APPENDIX A – PUBLIC OUTREACH SUMMARY

Source: SCCRTC, 2015

2015 Rail Transit Study - Outreach Summary

	RTC		Project Team	Rail Peers	Technical Stakeholders	Community Leaders	Public
	Board Meeting	**Advisory Committees**					
Outreach #1: Scoping							
Kick Off meeting			Feb 2014				
Project Overview & Scope Review		Mar 2014	Apr 2014		Mar 2014	Mar 2014	
Approve Scope	**May 2014**						
Outreach #2: Goals, Objectives, Evaluation, Scenarios							
Review draft components	June 2014			Aug 2014	June 2014		
Survey							July 2014
Public Workshop							July 2014
Review Results of Public Input	Aug 2014						
Approve Scenarios to be Analyzed	**Sep 2014**						
Outreach #3: Technical Memos							
Review Initial Ridership and Cost Estimates				Dec 2014			
Outreach #4: Review Draft Report							
Review Administrative Draft			May 2015	May 2015			
Release Draft Report	May/Jun 2015						
Review Draft Report	June 2015	June 2015			June-July 2015	June-July 2015	June-July2015
Survey							June-July2015
Project Open House							June 4, 2015
Outreach #5: Final Report							
Review Results of Public Input and proposed updates for final	Sept 2015						
Review Final Report	**Dec 2015**						Dec 2015

Bold = Key Decision Points

Summary of Public Comments on the Draft Study and Updates in Final Rail Transit Study

The following is a summary of comments received on the draft rail feasibility study by topic and a summary of updates made in the final study *(shown in italics)*. Input was received by the RTC via emails, letters, comment forms, an online survey, and at several meetings held from May 21, 2015 to July 31, 2015. All of the emails, comment letters, and forms, as well as the survey results, were posted on the RTC website and available to the RTC board. While the following summary does not include every unique comment, additional information is included in the final document in response to most comments and questions received during the comment period. Answers to some questions and comments are beyond the scope of this feasibility study and would not be explored until detailed analysis is done in later phases, including project-level environmental review, design engineering, or operational service planning; or as part of a comparative unified corridors plan.

GENERAL SUMMARY OF COMMENTS

- Comments received ranged from strong support for any type of rail service, to support of certain types or frequency of service, to voicing concerns about potential impacts or certain aspects of scenarios analyzed, to strong opposition to any type of rail service, to opposition to any activity on the rail line and other comments in between.
- Many respondents that expressed general support for rail transit proposed specific parameters (such as service area, station locations, vehicle types, cost, service hours) for a preferred service scenario.
- Concerns expressed by those opposed to rail transit often focused on the number of daily trains, cost, ridership estimates, horn noise, and trail integration.

SERVICE CHARACTERISTICS

- SERVE WATSONVILLE: Strong support for serving Watsonville to address congestion and equity. Some suggested a "hybrid" scenario, with peak or commute hour service to Watsonville and regular local service between Westside Santa Cruz and Aptos/Cabrillo throughout the day. *Document Updates: Section 8 was revised to show options for a hybrid scenario that serves Watsonville.*
- REGIONAL RAIL CONNECTIONS: Support for regional rail connections at Pajaro to provide both links for Santa Cruz County residents to travel to places outside the county and for visitors to come to Santa Cruz County without their vehicles, many citing that regional connection would be key to project success and/or funding. Connections to Monterey were also encouraged. *Document Updates: Addressed in document as Scenario J and revised Section 8.*
- HOURS and FREQUENCY: Concerns were expressed that 60 trains a day is too many. Others requested that trains run frequently so service is convenient for regular use. Some respondents wanted frequent service throughout the day (not just peak periods). Some communicated importance of late night service for students and workers with non-traditional hours. Some were opposed to early morning or late night service. Some requested that train service operate on holidays. *Document Updates: The sample service scenarios identified in the study include a range of service hours and frequencies in order to understand differences in costs and ridership. Text edited to emphasize that actual service hours would be established with public input during service planning*

(similar to bus system service planning), including in Sections 8 and 9. Section 8 suggests scalable implementation options.

- SPEED: Concerns that trains traveling 45-60 mph would be too fast in neighborhoods. *Document Updates: Clarifies that under the scenarios analyzed, trains are traveling 25-35 mph on average, provides information on regulations regarding train speeds, and sample trip graph (Section 5.1.2).*
- FARES: Requests for a unified fare card that works on buses. Request for affordable fares. Requests that rider fares cover a higher percentage of the cost. *Document Updates: Additional information added to Section 9.3 about fare collection and rate options used by transit systems. Additional information on farebox recovery ratios (portion of cost covered by rider fares) added to section 6.4.3.*
- SPUR LINE: Requests for service to downtown Santa Cruz via Chestnut Street, to Harvey West businesses, and to San Lorenzo Valley; suggestions to reach out to Roaring Camp and Big Trees RR. *Document Updates: Executive Summary includes explanation that this study focuses on the main portion of the RTC-owned Branch Rail Line between Santa Cruz and Watsonville/Pajaro. Coordination with Big Trees/Roaring Camp to extend service toward Harvey West and the San Lorenzo Valley could take place in the future.*
- OVER-THE-HILL: Interest in expanding future train service to the Bay Area north through the Santa Cruz mountains. *Document Updates: Expanded discussion* Section 1.4: History of Corridor and Rail Line Purchase *regarding the history of rail corridor over "the hill" and current conditions*. *This study focuses on the existing RTC-owned Santa Cruz Branch Rail Line.*

VEHICLES:

- VEHICLE TECHNOLOGY: High level of interest in lighter, smaller, quieter, more efficient vehicles than traditional commuter trains. Interest in energy options other than diesel. *Document Updates: Expanded information on current and potential future vehicle options, including rail transit vehicles that are low and zero emission, included in Sections 2 and 8.2.4. General information about available vehicle technologies/types is already included in the document.*
- VEHICLE DESIGN: Requests that rail cars have the capacity to accommodate many bikes, large baggage (surfboards, kayaks, etc.), dogs and restrooms. *Document Updates: Text added throughout the document and in Section 2, especially regarding bikes on board. Section 8 notes that given the high level of community interest in this feature, specifications for rail transit vehicles should include accommodations for transporting bicycles. The specifics would be decided at future stages. Vehicle design and floor plan could undergo public review prior to vehicle procurement/purchase.*

STATIONS

- STATION LOCATIONS: Concern expressed that proposed stations are not close enough to major destinations and employment centers, such as UCSC, Dominican Hospital, the Capitola Mall, and Cabrillo College. Suggestion that downtown station be moved to the north leg of the wye (by old Depot Park station) to be closer to downtown and Laurel St. buses serving UCSC, others suggested that Westside Santa Cruz be considered the primary UCSC station instead of Bay St. *Document Updates: Section 8 was modified to include a potential initial service option with less frequent service and shorter length between Watsonville and Depot Park in downtown Santa Cruz. Text added to Section 8 regarding access to/from stations. Coordination with METRO buses and future developments*

discussed in Section 9. Appendix H includes maps and information on key destination and employment areas within ¼ and ½ mile of potential rail stations analyzed in this study.

- AMENITIES: Suggestions that stations include bathrooms and concessions/retail (latter to finance project) and wi-fi in stations/on trains to enhance trip productivity. *Document Updates: Updated text in several sections to clarify that detailed station design would be decided at future stages of rail transit development.*
- PARKING: Comments that additional parking at stations is needed, and that permitting may be appropriate to prevent spill over into neighborhoods. *Document Updates: Discussion of parking in Sections 8 and 9 expanded to identify policy decisions and experience in other areas, and coordination needed with local jurisdictions for parking restrictions. The location and size of park-and-ride lots would be analyzed in future stages of rail transit development.*

COST

- COSTS & FUNDING: Concerns expressed about the total cost, that cost would outweigh benefits, cost per rider, that funding (including ongoing Operating & Maintenance) is uncertain, and that considerable support by taxpayers would be required. Comments that project will be more expensive in the future, so investment should happen now. *Document Updates: Text added to Sections 6, 8 and 9 about cost and funding methodology, farebox recovery rates, and comparable rail system costs. O&M costs are based on an average of costs shown in the National Transit Database; study includes 30% contingency. Sections 6 and 7 include comparisons of costs and farebox recovery rates for other transit systems.*
- ALTERNATIVE SPENDING OPINIONS: Support expressed for spending funds on other transportation projects, including widening Highway 1, expanding Metro bus service, and fixing local roads. Comments that rail construction costs less than widening Highway 1. *Document Updates: The Santa Cruz County Regional Transportation Plan (RTP) included an analysis of different funding scenarios for the countywide transportation system. Comparative information about specific other transportation modes or projects is proposed to be analyzed as part of Unified Corridors Plan.*
- METRO FUNDING: Concern that rail project would dilute funds to Metro. *Document Updates: Section 6.4 modified to focus on funding sources that are potentially available for rail transit and text added to Section 6.4 to emphasize that the study assumes funds currently designated for METRO operations would not be available for rail transit; STIC and METRO UCSC fees removed from list of candidate sources.*

RIDERSHIP

- RIDERSHIP MODEL: Ridership numbers were thought to be either too optimistic (high) or too conservative (low), especially for Watsonville. Clarification requested on how the ridership numbers were generated, including Santa Cruz specific factors (students, tourists), growth projections, and how rail transit ridership might affect congestion on Highway 1 and local arterial roads. Concern was expressed that those who do not currently ride the bus would not switch out of their cars, or that Santa Cruz does not have the density to support rail. *Document Updates: Discussion in Section 5 on ridership methodology expanded. Appendix added with the input factors used. Modify text related to the AMBAG travel demand model to clarify about model capabilities.*

TIMING

- TIMING: Comments that it is taking too long to implement rail service and that a 10 year time line is too long. *Document Updates: The timeframe would depend on when/if a certain service alternative is pursued; based upon experience of other rail projects implemented in the past decade, a 10 year timeframe is considered realistic for a system requiring environmental review and procuring new vehicles.*

IMPACTS AND BENEFITS

- NOISE: The most common concern voiced was regarding noise. In particular, horn noise was of greatest concern, though there was some concern regarding the noise from vehicle engines and wheels. Many people reported being bothered by the horn noise from past recreational trains on the Westside of Santa Cruz and voiced opposition to any rail projects if that volume of horn/duration of signal were to be used. Support expressed for Quiet Zones, though some are concerned that Quiet Zone crossing warnings would still be too loud. *Document Updates: Additional information on horn options and regulations, quiet zones, rail infrastructure and vehicles added to Section 8.*
- ENVIRONMENT: Belief was expressed that the rail project would have positive environmental impacts and reduce emissions in general. Concern was expressed about emissions from trains on nearby neighborhoods. Strong support was expressed for creating environmentally-friendly alternatives to automobile travel. Belief expressed that Highway 1 creates too much pollution via congestion. *Document Updates: Text added to Section 8 regarding vehicle emissions. Environmental benefits and impacts would be evaluated in more detail in a future environmental documentation phase. Text added in several sections on California, regional (RTC and AMBAG), and local sustainability goals and plans.*
- ECONOMY: Belief expressed rail project would be good for the economy, specifically providing access to jobs and increasing mobility options for visitors. *Document Updates: Additional information on economic benefits of transit included in Section 1.*
- LAND USE: Concerns and/or support that rail transit could result in densification around stations. Some believe this will create an undesirable urban feel, while others believe it will curb urban sprawl and preserve agricultural land, support the state-mandated Sustainable Communities Strategy (SCS), support construction of affordable housing options, and/or encourage new employers to locate in Santa Cruz County. Others stated that rail could provide access to recently approved development, such as Aptos Village. *Document Updates: Add additional information on impacts rail has on land use and the SB375 Sustainable Communities Strategy (SCS) added to Section 1.*
- CROSSINGS: Strong concern was expressed about potential traffic impacts that rail transit (especially the maximum frequency studied - 60 trains/day) would have at street crossings, and requests that more information be included in the study. *Document Updates: Text on at-grade crossing and gate downtimes added to Section 8, including information about typical crossing gate time on local streets, based on other rail systems and factors that might impact crossings.*
- CONGESTION RELIEF: Many respondents commented rail transit would reduce congestion, some others believe it will not. Many focused on the need for more reliable and faster alternatives to driving or riding buses on congested roads. *Document Updates: Introduction and Section 7 updated to clarify that rail transit would increase travel choices by providing an additional travel option with reliable travel times.*

- PROPERTY VALUES: Concern that rail project would negatively affect nearby property values. Comments that the rail project would positively affect property values and economic activity near stations, particularly in commercial areas. *Document Updates: Information added to Section 7.4 about the role rail has had on property values in other areas*.
- ACCESS TO COAST: Some concern expressed that rail transit would restrict beach access; the Coastal Commission stated it would enhance beach access. *Document Updates: Information from Coastal Commission comment letter added. Coastal access would also be analyzed in the environmental document*.

INTEGRATION WITH OTHER MODES:

- ACCESS TO STATIONS: Many questions about access to and from the rail transit system or "first/last mile" and total trip time. Strong support for using bicycles to access rail transit. Other suggestions include shuttles, ride pools, a bike/pedestrian bridge to Cabrillo. *Document Updates: Text added to Section 8 regarding access to/from stations*.
- BUS COORDINATION: Comments strongly support Metro bus and rail service working in tandem as an integrated transit network. Specifically, a system of feeder busses to the rail line was suggested, with many suggesting that current Metro routes will need to be modified. *Document Updates: Study includes information about current transit routes, assumes funding sources currently used for bus operations would not be used for rail operations, and includes information about a coordinated transit network. Section 9 includes discussion about schedule planning and coordination and transit system governance options*.
- Trail/MBSST: Strong support for the trail. Some supported creating a trail only option. Others supported combined trips using trail and rail to go longer distances, especially for people with limited mobility. Questions about safety, access to, and width of the trail, including need for additional bridges and the locations of sidings. *Document Updates: Discussion on integration and coordination of trail and rail, as well as right-of-way widths expanded in Introduction*.
- BIKES: Strong support for allowing bicycles on trains, including a bike-specific car similar to Caltrain. Strong support for covered/secure bike parking at stations, inclusion of bike sharing systems, as well as the need to improve bicycle facilities around stations (in addition to MBSST). *Document Updates: Information about bike on board railcars added to Section 2. Section 8 recognizes strong support for integrated bicycle facilities, amenities and accommodation of bikes on rail transit vehicles. Document notes that specific details about vehicle and station amenities would be determined in future project stages*.
- RECREATIONAL TRAINS: Respondents generally less supportive of recreational trains than rail transit. Concerns expressed that rail line would only benefit tourists. Others expressed belief that tourists using the train would be of benefit to the economy and reduce tourist-related congestion. Support for recreational trains to Davenport, Coast Dairies and other north coast public lands. *Document Updates: Sections 1 and 2 include information about current and potential future recreational excursion and tourist-type passenger rail services. Text was added to emphasize that the scope of this study is public transportation and notes that ridership projections from recreational users was not modeled, but could result in higher ridership numbers. Text also added under Sections 1 and 7.4 to reflect benefits identified by the California Coastal Commission*.
- OTHER MODES: Other ideas for modes/use of the rail line (besides the Monterey Bay Sanctuary Scenic Trail/Coastal Rail Trail) include: Bus Rapid Transit (BRT), Railbus, Personal Rapid Transit (PRT),

monorail, a new road, waste removal, and utility location (water, broadband). *Document Updates: The scope and budget of this analysis limited the analysis of rail transit technologies to those widely used in the United States. Additional text was added to Sections 2 and 8 about potential rail transit vehicle options, including vehicles that are low and zero emission.*

- FREIGHT: Comments that there is limited demand for freight and that rail transit should have priority use of the rail line. Requests for clarification about the requirements for providing freight service and how freight and passenger rail would function together, including vehicle or temporal separation requirements. Comments that nighttime freight service could be unpopular. *Document Updates: Provided additional clarification under "Regulatory Setting" and "Integration/ Coordination with Freight Service" in Chapter 9 about federal and state rules and regulations.*

Other comments not included above:

SUPPORT OPINIONS

- Start rail service as soon as possible
- Rail line is great resource - be brave, think big
- Transportation alternatives – rail and trail - are needed, especially because of congestion and growth
- Do not remove the tracks – will be an important future asset
- Transit here should be more like Europe/East Coast/Portland
- Bus is not a viable alternative, is stuck in traffic

OPPOSE OPINIONS

- Trains should not run through residential neighborhoods
- V2V technology will surpass rail technology
- Train will ruin beauty/peace

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Passenger Rail Feasibility Study in Santa Cruz County
Project Participants

Project Team	Santa Cruz County Regional Transportation Commission (RTC) - Executive Director, Deputy Director, Senior Planners, Technicians
	Caltrans, District 5 - Planners
	Santa Cruz Metropolitan Transit District (Metro) – General Manager, Planners
	Iowa Pacific (Santa Cruz & Monterey Bay Railway) – Vice President of Strategic Planning, Local Manager
Technical Stakeholders	Association of Monterey Bay Area Governments (AMBAG) – Planning
	City of Capitola – Community Development
	City of Santa Cruz – Climate Action Coordinator, Economic Development, Planning, Public Works
	City of Watsonville – Economic Development, Planning, Public Works
	County of Santa Cruz – Economic Development, Planning, Public Works
	Cabrillo College – Student Services
	University of CA, Santa Cruz (UCSC) – Transportation Planning
	County Commission on Disabilities
	Community Bridges
Rail Peers	Altamont Commuter Express (ACE)
	Roaring Camp Railroads/Big Trees & Pacific Railway
	Caltrain
	Capitol Corridor
	Denton A-Train (Texas)
	Golden Gate Railroad Museum
	Monterey Salinas Transit
	Santa Clara VTA
	San Luis Obispo Council of Governments/Coast Daylight (SLOCOG)
	Transportation Agency for Monterey County (TAMC)
	Trimet Westside Express (Oregon)
	SMART (Sonoma/Marin)
	Sprinter/Coaster (North County Transit District – San Diego Co)
Interest Groups	Aptos Chamber of Commerce
(invited to participate)	Area Agency on Aging
	Barry Swenson Builders

	Business Council for Santa Cruz County
	Capitola Mall
	Commission on the Environment
	Community Foundation
	Downtown (Santa Cruz) Association
	Farm Bureau of Santa Cruz County
	Green Ways to School
	Bike Santa Cruz County (formerly People Power)
	Campaign for Sensible Transportation
	Capitola-Soquel Chamber of Commerce
	Central Coast Center for Independent Living
	Conference & Visitors Council for Santa Cruz County
	Ecology Action
	Friends of the Rail & Trail (FOR&T)
	Goodwill Industries
	GraniteRock
	Jovenes Sanos
	La Selva Beach Improvement Association
	League of Women Voters
	Live Oak Neighbors
	Metro Advisory Committee (MAC)
	Minetta Institute
	Monterey Bay Labor Council
	Net Com
	Office of Education for Santa Cruz County
	Pajaro Dunes
	Pajaro Valley Chamber of Commerce
	Pajaro Valley School District
	Pedestrian Safety Work Group
	Rio Del Mar Homeowners Association
	Salud Para La Gente
	Santa Cruz Beach Boardwalk/Seaside Company
	Santa Cruz Chamber of Commerce
	SC Co Parks & Recreation
	Santa Cruz Neighbors
	Seacliff Improvement Association
	Seascape Resort
	Sierra Club
	Sumner Woods Homeowners Association
	Swift Street employers
	United Way/211
	United Transportation Union (UTU)

Project Webpage

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SCCRTC Santa Cruz County Regional Transportation Commission

MEETINGS & EVENTS | FUNDING & PLANNING | PROJECTS | SERVICES | ABOUT THE RTC | CRUZ511

- Streets & Highways
  - Highway 1 Corridor Program
  - Highway 1 Environmental Documents
  - Highway 17 Access Management Plan
  - Highway 1 Aux Lanes
  - Other Highways
- Bicycle
- Pedestrian
- Rail
  - Passenger Rail
  - Rail Service Studies
  - Rail Line Purchase
    - Due Diligence
- Multi-Modal
  - Unified Corridors Plan
  - Santa Cruz County Complete Streets
    - Monterey Bay Area Complete Streets Guidebook
  - STARS
- Trails
  - Monterey Bay Sanctuary Scenic Trail
    - MBSST Master Plan
    - Final Environmental Impact Report
- Legislative Activities

Santa Cruz County Passenger Rail Study

Passenger Rail Transit Study

The RTC is studying the feasibility of passenger rail transit service along the Santa Cruz Branch Rail Line which roughly parallels Highway 1 and the coast in Santa Cruz County.

Passenger Rail Feasibility Study – Draft Report *(Note: The Final Report will include respones to feedback the RTC received before the end of July 31 comment deadline, per the study scope/budget/contract, and is currently under development)*

- Passenger Rail Feasibility Study Draft Report Full Document (10 MB)
  - Executive Summary
  - Draft Report without appendices
  - Appendices

Study Overview

The Passenger Rail Feasibility Study analyzes a range of rail transit service scenarios on the Santa Cruz Branch Rail Line. The feasibility study was initiated to answer questions about how rail transit could further transportation goals for Santa Cruz County providing cost effective travel options that enhance communities, the environment, and support economic vitality. This high-level study includes:

- Goals and objectives – such as providing more options for how people get places, increasing the number of people using transit, increasing access to jobs or education, cost effectiveness, and creating more reliable travel times, used to evaluate the feasibility of each scenario
- Service scenarios (map) sample of rail transit options representing a range of station locations, service hours, and vehicle types
- Technical Assessment of Service Scenarios
  - Capital Cost Estimates
  - Operations & Maintenance Cost Estimates
  - Ridership Forecasts
  - Funding Assessment
- Evaluation – comparing how well each scenario advanced goals and objectives
- Preferred Service Alternatives– based on evaluation and financial limitations
- Options for implementing service -conceptual

Quick Links

- Passenger Rail Feasibility Study Draft Report
- Executive Summary
- Map of Potential Stations
- Summary of Public Input (9/3/15 RTC meeting item #20 – page 64)
- Frequently Asked Questions
- **Stay informed!** Sign up for Rail eNews to receive periodic email updates

implementation considerations, timeline, and a summary of possible next steps if service is implemented

Key Findings

- A technical analysis and evaluation was conducted for seven sample service scenarios which differed by distance, number of stations, train technologies, service hours, and level of initial and ongoing investment.
- Ridership estimates range from 480,000 to 1,413,000 annually (base year).
- Travel times for rail transit range from 16 minutes between the west side of Santa Cruz and Capitola, to 43 minutes between Santa Cruz and Pajaro (see chart below).
- Adding rail transit would increase transportation choices and has the potential to improve connectivity, reduce sprawl and preserve farmland.
- Funding for construction would need to be secured from competitive grants.
- Funding for operation would need to be secured from fares and a local transportation ballot measure. Funding sources currently used for operations by Metro for bus transit were not considered.

Taking into consideration extensive input the RTC received on the draft report via online survey, formally submitted comments, and meeting participation, and the project scope and budget the final report will be prepared – including recommendations for next steps should the RTC decide to implement rail transit service.

Prior to implementing transit service, steps would include: securing funding, environmental review, detailed engineering/design, construction, purchasing trains, and scheduling (in coordination with bus service).

Public Participation

The public comment period for the Draft Passenger Rail Feasibility Study, was May 21 to July 31, 2015. During the public review period, the RTC received input from thousands of people on the Draft Report via emails, comment forms (430+ responses), an online survey (2600+ responses), and at community events and meetings. A summary of input received, including survey results are now available, as well as the aggregate statistics for all survey questions. Answers to some of the "Frequently Asked Questions" about rail service are available online and are updated periodically.

The broad countywide engagement in this conversation about rail transit on the Santa Cruz Branch Rail Line demonstrates the number of people that care deeply about their community and its future transportation options. Recommendations regarding amendments for the Final Report based on Public comments received on the Draft Report will be considered by the RTC board at its September 3, 2015 meeting (item #20 starting on page 64).

- **Stay informed: Sign up for Rail eNews**, to receive periodic emails about upcoming meetings and other updates on this rail transit study and rail line.

Initial input: The first stage of public input (Summer 2014)

included a public workshop and an online survey on goals and objectives, possible stations, and service scenarios. Over 2,000 people provided input on Santa Cruz County passenger rail by participating in the survey or attending the workshop.

Background

The RTC purchased the rail corridor in 2012 with CA and Santa Cruz County voter-approved passenger rail funds in order to expand the passenger rail network and increase transportation options for the community now and into the future. Planning for the rail corridor also includes: connectivity to existing and planned bus service, regional and state rail service, and coordination with other uses of the rail corridor- such as the Monterey Bay Sanctuary Scenic Trail Network (a planned bicycle and pedestrian "rail-trail" parallel to the tracks), freight, and recreational excursion rail service. The RTC secured a transit grant from Caltrans to conduct this passenger rail study in partnership with the Santa Cruz METRO Transit District and the Santa Cruz & Monterey Bay Railway/Iowa Pacific (SC&MB).

Resources

- Frequently Asked Questions about rail service
- Passenger Rail Service Study Fact Sheet (August 2015)
- Goals and Objectives for Passenger Rail Services
- Map of Potential Station Locations and Scenarios
- Service Scenarios undergoing analysis
- Summary of Comments on Draft Study
- Comments on Draft Report (received during comment period)
- 2015 Survey Summary Graphics
- 2015 Survey Results – All survey questions (as provided by the survey web host)
- Late Comments – received after close of comment period
- Summary of Public Survey (Summer 2014)
- Summary of Public Workshop (July 2014)
- Rail Acquisition
- Rail Corridor Acquisition Fact Sheet
- Other Rail Service Studies
- Monterey Bay Sanctuary Scenic Trail Network/Rail-with-Trail plans
- Dr. Anthony Perl video (2014) – Applicability of Global Passenger Rail Experience

RTC Contacts

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Senior Transportation Planners
info@sccrtc.org (831) 460-3200

Santa Cruz County Regional Transportation Commission (RTC)

Passenger Rail Study in Santa Cruz County

Fact Sheet

(updated August 2015)

The RTC was awarded a transit planning grant by Caltrans to analyze passenger rail transit service along the Santa Cruz Branch Rail Line. Rail transit is regularly scheduled public transportation service, with established fares on fixed guideway railroad tracks. This study focuses on the most populated sections of the rail corridor, between Santa Cruz and Watsonville.

The Draft Report is available online: www.sccrtc.org/rail
Public input gathered at the beginning of the analysis helped shape this study which includes:

- **Introduction** including why consider rail transit
- **Goals and Objectives** used to evaluate the feasibility of each scenario
- **Service Scenarios** representing a range of station locations, service hours, vehicle types (over for map)
- **Technical Assessment** of Seven Sample Service Scenarios
  - Capital Cost Estimates
  - Operations & Maintenance Cost Estimates
  - Ridership Forecasts - how many people would ride trains
  - Funding Assessment - how it could be funded
- **Evaluation** of how well each scenario advances community goals and objectives
- **Implementation Options**

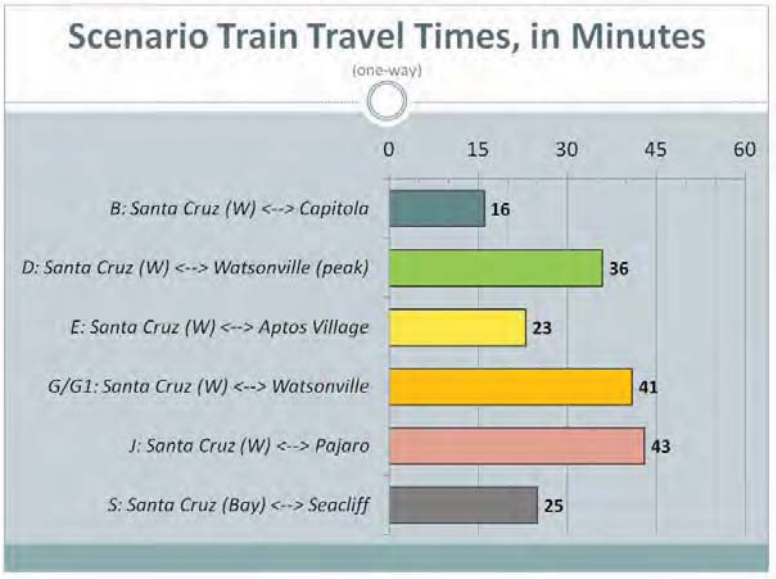
Key Findings

- A technical analysis and evaluation was conducted for seven sample service scenarios which differed by distance, number of stations, train technologies, service hours and level of initial and ongoing investment.
- Ridership estimates range from 480,000 to 1,413,000 annually (base year).
- Travel times for rail transit range from 16 minutes to 41 minutes between the west side of Santa Cruz and Capitola or Watsonville, respectively (see chart below).
- Adding rail transit would increase transportation choices and has the potential to improve connectivity, reduce sprawl and preserve farmland.
- Funding for construction would need to be secured from competitive grants.
- Funding for operation would need to be secured from fares and a local transportation ballot measure. Funding sources currently used for operations by Metro for bus transit were not considered.

The public comment period for the Draft Plan was May 21 to July 31, 2015. Over 450 written comments were received and over 2,600 people took a survey about the findings of the analysis. The final report, which will provide additional information based input received, is expected to be available by the end of 2015.

Prior to implementing rail transit service, future steps would include: securing funding, environmental review, detailed engineering/design, construction, purchasing trains, and scheduling (in coordination with bus service).

Stay Involved - Sign up for eNews to receive information about the study and to participate in the discussion.
http://www.sccrtc.org/about/esubscriptions/



For more information, please visit the RTC web site: www.sccrtc.org or call (831) 460-3200.

Santa Cruz County Regional Transportation Commission
1523 Pacific Avenue, Santa Cruz, CA 95060

REVIEW REPORT -- LEARN MORE -- PROVIDE FEEDBACK -- PARTICIPATE!

Is rail transit feasible in Santa Cruz County?

Draft Passenger Rail Feasibility Study now available for public review and comment at sccrtc.org/rail

The Passenger Rail Feasibility Study evaluates transit options on the Santa Cruz Branch Rail Line between Santa Cruz and Watsonville based on goals and objectives identified by the community. Review the results of the feasibility analysis, learn more and ask questions about the Draft Report.

COMMUNITY MEETINGS: JUNE 4, 2015

Presentation to RTC Board
10:00 a.m. – Watsonville
City Hall – 4th Floor
275 Main St, Watsonville
Board meeting begins at 9am

Open House & Workshop
6:30 p.m. – Live Oak
Live Oak Community Room at
Simpkins Family Swim Center
979 17th Avenue, Santa Cruz

PROVIDE FEEDBACK

SUBMIT COMMENTS BY JULY 8, 2015

Review the Draft Report online at **sccrtc.org/rail** or view print copies at the RTC Office (Downtown Santa Cruz), Santa Cruz Central Library, or Downtown Watsonville Library. Submit comments:

- Online at http://www.sccrtc.org/rail-study-comments/
- By Email info@sccrtc.org; subject line "Draft Rail Study Comments."
- Survey Online: June 4 – July 8 at sccrtc.org/rail

STAY INFORMED

Sign up for Rail Service eNews to receive information about upcoming meetings and other updates on rail in Santa Cruz County.

Your participation ensures that the Final Report reflects community input!

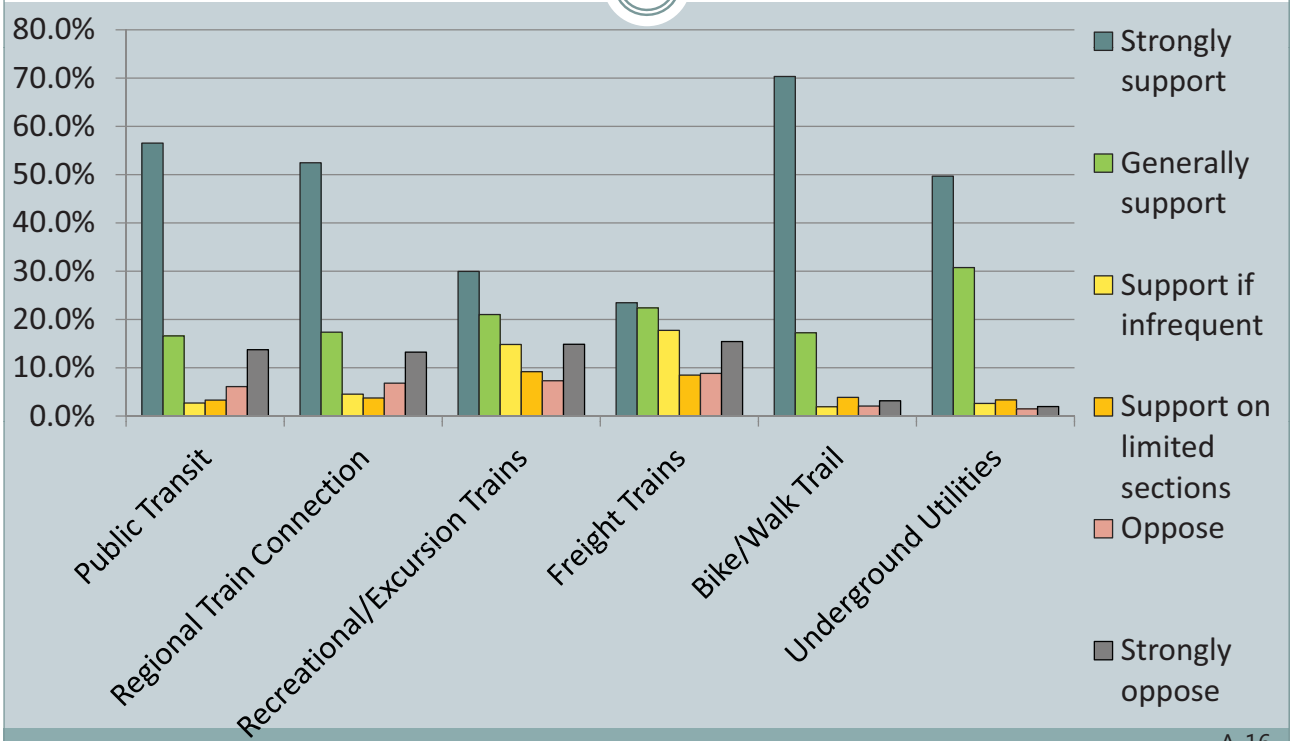
Santa Cruz County Regional Transportation Commission
1523 Pacific Ave, Santa Cruz, 95060; www.sccrtc.org
phone: 831.460.3200; email: info@sccrtc.org

Summary of Survey Results on Draft Study

- Online survey, respondents were self-selected
- Survey open: June 3 – July 31, 2015
- 2645 responses received
- Survey used as a tool to provide information on the study and solicit feedback on service scenarios and service parameters analyzed in the study
- 75% of survey respondents said they had read at least portions of the study
- Survey was available in English and Spanish

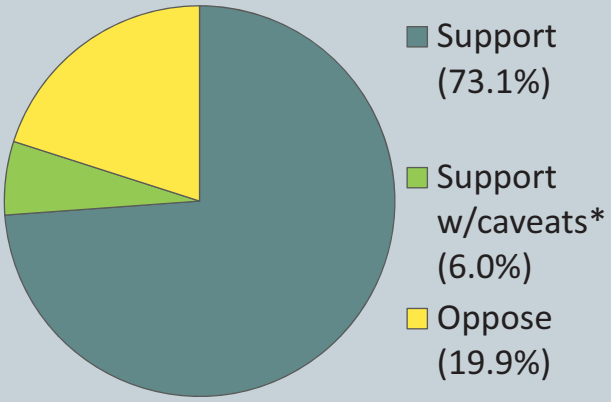
2015 Survey Results: Possible Corridor Uses

In general, do you support or oppose the following current or possible future uses of the rail corridor?

