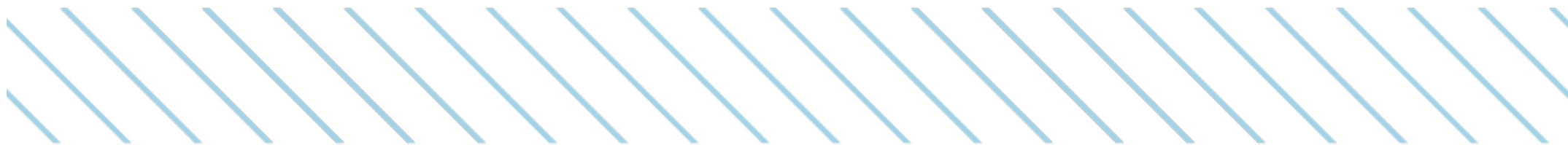


ZERO EMISSION PASSENGER RAIL AND TRAIL PROJECT

Project Update and Milestone 4 Kick-off in the
Development of the Draft Project Concept

June 12, 2025



Project Overview



Project Overview

- New high-capacity passenger rail service & stations on approximately 22 miles of Santa Cruz Branch Rail Line
- 12 miles of Coastal Rail Trail:
 - Segments 13-20
 - Capitola Trestle (Segment 11, Phase 2)



Project Milestones

PROJECT CONCEPT REPORT

Milestones and Engagement Opportunities

**MILESTONE 1
WINTER 2024**

- PRELIMINARY PURPOSE AND NEED STATEMENT
- PROJECT LOOK AHEAD

**MILESTONE 2
SUMMER 2024**

- CONCEPTUAL ALIGNMENTS
- ZERO EMISSION VEHICLE TYPES

**MILESTONE 3
FALL 2024**

- ONGOING CONCEPTUAL ALIGNMENT UPDATES
- STATION LOCATIONS AND FEATURES
- RIDERSHIP APPROACH

**MILESTONE 4
SUMMER 2025**

- DRAFT PROJECT CONCEPT
- PRELIMINARY COST ESTIMATES
- NEXT STEPS FOR PROJECT DEVELOPMENT



Recent Commission Actions

- **February 2024:** Public Hearing on the Project's Preliminary Purpose & Need
- ★ • **April 2024:** Adopted loading guidelines for railroad bridge repairs & replacements
- ★ • **May 2024:**
 - **Adopted typical design cross sections** for rail and trail facilities
 - **Adopted recommended horizontal setback guidelines** for new structures from the Branch Line right-of-way
- **June 2024:** Milestone 2 initial conceptual alignment & **analysis of conceptual rail transit vehicle types**
- **September 2024:** Milestone 2 engagement summary, approach to maximizing **eligibility for state and federal funds**, proximity to Santa Cruz and Watsonville downtown districts and south county beaches & update on CPUC coordination
- **December 2024:** Milestone 3 Public Hearing on alignment updates, station locations and amenities, ridership approach, **quiet zones**, etc.
- ★ • **March 2025:** Directed staff to pursue **intercity passenger rail service**



Community Engagement Summary



Meaningful Public Engagement Throughout Project Lifecycle

TOTAL CONNECTIONS
TO DATE

~500 PEOPLE
In-Person

~5,000 USERS
Virtually



1,000+
COMMENTS RECEIVED



60+
STAKEHOLDER MEETINGS



10
EMAIL BLASTS



9
IN-PERSON OPEN HOUSES



9
NEWSPAPER ADS



6
INFORMATIONAL
SESSIONS



4
VIRTUAL OPEN HOUSES



Draft Project Concept Key Components



Project Concept Components

- **Conceptual Rail & Trail Alignment***
- Railroad Bridge Assessment & Infrastructure
- **Conceptual Ridership Projections***
- Proposed Station Locations & Design Concept
- Initial Environmental Screening
- **Conceptual Network and Operating Plan***
- Conceptual Passenger & Freight Rail Interface Assessment
- Preferred Vehicle Type
- **Project Cost Estimates***
- Funding & Regulatory Strategy

