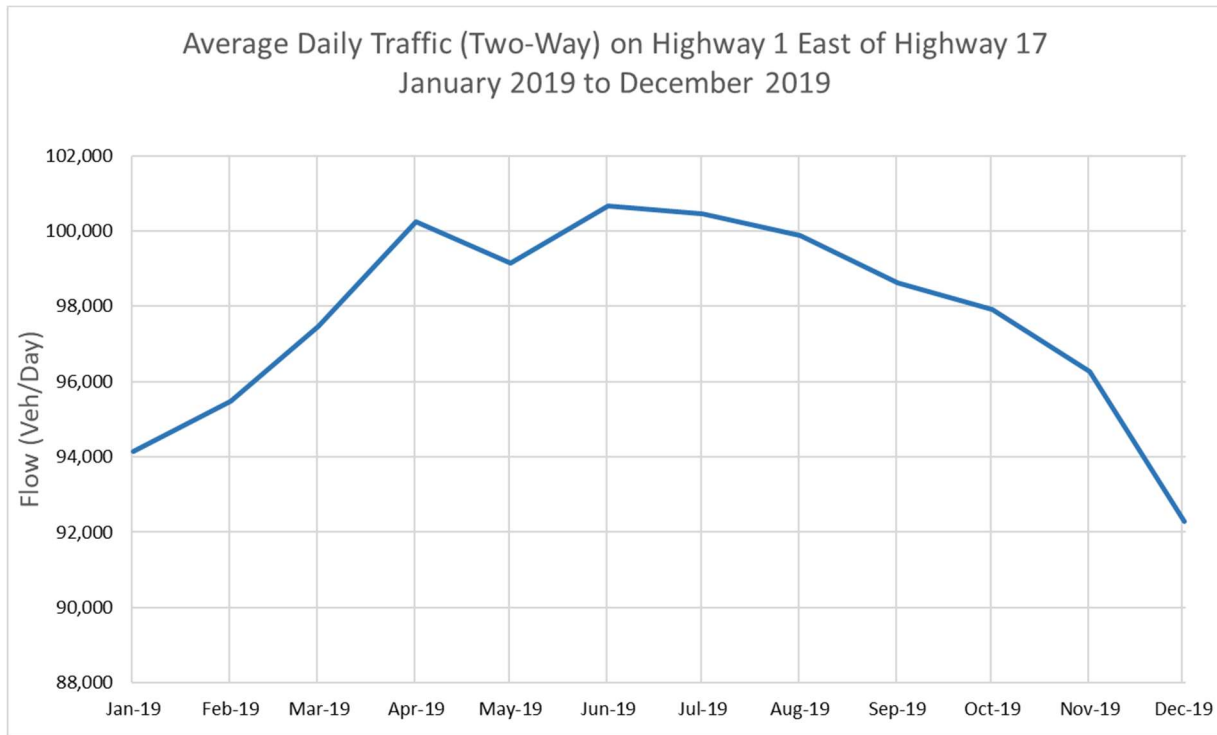
- Counts collected from Caltrans' PeMS database on Highway 1 and Highway 17 to determine peak hours of travel and seasonal effects (**Figure G.4**)
- School schedules and enrollment data from the University of California, Santa Cruz (UCSC) website to determine the appropriate months for StreetLight data collection

Based on available information and coordination with RTC, METRO and the project team, StreetLight data collection was split into two halves: 1) months of April to October in 2018 and 2019 to capture summer activities in Santa Cruz County, and 2) months of October to March in 2018 and 2019 to reflect the peak school enrollment (UCSC and K-12) period. Data for each time period (summer and winter) was then processed for weekday and weekend conditions separately, with analysis periods of daily, 6am-10am, 10am-3pm, and 3pm-7pm, based on the



peak period count data for Highway 1 and Highway 17. Tuesday through Thursday were selected as “typical” weekdays; and Saturday and Sunday for weekends.

**Figure F.4. Monthly Variations of Daily Traffic Volume on Highway 1 East of Highway 17**

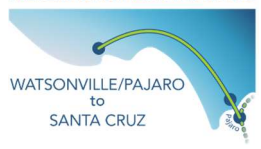


Source: Caltrans PeMS, 2019.

After the temporal processing of the data, origin-destination (OD) analysis was conducted in StreetLight with regional zones identified to analyze the level of travel activity between each OD pair. StreetLight provides the data in a tabular format that summarizes the total person trip flows in vehicles that occur within Santa Clara County and regionally. In other words, pedestrian and bicycle trips (as identified by StreetLight) are excluded from the analysis. These modes are excluded because they represent a relatively small proportion of overall travel, are generally not targets to convert to transit ridership, and StreetLight’s ability to isolate these modes is still in beta form.

**TRANSIT RIDERSHIP DATA**

The Santa Cruz Metropolitan Transit District (METRO) operates 26 bus routes throughout Santa Cruz County, serving over five million passengers annually. To develop effective transit alternatives and service plans for the TCAA, it is important to understand the existing transit

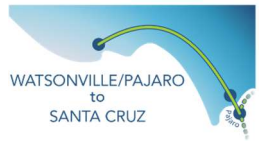


coverage/gaps, service level, and ridership for various routes. The following transit ridership data and reports were obtained from METRO for use in this study:

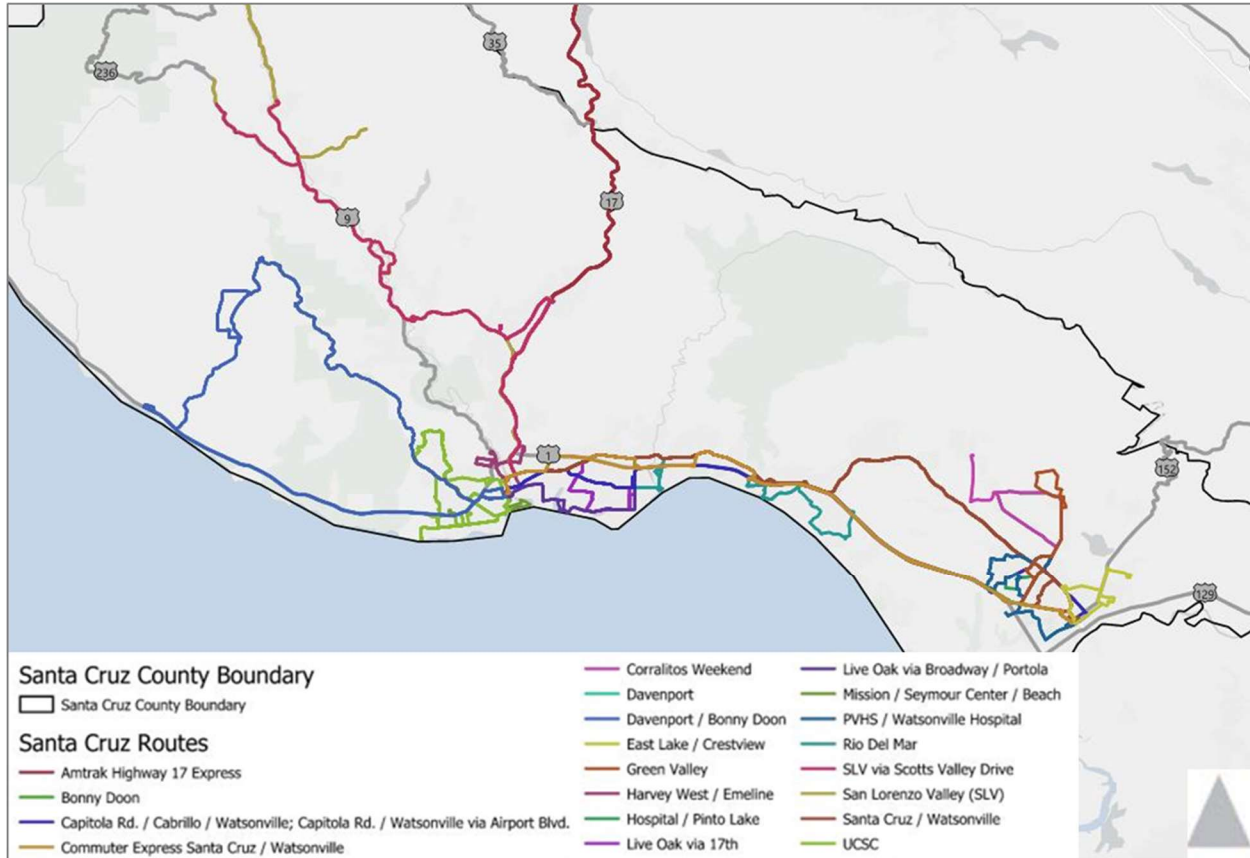
- GTFS data is a common format for public transportation schedules (.txt files) and associated geography information. METRO's GTFS data provides the routes and schedules of their existing transit services. **Figure F.5** presents a map of the all the existing transit routes extracted from the GTFS data provided by METRO.
- 2019 On-Board Transit Ridership Survey and Ride Check Report is an onboard survey of Santa Cruz METRO customers as well as a comprehensive ride check. It includes stop-level onboarding and alighting data for each transit route, except routes serving UCSC.
- The 2016 Comprehensive Operational Analysis provides a summary of analysis of the Santa Cruz METRO transit system by examining service system-wide, as well as by service role and by route. It includes a daily and annual ridership summary for each route.
- The 2012 Onboard Transit Ridership Survey is an onboard survey of Santa Cruz METRO customers as well as a comprehensive ride check. It includes stop-level boarding and alighting data, as well as on-time-performance summary, for each transit route. The 2012 data is used to supplement the 2019 On-Board Transit Ridership Survey and Ride Check Report data for UCSC routes that were not surveyed in 2019.

Existing transit data was used to support all three phases of the transit ridership and market analysis, from the initial screening to the detailed alternatives analysis including existing transit ridership, transit origin-destination, and reliability analysis.





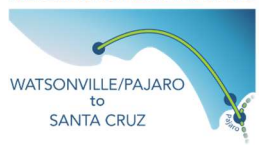
**Figure F.5: Existing Transit Routes in Santa Cruz County, METRO's GTFS Data**



## TRAFFIC DATA

Traffic count data on Highway 1 and major arterials were collected and are being used to understand existing vehicle demand and overall traffic flow patterns within Santa Cruz County. The following count locations on Highway 1 were acquired from Caltrans Performance Measurement System (PeMS) database:

1. Highway 1 east of Emeline Ave NB
2. Highway 1 east of Emeline Ave SB
3. Highway 17 south of Pasatiempo NB
4. Highway 17 south of Pasatiempo SB
5. Highway 1 north of Highway 129 NB
6. Highway 1 north of Highway 129 SB
7. Highway 1 north of Larkin Valley Rd NB
8. Highway 1 north of Larkin Valley Rd SB
9. Highway 1 east of Park Ave NB



10. Highway 1 east of Park Ave SB
11. Highway 1 west of Ocean WB
12. Highway 1 west of Ocean EB
13. Highway 1 south of Highway 129 NB
14. Highway 1 south of Highway 129 SB.

Additional traffic data, including historical travel speed and travel time data for highways and major arterials, were needed to understand the level of existing congestion and were used as a baseline to compare travel times with the proposed alternatives in the TCAA. These additional data were collected for the Unified Corridor Investment Study and were made available for the use in the TCAA via RTC. The UCS data used automobile peak travel time, which is measured using a combination of data available from the Federal Highway Administration, Caltrans, and vendors of cell data. For traffic speed data on Highway 1, estimates were acquired using the National Performance Measurement Research Data Set (NPMRDS) from the Federal Highway Administration. For Soquel/Freedom, cellular data from StreetLight was used to determine travel time.

#### **UNIVERSITY OF CALIFORNIA, SANTA CRUZ DATA**

The University of California, Santa Cruz (UCSC) is one of the major trip generators in Santa Cruz County, with more than 18,000 students and over 1,000 faculty members. Based on available transit data from METRO, UCSC accounts for nearly 50 percent of the transit ridership on the METRO system. Therefore, it is important to understand travel patterns associated with UCSC and how school schedules affect traffic volumes and transit ridership. To support the TCAA transit ridership and market analysis, the following information was obtained from UCSC and is being used in this modeling process:

- Student enrollment information by quarter
- Existing transit ridership data
- Enrollment projections for 2040 (as available)
- Student and faculty mode share data (as available)
- Cordon counts and/or parking permit data (as available).

#### **AMERICAN COMMUNITY SURVEY DATA**

The American Community Census (ACS) data compiles five year (2013-2017) demographic and economic data from the United States Census. This block-group data is being used to assess accessibility of the population in Santa Cruz County proportional to the potential stations and the analysis zones. This data is being used to support the market assessment and ridership modeling of the detailed alternatives (Phases 2 and 3 of the transit ridership and market



analysis approach). This data is available and was obtained via the United States Census Bureau website.