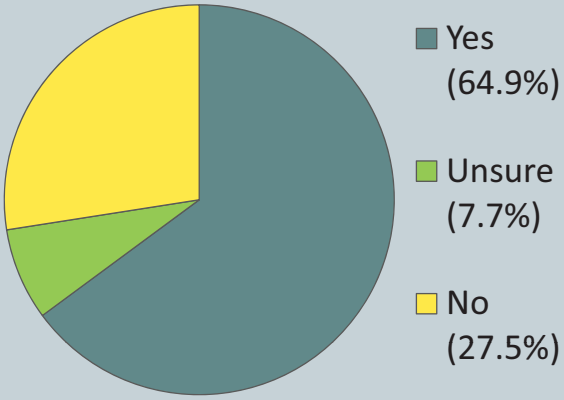


2015 Survey Results: Support for Transit Service on Rail Line

Q1: Support Using Rail Line for Public Transit Service



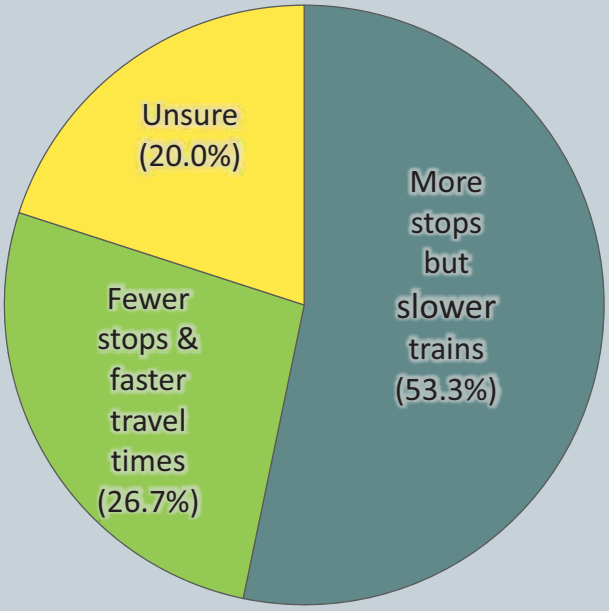
Q15: Makes sense to expand public transportation to include rail transit



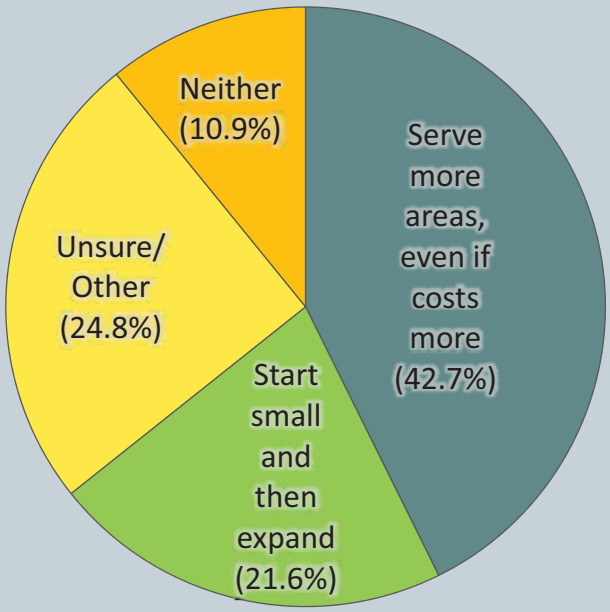
* Caveats included "If infrequent" and "On limited sections"

2015 Survey Results: Service Scenarios

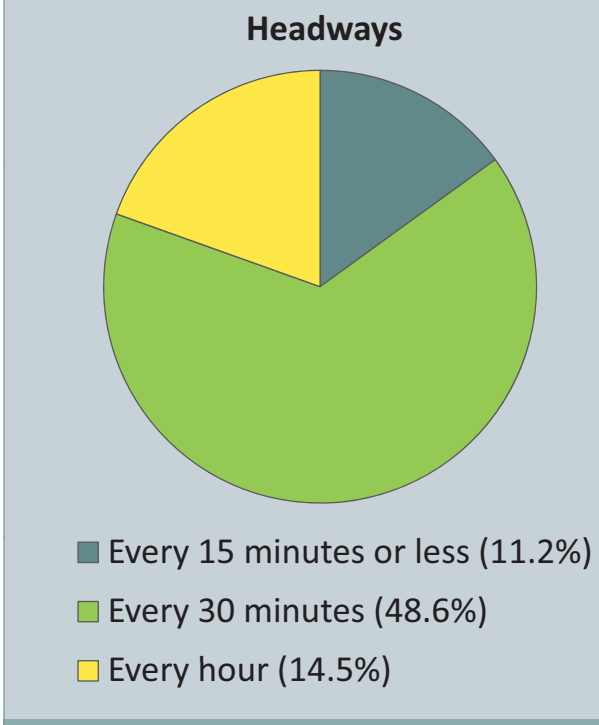
Q3: General Service Preference

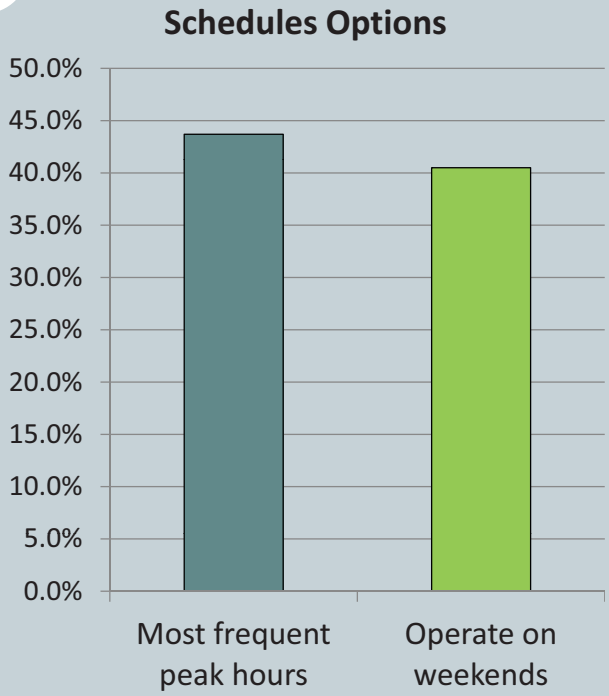


Q6: Service Implementation



2015 Survey Results: Q4 Service Options





* Questions allowed more than one answer selection

2015 Survey Results: Evaluation Factors

- Q2: When evaluating rail transit- most important factors
  - Reduce traffic – 75.7%
  - Provide more transportation options – 69.7%
  - Environmental benefits/emission reduction – 69.4%
  - Ridership: Increase transit ridership – 68.9%

- Q8: Deciding to take transit – most important factors
  - Predictable travel times – 76.6%
  - Ease of connection to final destination – 64.6%
  - How close stations are to final destination – 62.6%
  - Security at stations – 59.1%

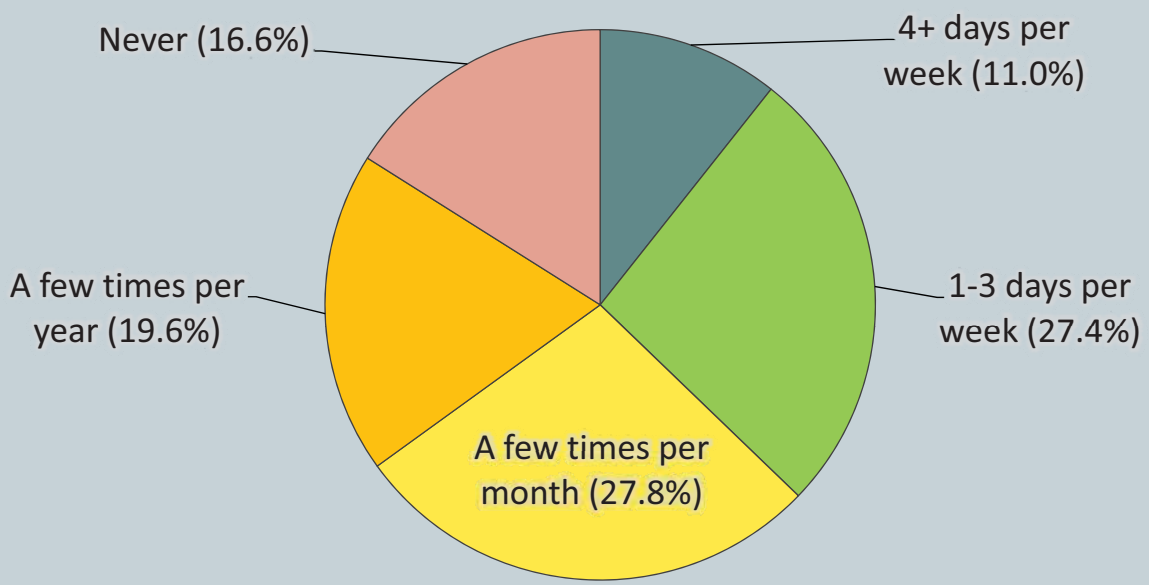
*Q2 percentages included responses “4” & “5”; Q8 sums “very important” and “extremely important”

2015 Survey Results: Top Support and Concerns

- Q14: Reasons to support the rail line project
  - Provides mobility for those who cannot drive
  - Other transportation is publicly funded, rail should be also
  - Rail provides transportation options
  - Traffic and emissions concerns require car alternatives
- Q13: Areas of concern regarding the rail line project
  - Capital and operating costs
  - Rail could compete with other projects for funding
  - Rail means narrower trail and need for trail bridges
  - Noise from trains

2015 Survey Results: Rail Service Ridership

Q9: How often would you ride the train?

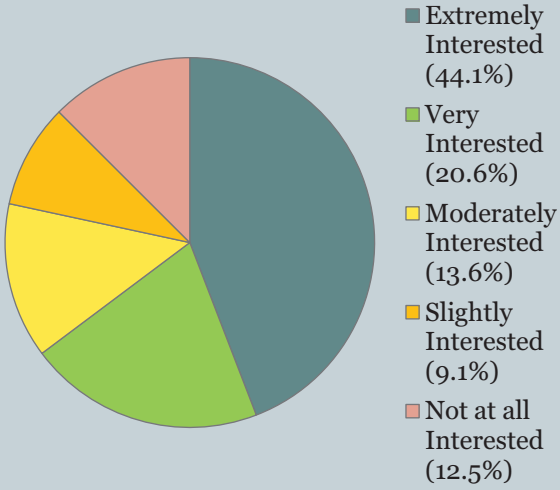


Summary of 2014 Survey Results

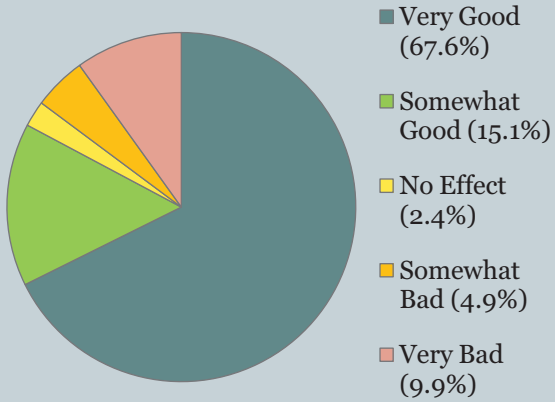
- Online survey, respondents were self-selected
- Survey open: July 11- August 11, 2014
- 1,936 responses received
- Survey used to solicit input on goals, objectives, station locations, and service scenarios

2014 Rail Survey Results: Overview Questions

In general, how interested are you in taking a train to destinations along the Santa Cruz County Branch Line?

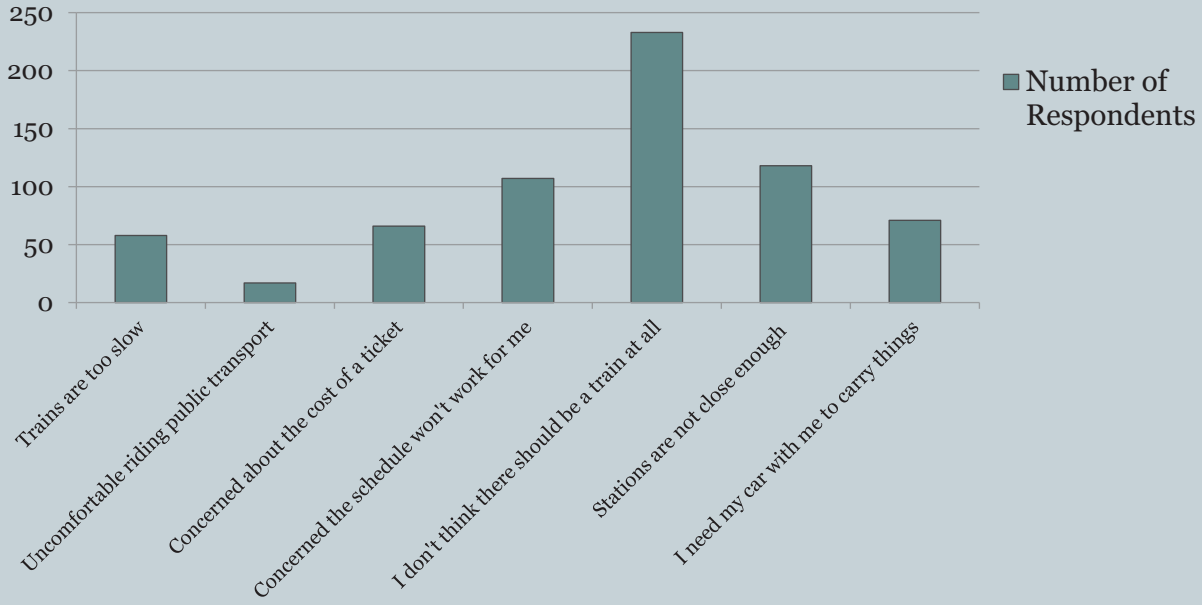


After considering the possible positive and negative impacts of passenger rail, do you think train service will be good or bad for Santa Cruz County, as a whole, in the long term?



2014 Survey Results: Why are you not interested?

Out of those who chose "Slightly Interested" or "Not at all Interested", why are you not interested in taking the train?



* Questions allowed more than one answer selection

2014 Survey Results: Potential Stations

After looking at the maps of potential station sites located above, please mark how often you would potentially use each station.

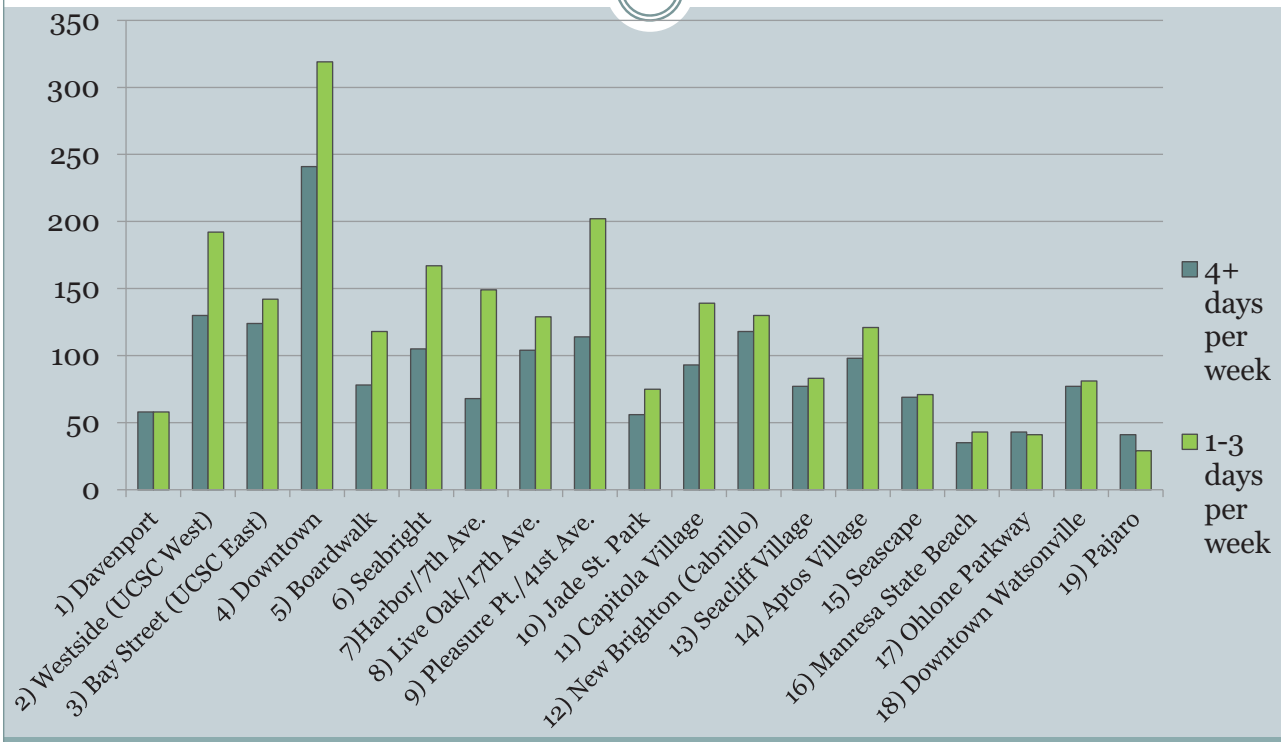
Most Popular

- Westside Santa Cruz
- Bay Street, Santa Cruz
- Downtown Santa Cruz
- Seabright Ave.
- 41st Avenue/Pleasure Pt.
- Capitola Village
- Cabrillo

Lowest Use

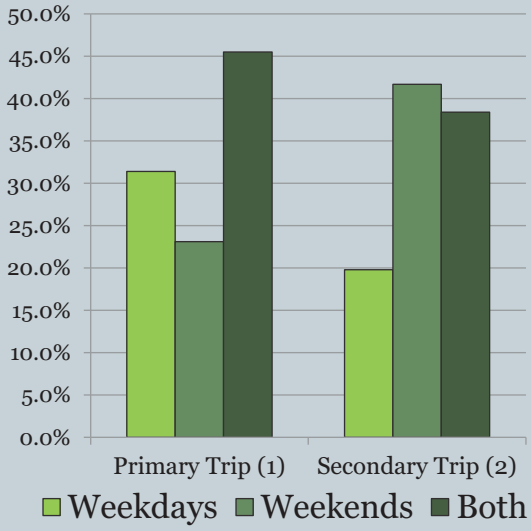
- Davenport
- Jade Street Park
- Seascape
- Manresa State Beach
- Ohlone Parkway
- Pajaro

2014 Survey Results: Potential Station Options

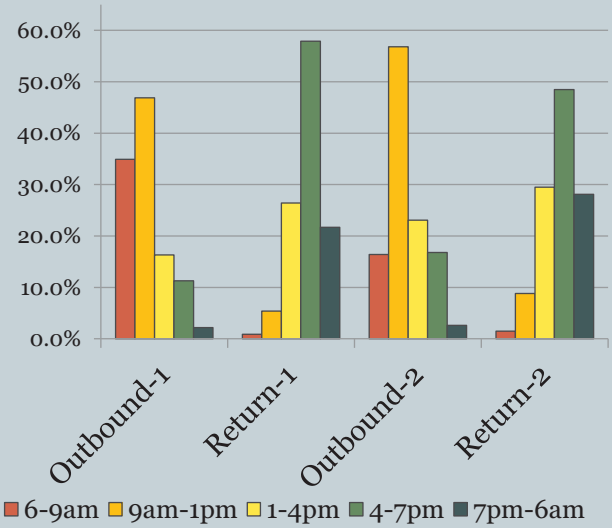


2014 Survey Results: Common Trip Times

Do you usually take this trip on Weekdays (Monday-Friday) or Weekends (Saturday/Sunday)?



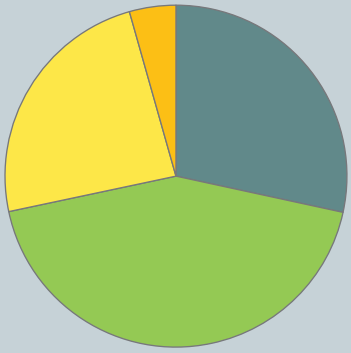
When do you usually START and RETURN from the trip you take most often (1); and second most likely (2) trip?



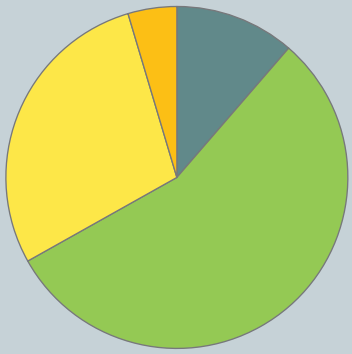
* Questions allowed more than one answer selection

2014 Survey Results: Trip Purpose

What is the purpose of your PRIMARY trip?



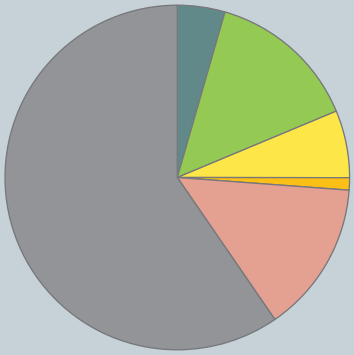
What is the purpose of your SECONDARY trip?



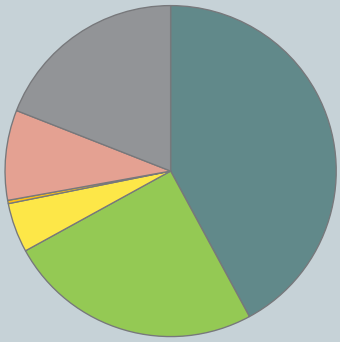
* Questions allowed more than one answer selection

2014 Survey Results: How do you get there?

How do you make your primary trip NOW?



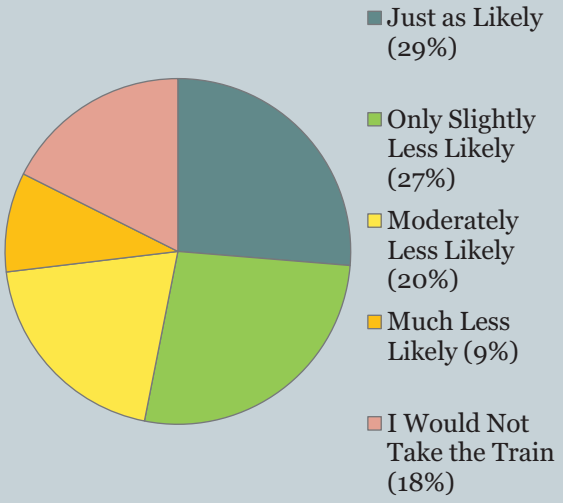
How do you think you would get to your closest neighborhood station?



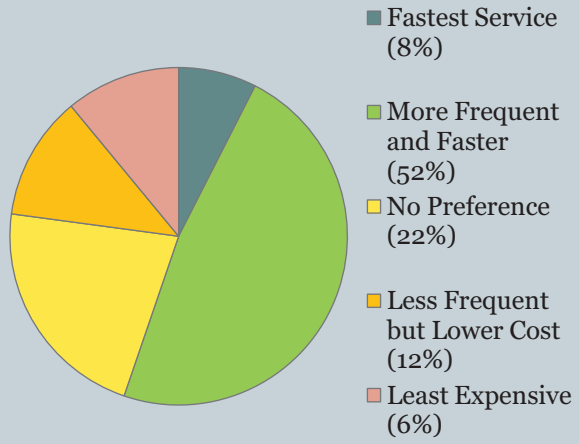
* Questions allowed more than one answer selection

2014 Survey Results: Scope and Service

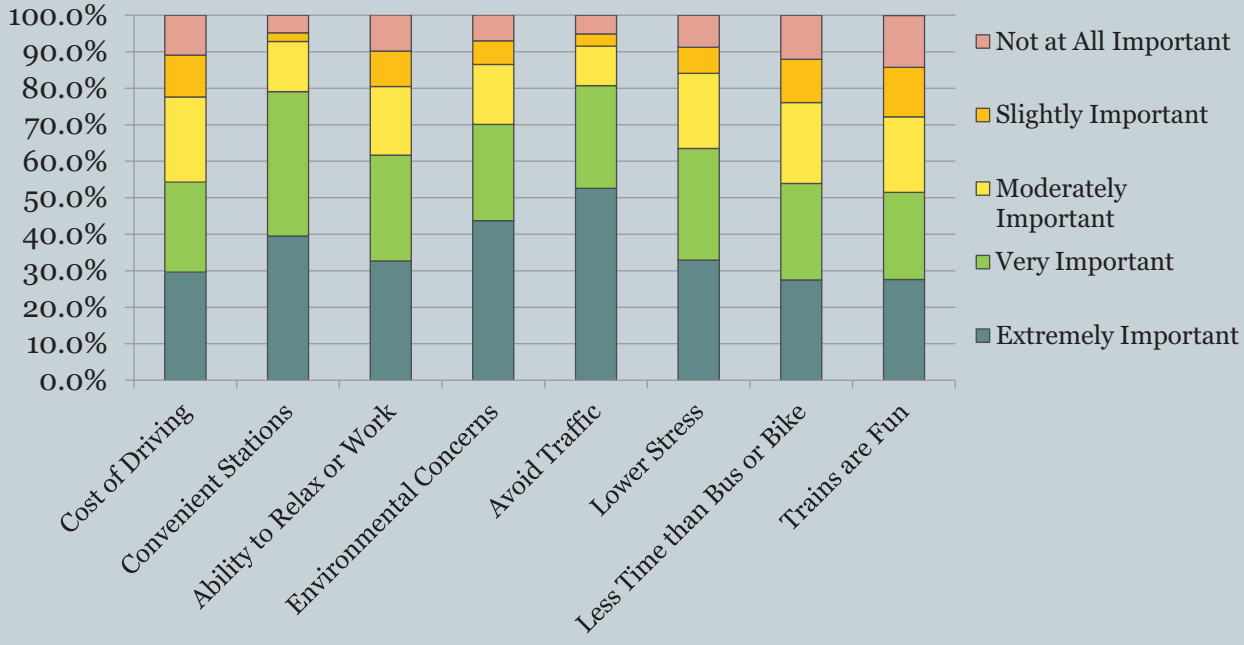
If the train did NOT stop at your closest neighborhood station, but rather the next closest, how likely would you be to ride the train?



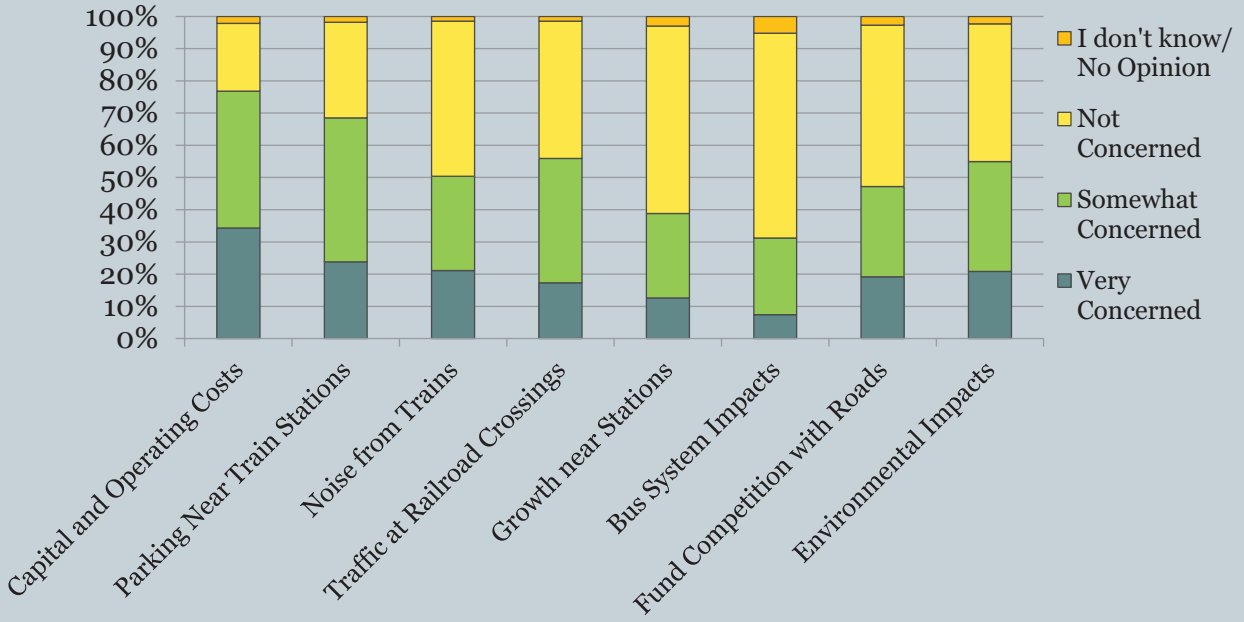
Is it more important to you that this rail project provides the fastest and most frequent service, or that construction and operation costs are kept as low as possible?



2014 Survey Results: Why Take the Train?

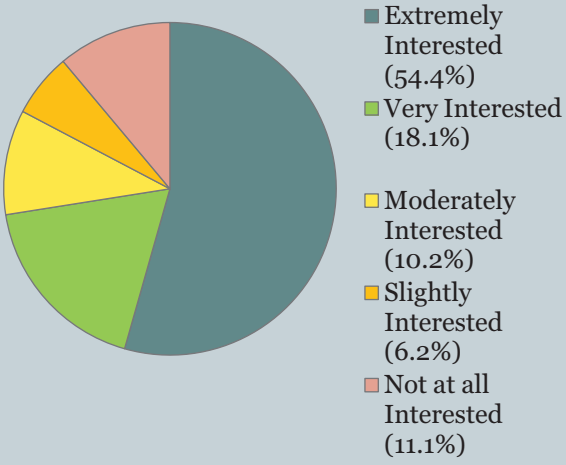


2014 Survey Results: Considerations

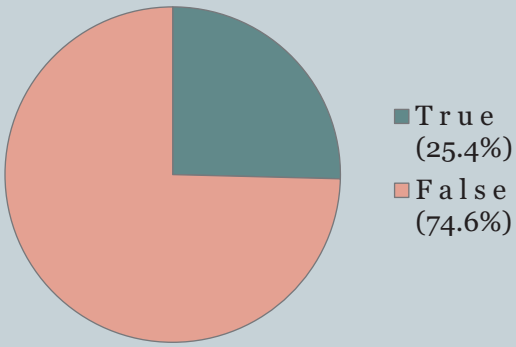


2014 Survey Results: Connections & Cost

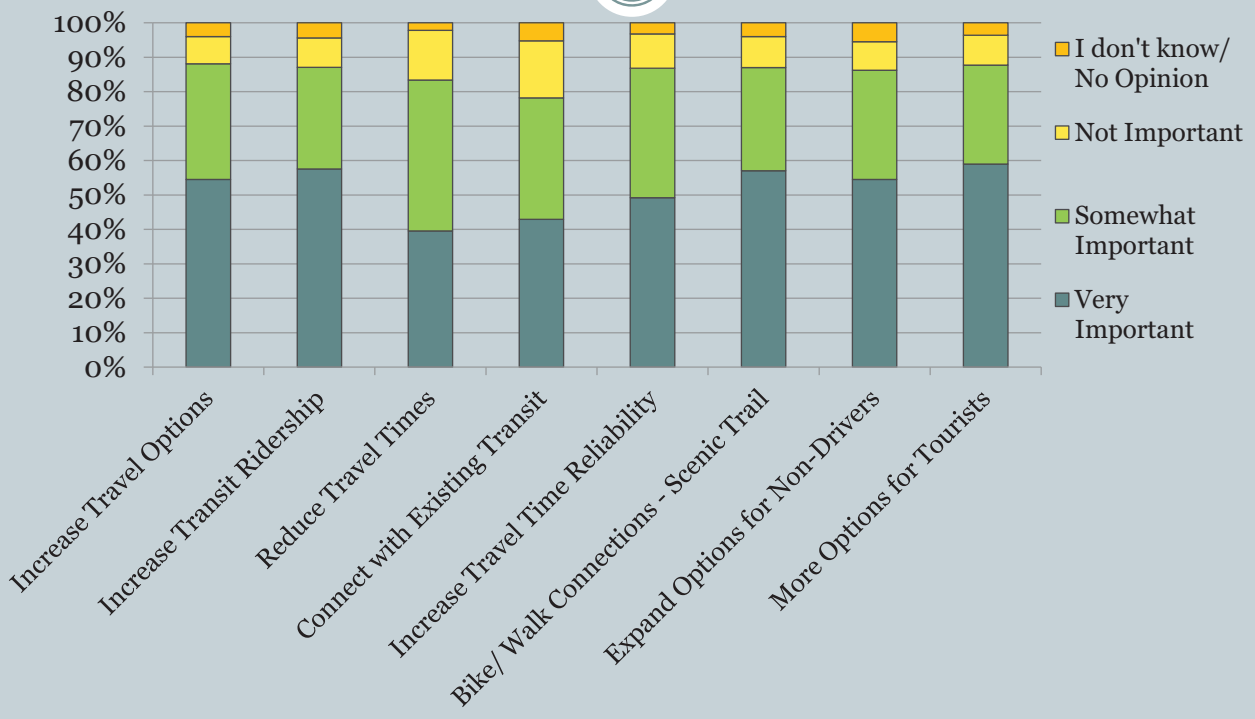
How interested would you be in using a connection in Pajaro to transfer to future trains to the San Francisco Bay Area, Monterey, and beyond?



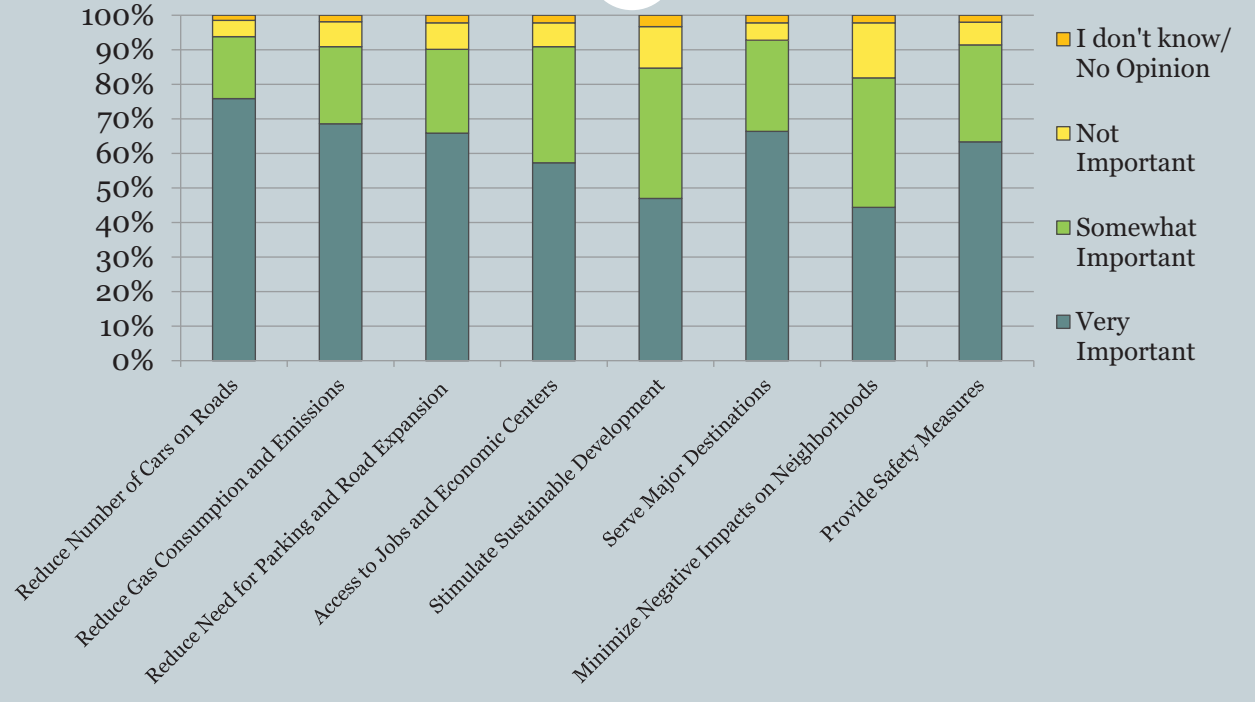
I would only ride the train if it cost LESS than the type of transportation I use currently.