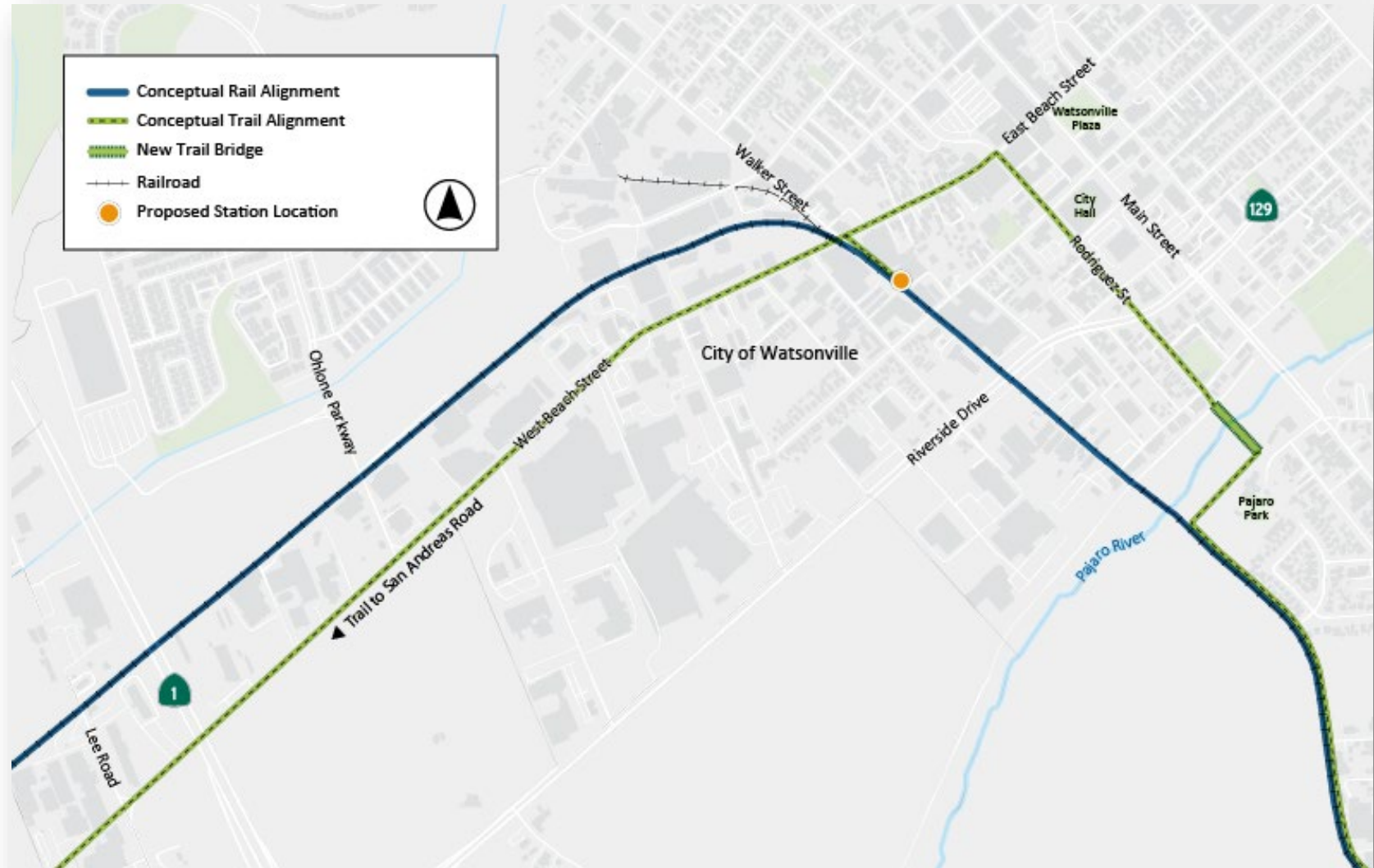
****Detailed Slides Follow***



Conceptual Rail & Trail Alignment

Watsonville

- Walker Street Rail Realignment
- Downtown Station Options
- Trail Segments 17-19
- Trail Bridge Location Options



Conceptual Draft

Conceptual Rail & Trail Alignment

Santa Cruz

- Beach Street Alignment Considerations
- Natural Bridges Dr. Station on West Side



Conceptual Rail & Trail Alignment

Beach Street Alignment

Considered at-grade & elevated options to address:

- Roadway network & public space along Beach Street
- Station option
- Emergency access
- Visual aesthetics
- Pedestrian access & safety
- Cost

Baseline cost estimate assumes an at-grade alignment

- Requires additional refinement and coordination with beach area stakeholders
- Both alignment options & associated network infrastructure elements still under consideration as means to address challenges (related additional costs not included in baseline cost estimate)



Conceptual Operations



Rail Operations Plan



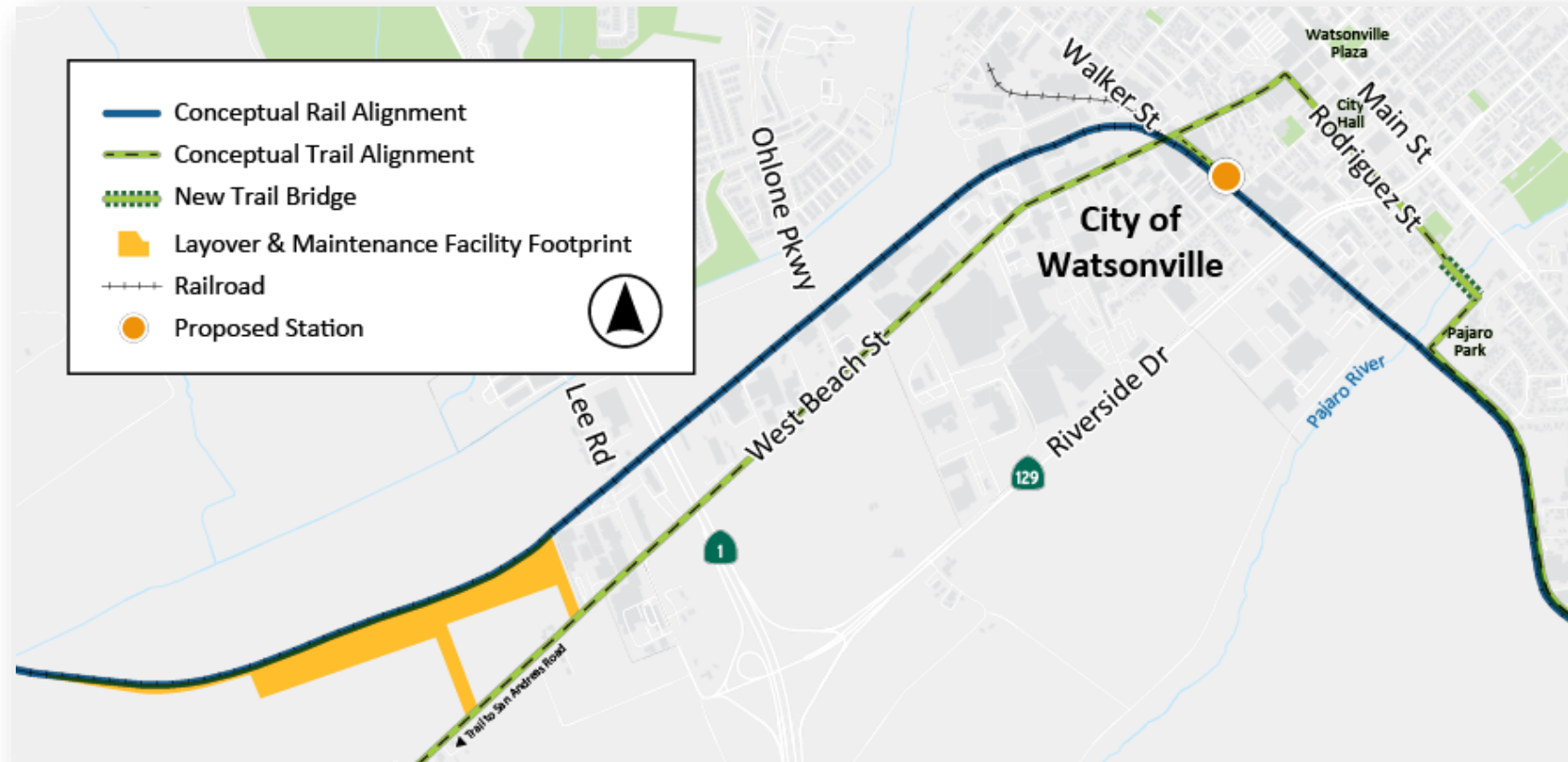
Operations Plan: Based on direction from RTC Commission and previous community input regarding grant program funding eligibility

