

## **Contents**

INTRODUCTION	1
HISTORY AND BACKGROUND OF THE SANTA CRUZ BRANCH LINE	
LOCAL CONTEXT	4
RAIL-WITH-TRAIL CONSTRAINTS	
A VISION FOR THE GREAT SANTA CRUZ TRAIL.  CASE STUDIES OF SIGNATURE TRAILS	<b>15</b>
COMPARING THE EXPERIENCE OF TRAIL-ONLY WITH RAIL-WITH-TRAIL	24
PROJECT COST. FUNDING OPPORTUNITIES THE BENEFITS OF A HIGHEST QUALITY TRAIL TAXPAYERS DESERVE CONSIDERATION OF THE TRAIL-ONLY OPTION	27 28 29
APPENDIX A: LEVEL OF TRAFFIC STRESS METHODS	33
APPENDIX B: USAGE ESTIMATION METHOD	34
APPENDIX C: LEVEL OF SERVICE	35



## INTRODUCTION

California voters approved Proposition 116 in 1990, providing new funding for passenger rail statewide. In 2012, the Santa Cruz County Regional Transportation Commission (SCCRTC) used \$10.2 million of this funding to purchase the Santa Cruz Branch Rail Line. The current direction for Rail-with-Trail was prescribed as a result of Prop 116 funding requirements and the extent it constrained the examination of alternatives both before and after. However, options exist for alternative approaches—such as a Trail-Only design—if these funds are repaid.

SCCRTC's Santa Cruz Branch Rail Line Rail Transit Feasibility Study and Monterey Bay Sanctuary Scenic Trail Master Plan (MBSST) both include a 32-mile multi-use trail, parallel to rail. Unfortunately, no study has considered the option for a Trail-Only scenario. We appreciate that this plan would be incomplete without consideration of the vast amount of time, cost, and effort that has already been expended on policy decisions, community building, and contractual obligations related to the corridor. As such, this plan has at its core a desire to assist the SCCRTC in achieving its bold, aspirational health, safety, and sustainability goals for transportation over the next 20 years and beyond.

So in this plan we ask, "Is there a better use for this corridor?"

To facilitate a regional, public discussion regarding the option to convert up to 32 miles of existing lightly used rail corridor to a highest quality trail between Santa Cruz and Watsonville, this report presents a vision for implementation of a Trail-Only option.

"

# PRIMARY OBJECTIVES OF THIS PLAN

- Create a vision and garner support for a continuous Great Santa Cruz Trail (without rail) along the 32-mile corridor
- Establish The Great
   Santa Cruz Trail-Only
   as an alternative to
   be considered as
   part of the SCCRTC's
   corridor studies



# HISTORY AND BACKGROUND OF THE SANTA CRUZ BRANCH LINE

The Santa Cruz Branch Rail Line began operations in 1876, when the Santa Cruz Railroad opened freight and passenger service between Santa Cruz and Watsonville. Freight service north of Watsonville largely stopped with the closing of the Cemex plant in Davenport. Santa Cruz Big Trees and Pacific Railroad seasonal tourist trains serve the Santa Cruz Beach Boardwalk, but no regular passenger service has existed since the last run of the Suntan Special in 1959.

No shortage of studies have debated the feasibility of recommencing passenger, recreation, or freight rail between Davenport and Watsonville compared to railbanking or abandonment. Items under debate include the potential for any train service to improve congestion on Highway 1, draw Watsonville riders, or generate sufficient capital and operational funding.

The Rail Transit Feasibility and the SCCRTC's Monterey Bay Sanctuary Scenic Trail Network Master Plan (MBSST) currently guide SCCRTC's decisions regarding the 32-mile right-of-way. The SCCRTC has selected Iowa Pacific Holdings to operate railway service on the Branch Line through September 2022. Although all planning efforts to date have agreed that, where feasible, a trail should parallel

the tracks, no planning efforts have studied a Trail-Only scenario. Yet it is just this scenario that holds promise to be fully constructible and operational within a reasonable time frame using discrete and attainable funding.

A Trail-Only alternative must be studied to determine how it could support the County's ambitious goals:<sup>1</sup>

"To increase bicycle use to 20% of all work trips and to increase general bicycle trips to 5% of all trips by the year 2035."<sup>2</sup>

"

#### BIRTH OF THE GREAT SANTA CRUZ TRAIL GROUP

SCCRTC's acquisition of and focus on the rail right-of-way. coupled with its ambitious policy goals related to multimodal transportation in the county, have spurred impassioned debate around how best to use the Santa Cruz Branch Rail Line right-of-way for the public good. Local agencies have generally been supportive of rail along the corridor and have financed several of the studies concluding the viability of a Rail-with-Trail option. When the Rail Transit Feasibility Study was presented in 2015, local advocacy groups, business leaders, and individuals took a closer look at the design constraints, cost, funding sources, and projected ridership in implementing rail alongside a pedestrian and bicycle path.

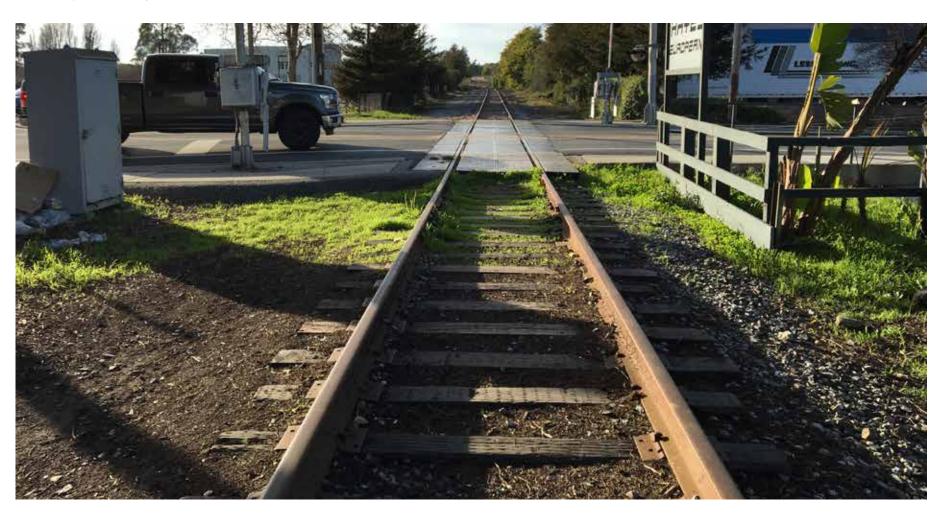
http://www.SCCRTC.org/wp-content/uploads/2014/07/Final-2014-RTP-FULL-7-01-2014.pdf

<sup>2 &</sup>lt;a href="http://sccrtc.org/wp-content/uploads/2011/08/2011BikePlan">http://sccrtc.org/wp-content/uploads/2011/08/2011BikePlan</a> SC County.pdf