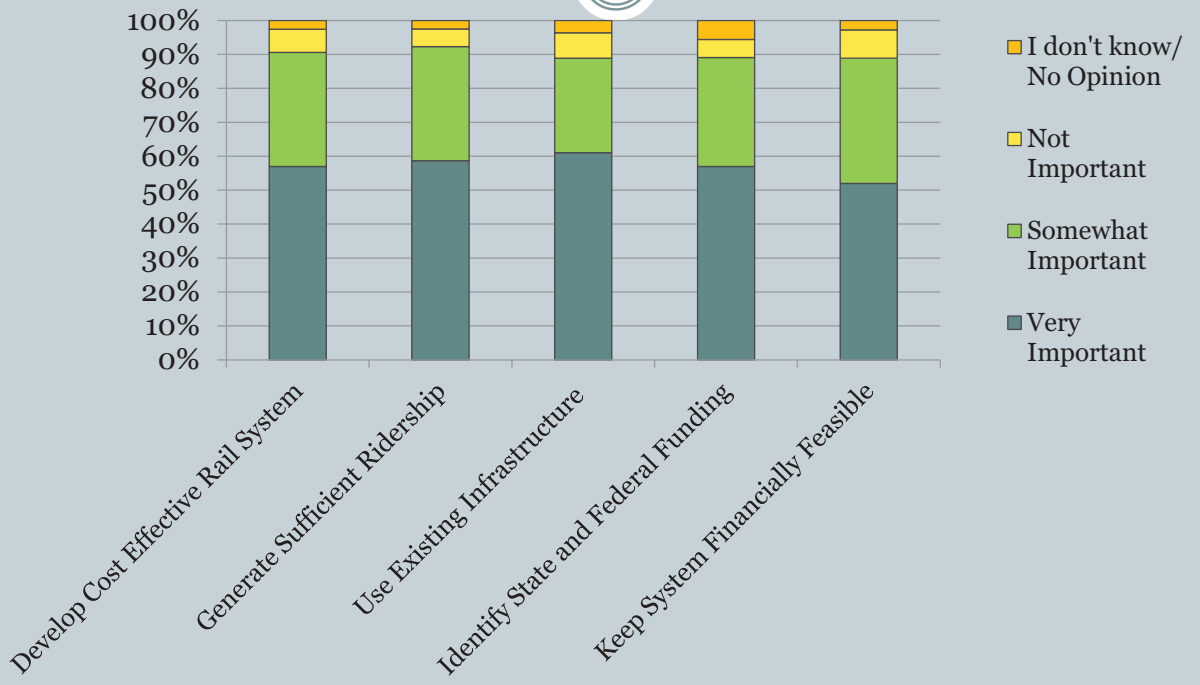
2014 Study Goals: Transportation Choices & Alternatives



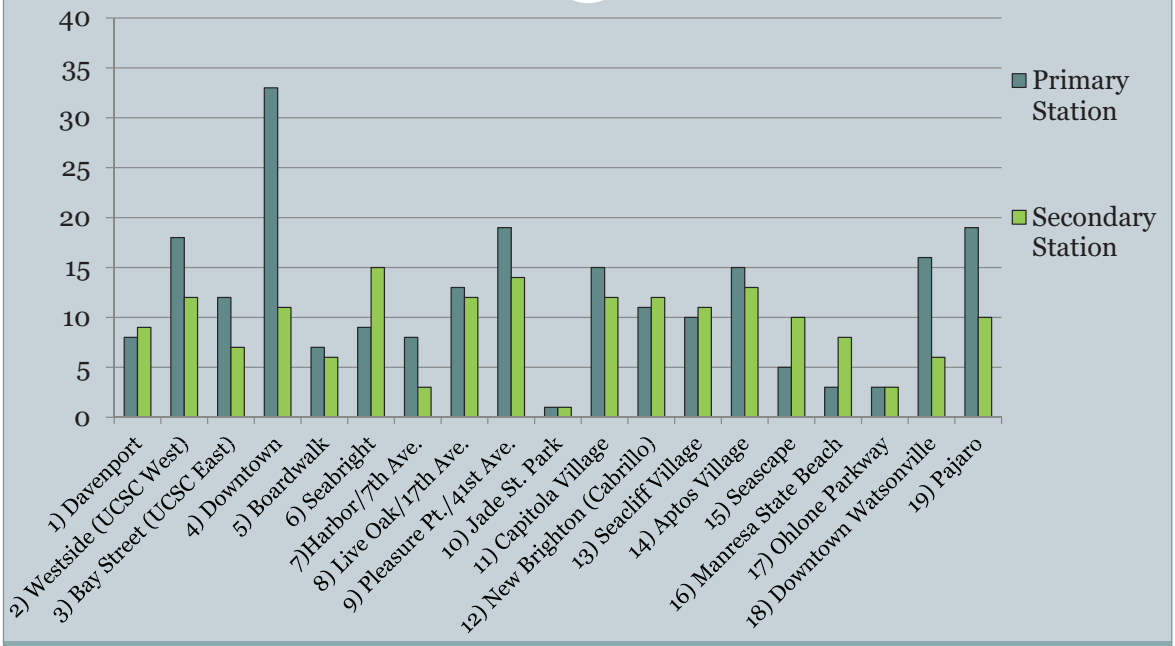
2014 Study Goals: Sustainability & Economic Vitality



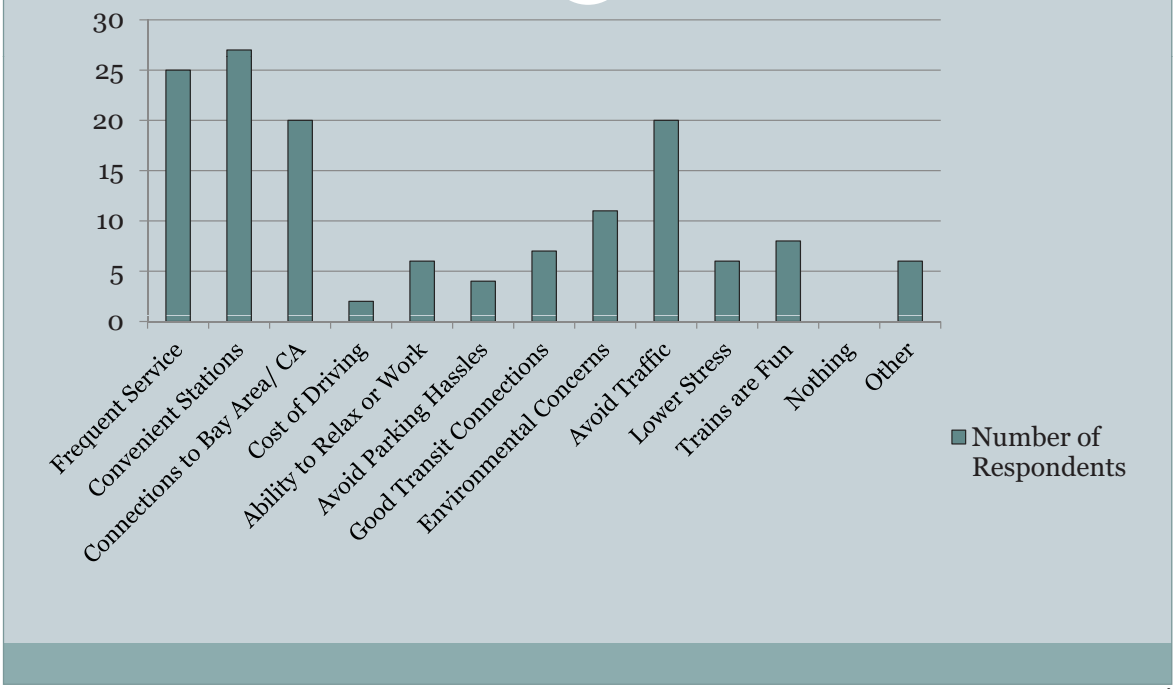
2014 Study Goals: Cost Effectiveness & Performance



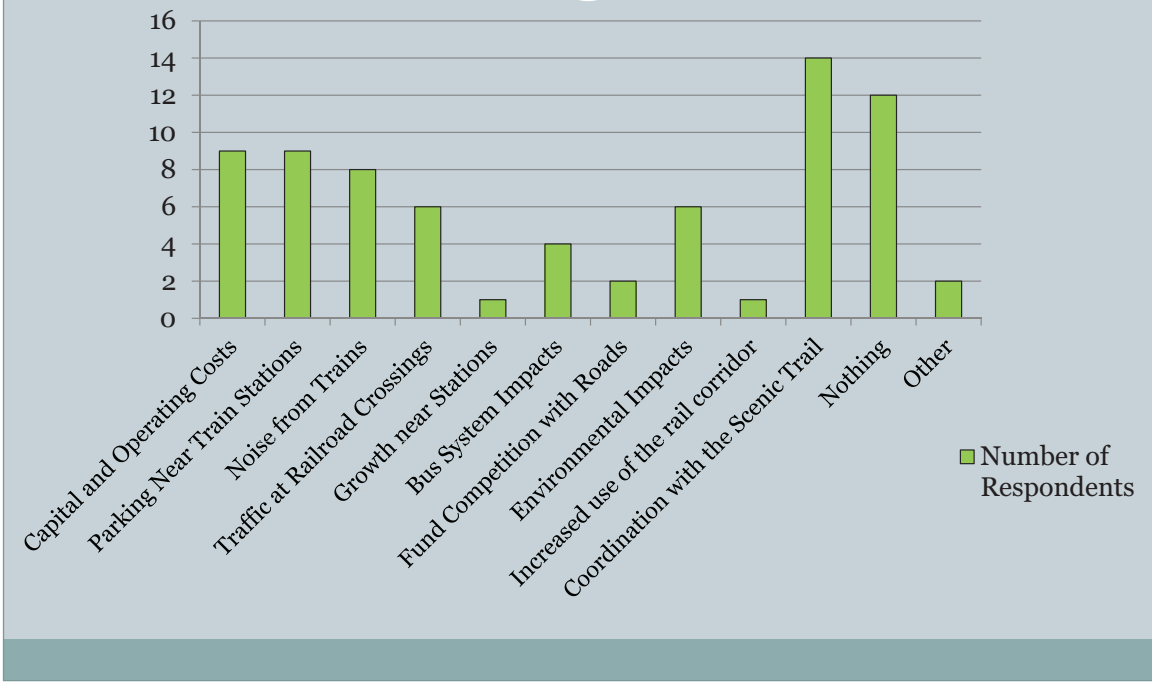
July 17, 2014 Workshop: Potential Station Options



Workshop Results: Why Take the Train?

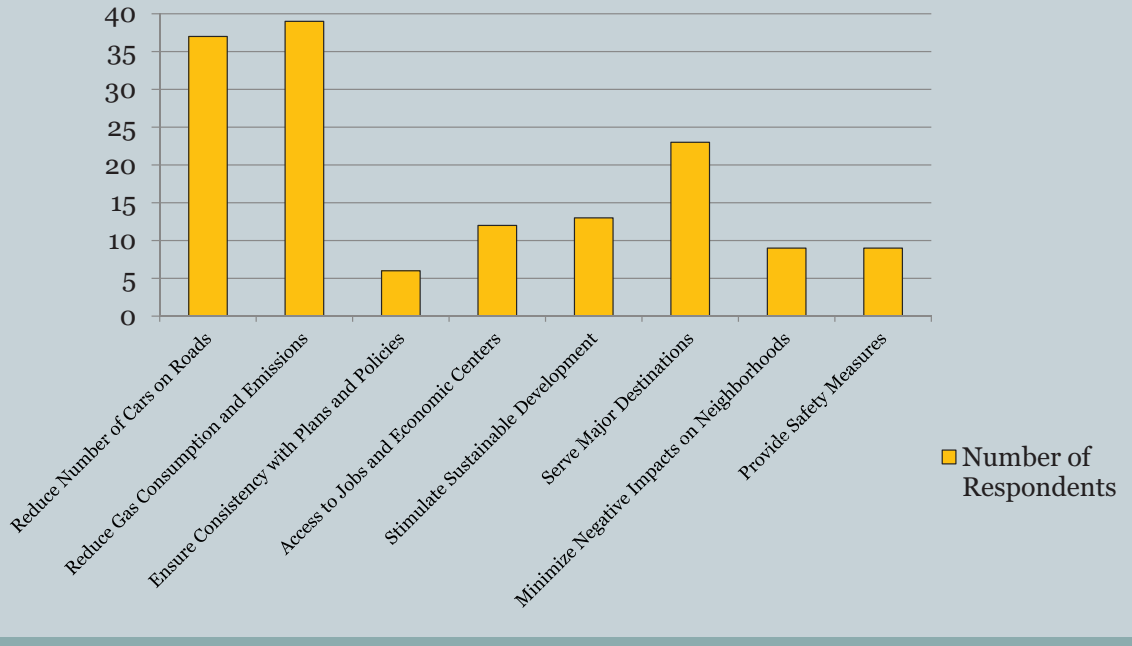


Workshop Results: Concerns

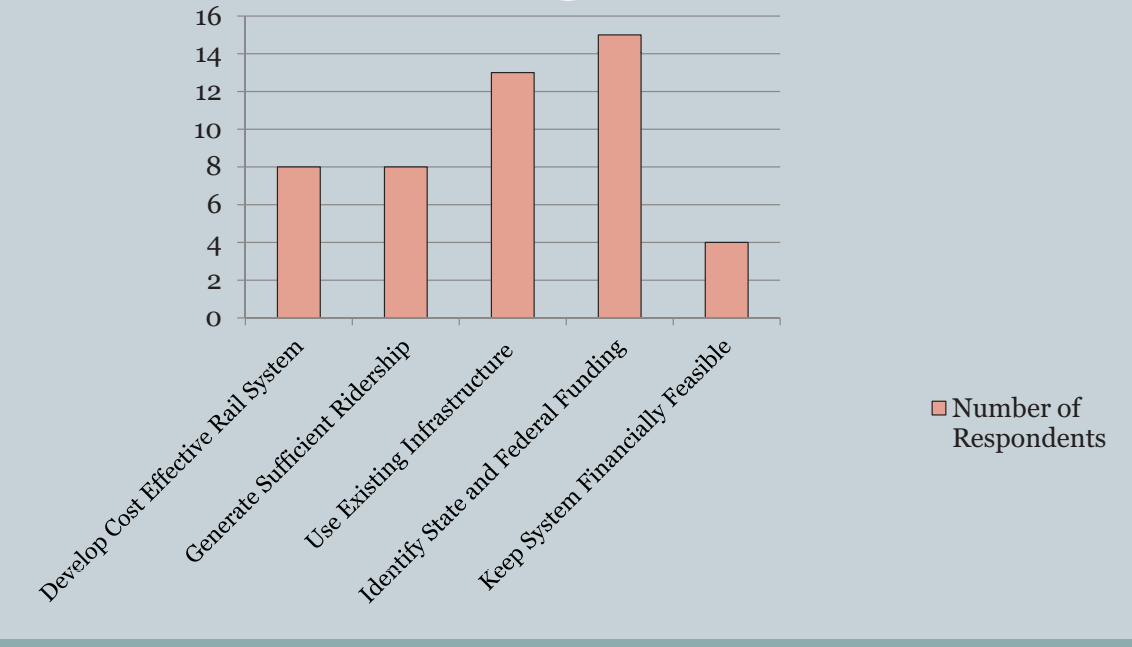


Workshop: Importance of different goals/objectives - Transportation Choices & Alternatives

Workshop: Importance of different goals/objectives – Sustainability & Economic Vitality



Workshop: Importance of different goals/objectives – Cost Effectiveness & Performance



Sample eNews and Facebook Notices

From: Regional Transportation Commission
Sent: Friday, May 22, 2015 10:25 AM
To: Interested Parties
Subject: **RTC: Santa Cruz County Passenger Rail Feasibility Study Draft Now Available

Santa Cruz County Passenger Rail Feasibility Study – Draft Report now available

Is rail transit service feasible on the Santa Cruz Branch Rail Line? The Santa Cruz County Regional Transportation Commission (RTC) is analyzing the feasibility of passenger rail transit service along the Santa Cruz Branch Rail Line which roughly parallels Highway 1 and the coast in Santa Cruz County.

This high-level study includes ridership and cost information for seven service scenarios and evaluates them based on goals and objective identified by the community.

Review the Report – Learn More – Provide Feedback - Participate! Visit www.sccrtc.org/rail

Opportunities to Learn More:

- **Open house and workshop:** June 4, 6:30pm at Simpkins Swim Center, 979 17th Ave, Santa Cruz. View findings, hear overview presentation, and ask questions.

- **RTC Board Meeting:** June 4, 10:00am at Watsonville City Hall (275 Main Street). The RTC board will receive a presentation on the study from the consultant during its regular meeting. The RTC meeting starts at 9:00 a.m. and will be rebroadcast on Community TV.

Provide Input: Written comments are encouraged. The comment period closes July 8, 2015.

  - **Comment Form:** Submit comments online
  - **Email** the RTC with the subject line "Draft Rail Study Comments."
  - **Survey**: Complete the Passenger Rail Study Online Survey – *Note: Survey available June 4-July 8*

Your participation will help ensure that the Final Report reflects community input! The final report and any recommended actions will be considered by the RTC following a public hearing in fall 2015.

Stay Informed: *Sign up for **Rail eNews**, to receive periodic emails about upcoming meetings, the survey, and other updates on this rail transit study and rail line.*

Please share this email with others.

Santa Cruz County Regional Transportation Commission
831.460.3200 - Santa Cruz Office (main location)
831.768.8012 - Watsonville Office
1523 Pacific Avenue | Santa Cruz, CA 95060

Follow our social networks for the latest RTC news

From: Regional Transportation Commission
Sent: June 24, 2015
To: Interested Parties
Subject: Santa Cruz-Watsonville Rail Survey/Encuesta del Servicio Ferrovario

Unase a la conversación acerrca del Servicio Ferrovario entre Watsonville y Santa Cruz

(The following message repeats in English below.)

La Comisión Regional de Transporte del Condado de Santa Cruz *[por sus siglas en inglés RTC]* está evaluando opciones de servicio ferroviario para pasajeros, entre Santa Cruz y Watsonville. El estudio preliminar del Servicio Ferroviario del Condado de Santa Cruz está disponible (en inglés) para revisión en: www.sccrtc.org/rail y las bibliotecas en Watsonville y Santa Cruz. Completar una encuesta y ayudarnos a asegurar que el informe final refleje la opinión de la comunidad.

La encuesta ya esta disponible en línea en inglés y español:

- Encuesta-Español
- Survey-English

Le invitamos a ofrecer sugerencias y comentarios usando la **forma de sugerencias** en línea o escriba un correo a: info@sccrtc.org con el asunto "Comentarios Proyecto de Servicio Ferroviario"

Manténgase informado: Inscríbase para recibir correos electrónicos, avisos o noticias acerca del estudio de servicio ferroviario.

Porfavor comparta este correo con sus amigos/amigas, vecinos, familiares, compañeros de trabajo y otras personas. Información sobre el Ferroviario, carretera, y otros proyectos de transporte está disponible en línea en: www.sccrtc.org. También le invitamos que visite nuestra nueva página de internet www.cruz511.org para información sobre tráfico, autobuses, transporte colectivo, y otra información al viajero.

Join the conversation about Rail Transit!

The Santa Cruz County Regional Transportation Commission (RTC) is analyzing the feasibility of passenger rail transit service between Santa Cruz and Watsonville. **The Passenger Rail Feasibility Study- Draft Report (in English) is online at: www.sccrtc.org/rail.**

Online survey now available in English & Spanish.

- Survey-English
- Encuesta-Español

You can also submit written comments using the online **Comment Form** or by Email. Provide your feedback by July 31.

The final report and any recommended actions will be considered by the RTC in fall 2015.

Stay Informed: *Sign up for **Rail eNews**, to receive periodic emails about upcoming meetings, the survey, and other updates on this rail transit study and rail line.*

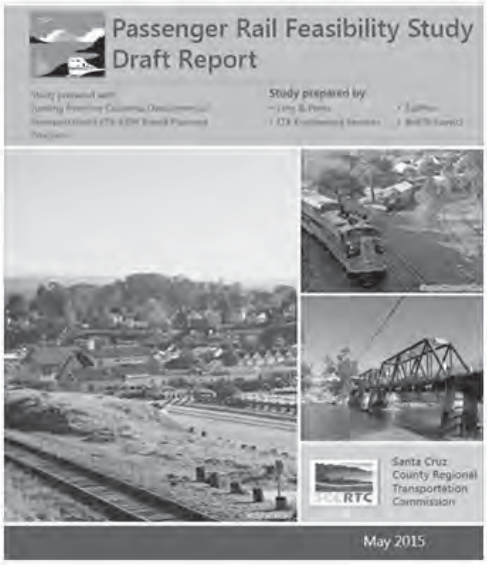
Please share this email with your friends, family, neighbors, co-workers, and others. *More information about the rail line, trail, highway and other transportation projects is available on the RTC website: www.sccrtc.org. Also check out the new www.Cruz511.org website for traffic, bus, carpool, and other traveler information.*

Santa Cruz County Regional Transportation Commission
831.460.3200 - Santa Cruz Office (main location)
831.768.8012 - Watsonville Office
1523 Pacific Avenue | Santa Cruz, CA 95060

Facebook Posts

Santa Cruz County Regional Transportation Commission (RTC)
May 21

Santa Cruz County Passenger Rail Feasibility Study – Draft Report now available. Visit www.sccrtc.org/rail.
Review the Report – Learn More – Provide Feedback - Participate!



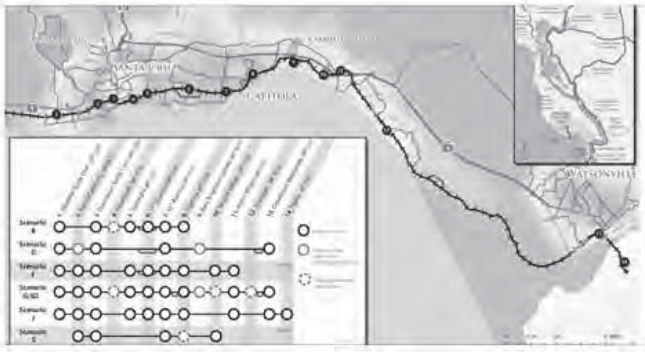
Like Comment Share

Santa Cruz County Regional Transportation Commission (RTC)
Government Organization · 409 Likes · June 24 · Edited

Like Page

LA ENCUESTA YA ESTA DISPONIBLE EN ESPAÑOL.
https://es.surveymonkey.com/r/NSDPXCK
Ayúdenos asegurar que la opinión de la comunidad se refleje en el studio preliminar del Servicio Ferroviario del Condado de Santa Cruz. Visite nuestra pagina de internet para tomar la encuesta Please share/Porfavor comparta!

See Translation



Passenger Rail
The RTC is studying the feasibility of passenger rail transit service along the Santa Cruz Branch Rail Line which roughly parallels Highway 1 and the coast in Santa Cruz County. The RTC is seeking input on the Draft Report through July 31.
SCCRTC.ORG

Santa Cruz County Regional Transportation Commission (RTC)
June 2 · Edited

JUNE 4 – RAIL TRANSIT REPORT OPEN HOUSE: 6:30 pm @ Simpkins Swim Center, 17th Ave in Live Oak. https://goo.gl/maps/3sMY4 Learn about travel time, ridership, costs, train technologies, recommendations, and more. The RTC will also hear a presentation by the consultant team (10am) at their regularly scheduled morning meeting in Watsonville. https://goo.gl/maps/YHvxx

Like Comment Share

Santa Cruz County Regional Transportation Commission (RTC)
July 15 · Santa Cruz, CA

Join the conversation about Rail Transit in Santa Cruz County!

Only 3 weeks left to review the report, take the survey, and encourage your friends, family, neighbors, and co-workers to participate in this important community discussion. The comment/survey period closes July 31.

Take the online survey
- English Survey: https://www.surveymonkey.com/r/FTFRR8P
- Encuesta-Español: https://es.surveymonkey.com/r/NSDPXCK

Please share this information with your friends, family, neighbors, co-workers, and others. More information about the rail line, trail, highway and other transportation projects is available at sccrtc.org

Santa Cruz County Rail Transit Study - Draft Report Survey
Web survey powered by SurveyMonkey.com. Create your own online survey now with SurveyMonkey's expert certified FREE templates.
SURVEYMONKEY.COM

Like Comment Share

From: Regional Transportation Commission
Sent: Monday, August 31, 2015 10:06 AM
To: Interested Parties
Subject: RTC: Rail Study eNews

THANK YOU to everyone that provided input on the **Passenger Rail Feasibility Study – Draft Report**!

Community engagement on the Passenger Rail Feasibility Study is high as evidenced by the over **2600 online survey responses** and over **430 comment forms, emails, and letters** submitted on the draft during the comment period (May 21 to July 31, 2015). Comments ranged from strong support, to voicing concerns and suggestions, to opposition of any activity on the rail line. The Regional Transportation Commission (RTC) will receive an overview of the public input received and suggested updates for the final Passenger Rail Study at its September 3 meeting (staff report including a link to all comments posted online and a summary of the survey are available here, item #20 starting on 64). The Final Report is expected to be available later this year.

The Passenger Rail Feasibility Study – Draft Report identifies sample rail transit options on the Santa Cruz Branch Rail Line between Santa Cruz and Watsonville/Pajaro including cost, ridership, and funding forecasts.

Please visit the RTC website for more information about this and other transportation projects and projects: ***www.sccrtc.org*** .

. . . . . .

Santa Cruz County Regional Transportation Commission
Santa Cruz Office (main) 831.460.3210 | Watsonville 831.768.8012
1523 Pacific Avenue | Santa Cruz, CA 95060

Follow our social networks for the latest RTC news

Initial Public Outreach - 2014

From: Regional Transportation Commission
Sent: Friday, July 11, 2014 11:13 AM
To: Interested Parties
Subject: RTC: Passenger Rail Study - Survey and 7/17 Workshop

Passenger Rail Study Survey and Workshop:
Your ideas are important!

The Santa Cruz County Regional Transportation Commission (SCCRTC) is analyzing the feasibility of passenger rail transit service along the 32-mile Santa Cruz Branch Rail Line.

Complete an **Online Survey** on 'Passenger Rail Goals & Scenarios' and attend the first public workshop: **6:30 pm on Thursday, July 17 at the Live Oak Senior Center (1777 Capitola Rd near 17th Ave, Santa Cruz)**. Your feedback will guide station, service scenario, and ridership analysis. Ensure the passenger rail study reflects everyone in the community.

Check out the RTC project **website** for more information and project updates.

You are receiving this email because you expressed interest in passenger rail or rail corridor issues. If you would like to be removed from the Rail eNews list, please reply with the words "Delete From Rail eNews" in the subject.

If a friend forwarded this email to you, and you would like to receive occasional email updates from the RTC on rail projects directly, click here to sign up for the Rail eNews.

. . . . . .

Santa Cruz County Regional Transportation Commission
Santa Cruz Office (main) 831.460.3210 | Watsonville 831.768.8012
1523 Pacific Avenue | Santa Cruz, CA 95060

Follow our social networks for the latest RTC news

From: Regional Transportation Commission
Sent: Tuesday, September 02, 2014 10:28 AM
To: Interested Parties
Subject: RTC: Selection of 5 Passenger Rail Service Scenarios

Rail eNews Recipients:

Based on your extensive feedback (2,000 survey participants and standing room only workshop in July), five passenger rail service scenarios are recommended for detailed analysis.

1. Weekend Service: Santa Cruz ßà Capitola – weekend only service to 6-8 primary stations and key visitor destinations

2. Peak Express Service: Santa Cruz ßà Watsonville – peak weekday commute, plus seasonal weekends to 4-8 primary stations and key visitor destinations

3. Local Service: Santa Cruz ßà Cabrillo – seven day service to 6-8 primary and secondary stations (near-term)

4. Expanded Local Service: Santa Cruz ßà Watsonville – seven day service to 10+ primary and secondary stations (longer-term)

5. Regional Rail Connector Service: Santa Cruz ßà Pajaro – service connecting 11+ stations to Capitol Corridor/Amtrak at Pajaro to test potential ridership demand with regional rail accessibility

The Regional Transportation Commission (RTC) will consider approval of these service scenarios at their September 4, 2014 meeting. For more information, the staff report to the board is Item # 17 in the RTC packet and the results of the survey and 7/17/14 public workshop are posted on the Passenger Rail Service project webpage (see bullet under "What's New").

Following approval of the service scenarios, the consultants will develop ridership forecasts and cost estimates. The results of this analysis will be available early next year.

Stay tuned!

. . . . . .

Santa Cruz County Regional Transportation Commission
831.460.3200 - Santa Cruz Office (main location)
831.768.8012 - Watsonville Office
1523 Pacific Avenue | Santa Cruz, CA 95060

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Public Workshop

Santa Cruz County Passenger Rail Study

Thursday, July 17, 6:30 pm
Live Oak Senior Center
1777 Capitola Road, Santa Cruz, CA
(Traductor al español estará disponible.)

You are invited to be a collaborative partner in the Santa Cruz County Passenger Rail Study, a feasibility analysis of potential train service options on the 32-mile rail line from Davenport to Watsonville.
This workshop will feature an overview of the feasibility analysis and seek your feedback on the goals & objectives, as well as possible train service scenarios to be evaluated.
Broad community participation is encouraged to ensure an informed decision making process.
An online survey is also available.