- Intercity service within Santa Cruz County and connecting to statewide destinations
- **Vehicles:** Assumes 5 hydrogen fueled multiple unit vehicles
- **Hours of service:** 6 a.m. to 10 p.m. daily
- **Frequency:** State Rail Plan envisions intercity passenger rail service commencing around the year 2040 with departures every 30 minutes, but 60-minute headways could be considered for initial service
- **Travel Time:** 40-45 minutes (includes 9 stations)

Conceptual Layover & Maintenance Facility

Proposed location west of Watsonville:

- Provides operational efficiency for both end-of-line service & potential interregional coordination with TAMC
- Additional alternatives may be considered during environmental process



Conceptual Ridership Projections



What is Ridership Forecasting?



Estimating Passenger Demand

Analyzing historical and current data to predict the number of passengers who will use a transportation system or service in the future.



Informing Transportation Planning

Ridership forecasting helps transportation agencies make informed decisions about service frequency and resource allocation.



Accounting for Variables

Considering factors such as population growth, economic trends, transportation preferences, and seasonal fluctuations that can influence ridership.

Ridership forecasting is a crucial tool for transportation planning, allowing agencies to anticipate and prepare for future passenger demand, ensuring efficient and effective transportation services.

Ridership Approach and Considerations



SCC Regional Travel Demand Model



Custom-built Direct Ridership Model (DRM)



Regional Context

Capture inter-county travel



Non-Commuter Trip Applicability

Account for various trip purposes



Complementary & Competing Modes

Connect various mode choices en-route



Station Area Context

Has detailed station area network



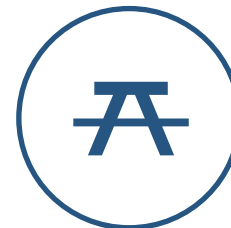
Transit Network & Service Plan

Include active service network and plan



Parking Supply & Pricing

Utilize parking as a variable influencing travel behavior



Weekend & Seasonal Travel

Understand travel characteristics on atypical days



Transit Focus

Emphasis on transit related factors

Preliminary Ridership Ranges

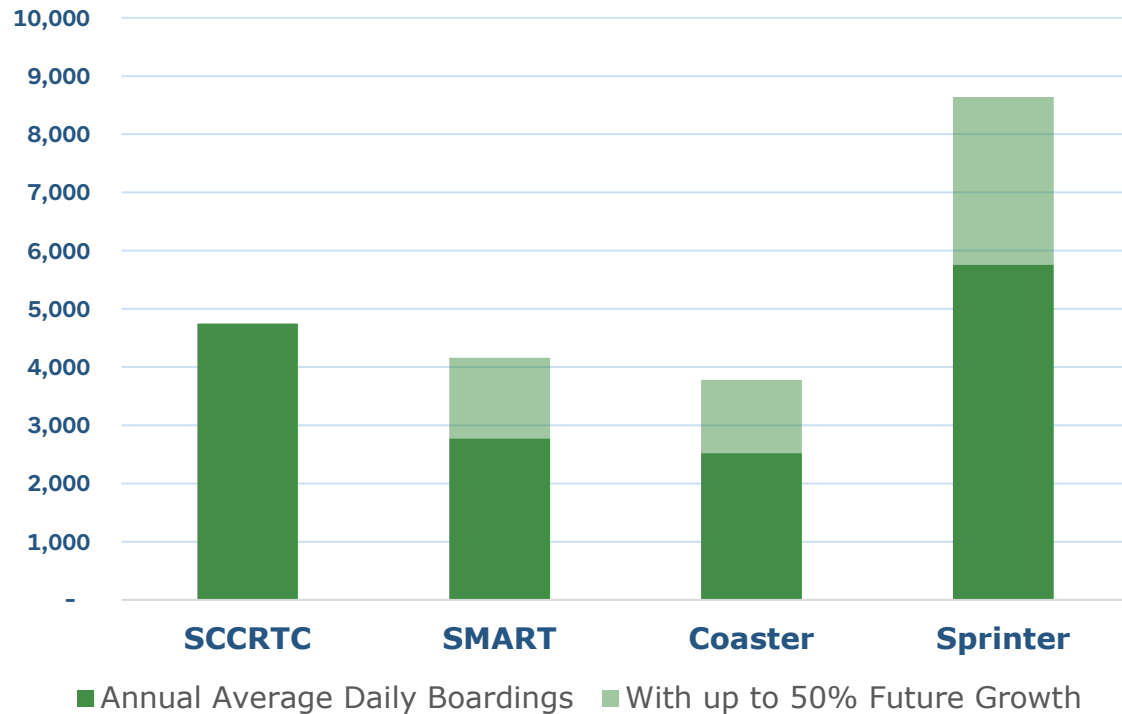
Station Name	Preliminary Ridership Ranges (Draft for Discussion Only)		
	Weekday Ridership	Weekend Ridership	Notes
Pajaro	400-500	Low	Interregional connection
Downtown Watsonville	800-1,200	Med	Accounts for Downtown Watsonville development
Aptos Station	200-500	Med	
Cabrillo (south) / State Beach	200-400	Med	Higher ridership if new connection to Cabrillo College built
Capitola Station	400-600	High	High weekend activity
17th Ave Station	400-600	Med	
Seabright Station	200-500	Med	
Beach Station	800-1,500	High	Highest activity station, potential UCSC connection
Natural Bridges Station	100-200	Med	Higher ridership with improved UCSC connection
Total	3,500-6,000 riders/day		