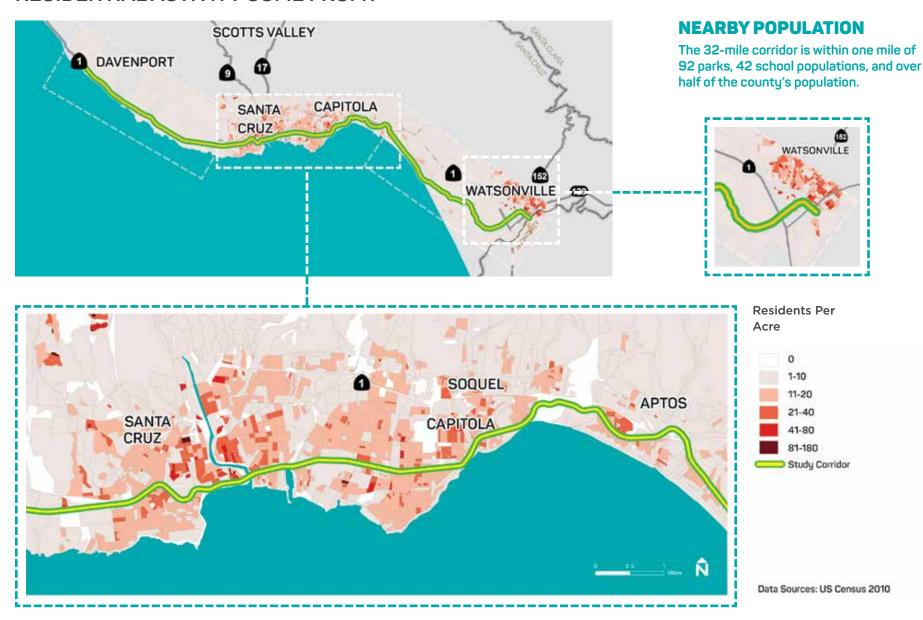
## **LOCAL CONTEXT**

In this chapter the demographic characteristics of the corridor are explored in order to understand the level of activity that can be anticipated along different reaches of

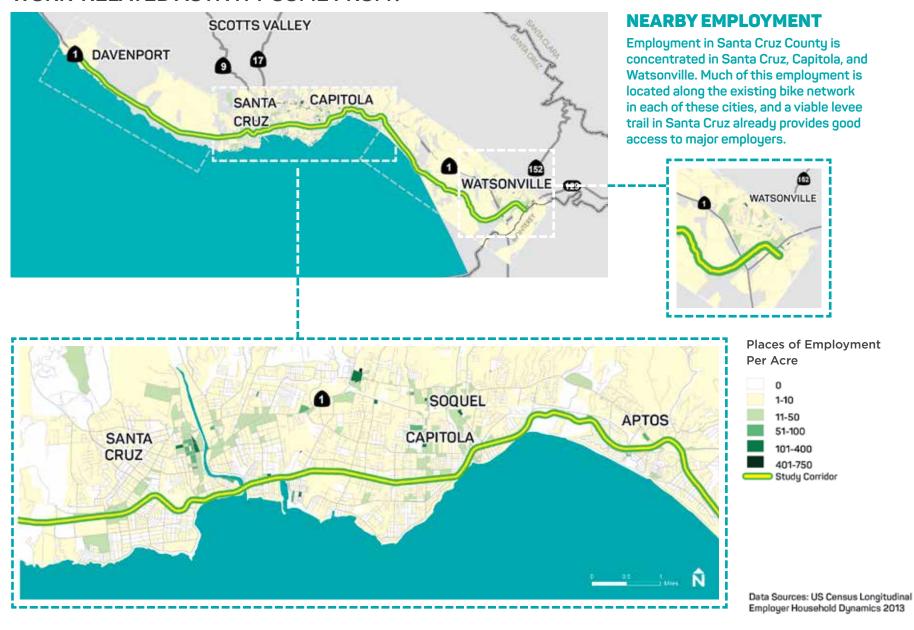
the trail. Furthermore, the natural and built environments are discussed to come to a richer understanding of potential constraints to the Rail-with-Trail scenario.



# WHERE WILL THE HIGHEST RESIDENTIAL ACTIVITY COME FROM?



### WHERE WILL THE HIGHEST **WORK-RELATED ACTIVITY COME FROM?**



#### HOW FAR WILL PEOPLE WALK TO USE THE TRAIL?



#### **TRAIL WALKSHEDS**

"Walksheds" are areas within a 15 minute walk to corridor access points, and are a common way to measure accessibility of recreational amenities. Walksheds are important to consider as they indicate how far people would have to walk to use the trail facility. Despite limited connectivity in the northern, and portions of the southern segments, the overall convenience of access for people walking and biking would be higher in a Trail-Only scenario, because it would not be constrained by designated rail crossings.

WATSONVILLE



#### **TRAIL BIKESHEDS**

"Bikesheds" are areas within 2 miles bikingdistance to corridor access points. The 2 mile on street biking distance is about a ten minute ride. Bikesheds are smaller on hilly sections of road to account for the additional energy required for biking uphill (25,000 joules is the energy required to bike 2 miles on flat ground). Bikesheds are important to consider as they indicate who is likely to bike to and use a trail facility, and where they will be traveling from.

The cities of Santa Cruz, Capitola, and Watsonville have the most bike accessibility to and from the trail corridor. Bikeshed analysis provides an excellent opportunity to leverage the highest quality Santa Cruz Trail with as high quality on-street routes in the region.

#### HOW FAR WILL PEOPLE RIDE TO USE THE TRAIL?





Cyclists Access Points

Study Corridor

Bikesheds (with 25,000 joules)

#### Bike Network

Paved Trail (off street) Unpaved Trail (off street) On-Street Bike Lane (adjacent to vehicle lane) On-Street Bike Route (signs or shared route

markings only)



## **RAIL-WITH-TRAIL CONSTRAINTS**

The construction of an attractive continuous trail without on-street detours depends on securing sufficient width to maintain two way bicycle and pedestrian traffic. Constraints posed by width limitations may influence both a Rail-with-Trail and Trail-Only option, but with the Trail-Only option, the solution might simply be to reduce the trail width. The Rail-with-Trail depends upon potentially expensive design solutions such as bridges, retaining walls, and safety structures to achieve the SCCRTC policy level preferred design cross section of a 12' minimum trail with a 20' envelope for train operations. Right-ofway purchase or dedication may also be required in some places.

#### CONSTRAINTS ALONG THE SANTA CRUZ BRANCH LINE RIGHT-OF-WAY

The SCCRTC identified locations where underlying legal property boundaries constrain the corridor to less than 25

feet in the MBSST Study. That 25-foot threshold is based on SCCRTC's policy of retaining a minimum setback from the centerline between the two rails of 8.5 feet on both sides, plus an 8-foot two-way path, in constrained conditions. These are illustrated on the constraints maps on pages 10-12.

Although property lines may extend beyond this width, in many cases steep slopes, property encroachment, narrow crossing structures, or sensitive habitats limit the apparent available width to less than 25 feet. Fifty-one such constrained areas related to topography, adjacent land uses, built environment, and bridges were identified through field observations in February 2016.