### LONGITUDINAL EMPLOYER-HOUSEHOLD DYNAMICS DATA

Longitudinal Employer-Household Dynamics (LEHD) data provides year-by-year employer-based data from the United States Census. The latest data available is from 2017. This data was joined to the Census Block Group data and is being used to assess the accessibility of employees working in Santa Cruz County proportional to the right of way's potential stations and the analysis zones. This data is being used to support the market assessment and ridership modeling of the detailed alternatives (Phases 2 and 3 of the transit ridership and market analysis approach). This data was obtained and is available via the United States Census Bureau website.

## METHODOLOGIES FOR RIDERSHIP ANALYSIS

### PHASE 1: INITIAL DEMAND ASSESSMENT

The Phase 1 screening of the TCAA uses the screening criteria to narrow the universe of alternatives to a smaller set of alternatives for detailed analysis. This initial demand assessment supports the high-level screening by qualitatively assessing ridership potential and travel time for all project alternatives.

Existing available data, such as ridership estimates from previous studies, transit ridership data, historical travel time, and travel origin-destination (OD) data from the Santa Cruz County Travel Demand Model (SCC Model), are processed and summarized in a sketch-level ridership model. This model incorporates elasticity analysis from the Transit Capacity and Quality of Service Manual (TCQSM), third edition to evaluate how various operating characteristics would change ridership potential. The steps are described below:

#### TRAVEL OD DEVELOPMENT

- Develop seven screenline zones to reflect major neighborhoods and destinations in Santa Cruz County (**Figure F.2**):
  1. North County
  2. North Coast
  3. University of California, Santa Cruz
  4. City of Santa Cruz
  5. Capitola / Soquel
  6. Mid-County / Aptos
  7. South County / Watsonville
- Collect StreetLight OD data for the screenline zones to summarize existing OD patterns



- Aggregate SCC Model OD data to the seven screenline zones and develop a person trip table and a vehicle trip table
- Develop person trip OD matrix for the screenline zones from StreetLight data and SCC Model OD data

#### **METRO TRANSIT DATA SUMMARY**

- Develop initial transit OD for screenline zones based on transit ridership, boarding and alighting data from previous ride check reports
- Summarize transit frequencies and travel time for key OD pairs within the county based on transit schedule and historical travel time data in the Unified Corridor Investment Study
- Estimate transit share of each screenline OD pair from the transit OD and total person OD matrices

#### **RIDERSHIP ASSESSMENT USING TCQSM'S ELASTICITY ANALYSIS**

- Identify basic operating parameters for each transit alternative based on existing systems in similar regions and previous studies: speed, right-of-way, frequency, vehicle capacity
- Select “planning-level” stop locations based on the transit mode, as informed by the Unified Corridor Investment Study and Rail Feasibility Study
- Use ridership estimates from previous studies and existing transit share as baseline ranges of ridership and scale ridership potential based on stop coverage of each alternative
- Pivot from existing transit share and apply elasticity analysis in the sketch ridership model to estimate the potential effects of transit frequency, travel time and reliability on ridership; and adjust ridership potential developed in previous step for each project alternative
- Develop high-level transit travel time based on the transit mode and operating right-of-way condition

#### **PERFORMANCE METRICS**

- Ridership potential (high, medium, low) for all project alternatives
- Emissions (high, medium, low) for all project alternatives
- Reliability (high, medium, low) for all project alternatives
- Travel time assessment (high, medium, low) for all project alternatives
- High-level summary of existing travel patterns (total daily trips within county and in/out of county) and transit ridership data

Note that this Phase 1 analysis is very high level and details like how potential riders would specifically access transit (walk, bike, connecting transit, park-and-ride, drop-off, etc.) are not



considered as a barrier or constraint. Fares are also not specifically addressed, even though some modes are likely to cost more than others. Overall, this evaluation is designed to, at a high level, identify the modes that could have the highest ridership and best travel time/reliability characteristics so that these factors could be considered alongside other high-level Phase 1 metrics like cost and environmental impacts.

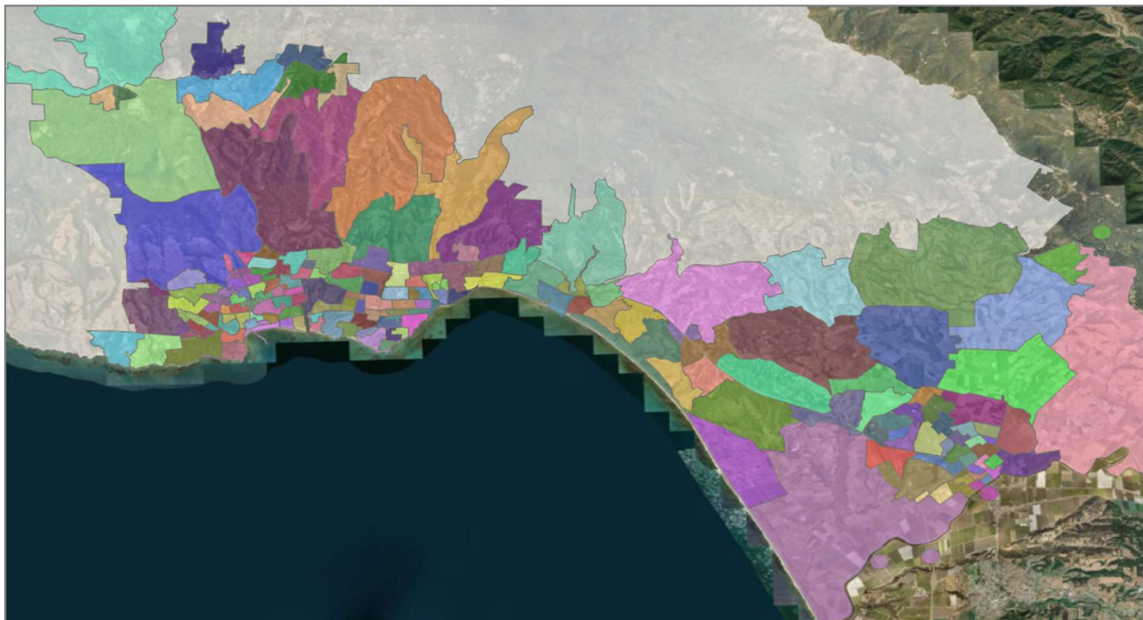
## PHASE 2: MARKET ANALYSIS

The goal of the market analysis is to understand the transit market potential at a more refined level and support the project’s value engineering to refine service parameters for the final project alternatives. Identifying potential transit markets is a key component in establishing where and how to serve people most effectively. Potential markets include not only those travelers already using existing transit service, but also those potential high capacity transit riders who would shift from driving due to the service, coverage and capacity improvements. The steps for the market analysis are described below:

### OD ANALYSIS REFINEMENT

- Process StreetLight data (SLD) with the refined zone structure (~100 total zones covering Santa Cruz County, gateways, and major highways/arterials within County) to develop trip distribution patterns (**Figure F.6**).

**Figure F.6: Draft Zone Structure for Detailed StreetLight OD Analysis**







- Combine SLD distribution patterns, traffic counts and baseline model OD data to develop existing travel flows for internal-external, external-internal, internal-internal, and external-external trips for the following analysis time periods:
  - Weekday: daily and peak commute (6-10AM and 3-7PM), based on existing traffic count patterns
  - Weekend: daily
- Disaggregate transit OD data summarized in Phase 1 to a more refined zone structure
- Review base and future year model OD data to identify growth areas; scale existing transit and travel market to reflect anticipated growth within County

### **STATION ACCESSIBILITY & DEMOGRAPHIC ANALYSIS**

- Perform transit accessibility analysis using GIS network analyst to evaluate transit stop/station accessibility via biking and walking
- Develop maps to summarize socio-demographic information by zone and socio-demographic transit coverage using GIS network analyst (e.g., proportion of low-income population within a half-mile of frequent transit)
- Cross examine travel flow/transit share data with socio-demographic and land use data to identify key transit service areas (e.g. high-density zones, low income, low auto availability, etc.)

### **TRANSIT MARKET SUMMARY**

- Expand Phase 1 demand assessment to include more refined analysis zones, and incorporate the accessibility and demographic analysis
- Work with project team to refine operating parameters (e.g. stop locations, schedules, for the transit alternatives)
- Estimate high-level regional transit demand for potential interregional connections to Monterey County, Bay Area and Gilroy based on existing transit share and total demand data

### **MARKET ANALYSIS OUTPUTS**

- Summary of existing travel patterns in Santa Cruz County for weekday (daily, peak period) and weekend (daily) conditions
- Estimated market share for the proposed transit alternatives during different time periods of the day
- Key transit OD pairs within county based on existing transit flows, major commuter/student OD patterns, and areas with relatively high densities of population and employment uses
- Regional travel demand and transit potential to adjacent counties



- Transit accessibility maps; maps highlighting focus transit areas for existing and future conditions to help refine stop locations and service/capacity requirements; summary of transit accessibility for disadvantaged populations

### PHASE 3: RIDERSHIP MODELING

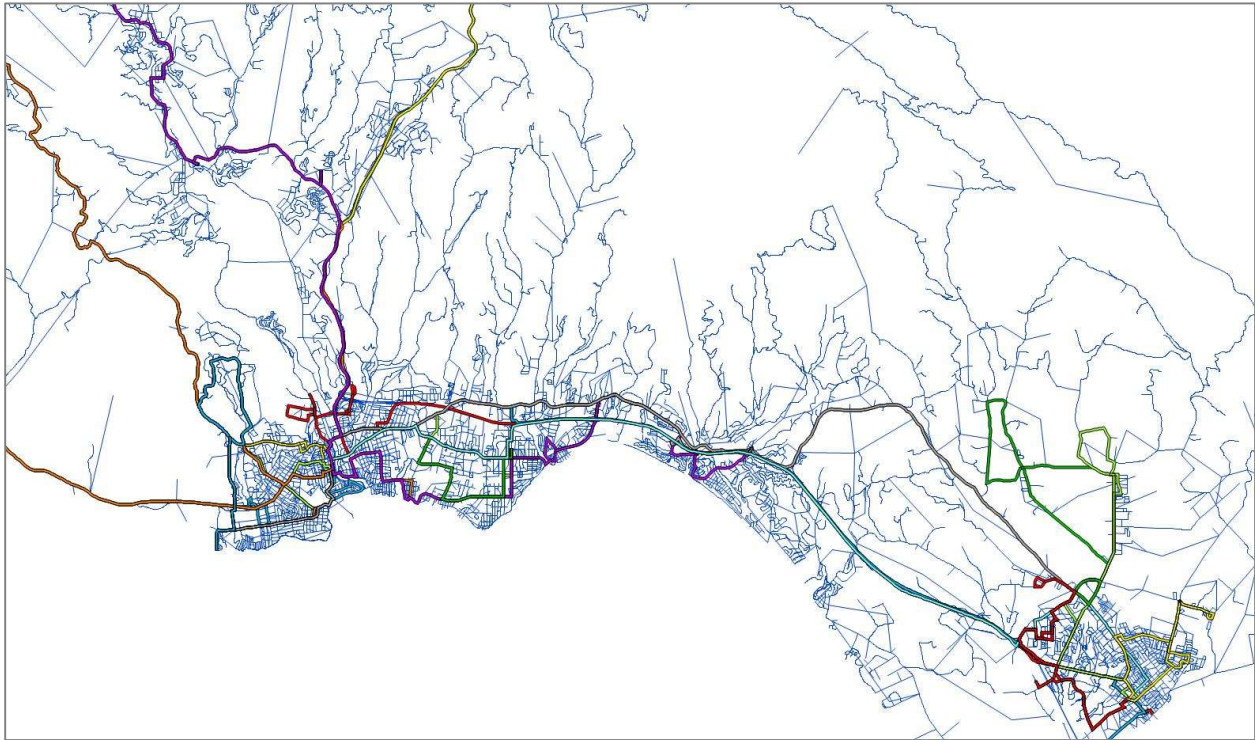
Following the development of service plans and operating parameters, ridership estimates and other performance metrics are produced for final transit alternatives through the application of the SCC Model. The SCC Model is not only able to analyze travel patterns for existing conditions, but also capable of forecasting travel demand changes in future conditions. The roadway and transit network in the Santa Cruz County Travel Demand Model is shown in **Figure F.7**. SCC Model Operating parameters of the final alternatives are coded into the base year (2019) and future (2040) year scenarios to produce performance metrics for the final evaluation. Minor refinements to model inputs (e.g. land use, transit network, roadway network) are performed as appropriate. Ridership estimates from the SCC Model are compared against demand estimates developed from the market analysis in Phase 2 for a reasonableness check. The ridership modeling steps are described below:

#### MODEL SENSITIVITY TESTS

- Compare existing transit ridership in SCC Model with METRO transit data to understand model limitations, particularly for special trip generators such as colleges and tourist activities
- Conduct sensitivity tests of SCC Model to evaluate effects of adding new transit services and updating transit service parameters, and review reasonableness of outputs
- Make minor adjustments to model network and land use data to reflect the latest planning of Santa Cruz RTC and local jurisdictions



**Figure F.7: Overview of Roadway and Transit Network in the Santa Cruz County Travel Demand Model (SCC Model)**

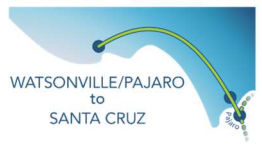


#### **ALTERNATIVES CODING**

- Code in transit route, schedule, operating speed, transfer penalties, and stop locations for each alternative
- For emerging transit modes that are not available in the SCC Model, evaluation of operating parameters is performed off-model to develop the corresponding inputs for SCC Model to simulate the mode appropriately
- Adjust access times based on the accessibility analysis results from market analysis
- Perform model runs

#### **POSTPROCESSING**

- Postprocess model outputs to minimize model errors and ensure consistent results across the different alternatives
- Review ridership forecasts for each alternative based on existing ridership data and market analysis results to ensure reasonableness of model results
- Evaluate effects on vehicle-miles-traveled (VMT)



### ***PERFORMANCE METRICS***

- Daily and peak period ridership estimates for each project alternative
- Sub-area ridership
- Effects on VMT (to support GHG and energy consumption estimates)
- Average transit travel time and access time

## **APPENDIX G – MILESTONE 3: Detailed Performance Evaluation Results Tables**



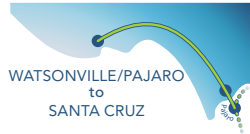


## GOAL: Fiscal Feasibility

| METRIC :   | BRT  | CRT   | LRT   | ART   |
|--|--|---|---|---|
| CAPITAL COSTS (2020 DOLLARS)                             | \$410,000,000  | \$478,000,000   | \$465,000,000   | \$720,000,000   |
| CAPITAL COST/MILE  | \$18,000,000   | \$22,000,000  | \$21,000,000  | \$31,000,000  |
| CAPITAL COST/RIDER/30 YEARS                              | \$6.40   | \$9.70  | \$8.90  | \$14.60   |
| CAPITAL COST/PASSENGER MILE/30 YEARS                     | \$1.40   | \$1.20  | \$1.00  | \$1.70  |
| OPERATIONS & MAINTENANCE (O&M) COSTS/YEAR (2020 DOLLARS) | \$19,540,000   | \$25,000,000  | \$25,000,000  | \$28,000,000  |
| O&M COSTS/MILE/YEAR                                      | \$875,000  | \$1,126,000   | \$1,106,000   | \$1,217,000   |
| O&M COST/RIDER   | \$9.20   | \$15.20   | \$14.3  | \$17.00   |
| O&M COST/PASSENGER MILE                                  | \$1.20   | \$2.10  | \$1.90  | \$2.20  |
| % CAPITAL LIKELY FROM EXISTING FUND SOURCES              | 64%  | 59%   | 61%   | 36%   |
| FUNDING LIKELY FROM POTENTIAL FUTURE SOURCES             | While difficult to predict what future funding sources will be available for each alternative, Governor Newsom's recent Executive Order (EO N-79-20) directs state agencies to "build toward an integrated, statewide rail and transit network, consistent with the California State Rail Plan, to provide seamless, affordable multimodal travel options for all." Future funding is likely to increase for each alternative, but unknown to what extent. |   |   |   |
|  | \$390M additional funding sources (local or other) needed to provide extra capital funds and 25 years of operations & maintenance funds to fully fund project  | \$540M additional funding sources (local or other) needed to provide extra capital funds and 25 years of operations & maintenance funds to fully fund project | \$520M additional funding sources (local or other) needed to provide extra capital funds and 25 years of operations & maintenance funds to fully fund project | \$910M additional funding sources (local or other) needed to provide extra capital funds and 25 years of operations & maintenance funds to fully fund project |

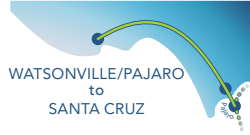
## GOAL: Well-integrated transportation system that supports economic vitality

|  |   |   |   |   |
|--|---|---|---|---|
| WILL THE PROJECT INCREASE DEVELOPMENT ALONG THE CORRIDOR?                                | Likely to increase transit-oriented development (TOD) in segments along rail ROW where BRT guideway is built, less likely where BRT runs on roadway network   | More likely to generate TOD on entire route   | More likely to generate TOD on entire route   | More likely to generate TOD on majority of route  |
| TOTAL NUMBER OF JOBS (DIRECT & INDIRECT) GENERATED THROUGH CONSTRUCTION IN THE NEAR TERM | 4,100   | 5,100   | 4,900   | 7,400   |
| TOTAL NUMBER OF JOBS (DIRECT & INDIRECT) GENERATED LONGER TERM THROUGH O&M ACTIVITY      | 210   | 270   | 270   | 300   |
| IMPACTS ON FREIGHT RAIL OPERATIONS   | <ul style="list-style-type: none"> <li>Assumes freight rail can only be accommodated between Pajaro up to Park Ave. at Coronado St. in Capitola</li> <li>Converts railway to a paved guideway between Park Ave. in Capitola &amp; Natural Bridges Dr.</li> <li>Freight would need to be abandoned north of Park Ave.</li> </ul> | <ul style="list-style-type: none"> <li>Allows freight &amp; passenger rail to comingle with positive train control</li> <li>Passenger rail frequency may make it more challenging to run freight at same time as passenger rail, but can be accommodated</li> <li>Freight rail can also run outside of passenger service hours</li> </ul> | <ul style="list-style-type: none"> <li>Can run with or without FRA-compliant vehicle</li> <li>With: freight impact same as CRT</li> <li>Without: freight cannot comingle with passenger rail &amp; required to be temporally separated</li> </ul> | <ul style="list-style-type: none"> <li>Assumes freight rail can only be accommodated within Watsonville up to Lee Rd.</li> <li>Converts railway to a paved guideway between Lee Rd. in Watsonville &amp; Natural Bridges Dr. in Santa Cruz</li> <li>Freight rail would need to be abandoned north of Lee Rd.</li> </ul> |



GOAL: Well-integrated transportation system that supports economic vitality

| METRIC:   | BRT   | CRT   | LRT   | ART  |
|---|---|---|---|--|
| IMPACTS ON SANTA CRUZ BIG TREES & PACIFIC RAILWAY (SCBG)  | <ul style="list-style-type: none"> <li>Expected to bypass boardwalk area via San Lorenzo Blvd. &amp; Laurel St. to access Pacific Ave. Metro Transit Center allowing SCBG to continue accessing boardwalk via east leg of the Wye</li> <li>Utilizes west leg of Wye &amp; thus alternatives would be needed for SCBG to turn their trains</li> <li>Eliminates access for SCBG to bring rail cars in/out of greater rail network via Pajaro</li> </ul>   | <ul style="list-style-type: none"> <li>Can share same set of tracks with SCBG if scheduling allows, since vehicles are both FRA-compliant                             <ul style="list-style-type: none"> <li>Siding may be beneficial for SCBG in boardwalk area to allow commuter rail to pass SCBG while boarding/alighting</li> </ul> </li> <li>If there are scheduling challenges for SCBG with high frequency commuter rail &amp; freight rail equipment, SCBG could benefit from separate set of tracks from east leg of Wye to boardwalk area although expense &amp; ROW needed to accommodate additional set of tracks along Beach St. may make this infeasible</li> <li>Another option is for SCBG boarding/alighting to occur at Depot Park Station although this is not of interest to SCBG given potential significant impact on their business</li> <li>Allows SCBG &amp; Pacific Railway to bring rail cars in/out via Pajaro as long as there is proper coordination with passenger &amp; freight rail services</li> </ul> | <ul style="list-style-type: none"> <li>With FRA-compliant vehicle has same impact on SCBG as CRT (see explanation under CRT)</li> <li>If not FRA-compliant, SCBG &amp; LRT can share same set of tracks if there's temporal separation between vehicles                             <ul style="list-style-type: none"> <li>Length of time may be short enough to allow this but needs further investigation</li> <li>Technological changes in rail signaling may also reduce time for temporal separation even further</li> </ul> </li> <li>If need for temporal separation is too limiting or there are scheduling challenges between SCBG with high frequency light rail, SCBG could benefit from a separate set of tracks from east leg of Wye to boardwalk area although expense &amp; ROW needed to accommodate additional set of tracks along Beach St. may make this infeasible                             <ul style="list-style-type: none"> <li>Another potential option is for SCBG boarding/alighting to occur at Depot Park Station although this is not of interest to SCBG given potential significant impact on their business</li> </ul> </li> <li>With non-FRA compliant vehicle, allows SCBG to bring rail cars in/out via Pajaro as long as there's proper coordination with passenger and freight rail service.</li> </ul> | <ul style="list-style-type: none"> <li>Requires paved, dedicated guideway through boardwalk area, along Beach St. &amp; up to Depot Park Station</li> <li>SCBG existing route served with a set of tracks parallel to ART guideway from east leg of Wye to boardwalk area                             <ul style="list-style-type: none"> <li>Beach St. would need to accommodate ART guideway, one set of tracks, a cycle track for bikes, one vehicle lane at minimum, &amp; sidewalks on both sides which may be infeasible</li> <li>A set of tracks &amp; ART guideway crossing through Wharf roundabout will be challenging</li> </ul> </li> <li>Another option is for SCBG boarding/alighting to occur at Depot Park Station although this is not of interest to SCBG given potential significant impact on their business</li> <li>Alternative configurations would be needed for SCBG to reverse their trains as they currently use entire Wye</li> <li>Eliminates access for SCBG to bring in/out rail cars or locomotives of greater rail network via Pajaro</li> </ul> |
| IMPACTS ON EXISTING & FUTURE FREIGHT RAIL BUSINESSES & RAIL VOLUMES   | <ul style="list-style-type: none"> <li>Not compatible with freight rail north of Park Ave. near Highway 1</li> <li>Increased freight rail volumes limited between Park Ave. near Highway 1 &amp; Lee Rd. in Watsonville with exception of Buena Vista Landfill that could benefit from freight rail</li> <li>Potential freight customers include Buena Vista Landfill plus existing &amp; future customers in Watsonville including agricultural, fuel, lumber &amp; food products</li> </ul> | <ul style="list-style-type: none"> <li>Freight rail customers could be served along entire length of rail line from Pajaro to Davenport</li> <li>Potential freight customers include construction materials, agricultural, lumber, fuel &amp; food products plus material from Buena Vista Landfill</li> <li>Freight volumes in Watsonville &amp; Pajaro could increase for existing &amp; future customers including additional agricultural, fuel, lumber &amp; food products</li> <li>Transload site for transferring goods to/from rail would increase freight volumes with potential site location in Watsonville</li> </ul>   | <ul style="list-style-type: none"> <li>Freight rail customers could be served along entire length of rail line from Pajaro to Davenport</li> <li>Potential freight customers include construction materials, agricultural, lumber, fuel &amp; food products plus material from Buena Vista Landfill</li> <li>Freight volumes in Watsonville &amp; Pajaro could increase for existing &amp; future customers including additional agricultural, fuel, lumber &amp; food products</li> <li>Transload site for transferring goods to/from rail would increase freight volumes with potential site location in Watsonville</li> </ul>   | <ul style="list-style-type: none"> <li>Freight Rail would be limited to freight customers between Lee Rd. in Watsonville to Pajaro</li> <li>Freight volumes in Watsonville &amp; Pajaro could increase from existing &amp; future customers including additional agricultural, fuel, lumber &amp; food carloads</li> <li>Transload site for transferring goods to/from rail would increase freight volumes with potential site location in Watsonville</li> </ul>  |
| WHAT IS THE LEVEL OF RISK THAT THE CORRIDOR WILL NOT REMAIN CONTINUOUS? WILL ALTERNATIVE BEST UTILIZES RAIL CORRIDOR & PRESERVE FUTURE OPTIONS? | <ul style="list-style-type: none"> <li>Implementation would require petitioning Surface Transportation Board for abandonment of freight rail service north of Park Ave. The petition could include a request to railbank which would stop short of complete abandonment and preserve a continuous corridor.</li> </ul>  | <ul style="list-style-type: none"> <li>Utilizes 22.2 miles of rail ROW from Pajaro Station to Natural Bridges Dr., thus has no risks of losing rail corridor continuity</li> </ul>  | <ul style="list-style-type: none"> <li>Utilizes 22.6 miles of rail ROW from Pajaro Station to Natural Bridges Dr. &amp; if freight rail continues, has no risks of losing rail corridor continuity</li> </ul>   | <ul style="list-style-type: none"> <li>Implementation would require petitioning Surface Transportation Board for abandonment of freight rail service north of Lee Rd. The petition could include a request to railbank which would stop short of complete abandonment and preserve a continuous corridor.</li> </ul>   |