Ridership by Station



Other System Ridership Comparisons

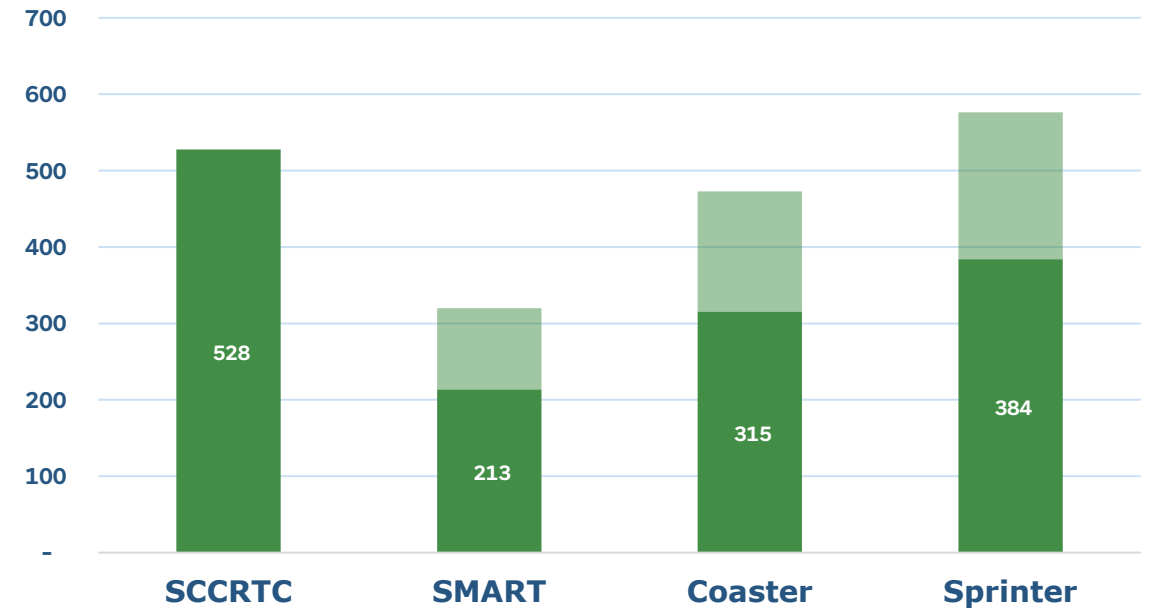
Average Daily Boardings



Mid-range of ridership



Average Daily Ridership per Station



Stations: 9 13 8 15

Cost Estimates



Capital Costs

Capital Costs:

Design & construction of conceptual project based on level of design completed to date, with contingency applied

Estimate includes:

- Guideway & Track Elements
 - Track construction
 - Grade crossing improvements
 - Rail bridges and infrastructure
- Stations
- Support Facilities
 - Layover and maintenance facility
- Signals, Systems and Communications
- Right-of-way acquisitions, land and other improvements
- Hydrogen multiple unit vehicles
- Professional services
- Contingency costs

Includes certain grading and construction costs for segments of the Coastal Rail Trail where the trail is within the rail corridor, but excludes costs for major trail structures (such as bridges) as well as costs for the trail where it is located outside of the rail corridor.



Total Capital Cost Estimate

Cost estimate assumes an at-grade alignment on Beach Street in Santa Cruz, with a total cost estimate of **approximately \$4.28 billion.**

ZEPRT Project team will continue to refine options for next steps and to develop a project funding and implementation strategy

Cost Category	Estimated Cost (Millions)
Guideway, Track Elements and Bridges	\$729.3
Stations	\$80.3
Support Facilities	\$253.6
Sitework & Special Conditions	\$740.2
Signals, Systems and Communication	\$152.5
Construction Subtotal	\$1,955.9
Right-of-Way, Land & Other Improvements	\$215.7
Vehicles	\$144.3
Professional Services	\$684.6
Subtotal	\$1,044.6
Contingency	\$1,282.7
Total Project Cost	\$4,283



Operating Expense Estimates

Operating Expenses:

Day-to-day costs to operate and maintain the ZEPRT passenger rail service, based on operating schedule, run times, headways, etc.