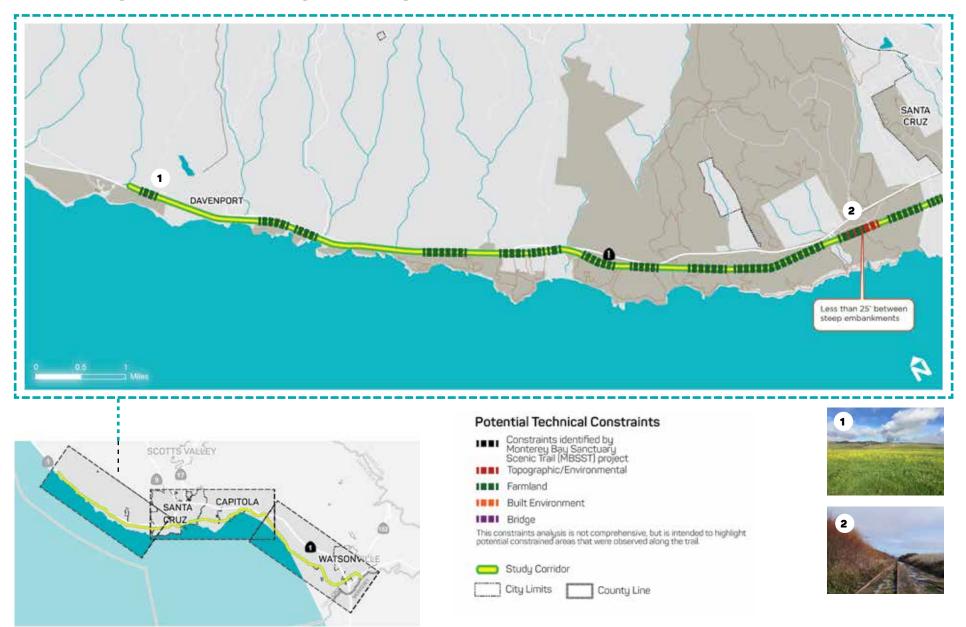
**Topographic constraints** include segments along cliff sides, steep embankments, and old growth trees. **Natural constraints** include adjacent farmland, public beaches, possible wetlands, and protected wildlife

areas. **Built environment constraints** include narrow city streets, private properties, building structures and private driveways. **Bridge-based constraints** include four bridges as narrow as 15 feet wide that could be repurposed for a Trail-Only scenario. According to the MBSST, the Rail-with-Trail scenario will require 22 bridge accommodations including the use of cantilevers or parallel bridges.

Although the exact design solutions for the Rail-with-Trail design are unknown at this time, potential solutions include relocating tracks, significant retaining walls, on-street detours, and new bridges. The figures on the following three pages show apparent design or right-of-way availability constraints, many of which have not been identified in planning efforts to date.



# FARMLAND AND ENVIRONMENTAL DESIGN CONSTRAINTS ARE PREDOMINANT IN THE NORTH REACH



# COSTLY OR OUT OF DIRECTION SOLUTIONS TO DESIGN CONSTRAINTS IN THE DENSELY POPULATED CENTRAL SECTION CAN BE AVOIDED IN A TRAIL-ONLY SCENARIO



# A SURPRISING NUMBER AND A VARIETY OF DESIGN CONSTRAINTS IN THE SOUTH REACH SUPPORT A TRAIL-ONLY SOLUTION





Source: USDOT, "Rails-with-Trails: Lessons Learned," August 2002

#### SANTA CRUZ RAIL-WITH-TRAIL APPARENT CONSTRAINTS

	NORTHERN	CENTRAL	SOUTH
Bridges	0	7	3
Environmental	1	5	7
Man-made	0	4	3
Farmland	14	0	5
MBSST-Identified	0	1	1

Bridge, environmental, man-made, and farmland constraints identified in a corridor walk far outnumber the constraints identified through preliminary analysis for the MBSST Plan.

# LEVEL OF TRAFFIC STRESS (LTS) ANALYSIS

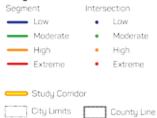
Should the design challenges prove insurmountable with the Rail-with-Trail option, those segments without sufficient available right-of-way will be bridged with on-street detours. Available data related to speed limits and roadway design were used to estimate the level of traffic stress<sup>3</sup> along a selection of shortest path out-of-direction travel segments on the existing or planned on-street network. At this point in the development of the MBSST trail plan, it is unclear how many detours off the trail will be required.

This illustration of known potential detours shows what the user experience will be should design challenges to a continuous path be insurmountable. A higher level stress experience with significant out-of-direction travel is unlikely to attract the interested users who are concerned about safety. In the Trail-Only scenario, we believe these onstreet experiences can be eliminated.

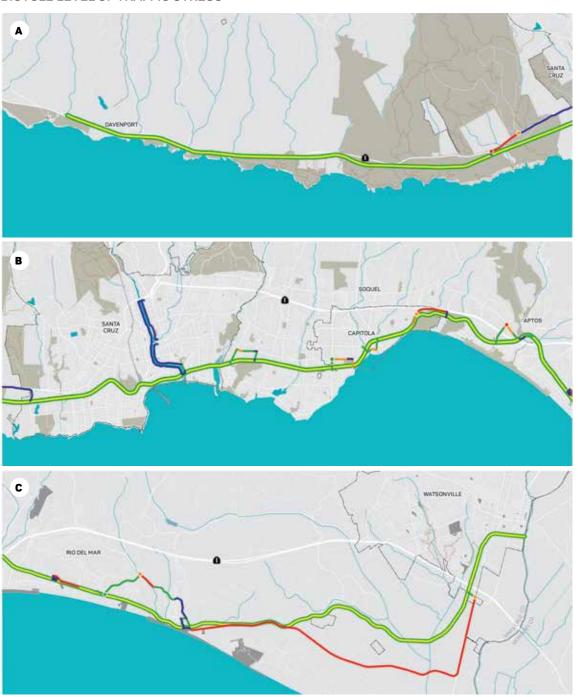
3 Level of Traffic Stress Appendix A



#### Bicycle Level of Traffic Stress



#### **BICYCLE LEVEL OF TRAFFIC STRESS**



## A VISION FOR THE GREAT SANTA CRUZ TRAIL

66 A wide, beautifully landscaped, and completely off-street multi-use trail running from Davenport to Watsonville, through Santa Cruz.

#### A WORLD-CLASS TRAIL FOR SANTA CRUZ COUNTY

The Great Santa Cruz Trail builds on the excellent work done with the award-winning Monterey Bay Sanctuary Scenic Trail Network Master Plan, and furthers the policy goals of Santa Cruz County. The difference is the opportunity presented by considering a Trail-Only scenario.

A wide, beautifully landscaped, and completely off-street multi-use path running from Davenport to Watsonville, through Santa Cruz, will help the county achieve its ambitious goal of 20% bicycle mode share by 2035. The Great Santa Cruz Trail can be the primary trunk route for pedestrian, bike and electric bike commuters throughout the region, and a beautiful recreational resource for locals and visitors.

A premier trail honors all residents with a high quality experience, including the 10% of Santa Cruz County's residents who do not own a car, and the 16% below the poverty line. It will be comfortable and safe for people of all ages.

Finally, the Great Santa Cruz Trail will act as a beautiful linear park showcasing the natural beauty of the Santa Cruz County coastline without the interruption of train activity in close proximity. With room for native flora landscaping and calming spaces, users can spend afternoons strolling along the ocean and getting lost in thought. This peaceful oasis will serve as a sanctuary for Santa Cruz County residents, an amenity for creative businesses and a world-class visitor attraction.