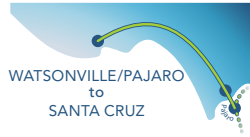
## GOAL: Promotes active transportation

| METRIC:  | BRT   | CRT   | LRT   | ART  |
|--|---|---|---|--|
| <b>BICYCLE CAPACITY ON TRANSIT/EVERY 30 MINUTES DURING PEAK PERIOD</b> | <ul style="list-style-type: none"> <li>Standard storage is 2-4 bicycles per articulated BRT (eight bicycles for two BRT every 30 mins.)</li> <li>Flexible design to include seats, space for bicycles and mobility devices</li> </ul>   | <ul style="list-style-type: none"> <li>Standard storage is 2-4 bicycles per car (Marin's SMART has space for 12 bicycles per car. A three car train set could accommodate 36 bicycles every 30 mins.)</li> <li>Flexible design to include seats, space for bicycles and mobility devices</li> </ul>   | <ul style="list-style-type: none"> <li>Standard storage is 2-4 bicycles per car (Siemens S70 has 24 bikes for each 3-car trainset every 30 minutes)</li> <li>Flexible design to include seats, space for bicycles and mobility devices</li> </ul>   | <ul style="list-style-type: none"> <li>Flexible design to include seats, space for bicycles and mobility devices</li> </ul>  |
| <b>LEVEL BOARDING ABILITY FOR BICYCLISTS</b>                           | <ul style="list-style-type: none"> <li>Able to provide level boarding platforms at all stations along rail ROW</li> <li>Stops along roadway alignment may not accommodate level boarding due to space limitations</li> </ul>  | <ul style="list-style-type: none"> <li>Able to provide level boarding platforms at all stations</li> </ul>  | <ul style="list-style-type: none"> <li>Able to provide level boarding platforms at all stations</li> </ul>  | <ul style="list-style-type: none"> <li>Able to provide level boarding platforms at all stations</li> <li>Connection from ART station at Lee Rd to downtown Watsonville and Pajaro Station are via local bus and would not have level boarding.</li> </ul>  |
| <b>EFFECTS ON RAIL TRAIL &amp; CALIFORNIA COASTAL TRAIL</b>            | <ul style="list-style-type: none"> <li>No change to coastal rail trail location as planned in Monterey Bay Sanctuary Scenic Trail Master Plan with exception of minor station adjustments where passing sidings may be needed</li> <li>Single guideway in two narrow sections of ROW (California St. to Laurel St. &amp; 30th Ave. to 47th Ave.) with two-way signaled operation so both transit and trail could coexist</li> </ul> | <ul style="list-style-type: none"> <li>No change to coastal rail trail location as planned in Monterey Bay Sanctuary Scenic Trail Master Plan with exception of minor adjustments at siding locations</li> <li>A few potential locations identified for passing sidings where coastal rail trail may need to be shifted to immediately adjacent public way &amp; physically separated from traffic</li> </ul> | <ul style="list-style-type: none"> <li>No change to coastal rail trail location as planned in Monterey Bay Sanctuary Scenic Trail Master Plan with exception of passing sidings and station locations</li> <li>A few potential locations identified for passing sidings where coastal rail trail could be shifted to immediately adjacent public way &amp; physically separated from traffic</li> </ul> | <ul style="list-style-type: none"> <li>No change to coastal rail trail location as planned in Monterey Bay Sanctuary Scenic Trail Master Plan with exception of siding locations</li> <li>A few potential locations identified for passing sidings where coastal rail trail could be shifted to immediately adjacent public way &amp; physically separated from traffic</li> </ul> |

## GOAL: Supports safer transportation for all modes

|  |           |            |           |           |
|--|-----------|------------|-----------|-----------|
| <b>ANNUAL COLLISIONS BY TRANSIT ALTERNATIVE PER YEAR</b>   | 2.00      | 0.05       | 0.91      | 0.80      |
| <b>CHANGE IN TOTAL ANNUAL FATAL &amp; INJURY COLLISIONS PER YEAR (CONSIDERING REDUCED AUTO TRAVEL)</b> | 0.46      | -1.89      | -1.18     | -1.16     |
| <b>ANNUAL CHANGE IN COST OF COLLISIONS</b>   | -\$62,700 | -\$612,800 | -\$52,100 | -\$92,600 |





GOAL: Provides accessible & equitable transportation system that is responsive to the needs of all users

| METRIC:  | BRT   | CRT  | LRT   | ART   |
|--|---|--|---|---|
| TOTAL NUMBER OF STATIONS/STOPS   | 23  | 11   | 13  | 11  |
| NUMBER OF STATIONS/STOPS WITHIN DISADVANTAGED CENSUS TRACTS  | 17  | 10   | 12  | 10  |
| % OF STATIONS/STOPS WITHIN DISADVANTAGED CENSUS TRACTS   | 74%   | 91%  | 92%   | 91%   |
| NUMBER OF STATIONS/STOPS WITHIN 1/2 MILE OF DISADVANTAGED CENSUS TRACTS  | 22  | 11   | 13  | 11  |
| % OF STATIONS/STOPS WITHIN 1/2 MILE OF DISADVANTAGED CENSUS TRACTS   | 96%   | 100%   | 100%  | 100%  |
| TRANSIT FREQUENCY (# PER HOUR) OFF PEAK  | 4   | 1  | 2   | 2   |
| TRANSIT PASSENGER CAPACITY MILES TRAVELED<br><i>Based on transit frequency per hour, transit capacity per vehicle (bus/train) &amp; hours of service per day</i> | 204,000   | 209,800  | 299,000   | 262,000   |
| TRANSIT FARE<br><i>Fare range depending on distance traveled</i>   | <ul style="list-style-type: none"> <li>• Typical service fare (similar to options evaluated): \$2-5 per one-way trip (based on average of Santa Cruz METRO &amp; five San Francisco Bay Area transit agencies)</li> <li>• Average fare per trip assumed to be \$3.50 for estimating funding revenues</li> </ul> | <ul style="list-style-type: none"> <li>• Typical service fare (similar to options evaluated): \$2.75-5.75 per one-way trip (based on average of seven CA commuter rail systems)</li> <li>• Average fare per trip assumed to be \$4.50 for estimating funding revenues</li> </ul> | <ul style="list-style-type: none"> <li>• Typical service fare (similar to options evaluated): \$1.75-3.25 per one-way trip (based on survey of five CA light rail &amp; two Pacific Northwest systems)</li> <li>• Average fare per trip assumed to be \$4.50 for estimating funding revenues</li> </ul> | <ul style="list-style-type: none"> <li>• No data available for ART system so LRT fares assumed to be representative of an ART fare</li> <li>• Average fare per trip assumed to be \$4.50 for estimating funding revenues</li> </ul>   |
| MOBILITY DEVICE CAPACITY ON TRANSIT EVERY 30 MINUTES DURING PEAK PERIOD  | <ul style="list-style-type: none"> <li>• Typical capacity is two ADA accessible seats per articulated BRT (four seats for two BRT every 30 mins.)</li> <li>• Flexible design to include seats, space for bicycles &amp; mobility devices</li> </ul>   | <ul style="list-style-type: none"> <li>• Typical capacity is two ADA accessible seats per car (six seats for each three car trainset every 30 mins.)</li> <li>• Flexible design to include seats, space for bicycles &amp; mobility devices</li> </ul>                           | <ul style="list-style-type: none"> <li>• Typical capacity is four ADA accessible seats per car (12 seats for each three car trainset every 30 mins.)</li> <li>• Flexible design to include seats, space for bicycles &amp; mobility devices</li> </ul>  | <ul style="list-style-type: none"> <li>• Typical capacity is four ADA accessible seats per car (12 seats for each three car trainset every 30 mins.)</li> <li>• Flexible design to include seats, space for bicycles &amp; mobility devices</li> </ul>                              |
| INDEPENDENT ACCESSIBILITY FOR ALL AGES & ABILITIES INCLUDING LEVEL BOARDING  | <ul style="list-style-type: none"> <li>• Able to provide level boarding platforms at all stations along rail ROW</li> <li>• Stops along roadway alignment may not accommodate level boarding due to space limitations</li> </ul>  | <ul style="list-style-type: none"> <li>• Able to provide level boarding platforms at all stations</li> </ul>   | <ul style="list-style-type: none"> <li>• Able to provide level boarding platforms at all stations</li> </ul>  | <ul style="list-style-type: none"> <li>• Able to provide level boarding platforms at stations between Natural Bridges Dr. &amp; Lee Rd. Station</li> <li>• Local bus connection from Lee Rd. Station to downtown Watsonville &amp; Pajaro Station with no level boarding</li> </ul> |



GOAL: Offers reliable & efficient transportation choices that serve the most people

| METRIC:   | BRT   | CRT  | LRT   | ART  |
|---|---|--|---|--|
| TRANSIT TRAVEL TIME DURING PEAK PERIODS<br><i>Average end-to-end Travel Time in minutes (includes station dwell time)</i> | 90  | 45   | 55  | 62   |
| AUTO TRAVEL TIME ON HWY 1 NB A.M. PEAK (MINS)   | 60  | 60   | 60  | 60   |
| AUTO TRAVEL TIME ON HWY 1 SB A.M. PEAK (MINS)   | 30  | 30   | 30  | 30   |
| AUTO TRAVEL TIME ON HWY 1 NB P.M. PEAK (MINS)   | 35  | 35   | 35  | 35   |
| AUTO TRAVEL TIME ON HWY 1 SB P.M. PEAK (MINS)   | 61  | 61   | 61  | 61   |
| NUMBER OF AT-GRADE CROSSINGS & MITIGATION MEASURES  | <ul style="list-style-type: none"> <li>• 34 grade crossings (26 public/8 private)</li> <li>• Assumes appropriate active warning devices, traffic signal interconnects &amp; improved sight distances</li> </ul>   | <ul style="list-style-type: none"> <li>• 70 grade crossings (41 public/29 private)</li> <li>• Assumes appropriate active warning devices, traffic signal interconnects, quiet zones &amp; improved sight distances</li> </ul>  | <ul style="list-style-type: none"> <li>• 70 grade crossings (41 public/29 private)</li> <li>• Assumes appropriate active warning devices, traffic signal interconnects, quiet zones &amp; improved sight distances</li> </ul>   | <ul style="list-style-type: none"> <li>• 62 grade crossings (35 public/27 private)</li> <li>• Assumes an appropriate active warning devices, traffic signal interconnects, quiet zones &amp; improved sight distances</li> </ul> |
| IMPACTS AT GRADE CROSSINGS - ESTIMATED SIGNAL GATE DOWN TIME EACH TIME TRANSIT PASSES GRADE CROSSING (SECONDS)            | 60-90   | 90-120   | 75-120  | 75-120   |
| REGIONAL CONNECTIVITY   | <ul style="list-style-type: none"> <li>• Would connect with planned regional &amp; intercity rail service at Pajaro Station via a transfer from BRT to rail for access to Gilroy and the planned high speed rail line and to Salinas and destinations south.</li> <li>• The longer travel time for BRT to access Pajaro Station for regional trips is less time efficient than the other alternatives.</li> </ul> | <ul style="list-style-type: none"> <li>• Would connect to proposed intercity rail service at Pajaro via a cross-platform transfer for access to Gilroy, planned High Speed Rail line plus Salinas &amp; destinations south</li> <li>• An FRA-compliant vehicle would allow "one-seat" ride on proposed regional service between Santa Cruz &amp; Monterey</li> </ul> | <ul style="list-style-type: none"> <li>• Would connect to proposed intercity rail service at Pajaro via a cross-platform transfer for access to Gilroy, planned High Speed Rail line plus Salinas &amp; destinations south</li> <li>• A non-FRA-compliant vehicle would require separate set of tracks into Pajaro station &amp; cross platform transfer to regional service to Monterey.</li> <li>• If FRA-compliant vehicle, connection would be same as CRT</li> </ul> | <ul style="list-style-type: none"> <li>• On Santa Cruz Branch Rail Line would need transfer to local bus service at Lee Rd. plus transfer from bus to regional &amp; intercity rail service at Pajaro Station</li> </ul>         |