Operating expenses include:

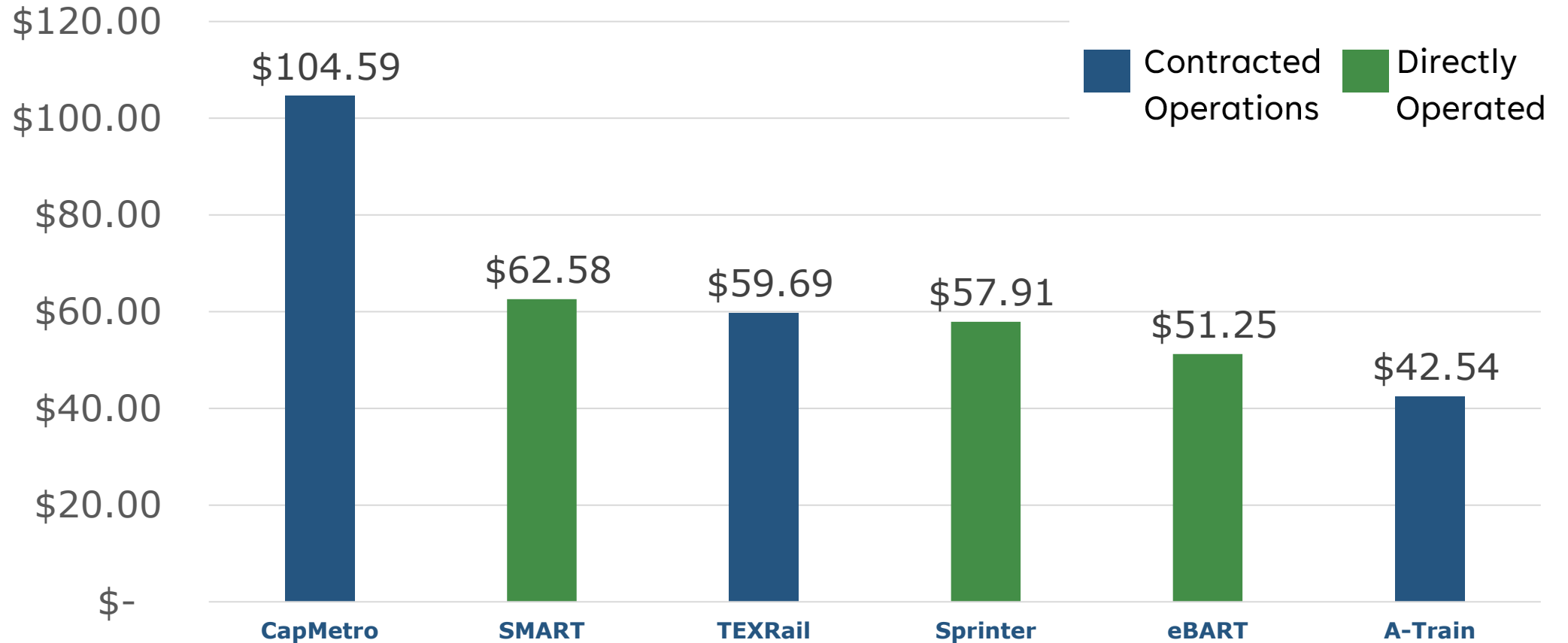
- Vehicle operations & maintenance
- Non-vehicle maintenance (including right-of-way)
- General administration, agency operations & labor
- Materials and supplies, utilities & fuel costs

Excludes major maintenance or rehabilitation of structures as well as trail costs



Operating Expense Estimates

2023 Annual Operating Expense per Train Revenue Mile



Operating Expense Estimates

Calculation & Estimate

513,920 TRM x \$63.09 (avg. OpEx per TRM) x escalation to 2025 dollars =

\$34,000,000 (for 30-min. headways)

Headway	Average	Contingency
30-minutes	\$34,000,000	\$41,000,000
60-minutes	\$17,000,000	\$21,000,000

- Annual operating expenses may be higher due to historical experience of Santa Cruz METRO labor agreements and uncertainty around hydrogen-fueled train operations, a technology which is undergoing rapid development and change
 - To account for these variables, a contingency of +20% has been applied to the average estimate
- Operations & maintenance cost estimate does not include major maintenance or rehabilitation of structures as well as trail costs



Next Steps



Next Steps

- Complete Project Concept Report
- Continue engagement with community & stakeholders
- Identify and pursue remaining funding needed (\$14-16 million) to complete the environmental analysis
- Develop a project funding and implementation strategy

Upcoming Activities

Summer:

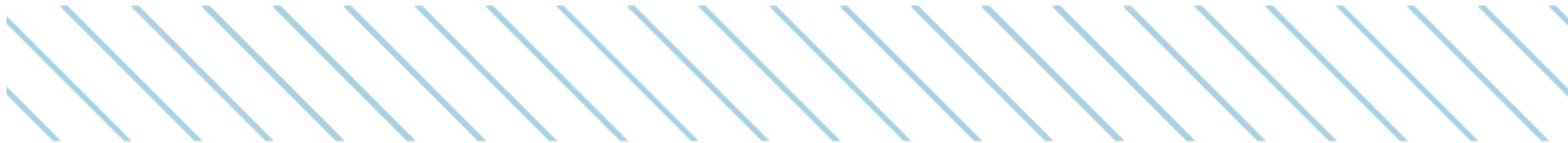
- Launch Virtual Open House
Live thru Aug. 15, 2025
- Host office hours and information sessions
In-person & virtual options
- Promote engagement opportunities
Encouraging community participation
- Public Hearing
August 7 Commission Meeting

Fall:

- Present Final Project Concept Report
Commission Meeting



Thank You!