The survey and more information are available online:
http://www.sccrtc.org/projects/rail/passenger-rail/

*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, info@sccrtc.org, (831)460-3200

Passenger Rail Study - Draft Report Outreach	
	Date
Draft Document Released for Public Review	5/21/15
Comment Period Close (70 days)	7/31/15

RTC Meeting/Consultant Presentation in Watsonville (morning)	6/4/15
Public Open House in Live Oak (evening)	6/4/15

RTC Website	Document available online	5/21/15
	Survey link	6/4/15
	Survey in Spanish link	6/23/15
	FAQ posted	7/13/15

Survey	Survey online	6/4-7/31/15
	Survey in Spanish	6/23-7/31/15
FAQ	Posted on RTC website	7/10/15
Fact Sheet	Overview of study and how to provide input	Ongoing
Flyers	Regarding meetings and document	5/21-6/4/2015
Outreach cards -Distributed at meetings and events		June/July 2015

eNews: Rail/Youth/Trail/Highlights/Media		
	1. Announce w/ Report	5/22/15
	2. Report & Meeting Info	5/27/15
	3. Meeting/Open House Reminder	6/1/15
	4. Survey Focus	6/10/15
	5. Survey/Comment Close Reminder	6/22/15
	6. Survey in Spanish	6/23/15
	7. Survey Closes in 3 weeks	7/8/15
	8. Final days to comment	7/28/15

Social Media	RTC Facebook (FB) Posts	5/21 & 7/28/15
	Twitter	5/21 & 7/28/15
	Next Door	6/1 & 7/27/15

Document at Libraries		
	Santa Cruz	5/21/15
	Watsonville	5/22/15
	Aptos	6/3/15
	Live Oak	6/5/15

Media Outreach		
	New Releases	5/22 & 7/29/15
	-Announement Report Available	5/22 & 7/29/15
	PSA	
	- KUSP	5/22/15
	- KSCO	5/22/15
	- KZSC	5/22/15
	- KAZU	5/22/15
	- CTV meeting info	5/22/15
	Street Smarts, Sentinel	5/22/15
	Sentinel Edtorial: RTC Chair & Vice Chair	7/26/15

Media Meetings/Calls		
	Sentinel	7/30/15
	Good Times	6/10/15
	Times Publishing Group	6/17/15

Community Calendars		
	Sentinel	5/22/15
	Good Times	5/22/15
	Times Pub Group	5/22/15
	Santa Cruz.com	5/22/15

Newsletters, Emails, Website, and Social Media Posts by others		
	Information sent to Chambers	5/22/15
	Coast Rail Coordinating Council	5/22/15
	Supervisor Leopold FB Posts on Study	6/2 & 6/4/15
	Supervisor Leopold Newsletter	6/2/15
	Bike Santa Cruz County - FB Post	6/2/15
	Councilman Jimmy Dutra FB Post on Study	6/3/15
	Civinomics	6/9/15
	SC Chamber Newsletter	6/18/15
	SC Chamber email	6/29/15
	Live Oak Neighbors Yahoo Group	6/30 & 7/13
	South County Health in All Policies (HiAP)	7/7/15
	TAMC Rail Policy Committee	7/8/15
	Freedom Rotary - eNews	7/16/15
	Land Trust	7/17/15
	PV Chamber-"Bits & Blogs"	7/21/15
	Civinomics	7/28/15
	Ecology Action Action Alert	7/30/15
	Friends of the Rail & Trail (FORT)	7/30/15
	Santa Cruz Chamber Endorsement	7/30/15
	Bike Santa Cruz	7/31/15
	Santa Cruz County Cycling Club-Roadrunner Newsletter	Jul–Aug 2015
	City of Watsonville Website Banner	July 2015
	PV Chamber-"Bits & Blogs"	July 2015

RTC & Advisory Meetings/Presentations		
	RTC Board	6/4/15
	Public Open House Workshop	6/4/15
	Transportation Agency for Monterey County (TAMC) Rail Policy Committee	6/1/15
	Rail Study Technical Stakeholder	6/8/15
	RTC Bicycle Committee	6/8/15
	RTC Elderly and Disabled Transportation Advisory Committee (E&D TAC)	6/9/15
	RTC Interagency Technical Advisory Committee (ITAC)	6/18/15
	Pajaro Valley Stakeholders/Interest Groups	7/6/15
	Countywide Stakeholders/Interest Groups	7/8/15
	ITAC-email reminder to submit comments	7/14/15

Presentations at Other Entities' Meetings		
	Watsonville City Council	5/12/15
	Santa Cruz Business Council	6/10/15
	METRO Board	6/12/15
	SC Chamber Community Affairs Committee	6/11 & 7/9
	SC Rotary	6/12/15
	Commission on the Environment	7/15/15
	Penny University	7/27/15
	Capitola/Aptos Rotary	7/30/15

Events		
	Pleasure Point Fest	6/27/15
	Bike Friendly Watsonville	6/27/15
	Jewish Cultural Festival Aptoa	6/28/15
	First Friday Santa Cruz	7/3/15
	Farmers Markets	
	- Watsonville - Fri	7/24/15
	- Santa Cruz - Wed	7/8/15
	- Aptos - Sat	6/27/15
	Capitola City Hall	6/25/15
	Watsonville City Hall	7/7/15
	Santa Cruz City Hall	6/23/15
	City of Wats - Streetscape Mtg	7/1/15
	Watsonville Flea Market	7/26/15

Media Coverage - Draft Passenger Rail Study

Media Outlet	What	Date	Reporter/Author
PRINT:			
Santa Cruz Sentinel	Street Smarts	5/24/15	Ramona Turner
	Article	6/3/15	Samantha Clark
	Cartoon	6/7/15	DeCinzo
	Op-Ed	6/19/15	George Dondero
	Cartoon	6/25/15	DeCinzo
	Op-Ed	6/27/15	Bruce Sawhill
	Op-Ed	7/4/15	Lou Rose
	Cartoon	7/5/15	DeCinzo
	Op-Ed	7/11/15	Ryder/Colligan
	Op-Ed	7/25/15	Amelia Cohen
	Op-Ed - RTC	7/25/15	Chair Leopold & VC Lane
	Coastlines	7/27/15	Sentinel staff
	Article	7/30/15	Samantha Clark
	Editorial	7/31/15	Don Miller & Co
	Letter to Ed	many	varied
Register-Pajaronian	Article	6/2/15	Eric Chalhoub
	Article	6/5/15	Eric Chalhoub
Good Times	Article	6/17/15	Anne-Marie Harrison
Times Publishing Group	Article	Jul-15	Noel Smith
	Article	Jul-15	Noel Smith
	Article	Aug-15	Noel Smith
RADIO:			
KUSP	PSAs	regularly	Karena Pushnik
	Land Use Report	5/29/15	Gary Patton
	Land Use Report	6/3/15	Gary Patton
KSCO	Announcements	5/28/15	
	Interview	7/30/15	Rosemary Chalmers
TV:			
KSBW	Story	6/5/15	Phil Gomez
KION	Story	7/9/15	KION Staff
Online:			
Progressive Railroading	Article	5/27/15	

Rail Transit Study - 2014 Public Information Gathering
Goals, Objectives and Scenarios
Outreach for Survey and 7/17/14 First Public Workshop

RTC eNews	Save the date	1-Jul	
	Workshop Reminder + Survey	9-Jul	
	Workshop Reminder + Survey	16-Jul	
	Survey Reminder -Close Date	29-Jul	
Announcement	RTC's TPW	26-Jun	
	FORT Board	7-Jul	
RTC web/FB	Updated webpage w/ What's New	2-Jul	
	FB Event Created	30-Jun	
	Survey on FB page	10-Jul	
	Web Update	7-Aug	
Ads	Sentinel	9-Jul	
	Register-Pajonian	10-Jul	
	Aptos Times	11-Jul	
	Good Times	10-Jul	
Calendars	Sentinel	8-Jul	
	Good Times	8-Jul	
	Patch.com	8-Jul	
Press Contacts	Sentinel - Jason Hoppin		
	Register-Pajaronian - Tarmo or Rosanne	sent 7/15	
	Good Times - Jake Pierce and Aric Sleeper	27-Jun	
Media	KSCO Radio Interview (Moriconi/Pushnik)	15-Jul	
	Sentinel Coastlines	6-8-Jul	
	KUSP Land Use Report	17-Jul	
	KUSP Land Use Report	7-Aug	
	KUSP PSA	ongoing	
	Sentinel Article	16-Jul	
	Good Times blurb (part of RTP article)	9-Jul	
	KAZU Interview (Dondero)	31-Jul	
	Aptos Community News re: workshop	15-Jul	
Community Groups	Bike to Work Newsletter (Requested 7/1)		
	Ecology Action Sustainable Transportation	8-Jul	
	People Power Action Alert	8-Jul	
	People Power Action Alert #2	14-Jul	reminder and survey
	Green Ways to School (Requested 7/15)		
	Safe Routes to School	15-Jul	
	Live Oak Neighbors Email lists	7-Jul	
	Live Oak Neighbors Email lists	10-Jul	reminder and survey
	Next Door-SC Neighbors Email	15-Jul	

	Bratton Online	15-Jul
	Freedom Rotary email	24-Jul
	Watsonville Rotary email	24-Jul
	Leadership Santa Cruz email	24-Jul
Colleges	UCSC Office of Sustainability	16-Jul
	UCSC Student Environmental Center (requested 7/15)	
	UCSC Transportation and Parking (requested 7/15)	
	Cabrillo College staff	16-Jul
	Sustainable Cabrillo (requested 7/15)	
Canvassing	**Farmers Markets**	
	- Santa Cruz - Wed 1:30 - 6:30 pm	16-Jul
	- Watsonville - Fri 3-7 pm	25-Jul
	Metro Centers	
	- Watsonville	25-Jul
	- Capitola	25-Jul
	- Felton	31-Jul
	- Scotts Valley	31-Jul
	Santa Cruz Flea Market	18-Jul, 1-Aug
Flyering	Steam Event - Westside Santa Cruz	8-Jul
	Seabright Businesses	25-Jul
	Capitola Village Businesses	25-Jul
	Aptos Village Businesses	25-Jul
	Felton Businesses	31-Jul
	Scotts Valley Businesses (King's Village/Library)	31-Jul
Email	**High School Outreach**	
	- Santa Cruz High	22-Jul
	- Pacific Collegiate	22-Jul
	- Georgiana Bruce Kirby	22-Jul
	- Harbor High	22-Jul
	- Soquel High	22-Jul
	- Aptos High	22-Jul
	- Watsonville High	22-Jul
	- Pajaro Valley High	22-Jul
	Business Outreach	
	- All Chamber Newsletters (requested 7/1)	
	- PV Chamber Newsletter (print)	Jul
	- PV Chamber eNews - Bits & Blogs	29-Jul
	- Downtown Santa Cruz Assoc.	15-Jul
	- Santa Cruz Chamber (requested 7/25)	1-Aug
	- Capitola Soquel Chamber	15-Jul
	- Santa Cruz Boardwalk	15-Aug
	- Capitola By the Sea Business Assoc. (requested 7/15)	
	- Capitola Mall (requested 7/15)	
	- Aptos Chamber of Commerce (requested 7/15)	
	- Scotts Valley Chamber (requested 7/25)	

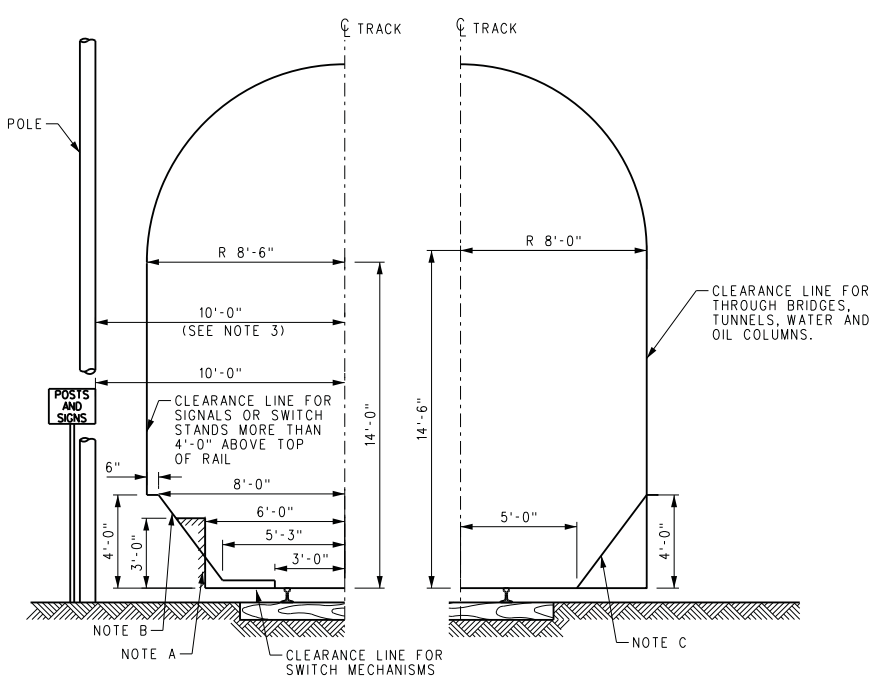
APPENDIX B – METROLINK ENGINEERING STANDARDS FOR CPUC GO 26-D COMPLIANCE

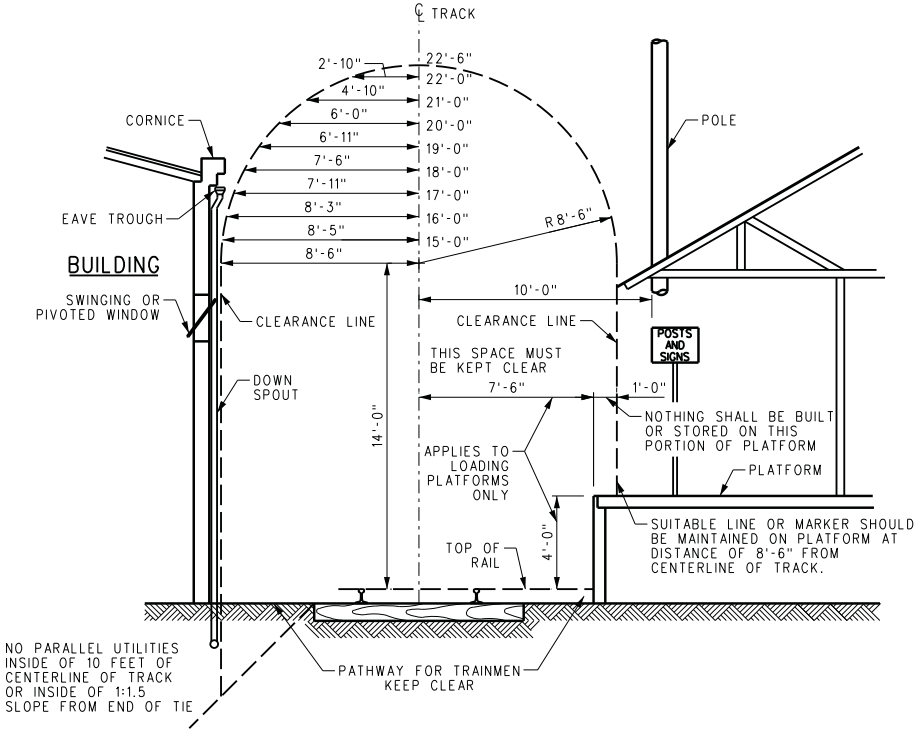
NOTES:

A. CLEARANCE LINE SHOWN BELOW IS FOR SIGNALS OR SWITCH STANDS 3'-0" OR LESS ABOVE TOP OF RAIL AND LOCATED BETWEEN TRACKS WHERE NOT PRACTICABLE TO MAINTAIN CLEARANCES OTHERWISE PRESCRIBED.
B. CLEARANCE LINE SHOWN BELOW IS FOR PORTIONS OF BLOCK SIGNALS 4'-0" OR LESS ABOVE TOP OF RAIL.
C. DECREASED CLEARANCES SHOWN BELOW ARE FOR:
1) REFUGE PLATFORMS ON BRIDGES AND TRESTLES NOT PROVIDED WITH WALKWAYS
2) HANDRAILS
MINIMUM CLEARANCES FOR HANDRAILS ON BRIDGES WITH WALKWAYS SHALL BE 8'-6". DECREASED CLEARANCES, EXCEPT AS PROVIDED FOR HANDRAILS ARE NOT PERMITTED ON THROUGH BRIDGES WHERE WORK OF TRAINMEN OR YARDMEN REQUIRE THEM TO BE ON DECK OF BRIDGE FOR PURPOSE OF COUPLING OR UNCOUPLING CARS IN PERFORMING SWITCHING SERVICE ON A SWITCHING LEAD.

NOTES:

1. SEE SCRRA ES2104 FOR MINIMUM VERTICAL CLEARANCES FOR OVERHEAD WIRES.
2. ALL CLEARANCES LISTED ON THIS SHEET ARE MINIMUM REQUIREMENTS. USE STANDARD CLEARANCES SHOWN ON SCRRA ES2101 FOR NEW CONSTRUCTION.
3. POSTS, POLES, SIGNS AND SIMILAR FACILITIES MAY HAVE MINIMUM CLEARANCE OF 8'-6", BUT CLEARANCE OF 10'-0" IS RECOMMENDED WHERE PRACTICABLE
4. ALL SIDE CLEARANCE DIMENSIONS ARE FOR TANGENT TRACK. IN GENERAL, SIDE CLEARANCE FOR CURVED TRACK SHALL BE 1'-0" GREATER THAN THAT FOR TANGENT TRACK.
5. PLATFORMS 4'-0" OR LESS IN HEIGHT WITH MINIMUM CLEARANCE OF 7'-3" MAY BE EXTENDED AT EXISTING CLEARANCES IF SUCH EXTENSION IS NOT IN CONNECTION WITH RECONSTRUCTION OF ORIGINAL PLATFORM.





TYPICAL
CLEARANCE OF STRUCTURES FROM RAILROAD TRACKS AS GENERALLY PRESCRIBED BY PUBLIC UTILITIES COMMISSION - STATE OF CALIFORNIA GENERAL ORDER NO 26-D

(EFFECTIVE FEBRUARY 1, 1948)

FOR NEW WORK AND RECONSTRUCTION OF EXISTING FACILITIES ADJACENT TO STANDARD GUAGE RAILROAD TRACKS TRANSPORTING FREIGHT CARS.

REV.	DATE	DESCRIPTION	DES.	ENG.
X	XX-XX-XX	REVISION	XX	XX

DRAWN BY: A. CARLOS DATE: 03/31/2011

ASSISTANT DIRECTOR: STANDARDS & DESIGN

DIRECTOR OF ENGINEERING AND CONSTRUCTION

METROLINK®

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS

MINIMUM CLEARANCE OF STRUCTURES

STANDARD: 2102
SCALE: NTS
REVISION: –
SHEET: 1 OF 1
CADD FILE: ES2102

APPENDIX C – STADLER GTW TECHNICAL INFORMATION

STADLER
We Track Clever Solutions

GTW DMU 2/6 low-floor

for Denton County Transportation Authority (DCTA), Texas, USA

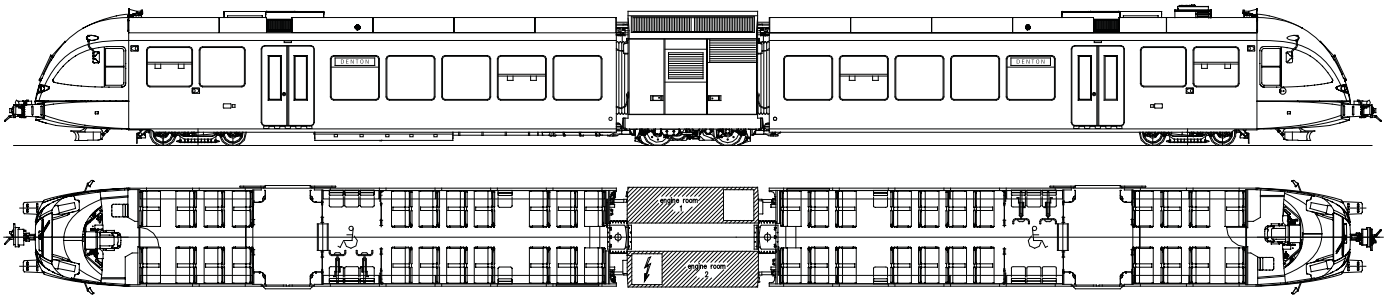
The Denton County Transportation Authority (DCTA) ordered 11 diesel-electric GTW 2/6 articulated rail vehicles from Stadler Rail. DCTA is constructing a passenger rail line known as the A-train to serve Denton County residents and visitors. The route follows along the east side of I-35E and is 21 miles long from Denton to Carrollton. Five stations will be located in Denton County and a transfer station will be built at Trinity Mills Road in Carrollton to allow travel to Dallas and other points in the North Texas region via Dallas Area Rapid Transit's (DART) light rail and bus systems. The vehicles will be compliant with the Americans with Disabilities Act (ADA), and will incorporate enhanced air conditioning, passenger information system, video surveillance and a significant part of the Federal Railroad Administration (FRA) compliant elements. The generous interior has room for wheelchairs, strollers and bicycles. There are 104 seats and standing room for 96 persons in every vehicle, with bright compartments, large windows and plush seating.

Stadler US Inc
231 North Ave W No. 112
Westfield, NJ 07090 USA
Phone 1 (908) 232-2778
Fax 1 (908) 654-0222
stadler.us@stadlerrail.com

A Company of Stadler Rail Group
Ernst-Stadler-Strasse 1
CH-9565 Bussnang, Switzerland
Phone +41 (0)71 626 21 20
Fax +41 (0)71 626 21 28
stadler.rail@stadlerrail.com

www.stadlerrail.com

Note: Exact vehicle type and interior layout to be determined during future procurement process



Technical features

- Bright, friendly interior with large windows and plush seating
- Fully ADA compliant with wide entrance doors
- EPA compliant
- NFPA 130 compliant
- Passenger compartment with 75% low floor section providing level boarding at all passenger doors
- Enhanced air conditioning systems (fully redundant) for passenger compartments and driver cabs. Systems designed for ambient temperatures up to 40 °C (104 °F)
- Unique and very efficient crash absorption system for the protection of driver and passengers (fulfills European crashworthiness standards)
- Air-suspended motor and trailer trucks
- Ergonomically designed driver's cab
- Traction equipment housed in a separate power car, efficiently insulating the passenger compartments from noise
- Redundant traction power system consisting of two units, each with a diesel engine, asynchronous generator, IGBT power converter and asynchronous drive motor
- Glass fiber reinforced front section with automatic coupling
- Car body of end cars incorporates an extruded aluminum superstructure
- Car body of power car incorporates a steel superstructure
- Latest generation of vehicle control systems including detailed diagnostic features
- Multiple-unit control for up to three vehicles
- CCTV equipped
- Event recorder monitoring of on board systems
- Fire detection and suppression systems
- Interior seating arranged to allow passengers unobstructed access to emergency exit windows
- Enhanced fuel tank protection
- Emergency roof access system
- Emergency intercoms in passenger sections
- Luminescent emergency decals installed within interior to aid with emergency egress

Vehicle data

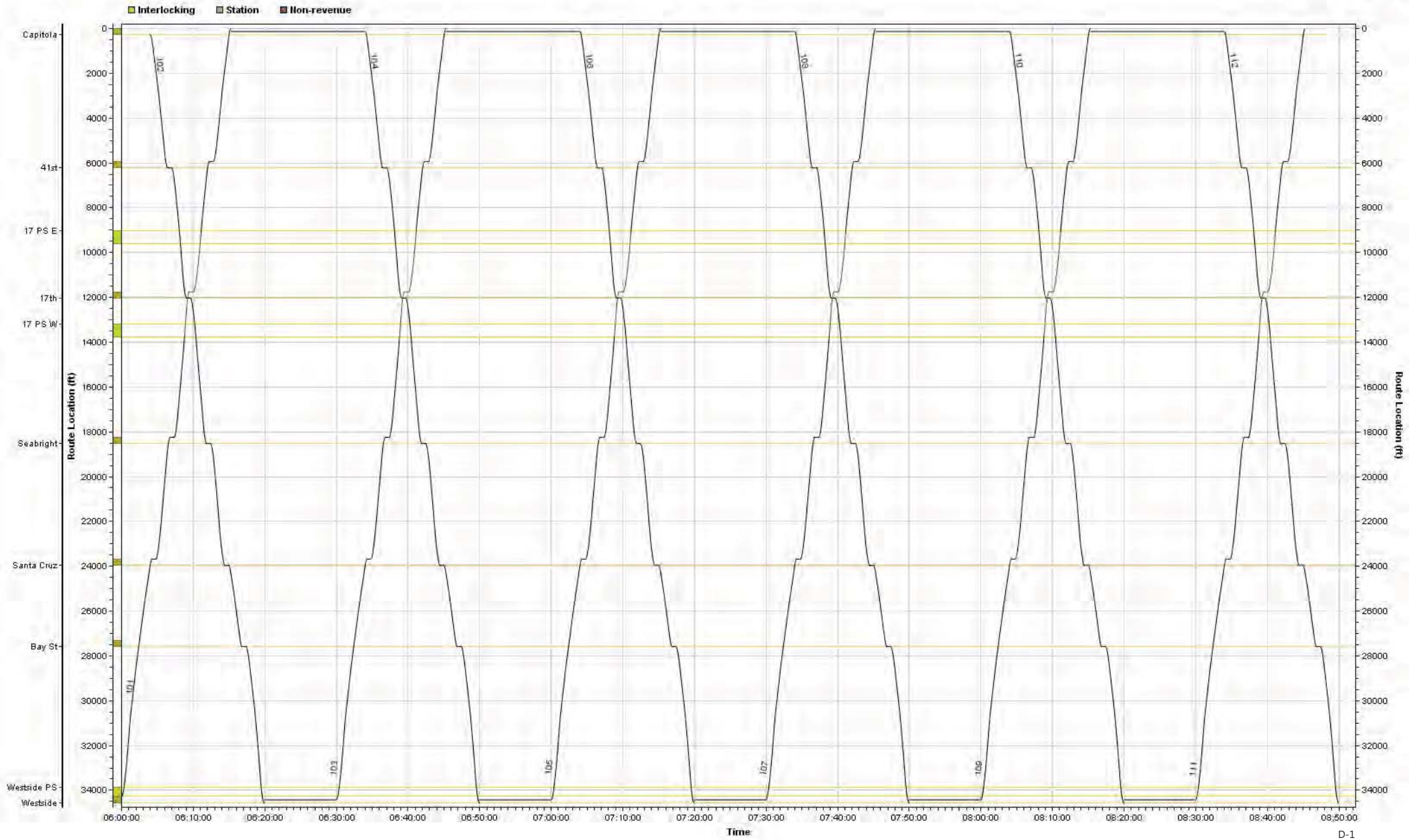
Customer	Denton County Transportation Authority (DCTA), Texas, USA	
Line operated	A-train from Denton to Carrollton	
Gauge	1435 mm	(4'–8.5")
Axle arrangement	2'Bo2'	
Number of vehicles	11	
Service start-up	2012	
Seating capacity	104 (including flip up seat)	
Flip up seats	16	
Stand capacity	96 (at 4 persons/m²)	
Floor height:		
Low floor	600 mm	(23.6")
High floor	1000 mm	(39.4")
Door width	1300 mm	(51.2")
Longitudinal strength	1500 kN	
Overall length	40 890 mm	(134'–1.8")
Vehicle width	2950 mm	(9'–8")
Tare weight	72 200 kg	159 170 lb
Truck (bogie) wheelbase:	2100 mm	(82.7")
Motor truck, new	860 mm	(33.9")
Trailer truck, new	750 mm	(29.5")
Maximum power at wheel	470 kW	
Starting tractive power	80 kN	
Max acceleration empty / full	1.0 / 0.8 m/s²	
Max braking service / emerg / max	1.3 / 2.1 / 2.4 m/s²	
Maximum speed	120 kph	(75 mph)

APPENDIX D – SCENARIO STRING CHARTS (WEEKDAYS 6-9 AM) AND SAMPLE TRIP CHART

Scenario B String Chart (Weekdays 6-9 a.m.)

String Chart for Route: B West
06:00:00 – 08:52:20
(02:52:20)

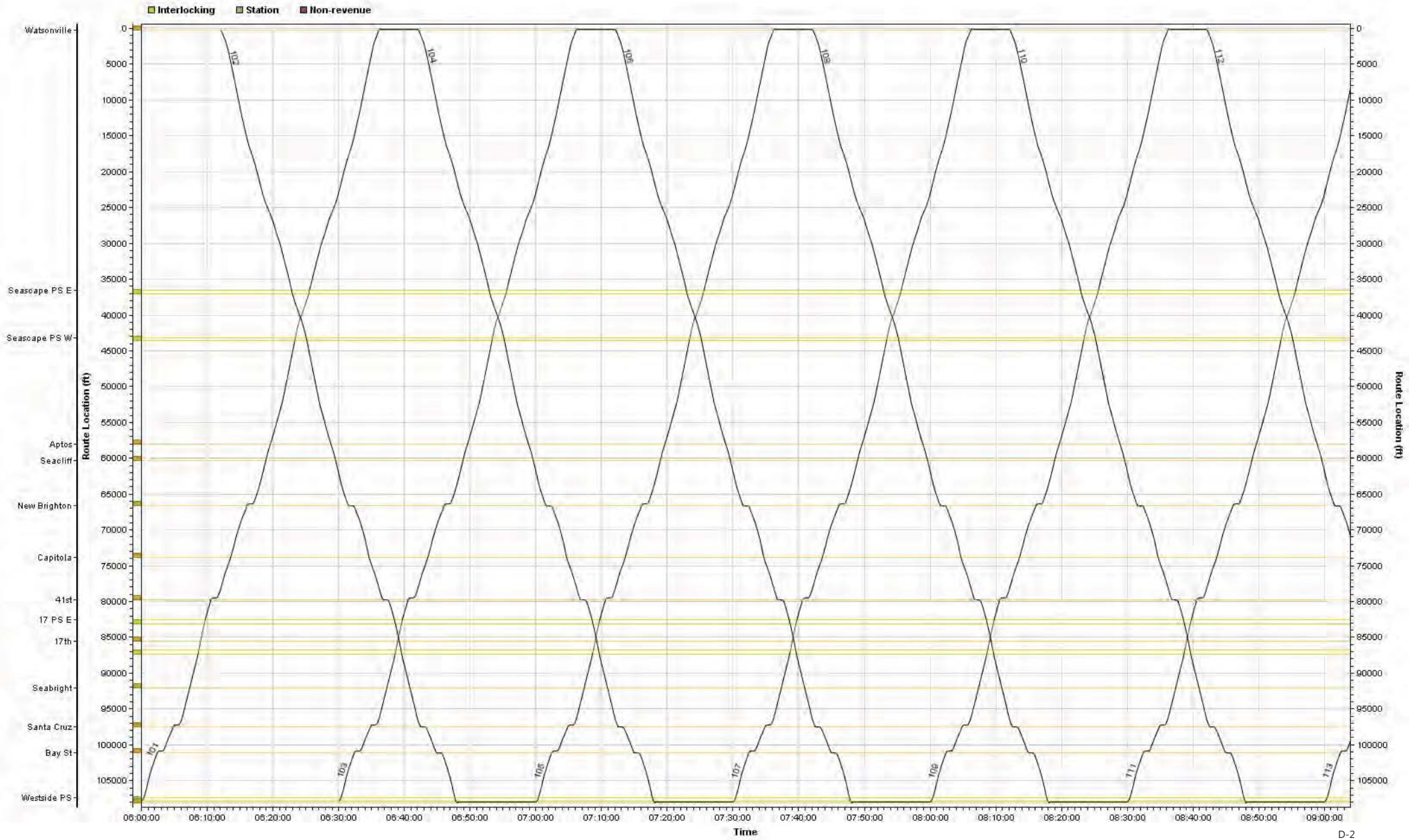
C:\Users\Ted\Desktop\Santa Cruz\TrainOps Simulations\SCCRTC 55mph 17th+Seascape
TrainOps® 0.14.5
2014-Nov-13 15:01:01
No electrical network



Scenario D String Chart (Weekdays 6-9 a.m.)

String Chart for Route: G West
06:00:00 – 09:03:57
(03:03:57)

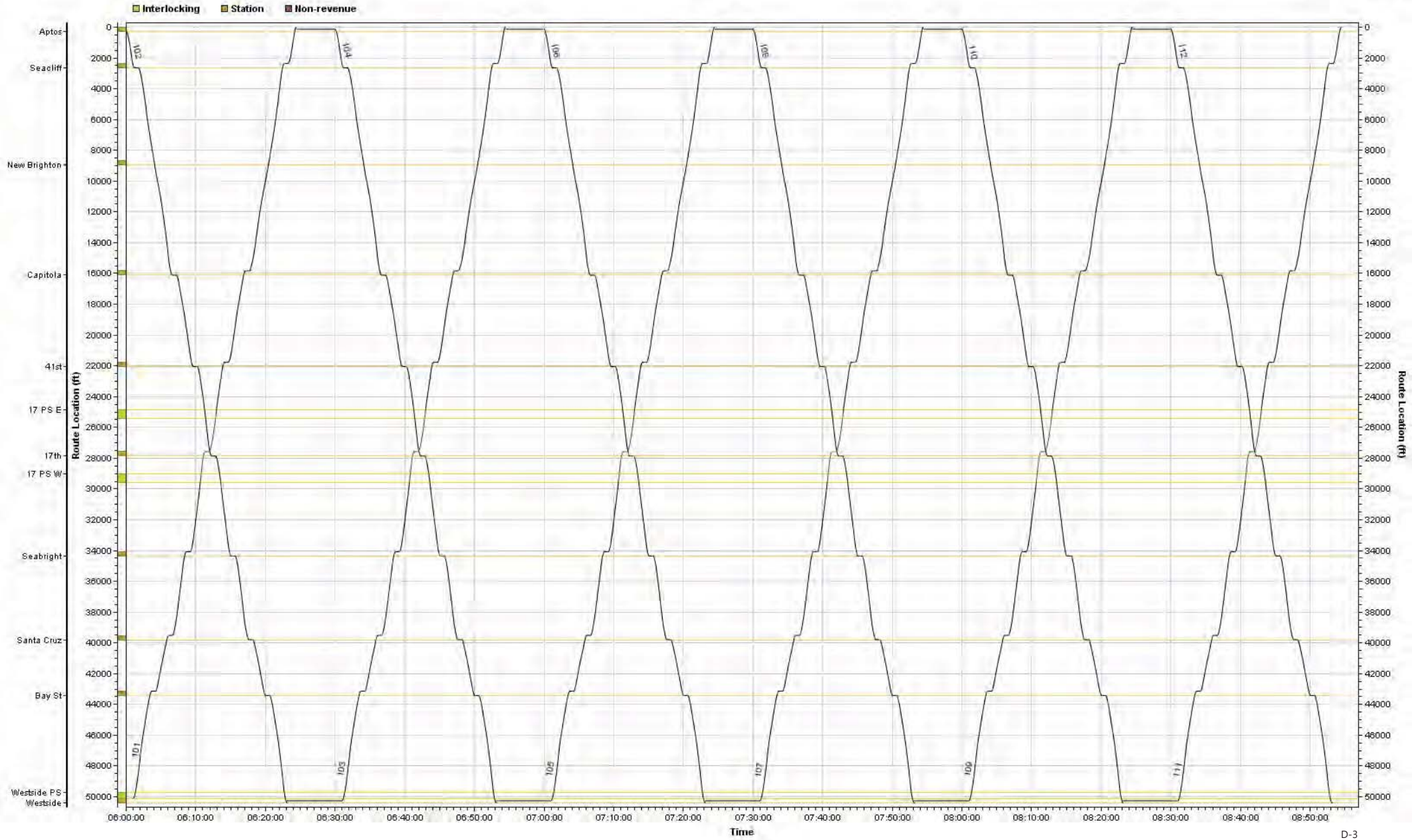
C:\Users\Ted\Desktop\Santa Cruz\TrainOps Simulations\SCCRTC 55mph 17th+Seascape
TrainOps® 0.14.5
2014-Nov-13 15:25:16
No electrical network



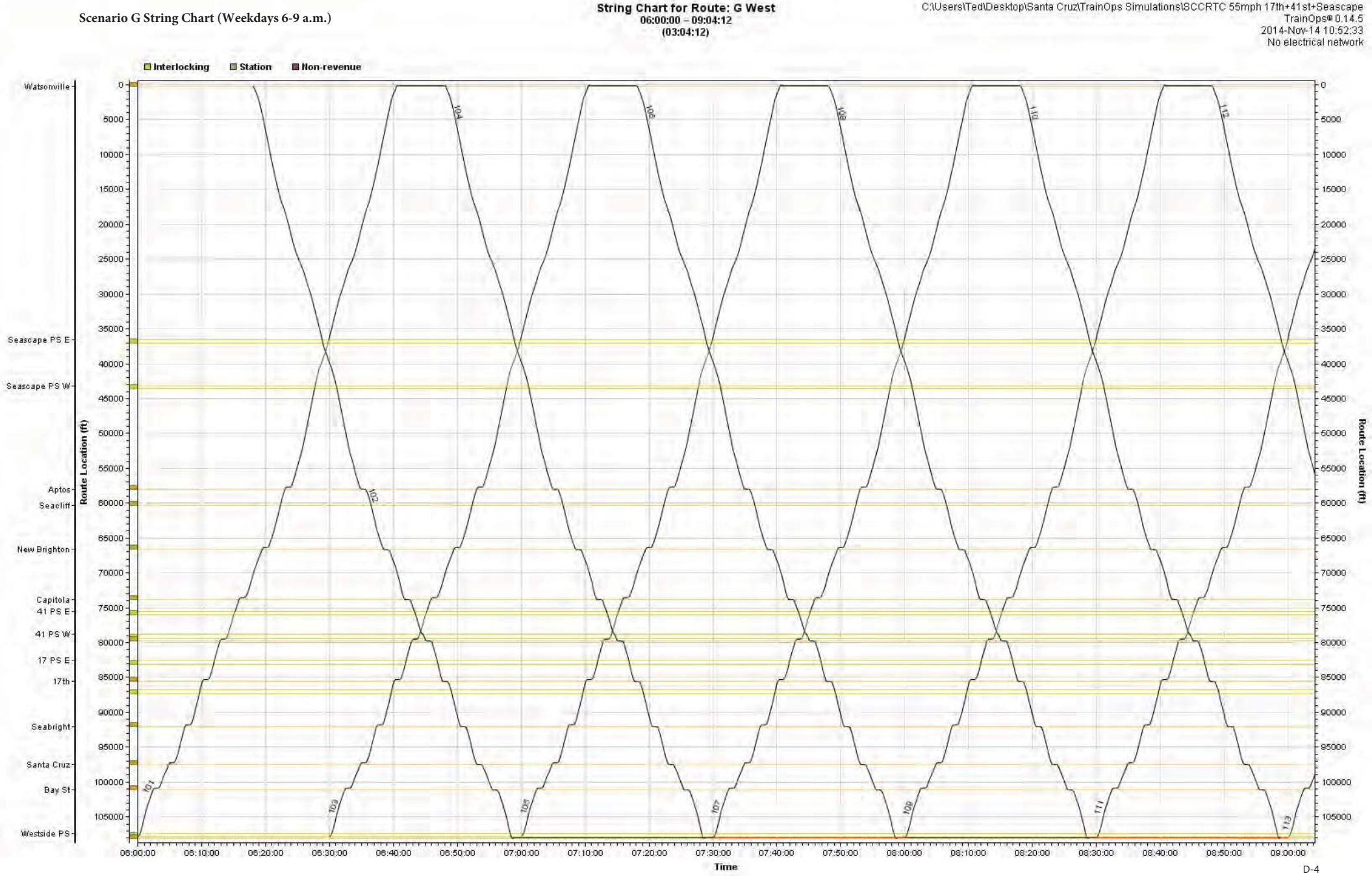
Scenario E String Chart (Weekdays 6-9 a.m.)