GOAL: Offers reliable & efficient transportation choices that serve the most people

| METRIC:   | BRT  | CRT   | LRT   | ART   |
|---|--|---|---|---|
| <b>TRAVEL TIME RELIABILITY DURING PEAK PERIODS</b><br><i>The 95th percentile planning reliability time (in mins) in 2040 conditions, estimated using reliability factors presented in Highway Capacity Manual</i> | 132  | 56  | 69  | 78  |
| <b>TRAVEL TIME RELIABILITY DURING PEAK PERIODS</b>  | <ul style="list-style-type: none"> <li>• Lowest travel time reliability due to traveling on mixed traffic roadways 70% of route</li> <li>• Utilizes exclusive 6.7 miles guideway on ROW -BRT can pass a stalled BRT vehicle for greater reliability</li> <li>• Operates in mixed traffic for 6.6 miles on Highway 1 between Airport &amp; Rio Del Mar Blvds.                             <ul style="list-style-type: none"> <li>– Travels in bus shoulders/auxiliary lane for 1 mile on Highway 1 between Freedom &amp; Rio Del Mar Blvd.</li> </ul> </li> <li>• Operates in mixed traffic on local roadways in Watsonville, Aptos, Soquel &amp; downtown Santa Cruz                             <ul style="list-style-type: none"> <li>– Could utilize bus priority system designs (i.e. queue jumps &amp; signal priority) at many of the 9 miles of local road intersections to provide travel time reliability benefits</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Highest travel time reliability due to traveling nearly exclusively on dedicated facility</li> <li>• Delays may occur if not separated into dedicated facility in areas where ROW is shared use with autos such as on Walker St. in Watsonville &amp; Beach St. in Santa Cruz</li> <li>• Reliability can be impacted by mechanical problems of rail vehicles as they cannot be passed without use of a siding</li> </ul> | <ul style="list-style-type: none"> <li>• Highest travel time reliability due to traveling nearly exclusively on dedicated facility</li> <li>• Delays may occur if not separated into dedicated facility in areas where ROW is shared use with autos such as on Walker St. in Watsonville &amp; Beach St. in Santa Cruz</li> <li>• Reliability can be impacted by mechanical problems of rail vehicles as they cannot be passed without use of a siding</li> </ul> | <ul style="list-style-type: none"> <li>• Highest travel time reliability due to traveling nearly exclusively on dedicated facility</li> <li>• Reliability can be impacted by mechanical problems of ART vehicles as they cannot be passed readily without use of a siding</li> <li>• Delays may occur for travelers using bus connector service at Lee Rd. Station to downtown Watsonville &amp; Pajaro Station due to mixed traffic operations                             <ul style="list-style-type: none"> <li>– Could utilize bus priority system designs (i.e. queue jumps &amp; signal priority) at many of the 3.2 miles of local road intersections to provide travel time reliability benefits</li> </ul> </li> </ul> |





GOAL: Promotes a healthier environment

Will project substantially increase transit ridership?

| METRIC:  | BRT    | CRT    | LRT    | ART    |
|--|--------|--------|--------|--------|
| WEEKDAY TRANSIT RIDERSHIP IN CORRIDOR IN 2040 (DAILY BOARDINGS)  | 6,650  | 5,150  | 5,450  | 5,150  |
| WEEKDAY TRANSIT RIDERSHIP IN CORRIDOR IN 2040 - CONSIDERS FUTURE GENERAL PLAN UPDATES (DAILY BOARDINGS)  | 7,650  | 7,150  | 7,300  | 7,000  |
| WEEKDAY TRANSIT RIDERSHIP IN CORRIDOR IN 2040 - ASSUMES 10% ADDITIONAL RIDERSHIP DUE TO TRANSIT ORIENTED DEVELOPMENTS ONCE TRANSIT FACILITY IS OPERATIONAL (DAILY BOARDINGS) | 8,400  | 7,900  | 8,000  | 7,700  |
| WEEKEND TRANSIT RIDERSHIP IN CORRIDOR - LOCAL/REGIONAL TRIPS IN 2040 (DAILY)   | 3,400  | 2,800  | 3,000  | 2,800  |
| COUNTYWIDE TRANSIT RIDERSHIP (DAILY)   | 37,500 | 34,500 | 34,300 | 34,100 |
| TRANSIT PASSENGER CAPACITY/3-HOUR PEAK PERIOD  | 1,440  | 2,700  | 2,650  | 2,650  |

Does project support the goal of minimizing emissions? How long will the project take to implement?

|   |         |         |         |         |
|---|---------|---------|---------|---------|
| AUTO VEHICLE MILES TRAVELED REDUCED/DAY   | -16,280 | -20,490 | -22,020 | -20,650 |
| REDUCTION IN GREENHOUSE GAS EMISSIONS - IN ANNUAL METRIC TONS IN YEAR 2040  | 1096    | 1379    | 1482    | 1389    |
| LENGTH OF TIME TO IMPLEMENT (IN YEARS)<br><i>High level planning estimates without details for the final design, funding plan, construction schedules, etc.</i> | 15-17   | 11-13   | 11-13   | 20-24   |
| CRITERIA POLLUTANTS - IN ANNUAL METRIC TONS IN YEAR 2040  | 2.54    | 3.20    | 3.44    | 3.22    |

Will project adapt to climate change?

|  |      |      |      |      |
|--|------|------|------|------|
| CLIMATE CHANGE RESILIENCY<br><i>Length of alignment with potential for coastal erosion impacts due to 88 cm sea level rise with 100 year storm event (miles)</i> | 0.57 | 1.85 | 1.85 | 1.85 |
|--|------|------|------|------|



GOAL: Promotes a healthier environment

Are there effects of the project on biological resources, visual, noise & vibration?

| METRIC:  | BRT   | CRT  | LRT   | ART  |
|--|---|--|---|--|
| EFFECTS ON BIOLOGICAL RESOURCES, VISUAL, NOISE & VIBRATION | <ul style="list-style-type: none"> <li>• Electric BRT quieter than diesel powered bus</li> <li>• Not visually obstructive &amp; least likely to cause vibration</li> <li>• Least impact on environmentally sensitive areas as it's primarily in vicinity of the sloughs in Watsonville</li> </ul> | <ul style="list-style-type: none"> <li>• Noisier than other alternatives, but quiet zones would eliminate need for sounding horns at roadway crossings &amp; are included in cost estimates</li> <li>• Not visually obstructive &amp; moderate level of vibration that may impact land use within 100 feet of ROW</li> <li>• Increased rail service along ROW may impact environmentally sensitive areas including biological resources as it utilizes ROW in vicinity of the sloughs west of Watsonville</li> </ul> | <ul style="list-style-type: none"> <li>• Moderate noise level, but quiet zones would eliminate need for sounding horns at roadway crossings &amp; are included in cost estimates</li> <li>• Not visually obstructive &amp; moderate level of vibration that may impact land use within 100 feet of ROW</li> <li>• Increased rail service along ROW may impact environmentally sensitive areas including biological resources as it utilizes ROW in vicinity of the sloughs west of Watsonville</li> </ul> | <ul style="list-style-type: none"> <li>• Noise level unknown, but sounding horns at roadway crossings are not required due to rubber wheel option</li> <li>• Not visually obstructive &amp; least likely to cause vibration although there may be vibration impacts within 100 feet of ROW</li> <li>• Increased transit service along ROW may impact environmentally sensitive areas including biological resources as it utilizes ROW in vicinity of the sloughs west of Watsonville</li> </ul> |

Does project support the goal of reduced energy usage?

|   |       |       |       |             |
|---|-------|-------|-------|-------------|
| REDUCTION OF ENERGY/FUEL CONSUMPTION BASED ON AUTO MODE SHIFTS TO THE ALTERNATIVES (AVERAGE BTU/PASSENGER MILE) | 1,957 | 1,528 | 1,500 | 1,500-1,957 |
|---|-------|-------|-------|-------------|



## GOAL: Addresses project-specific concerns

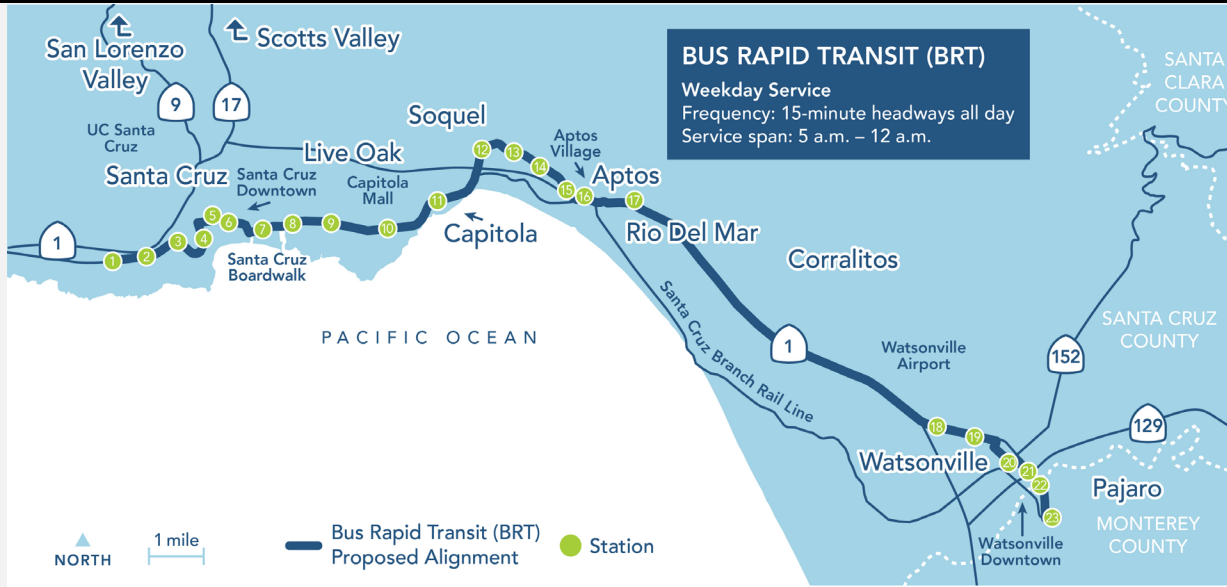
| METRIC:  | BRT   | CRT  | LRT  | ART  |
|--|---|--|--|--|
| IS PROJECT TECHNICALLY FEASIBLE?   | Traditional, tested technology & technically feasible   | Traditional, tested technology & technically feasible  | Traditional, tested technology & technically feasible  | Existing, testing infrastructure, but not traditional & introduces new technological risks   |
| IS PROJECT CONSISTENT WITH OTHER LOCAL, STATE & FEDERAL PLANNING EFFORTS?    | <ul style="list-style-type: none"> <li>• SCC Regional Transpo Plan</li> <li>• Unified Corridor Study</li> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul>  | <ul style="list-style-type: none"> <li>• SCC Regional Transpo Plan</li> <li>• Unified Corridor Study</li> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul>   | <ul style="list-style-type: none"> <li>• SCC Regional Transpo Plan</li> <li>• Unified Corridor Study</li> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul>   | <ul style="list-style-type: none"> <li>• CA State Rail Plan</li> <li>• MBSST Master Plan</li> </ul>  |
| IS PROJECT CONSISTENT WITH LOCAL, STATE AND FEDERAL REGULATORY REQUIREMENTS? | <ul style="list-style-type: none"> <li>• SB375/other GHG regulations</li> <li>• Coastal Commission</li> </ul>   | <ul style="list-style-type: none"> <li>• SB375/other GHG regulations</li> <li>• Coastal Commission</li> <li>• Proposition 116</li> <li>• FAST Act (travel time reliability)</li> </ul>   | <ul style="list-style-type: none"> <li>• SB375/other GHG regulations</li> <li>• Coastal Commission</li> <li>• Proposition 116</li> <li>• FAST Act (travel time reliability)</li> </ul>   | <ul style="list-style-type: none"> <li>• SB375/other GHG regulations</li> <li>• Coastal Commission</li> <li>• FAST Act (travel time reliability)</li> </ul>  |
| DOES PROJECT INTEGRATE INTO EXISTING TRANSPORTATION INFRASTRUCTURE?          | <ul style="list-style-type: none"> <li>• Connects with local bus service at Santa Cruz Metro Center &amp; Watsonville Transit Center</li> <li>• Existing local bus service connects at four future stations along the SCBRL ROW and existing local bus service connects with all the stops along Soquel Drive between Park Ave and Rio Del Mar Blvd</li> <li>• Local bus service could be provided to/from all future stations</li> </ul> | <ul style="list-style-type: none"> <li>• Connects with local bus service at seven future stations (Watsonville Downtown, Aptos Village, 41st Ave., 17th Ave., Seabright Ave., Downtown Boardwalk, Natural Bridges Dr.)</li> <li>• Local bus service could be provided to/from all future stations</li> </ul> | <ul style="list-style-type: none"> <li>• Connects with local bus service at eight future LRT stations (Watsonville Downtown, Ohlone Parkway, Aptos Village, 41st Ave., 17th Ave., Seabright Ave., Downtown Boardwalk, Natural Bridges Dr.)</li> <li>• Local bus service could be provided to/from all future stations</li> </ul> | <ul style="list-style-type: none"> <li>• Connects with local bus service at six future ART stations (Aptos Village, 41st Ave., 17th Ave., Seabright Ave., Downtown Boardwalk, Natural Bridges Dr.)</li> <li>• Local bus service could be provided to/from all future stations</li> <li>• Local bus connector service from Lee Rd. station to Pajaro would also connect to Watsonville Downtown Transit Center</li> </ul> |
| DOES PROJECT HAVE ABILITY TO ADAPT TO FUTURE TECHNOLOGY?                     | <ul style="list-style-type: none"> <li>• More flexibility adapting to new technologies due to more flexible infrastructure with pavement and lower vehicle costs/shorter useful life</li> </ul>   | <ul style="list-style-type: none"> <li>• Less flexibility adapting to new technologies due to less flexible infrastructure due to fixed guideway and higher vehicle cost/longer useful life</li> </ul>   | <ul style="list-style-type: none"> <li>• Less flexibility adapting to new technologies due to less flexible infrastructure due to fixed guideway and higher vehicle cost/longer useful life</li> </ul>   | <ul style="list-style-type: none"> <li>• Moderate flexibility adapting to new technologies due to more flexible infrastructure due to pavement and higher vehicle costs/longer useful life</li> </ul>  |
| HOW EASILY CAN PROJECT BE INTEGRATED INTO EXISTING RIGHT-OF-WAY?             | <ul style="list-style-type: none"> <li>• No significant ROW expected to be needed to construct facility on ROW</li> <li>• Additional ROW could be required at larger stations that include parking or other amenities that require more space</li> </ul>  | <ul style="list-style-type: none"> <li>• No significant ROW expected to be needed to construct facility on ROW</li> <li>• Additional ROW could be required at larger stations that include parking or other amenities needing more space</li> </ul>  | <ul style="list-style-type: none"> <li>• No significant ROW expected to be needed to construct facility on ROW</li> <li>• Additional ROW could be required at larger stations that include parking or other amenities needing more space</li> </ul>  | <ul style="list-style-type: none"> <li>• No significant ROW expected to be needed to construct facility on ROW</li> <li>• Additional ROW could be required at larger stations that include parking or other amenities needing more space</li> </ul>  |