Back-up Slides



Key Themes of What We've Heard

- Preference for efficient, reliable and quiet passenger rail service
- Strong interest in ensuring high-quality, continuous, safe trail facilities
- Desire for improved connectivity to downtown areas, employment centers, key community centers, recreation and to state rail system
- Support for most efficient, least expensive rail and trail alignments
- Preference for efficient, reliable and quiet multiple unit vehicles
- Requests for transparency on project costs and benefits
- Concerns related to project cost, feasibility, funding, and environmental and noise impacts
- Desire for investing in underserved communities, particularly pertaining to access to affordable, reliable and safe transportation



Community input received to-date has played a critical role in shaping the ZEPRT's Draft Project Concept!

Conceptual Project Definition

Developed to Address Purpose & Need:

- 22 miles of zero-emission rail infrastructure including new and rehabilitated bridges, updated grade crossings and passenger stations
- New rail stations designed for intermodal connectivity
- 12 miles of Coastal Rail Trail with integrated design strategies for constrained and unconstrained rights-of-way
- Vehicle technology options (battery-electric and hydrogen fuel cell-powered units) compatible with state climate and rail modernization goals

Design typologies accommodate varying right-of-way widths with preferred sections (12 ft. trail width & 12 ft. track clearance) and minimum sections applying design exceptions, retaining walls and underdrain systems where necessary.



Conceptual Rail & Trail Alignment

Proposed alignments include:

- Design elements to improve multimodal connectivity, minimize right-of-way impact & address key constraints in Capitola, Beach St. in Santa Cruz & Walker Street in Watsonville
- Track improvements to address transit operational needs, revised trail routes for safety considerations, connectivity and continuity
- Other elements to address constrained segments of the Branch Line right-of-way
- Minimum required horizontal clearances between trail and active rail operations for safe operation of rail transit facility

Draft Project Concept advances preferred rail & trail alignments developed through Milestones 2 & 3, incorporating additional refinements to address community input, technical analysis & engineering constraints.



Railroad Bridge Assessment & Infrastructure

- Extensive field inspections and rating assessments completed for over 33 bridge segments within study area
- 28 existing bridge structures recommended for full replacement due to condition or capacity deficiencies, functionality needs, and/or maintenance and operation considerations
- In most cases, separate parallel bridges are supported by separate substructures, but in constrained segments designs include combined substructures or possibly connections to outside of rail corridor



Draft Project Concept recommends conceptual bridge types and layouts for each to be replaced or rehabilitated with planning-level cost estimates.



Ridership Assumptions

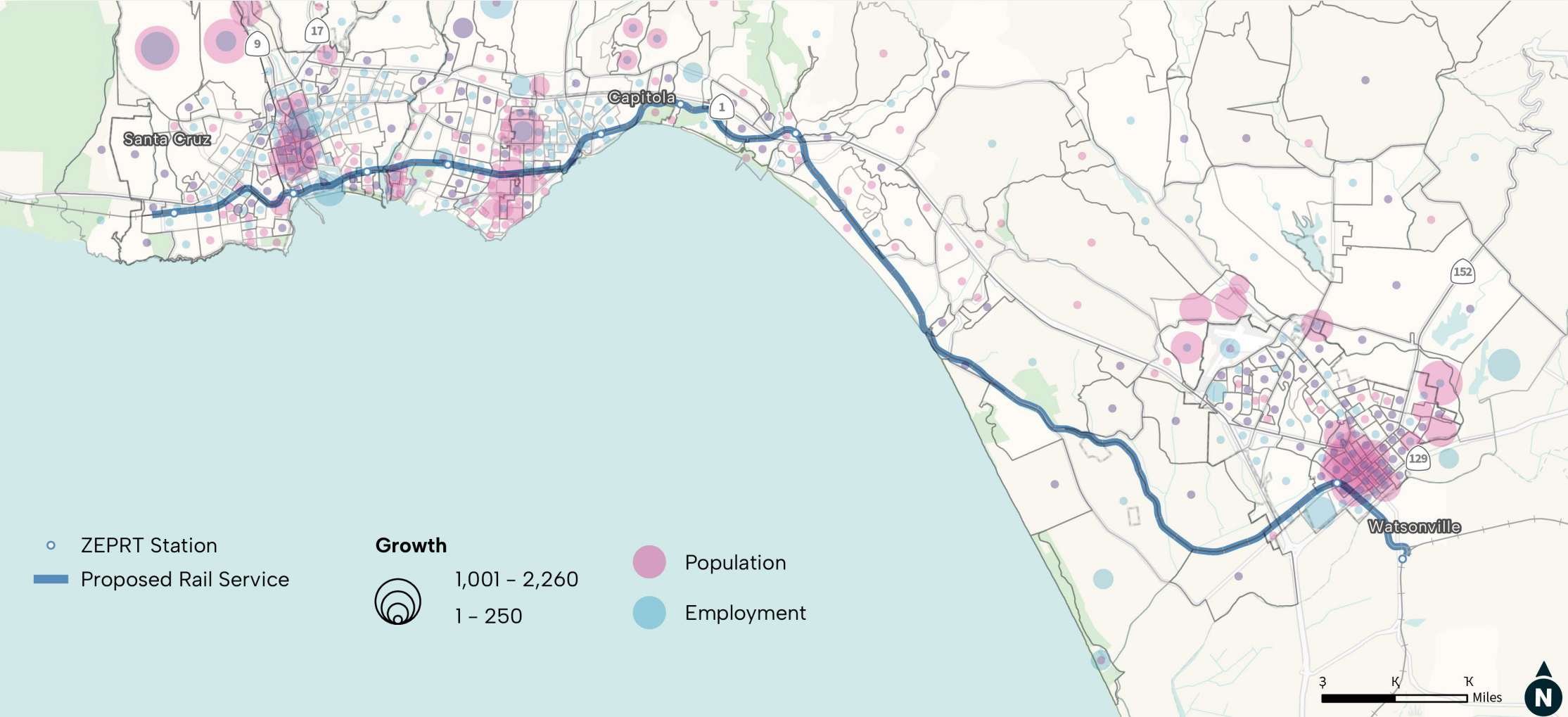
- 🚆 30-minute service frequency (weekday and weekend)
- 🚆 9 key stations (Pajaro to Natural Bridges)
- 🚆 Interregional connection at Pajaro
- 🚆 40 to 45-minute end-to-end travel time