## 

- Serves the transportation needs of the Santa Cruz community today and into the future
- Becomes a regional trail resource for people of all ages and abilities, from our community and beyond
- Increases access to jobs and destinations, sustainability, and public health
- Becomes a world-class resource for Santa Cruz County
- Ensures the highest and best use of public resources
- Advances health, economic, environmental and equity outcomes

#### **NORTH REACH**





#### **◀** BEFORE

The vision at this constrained section in the northern stretch of the trail shows how beautifully the trail fits into the rural portions of the existing rail line without scarring the bluffs with grading or retaining walls. In other less constrained locations, an expansive design that permits separation of pedestrian and equine users would be possible. However, in this lower volume section, a shared use trail without separation would be suitable.

The Santa Cruz Trail Group's Vision includes maintaining the rock formations of the beach cliffs and preserving the view of the surprisingly rolling terrain without significant fill, grading and retaining walls.

### SEABRIGHT AVE AND MURRAY STREET, SANTA CRUZ (CENTRAL REACH)



#### **BEFORE**

Where the trail crosses Seabright Avenue, a "two-can" crossing treatment allows crossings for people walking and bicycling separate from vehicle movements. Along this stretch, the onstreet bike lanes are maintained on Murray Street. The trail's bikeway is 12-feet here with 2.5-foot buffers between the roadway, bikeway, and walkway. Where the Seabright Avenue sidewalk crosses the bikeway, "watch for bikes" and "yield to peds" paint markings reinforce safe user interactions. The Santa Cruz Trail Group's Vision includes maintaining access to local destinations along the corridor using safe and established street crossing methods. Clearly, a train through this area would dramatically change the environment and utility for pedestrians, people on bicycles and residents.



## **APTOS VILLAGE (CENTRAL REACH)**





#### **■** BEFORE

In Aptos Village, the trail parallels Soquel Drive. Near the intersection of Trout Gulch Drive, the trail becomes especially constrained between the roadway and the adjacent parking lot. Thus, this section of trail would borrow the 10-foot width of the existing bike lanes to create a 12-foot bikeway with 1.5-foot edges and separation between modes. We have chosen this approach because of the importance of enhancing the village environment for pedestrians in this small shopping, restaurant area. Because the right-of-way opens up just west of here, all on-street parking can be sustained. As on Seabright Avenue, and other constrained locations, a train through this area would dramatically change the environment and utility for pedestrians, people on bicycles and residents.

## 41ST AVE, CAPITOLA (CENTRAL REACH)





#### **■** BEFORE

Even in this relatively-constrained area near the intersection with 41st Ave, a separate use configuration can be employed to mitigate conflict in an area of high density. Here, a 16-foot total width on the bikeway allows for anticipated high ridership, comfortable passing, and conversational side-by-side riding. A 7-foot walkway is buffered from people bicycling, by plants and lighting. The Santa Cruz Trail Group's Vision includes maintaining separation between people bicycling and walking wherever possible to make the trail suitable for both lingering and commuting. This would not be possible in the Rail-with-Trail scenario without affecting existing built edges.

## LA SELVA BEACH (SOUTHERN REACH)



#### **BEFORE** ▶

The trail along La Selva Beach enhances the extraordinary sense of place provided by the efficient and beautiful trestles. At the iconic La Selva bridge, the trail connects residential areas with nearby beach recreation opportunities. On the trestle, the trail becomes constrained to only 12-feet. An 8-foot shareduse trail is flanked by 2-foot edges of a different material, encouraging slower foot traffic to use the edges with wheeled traffic closer to the centerline. Signage encourages kind yielding behavior between users. There is insufficient space on the 22 bridges of the corridor to accommodate a train and path; thus the trail will need to go off-corridor, a new bridge will need to be built, or the trail will need to be cantilevered off the existing bridge (assuming the bridge can support it). The Santa Cruz Trail Group's Vision includes using existing infrastracture at a fraction of the cost of the Rail Plan.



## CASE STUDIES OF SIGNATURE TRAILS

Since the mid-1980s, the number of bicycle and pedestrian trails along existing or former rail rights-of-way has grown from less than 200 to more than 1,800.

Since the mid-1980s, the number of bicycle and pedestrian trails along existing or former rail rights-of-way has grown from less than 200 to more than 1,800, totaling more than 21,000 miles, and spanning all 50 states. Among these 1,800 trails, around 90% are Trail-Only corridors, where train operations have ceased.<sup>4</sup>

This chapter focuses on describing five existing and proposed signature trail projects from around the country. These trails were chosen based on a variety of factors, including length, location, and connectivity to job centers. These case studies illustrate how common it is to have Trail-Only projects without an adjacent operating train.

## MONTEREY BAY COASTAL RECREATION TRAIL

The Monterey Bay Coastal Recreation Trail is an 18-mile long Rail-to-Trail path that stretches from Castroville to Pacific Grove, in California. The trail follows the area's former Southern Pacific railroad line and uses former Fort Ord trails.<sup>5</sup> The Monterey Peninsula Regional Park District (MPRPD) initially proposed the idea to transform the abandoned rail line into a public trail in the early 1970s. Starting in 1976, the MPRPD and other cities along the former rail line began construction on the trail that was opened to the public in 1984.<sup>6</sup>

## RAZORBACK REGIONAL GREENWAY TRAIL

The Razorback Regional Greenway—opened in May 2015—is a **36-mile Rail-to-Trail that was constructed in phases to link six Northwest Arkansas communities,** from Bentonville to Fayetteville. Importantly, it provides direct access to popular community destinations including downtowns, schools, retail centers, historic sites, major employers, recreational opportunities and the University of Arkansas.<sup>7</sup> Most sections of the trail mix people bicycling and walking on the same path, using design cues to encourage safe passage.

<sup>4</sup> http://www.railstotrails.org/resourcehandler.ashx?id=2982

<sup>5</sup> https://www.traillink.com/trail/ monterey-bay-coastal-recreation-trail.aspx

<sup>6</sup> http://www.montereycountyweekly.com/news/ local\_news/could-sand-city-link-be-the-latestpiece-of-a/article\_4479e81b-6dfd-548d-9ffb-0727cfea22b5.html

<sup>7 &</sup>lt;a href="http://www.traillink.com/trail/razorback-regional-greenway.aspx">http://www.traillink.com/trail/razorback-regional-greenway.aspx</a>

#### COACHELLA VALLEY LINK

Once constructed, the Coachella Valley Link (CV Link) will be a 50-mile multi-use transportation corridor along the Whitewater River, connecting eight cities in Coachella Valley and two federally recognized tribal areas. The Trail-Only pathway was never a rail corridor. It is intended as a safe, healthy off-street alternative to Highway 111. Where space permits, cyclists, pedestrians, golf carts, and neighborhood electric vehicles will also be separated from each other on the CV Link. For the most part, the corridor is separated from the surface street system by overpasses and underpasses. The planning and implementation of CV Link has been led by the Coachella Valley Association of Governments (CVAG), with construction anticipated between 2017 and 2020.