## **APPENDIX H – Detailed Cost Tables**



|                    |  |
|--------------------|--|
| <b>Project</b>     | <b>TCAA/RNIS - Bus Rapid Transit Watsonville to Santa Cruz on Rail ROW with portions of route on parallel roadways</b>   |
| <b>Limits</b>      | Watsonville Transit Center to Natural Bridges Drive on West side of Santa Cruz   |
| <b>Description</b> | BRT can be described by a fixed-route bus system that could operate on the Santa Cruz Branch Rail Line as a dedicated right-of-way, as well as on Highway 1 bus on shoulders/auxiliary lanes and the local roadway network. BRT systems typically provide an urban or interurban service. These systems also have defined passenger stations, short headway bidirectional services for a substantial part of weekdays and weekend days, and separate branding of the service. Agencies typically use off-board fare collection as well to reduce travel times. |

**Scope/Map**

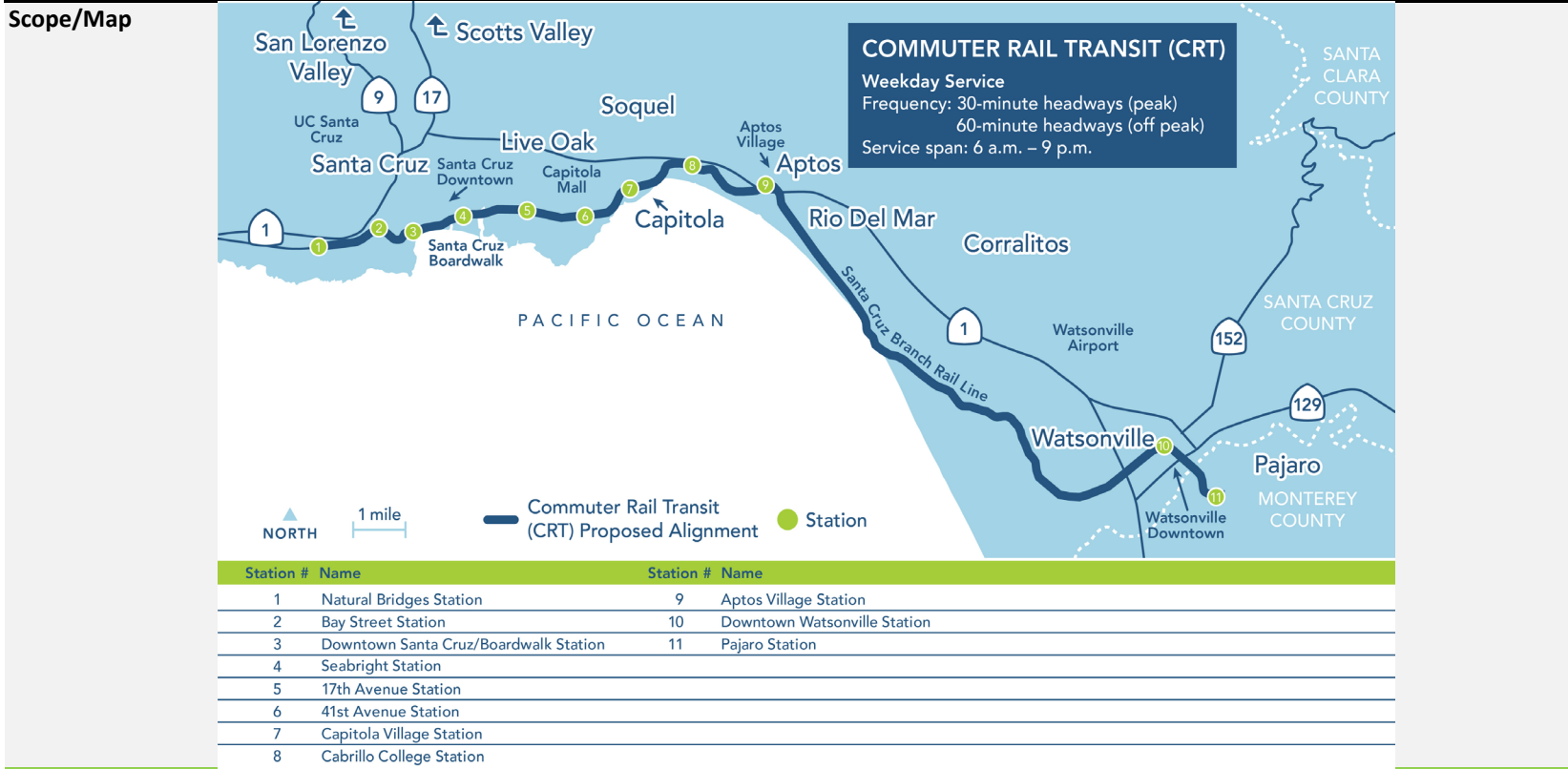


| Station # | Name                            | Station # | Name                          | Station # | Name                               |
|-----------|---------------------------------|-----------|-------------------------------|-----------|------------------------------------|
| 1         | Natural Bridges Station         | 9         | 17th Avenue Station           | 17        | Rio Del Mar/Soquel Station         |
| 2         | Fair/Almar Avenue Station       | 10        | 41st Avenue Station           | 18        | Main/Green Valley Station          |
| 3         | Bay Street Station              | 11        | Capitola Village              | 19        | Ramsay Park Station                |
| 4         | Depot Park Station              | 12        | Soquel/Park Station           | 20        | Watsonville Transit Center Station |
| 5         | SC Metro Transit Center Station | 13        | Cabrillo College Station      | 21        | Main/Riverside Station             |
| 6         | Riverside/San Lorenzo Station   | 14        | Soquel/Mar Vista Station      | 22        | Porter/San Juan Station            |
| 7         | Seabright/Murray Station        | 15        | Rancho Del Mar Center Station | 23        | Pajaro Station                     |
| 8         | 7th Avenue Station              | 16        | Aptos Village Station         |           |                                    |

**TCAA/RNIS BRT Capital Costs**

|  |           |                    |
|--|-----------|--------------------|
| Earthwork and Pavement   | \$        | 25,266,000         |
| Drainage   | \$        | 7,260,000          |
| Specialty Items (Retaining Walls, Fencing, Curbs, Rail Removal, Platforms, Signal Priorities and Queue Jumps, Other) | \$        | 35,201,100         |
| Environmental (Mitigation, Landscape, Irrigation, Erosion Control)   | \$        | 9,735,700          |
| Traffic (Electrical, Signing, Striping, Traffic Management, Construction, Handling)                                  | \$        | 19,628,000         |
| Minor Items (ADA Compliance, Connections to Trails)  | \$        | 11,650,900         |
| Roadway Mobilization   | \$        | 10,874,200         |
| Supplemental Work  | \$        | 5,437,100          |
| State Furnished  | \$        | 4,349,700          |
| Contingency  | \$        | 64,701,400         |
| Structures   | \$        | 50,400,000         |
| ROW  | \$        | 13,650,000         |
| Bus Vehicles (16)  | \$        | 19,968,000         |
| Support (PA/ED, PS&E, ROW and Construction Support)  | \$        | 102,394,500        |
| Proposition 116 Payback to CTC   | \$        | 28,000,000         |
| <b>TOTAL PROJECT COST- CAPITAL</b>   | <b>\$</b> | <b>410,000,000</b> |

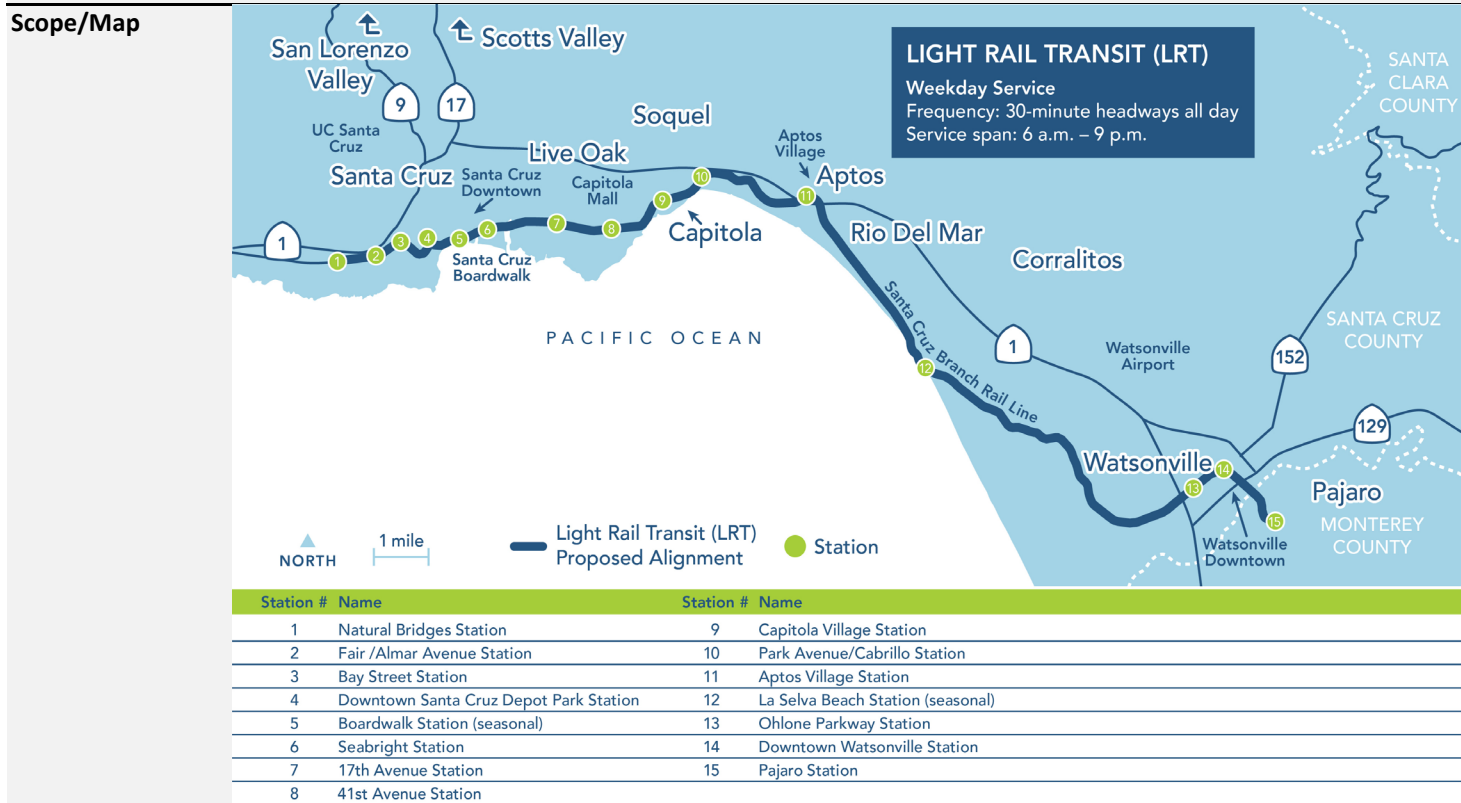
|                    |  |
|--------------------|--|
| <b>Project</b>     | <b>TCAA/RNIS - Commuter Rail Watsonville/Pajaro to Santa Cruz on Rail ROW</b>  |
| <b>Limits</b>      | Watsonville/Pajaro to Natural Bridges Drive on West side of Santa Cruz   |
| <b>Description</b> | Commuter rail options can be described as passenger rail service operating on fixed rails with multiple individually-propelled cars, typically providing an interurban or regional service. Commuter rail usually has a higher volume ridership capacity and relatively longer distances between stops when compared to light rail. Operations on a single track with sidings allows for two-way travel. |