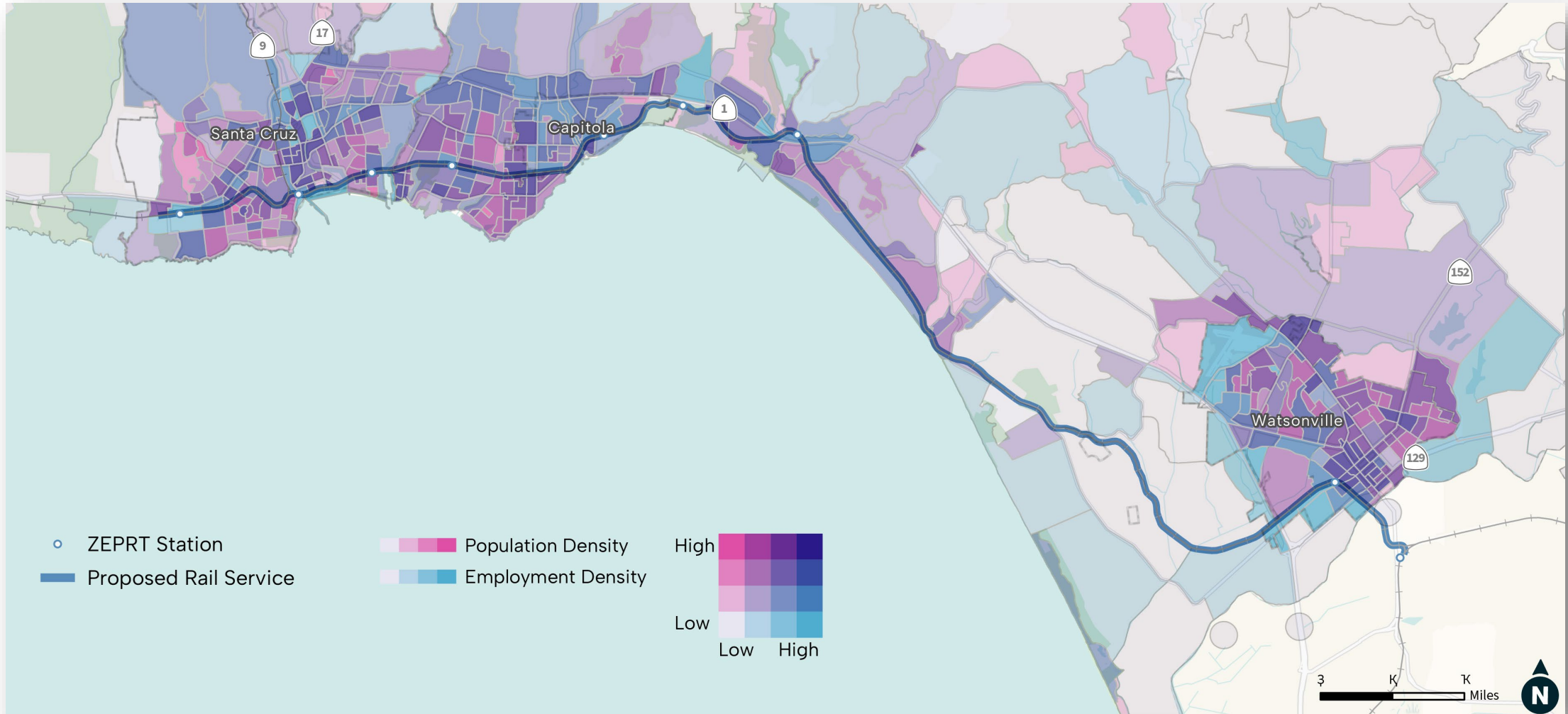
Potential Strategies for Higher Ridership

Station Name	Potential Improvements
Pajaro	<ul style="list-style-type: none">• Park and ride facility, timed transfers
Downtown Watsonville	<ul style="list-style-type: none">• Bike parking, connections to new housing; park & ride
Aptos Station	<ul style="list-style-type: none">• Pedestrian access improvements
Cabrillo (south) / State Beach	<ul style="list-style-type: none">• New direct walk/bike connection to Cabrillo College, sidewalks, bike infrastructure, park & ride
Capitola Station	<ul style="list-style-type: none">• Better access to downtown, sidewalks on Park Ave.
17th Ave Station	<ul style="list-style-type: none">• Bike parking; pedestrian access improvements
Seabright Station	<ul style="list-style-type: none">• Better sidewalks on Murray St.
Beach Station	<ul style="list-style-type: none">• Direct bus connections, wayfinding/access improvements
Natural Bridges Station	<ul style="list-style-type: none">• Direct bus connections, bike parking, bike infrastructure

Anticipated Growth Along Corridor



Future Growth: Population & Employment Density 2045



Station Locations

- 9 proposed stations for initial service
 - Selected for regional significance, estimated passenger demand, proximity to downtowns and transit hubs & intermodal connectivity
- Each location includes conceptual design considerations & proposed multimodal integration strategies



In response to community interest, Draft Project Concept Report will include analysis of limited-use or seasonal stations (referred to as exception stops) and identify opportunities to integrate with future park-and-ride and trail access points.