#### **EASTSIDE CORRIDOR REGIONAL TRAIL**

The Eastside Corridor Regional Trail is 16.7-miles long, connecting some of the largest and fastest growing communities and employment centers in King County, Washington within the Eastside Rail Corridor (ERC)—a 42-mile rail corridor that provided freight rail service for over 100 years. The corridor was brought into public ownership and has been railbanked. Freight rail currently operates on an approximately 12-mile segment between Woodinville and Snohomish. A multi-use trail is in the planning stages. It is envisioned to be the most heavily used trail corridor in the eastern suburbs of Seattle, serving everyday commute and recreation trips, and linking to several other regional trails to provide an integrated trail network.8

#### **GREAT ALLEGHENY PASSAGE**

The Great Allegheny Passage (GAP) is a 150-mile long trail corridor that travels from Cumberland, Maryland to Pittsburgh, Pennsylvania. The eastern section of the trail connects to the C&O Canal Towpath, which spans from Cumberland to Washington, DC, making the total length of the non-motorized path 335 miles.9 While the majority of the GAP is a Trail-Only corridor, there is a 16-mile stretch between Cumberland and Frostburg, Maryland that shares the rightof-way with the Western Maryland Scenic Railroad (WMSR), which offers both freight and passenger services on a limited basis at travel speeds of no more than 15 miles per hour. 10 The GAP opened in 2013. 11

- http://www.nps.gov/experiences/gap-connection.htm
- 10 https://gaptrail.org/
- 11 2013, June 16. "Celebration marks the completion of the Great Allegheny Passage Trail." Examiner

Among these 1,800 trails, around 90% are Trail-Only corridors, where people walk and bicycle where train passage has ceased.

## ·SUMMARY

The review of signature trails in concert with a review of the Rails-to-Trails Conservancy study of 88 trails entitled 'America's Rails-with-Trails" (September 2013) illustrates that:

- The average setbacks between rail and trail is 20 30 ft in Rail-with-Trails corridors, with higher speed trains yielding larger setbacks or safety separations
- Most trails along rail corridors are Trail-Only
- Rails to Trails conversions provide broad economic, environmental, health and transportation benefits

<sup>8 &</sup>lt;a href="http://kingcounty.gov/services/parks-recreation/">http://kingcounty.gov/services/parks-recreation/</a> parks/capital-improvements/erc.aspx

#### SIGNATURE TRAIL OVERVIEW

PEER TRAIL	LOCATION	TRAIL LENGTH (MILES)	RAIL BANKING	VISION	FUNDING	OUTCOMES/ BENEFITS	COST PER MILE
Monterey Bay Coastal Recreation Trail	Monterey County, California	18	-	Maximize the economic and education benefits of the National Marine Sanctuary; address transportation impact issues such as parking and traffic circulation	The cost of this section of the coastal trail is unclear, due to the various mechanisms for making the trail corridor available. However, the 2007 Monterey Bay Sanctuary Scenic Trail Master Plan identifies a cost of \$28.5 million for upgrades of existing sections and construction of new trail segments along the 34 miles between Pacific Grove to the Santa Cruz County line.*	Public connection to natural resources, economic development, non-motorized transportation alternative	\$0.8 Million
Razorback Regional Greenway	Northwestern Arkansas	36	-	Create a "spine" trail and integrate existing trails into a regional trail network	\$38 million, mostly funded through TIGER and private grant	Economic development, increased foot traffic to nearby businesses, education, mobility	\$1.1 Million
CV Link	Riverside County, California	50	-	Create an alternative to Highway 111 for non-motorized and Neighborhood Electric Vehicle uses	\$99.4 million, \$75.6 million funded through various sources	Public health, safety, tourism, increased property values, reduced VMT, job creation	\$2 Million
ERC Regional Trail	King County, Washington	42	Yes	Provide a regional non-motorized trail for everyday commuters and recreational users	\$132–\$183 million, funding not yet identified	Regional mobility, economic development, public health, non- motorized transportation, cultural preservation, art	\$2.1-\$3.6 Million
Great Allegheny Passage	West Pennsylvania/ Central Maryland	150	Yes	Provide a non-motorized, multipurpose trail	\$80 million, various funding sources	Economic development, local business growth	\$0.5 Million
Great Santa Cruz Trail	Santa Cruz	32	TBD	A highest quality trail to meet Santa Cruz County Transportation goals	TBD	Improved health, safety, and sustainability	Estimated \$1.6 Million

<sup>\*</sup>Source: www.co.monterey.ca.us/planning/Long-range-planning/Moss Landing Community Plan/Monterey Bay Sanctuary Scenic Trail Master Plan July 2007.pdf



# COMPARING THE EXPERIENCE OF TRAIL-ONLY WITH RAIL-WITH-TRAIL

## **ANTICIPATED USAGE**

We used bicycle demand forecasting methods published by the National Cooperative Highway Research Program (NCHRP) in Report 552 to estimate the number of existing bicyclists who would shift their trips to the corridor and people who would begin cycling as a result of it (see Appendix B for description). The estimates of total daily usage on page 25 show that 6,105 cyclists will use the trail daily, which compares favorably to the 2,750 daily round-trip users for a train.<sup>12</sup>

The numbers modeled on the following page do not include pedestrians. According to the City of Santa Cruz Active Transportation Plan (2016), the county ratio of cyclists to pedestrians for commuting to work is 45 to 55, respectively. Therefore, assuming a similar ratio, we can expect 13,567 daily bicycle and pedestrian users of the Great Santa Cruz Trail. The prospect of achieving these pedestrian numbers is enhanced by providing safe and convenient separation from cyclists.

We believe that a highest quality trail in our region will attract ridership exceeding

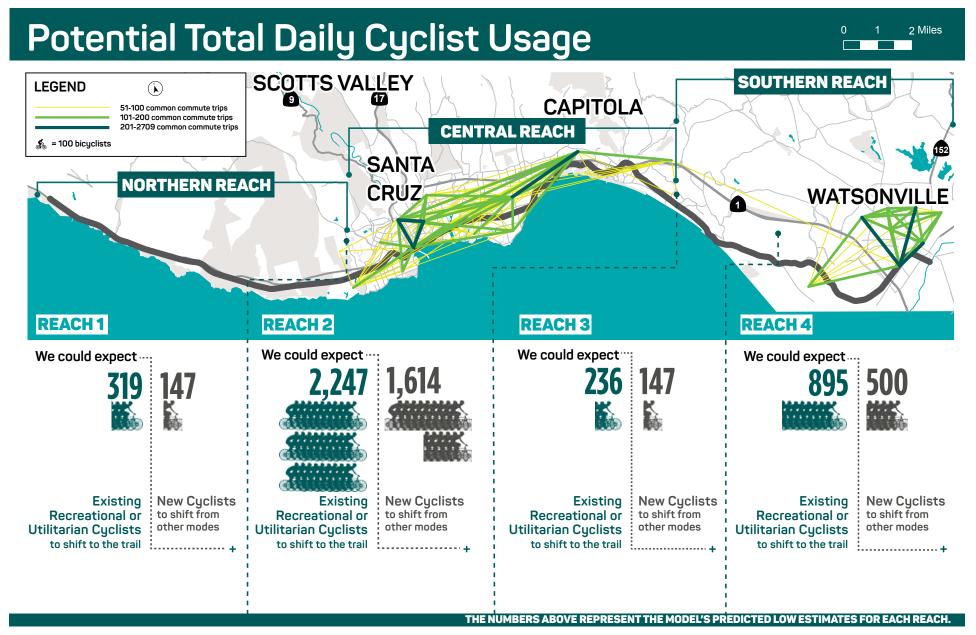
that calculated by the standard predicted by the NCHRP model. The Trail-Only option capitalizes on available corridor width to provide additional separation between users and it also uses existing bridge structures to avoid on-street detours. This world-class trail facility will serve as the backbone of a countywide network, and as a catalyst for shifting bicycle and pedestrian commutes from 3.5% to 20% countywide.

