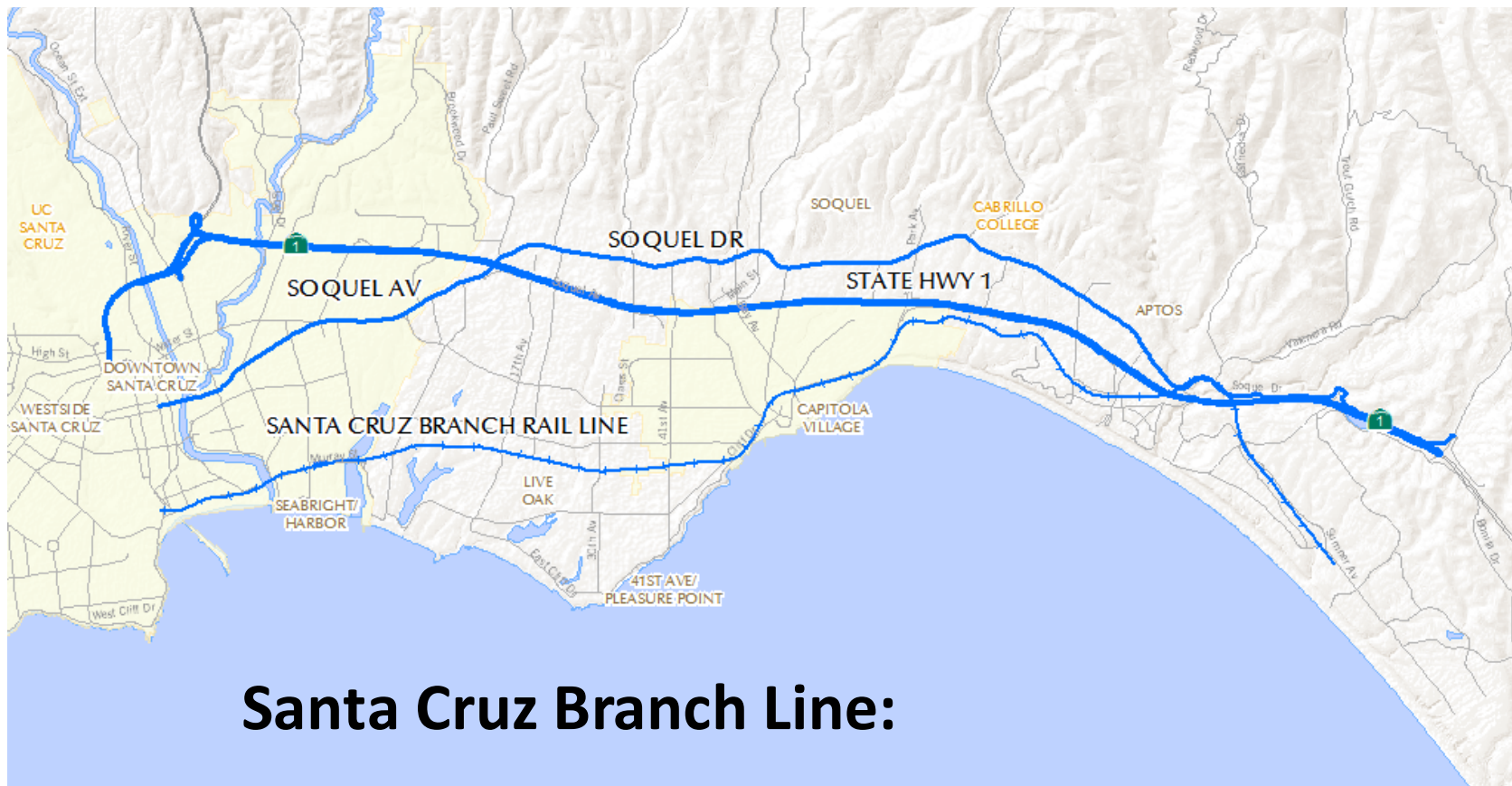




# Rail Transit on the Branch Line

Barry Scott, [www.CoastalRail.org](http://www.CoastalRail.org)



## Santa Cruz Branch Line:

- 32 miles, 100+ years old, backbone of our cities
    - Already perfect for rail transit, flat, central
    - The only practical route for passenger rail
- Irreplaceable, we have one shot to get this right.