String Chart for Route: E West
06:00:00 – 08:56:57
(02:56:57)

C:\Users\Ted\Desktop\Santa Cruz\TrainOps Simulations\SCCRTC 55mph 17th+Seascape
TrainOps® 0.14.5
2014-Nov-13 15:17:16
No electrical network



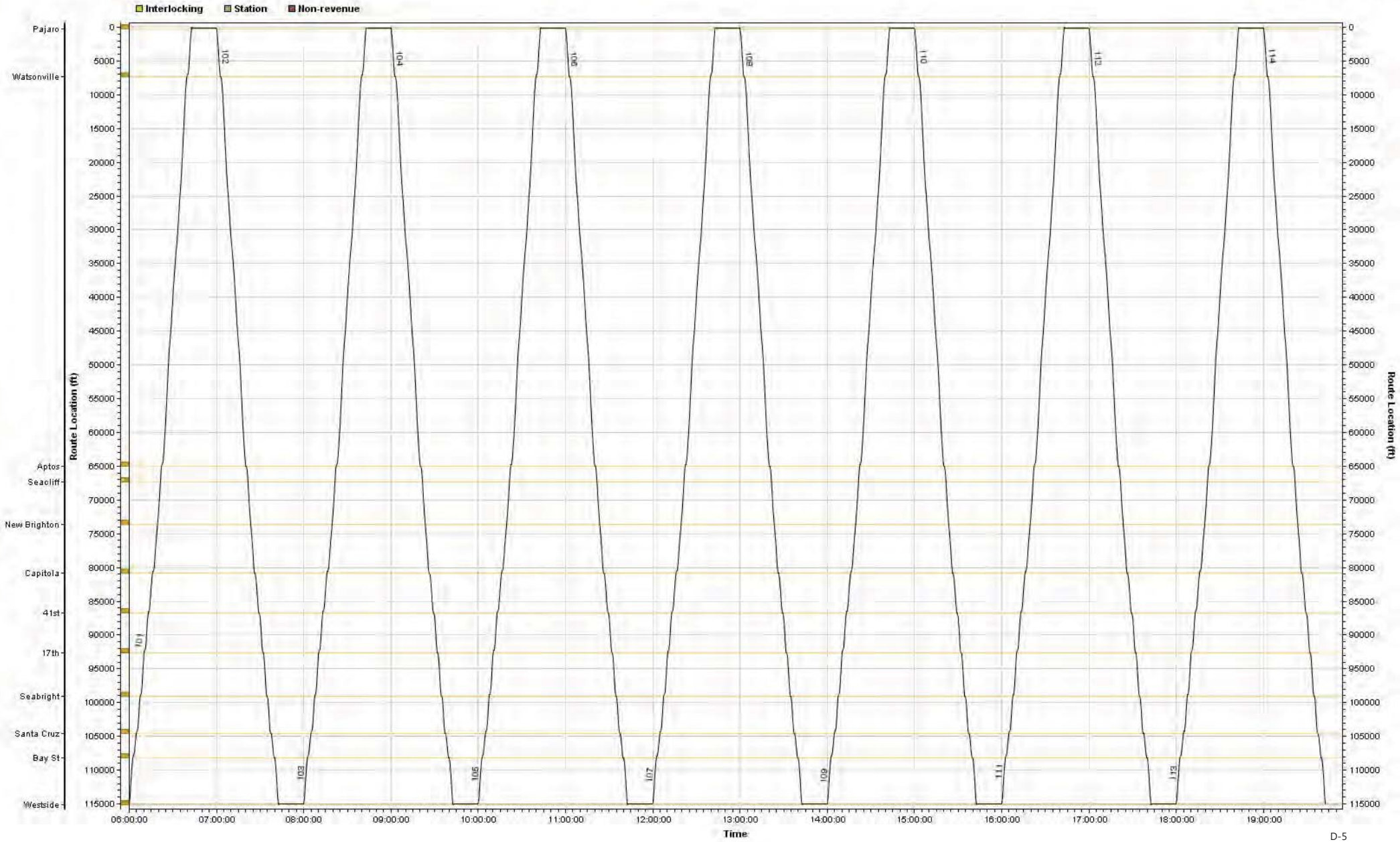
Scenario G String Chart (Weekdays 6-9 a.m.)

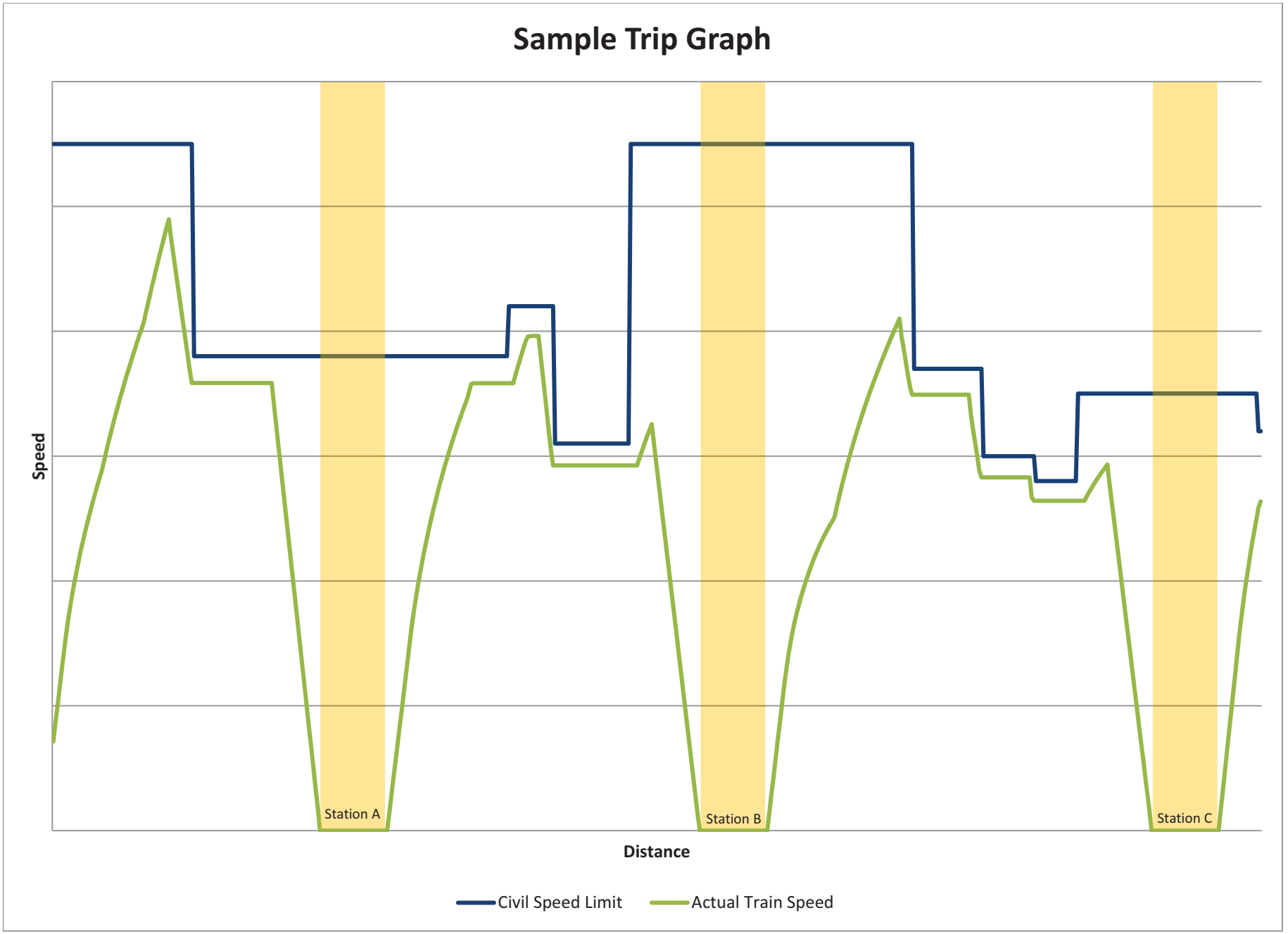


Scenario J String Chart (Full Weekday Service)

String Chart for Route: J West
06:00:00 – 19:54:20
(13:54:20)

C:\Users\Ted\Desktop\Santa Cruz\TrainOps Simulations\SCCRTC 55mph 17th+Seascape
TrainOps® 0.14.5
2014-Nov-13 14:49:56
No electrical network




Sample Trip Graph
Speed
Station A
Station B
Station C
Distance
Civil Speed Limit
Actual Train Speed

SAMPLE Weekday Schedule - SCENARIO S (Bay St-Santa Cruz to Seacliff Village/State Park Dr)

NUMBER	1	3	5	7	9	11	13	15
EASTBOUND								
BAY ST	6:57 AM	7:35 AM	8:13 AM	8:51 AM	9:51 AM	10:51 AM	11:51 AM	12:51 PM
PACIFIC ST	7:01 AM	7:39 AM	8:17 AM	8:55 AM	9:55 AM	10:55 AM	11:55 AM	12:55 PM
17TH AVE W***	7:06 AM	7:44 AM	8:22 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM
17TH AVE E***	7:08 AM	7:46 AM	8:24 AM	9:02 AM	10:02 AM	11:02 AM	12:02 PM	1:02 PM
41ST AVE	7:12 AM	7:50 AM	8:28 AM	9:06 AM	10:06 AM	11:06 AM	12:06 PM	1:06 PM
CAPITOLA VILLAGE**	7:15 AM	7:53 AM	8:31 AM	9:09 AM	10:09 AM	11:09 AM	12:09 PM	1:09 PM
SEACLIFF/STATE PARK	7:22 AM	8:00 AM	8:38 AM	9:16 AM	10:16 AM	11:16 AM	12:16 PM	1:16 PM

NUMBER	2	4	6	8	10	12	14	16
WESTBOUND								
SEACLIFF/STATE PARK	6:54 AM	7:32 AM	8:10 AM	8:48 AM	9:48 AM	10:48 AM	11:48 AM	12:48 PM
CAPITOLA VILLAGE**	7:03 AM	7:41 AM	8:19 AM	8:57 AM	9:57 AM	10:57 AM	11:57 AM	12:57 PM
41ST AVE	7:07 AM	7:45 AM	8:23 AM	9:01 AM	10:01 AM	11:01 AM	12:01 PM	1:01 PM
17TH AVE E***	7:07 AM	7:45 AM	8:23 AM	9:01 AM	10:01 AM	11:01 AM	12:01 PM	1:01 PM
17TH AVE W***	7:09 AM	7:47 AM	8:25 AM	9:03 AM	10:03 AM	11:03 AM	12:03 PM	1:03 PM
PACIFIC ST	7:17 AM	7:55 AM	8:33 AM	9:11 AM	10:11 AM	11:11 AM	12:11 PM	1:11 PM
BAY AVE	7:19 AM	7:57 AM	8:35 AM	9:13 AM	10:13 AM	11:13 AM	12:13 PM	1:13 PM

** CAPITOLA VILLAGE STOP SEASONAL JUNE-SEPTEMBER AND SPECIAL EVENTS ONLY

***PASSING SIDING AT/NEAR 17TH AVE, NO PASSENGER STOP

17	19	21	23	25	27	29	31	33	35
1:51 PM	2:51 PM	3:29 PM	4:07 PM	4:45 PM	5:23 PM	6:01 PM	6:39 PM	7:39 PM	8:39 PM
1:55 PM	2:55 PM	3:33 PM	4:11 PM	4:49 PM	5:27 PM	6:05 PM	6:43 PM	7:43 PM	8:43 PM
2:00 PM	3:00 PM	3:38 PM	4:16 PM	4:54 PM	5:32 PM	6:10 PM	6:48 PM	7:48 PM	8:48 PM
2:02 PM	3:02 PM	3:40 PM	4:18 PM	4:56 PM	5:34 PM	6:12 PM	6:50 PM	7:50 PM	8:50 PM
2:06 PM	3:06 PM	3:44 PM	4:22 PM	5:00 PM	5:38 PM	6:16 PM	6:54 PM	7:54 PM	8:54 PM
2:09 PM	3:09 PM	3:47 PM	4:25 PM	5:03 PM	5:41 PM	6:19 PM	6:57 PM	7:57 PM	8:57 PM
2:16 PM	3:16 PM	3:54 PM	4:32 PM	5:10 PM	5:48 PM	6:26 PM	7:04 PM	8:04 PM	9:04 PM

18	20	22	24	26	28	30	32	34	36
1:48 PM	2:48 PM	3:26 PM	4:04 PM	4:42 PM	5:20 PM	5:58 PM	6:36 PM	7:36 PM	8:36 PM
1:57 PM	2:57 PM	3:35 PM	4:13 PM	4:51 PM	5:29 PM	6:07 PM	6:45 PM	7:45 PM	8:45 PM
2:01 PM	3:01 PM	3:39 PM	4:17 PM	4:55 PM	5:33 PM	6:11 PM	6:49 PM	7:49 PM	8:49 PM
2:01 PM	3:01 PM	3:39 PM	4:17 PM	4:55 PM	5:33 PM	6:11 PM	6:49 PM	7:49 PM	8:49 PM
2:03 PM	3:03 PM	3:41 PM	4:19 PM	4:57 PM	5:35 PM	6:13 PM	6:51 PM	7:51 PM	8:51 PM
2:11 PM	3:11 PM	3:49 PM	4:27 PM	5:05 PM	5:43 PM	6:21 PM	6:59 PM	7:59 PM	8:59 PM
2:13 PM	3:13 PM	3:51 PM	4:29 PM	5:07 PM	5:45 PM	6:23 PM	7:01 PM	8:01 PM	9:01 PM

SAMPLE Weekend/Holiday Schedule - SCENARIO S (Bay St-Santa Cruz to Seacliff Village/State Park Dr)

NUMBER	101	103	105	107	109	111	113	115	117	119	121	123	125
EASTBOUND													
BAY ST	8:57 AM	9:57 AM	10:57 AM	11:57 AM	12:57 PM	1:57 PM	2:57 PM	3:57 PM	4:57 PM	5:57 PM	6:57 PM	7:57 PM	8:57 PM
PACIFIC ST	9:01 AM	10:01 AM	11:01 AM	12:01 PM	1:01 PM	2:01 PM	3:01 PM	4:01 PM	5:01 PM	6:01 PM	7:01 PM	8:01 PM	9:01 PM
17TH AVE W***	9:06 AM	10:06 AM	11:06 AM	12:06 PM	1:06 PM	2:06 PM	3:06 PM	4:06 PM	5:06 PM	6:06 PM	7:06 PM	8:06 PM	9:06 PM
17TH AVE E***	9:08 AM	10:08 AM	11:08 AM	12:08 PM	1:08 PM	2:08 PM	3:08 PM	4:08 PM	5:08 PM	6:08 PM	7:08 PM	8:08 PM	9:08 PM
41ST AVE	9:12 AM	10:12 AM	11:12 AM	12:12 PM	1:12 PM	2:12 PM	3:12 PM	4:12 PM	5:12 PM	6:12 PM	7:12 PM	8:12 PM	9:12 PM
CAPITOLA VILLAGE**	9:15 AM	10:15 AM	11:15 AM	12:15 PM	1:15 PM	2:15 PM	3:15 PM	4:15 PM	5:15 PM	6:15 PM	7:15 PM	8:15 PM	9:15 PM
SEACLIFF/STATE PARK	9:22 AM	10:22 AM	11:22 AM	12:22 PM	1:22 PM	2:22 PM	3:22 PM	4:22 PM	5:22 PM	6:22 PM	7:22 PM	8:22 PM	9:22 PM

NUMBER	102	104	106	108	110	112	114	116	118	120	122	124	126
WESTBOUND													
SEACLIFF/STATE PARK	8:54 AM	9:54 AM	10:54 AM	11:54 AM	12:54 PM	1:54 PM	2:54 PM	3:54 PM	4:54 PM	5:54 PM	6:54 PM	7:54 PM	8:54 PM
CAPITOLA VILLAGE**	9:03 AM	10:03 AM	11:03 AM	12:03 PM	1:03 PM	2:03 PM	3:03 PM	4:03 PM	5:03 PM	6:03 PM	7:03 PM	8:03 PM	9:03 PM
41ST AVE	9:07 AM	10:07 AM	11:07 AM	12:07 PM	1:07 PM	2:07 PM	3:07 PM	4:07 PM	5:07 PM	6:07 PM	7:07 PM	8:07 PM	9:07 PM
17TH AVE E***	9:07 AM	10:07 AM	11:07 AM	12:07 PM	1:07 PM	2:07 PM	3:07 PM	4:07 PM	5:07 PM	6:07 PM	7:07 PM	8:07 PM	9:07 PM
17TH AVE W***	9:09 AM	10:09 AM	11:09 AM	12:09 PM	1:09 PM	2:09 PM	3:09 PM	4:09 PM	5:09 PM	6:09 PM	7:09 PM	8:09 PM	9:09 PM
PACIFIC ST	9:17 AM	10:17 AM	11:17 AM	12:17 PM	1:17 PM	2:17 PM	3:17 PM	4:17 PM	5:17 PM	6:17 PM	7:17 PM	8:17 PM	9:17 PM
BAY AVE	9:19 AM	10:19 AM	11:19 AM	12:19 PM	1:19 PM	2:19 PM	3:19 PM	4:19 PM	5:19 PM	6:19 PM	7:19 PM	8:19 PM	9:19 PM

** CAPITOLA VILLAGE STOP SEASONAL JUNE-SEPTEMBER AND SPECIAL EVENTS ONLY

***PASSING SIDING AT/NEAR 17TH AVE, NO PASSENGER STOP

APPENDIX E – DETAILED CAPITAL COST ESTIMATES

Row	Santa Cruz Branch Line: Infrastructure Conceptual Cost Summary Table	Capitola (Monterey Ave) to Westside Santa Cruz MP 15.5-22.1	Watsonville to Westside Santa Cruz MP 1.6-22.1	Aptos to Westside Santa Cruz MP 12.5-22.1	Watsonville to Westside Santa Cruz MP 1.6-22.1 - DMU (expanded service)	Watsonville to Westside Santa Cruz MP 1.6-22.1 - Loco Hauled (expanded service)	Pajaro to Westside Santa Cruz MP 0.0-22.1
	Scenario =>	**B**	**D**	**E**	**G**	**G1**	**J**
A	**Estimated Infrastructure Construction (only) Cost**	$ 22,660,000	$ 40,420,000	$ 27,810,000	$ 40,720,000	$ 48,220,000	$ 40,940,000
B	**Total Estimated Capital Cost (including Vehicles, 30% Soft Costs, and 30% Contingency)**	$ 77,100,000	$ 119,100,000	$ 85,300,000	$ 133,200,000	$ 175,600,000	$ 92,700,000
C	**Cost Range - Upper (130% of Total Estimated Capital Cost)**	$ 100,230,000	$ 154,830,000	$ 110,890,000	$ 173,160,000	$ 228,280,000	$ 120,510,000
D	**Cost Range - Lower (70% of Total Estimated Capital Cost)**	$ 53,970,000	$ 83,370,000	$ 59,710,000	$ 93,240,000	$ 122,920,000	$ 64,890,000
E	**Total Track Miles**	6.6	20.5	9.6	20.5	20.5	22.1
F	**Annual Infrastructure Maintenance Cost (*excluding* Annualized Capitalized Maintenance), same each year for Years 1-20.**	$ 517,000	$ 950,000	$ 587,000	$ 986,000	$ 1,261,000	$ 1,023,000
G	**Additional Capitalized Maintenance Cost, Expressed As An Annualized Cost.**	$ 189,000	$ 498,000	$ 255,000	$ 498,000	$ 498,000	$ 540,000

LF = linear feet; TF = track feet; Hr = hour; Xing = crossing; AC = acres; Ea = Each; SF = square feet

Table 1A: CONCEPTUAL CAPITAL COST - Capitola to Santa Cruz - Scenario B

Capitola (Monterey Ave) to Westside Santa Cruz MP 15.5-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	6.6	Miles
End of Siding Control Points Maintained	2	Ea
Total Non-Powered Turnouts Maintained	5	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	24	Ea
Xings Requiring New Active Warning Devices	13	Ea
Private Xings	7	Ea
Total Stations	6	Ea

Item	Misc Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track						
Tie Replacement			Ea	5,700	$ 165	$ 940,500
Rail Replacement			TF	34,848	$ 90	$ 3,136,320
Ballast for Surfacing			Ton	5,412	$ 30	$ 162,360
Out of Face Surfacing			TF	34,848	$ 6	$ 209,088
Out of Face Track Replacement			TF	1,000	$ 320	$ 320,000
Grade Crossing Track/Surface Replacement	50	TF/Xing	TF	1,200	$ 900	$ 1,080,000
Private Crossing Rehabilitation	20	TF/Xing	TF	140	$ 1,000	$ 140,000
Ditching/Drainage Improvements			Day	15	$ 5,200	$ 78,000
Hirail Vaccuum Truck Ballast Cleaning			Day	20	$ 3,560	$ 71,200
Tree Trimming			Day	20	$ 4,490	$ 89,800
Turnouts - Composite Cost for 2nd Hand No 11+No 15 at Sidings			Ea	7	$ 90,000	$ 630,000
Trackwork for 400' Long Gauntlet Tracks at Stations			Ea	6	$ 250,000	$ 1,500,000
Trackwork at Maintenance Facility			TF	1050	$ 375	$ 393,750
Trackwork Between Siding Turnouts			TF	4600	$ 250	$ 1,150,000
Curve Lubricator			Ea	3	$ 12,500	$ 37,500
R/W Acquisition Allowance per Siding			Ea	1	$ 250,000	$ 250,000
Signal						
Grade Crossing Equipment: Bells, Fashers, Gates			Ea	13	$ 350,000	$ 4,550,000
Quiet Zones			Xing	0	$ 90,000	$ -
Spring or Fast-Pass Switch Machines @ Sidings and Gauntlet Tracks			Ea	8	$ 135,000	$ 1,080,000
Intermediate Signals			Ea	2	$ 125,000	$ 250,000
Radio Communciations/Dispatching Infrastructure			LS	1	$ 100,000	$ 100,000
Structures						
Bridge Rehabilitation			LS	1	$ 2,666,340	$ 2,666,340
Retaining Wall Allowance			SF	1000	$ 125	$ 125,000
Stations/Maintenance Facility						
Station within R/W			Ea	6	$ 300,000	$ 1,800,000
R/W Acquisition Allowance per Station			Ea	6	$ 150,000	$ 900,000
Maintenance Facility			LS	1	$ 1,000,000	$ 1,000,000
Construction Total						**$ 22,659,858**
Vehicles			Ea	3	$ 8,500,000	$ 25,500,000
Contingency				30%		$ 14,448,000
Soft Costs (Permitting, Bid Document Preparation, Project Administration and CM)				30%		$ 14,448,000
Grand Total (Rounded)						**$ 77,100,000**

Table 1B: CONCEPTUAL MAINTENANCE COST - Capitola to Santa Cruz - Scenario B

Capitola (Monterey Ave) to Westside Santa Cruz MP 15.5-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	6.6	Miles
End of Siding Control Points Maintained	2	Ea
Total Non-Powered Turnouts Maintained	5	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	24	Ea
Xings Requiring New Active Warning Devices	13	Ea
Private Xings	7	Ea
Total Stations	6	Ea

Item	Misc $/Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track Inpsection						
Inspector+ HiRail			Day	64	$ 960	$ 61,440
Hourly Cost	$ 120	Hr				
Track Maintenance						
3-Person Maintenace Crew + HiRail			Day	52	$ 2,000	$ 104,000
Hourly Cost for 3 people and truck	$ 250	$/Hr				
Equipment Rental			Day	7	$ 1,000	$ 7,000
Spot Surfacing			Day	2	$ 4,000	$ 8,000
Spot Tie Renewal			Ea	35	$ 190	$ 6,650
Ditching			Day	1.3	$ 3,560	$ 4,699
Hourly cost for ditching equipment + labor	$ 445	$/Hr				
Annual Rail Inspection			LS	1	$ 25,000	$ 25,000
Culvert Maintenance						
Culvert Replacement			LF	15	$ 120	$ 1,800
Vegatation Management						
Pre-emergent			AC	19	$ 200	$ 3,840
Spray Pattern Width	24	Ft				
Post-emergent			LS	1	$ 3,000	$ 3,000
Tree Trimming			Day	12	$ 4,090	$ 49,080
Signal Maintenance						
Regular Inspections (maintainer+truck)			Hr	496	$ 150	$ 74,400
Trouble Calls			Hr	96	$ 200	$ 19,200
Station Maintenance						
1-Person Maintenance Crew + Pickup Truck						
Time Spent at Each Station (Every Other Day)	1	Hrs/Station/Day	Hr	390	$ 110	$ 42,900
Contract Station Repairs			LS	1	$ 12,000	$ 12,000
Structures Maintenance						
Contract bridge maintenance			LS	1	$ 34,000	$ 34,000
Consumables and Services						
Consumables (light bulbs, curve lubricant, garbage, etc)			LS	1	$ 13,000	$ 13,000
Capitalized Maintenance						
Contract Surfacing (Annualized Cost)			TF	3,485	$ 6	$ 20,909
Number of Years Between Surfacing Cycle	10	Yrs				
Contract Tie Renewal (Annualized)			Ties	572	$ 180	$ 102,960
Tie Life	30	Yrs				
Frequency of Tie Program	10	Yrs				
Grade Crossing Repair			TF	48	$ 1,000	$ 48,000
Crossing Service Life	25	Yrs				
Average Crossing Length	50	TF				
Subtotal						$ 641,878
Contingency				10%		$ 64,188
Grand Total (Rounded)						**$ 706,000**

Table 2A: CONCEPTUAL CAPITAL COST - Watsonville to Santa Cruz - Scenario D

Watsonville to Westside Santa Cruz MP 1.6-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	20.5	Miles
End of Siding Control Points Maintained	5	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	34	Ea
Xings Requiring New Active Warning Devices	19	Ea
Private Xings	22	Ea
Total Stations	6	Ea

Item	Misc Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track						
Tie Replacement			Ea	17,800	$ 165	$ 2,937,000
Rail Replacement			TF	108,240	$ 90	$ 9,741,600
Ballast for Surfacing			Ton	16,810	$ 30	$ 504,300
Out of Face Surfacing			TF	108,240	$ 6	$ 649,440
Out of Face Track Replacement			TF	1,000	$ 320	$ 320,000
Grade Crossing Track/Surface Replacement	50	TF/Xing	TF	1,700	$ 900	$ 1,530,000
Private Crossing Rehabilitation	20	TF/Xing	TF	440	$ 1,000	$ 440,000
Ditching/Drainage Improvements			Day	30	$ 5,200	$ 156,000
Hirail Vaccuum Truck Ballast Cleaning			Day	60	$ 3,560	$ 213,600
Tree Trimming			Day	60	$ 4,490	$ 269,400
Turnouts - Composite Cost for 2nd Hand No 11+No 15 at Sidings			Ea	14	$ 90,000	$ 1,260,000
Trackwork for 400' Long Gauntlet Tracks at Stations			Ea	6	$ 250,000	$ 1,500,000
Trackwork at Maintenance Facility			TF	1200	$ 375	$ 450,000
Trackwork Between Siding Turnouts			TF	11600	$ 250	$ 2,900,000
Curve Lubricator			Ea	6	$ 12,500	$ 75,000
R/W Acquisition Allowance per Siding			Ea	2	$ 250,000	$ 500,000
Signal						
Grade Crossing Equipment: Bells, Fashers, Gates			Ea	19	$ 350,000	$ 6,650,000
Quiet Zones			Xing	0	$ 90,000	$ -
Spring or Fast-Pass Switch Machines @ Sidings and Gauntlet Tracks			Ea	11	$ 135,000	$ 1,485,000
Intermediate Signals			Ea	5	$ 125,000	$ 625,000
Radio Communciations/Dispatching Infrastructure			LS	1	$ 100,000	$ 100,000
Structures						
Bridge Rehabilitation			LS	1	$ 3,539,562	$ 3,539,562
Retaining Wall Allowance			SF	7000	$ 125	$ 875,000
Stations/Maintenance Facility						
Station within R/W			Ea	6	$ 300,000	$ 1,800,000
R/W Acquisition Allowance per Station			Ea	6	$ 150,000	$ 900,000
Maintenance Facility			LS	1	$ 1,000,000	$ 1,000,000
Construction Total						**$ 40,420,902**
Vehicles			Ea	4	$ 8,500,000	$ 34,000,000
Contingency				30%		$ 22,326,000
Soft Costs (Permitting, Bid Document Preparation, Project Administration and CM)				30%		$ 22,326,000
Grand Total (Rounded)						**$ 119,100,000**

Table 2B: CONCEPTUAL MAINTENANCE COST - Watsonville to Santa Cruz - Scenario D

Watsonville to Westside Santa Cruz MP 1.6-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	20.5	Miles
End of Siding Control Points Maintained	5	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	34	Ea
Xings Requiring New Active Warning Devices	19	Ea
Private Xings	22	Ea
Total Stations	6	Ea

Item	Misc $/Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track Inpsection						
Inspector+ HiRail			Day	168	$ 960	$ 161,280
Hourly Cost	$ 120	Hr				
Track Maintenance						
3-Person Maintenace Crew + HiRail			Day	104	$ 2,000	$ 208,000
Hourly Cost for 3 people and truck	$ 250	$/Hr				
Equipment Rental			Day	25	$ 1,000	$ 25,000
Spot Surfacing			Day	3	$ 4,000	$ 12,000
Spot Tie Renewal			Ea	100	$ 190	$ 19,000
Ditching			Day	4.1	$ 3,560	$ 14,596
Hourly cost for ditching equipment + labor	$ 445	$/Hr				
Annual Rail Inspection			LS	1	$ 25,000	$ 25,000
Culvert Maintenance						
Culvert Replacement			LF	50	$ 120	$ 6,000
Vegatation Management						
Pre-emergent			AC	60	$ 200	$ 11,927
Spray Pattern Width	24	Ft				
Post-emergent			LS	1	$ 7,500	$ 7,500
Tree Trimming			Day	20	$ 4,090	$ 81,800
Signal Maintenance						
Regular Inspections (maintainer+truck)			Hr	700	$ 150	$ 105,000
Trouble Calls			Hr	136	$ 200	$ 27,200
Station Maintenance						
1-Person Maintenance Crew + Pickup Truck						
Time Spent at Each Station (Every Other Day)	1	Hrs/Station/Day	Hr	390	$ 110	$ 42,900
Contract Station Repairs			LS	1	$ 12,000	$ 12,000
Structures Maintenance						
Contract bridge maintenance			LS	1	$ 91,200	$ 91,200
Consumables and Services						
Consumables (light bulbs, curve lubricant, garbage, etc)			LS	1	$ 13,000	$ 13,000
Capitalized Maintenance						
Contract Surfacing (Annualized Cost)			TF	10,824	$ 6	$ 64,944
Number of Years Between Surfacing Cycle	10	Yrs				
Contract Tie Renewal (Annualized)			Ties	1,777	$ 180	$ 319,800
Tie Life	30	Yrs				
Frequency of Tie Program	10	Yrs				
Grade Crossing Repair			TF	68	$ 1,000	$ 68,000
Crossing Service Life	25	Yrs				
Average Crossing Length	50	TF				
Subtotal						$ 1,316,147
Contingency				10%		$ 131,615
Grand Total (Rounded)						**$ 1,448,000**

Table 3A: CONCEPTUAL CAPITAL COST - Aptos to Santa Cruz - Scenario E

Aptos to Westside Santa Cruz MP 12.5-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	9.6	Miles
End of Siding Control Points Maintained	2	Ea
Total Non-Powered Turnouts Maintained	5	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	26	Ea
Xings Requiring New Active Warning Devices	14	Ea
Private Xings	10	Ea
Total Stations	9	Ea

Item	Misc Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track						
Tie Replacement			Ea	8,300	$ 165	$ 1,369,500
Rail Replacement			TF	50,688	$ 90	$ 4,561,920
Ballast for Surfacing			Ton	7,872	$ 30	$ 236,160
Out of Face Surfacing			TF	50,688	$ 6	$ 304,128
Out of Face Track Replacement			TF	1,000	$ 320	$ 320,000
Grade Crossing Track/Surface Replacement	50	TF/Xing	TF	1,300	$ 900	$ 1,170,000
Private Crossing Rehabilitation	20	TF/Xing	TF	200	$ 1,000	$ 200,000
Ditching/Drainage Improvements			Day	20	$ 5,200	$ 104,000
Hirail Vaccuum Truck Ballast Cleaning			Day	30	$ 3,560	$ 106,800
Tree Trimming			Day	30	$ 4,490	$ 134,700
Turnouts - Composite Cost for 2nd Hand No 11+No 15 at Sidings			Ea	7	$ 90,000	$ 630,000
Trackwork for 400' Long Gauntlet Tracks at Stations			Ea	9	$ 250,000	$ 2,250,000
Trackwork at Maintenance Facility			TF	1050	$ 375	$ 393,750
Trackwork Between Siding Turnouts			TF	4600	$ 250	$ 1,150,000
Curve Lubricator			Ea	4	$ 12,500	$ 50,000
R/W Acquisition Allowance per Siding			Ea	1	$ 250,000	$ 250,000
Signal						
Grade Crossing Equipment: Bells, Fashers, Gates			Ea	14	$ 350,000	$ 4,900,000
Quiet Zones			Xing	0	$ 90,000	$ -
Spring or Fast-Pass Switch Machines @ Sidings and Gauntlet Tracks			Ea	11	$ 135,000	$ 1,485,000
Intermediate Signals			Ea	2	$ 125,000	$ 250,000
Radio Communciations/Dispatching Infrastructure			LS	1	$ 100,000	$ 100,000
Structures						
Bridge Rehabilitation			LS	1	$ 2,669,343	$ 2,669,343
Retaining Wall Allowance			SF	1000	$ 125	$ 125,000
Stations/Maintenance Facility						
Station within R/W			Ea	9	$ 300,000	$ 2,700,000
R/W Acquisition Allowance per Station			Ea	9	$ 150,000	$ 1,350,000
Maintenance Facility			LS	1	$ 1,000,000	$ 1,000,000
Construction Total						**$ 27,810,301**
Vehicles			Ea	3	$ 8,500,000	$ 25,500,000
Contingency				30%		$ 15,993,000
Soft Costs (Permitting, Bid Document Preparation, Project Administration and CM)				30%		$ 15,993,000
Grand Total (Rounded)						**$ 85,300,000**

Table 3B: CONCEPTUAL MAINTENANCE COST - Aptos to Santa Cruz - Scenario E

Aptos to Westside Santa Cruz MP 12.5-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	9.6	Miles
End of Siding Control Points Maintained	2	Ea
Total Non-Powered Turnouts Maintained	5	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	26	Ea
Xings Requiring New Active Warning Devices	14	Ea
Private Xings	10	Ea
Total Stations	9	Ea