In addition to congestion relief, bicycling, and walking combined with other attainable public transport options such as bus, ridesharing, network transportation, and paratransit offer many similar benefits that are not disputed by this analysis. These include shifting trips from single-occupancy vehicles onto transit, increasing transportation options for traveling between destinations, and providing low cost and reliable ways for people with limited abilities to travel more than 3 miles.

However, because it was excluded from the initial environmental review, the benefits and impacts of a Trail-Only option have never been duly studied.

<sup>12</sup> Based on 5,500 boardings from Scenario G of the Santa Cruz Branch Rail Line Rail Transit Feasibility Study

Model estimates indicate that the Great Santa Cruz Trail has the potential to draw **6,105** daily cyclists (sum of all numbers in the chart below), including commuters, students, and those cycling for recreation. The numbers below represent the low estimates for each reach.



## THE PEDESTRIAN AND BICYCLIST USER EXPERIENCE

As described, current estimating methods are insensitive to trail qualities. However, the user experience will vary depending upon trail width, the likelihood of encountering and passing other types of users from either direction, and the presence of a centerline.<sup>13</sup>

We used accepted Level of Service methods to describe the bicycle user experience (using low-end bike only activity) at the locations envisioned on pages 16-20. We compared the user experience assuming the trail dimensions for the easy to build Trail-Only scenario with the lowest impact Rail-with-Trail design scenario. The Rail-with-Trail crosssection was calculated by reducing the space available by 17' for the train and setback.14 15

surpasses 15% of all trail users. A grade of E (very poor) predicts a trail that has reached its functional capacity at construction, where users will experience crowding and may shift to other routes.<sup>16</sup>

In sum, the user experience in the Trail-Only scenario will be vastly superior and will help meet the 20% commuter goal.

#### **GRADING THE USER EXPERIENCE**

SEGMENT	TRAIL-ONLY (available width for bicyclists)***	RAIL-WITH-TRAIL (available width for entire trail)***
Aptos Village	B (12')	E (12')
La Selva Beach	B (8')	N/A (0')*
41st Ave, Capitola	B (14')	E (11')
North Reach	A (12')	B (8')**
Seabright Ave, Santa Cruz	B (12')	F (8')

<sup>\*</sup>Where no width remains available after accounting for rail right-of-way, either a new facility such as a bridge would have to be funded, designed, and constructed, or the trail would have to divert onto the street. The trail LOS methodology does not apply to on-street facilities, so no LOS was calculated for this scenario, in which it is assumed a new pedestrian bridge is not constructed.

In general, grades of A-C are considered acceptable, with a B indicating a trail that has good bicycling conditions and retains significant room to absorb more users...

In general, grades of A-C are considered acceptable, with a B indicating a trail that has good bicycling conditions and retains significant room to absorb more users while maintaining an ability to provide a high-quality user experience. Research shows every additional foot of trail width has a positive impact on LOS, and the experience of bicycle users is significantly impacted when the amount of foot traffic

<sup>16</sup> Patten, Schneider, Toole, Hummer, and Rouphail.(July 2006) Shared-Use Path Level of Service Calculator - A User's Guide.FHWA-HRT-05-138

<sup>\*\*</sup>We have assumed grading, filling, or additional right-of-way could be identified to avail 8' of right-of-way for the trail. The trail LOS methodology does not apply to on-street facilities, so no LOS was calculated for this scenario.

<sup>\*\*\*</sup> All widths exclusive of the shoulder, which is not considered a travelway for people on bicycles.

<sup>13</sup> Level of Service Appendix. The Level of Service calculation is based on the method described in: Patten, Schneider, Toole, Hummer, and Rouphail.(July 2006) Shared-Use Path Level of Service Calculator - A User's Guide.FHWA-HRT-05-138

<sup>14</sup> Minimum 8' trail width is assumed where apparent available right of way does not accommodate Rail-with-Trail.

<sup>15</sup> Where insufficient width remains for a standard Rail-with-Trail, we increase the total width available, assuming the SCCRTC will achieve a design solution through facility grading or retaining walls. Due to available width in these sections, in all Rail-with-Trail scenarios, we have assumed a shared-use path design with no separation between people walking and bicycling.

## **BRINGING THE VISION TO LIFE**

## **PROJECT COST**

The table to the right compares the estimated per-mile capital costs of the Trail-Only and Rail-with-Trail scenarios.

There are still many decisions to be made regarding either scenario's design, vehicle type, alignment, amenities, access improvements, and other investments. These decisions will have significant impacts on the costs of either outcome. However, the table demonstrates the vast differences in per mile start-up capital needs. To put these numbers into context. we estimate the Trail-Only scenario to serve tens of thousands of people daily (including people who would start bicycling due to the comfort provided by the new off-street facility), whereas the SCCRTC estimates 2.750 daily round-trip users.<sup>17</sup> A Trail-Only design will provide transportation, economic, recreation, and health benefits to Santa Cruz County residents and visitors at a fraction of the cost of passenger rail.

TRAIL-ONLY: A MORE COST EFFECTIVE AND TIMELY OPTION

COSTS	TRAIL-ONLY	RAIL-WITH-TRAIL*
Construction Costs (per mile)	\$1.6 million**	\$4 million***

<sup>\*</sup> Represents costs for the trail portion

Eight miles of the MBSST trail are currently in design and environmental review phases, with construction scheduled in 2017. The remainder of the trail will be built as funding becomes available. This study acknowledges that a change in direction would require a new public process. Even so. because of the high cost of likely bridge and environmental mitigations for the full 32-mile Rail-with-Trail solution, we believe a less costly Trail-Only option could be open for use by residents and visitors much sooner.



<sup>\*\*</sup>Conservative estimate based on average cost of the five case study trails included in this report

<sup>\*\*\*</sup>Appendix C, page C-8, Monterey Bay Sanctuary Scenic Trail Network Master Plan

<sup>17</sup> SCCRTC Rail Transit Feasibility Study, Table 6-11

### **FUNDING OPPORTUNITIES**

Federal, state, regional, local, and private funds are being tapped throughout the country to improve active transportation.<sup>18</sup> Funding sources include the Transportation Alternatives Program (TAP), Recreational Trails Program, Congestion Mitigation and Air Quality Improvement (CMAQ) Program. Surface Transportation Program, TIGER Grants, Community Prevention Grants, and the Transportation Infrastructure Financing and Innovation Act (TIFIA) funding.19

Philanthropic donations for completing trail networks are increasingly common. The Walton Family Foundation supported much of the Razorback. In Philadelphia, the William Penn Foundation supported construction of a trail network as a platform for building a constituency for water quality.20

Philanthropic donations for completing trail networks are increasingly common.

Through crowdsourcing in Denver, substantial funds were received for protected bike lanes from the Gates Family Foundation, in alliance with business leaders, property owners, and young professionals.21 Throughout the country, the Knight Foundation is supporting a variety of bicycle projects in the interest of improving economic strength in communities.<sup>22</sup> A diverse coalition, supporting a project with a wide range of positive outcomes in Santa Cruz County is likely to generate substantial public and private support.