# Transportation options benefit all!

- More options means less stress on each mode.
- No single mode serves all citizens directly, but all of us benefit from the blend.
- Many options work together: bikes extend train trips, trains extend bike trips.



## **Rail Transit is sustainable:**

- Very low environmental impact powered transport.
- Low long term costs, stimulates local economy.
- Equitable; useful to broad range of users

A new mobility pipeline, a new layer of movement with a dedicated corridor.

Rail transit expands the hope millennials have of a world without driving.

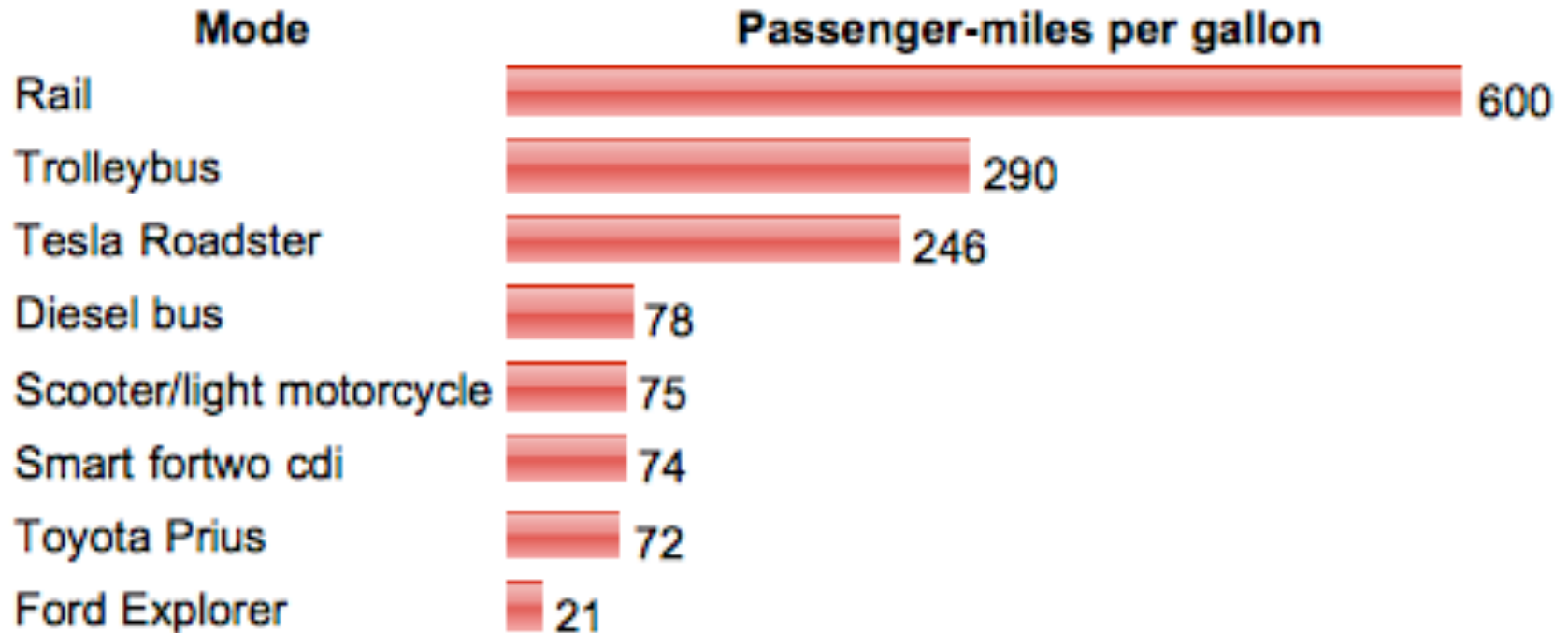


# Typical Efficiencies

## Typical efficiency in urban service

Approximate, assumes 1.5 per road vehicle, 1 per motorcycle, see full table for details.

"Typical" uses vary widely; see the table, and do your own calculation based on actual or expected ridership!



# How much does your commute cost (or save) society?

Every time you travel you put money into the system, but you also cost the system. Your contribution to and burden on the system differs depending on how you travel.

For example, when you ride the bus you pay a fare – money into the system. Your burden on the system includes the cost of operating the bus, and also less obvious impacts like emissions and noise pollution.

By looking at the ratio of what we put in versus what we cost the system, we see that different ways of travelling are more subsidized than others.