Station Design

User-centered design developed to represent community and its people through design pillars!

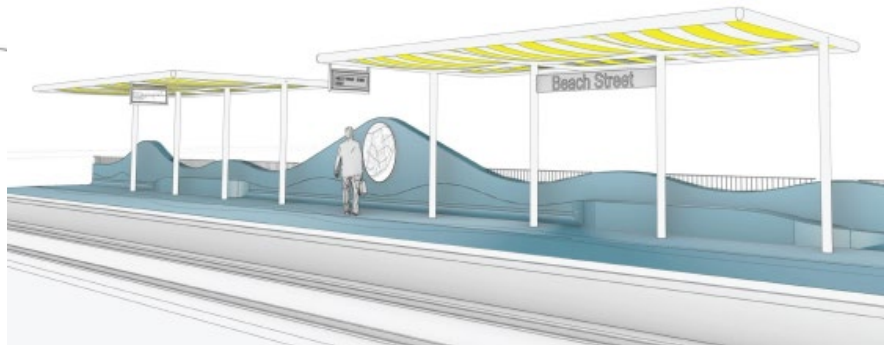
Woody Concept



Industrial & Rail Concept



Beachy Concept



Environmental Screening

Initial high-level environmental screening to:

- Identify potential constraints and considerations that may affect design, permitting and delivery
- Review sensitive resources (i.e. wetlands, riparian areas, cultural resources, hazardous materials sites, areas subject to flooding or coastal erosion)
- Assess land use compatibility, proximity to disadvantaged communities, potential for noise, vibration and visual impacts associated with passenger rail operations and trail development

Preliminary findings:

- Many impacts likely reduced through design refinement and early coordination with regulatory agencies
- Localized constraints at bridge crossings, urban infill locations, and adjacent to coastal areas and sensitive ecological areas



Project-level environmental document anticipated to be prepared during next ZEPRT phase, supported by targeted technical studies, stakeholder input & public review.

Conceptual Passenger & Freight Rail Interface Assessment

Branch Line currently designated as freight rail corridor

- Future zero-emission passenger rail service was evaluated to see how it could be accommodated alongside potential continued freight operations
 - Assessment considered regulatory, operational & infrastructure factors to ensure long-term flexibility

Identification of two primary strategies

- **Temporal Separation:** Passenger and freight trains operate at different times of day and regulatory waivers or alternative compliance approaches under Federal Railroad Administration's Risk Reduction Program
- **Conceptual Designs:** Accounts for both passenger and freight vehicle requirements (structural loadings, horizontal clearances, siding locations, station & platform designs)



Ongoing coordination with freight stakeholders & alignment with California State Rail Plan to preserve future interoperability!

Preferred Vehicle Type

- Multiple-unit, zero-emission train set
- Meets Federal Railroad Administration performance and safety requirements



Capital Costs

Methodology

- Cost estimate developed using quantities from preliminary plans when available or other known values (i.e. Track Foot for alignment or Square Foot of roadway when specific design data was unavailable)
- Pricing developed using cost data from similar projects and estimator experience
- Pricing in 2025 dollars and contingency values set based on current level of preliminary design



Capital Costs

Methodology:

Costs for certain features are compiled from each cost category

Conceptual Railroad Bridge Replacement & Rehab Cost Estimate = \$980 million

Includes:

- Base bridge construction
(*Guideway, Track Elements & Bridges*)
- Sitework & Special Conditions
- Right-of-Way
- Professional Services
- Bridge construction contingency

Cost Category	Estimated Cost (Millions)
Guideway, Track Elements and Bridges	\$729.3
Stations	\$80.3
Support Facilities	\$253.6
Sitework & Special Conditions	\$740.2
Signals, Systems and Communication	\$152.5
Construction Subtotal	\$1,955.9
Right-of-Way, Land & Other Improvements	\$215.7
Vehicles	\$144.3
Professional Services	\$684.6
Subtotal	\$1,044.6
Contingency	\$1,282.7



Operating Expense Estimates

Methodology

- Benchmark Cost Estimate compares similar passenger rail operating costs to estimate a reasonable range of regular operating and maintenance costs that are comparable to industry standards
- Six different passenger rail systems selected as representative benchmarks (each operates electric or diesel multiple-unit trains on a single line)
- Operating expenses per train revenue mile calculated for each passenger rail service (based on data reported to the National Transit Database)

Assumptions

Category	Assumption
Service pattern	All-day end-to-end service, a one-way trip of 22 miles
Operating Hours	6:00 a.m. to 10:00 p.m. every day
Operating Days	365 days per year
End-to-end Run Time	45 minutes
Headway	Every 30 minutes



Operating Expense Estimates

Selected National Transit Database Operations Figures and Calculations (2023 dollars*)

Transit Service	Service Type	Total Annual Operating Expense	Total Train Revenue Miles	Annual Operating Expense per Train Revenue Mile
eBART	Directly operated	\$19,617,059	382,785	\$51.25
Sprinter	Directly operated	\$29,883,425	516,006	\$57.91
SMART	Directly operated	\$30,585,066	488,765	\$62.58
Capital Metro	Purchased transportation	\$34,842,819	333,124	\$104.59
TEXRail	Purchased transportation	\$36,897,485	618,139	\$59.69
A-Train	Purchased transportation	\$16,322,003	383,720	\$42.54