Item	Misc $/Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track Inpsection						
Inspector+ HiRail			Day	64	$ 960	$ 61,440
Hourly Cost	$ 120	Hr				
Track Maintenance						
3-Person Maintenace Crew + HiRail			Day	52	$ 2,000	$ 104,000
Hourly Cost for 3 people and truck	$ 250	$/Hr				
Equipment Rental			Day	8	$ 1,000	$ 8,000
Spot Surfacing			Day	2	$ 4,000	$ 8,000
Spot Tie Renewal			Ea	45	$ 190	$ 8,550
Ditching			Day	1.9	$ 3,560	$ 6,835
Hourly cost for ditching equipment + labor	$ 445	$/Hr				
Annual Rail Inspection			LS	1	$ 25,000	$ 25,000
Culvert Maintenance						
Culvert Replacement			LF	15	$ 120	$ 1,800
Vegatation Management						
Pre-emergent			AC	28	$ 200	$ 5,585
Spray Pattern Width	24	Ft				
Post-emergent			LS	1	$ 3,500	$ 3,500
Tree Trimming			Day	15	$ 4,090	$ 61,350
Signal Maintenance						
Regular Inspections (maintainer+truck)			Hr	556	$ 150	$ 83,400
Trouble Calls			Hr	104	$ 200	$ 20,800
Station Maintenance						
1-Person Maintenance Crew + Pickup Truck						
Time Spent at Each Station (Every Other Day)	1	Hrs/Station/Day	Hr	585	$ 110	$ 64,350
Contract Station Repairs			LS	1	$ 12,000	$ 12,000
Structures Maintenance						
Contract bridge maintenance			LS	1	$ 44,800	$ 44,800
Consumables and Services						
Consumables (light bulbs, curve lubricant, garbage, etc)			LS	1	$ 14,500	$ 14,500
Capitalized Maintenance						
Contract Surfacing (Annualized Cost)			TF	5,069	$ 6	$ 30,413
Number of Years Between Surfacing Cycle	10	Yrs				
Contract Tie Renewal (Annualized)			Ties	832	$ 180	$ 149,760
Tie Life	30	Yrs				
Frequency of Tie Program	10	Yrs				
Grade Crossing Repair			TF	52	$ 1,000	$ 52,000
Crossing Service Life	25	Yrs				
Average Crossing Length	50	TF				
Subtotal						$ 766,083
Contingency				10%		$ 76,608
Grand Total (Rounded)						**$ 843,000**

Table 4A: CONCEPTUAL CAPITAL COST - Watsonville to Santa Cruz-DMU (expanded) - Scenario G

Watsonville to Westside Santa Cruz MP 1.6-22.1 - DMU (expanded service)

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	20.5	Miles
End of Siding Control Points Maintained	3	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	34	Ea
Xings Requiring New Active Warning Devices	19	Ea
Private Xings	22	Ea
Total Stations	10	Ea

Item	Misc Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track						
Tie Replacement			Ea	17,800	$ 165	$ 2,937,000
Rail Replacement			TF	108,240	$ 90	$ 9,741,600
Ballast for Surfacing			Ton	16,810	$ 30	$ 504,300
Out of Face Surfacing			TF	108,240	$ 6	$ 649,440
Out of Face Track Replacement			TF	1,000	$ 320	$ 320,000
Grade Crossing Track/Surface Replacement	50	TF/Xing	TF	1,700	$ 900	$ 1,530,000
Private Crossing Rehabilitation	20	TF/Xing	TF	440	$ 1,000	$ 440,000
Ditching/Drainage Improvements			Day	30	$ 5,200	$ 156,000
Hirail Vaccuum Truck Ballast Cleaning			Day	60	$ 3,560	$ 213,600
Tree Trimming			Day	60	$ 4,490	$ 269,400
Turnouts - Composite Cost for 2nd Hand No 11+No 15 at Sidings			Ea	12	$ 90,000	$ 1,080,000
Trackwork for 400' Long Gauntlet Tracks at Stations			Ea	10	$ 250,000	$ 2,500,000
Trackwork at Maintenance Facility			TF	1500	$ 375	$ 562,500
Trackwork Between Siding Turnouts			TF	2800	$ 250	$ 700,000
Curve Lubricator			Ea	6	$ 12,500	$ 75,000
R/W Acquisition Allowance per Siding			Ea	1	$ 250,000	$ 250,000
Signal						
Grade Crossing Equipment: Bells, Fashers, Gates			Ea	19	$ 350,000	$ 6,650,000
Quiet Zones			Xing	0	$ 90,000	$ -
Spring or Fast-Pass Switch Machines @ Sidings and Gauntlet Tracks			Ea	13	$ 135,000	$ 1,755,000
Intermediate Signals			Ea	3	$ 125,000	$ 375,000
Radio Communciations/Dispatching Infrastructure			LS	1	$ 100,000	$ 100,000
Structures						
Bridge Rehabilitation			LS	1	$ 3,539,562	$ 3,539,562
Retaining Wall Allowance			SF	7000	$ 125	$ 875,000
Stations/Maintenance Facility						
Station within R/W			Ea	10	$ 300,000	$ 3,000,000
R/W Acquisition Allowance per Station			Ea	10	$ 150,000	$ 1,500,000
Maintenance Facility			LS	1	$ 1,000,000	$ 1,000,000
Construction Total						**$ 40,723,402**
Vehicles			Ea	5	$ 8,500,000	$ 42,500,000
Contingency				30%		$ 24,967,000
Soft Costs (Permitting, Bid Document Preparation, Project Administration and CM)				30%		$ 24,967,000
Grand Total (Rounded)						**$ 133,200,000**

Table 4B: CONCEPTUAL MAINTENANCE COST - Watsonville to Santa Cruz-DMU (expanded) - Scenario G

Watsonville to Westside Santa Cruz MP 1.6-22.1 - DMU (expanded service)

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	20.5	Miles
End of Siding Control Points Maintained	3	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	34	Ea
Xings Requiring New Active Warning Devices	19	Ea
Private Xings	22	Ea
Total Stations	10	Ea

Item	Misc $/Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track Inpsection						
Inspector+ HiRail			Day	168	$ 960	$ 161,280
Hourly Cost	$ 120	Hr				
Track Maintenance						
3-Person Maintenace Crew + HiRail			Day	104	$ 2,000	$ 208,000
Hourly Cost for 3 people and truck	$ 250	$/Hr				
Equipment Rental			Day	25	$ 1,000	$ 25,000
Spot Surfacing			Day	3	$ 4,000	$ 12,000
Spot Tie Renewal			Ea	100	$ 190	$ 19,000
Ditching			Day	4.1	$ 3,560	$ 14,596
Hourly cost for ditching equipment + labor	$ 445	$/Hr				
Annual Rail Inspection			LS	1	$ 25,000	$ 25,000
Culvert Maintenance						
Culvert Replacement			LF	50	$ 120	$ 6,000
Vegatation Management						
Pre-emergent			AC	60	$ 200	$ 11,927
Spray Pattern Width	24	Ft				
Post-emergent			LS	1	$ 7,500	$ 7,500
Tree Trimming			Day	20	$ 4,090	$ 81,800
Signal Maintenance						
Regular Inspections (maintainer+truck)			Hr	716	$ 150	$ 107,400
Trouble Calls			Hr	136	$ 200	$ 27,200
Station Maintenance						
1-Person Maintenance Crew + Pickup Truck						
Time Spent at Each Station (Every Other Day)	1	Hrs/Station/Day	Hr	650	$ 110	$ 71,500
Contract Station Repairs			LS	1	$ 12,000	$ 12,000
Structures Maintenance						
Contract bridge maintenance			LS	1	$ 91,200	$ 91,200
Consumables and Services						
Consumables (light bulbs, curve lubricant, garbage, etc)			LS	1	$ 15,000	$ 15,000
Capitalized Maintenance						
Contract Surfacing (Annualized Cost)			TF	10,824	$ 6	$ 64,944
Number of Years Between Surfacing Cycle	10	Yrs				
Contract Tie Renewal (Annualized)			Ties	1,777	$ 180	$ 319,800
Tie Life	30	Yrs				
Frequency of Tie Program	10	Yrs				
Grade Crossing Repair			TF	68	$ 1,000	$ 68,000
Crossing Service Life	25	Yrs				
Average Crossing Length	50	TF				
Subtotal						$ 1,349,147
Contingency				10%		$ 134,915
Grand Total (Rounded)						**$ 1,484,000**

Table 4C: CONCEPTUAL CAPITAL COST - Watsonville to Santa Cruz-Loco Hauled (expanded) - Scenario G1

Watsonville to Westside Santa Cruz MP 1.6-22.1 - Loco Hauled (expanded service)

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	20.5	Miles
End of Siding Control Points Maintained	3	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	34	Ea
Xings Requiring New Active Warning Devices	19	Ea
Private Xings	22	Ea
Total Stations	10	Ea

Item	Misc Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track						
Tie Replacement			Ea	17,800	$ 165	$ 2,937,000
Rail Replacement			TF	108,240	$ 90	$ 9,741,600
Ballast for Surfacing			Ton	16,810	$ 30	$ 504,300
Out of Face Surfacing			TF	108,240	$ 6	$ 649,440
Out of Face Track Replacement			TF	1,000	$ 320	$ 320,000
Grade Crossing Track/Surface Replacement	50	TF/Xing	TF	1,700	$ 900	$ 1,530,000
Private Crossing Rehabilitation	20	TF/Xing	TF	440	$ 1,000	$ 440,000
Ditching/Drainage Improvements			Day	30	$ 5,200	$ 156,000
Hirail Vaccuum Truck Ballast Cleaning			Day	60	$ 3,560	$ 213,600
Tree Trimming			Day	60	$ 4,490	$ 269,400
Turnouts - Composite Cost for 2nd Hand No 11+No 15 at Sidings			Ea	12	$ 90,000	$ 1,080,000
Trackwork for 400' Long Gauntlet Tracks at Stations			Ea	10	$ 250,000	$ 2,500,000
Trackwork at Maintenance Facility			TF	1500	$ 375	$ 562,500
Trackwork Between Siding Turnouts			TF	2800	$ 250	$ 700,000
Curve Lubricator			Ea	6	$ 12,500	$ 75,000
R/W Acquisition Allowance per Siding			Ea	1	$ 250,000	$ 250,000
Signal						
Grade Crossing Equipment: Bells, Fashers, Gates			Ea	19	$ 350,000	$ 6,650,000
Quiet Zones			Xing	0	$ 90,000	$ -
Spring or Fast-Pass Switch Machines @ Sidings and Gauntlet Tracks			Ea	13	$ 135,000	$ 1,755,000
Intermediate Signals			Ea	3	$ 125,000	$ 375,000
Radio Communciations/Dispatching Infrastructure			LS	1	$ 100,000	$ 100,000
PTC Infrastructure			LS	1	$ 7,500,000	$ 7,500,000
Structures						
Bridge Rehabilitation			LS	1	$ 3,539,562	$ 3,539,562
Retaining Wall Allowance			SF	7000	$ 125	$ 875,000
Stations/Maintenance Facility						
Station within R/W			Ea	10	$ 300,000	$ 3,000,000
R/W Acquisition Allowance per Station			Ea	10	$ 150,000	$ 1,500,000
Maintenance Facility			LS	1	$ 1,000,000	$ 1,000,000
Construction Total						**$ 48,223,402**
Locomotives + Spare Parts			EA	5	$ 4,500,000	$ 22,500,000
Cars + Spare Parts			EA	12	$ 3,250,000	$ 39,000,000
Vehicles - Total				5		**$ 61,500,000**
Contingency				30%		$ 32,917,000
Soft Costs (Permitting, Bid Document Preparation, Project Administration and CM)				30%		$ 32,917,000
Grand Total (Rounded)						**$ 175,600,000**

Table 4D: CONCEPTUAL MAINTENANCE COST - Watsonville to Santa Cruz-Loco Hauled (expanded) - Scenario G1

Watsonville to Westside Santa Cruz MP 1.6-22.1 - Loco Hauled (expanded service)

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	20.5	Miles
End of Siding Control Points Maintained	3	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	34	Ea
Xings Requiring New Active Warning Devices	19	Ea
Private Xings	22	Ea
Total Stations	10	Ea

Item	Misc $/Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track Inpsection						
Inspector+ HiRail			Day	168	$ 960	$ 161,280
Hourly Cost	$ 120	Hr				
Track Maintenance						
3-Person Maintenace Crew + HiRail			Day	104	$ 2,000	$ 208,000
Hourly Cost for 3 people and truck	$ 250	$/Hr				
Equipment Rental			Day	25	$ 1,000	$ 25,000
Spot Surfacing			Day	3	$ 4,000	$ 12,000
Spot Tie Renewal			Ea	100	$ 190	$ 19,000
Ditching			Day	4.1	$ 3,560	$ 14,596
Hourly cost for ditching equipment + labor	$ 445	$/Hr				
Annual Rail Inspection			LS	1	$ 25,000	$ 25,000
Culvert Maintenance						
Culvert Replacement			LF	50	$ 120	$ 6,000
Vegatation Management						
Pre-emergent			AC	60	$ 200	$ 11,927
Spray Pattern Width	24	Ft				
Post-emergent			LS	1	$ 7,500	$ 7,500
Tree Trimming			Day	20	$ 4,090	$ 81,800
Signal Maintenance						
Regular Inspections (maintainer+truck)			Hr	716	$ 150	$ 107,400
Trouble Calls			Hr	136	$ 200	$ 27,200
PTC Maintenance, Upgrades, Licensing			LS	1	$ 250,000	$ 250,000
Station Maintenance						
1-Person Maintenance Crew + Pickup Truck						
Time Spent at Each Station (Every Other Day)	1	Hrs/Station/Day	Hr	650	$ 110	$ 71,500
Contract Station Repairs			LS	1	$ 12,000	$ 12,000
Structures Maintenance						
Contract bridge maintenance			LS	1	$ 91,200	$ 91,200
Consumables and Services						
Consumables (light bulbs, curve lubricant, garbage, etc)			LS	1	$ 15,000	$ 15,000
Capitalized Maintenance						
Contract Surfacing (Annualized Cost)			TF	10,824	$ 6	$ 64,944
Number of Years Between Surfacing Cycle	10	Yrs				
Contract Tie Renewal (Annualized)			Ties	1,777	$ 180	$ 319,800
Tie Life	30	Yrs				
Frequency of Tie Program	10	Yrs				
Grade Crossing Repair			TF	68	$ 1,000	$ 68,000
Crossing Service Life	25	Yrs				
Average Crossing Length	50	TF				
Subtotal						$ 1,599,147
Contingency				10%		$ 159,915
Grand Total (Rounded)						**$ 1,759,000**

Table 5A: CONCEPTUAL CAPITAL COST - Pajaro to Santa Cruz - Scenario J

Pajaro to Westside Santa Cruz MP 0.0-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	22.1	Miles
End of Siding Control Points Maintained	0	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	38	Ea
Xings Requiring New Active Warning Devices	22	Ea
Private Xings	28	Ea
Total Stations	10	Ea

Item	Misc Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track						
Tie Replacement			Ea	19,200	$ 165	$ 3,168,000
Rail Replacement			TF	116,688	$ 90	$ 10,501,920
Ballast for Surfacing			Ton	18,122	$ 30	$ 543,660
Out of Face Surfacing			TF	116,688	$ 6	$ 700,128
Out of Face Track Replacement			TF	1,000	$ 320	$ 320,000
Grade Crossing Track/Surface Replacement	50	TF/Xing	TF	1,900	$ 900	$ 1,710,000
Private Crossing Rehabilitation	20	TF/Xing	TF	560	$ 1,000	$ 560,000
Ditching/Drainage Improvements			Day	30	$ 5,200	$ 156,000
Hirail Vaccuum Truck Ballast Cleaning			Day	60	$ 3,560	$ 213,600
Tree Trimming			Day	60	$ 4,490	$ 269,400
Turnouts - Composite Cost for 2nd Hand No 11+No 15 at Sidings			Ea	9	$ 90,000	$ 810,000
Trackwork for 400' Long Gauntlet Tracks at Stations			Ea	10	$ 250,000	$ 2,500,000
Trackwork at Maintenance Facility			TF	700	$ 375	$ 262,500
Trackwork Between Siding Turnouts			TF	0	$ 250	$ -
Curve Lubricator			Ea	6	$ 12,500	$ 75,000
R/W Acquisition Allowance per Siding			Ea	0	$ 250,000	$ -
Signal						
Grade Crossing Equipment: Bells, Fashers, Gates			Ea	22	$ 350,000	$ 7,700,000
Quiet Zones			Xing	0	$ 90,000	$ -
Spring or Fast-Pass Switch Machines @ Sidings and Gauntlet Tracks			Ea	10	$ 135,000	$ 1,350,000
Intermediate Signals			Ea	0	$ 125,000	$ -
Radio Communciations/Dispatching Infrastructure			LS	1	$ 100,000	$ 100,000
Structures						
Bridge Rehabilitation			LS	1	$ 3,620,858	$ 3,620,858
Retaining Wall Allowance			SF	7000	$ 125	$ 875,000
Station						
Station within R/W			Ea	10	$ 300,000	$ 3,000,000
R/W Acquisition Allowance per Station			Ea	10	$ 150,000	$ 1,500,000
Maintenance Facility			LS	1	$ 1,000,000	$ 1,000,000
Construction Total						**$ 40,936,066**
Vehicles			Ea	2	$ 8,500,000	$ 17,000,000
Contingency				30%		$ 17,381,000
Soft Costs (Permitting, Bid Document Preparation, Project Administration and CM)				30%		$ 17,381,000
Grand Total (Rounded)						**$ 92,700,000**

Table 5B: CONCEPTUAL MAINTENANCE COST - Pajaro to Santa Cruz - Scenario J

Pajaro to Westside Santa Cruz MP 0.0-22.1

All costs expressed on an Annual Basis
All costs assume work performed by a contractor

Total Track Miles Maintained	22.1	Miles
End of Siding Control Points Maintained	0	Ea
Total Non-Powered Turnouts Maintained	9	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	38	Ea
Xings Requiring New Active Warning Devices	22	Ea
Private Xings	28	Ea
Total Stations	10	Ea

Item	Misc $/Qty	Misc. Unit	U/M	Qty	Unit Cost	Ext. Cost
Track Inpsection						
Inspector+ HiRail			Day	168	$ 960	$ 161,280
Hourly Cost	$ 120	Hr				
Track Maintenance						
3-Person Maintenace Crew + HiRail			Day	104	$ 2,000	$ 208,000
Hourly Cost for 3 people and truck	$ 250	$/Hr				
Equipment Rental			Day	25	$ 1,000	$ 25,000
Spot Surfacing			Day	3	$ 4,000	$ 12,000
Spot Tie Renewal			Ea	100	$ 190	$ 19,000
Ditching			Day	4.4	$ 3,560	$ 15,735
Hourly cost for ditching equipment + labor	$ 445	$/Hr				
Annual Rail Inspection			LS	1	$ 25,000	$ 25,000
Culvert Maintenance						
Culvert Replacement			LF	50	$ 120	$ 6,000
Vegatation Management						
Pre-emergent			AC	64	$ 200	$ 12,858
Spray Pattern Width	24	Ft				
Post-emergent			LS	1	$ 7,500	$ 7,500
Tree Trimming			Day	20	$ 4,090	$ 81,800
Signal Maintenance						
Regular Inspections (maintainer+truck)			Hr	764	$ 150	$ 114,600
Trouble Calls			Hr	152	$ 200	$ 30,400
Station Maintenance						
1-Person Maintenance Crew + Pickup Truck						
Time Spent at Each Station (Every Other Day)	1	Hrs/Station/Day	Hr	650	$ 110	$ 71,500
Contract Station Repairs			LS	1	$ 12,000	$ 12,000
Structures Maintenance						
Contract bridge maintenance			LS	1	$ 112,250	$ 112,250
Consumables and Services						
Consumables (light bulbs, curve lubricant, garbage, etc)			LS	1	$ 15,000	$ 15,000
Capitalized Maintenance						
Contract Surfacing (Annualized Cost)			TF	11,669	$ 6	$ 70,013
Number of Years Between Surfacing Cycle	10	Yrs				
Contract Tie Renewal (Annualized)			Ties	1,915	$ 180	$ 344,760
Tie Life	30	Yrs				
Frequency of Tie Program	10	Yrs				
Grade Crossing Repair			TF	76	$ 1,000	$ 76,000
Crossing Service Life	25	Yrs				
Average Crossing Length	50	TF				
Subtotal						$ 1,420,696
Contingency				10%		$ 142,070
Grand Total (Rounded)						**$ 1,563,000**

CONCEPTUAL CAPITAL COST - Seacliff to Santa Cruz - Scenario S

Seacliff (State Park Dr) to Santa Cruz (Bay St)
MP 13.2 to 20.7

Total Track Miles Maintained	7.6	Miles
End of Siding Control Points Maintained	0	Ea
Total Non-Powered Turnouts Maintained	5	Ea
Total Public Xings Maintained	11	Ea
Xings with New Active Warning Devices	1	Ea
Private Xings	3	Ea
Total Stations	5	Ea

Item	Unit Measure	Unit Cost (new)	Cost Estimate
Infrastructure			
Tie Replacement (ties/mile)	Ea	$ 165	$ 1,003,200
Rail Replacement	TF	$ 90	$ 3,896,640
Ballast	Ton	$ 30	$ 68,400
Surfacing	TF	$ 6	$ 240,768
Grade Crossing improvements	TF	$ 900	$ 360,000
Ditching/Drainage	Day	$ 5,200	$ 156,000
Ballast Cleaning/day	Day	$ 3,560	$ 35,600
Tree Trimming	Day	$ 4,490	$ 134,700
New turnouts	Ea	$ 90,000	$ 450,000
Trackwork for Gauntlet Tracks at Stations	Ea	$ 250,000	$ -
Spring Switches at termini	Ea	$ 10,000	$ 20,000
Trackwork between Siding Turnouts	TF	$ 250	$ 594,000
Passing track grading	TF	$ 200	$ 475,200
Curve Lubricator	Ea	$ 12,500	$ 50,000
R/W Acquisition Allowance per Siding	Ea	$ 250,000	$ 250,000
Signal			
Grade Crossing Signals	Ea	$ 350,000	$ 350,000
Positive Train Control*	Ea	$ 7,500,000	$ 7,500,000
Structures			
Bridge Rehabilitation	Allow	$ 856,315	$ 856,315
Stations/Maintenance Facility			
Stations	Ea	$ 300,000	$ 1,500,000
Station Property Acquisition	Ea	$ 150,000	$ 750,000

Item	Unit Measure	Unit Cost (new)	Cost Estimate
Maintenance Facility	Ea	$ 1,000,000	$ 1,000,000
Maintenance of way vehicles	Ea	$ 5,000	$ 5,000
Maintenance of way tools	Ea	$ 4,000	$ 4,000
Construction "Raw" Total			$ 19,699,823
Rolling Stock (locomotives + coaches)**			0
Contingency*		30%	$ 5,909,947
Soft Costs* (permitting, construction admin, etc)		30%	$ 5,907,247
Total Capital Outlay Construction Cost			$ 31,517,017
"Raw" Capital Cost per Mile (excluding contingency & soft costs)			*$2.6 million*
Total Capital Cost per Mile			*$4.15 million*

Long Term Costs - Item	Each	Frequency	20 year Cost
Additional Capitalized Maintenance			
Tie renewal/surfacing program	$4.2M		$ 8,400,000
Number of years between cycle		10 Years	
Ditching/Drainage improvements	$156K		$ 468,000
Number of years between cycle		5 Years	
Subtotal			***$ 8,868,000***
Annualized cost over 20 years			$ 443,400

Notes:

Actual costs subject to more detailed design and bids; and some assumptions subject to concurrence from regulatory entities (e.g. assumes bridge plate rather than gauntlet track at stations and only one grade crossing signal upgrade)

**Cost modified from estimate provided by Iowa Pacific, to match other scenarios*

***Rolling stock assumed to be leased, with upgrades paid by leasor*

CONCEPTUAL MAINTENANCE and OPERATING COST - Scenario S

Seacliff (State Park Dr) to Santa Cruz (Bay St)
MP 13.2 to 20.7
All costs expressed on an Annual Basis

Total Track Miles Maintained	7.6	Miles
Weekday daily departures (RT)	18	RT
Weekend/holiday daily departures (RT)	13	RT
Total annual revenue miles	91,580	miles
Revenue train hours (per year)	5,513	hours
End of Siding Control Points Maintained	-	Ea
Total Non-Powered Turnouts Maintained	5	Ea
Total Public Xings Maintained (w/ Active Warning Dvcs)	11	Ea
Xings Requiring New Active Warning Devices	1	Ea
Private Xings	3	Ea
Total Stations	5	Ea

Item	Cost
Annual Operating Expense	**$ 2,337,970**
Train crew, trainmasters, & superintendent*	*$ 1,402,600*
Fuel	*$ 860,370*
Insurance	*$ 75,000*
Rolling Stock	**$ 911,200**
*Lease** (E9 Locomotives + single-level MARC cars)*	*$ 331,200*
Equipment maintenance and servicing	*$ 580,000*
Track/Station Maintenance	**$ 588,843**
*3-person maintenance crew (1 foreman, 2 crew)**	*$ 170,352*
Maintenance Vehicle ($500/mo)	*$ 6,000*
Track maintenance materials ($3000/mo)	*$ 36,000*
Track inspection	*$ 61,440*
Spot Tie Renewal	*$ 19,000*
Ditching	*$ 5,411*
Annual Rail Inspection	*$ 15,000*
Culvert Maintenance	*$ 1,800*
Vegatation Management	*$ 33,000*
Tree Trimming	*$ 24,540*
Signal Maintenance	*$ 44,500*
Station maintenance/repairs	*$ 12,000*
Contract bridge maintenance	*$ 44,800*
Consumables (light bulbs, curve lubricant, garbage, etc)	*$ 15,000*
PTC Maintenance, Upgrades, Licensing	*$ 100,000*
Subtotal - O&M	**$ 3,838,013**
General Admin	**$ 647,380**
Contingency (20%)	**$ 897,079**
Total Annual O&M	**$ 5,382,472**
Operating cost per Revenue Hour (excluding vehicles)	*$ 424*
Operating cost per Revenue Hour (including vehicles)	*$ 589*
Total O&M per Mile	*$ 59*

Notes:

**Cost modified from preliminary est. provided by Iowa Pacific (e.g. labor cost adjusted to match industry standard, common overhead rates).*

***Lease rates assume IP pays for upgrades to vehicles at start*

APPENDIX F – FUNDING PROGRAMS CONSIDERED

TABLE F-1: EXISTING FEDERAL FUNDING PROGRAMS

SOURCE[1]
EDA Public Works Grants
FHWA Regional Surface Transportation Program (RSTP)
FHWA Transportation Infrastructure Finance and Innovation Act (TIFIA) – Loan program
FRA Railroad Rehabilitation and Improvement Financing (RRIF) – Loan program
FTA §5303/5304/5305 Planning Assistance
FTA §20005(b) Transit Oriented Development (TOD)
FTA §5307 Urbanized Area Formula Program
FTA §5309 Fixed Guideway New Starts/Small Starts
FTA §5336(i) Urban Small Transit Intensive Cities (STIC)
FTA §5340 Urban and Rural Growing and High Density States
FTA Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER)
USDOT Transp. Investment Generating Economic Recovery Program (TIGER)

Source: Robert Schaevitz, 2015

[1] EDA – US Economic Development Administration
FHWA – Federal Highway Administration
FRA – Federal Railroad Administration
FTA – Federal Transit Administration
HUTA – Highway Users Tax Account
JPA – Joint Powers Authority
SCCRTC – Santa Cruz County Regional Transportation Commission
USDOT – US Department of Transportation

TABLE F-2: EXISTING STATE FUNDING PROGRAMS

SOURCE
Active Transportation Program (ATP) - Regional & Statewide
Cap and Trade Program (SB 862)
High Speed Rail Connectivity Program (Prop 1A and possibly Cap and Trade)
Santa Cruz County Regional Transportation Improvement Program (RTIP)
State Transit Assistance (STA) – *Subvention*
Transportation Development Act (TDA) / Local Transportation Fund (LTF) – *Subvention*

Source: Robert Schaevitz, 2015

TABLE F-3: EXISTING REGIONAL AND LOCAL SOURCES

SOURCE	Type
Motor Vehicle Emissions Reduction Grant Program (AB 2766)	Grant
Metro Transit Non-Fare Revenue	Operating Rev
Metro Transit Passenger Fares	Operating Rev
Metro Transit Sales Tax	Tax
Metro UC Santa Cruz User Fees	Operating Rev
Rail Corridor Short Line Lease Revenue (to SCCRTC)	Operating Rev

Source: Robert Schaevitz, 2015

TABLE F-4: AVAILABLE AND POTENTIAL NEW FUNDING MECHANISMS

SOURCE	Type	Status
California Transportation Finance Authority (CTFA)	Loan	Pending
Congressional Earmarks	Grant	Suspended
Road User Charge Fees (Based on Vehicle-Miles Traveled)	Grant	Potential
Benefit Assessment Districts (SAD)	Assessment	Available
Santa Cruz County 2016 Transportation Sales Tax	Tax	Available
City/County Developer Fees (Including JPAs)	Fee	Available
City/County General Funds	Mixed	Available
Community Facilities District (CFD)	Assessment	Available
County Local Option Fuel Tax (New)	Tax	Potential
Employer/Employee (Head) Tax (New)	Tax	Potential
New Rail System Advertising and Concession Revenue	Operating Rev	Available
New Rail System Fare Revenue	Operating Rev	Available
New Rail System Parking and Miscellaneous Revenue	Operating Rev	Available
P3 - Short-line Operator	Rev/Cost Shrg	Available
P3 - Tourism-Based Businesses	Rev/Cost Shrg	Available
P3 - Station Area Development, Services, etc.	Rev/Cost Shrg	Available
Tax Increment Financing (TIF) (SB 628, AB 229)	Tax	Available
Transient Occupancy Tax (TOT)	Tax	Available
Vehicle Registration Fee (SB 83)	Fee	Available

Robert Schaevitz, 2015

APPENDIX G – GOALS AND EVALUATION FRAMEWORK

Table 1 - Evaluation Crtieria

Goal	Evaluation Measure	Evaluation Criteria	Methodology/Definition	Type of Analysis*	Possible Source
Provide a convenient, competitive and accessible, travel option	Transit Operations and Performance	Travel time	Train travel time vs. auto travel time for specified origin/destination pairs	Quantitative	LTK Train Ops/Travel Demand Model
			Boardings per service mile or service hour	Quantitative	Ridership+ Model/Service Plan
		Equity analysis	Serves low income/disadvantaged populations and assess cost to users	Qualitative	Travel Demand Model/Census/Stations/GIS
	Connectivity/Quality of access	Quality of access	Number of households accessible within a 15-minute walk from a station	Quantitative	Travel Demand Model/Census/Stations/GIS
			Convenient, direct pedestrian/bicycle access between stations and adjacent land uses	Qualitative	Service Scenarios/Stations
		Transit Connectivity	Connectivity to local, regional, and state (intercity rail) transit services (e.g. METRO, Capitol Corridor, state rail, Hwy 17 Express bus)	Qualitative	Service Scenarios/Stations/Transit Routes
Enhance communities, the environment, and support economic vitality	Livability and Commercial Vitality	Support/promote economic vitality	Economic benefits (ex. access to jobs and services, redevelopment and infill, attract visitors)	Qualitative	Order of magnitude estimate based on Service Scenarios/Stations
			Number of jobs accessible within a 15-minute walk from a station	Quantitative	Travel Demand Model/Census/Stations/GIS
	Neighborhood & Environmental Impacts	Traffic Impacts	Potential for traffic impacts at grade crossings, stations, etc.	Qualitative	Order of magnitude estimate; Service Scenarios/Stations
		Environmental Benefits	Reduced VMT and greenhouse gas emissions	Quantitative	Order of magnitude estimate; Ridership+ Model/EMFAC Estimates
		Noise & Vibration	Noise/vibration impacts along corridor	Qualitative	Service Scenarios/Stations
		Parking	Parking demand and potential impact on areas near stations if not sufficient parking at station; land needed for park-and-ride/parking lots.	Qualitative	Service Scenarios/Stations
	Construction Impacts	Minimize impacts to homes/local businesses	Construction period length/intensity	Qualitative	Construction Estimate
Develop a rail system that is cost effective and financially feasible	Capital and operating costs	Capital cost	Total construction cost (includes design, construction, construction management, right-of-way, vehicles, support facilities-stations, parking, crossings, safety features, track improvements, sidings, etc.; and assume trail present)	Quantitative	Cost Estimate
		Operating and maintenance (O&M)	O&M cost per service mile or service hour	Quantitative	LTK Train Ops/Cost Estimate
		Service efficiency and Cost effectiveness	Farebox recovery ratio (percent of operating costs paid for by passenger fares)	Quantitative	LTK Train Ops/Revenue Estimate
			Annualized/life cycle cost per trip (annualized capital cost over useful life + O&M ÷ annual trips)	Quantitative	LTK Train Ops/Revenue Estimate
	Funding Competiveness	Funding potential of scenario	Ability to compete for local, state, federal funding sources (but not compete with METRO buses) for capital and O&M	Qualitative	Funding Plan

**Quantitative or qualitative analysis would result in a high, medium, or low ranking for each criterion for alternatives analysis*

Table 2 - Crtieria Addressed in Definition of Project / Alternatives

Evaluation Measure	Criteria	Methodology/Definition	Way to Address in Study	Type of Analysis	Possible Source
Transit Operations and Performance	Travel Time	Travel time and speed	Include alternative travel time/speed data in description of each alternative	Quantitative	LTK Train Ops
	Reliability	Travel time reliability	Include discussion of auto, bus, and rail reliability	Qualitative	Highway 1 data, SC METRO, industry best practices for rail OTP
	Ridership	Ridership (number of boardings)	Include alternative ridership data in description of each alternative	Quantitative	Ridership+ Model
Connectivity/Quality of access	Local Transit	Impact on METRO bus system - Will this help or hurt METRO?	Covered under system connectivity and funding potential. Text will discuss where new bus connections would be needed and potential resource reallocation on parallel/redundant routes.	Qualitative	N/A
	Non-Motorized	Connectivity with rail trail, any impacts on planned rail trail and trail users	Include discussion of connectivity to trail and potential issues (sidings, stations) in project description	Qualitative	Rail Trail plans
Capital and operating costs	Service Efficiency and Cost Effectiveness	Operating expense per unlinked passenger trip	Evaluation criteria captured with farebox recovery but will be described in description of each alternative	Quantitative	LTK Train Ops/Cost Estimate
		Subsidy per passenger	Evaluation criteria captured with farebox recovery but will be described in description of each alternative	Quantitative	LTK Train Ops/Cost Estimate
Neighborhood & Environmental Impacts	Safety	Avoid model conflicts, especially at railroad crossings. Ensure no increase in risk/transportation related fatalities and injures. (e.g. train-car; train-bike/ped risk)	While this is a major issue of concern it would not differentiate between alternatives and text will include discussion of issues and how they can be addressed	Qualitative	N/A
Sustainable Communities	Regional, state, and federal goals	Ability to advance Regional Transportation Plan, local, state, and federal goals	Include discussion of ability to meet goals in project description	Qualitative	Applicable regional, state, and federal goals

Table 3 - Other Evaluation Criteria Considered

Evaluation Criteria	Methodology/Definition	Type of Analysis	Possible Source	Comments
Ridership/Performance	Riders shifted from roads (esp Hwy 1) and number of riders shifted from bus	Quantitative	N/A	Data needed to quantify this not avaialble
Support/promote economic vitality	Ability to increase transportation network throughput	Qualitative	N/A	Data needed to quantify this not avaialble
Local Connectivity	Locations (origins and destinations) accessible within a 15-minute walk, bike ride, or bus transfer from a station	Quantitative	Travel Demand Model/Census/Stations/GIS	Redundant, criteria capturing jobs/housing
	Number of schools accessible within a 15-minute walk or bike ride from a station	Quantitative	Census/Stations/GIS	Redundant, criteria capturing jobs/housing
	Percentage of people that can travel to households, schools, jobs, key destinations within 30 minutes	Quantitative	Travel Demand Model/Census/Stations/GIS	Data needed to quantify this not avaialble
Local Transit	Connectivity to local and Hwy 17 Express_bus	Qualitative	Service Scenarios/Stations/SC Metro (GIS)	Redundant, captured with connectivity to all transit modes
Non-Motorized	Connectivity to sidewalks and bike routes	Qualitative	City/County Sidewalk/Bicycle Inventory (GIS)	Redundant, captured in quality of access
Service Efficiency and Cost Effectiveness	Mobility benefits vs cost ratio	Quantitative	N/A	Detailed analysis better suited for TIGER grant application process (post-feasibility study)

APPENDIX H – STATION AREA CHARACTERISTICS

Source: SCCRTC, 2015

STATION AREA CHARACTERISTICS

Many possible station locations exist along the Santa Cruz Branch Rail Line. Areas that have high transit ridership potential were identified, taking into consideration variables including population and employment density, key destinations (e,g, commercial, recreational, employment), demographics – including low income and zero-car households, walkability (pedestrian facilities in the area), existing and planned land uses, and connectivity to existing bus routes. Based on input from technical stakeholders (e.g. planning departments, business groups, UCSC, Cabrillo College, Santa Cruz METRO, and transit riders), the RTC board, and community members, the list was refined and 14 locations were included in one or more of the seven scenarios analyzed in this study. Other locations remain possible future or conditional stations that might be added to a rail system in conjunction with growth in jobs, housing, or transit connections.