**TCAA/RNIS CRT CAPITAL COSTS**

|   |           |                    |
|---|-----------|--------------------|
| Track Rehabilitation/Maintenance [Ties (75% replacement), Rails (100% replacement), Ballast]                        | \$        | 20,100,000         |
| New Track Construction and Special Trackwork (Construction, Grading, Turnouts)                                      | \$        | 16,900,000         |
| Grade Crossings   | \$        | 14,000,000         |
| ROW Improvements/Maintenance (Drainage, Utility Relocations, Fencing)   | \$        | 8,400,000          |
| SCBG Improvements   | \$        | 2,900,000          |
| Crossing Signals (Grade Cross Equipment and Quiet Zones)  | \$        | 22,600,000         |
| Train Control   | \$        | 48,000,000         |
| Structures  | \$        | 32,000,000         |
| Retaining Walls   | \$        | 8,400,000          |
| Stations/Maintenance Facility   | \$        | 31,800,000         |
| Rail Vehicles (6 trainsets with 3 cars each)  | \$        | 63,500,000         |
| Contingency   | \$        | 130,800,000        |
| Support Costs (Documentation, Permitting, Bid Document Preparation, Project Administration, Construction Mangement) | \$        | 78,500,000         |
| <b>TOTAL PROJECT COST- CAPITAL</b>  | <b>\$</b> | <b>478,000,000</b> |

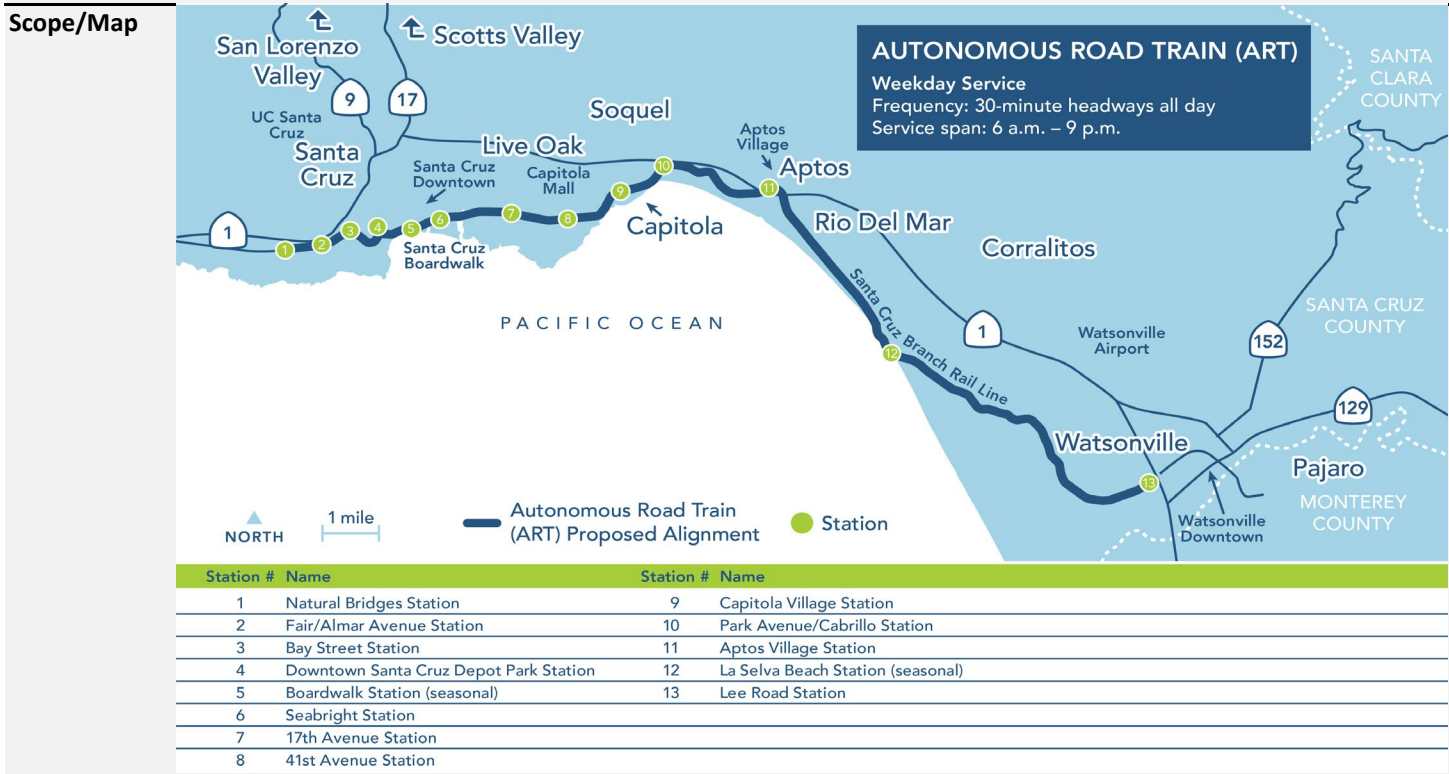
|                    |   |
|--------------------|---|
| <b>Project</b>     | <b>TCAA/RNIS - Light Rail Watsonville/Pajaro to Santa Cruz on Rail ROW</b>  |
| <b>Limits</b>      | Watsonville/Pajaro to Natural Bridges Drive on West side of Santa Cruz  |
| <b>Description</b> | Light rail options can be described as passenger rail service operating on fixed rails with single or multiple individually-propelled cars, typically providing an urban or interurban service with a lighter volume ridership capacity per consist compared to commuter rail. Operations on a single track with sidings allows for two-way travel. |



**TCAA/RNIS LRT CAPITAL COSTS**

|   |           |                    |
|---|-----------|--------------------|
| Track Rehabilitation/Maintenance [Tie (75% replacement), Rails (100% replacement), Ballast]                         | \$        | 20,100,000         |
| New Track Construction and Special Trackwork (Construction, Grading, Turnouts)                                      | \$        | 19,300,000         |
| Grade Crossings   | \$        | 14,000,000         |
| ROW Improvements/Maintenance (Drainage, Utility Relocations, Fencing)   | \$        | 8,400,000          |
| SCBG Improvements   | \$        | 2,900,000          |
| LRT Stub Connection   | \$        | 2,500,000          |
| Crossing Signals (Grade Cross Equipment and Quiet Zones)  | \$        | 22,600,000         |
| Train Control   | \$        | 26,000,000         |
| Structures  | \$        | 32,000,000         |
| Retaining Walls   | \$        | 8,400,000          |
| Stations/Maintenance Facility   | \$        | 42,100,000         |
| Rail Vehicles (8 trainsets with 3 cars each)  | \$        | 63,000,000         |
| Contingency   | \$        | 127,200,000        |
| Support Costs (Documentation, Permitting, Bid Document Preparation, Project Administration, Construction Mangement) | \$        | 76,300,000         |
| <b>TOTAL PROJECT COST- CAPITAL</b>  | <b>\$</b> | <b>465,000,000</b> |

|                    |  |
|--------------------|--|
| <b>Project</b>     | <b>TCAA/RNIS - Autonomous Road Train Watsonville (Lee Road) to Santa Cruz on Rail ROW</b>  |
| <b>Limits</b>      | Watsonville (Lee Road) to Natural Bridges Drive on West side of Santa Cruz   |
| <b>Description</b> | An autonomous road “train” is an emerging transit mode that combines the benefits of bus rapid transit and light rail with advanced autonomous driving features, providing an urban or interurban service. The system uses rubber tires running on pavement within a dedicated running way. The vehicles tend to visually resemble light rail vehicles, with a similar passenger capacity. The autonomous road “train” will run solely on the Santa Cruz Branch Rail Line. Operations on a single lane with sidings allows for two-way travel. |



**TCAA/RNIS ART Capital Costs**

|  |           |                    |
|--|-----------|--------------------|
| Earthwork and Pavement   | \$        | 49,229,400         |
| Drainage   | \$        | 15,610,000         |
| Specialty Items (Retaining Walls, Fencing, Curbs, Rail Removal, Platforms, Signal Priorities and Queue Jumps, Other) | \$        | 80,838,500         |
| Environmental (Mitigation, Landscape, Irrigation, Erosion Control)   | \$        | 20,888,300         |
| Traffic (Electrical, Signing, Striping, Traffic Management, Construction, Handling)                                  | \$        | 26,748,000         |
| Minor Items (ADA Compliance, Connections to Trails)  | \$        | 23,197,800         |
| Roadway Mobilization   | \$        | 21,651,200         |
| Supplemental Work  | \$        | 10,825,600         |
| State Furnished  | \$        | 8,660,500          |
| Contingency  | \$        | 128,824,700        |
| Structures   | \$        | 51,200,000         |
| ROW  | \$        | 27,090,000         |
| Bus Vehicles (6 vehicle sets with 3 cars each)   | \$        | 39,000,000         |
| Support (PA/ED, PS&E, ROW and Construction Support)  | \$        | 184,172,100        |
| Proposition 116 and STIP Payback to CTC  | \$        | 28,000,000         |
| Local Bus Connection between Lee Rd Station, Watsonville Transit Center and Pajaro Station                           | \$        | 3,000,000          |
| <b>TOTAL PROJECT COST- CAPITAL</b>   | <b>\$</b> | <b>720,000,000</b> |