While the Proposition 116 Funding was specifically allocated for a rail project, a 2015 letter from the California Transportation Commission (CTC) clarifies that Santa Cruz County can return this money to the CTC and re-purchase the right-of-way without jeopardizing the future of a Trail-Only project.<sup>23</sup>

"Investments in trails, bike lanes, and bicycle-sharing systems have high levels of return on investment. Regions and cities have found that relatively small investments in active transportation can have outsized economic returns due to improved health and environmental outcomes and reduced negative externalities, such as automobile traffic congestion and poor air qualitu."

~ Urban Land Institute. "Active Transportation and Real Estate"

<sup>18 &</sup>lt;a href="http://www.advocacyadvance.org/docs/">http://www.advocacyadvance.org/docs/</a> PayingForInnovativeInfrastructure.pdf

<sup>19 &</sup>lt;a href="http://www.railstotrails.org/policy/building-active-">http://www.railstotrails.org/policy/building-active-</a> transportation-systems/obtaining-funding/

<sup>20</sup> http://www.insidephilanthropy.com/grants-for-parksgardens/2013/11/20/who-should-pay-for-bike-trails-privatefoundations-or-taxpay.html

<sup>21 &</sup>lt;a href="https://philanthropy.com/article/Local-">https://philanthropy.com/article/Local-</a> Governments-and/152005

<sup>22</sup> http://www.insidephilanthropy.com/home/2016/4/25/twowheeled-philanthropy-what-is-it-about-funders-and-bicycl.html#

<sup>23</sup> California Transportation Commission. September 8, 2015 letter to Supervisors Friend and McPherson, RE: Santa Cruz Branch Line

## THE BENEFITS OF A HIGHEST QUALITY TRAIL

Santa Cruz County's 2011 Bicycle Plan aspires to shift the commute mode share for bicycling from 2% to 20%.

This outcome requires a vision of bicycle facilities that accommodate large numbers of people with a variety of abilities.

The Rail-with-Trail design option faces substantial funding obstacles and offers limited transportation benefits.

A Trail-Only project is inclusive, scalable, and dynamic. Santa Cruz County residents will have many access points to the corridor. Due to its role as a piece of a broader bicycle and pedestrian network, a trail can be partially implemented and still provide benefit, and the cost of doing so permits a pilot-and-test approach to achieving a full-scale active transportation system. And, a trail-only design provides option value—it could accommodate innovative mobility devices yet to be invented or tried in Santa Cruz County. Another key benefit of a Trail-Only option is that it is substantially less expensive to build and operate over time.

Beyond these strategic investment benefits, a growing body of research suggests that high quality active transportation infrastructure will result in improved local economies and quality of life:

- Economic Development. An economic analysis of the recently opened Northwest Arkansas Razorback Regional Greenway trail projects that the region will see a three to one return on investment.<sup>24</sup> Recent studies of trail facilities in Indiana, Texas, Pennsylvania, Georgia, and Minnesota demonstrate real estate values increase with proximity to bicycle paths and walking trails.<sup>25</sup>
- Health. In Lincoln, Nebraska, every \$1 invested in bicycle trails resulted in medical cost savings of about \$3.26 Copenhagen's local government recently estimated that the physical activity generated by new bicycle paths will lead to a \$60 million reduction in healthcare costs citywide.27

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# BICYCLE-ORIENTED DESIGN

A Great Santa Cruz Trail without substantial onstreet detours will offer long seaments of protected offstreet trail, with adequate width and mode separation. serving to connect students, professionals, visitors, and residents with jobs, community destinations, and regional assets. The Great Santa Cruz Trail will be the spine of and inspiration for a world-class countywide network, including protected on-street bike lanes, secure bicycle parking, and bikesupportive designs at private and institutional destinations. High quality protected networks lead to higher ridership in locations across California and the world. inspiring business owners and real estate developers to integrate bicycle friendly designs into their business models and inspiring the level of mode share called for in the Countywide Bicycle Plan.\*

<sup>24</sup> Kelly Kemp and Josh Luck reporters for 5News (1/9/2013) "Trail System to Have Long-Term Economic Impact." (http://5newsonline.com/2013/01/09/arkansas-greenway-eye-opener/)

<sup>25</sup> http://uli.org/wp-content/uploads/ULI-Documents/ Active-Transportation-and-Real-Estate-The-Next-Frontier.pdf

<sup>26</sup> http://www.ncrailtrails.org/pdfs/CostBenefitTrailsStudy294.pdf

<sup>27</sup> Urban Land Institute Building Healthy Places Initiative. (March 2016) "Active Transportation and Real Estate: The Next Frontier". p. 44.

http://www.nytimes.com/2011/09/21/business/portland-ore-developments-cater-to-bicycle-riders.html? r=0

- Quality of Life. A Sydney, Australia study found that bicycle commuters have an overall higher quality of life than users of all other modes of transportation including driving, walking, and public transportation.<sup>28</sup> A 2015 national survey found that 52% of Americans and 63% of millennials would like to live in a place where they do not need to rely on a car.29
- Connectivity and Comfort. Separated and protected facilities that connect people to local businesses, schools, municipal services, and other important neighborhood destinations will support increased ridership citywide.

The Great Santa Cruz Trail would serve as the spine of a world-class network of bicycle and pedestrian facilities that permeates neighborhoods and job centers. With safe and comfortable facilities citywide, including secure bike parking and wayfinding, the area can anticipate seeing more people on bikes, like other cities have seen. In Washington, DC, bicycling increased 200% on Pennsylvania Avenue after the city installed a protected bicycle lane.30





<sup>28 &</sup>lt;a href="http://www.sydneycycleways.net/the-happiness-cycle/">http://www.sydneycycleways.net/the-happiness-cycle/</a>

<sup>29</sup> http://uli.org/wp-content/uploads/ULI-Documents/ America-in-2015.pdf

<sup>30</sup> http://www.peopleforbikes.org/statistics/category/ protected-bike-lane-statistics

# TAXPAYERS DESERVE CONSIDERATION OF THE TRAIL-ONLY OPTION

Santa Cruz County officials and the Great Santa Cruz Trail Group have a shared vision of increasing bicycling and walking tenfold in the next 20 years. We must commit to world-class investments to make this a reality. The time is right to capitalize on the opportunities presented by a Trail-Only scenario that increases sustainable transportation choices for the county because:

- A Trail-Only scenario has the potential to move more people quicker than any other scenario examined by the SCCRTC at a fraction of the cost. It also presents the opportunity to increase the return on other pedestrian and bike investments countywide by creating a north-south backbone that increases safety and acts as the major artery for a pedestrian and bicyclist transportation system.
- There are numerous and costly design constraints for any rail option, particularly in the central and southern reaches of the 32-mile corridor. These design constraints require substantial workarounds or off-trail detours, the costs of which are unknown at this time and will only add to what is already an expensive trail plan when compared to others

- nationwide. Further, a Rail-with-Trail scenario constrains trail capacity, and dampens its ability to provide for a 20% bicycle mode share.
- There is a substantial difference in the user experience between walking and bicycling adjacent to an active train versus the Trail-Only approach. The user experience grade, as calculated by an objective Level of Service methodology, is very high for Trail-Only and very low for Railwith-Trail. Higher train speeds and frequencies—to ensure transit service is attractive to current drivers—require larger setbacks or costly safety structures for trails. Without evidence that the proposed train will serve the needs of commuters, improve regional congestion, and connect to other high quality public transit, we reject the idea that the train will relieve congestion and that construction measures will satisfy our concerns about trail safety and use. Rail-with-Trail also forgoes forever the beauty, tranquility, and emissionfree outcomes of a Trail-Only approach.