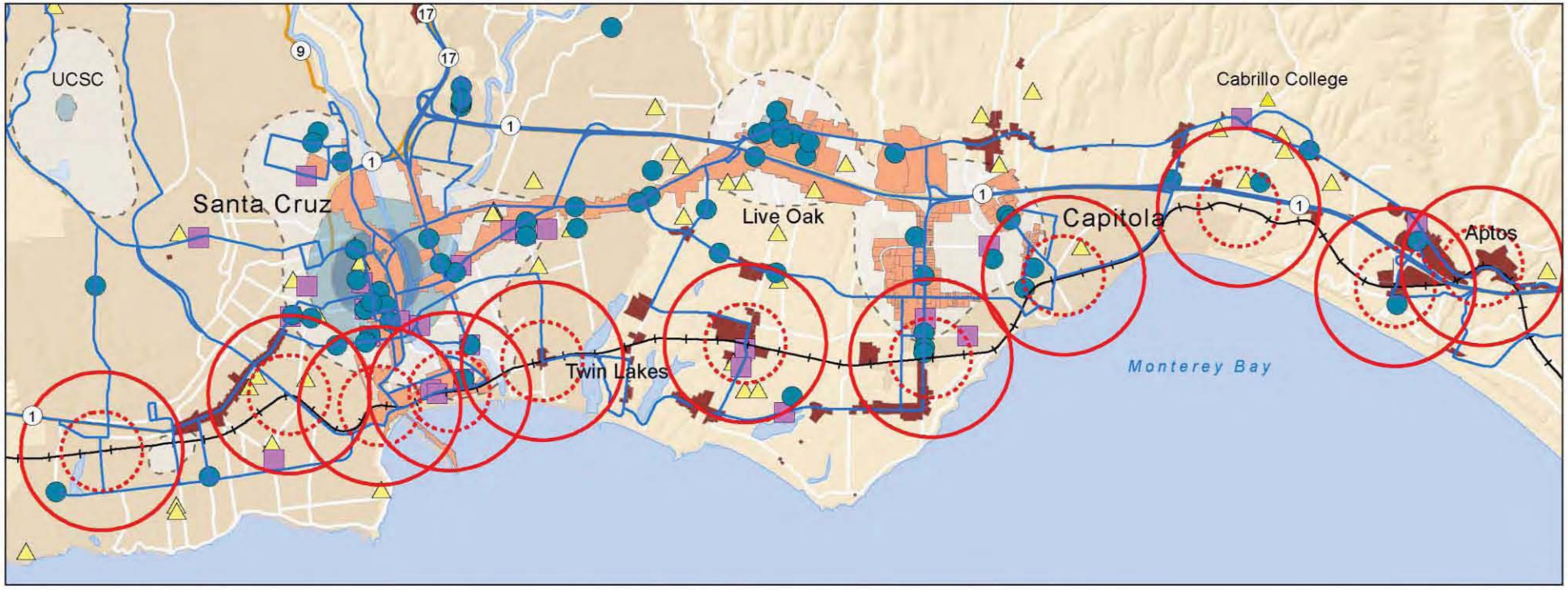
The following provides a snapshot of some of the characteristic around each station area that was included in one or more of the scenarios, including approximate location[1] and post mile (PM), alternate locations that could be considered, examples of some nearby destinations (¼ and ½ mile radius) and transit connections (bus routes shown in blue).

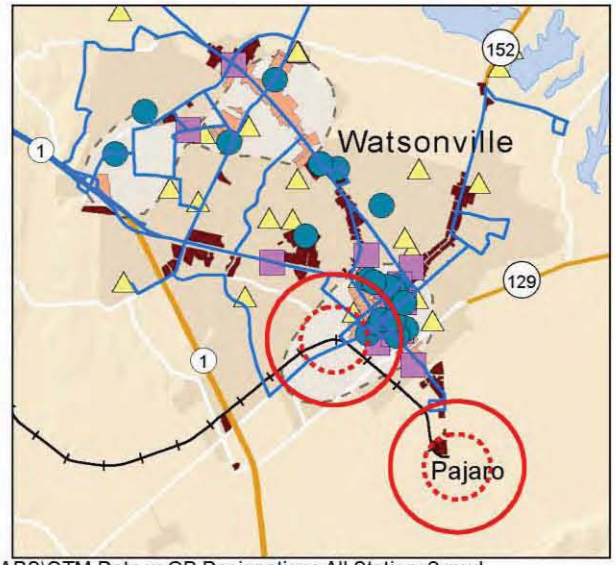
STATION LIST

Station Name	Post Mile (PM)	Approximate Location	Service Scenarios	Primary Uses			
				Residential	Work/College (M-F)	Commercial	Visitor
1) Westside Santa Cruz	22	Natural Bridges/ROW	All	x	x	x	x
2) Bay St./California (UC East)	20.7	Bay St./California St.	D-ST only E, G, J	x	x	x	
3) Downtown Santa Cruz	20	Pacific Ave/Beach St	All	x	x	x	x
4) Santa Cruz Boardwalk	19.6	Leibrandt Ave/ROW	B and G – seasonal	x			x
5) Seabright	19.1	Seabright Ave/ROW	B, E, G, J	x		x	x
6) 17th Avenue	17.8	17th Ave/ROW	B, E, G, J	x		x	
7) 41st Ave. (Pleasure Pt & Capitola)	16.8	41st Ave/ROW	All	x		x	x
8) Capitola Village/Depot Hill	15.7	Monterey Ave/Park Ave	B, E, G, J	x		x	x
9) New Brighton/Cabrillo	14.2	New Brighton Rd/Cabrillo College Dr	D and G –ST only		x		x
10) Seacliff Village/Cabrillo	13.2	State Park Dr	E; G-seasonal	x	x	x	x
11) Aptos Village	12.5	Soquel Dr/Aptos Creek Rd	E, G, J	x		x	x
12) Seascape	10.3	Seascape Blvd/ROW	G – seasonal				x
13) Downtown Watsonville	1.7	W. Beach St/Walker St	D, G, J	x	x	x	x
14) Pajaro (regional rail connection)	0.3	Salinas Rd/Railroad Ave	J		x		x

[1] *Aerial images from Google 2015.*

Key Destinations and Employment Densities near Possible Rail Stations





Legend updated Nov 2015

- Key Destinations
- Commercial Zone
- Public Schools
- Youth Activity Centers
- Centers for population with limited transportation options
- Bus Routes
- Rail Line

Station Locations
- 1/4 Mile Radius
- 1/2 Mile Radius

Employment Density
- 2,967 - 6,673 Jobs/SqMi
- 6,674 - 11,860 Jobs/ SqMi
- 11,861 - 18,529 Jobs/ SqMi

SCCRTC

Document Path: S:\GIS\Projects\SantaCruzCounty\RTP\STARS\GISMAPS\OTM Data w GP Designations All Stations2.mxd

1) WESTSIDE SANTA CRUZ

¼ mile: Dashed line

½ mile: Solid red line

Bus routes: Blue

Approximate Location: Natural Bridges Drive at Rail Right-of-Way (ROW), Milepost 22

Alternate Possible Locations: *Schaffer Road, Swift Street/Fair Ave, or Almar Ave.*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *UCSC 2300 Delaware Administrative and Research facilities*
- *Ow Building (formerly the Wrigley's Gum Plant)*
- *Mission St., Delaware Ave., and Swift Street businesses (light industrial, commercial)*
- *Westside Farmers Market*
- *Marine labs*
- *Planned developments in the area (hotel, residential, commercial)*

Residential: *Westside, Grandview*

- *Approximately 2100 people live within ½ mile radius*[2]

Recreational:

- *Natural Bridges State Beach*
- *Wilder Ranch Path*
- *Antonelli Pond*

Transit Connections: *Bus Route 20: Downtown Santa Cruz to UCSC via Delaware Ave (60 minute headways)*

[2] *Population estimates from 2010 U.S. Census, based on Census Blocks with their "centroids" within a ½ mile buffer.*

2) BAY STREET - SANTA CRUZ

Approximate Location: Bay Street/California Avenue, Milepost 20.7

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Mission Street commercial district*
- *UCSC via Bay Street bus connections*

Residential: *Westside, Downtown*

- *Approximately 7425 people live within ½ mile radius*

Recreational:

- *Neary Lagoon Park*
- *West Cliff Drive path*

Transit Connections: *(access to some routes require short walk north to Mission Street)*

Bus route 3: Boardwalk to Natural Bridges via Mission/Bay (60 minute headways)

Bus route 12: UCSC/East Side Direct (1 time per day during morning peak)

Bus route 15: UCSC via Laurel West (5 to 30 min headways)

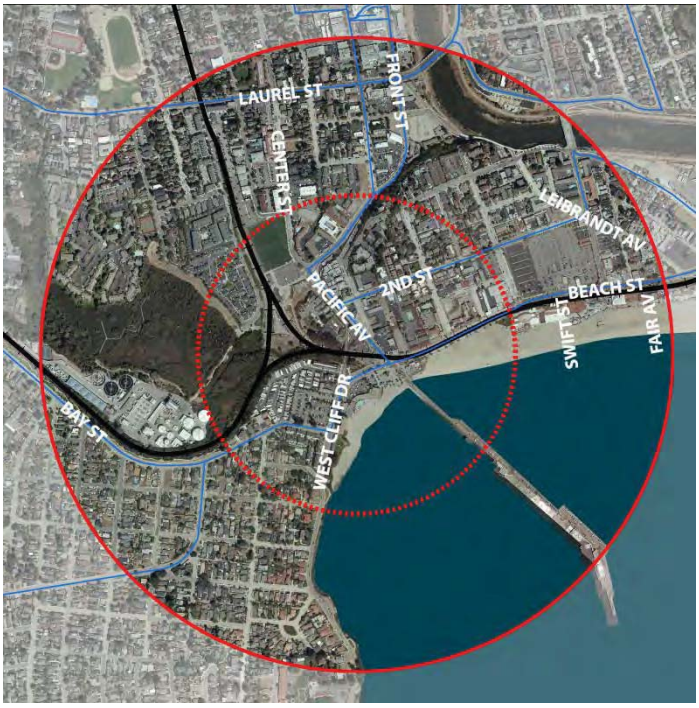
Bus route 16: UCSC via Laurel East (generally 10 to 15 min headways)

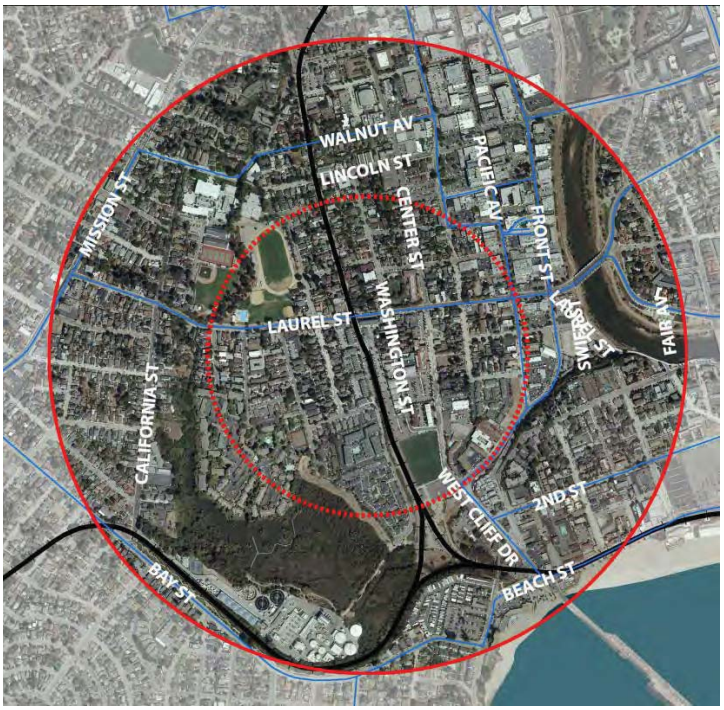
Bus route 19: UCSC via lower Bay (30 minute headways)

Bus route 40: Davenport/North Coast Beaches (4 times per day)

Bus route 41: Bonny Doon via Empire Grade (4 times per day)

3) DOWNTOWN/WHARF - SANTA CRUZ





Approximate Location: Pacific Ave/Beach St, Milepost 20

Alternate Possible Locations: *Depot Park or Chestnut near Laurel St*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Santa Cruz Wharf businesses, hotels*
- *Downtown Santa Cruz, Santa Cruz Warriors Arena*
- *Several planned developments in the area (hotel, residential, commercial)*

Residential: *Westside, Downtown*

- *Approximately 6150 people live within ½ mile radius*

Recreational:

- *Beaches and Municipal Wharf*
- *Santa Cruz Beach Boardwalk*
- *Monterey Bay National Marine Sanctuary Exploration Center*
- *Depot Park and Neary Lagoon*
- *West Cliff Drive path*

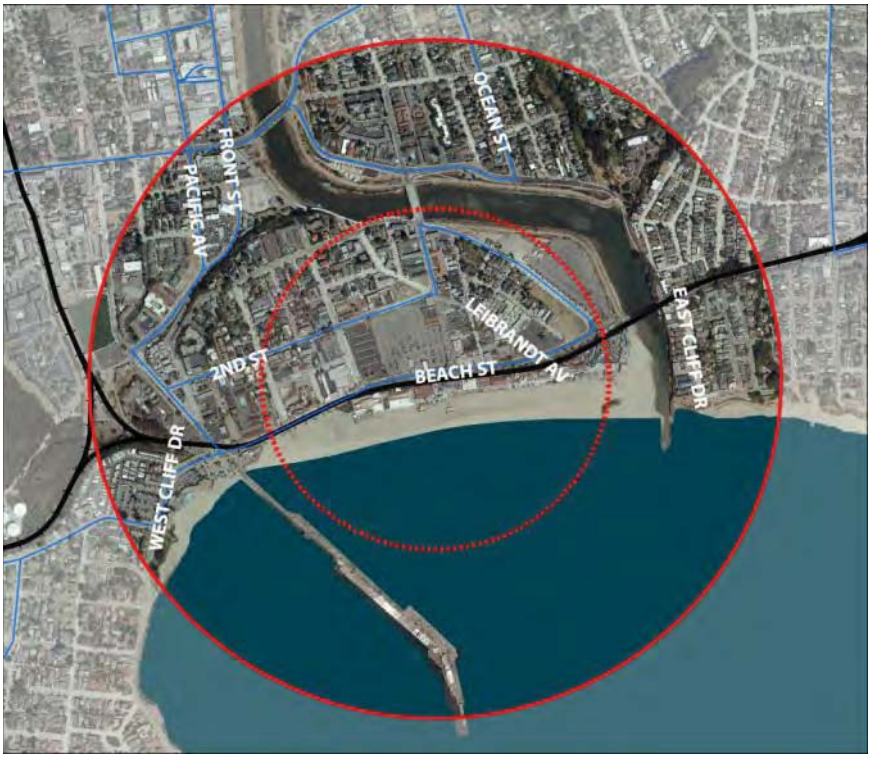
Transit Connections:

Pacific/Beach: Bus routes to Westside (3), UCSC (19, 20), Downtown Shuttle (summer)

Depot Park/Chestnut: Bus routes to UCSC (12, 15, 16); North Coast/Bonny Doon 40, 41, 42

4) SANTA CRUZ BOARDWALK - SANTA CRUZ

Seasonal Station



Approximate Location: Leibrandt Ave/Beach St, Milepost 19.6

Alternate Locations: *elsewhere near Boardwalk or Downtown/Wharf Station*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Beach and Wharf area businesses*
- *Downtown Santa Cruz*

Residential: *Beach Flats, Beach Hill, Lower Ocean, Seabright*

- *Approximately 5135 people live within ½ mile radius*

Recreational:

- *Beaches*
- *Santa Cruz Beach Boardwalk*
- *Monterey Bay National Marine Sanctuary Exploration Center*
- *Wharf*

Transit Connections:

Bus route 3: Boardwalk to Natural Bridges via Mission/Bay (60 minute headways)
Seasonal Downtown Shuttle: 12pm-10pm, 20 minute headways Memorial Day through Labor day

5) SEABRIGHT - SANTA CRUZ

Approximate Location: Seabright Ave/ROW, Milepost 19

Alternate Possible Locations: *Santa Cruz Harbor*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Seabright businesses (restaurants, groceries, services)*

Residential: *Seabright*

- *Approximately 5875 people live within ½ mile radius*

Recreational:

- *Seabright State Beach*
- *Boardwalk*
- *Santa Cruz Small Craft Harbor*

Transit Connections:

Bus route 68: Downtown Santa Cruz to Capitola Mall via Broadway/Portola (60 minute headways)

6) 17TH AVENUE – LIVE OAK

Approximate Location: 17th Avenue/ROW, Milepost 17.8

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Brommer St/17th Avenue businesses*
- *Art center and studios*
- *Shoreline Middle School and Boys and Girls Club*
- *East Cliff Family Health Center*
- *East Cliff Village/Portola businesses*
- *Planned redevelopment*
- *Live Oak Farmer's Market*

Residential: *Live Oak*

- *Approximately 6550 people live within ½ mile radius*

Recreational:

- *Simpkins Family Swim Center*
- *Twin Lakes State Beach*

Transit Connections:

Bus route 66: Downtown Santa Cruz to Capitola Mall, via Water/17th Ave (60 minute headways)

7) 41ST AVENUE – CAPITOLA/PLEASURE POINT

Approximate Location: 41st Avenue/ROW, Milepost 16.8

Alternate Possible Locations: *Jade Street Park or Cliff Drive areas*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Pleasure Point business district*
- *41st Avenue businesses (commercial, services, hotels)*
- *Capitola Road and Capitola Mall businesses*

Residential: *Pleasure Point, Live Oak, Capitola Jewel Box, Opal Cliffs*

- *Approximately 5370 people live within ½ mile radius*

Recreational:

- *East Cliff Drive shoreline and path*
- *Jade Street Park*

Transit Connections:

Bus route 66: Downtown Santa Cruz to Capitola Mall (60 minute headways)

Bus route 68: Downtown SC to Capitola Mall via Broadway/Portola (60 minute headways)

Bus route 69A: Downtown SC to Watsonville via Capitola Rd/Airport Blvd (60 minute headways)

Bus route 69W: Capitola Rd to Cabrillo/Watsonville (60 minute headways)

8) CAPITOLA VILLAGE/DEPOT HILL

Approximate Location: Monterey Ave/Park Ave, Milepost 15.7

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Capitola Village*
- *Capitola City Hall*
- *Bay Avenue business*
- *New Brighton Middle School*

Residential: *Depot Hill, Capitola Village, Upper Village, Cliffwood Heights*

- *Approximately 4680 people live within ½ mile radius*

Recreational:

- *Capitola City Beach*
- *Monterey Avenue Park*
- *Nobel Gulch Park*
- *Soquel Creek*

Transit Connections:

Bus route 54: Capitola – Aptos – La Selva Beach (1 time weekdays, 3 times per day weekends)

Bus route 55: Capitola Mall to Rio Del Mar via Soquel (60 minute headways)

9) NEW BRIGHTON/CABRILLO - CAPITOLA

Approximate Location: New Brighton Road – across freeway from Cabrillo College Dr, Milepost 14.2

Alternate Possible Locations: *Park Ave/McGregor Dr/Kennedy Dr area; Park Ave/Coronado St; State Park Drive/Seacliff Village*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Cabrillo College – if bicycle/pedestrian highway overpass built; new shuttle connections*

Residential: *Low density*

- *Approximately 1300 people live within ½ mile radius*

Recreational:

- *New Brighton State Beach*
- *New Brighton/McGregor Skate Park*

Transit Connections: *Currently none*

10) SEACLIFF VILLAGE/CABRILLO

Approximate Location: State Park Drive/ROW, Milepost 13.2

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Seacliff Village (commercial)*
- *Cabrillo College – via bus or shuttle connections*
- *State Park Drive/Soquel Drive businesses, Aptos*
- *Future developments in the area (e.g. Poor Clares Property)*

Residential: *Seacliff Village, Aptos/State Park/Soquel*

- *Approximately 2950 people live within ½ mile radius*

Recreational:

- *Seacliff State Beach*

Transit Connections:

Bus route 54: Capitola – Aptos – La Selva Beach (1 time per day weekdays, 3 times per day weekends)

Bus route 55: Capitola Mall to Rio Del Mar via Soquel (60 minute headways)

11) APTOS VILLAGE

Approximate Location: Soquel Dr/Aptos Creek Rd area, Milepost 12.5

Alternate Possible Locations: *Trout Gulch Road/Soquel Dr*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Aptos Village*
- *Seacliff Village*

Residential: *Aptos*

- *Approximately 2175 people live within ½ mile radius*

Recreational:

- *Aptos Village Park*
- *Rio Del Mar State Beach*
- *Forest of Nisene Marks State Park*

Transit Connections:

Bus route 71: Santa Cruz to Watsonville via Soquel/Freedom (30 minute headways)

12) SEASCAPE

Seasonal Station

Approximate Location: Seascape Blvd/Seascape Resort Dr, Milepost 10.3

Alternate Possible Locations: *Clubhouse Dr/Sumner Ave*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Seascape Village*

Residential: *Seascape, Rio Del Mar*

- *Approximately 1860 people live within ½ mile radius*

Recreational:

- *Beaches*
- *Seascape Resort*
- *Seascape Park*

Transit Connections:

Bus route 54: Capitola – Aptos – La Selva Beach (1 time per day weekdays, 3 times per day weekends)

Bus route 56: Capitola Mall to La Selva via Soquel (2 times per day weekdays)

13) DOWNTOWN - WATSONVILLE

Approximate Location: West Beach St/Walker Street, Milepost 1.7

Alternate Possible Locations: *Ohlone Parkway*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Downtown Watsonville*
- *Cabrillo College Watsonville Center*
- *Watsonville City Hall*

Residential: *Downtown Watsonville*

- *Approximately 4750 people live within ½ mile radius*

Recreational:

- *Watsonville Slough Trails*
- *Marinovich Park*
- *Ramsay Park*
- *Watsonville Plaza*

Transit Connections:

Bus route 72: Watsonville to Corralitos via Green Valley Rd (60 minute headways)
Bus route 74: Watsonville to Hospital/Freedom Center (60 minute headways)
Bus route 75: Watsonville to Monte Vista via Green Valley Rd (60 minute headways)
Bus route 77: Watsonville to Crestview Center and Pajaro (60 minute headways)
Bus route 79: Watsonville to College Dr via East Lake Ave (60 minute headways)
Bus route 91X Commuter Express SC-Cabrillo-Watsonville (30 minute headways)

14) PAJARO/WATSONVILLE JUNCTION

Approximate Location: Pacific Ave/Beach St, Milepost 20

Alternate Possible Locations: *Depot Park*

Destinations Nearby:

Commercial/ Jobs/Educational/Services:

- *Pajaro*
- *Pajaro Middle School*

Residential: *Pajaro*

- *Approximately 1450 people live within ½ mile radius*

Recreational:

- *Pajaro River*

Transit Connections:

Monterey-Salinas Transit (MST) Route 28: Watsonville-Pajaro-Moss Landing-Castroville-Salinas via Highway 1 (60 minute headways)

MST Rroute 29: Watsonville-Pajaro-Las Lomas-Prunedale-Salinas (60 minute headways)

Planned: *Capitol Corridor Extension (Salinas-San Jose-Oakland-Sacramento)*

Amtrak Coast Daylight (San Fransciso-Los Angeles)

Potential future "around the bay" connections to Monterey Peninsula

APPENDIX I – ADDITIONAL INFORMATION ON EXAMPLE RAIL SYSTEMS IN THE U.S.

Source: SCCRTC, 2015

APPENDIX I: ADDITIONAL INFORMATION ON EXAMPLE RAIL SYSTEMS IN THE U.S.

Example	ROW (miles)	Service Span	Typical Headways	# trains/ day (one direction)	Annual Ridership	Weekday/ Weekend ridership split	Fares (one way adult)	Fare Structure	Annual O&M Costs	Annual Fare Revenue	Farebox Recovery Rate	Cost per boarding
LOCOMOTIVE												
Caltrain (current)	77	5am-midnight	12 min (peak) to 60 min (off peak)	Weekdays: 46, Weekends: 18	13M	58,429 average weekday, 17,392 Saturdays, 8,849 Sundays	$3.25-$13.25	Zone System	$98M	$55M	51%	8.00
Capital Metro, Austin TX	32	5am-6:30pm M-Th, 5am-12:30am F, 10:20am-11pm Sa	30 min (peak) to 60 min (off peak)	18/20 M-Th, 24/26 F, 14 S	530K	2,500 average weekday	$2.75	Flat Rate	$14.3M Wikipedia	$2.3M	20%	22.00
Metrolink LA	388, 512 including shared miles	3:58am-10:10pm M-F, 6:15am-11:30pm Sa-Su	15 min (peak) to 60 min (off peak) to 180 min (weekends)	169 weekdays, 44 Saturday, 38 Sunday	12.07M	41K weekdays, 2,498 avg weekends	$5.00-$27.50	Flat boarding fare plus $0.25 per station	$75.3M	$35,8M	55%	13.04
Altamont Corridor Express (ACE)	86	4:20am-6:38pm M-F	Approx hourly 4:20am-7:05am, 3:35pm-6:38pm	4 roundtrips weekdays	790K	3,700 weekdays	$4.50-$13.75	Distance based (per stop)	$12.2M	$4.2M	34%	16.00
Music City Star (Nashville)	32	5:45am-5:45pm M-Th, -10:30pm F	Approx hourly 5:45am-8:25am, 3:20pm-5:45pm	6 (7F) weekdays	280K	1,225 weekdays	$5.25	Flat rate	$4.0M	$790M	20%	14.00
Coaster (NCTD)	41	5:13am-7:10pm M-F, 8:36am-7:10pm Sa-Su	Approx 30 min, mid-day gap in service	11 weekdays, 4 weekends	1.6M	5,600 weekdays	$4-$5.50	Zone system	$18.8M	$7.2M	40%	11.52
Amtrak Capitol Corridor	168 (~120 miles Sac to SJ)	4:30am-9:55pm M-F, 5:50am-9:10pm Sa-Su	Approx hourly	15 weekdays, 11 weekends	1.7M	Not measured	$6-$43	Distance based (per stop)	$58.3M	$29.6M	50%	U/A
Northstar Commuter Rail (Minnesota Metropolitan Council)	40	5am-6:15pm, M-F, 10:20am-7pm Sa, 9:30am-4:55 Su	30 min (peak), most trains southbound in AM, northbound in PM	6 M-F, 3 Sa-Su	787K	3,100 weekday	$3-$6	Distance based (per stop)	$17.7M	$2.6M	24%	22.55
RailRunner Express (NMDOT)	97	4:32am-9pm M-F, 7:30am-10:33pm Sa, 7:30am-8:12pm Su	30 min - 60 min peak	11 weekdays, 5 Sa, 4 Su	1.1M	3,700 average weekday,	$2-$10	Zone System	$27.1M	$3M	10%	24.86
HEAVY DMU												
SMART (Sonoma-Marin)	43 (phase 1), 70 final system	5-10am, 12-9pm	30 min	15	4,756 per day forecasted	U/A	Not finalized, avg fare assumed $5.07	Zone System	Projected $24M in 2017	$1.5M projected 2017, $4M by 2020	33+%	U/A
WES (Portland EMU)	15	5:21am-9:28am, 3:28pm-7:35pm M-F	30 min (peak), 6 hour gap midday	16	418K	1,880 average weekday	$2.50	Flat Rate (2 hr)	$6.5M	$450K	8%	16.00
EMU												
Caltrain (electrification, 2019)	50	5am-midnight	10min (peak), 30 min (off peak)	Increase to 6 trains per hour each direction (from 5), 114 trains a day weekdays	80% increase projected	72,000 weekday ridership projected	Same?	Same?	$4.47M increase initially, then $2.37M higher by 2035	U/A	50% reduction in required subsidy estimated	U/A

APPENDIX I: ADDITIONAL INFORMATION ON EXAMPLE RAIL SYSTEMS IN THE U.S.

Example	ROW (miles)	Service Span	Typical Headways	# trains/ day (one direction)	Annual Ridership	Weekday/ Weekend ridership split	Fares (one way adult)	Fare Structure	Annual O&M Costs	Annual Fare Revenue	Farebox Recovery Rate	Cost per boarding
PATCO Philadelphia Speedline	14.2	24 hours a day	30-45 min	103 M-W, 94 Th, 85 Fridays, 45 Sa Su	10.9M	33K Weekdays	$1.40-$3.00	Distance based (per stop)	$27.2M	$15.8M	57%	4.44
LIGHT DMU												
Sprinter (NCTD)	22	4am-9pm	30 min	34 weekdays, 6 extra trains Friday night, 3 trains Saturday, none Sunday	2.4M	7,800 weekdays	$2.00	Flat Rate	$13.8M	$2.7M	19%	6.00
DCTA A-Train (Denton County)	21	4:30am-11pm	20-40 (peak), 60-80 (off peak)	31 weekdays, 9 Saturdays	387K	2,000 weekdays, 1,100 weekend days	$3.00	Flat Rate (2hr)	$9.8M	$565K	6%	25.00
NJ Transit River line (Camden-Trenton)	34	5:27am-9:29pm M-F, 5:27am-11:59pm Sa Su	15 min (peak) 30 min (off peak)	51 M-F, 40 Sa Su	2.8M	9,014 weekdays, 5,922 Sa, 4,708 Su	$1.50	Flate Rate	$31.2M	$2.4M	8%	11.00
LIGHT EMU												
Sacramento LRT	23 Gold line, 38.6 miles total	3:53am-11:43pm	15 min weekdays, 30 min weekends	Blue Line: 67 M-F, 38 Sa, 33 Su Gold Line: 67 M-F, 38 Sa, 33 Su Green Line: 30 M-F, 0 Sa Su	13.2M	48,400 weekday	$2.50 2 hrs, $6 day pass	2hr transfer or day pass	$45.5M	$14.5M	30%	$2.20-$6.20 weekdays, $2.70-$15.12 weekends
STREETCAR												
Portland Streetcar (TriMet)	4 (north/ south line), 7.2 mi total	5:30am-11:30pm	15 (20 nights and Sunday)	70 weekdays, 65 Sa, 49 Su	5.6M	20,000 weekdays, 13.7k Sat, 8k Sun	$2 2 hrs, $5.00 all day	2.5 hr transfer or day pass	$99.7M (LRT and streetcar)	$43M (LRT and streetcar)	35%	$2.36 (LRT and streetcar)

APPENDIX I: ADDITIONAL INFORMATION ON EXAMPLE RAIL SYSTEMS IN THE U.S.

Example	Annual Revenue Hours	Cost per VRH	Capital Costs	Population & sq mi served by transit district	pop per sq mi	ROW ownership	Rail with Trail?	Freight Use?	Colleges within 1/2 mile	Tourists?	Quiet Zones?
LOCOMOTIVE											
Caltrain (current)	184,000	530	$67M	3.7M served, 425 sq mi	8,706	JPBX, Union Pacific		Yes, temporal separation to specific time windows	Santa Clara University, Stanford University, UCSF Mission Bay	Mostly a commuter service	None
Capital Metro, Austin TX	10,200	1115	$105M	1M served, 522 sq mi	1,916	Capital Metro		Yes, Capital Metro also runs their own freight services	University of Texas	Has additional service during SXSW	5 quiet zones (with quad gates)
Metrolink LA	164,963	456.39	$450M infrastructure,	6.8M served in 1,370 sq mi	4,964	SCRRA, Union Pacific	Yes	Yes, run simulateously and pass on sidings	Cal State LA, USC	Yes, see official 'tourism by train' site	Aneheim, Orange, Tustin
Altamont Corridor Express (ACE)	20,200	605	$48M	685K served, 1,489 sq mi	460	Union Pacific		Yes, run simultaneously	San Jose State, Mission College, Lawrence Livermore Labs,	Mostly a commuter service	Some in progress
Music City Star (Nashville)	6,800	580	$41M	1.6M served, 4,750 sq mi	337	Nashvile and Eastern RR		No, line publicly owned (planned expansion to CSX track)	Cumberland University	Mostly a commuter service	Quiet Zone in Mt. Juliet
Coaster (NCTD)	35,010	536.05	Funded via 0.5% TransNet sales tax, passed 1987	897K served, 403 sq mi	2,226	North County Transit District (NCTD)	Yes	Yes, BNSF runs simulatenously	UC San Diego	Mostly a commuter service, some tourism to Carlsbad, extra trains for Comic Con	In downtown SD
Amtrak Capitol Corridor	Not measured	U/A	$105M	Not measured		UP, JPBX	Yes	Yes, runs UP runs simultaneously	UC Davis, Laney College, San Jose State	52% of Amtrak CA passengers tourists	In Richmond, Berkeley in process, Fairfield tried
Northstar Commuter Rail (Minnesota Metropolitan Council)	15,064	$1,178	$317M	1.8M served, 638 sq mi	2,821	BNSF	Yes	Yes, BNSF runs simulatenously	University of St. Thomas Minneapolis, Minneapolis Community College	Mostly a commuter service	Anoka
RailRunner Express (NMDOT)	36,064	$751	$784M	930K served, 915 sq mi	1,016	NMDOT	Yes	Santa Fe Southern, BNSF	University of New Mexico, Santa Fe Indian School, New Mexico School for the Deaf	Mostly a commuter service	Santa Fe, San Felipe Pueblo, Albuquerque (7 sections total)
HEAVY DMU											
SMART (Sonoma-Marin)	U/A	U/A	$500M estimate, currently at $428M	5,044 persons/sq mi	5,044	SMART		Yes, restricted to "windows", freight runs on gauntlet tracks at stations	Dominican University, Santa Rosa Junior College	Weekend trains specifically for tourists, wine tourism	Several planned
WES (Portland EMU)	7,500	860	$166M	1.4M served, 570 sq mi	2,456	Portland & Western RR		Yes, frieght restricted to non-peak hours, DMUs run on gaunlets, allowing freight trains to bypass the high-level station platform	None	Mostly a commuter service	Tualatin
EMU											
Caltrain (electrification, 2019)	U/A	U/A	$785M infrastructure, $440M Rail Cars	Same	8,706	JPBX, Union Pacific		Yes, temporal separation to nighttime only, pending waiver	Santa Clara University, Stanford University, UCSF Mission Bay	Mostly a commuter service	Atherton pursuing

APPENDIX I: ADDITIONAL INFORMATION ON EXAMPLE RAIL SYSTEMS IN THE U.S.