## **APPENDIX I – Funding Source Table**



**FUNDING SOURCES - TRANSIT CORRIDOR ALTERNATIVES ANALYSIS\***

| Revenue Sources  | Assumptions  | 25-Year Total Capital Funds for New Dedicated Transit Facility on SCBRL-Rounded (\$000s) | Annual for O&M (\$000s) | Bus Rapid Transit |     | Commuter Rail |     | Light Rail |     | Autonomous Road "Train" |     |
|--|--|--|-------------------------|-------------------|-----|---------------|-----|------------|-----|-------------------------|-----|
|  |  |  |                         | Capital           | O&M | Capital       | O&M | Capital    | O&M | Capital                 | O&M |
| <b>FEDERAL SOURCES</b>   |  |  |                         |                   |     |               |     |            |     |                         |     |
| Capital Investment Grant 5309  | Capital investments eligible for all four alternatives. Est. based on combination of 1) FY18 and FY19 appropriations for CA and 2) mid range of a Small Starts project award between \$20-100 million. One-time award.   | \$60,000   |                         | x                 |     | x             |     | x          |     | x                       |     |
| Buses and Bus Facilities Grant 5339 Discretionary                                  | Could be used for future replacement buses. SCC population percentage as share of competitive program; appropriation amount from FY19 with growth rate from FY 18  | \$4,000  |                         | x                 |     |               |     |            |     |                         |     |
| State of Good Repair Grants Program (49 U.S.C. 5337)                               | Formula funds avail for high-intensity fixed guideway and bus systems in revenue service for at least seven years. Assume 8 years of funds, after 7 years of service. Based on population and population density per FAST ACT Sheet State of Good Repair Grants Chapter 53 Section 5337                              | \$18,000   |                         | x                 |     | x             |     | x          |     | x                       |     |
| Low or No Emission Vehicle Program - 5339(c)                                       | Discretionary grant for capital projects to purchasing or leasing low- or no-emission buses or installation of ZEB charging infrastructure. SCC population percentage as share of competitive program x 15 years   | \$2,000  |                         | x                 |     |               |     |            |     |                         |     |
| Better Utilizing Investments to Leverage Development (BUILD) Transportation Grants | Average between lowest award in the past five years (\$9M) and maximum project award (\$20M) to California. Projects average per year had been \$9-18M.  | \$15,000   |                         | x                 |     | x             |     | x          |     | x                       |     |
| Consolidated Rail Infrastructure and Safety Improvements (CRISI)                   | SCC population percentage as share of competitive program. Funds capital projects that address congestion challenges affecting rail service  | \$2,000  |                         |                   |     | x             |     | x          |     | x                       |     |
| Advanced Transportation and Congestion Management Technologies Deployment          | Maximum project award (\$12M; 20% of \$60M/yr competitive program). Competitive grants for the development of model deployment sites for large scale installation and operation of advanced transportation technologies to improve safety, efficiency, system performance, and infrastructure return on investment.  | \$12,000   |                         | x                 |     | x             |     | x          |     | x                       |     |
| Surface Transportation Block Grant (STBG)/RSTPX                                    | Assume 25% of regional shares for 10 years. SCC population percentage as share of sub allocation of formula grant program (5% from how 5307 appropriations to SC for areas with populations above 50k but under 200k)  | \$13,000   |                         | x                 |     | x             |     | x          |     | x                       |     |
| Pilot Program for TOD Planning- FTA 20005(b)                                       | Funds comprehensive planning for TOD on new fixed-guideway & core capacity route to encourage ridership, transit access, and economic and mixed-use development near public transportation projects. \$6.2M nationwide in 2020 (apps due 10/20) - min/max \$250,000 & \$2,000,000                                    | \$1,000  |                         |                   |     |               |     |            |     |                         |     |
| Railway Highway Crossing (Section 130)   | The purpose of the Railroad/Highway At-Grade Crossing Program is to reduce the number and severity of highway accidents by eliminating hazards to vehicles and pedestrians at existing railroad crossings. While transit not eligible, maybe avail if freight. SCC population percentage as share of formula program | \$3,000  |                         |                   |     | x             |     | x          |     |                         |     |
| <b>STATE SOURCES</b>   |  |  |                         |                   |     |               |     |            |     |                         |     |
| STA- New Service/Revenue-based (99314)   | Assume available once service starts - year 10 and will increase transit ridership in SC Co by 10%. Only available if there is a new STA-eligible operator (not METRO)   |  | \$200                   |                   |     |               |     | x          |     | x                       | x   |
| SGR- New Service/Revenue-based (99314)   | Assume available once service starts - year 10 and will increase transit ridership in SC Co by 10%. Only available if there is a new STA-eligible operator (not METRO)   | \$1,000  |                         |                   |     | x             |     | x          |     | x                       |     |
| State Transportation Improvement Program (STIP)*                                   | SCC share of \$569M new projects (total target) that runs through FY24/25 five years). FY19 shows transit and project developments shares are only \$5M (\$3.2M+\$1.8M) of \$30M.  | \$10,000   |                         | x                 |     | x             |     | x          |     | x                       |     |
| SB1 Local Partnership Program (LPP) RTC  | Assume same share as FY19/20. Formula share. Available to any projects selected by RTC. Assume 50% to rail corridor.   | \$4,000  |                         | x                 |     | x             |     | x          |     | x                       |     |
| SB-1 Local Partnership Program - Competitive                                       | SCC population percentage as share of \$100M competitive grant program. Assume \$25M max one time.   | \$25,000   |                         | x                 |     | x             |     | x          |     | x                       |     |

| Revenue Sources   | Assumptions   | 25-Year Total Capital Funds for New Dedicated Transit Facility on SCBRL-Rounded (\$000s) | Annual for O&M (\$000s) | Bus Rapid Transit |                  | Commuter Rail            |                  | Light Rail               |                  | Autonomous Road "Train"  |                  |                 |
|---|---|--|-------------------------|-------------------|------------------|--------------------------|------------------|--------------------------|------------------|--------------------------|------------------|-----------------|
|   |   |  |                         | Capital           | O&M              | Capital                  | O&M              | Capital                  | O&M              | Capital                  | O&M              |                 |
| SB1 - Solutions for Congested Corridors Program (SCCP)  | SCC population percentage as share of annual \$250M competitive grant program that is available on annual basis with maximum limit  | \$52,000   |                         | x                 |                  | x                        |                  | x                        |                  | x                        |                  |                 |
| Trade Corridor Enhancement Program (TCEP)   | Competitive. Allocation for rail projects to improve freights movements only with maximum of 10% total funding. 2% targeted for central coast programming.  | \$20,000   |                         |                   |                  | x                        |                  | x                        |                  |                          |                  |                 |
| SB1 State Rail Assistance (SRA)   | Using SCC population percentage of statewide funds allocated to commuter rail services to Santa Cruz County   | \$1,000  |                         |                   |                  | x                        |                  |                          |                  |                          |                  |                 |
| Transit and Intercity Rail Capital Program (TIRCP)  | SCC population percentage as share of \$5.3 billion statewide since 2015 with large variance in award amounts.  | \$30,000   |                         | x                 |                  | x                        |                  | x                        |                  | x                        |                  |                 |
| Affordable Housing and Sustainable Communities  | Transit-oriented development or integrated connectivity project; competitive and assumed maximum award of \$30M   | \$10,000   |                         | x                 |                  | x                        |                  | x                        |                  | x                        |                  |                 |
| STEP - Implementation   | Pilot program applicable to projects serving areas with over 51% disadvantaged and low-income populations. Assumes \$20M awards three grantees.   | \$7,000  |                         | x                 |                  | x                        |                  | x                        |                  | x                        |                  |                 |
| <b>LOCAL SOURCES</b>  |   |  |                         |                   |                  |                          |                  |                          |                  |                          |                  |                 |
| AB 2766 Subvention Fund Program   | Assume 50% of SCC shares 4 times for BRT ZEVs or infrastructure   | \$1,000  |                         | x                 |                  |                          |                  |                          |                  |                          |                  |                 |
| Measure D: 2016 Transportation Sales Tax - Rail Corridor vegetation control, system preservation and other maintenance (8%) | Total \$20M a year for SCC; 8% for rail corridor (analysis and maintenance). Cannot be used on rail service, but can be used on system preservation.  |  | \$1,600                 |                   | x                |                          | x                |                          | x                |                          | x                |                 |
| Rail Operator Maintenance Responsibilities based on Freight operations  | Based on assumptions from the Unified Corridor Investment Study assuming the freight rail operator is responsible for half the total cost of maintenance between Pajaro Station and Westside Santa Cruz Natural Bridges Station |  | \$1,200                 |                   |                  |                          | x                |                          | x                |                          |                  |                 |
| <b>OTHER SOURCES</b>  |   |  |                         |                   |                  |                          |                  |                          |                  |                          |                  |                 |
| Transit on Rail Right-of-Way Fares  | Fares from transit service on the rail right-of-way. Assume average \$3.50 fare for BRT and \$4.50 fare for CRT, LRT, and ART based on distance served.   |  | Varies                  |                   | x                |                          | x                |                          | x                |                          | x                |                 |
| Rail Line Lease, Concession Revenue and Advertising   | Revenues generated from rail leases, concessions and advertising based on revenues earned by other transit operators. Assumed \$750k per year based on similar systems  |  | \$750                   |                   | x                | yes but consider for O&M | x                | yes but consider for O&M | x                | yes but consider for O&M | x                |                 |
|   |   |  | <b>TOTAL</b>            |                   | <b>\$263,000</b> | <b>\$10,200</b>          | <b>\$283,000</b> | <b>\$11,600</b>          | <b>\$282,000</b> | <b>\$12,000</b>          | <b>\$259,000</b> | <b>\$10,400</b> |

\*NOTE: Funding for METRO's ongoing capital and operations and maintenance was not assumed to be available for any of the four transit alternatives evaluated in the TCAA/RNIS. Existing funding sources for METRO are provided on the following table.

| FUNDING SOURCES - SANTA CRUZ METROPOLITAN TRANSIT DISTRICT            |  |  |
|---|--|--|
| Revenue Source  | Assumptions  | Existing Service Total Use (\$000s/year) |
| <b>FEDERAL SOURCES</b>  |  |  |
| Urbanized Area Formula Fund 5307                                      | 100% used by Santa Cruz Metropolitan Transit District (METRO) for existing services. Annual estimate based on METRO's recent pop/pop density formula shares.   | \$4,582                                  |
| Small Transit Intensive Cities Performance                            | 100% used by METRO for existing services. Annual estimate based on METRO's recent formula shares.  | \$2,702                                  |
| Bus and Bus Facilities 5339 Formula                                   | 100% used by METRO for existing services. Annual estimate based on METRO's recent formula shares.  | \$568                                    |
| Surface Transportation Block Grant (STBG)/RSTPX                       | Assume 25% of regional shares for 10 years. SCC population percentage as share of sub allocation of formula grant program (5% of 5307 appropriations to SC for areas with populations above 50k but under 200k)  | \$200                                    |
| <b>STATE SOURCES</b>  |  |  |
| Transportation Development Act/Local Transportation Fund (LTF)        | Assumed from Regional Transportation Plan (RTP) for SCC appropriation  | \$7,628                                  |
| State Transit Assistance (STA) (99313)                                | Population-based estimate for SCC. Per 12/17 and 9/19 RTC action, up to 25% of these funds could be available for transit on the rail ROW.   | \$2,383                                  |
| STA - METRO (99314)   | Revenue-based estimate for METRO   | \$2,212                                  |
| SB 1 - STA- State of Good Repair (SGR) (99313)                        | Population-based estimate for SCC. SGR includes capital investment as well as O&M. Per 12/17 and 9/19 RTC action, up to 25% of these funds could be available for locally preferred alternative on the rail ROW. | \$401                                    |
| SB 1 - STA - SGR - METRO  | Revenue-based estimate for METRO. SGR includes capital investment as well as O&M.  | \$360                                    |
| State Transportation Improvement Program (STIP)                       | SCC share of \$569M new projects (total target) that runs through FY24/25 5 years. FY19 shows \$5M of \$30M for transit shares (\$3.2M) & project development shares (\$1.8M).                                   | \$317                                    |
| Low Carbon Transit Operations Program (LCTOP) - Sec 99313 (pop-based) | Population-based estimate for SCC; part of Transit, Affordable Housing, and Sustainable Communities Program. Assumed same appropriation in FY20 from FY19.   | \$503                                    |
| LCTOP - METRO (Sec 99314)   | Revenue-based estimate for METRO transit capital and initial years of new greenhouse gas reducing service. Assumed same appropriation in FY20 from FY19  | \$467                                    |
| SB1 Local Partnership Program (LPP)                                   | Available to METRO projects only. Assume same share as FY19/20. Formula share.   | \$302                                    |
| Affordable Housing & Sustainable Communities                          | Transit-oriented development or integrated connectivity project; competitive and assumed maximum award of \$30M  | \$10,000                                 |
| Hybrid & Zero-Emission Truck & Bus Voucher Incentive Project (HVIP)   | Funds available on first-come-first-serve basis, often oversubscribed. SCC population percentage as share of \$142M portion for buses (12% for shuttle and urban buses). Assumed same FY20 appropriation in FY21 | \$600                                    |
| <b>LOCAL SOURCES</b>  |  |  |
| AB 2766 Subvention Fund Program                                       | Assume 50% of SCC shares 4 times for BRT ZEVs or infrastructure  | \$150                                    |
| Measure D - METRO Allocation (16%)                                    | Total \$20M a year for SCC; 16% for METRO  | \$3,315                                  |
| <b>OTHER SOURCES</b>  |  |  |
| Transit on Roadways Fares (Bus)                                       | 100% for existing METRO services. Fares from bus service on roadways. Based on METRO transit revenues.   | \$7,734                                  |
| METRO Sales Tax (1978)  | 100% for existing METRO services   | \$21,588                                 |
| METRO- Other Revenue (Ads, rents, etc.)                               | 100% for existing METRO services   | \$1,041                                  |
| Fuel Tax Credit   | 100% for existing METRO services   | \$827                                    |
| <b>TOTAL</b>  |  | <b>\$67,879</b>                          |