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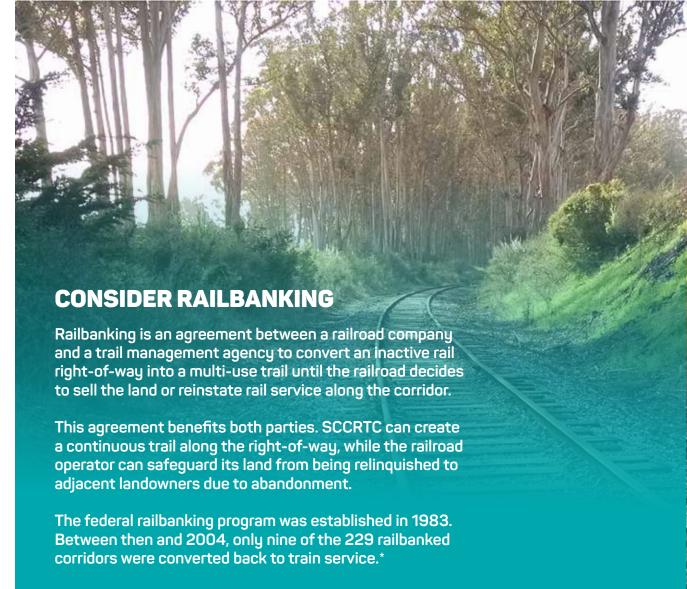
In general, transit service is attractive when it is faster than driving. But higher train speeds require larger setbacks or costly safety structures for trails.

Without evidence that the proposed train will serve the needs of commuters, improve regional congestion, and connect to other high quality public transit, we reject the idea that the train will relieve congestion and that construction measures will satisfy our concerns about trail safety and use.

Source: http://www.railstotrails.org/resourcehandler.ashx?id=2982

- Countless examples from other communities nationwide show the popularity and wisdom of public investments in more pedestrian and bike friendly infrastructure. Of the 1,800 trails in the U.S., over 90% are Trail-Only conversions from rail. Major bicycle and pedestrian infrastructure investments are being made across the U.S. and Europe. Why? Health, quality of life, and economic development benefits and community connectivity.
- Rapid changes in technology and the availability of other less costly public transit services, such as battery-powered trains, hyperloop, or bus rapid transit, provide useful alternatives for the future. Railbanking preserves the county's options for future transit service on the corridor. Further, the county can start providing real transit solutions that move substantial numbers of people some 10 to 20 years earlier.

Ultimately, the GSCTG and the SCCRTC have the same goal: to increase the pedestrian and bike share of trips to 20% as quickly as possible. This Trail-Only option gives the county the highest and quickest likelihood to achieve this stated objective. We have a choice to include the Trail-Only scenario in the county's decisionmaking process. It is our best chance at achieving the most benefits for our taxpayers' dollars.



Railbanking is a popular and successful strategy for preserving transit options that has legal and historic context. It should be considered by Iowa Pacific at the request of SCCRTC to support interim Trail-Only use.

\*http://www.americantrails.org/resources/railtrails/rerail04.html

# APPENDIX A: LEVEL OF TRAFFIC STRESS METHODS

The Level of Stress calculation is based on the method described in: Mekuria, Furth, and Nixon (May 2012) Report 11-19: Low-Stress Bicycling and Network Connectivity. Mineta Transportation Institute.

The report is available at the link below:

http://transweb.sjsu.edu/PDFs/research/1005-low-stress-bicycling-network-connectivity.pdf

# **APPENDIX B: USAGE ESTIMATION METHOD**

Trip forecasting was completed using a demand model developed by the National Cooperative Highway Research Program (NCHRP). The model was developed for use by planners and decision-makers in assessing the effects of bicycle infrastructure on future demand in an area. Demand estimates are determined using model inputs such as bicycle facility type, facility length, residential density, and bicycle mode share around the facility. Using these inputs. the model evaluates approximate use on the bicycle facility—in this case, an off-road, multi-use trail. No such model yet exists for pedestrians.

The study corridor was divided into four segments based on existing commute travel patterns (common trip start and end points). Corridor-adjacent areas with higher residential and employment density—Santa Cruz and Watsonville—generate more activity than the more rural and agricultural segments because of the trip patterns they exhibit, and is the reason that this part of the study's reaches were determined independently from trail segments that are represented as northern, central, and southern in other sections of this report.

Bicycle demand forecasting was modeled using the methodology put forth in Report 552: Guidelines for Analysis of Investments in Bicycle Facilities, published by the National Cooperative Highway Research Program (NCHRP). The inputs to the model include mode share and population density within .5. 1, and 1.5 miles of the facility. We used the county's current bicycle mode share—3.5%—to estimate a low end of predicted demand, and the bicycle mode share within 1.5 miles of the corridor—5.5%—to estimate a high end. The equation to evaluate bicycle demand is based on the commute mode share and residential population in each buffer:

### New adult cyclists = $\Sigma(L, (R, C^*0.8))$

#### Where:

L<sub>i</sub> = multipliers found by NCHRP research

R = residential population in each buffer distance

C = commuter mode share

Based on variations in recreational bicycle usage, the NCHRP model provides low- and high-end estimates of existing and new users.

Fuller details about the method are available in the report, linked below:

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp rpt 552.pdf

<sup>&</sup>lt;sup>\*</sup> 2010-2014 American Community Survey, 5-Year Estimates

# APPENDIX C: LEVEL OF SERVICE

The Level of Service calculation is based on the method described in: Patten, Schneider, Toole, Hummer, and Rouphail. (July 2006) Shared-Use Path Level of Service Calculator – A User's Guide. FHWA-HRT-05-138, available at the link below:

http://www.fhwa.dot.gov/publications/research/safety/pedbike/05138/05138.pdf

## **ACKNOWLEDGMENTS**

## **Great Santa Cruz Trail Study Group\***

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**Nancy Connelly, Save Our Shores** 

Will Menchine, SCCRTC Bicycle Committee Member (3rd District Alternate)

John Leckrone, Mountain Bikers of Santa Cruz

**Bud Colligan, South Swell Ventures** 

\* Organizations listed do not imply endorsement by the organization.



Nelson\Nygaard Consulting Associates, Inc. is an internationally recognized firm committed to developing transportation systems that promote vibrant, sustainable, and accessible communities. Founded by two women in 1987, Nelson\Nygaard has grown from its roots in transit planning to a 135-person, full-service transportation firm with offices across the United States.

In keeping with the values set by the firm's founders, Nelson\Nygaard puts people first. They recognize that transportation is not an end by itself but a platform for achieving broader community goals of mobility, equity, economic development, and healthy living. The firm's hands-on, national experience informs but doesn't dictate local solutions.