Example	Annual Revenue Hours	Cost per VRH	Capital Costs	Population & sq mi served by transit district	pop per sq mi	ROW ownership	Rail with Trail?	Freight Use?	Colleges within 1/2 mile	Tourists?	Quiet Zones?
PATCO Philadelphia Speedline	141K	193.07	$94M	718K served, 323 sq mi	2,223	Delaware River Port Authority		No	Thomas Jefferson University Hospital, Temple University, Drexel University College of Nursing, Community College of Philadelphia (and that's just the 15-16th and Locust downtown station)	Mentioned in many tourism sites (Trip Advisor, WikiTravel, Visit Philadelphia)	None
LIGHT DMU											
Sprinter (NCTD)	30,300	455	$477M	896K served, 403 sq mi	2,223	San Diego Northern RR	Yes	Yes, temporal separation	MiraCosta College, Vista Adult Education, Palomar College, Cal State San Marcos,	Has specific visitor pass	None, Oceanside in the works
DCTA A-Train (Denton County)	20,400	480	$325M	235K served, 157 sq mi	1,497	DCTA		Yes, temporal separation	Texas Women's University, University of North Texas,	Inconclusive	Corinth, Lewisville, possibly others
NJ Transit River line (Camden-Trenton)	49,300	635	$1.1B	18.4M served, 3,450 sq mi	5,333	Conrail/NJ Transit		Yes, temporal separation with Conrail	Rutgers University Camden, Camden City College,	Camden waterfront tourism	Some in the works, none currently
LIGHT EMU											
Sacramento LRT	195,769	$115.50 (whole system)	$176M	967K served, 221 sq mi	4,375.60	Sac RT	Yes	None, (accomodated on other LRT systems w/ temporal)	Cal State Sacramento, Sacramento City College,	Old Town Sacramento, Sacramento Kings arena	Eleven quiet zone crossings
STREETCAR											
Portland Streetcar (TriMet)	529K (LRT and streetcar)	$153	$56.9M	1.5M served, 570 sq mi	2,632	City of Portland		No	Portland State University, Oregon Health and Science University	Seems like yes (no official stats)	None

Note: U/A - information was unavailable

Sources: Data drawn from the National Transit Database (latest data 2013), rail transit system public websites, Wikipedia, and published news articles.

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APPENDIX J – SMART LOCATION DATABASE USERS GUIDE

Smart Location Database

Version 2.0 User Guide

Updated: March 14, 2014

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Background

The Environmental Protection Agency's (EPA) Smart Location Database (SLD) was developed to address the growing demand for data products and tools that consistently compare the location efficiency of various places. The SLD summarizes several demographic, employment, and built environment variables for every Census block group (CBG) in the United States.[1] The attributes measured serve as indicators of the commonly cited "D" variables that have been shown in the transportation research literature to be related to travel behavior.[2] The Ds include concepts such as residential and employment *density*, land use *diversity*, *design* of the built environment, access to *destinations*, and *distance* to transit. SLD variables can be used as inputs to travel demand models, baseline data for scenario planning studies, and combined into composite indicators characterizing the relative location efficiency of CBG within U.S. metropolitan regions.

This report contains a detailed description of the data sources and methodologies used to calculate each of the variables contained in the SLD. It also discusses any known limitations associated with variables in the SLD. More information about the environmental significance of several individual variables contained in the SLD will be available in the form of fact sheets developed for EPA's EnviroAtlas[3]. Links to these fact sheets will be added to this document as they become available.

Prior versions of the SLD

A previous version of the SLD (version 0.2b) was released by EPA in early 2012. This report describes a completely new version of the SLD (version 2, herein referred to as simply the SLD) intended to replace the prior release. This updated SLD features new geographic boundaries (Census 2010 block groups), new data sources, new variables, and new methods of calculation. Due to these changes, it is not appropriate to directly compare values across the two datasets.

[1] SLD version 2.0 uses 2010 Census TIGER/Line polygons for defining block group boundaries.
[2] For a review of the research literature summarizing the relationship between built environment variables and travel behavior see Ewing and Cervero (2001; 2010), Kuzmyak et al. (2003), National Research Council (2009).
[3] www.epa.gov/research/enviroatlas

Accessing the Smart Location Database

The SLD is a free resource available to the public for download, web service, or viewing online. Options are described below:

Download:

The SLD can be downloaded as a single file geodatabase at EPA's Environmental Dataset Gateway[4]. Users who only wish to download data for a single state, metro region, or locality can use EPA's Clip and Ship tool[5].

Web service:

The SLD is available as an Esri mapping service, REST, SOAP, WMS, and KML. See the SLD web service[6] for details.

Viewing online:

Several variables from the SLD are available for viewing online. Go to http://www.epa.gov/smartgrowth/smartlocationdatabase.htm for details.

Variables available in the Smart Location Database

Table 1 lists all of the variables available in the SLD. SLD variables are grouped into topic areas.

Table 1 – Variables included in the Smart Location Database

Field	Description	Data source(s)	Coverage
Administrative			
GEOID10	Census block group 12-digit FIPS code	2010 Census TIGER/Line	Entire U.S.
TRACTCE10	Census tract FIPS code in which CBG resides	2010 Census TIGER/Line	Entire U.S.
CFIPS	County FIPS code	2010 Census TIGER/Line	Entire U.S.
SFIPS	State FIPS code	2010 Census TIGER/Line	Entire U.S.
CSA	Combined Statistical Area Code	US Census	Entire U.S.
CSA_Name	Name of CSA in which CBG resides	US Census	Entire U.S.
CBSA	FIPS for core based statistical area (CBSA) in which CBG resides	US Census	Entire U.S.
CBSA_Name	Name of CBSA in which CBG resides	US Census	Entire U.S.
CBSA-wide statistics (same value for all block groups within the same CBSA (metropolitan area))			
CBSA_Pop	Total population in CBSA	US Census	Entire U.S.
CBSA_Emp	Total employment in CBSA	Census LEHD, 2010	Entire U.S. (except PR)
CBSA_Wrk	Total number of workers that live in CBSA	Census LEHD, 2010	Entire U.S. (except PR)

[4] http://goo.gl/JCpdr
[5] http://edg.epa.gov/clipship/
[6] http://geodata.epa.gov/ArcGIS/rest/services/OA/SmartLocationDatabase/MapServer

Area			
Ac_Tot	Total geometric area of the CBG	2010 Census TIGER/Line	Entire U.S.
Ac_Unpr	Total land area in acres that is not protected from development (i.e., not a park or conservation area)	Census, Navteq parks, PAD-US	Entire U.S.
Ac_Water	Total water area in acres	Census, Navteq Water and Oceans	Entire U.S.
Ac_Land	Total land area in acres	Census, Navteq Water and Oceans	Entire U.S.
Demographics			
CountHU	Housing units, 2010	2010 decennial Census	Entire U.S.
HH	Households (occupied housing units), 2010	2010 decennial Census	Entire U.S.
TotPop	Population, 2010	2010 decennial Census	Entire U.S.
P_WrkAge	Percent of population that is working aged, 2010	2010 decennial Census	Entire U.S.
AutoOwn0	Number of households in CBG that own zero automobiles, 2010	ACS, 2010 decennial Census	Entire U.S.
Pct_AO0	Percent of zero-car households in CBG	ACS	Entire U.S.
AutoOwn1	Number of households in CBG that own one automobile, 2010	ACS, 2010 decennial Census	Entire U.S.
Pct_AO1	Percent of one-car households in CBG	ACS	Entire U.S.
AutoOwn2p	Number of households in CBG that own two or more automobiles, 2010	ACS, 2010 decennial Census	Entire U.S.
Pct_AO2p	Percent of two-plus-car households in CBG	ACS	Entire U.S.
Workers	# of workers in CBG (home location), 2010	Census LEHD, 2010	Entire U.S. (except PR)
R_LowWageWk	# of workers earning $1250/month or less (home location), 2010	Census LEHD, 2010	Entire U.S. (except PR)
R_MedWageWk	# of workers earning more than $1250/month but less than $3333/month (home location), 2010	Census LEHD, 2010	Entire U.S. (except PR)
R_HiWageWk	# of workers earning $3333/month or more (home location), 2010	Census LEHD, 2010	Entire U.S. (except PR)
R_PctLowWage	% LowWageWk of total #workers in a CBG (home location), 2010	Census LEHD, 2010	Entire U.S. (except PR)
Employment			
TotEmp	Total employment, 2010	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E5_Ret10	Retail jobs within a 5-tier employment classification scheme (LEHD: CNS07)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E5_Off10	Office jobs within a 5-tier employment classification scheme (LEHD: CNS09 + CNS10 + CNS11 + CNS13 + CNS20)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E5_Ind10	Industrial jobs within a 5-tier employment classification scheme (LEHD: CNS01 + CNS02 + CNS03 + CNS04 + CNS05 + CNS06 + CNS08)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)

E5_Svc10	Service jobs within a 5-tier employment classification scheme (LEHD: CNS12 + CNS14 + CNS15 + CNS16 + CNS19)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E5_Ent10	Entertainment jobs within a 5-tier employment classification scheme (LEHD: CNS17 + CNS18)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E8_Ret10	Retail jobs within an 8-tier employment classification scheme (LEHD: CNS07)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E8_Off10	Office jobs within an 8-tier employment classification scheme (LEHD: CNS09 + CNS10 + CNS11 + CNS13)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E8_Ind10	Industrial jobs within an 8-tier employment classification scheme (LEHD: CNS01 + CNS02 + CNS03 + CNS04 + CNS05 + CNS06 + CNS08)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except MA, PR)
E8_Svc10	Service jobs within an 8-tier employment classification scheme (LEHD: CNS12 + CNS14 + CNS19)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E8_Ent10	Entertainment jobs within an 8-tier employment classification scheme (LEHD: CNS17 + CNS18)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E8_Ed10	Education jobs within an 8-tier employment classification scheme (LEHD: CNS15)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E8_Hlth10	Health care jobs within an 8-tier employment classification scheme (LEHD: CNS16)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E8_Pub10	Public administration jobs within an 8-tier employment classification scheme (LEHD:CNS20)	Census LEHD, 2010 InfoUSA, 2011 (MA only)	Entire U.S. (except PR)
E_LowWageWk	# of workers earning $1250/month or less (work location), 2010	Census LEHD, 2010	Entire U.S. (except MA and PR)
E_MedWageWk	# of workers earning more than $1250/month but less than $3333/month (work location), 2010	Census LEHD, 2010	Entire U.S. (except MA and PR)
E_HiWageWk	# of workers earning $3333/month or more (work location), 2010	Census LEHD, 2010	Entire U.S. (except MA and PR)
E_PctLowWage	% LowWageWk of total #workers in a CBG (work location), 2010	Census LEHD, 2010	Entire U.S. (except MA and PR)
D1 - Density			
D1a	Gross residential density (HU/acre) on unprotected land	Derived from other SLD variables	Entire U.S.
D1b	Gross population density (people/acre) on unprotected land	Derived from other SLD variables	Entire U.S.
D1c	Gross employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c5_Ret10	Gross retail (5-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c5_Off10	Gross office (5-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c5_Ind10	Gross industrial (5-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)

D1c5_Svc10	Gross service (5-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c5_Ent10	Gross entertainment (5-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Ret10	Gross retail (8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Off10	Gross office (8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Ind10	Gross industrial (8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Svc10	Gross service (8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Ent10	Gross entertainment (8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Ed10	Gross education(8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Hlth10	Gross health care (8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1c8_Pub10	Gross retail (8-tier) employment density (jobs/acre) on unprotected land	Derived from other SLD variables	Entire U.S. (except PR)
D1d	Gross activity density (employment + HUs) on unprotected land	Derived from other SLD variables	Entire U.S. (PR does not reflect employment)
D1_Flag	Flag indicating that density metrics are based on total CBG land acreage rather than unprotected acreage	Derived from other SLD variables	Entire U.S. (PR does not reflect employment)
D2 - Diversity			
D2a_JpHH	Jobs per household	Derived from other SLD variables	Entire U.S. (except PR)
D2b_E5Mix	5-tier employment entropy (denominator set to observed employment types in the CBG)	Derived from other SLD variables	Entire U.S. (except PR)
D2b_E5MixA	5-tier employment entropy (denominator set to the static 5 employment types in the CBG)	Derived from other SLD variables	Entire U.S. (except PR)
D2b_E8Mix	8-tier employment entropy (denominator set to observed employment types in the CBG)	Derived from other SLD variables	Entire U.S. (except PR)
D2b_E8MixA	8-tier employment entropy (denominator set to the static 8 employment types in the CBG)	Derived from other SLD variables	Entire U.S. (except PR)
D2a_EpHHm	Employment and household entropy	Derived from other SLD variables	Entire U.S. (except PR)
D2c_TrpMx1	Employment and Household entropy (based on vehicle trip production and trip attractions including all 5 employment categories)	Derived from other SLD variables	Entire U.S. (except PR)
D2c_TrpMx2	Employment and Household Entropy calculations, based on trips production and trip attractions including 4 of the 5 employment	Derived from other SLD variables	Entire U.S. (except PR)

	categories (excluding industrial)		
D2c_TripEq	Trip productions and trip attractions equilibrium index; the closer to one, the more balanced the trip making	Derived from other SLD variables	Entire U.S. (except PR)
D2r_JobPop	Regional Diversity. Standard calculation based on population and total employment: Deviation of CBG ratio of jobs/pop from regional average ratio of jobs/pop	Derived from other SLD variables	Entire U.S. (except PR)
D2r_WrkEmp	Household Workers per Job, as compared to the region: Deviation of CBG ratio of household workers/job from regional average ratio of household workers/job	Derived from other SLD variables	Entire U.S. (except PR)
D2a_WrkEmp	Household Workers per Job, by CBG	Derived from other SLD variables	Entire U.S. (except PR)
D2c_WrEmIx	Household Workers per Job Equilibrium Index; the closer to one the more balanced the resident workers and jobs in the CBG.	Derived from other SLD variables	Entire U.S. (except PR)
D3 – Design			
D3a	Total road network density	NAVSTREETS	Entire U.S.
D3aao	Network density in terms of facility miles of auto-oriented links per square mile	NAVSTREETS	Entire U.S.
D3amm	Network density in terms of facility miles of multi-modal links per square mile	NAVSTREETS	Entire U.S.
D3apo	Network density in terms of facility miles of pedestrian-oriented links per square mile	NAVSTREETS	Entire U.S.
D3b	Street intersection density (weighted, auto-oriented intersections eliminated)	NAVSTREETS	Entire U.S.
D3bao	Intersection density in terms of auto-oriented intersections per square mile	NAVSTREETS	Entire U.S.
D3bmm3	Intersection density in terms of multi-modal intersections having three legs per square mile	NAVSTREETS	Entire U.S.
D3bmm4	Intersection density in terms of multi-modal intersections having four or more legs per square mile	NAVSTREETS	Entire U.S.
D3bpo3	Intersection density in terms of pedestrian-oriented intersections having three legs per square mile	NAVSTREETS	Entire U.S.
D3bpo4	Intersection density in terms of pedestrian-oriented intersections having four or more legs per square mile	NAVSTREETS	Entire U.S.

D4 –Transit			
D4a	Distance from population weighted centroid to nearest transit stop (meters)	GTFS; TOD Database 2012	Participating GTFS transit service areas/TOD Database locations
D4b025	Proportion of CBG employment within ¼ mile of fixed-guideway transit stop	TOD Database 2012, SLD unprotected area polygons	Entire U.S.
D4b050	Proportion of CBG employment within ½ mile of fixed-guideway transit stop	TOD Database 2012, SLD unprotected area polygons	Entire U.S.
D4c	Aggregate frequency of transit service within 0.25 miles of block group boundary per hour during evening peak period	GTFS	Participating GTFS transit service areas
D4d	Aggregate frequency of transit service (D4c) per square mile	Derived from other SLD variables	Participating GTFS transit service areas
D5 – Destination Accessibility			
D5ar	Jobs within 45 minutes auto travel time, time-decay (network travel time) weighted	NAVSTREETS	Entire U.S. (except PR)
D5ae	Working age population within 45 minutes auto travel time, time-decay (network travel time) weighted	NAVSTREETS	Entire U.S.
D5br	Jobs within 45-minute transit commute, distance decay (walk network travel time, GTFS schedules) weighted	NAVSTREEETS GTFS	Participating GTFS transit service areas (except PR)
D5be	Working-age population within 45-minute transit commute, time decay (walk network travel time, GTFS schedules) weighted	NAVSTREETS GTFS	Participating GTFS transit service areas
D5cr	Proportional Accessibility to Regional Destinations - Auto: Employment accessibility expressed as a ratio of total MSA accessibility	Derived from other SLD variables	Entire U.S. (except PR)
D5cri	Regional Centrality Index – Auto: CBG D5cr score relative to max CBSA D5cr score	Derived from other SLD variables	Entire U.S.
D5ce	Proportional Accessibility to Regional Destinations - Auto: Working age population accessibility expressed as a ratio of total CBSA accessibility	Derived from other SLD variables	Entire U.S.
D5cei	Regional Centrality Index – Auto: CBG D5ce score relative to max CBSA D5ce score	Derived from other SLD variables	Entire U.S.
D5dr	Proportional Accessibility of Regional Destinations - Transit: Employment accessibility expressed as a ratio of total MSA accessibility	Derived from other SLD variables	Participating GTFS transit service areas
D5dri	Regional Centrality Index – Transit: CBG D5dr score relative to max CBSA D5dr score	Derived from other SLD variables	Participating GTFS transit service areas
D5de	Proportional Accessibility of Regional Destinations - Transit: Working age population accessibility expressed as a ratio of total MSA	Derived from other SLD variables	Participating GTFS transit service areas

APPENDIX K – GLOSSARY OF TERMS

GLOSSARY OF TERMS

Acronyms

CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
CTPP	Census Transportation Planning Package
CWR	Continuously Welded Rail
DMU	Diesel Multiple Unit
EMU	Electric Multiple Unit
EPA	Environmental Protection Agency
FRA	Federal Railroad Administration
FRR	Fare box Recovery Rate
FTA	Federal Transit Administration
GTFS	General Transit Feed Specification
IP	Iowa Pacific Holdings
JPA	Joint Powers Authority
JTW	Journey-to-Work
LRT	Light Rail Transit
MBSST	Monterey Bay Sanctuary Scenic Trail
METRO	Santa Cruz Metropolitan Transit District
MPO	Metropolitan Planning Organization
MTIS	Major Transportation Investment Study
NCTD	North County Transit District
NTD	National Transit Database
O&M	Operations & Maintenance
P3	public-private partnership
PRT	Personal Rapid Transit
PTC	Positive Train Control
ROW	Right-of-Way
RTC	Santa Cruz County Regional Transportation Commission (also SCCRTC)
RTD	Regional Transit District
RTDM	Regional Travel Demand Model
RTP	Regional Transportation Plan
SC	Santa Cruz
SCCRTC	Santa Cruz County Regional Transportation Commission
SC&MBRR	Santa Cruz and Monterey Bay Railway (Iowa Pacific Holding)
SFMTA	San Francisco Municipal Transportation Authority
SMART	Sonoma-Marin Area Rail Transit
STOPS	Simplified Trips-on-Project Software
TAMC	Transportation Agency for Monterey County
TIGER	Transportation Investment Generating Economic Recovery
TOD	Transit Oriented Development
UCSC	University of California-Santa Cruz
UPRR	Union Pacific Railroad
VMT	Vehicle Miles Traveled
VTA	Santa Clara Valley Transportation Authority
WES	TriMet Westside Express Service

GLOSSARY OF TERMS

Mode of Service Definitions

Mode is a system for carrying transit passengers described by specific right-of-way, technology, and operational features.

Automated Guideway Transit (also called **personal rapid transit**, **group rapid transit**, or **people mover**) is an electric railway (single or multi-car trains) of guided transit vehicles operating without an onboard crew. Service may be on a fixed schedule or in response to a passenger activated call button.

Bus is a mode of transit service (also called **motor bus**) characterized by roadway vehicles powered by diesel, gasoline, battery, or alternative fuel engines contained within the vehicle. Vehicles operate on streets and roadways in fixed-route or other regular service. Types of bus service include local service, where vehicles may stop every block or two along a route several miles long. When limited to a small geographic area or to short-distance trips, local service is often called **circulator**, **feeder**, **neighborhood**, **trolley**, or **shuttle service**. Other types of bus service are **express service**, **limited-stop service**, and **bus rapid transit (BRT)**.

Commuter Rail is a mode of transit service (also called **metropolitan rail**, **regional rail**, or **suburban rail**) characterized by an electric or diesel propelled railway for urban passenger train service consisting of local short distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas, or between urbanized areas and outlying areas. Such rail service, using either locomotive hauled or self-propelled railroad passenger cars, is generally characterized by multi-trip tickets, specific station to station fares, railroad employment practices and usually only one or two stations in the central business district. Intercity rail service is excluded, except for that portion of such service that is operated by or under contract with a public transit agency for predominantly commuter services. Most service is provided on routes of current or former freight railroads. Examples include the Sound Transit's commuter rail system in Puget Sound, Metrolink in Los Angeles, California, and British Columbia's West Coast Express.

Diesel Multiple Unit is the generic term for a diesel powered train where a separate locomotive is not required because the traction system is contained under various cars in the train.

Heavy Rail is a mode of transit service (also called **metro**, **subway**, **rapid transit**, or **rapid rail**) operating on an electric railway with the capacity for a heavy volume of traffic. It is characterized by high speed and rapid acceleration passenger rail cars operating singly or in multi-car trains on fixed rails; separate rights-of-way from which all other vehicular and foot traffic are excluded; sophisticated signaling, and high platform loading.

Intercity (Passenger) Rail is service connecting central city to central city on a railroad right-of-way in densely traveled corridors.

Light Rail is a mode of transit service (also called **streetcar**, **tramway**, or **trolley**) operating passenger rail cars singly (or in short, usually two-car or three-car, trains) on fixed rails in right-of-way that is often separated from other traffic for part or much of the way. Light rail vehicles are typically driven electrically with power being drawn from an overhead electric line via a trolley or a pantograph; driven by an operator on board the vehicle; and may have either high platform loading or low level boarding using steps.

GLOSSARY OF TERMS

Financial—Capital Expense Definitions

Capital Expenses are expenses related to the purchase of equipment. Equipment means an article of non-expendable tangible personal property having a useful life of more than one year and an acquisition cost which equals the lesser of the capitalization level established by the government unit for financial statement purposes or $5,000. Capital expenses in the National Transit Database accounting system do not include all expenses which are eligible uses for federal capital funding assistance; some of those expenses are included with operating expenses in the NTD accounting system.

Facilities capital expense includes administration, central/overhaul maintenance facilities, light maintenance and storage facilities, and equipment of any of these items. Categories of Facilities capital expense are:

> **Guideway** is capital expense for right-of-way facilities for rail or the exclusive use of buses including the buildings and structures dedicated for the operation of transit vehicles including elevated and subway structures, tunnels, bridges, track and power systems for rail, and paved highway lanes dedicated to bus. Guideway does not include passenger stations and transfer facilities.
>
> **Passenger Stations** is capital expense for passenger boarding and debarking areas with platforms including transportation centers and park-and-ride facilities but excluding transit stops on streets.
>
> **Administration Buildings** is capital expense for buildings which house management and support activities.
>
> **Maintenance Facilities** is capital expense for building used for maintenance activities such as garages and shops.

Rolling Stock capital expense is expense for vehicles, including boats, used by transit agencies. Categories of Rolling Stock capital expense are:

> **Revenue Vehicles** is capital expense for vehicles used to transport passengers.
>
> **Service Vehicles** is capital expense for vehicles used to support transit activities such as tow trucks, supervisor cars, and police cars

All Other capital expense includes furniture, equipment that is not an integral part of buildings and structures, shelters, signs, and passenger amenities (e.g., benches) not in passenger stations. Categories of All Other capital expense are:

> **Fare Revenue Collection Equipment** is capital expense for equipment used to collect fares such as fare boxes, turnstiles, and ticket machines.
>
> **Communications and Information Systems** is capital expense for equipment for communicating such as radios and for information management such as computers and software.
>
> **Other** is capital expense that does not fall in the categories defined above.

GLOSSARY OF TERMS

Financial—Operating Expense Definitions

Operating Expenses are the expenses associated with the operation of the transit agency and goods and services purchased for system operation. It is the sum of either the functions or the object classes listed below.

An **Operating Expense Function** is an activity performed or cost center of a transit agency. The four basic functions are:

> **Vehicle Operations** includes all activities associated with the subcategories of the vehicle operations function: transportation administration and support; revenue vehicle operation; ticketing and fare collection; and system security.
>
> **Vehicle Maintenance** includes all activities associated with revenue and non-revenue (service) vehicle maintenance, including administration, inspection and maintenance, and servicing (cleaning, fueling, etc.) vehicles.
>
> **Non-Vehicle Maintenance** includes all activities associated with facility maintenance, including: maintenance of vehicle movement control systems; fare collection and counting equipment; structures, tunnels and subways; roadway and track; passenger stations, operating station buildings, grounds and equipment; communication systems; general administration buildings, grounds and equipment; and electric power facilities.
>
> **General Administration** includes all activities associated with the general administration of the transit agency, including transit service development, injuries and damages, safety, personnel administration, legal services, insurance, data processing, finance and accounting, purchasing and stores, engineering, real estate management, office management and services, customer services, promotion, market research and planning.

An **Operating Expense Object Class** is a grouping of expenses on the basis of goods and services purchased. Nine Object Classes are reported as follows:

> **Salaries and Wages** are the pay and allowances due employees in exchange for the labor services they render on behalf of the transit agency. The allowances include payments direct to the employee arising from the performance of a piece of work.
>
> **Fringe Benefits** are the payments or accruals to others (insurance companies, governments, etc.) on behalf of an employee and payments and accruals direct to an employee arising from something other than a piece of work.
>
> **Employee Compensation** is the sum of "Salaries and Wages" and "Fringe Benefits."
>
> **Services** include the labor and other work provided by outside organizations for fees and related expenses. Services include management service fees, advertising fees, professional and technical services, temporary help, contract maintenance services, custodial services and security services.
>
> **Materials and Supplies** are the tangible products obtained from outside suppliers or manufactured internally. These materials and supplies include tires, fuel and lubricants. Freight, purchase discounts, cash discounts, sales and excise taxes (except on fuel and lubricants) are included in the cost of the material or supply.

Utilities include the payments made to various utilities for utilization of their resources (e.g., electric, gas, water, telephone, etc.). Utilities include propulsion power purchased from an outside utility company and used for propelling electrically driven vehicles, and other utilities such as electrical power for purposes other than for electrically driven vehicles, water and sewer, gas, garbage collection, and telephone.

Casualty and Liability Costs are the cost elements covering protection of the transit agency from loss through insurance programs, compensation of others for their losses due to acts for which the transit agency is liable, and recognition of the cost of a miscellaneous category of corporate losses.

Purchased Transportation is transportation service provided to a public transit agency or governmental unit from a public or private transportation provider based on a written contract. Purchased transportation does not include franchising, licensing operation, management services, cooperative agreements or private conventional bus service.

Other Operating Expenses is the sum of taxes, miscellaneous expenses, and expense transfers:

Total Operating Expense is the sum of all the object classes or functions.

Financial—Revenue Definitions

Passenger Fare Revenue is revenue earned from carrying passengers in regularly scheduled and paratransit service. Passenger fares include: the base fare; zone premiums; express service premiums; extra cost transfers; and quantity purchase discounts applicable to the passenger's ride. Passenger Fare Revenue is listed only for operating revenue sources.

Government Funds, Federal (also called **Federal Assistance**) is financial assistance from funds that are from the federal government at their original source that are used to assist in paying the operating or capital costs of providing transit service.

Government Funds, State (also called **State Assistance**) is financial assistance obtained from a state government(s) to assist with paying the operating and capital costs of providing transit services.

Government Funds, Local (also called **Local Assistance**) is financial assistance from local governments (below the state level) to help cover the operating and capital costs of providing transit service. Some local funds are collected in local or regional areas by the state government acting as the collection agency but are considered local assistance because the decision to collect funds is made locally.

Directly Generated Funds are any funds generated by or donated directly to the transit agency, including passenger fare revenues, advertising revenues, concessions, donations, bond proceeds, parking revenues, toll revenues from other sectors of agency operations such as bridges and roads, and taxes imposed by the transit agency as enabled by a state or local government. Some Directly Generated Funds are funds earned by the transit agency such as fare revenues, concessions, and advertising, while other Directly Generated Funds are Financial Assistance such as taxes imposed by the transit agency. Directly Generated Funds are listed in three categories:

Passenger Fares which is defined above.

Transit Agency Funds, Other Earnings are Directly Generated Funds that do not come from passenger fares or from government funds.

Government Funds, Directly Generated are Directly Generated Funds that come from taxes, toll transfers, and bond proceeds.

Total Government Funds is the sum of Federal assistance, state assistance, local assistance, and that portion of directly generated funds that accrue from tax collections, toll transfers from other sectors of operations, and bond proceeds.

Service Supplied Definitions

Average Speed of a vehicle is the miles it operated in revenue service divided by the hours it is operated in revenue service.

Miles of Track is a measure of the amount of track operated by rail transit systems where each track is counted separately regardless of the number of tracks on a right-of-way.

Revenue Service is the operation of a transit vehicle during the period which passengers can board and ride on the vehicle. Revenue service includes the carriage of passengers who do not pay a cash fare for a specific trip as well as those who do pay a cash fare; the meaning of the phrase does not relate specifically to the collection of revenue.

Revenue Vehicle is a vehicle in the transit fleet that is available to operate in revenue service carrying passengers, including spares and vehicles temporarily out of service for routine maintenance and minor repairs. Revenue vehicles do not include service vehicles such as tow trucks, repair vehicles, or automobiles used to transport employees.

Vehicle Total Miles are all the miles a vehicle travels from the time it pulls out from its garage to go into revenue service to the time it pulls in from revenue service, including "deadhead" miles without passengers to the starting points of routes or returning to the garage. For conventional scheduled services, it includes both revenue miles and deadhead miles.

Vehicle Revenue Miles are the miles traveled when the vehicle is in revenue service (i.e., the time when a vehicle is available to the general public and there is an expectation of carrying passengers). Vehicles operated in fare-free service are considered in revenue service. Revenue service excludes school bus service and charter service.

Vehicle Total Hours are the hours a vehicle travels from the time it pulls out from its garage to go into revenue service to the time it pulls in from revenue service, including "deadhead" miles without passengers to the starting points of routes or returning to the garage. For conventional scheduled services, it includes both revenue time and deadhead time.

Vehicle Revenue Hours are the hours traveled when the vehicle is in revenue service (i.e., the time when a vehicle is available to the general public and there is an expectation of carrying passengers). Vehicles operated in fare-free service are considered in revenue service. Revenue service excludes school bus service and charter service.

GLOSSARY OF TERMS

Vehicle Characteristics and Amenities

Accessible Vehicles are transit passenger vehicles that do not restrict access, is usable, and provides allocated space and/or priority seating for individuals who use wheelchairs.

Alternate Power transit vehicles are vehicles powered by any fuel except straight diesel or gasoline.

Rehabilitated transit vehicles are those rebuilt to the original specifications of the manufacturer.

Self-propelled vehicles have motors or engines on the vehicle that supply propulsion for the vehicle. Fuel may be carried on board the vehicle such as diesel fueled buses or supplied from a central source such as overhead wire power for light rail vehicles.

Traffic Light Preemption equipped vehicles are able to, either automatically by sensors or as a result of operator action, adjust traffic lights to provide priority or a green light.

Unpowered vehicles are those without motors. They are either pulled by self-propelled cars or locomotives or moved by cables such as an inclined plane.

Other Terms

At-grade crossings are types of crossings where railroad tracks, or railroad tracks and roads, intersect at ground-level.

Automatic Train Control (ATC) is a safety system where a train receives continuous data in order to maintain the correct speed and to prevent trains from passing stop signals if the driver should fail to react.

Ballast is a rock bed that supports tracks and provides drainage.

California Public Utilities Commission (CPUC) is a California agency that regulates privately owned electric, telecommunications, natural gas, water and transportation companies, in addition to household goods movement and rail safety. In terms of rail safety, the CPUC regulates issues such as grade crossings and clearance envelopes in which trains may operate.

Capitol Corridor is a 172-mile passenger train route operated by Amtrak in California. It carries about 16,000 passengers daily between the San Francisco Bay Area and Sacramento. In the Bay Area, it travels between Martinez an San Jose Diridon station via the East Bay. BART is the management agency for the Capitol Corridor on behalf of the Capitol Corridor Joint Powers Board (CCJPA).

Deadhead are non-revenue train movements where trains are being moved from one location to another without carrying any passengers.

Federal Railroad Administration (FRA) is the federal agency created in 1966, as a division of the U.S. Department of Transportation (DOT), to promote rail transportation and safety and to absorb the regulatory duties of the Interstate Commerce Commission in the area of railroads. The FRA sets standards for crashworthiness for vehicles that provide commuter or other short-haul rail passenger train service in a metropolitan or suburban area in the United States. Rapid transit operations in an urban area that are not

connected to the general railroad system of transportation are exempt from these requirements. The selection of rolling stock depends on compliance with FRA regulations.

Federal Transit Administration (FTA) is the administration within the U.S. DOT that provides financial and technical assistance to local public transit systems.

FRA-compliant is a term referring to rail vehicles that are compliant with FRA requirements for crashworthiness.

Gate Downtime is the period of time that a rail gate at an at-grade crossing is in the down position when it stops traffic to allow trains to cross a roadway or a pedestrian crossing.

Headway is the time interval between trains moving in the same direction on a particular route.

Level Boarding refers to having trains that have interior floors that are level with station platforms, so that a passenger does not have to climb any steps to board the train. This allows people in wheelchairs to board quickly and easily without any special assistance. It also speeds up boarding and disembarking by able-bodied passengers, passengers with strollers, and bicyclists, who tend to be slowed down by steps.

Lifecycle Costs is made up from the costs reflecting not only the acquisition and development costs but also the operational and support costs throughout the life of the equipment.

Minimum Operable Segment (MOS) is a portion or segment of an ultimate transit project that must be able to operate as a stand-alone system.

Positive Train Control (PTC) is a form of collision avoidance that integrates command, control, communications, and information systems for controlling train movements with safety, security, precision, and efficiency.

Rolling Stock is the collective term that describes all the vehicles that move on a railway. It usually includes both powered and unpowered vehicles, for example locomotives and railroad cars.

Run Time is the time required for a train to cover a given distance, from one location to another. End-to-end run time is the time required to run from one end of the rail line to another.

Siding is a track next to the mainline, connected by turnouts, used to allow trains to pass each other (usually on a single-track railroad).

Track Classes are a system of classification for track quality developed by the Federal Railroad Administration. The class of a section of track determines the maximum possible running speed limits and the ability to run passenger trains. Lower speed classifications include Class I (up to 15 mph), II (up to 30 mph), III (up to 60 mph), and IV (up to 79mph).

Wayside is the area right next to the tracks, but within the rail right-of-way.

Sources: American Public Transit Association, California High Speed rail Authority, Caltrain, Federal Railroad Administration