The practice of taking these less tangible costs and benefits into consideration and assigning them a dollar value is known as "full-cost accounting." While there are many ways of doing this, this infographic shows one example of how those costs and charges can be calculated.

IF WALKING  
COSTS YOU  
\$1



SOCIETY  
PAYS  
\$0.01



IF BIKING  
COSTS YOU  
\$1



SOCIETY  
PAYS  
\$0.08



IF BUSSING  
COSTS YOU  
\$1



SOCIETY  
PAYS  
\$1.50



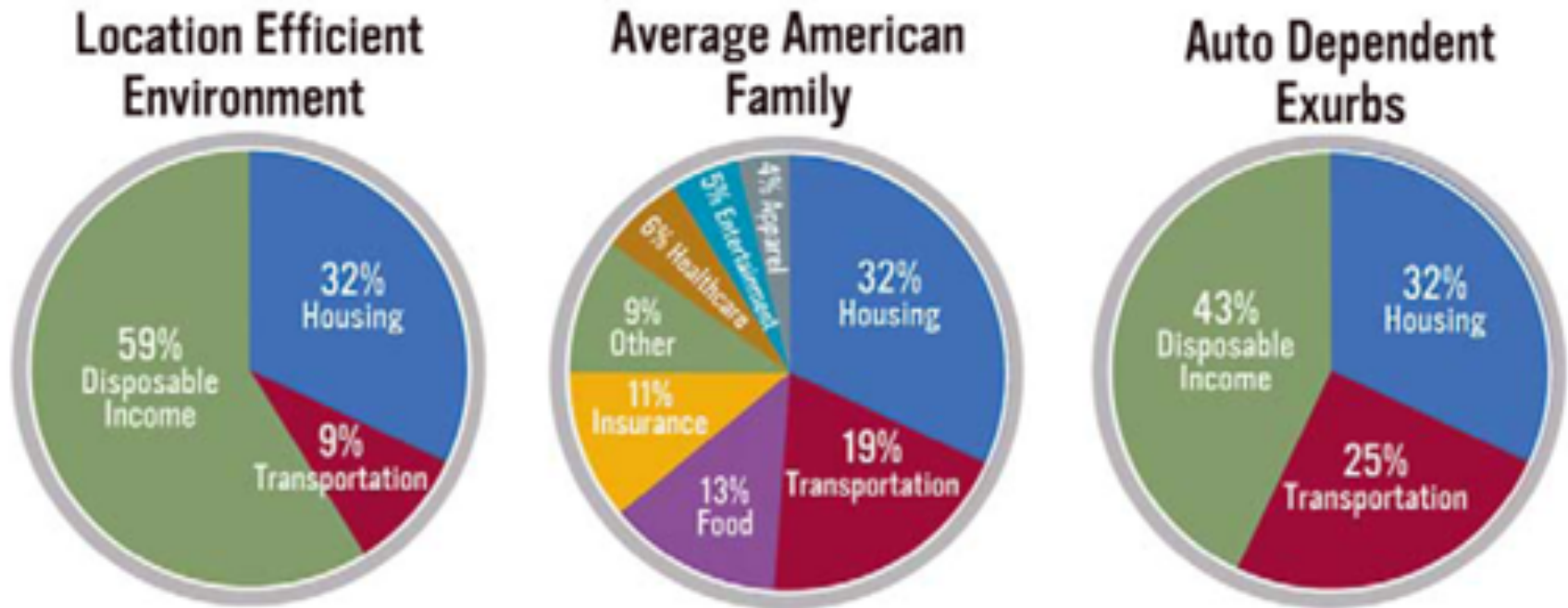
IF DRIVING  
COSTS YOU  
\$1



SOCIETY  
PAYS  
\$9.20



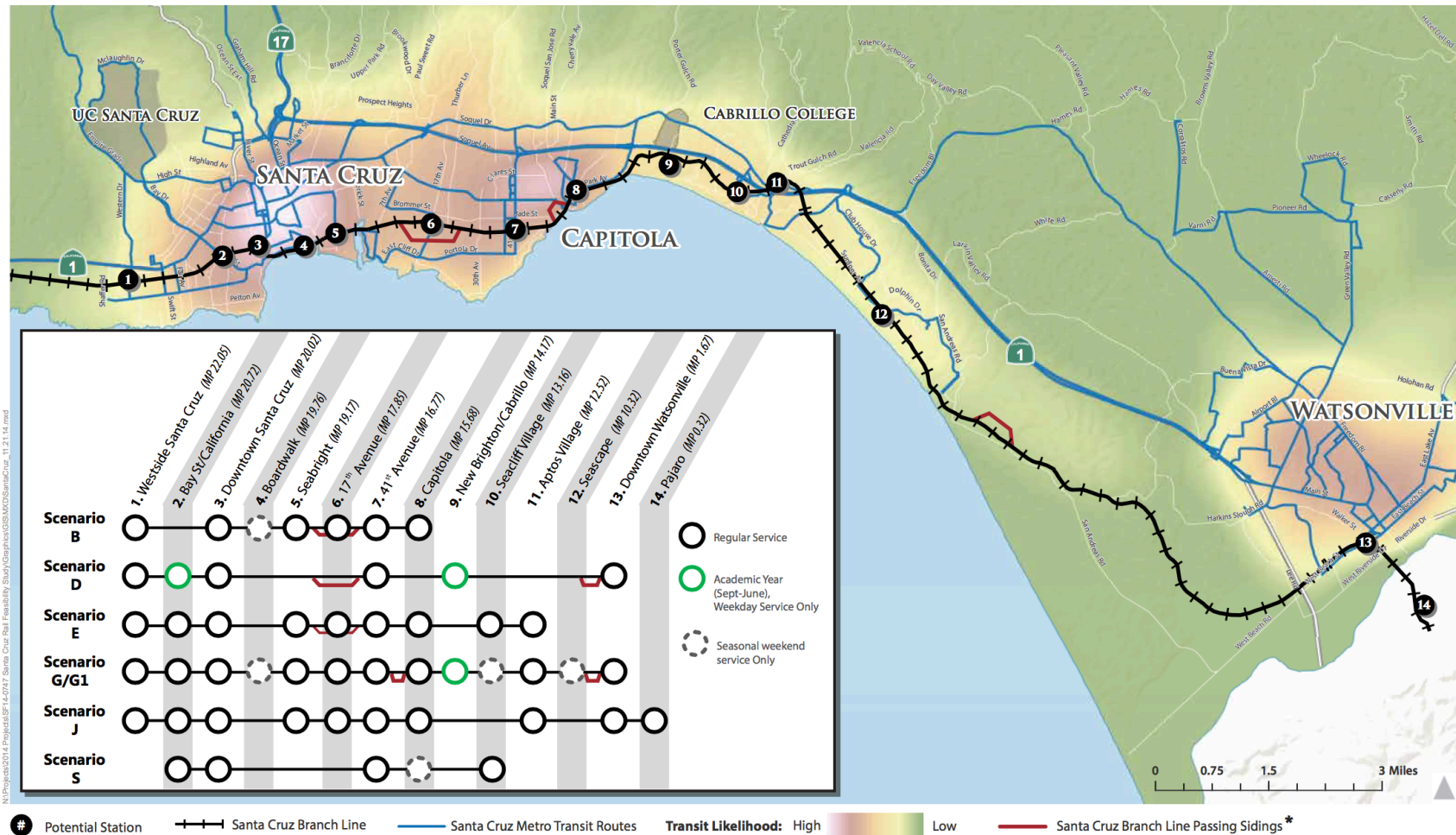
# Problems with auto dependency; An argument for better transit



More disposable income means greater financial security, more money in local economy.

Answer: There is no plan. There was a study and a report. Seven varied scenarios were selected for evaluation. None were selected; further study is needed.

1- E  
2- G  
2- S  
3- B  
4- J  
5- G1  
6- D

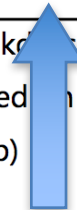




**TABLE 7-2: SCENARIO PERFORMANCE COMPARISON**

<b>Metric</b>	<b>Scenario B</b>	<b>Scenario D</b>	<b>Scenario E</b>	<b>Scenario G</b>	<b>Scenario G1</b>	<b>Scenario J</b>	<b>Scenario S</b>
Annual O&M Cost	\$7.0M	\$3.8M	\$7M	\$9.9M	\$14.0M	\$3.7M	\$5.4M
Weekday Ridership Low	2,800	1,100	4,700	5,000	5,000	1,750	1,400
Annual Ridership Low Estimate <sup>1</sup>	846,000	278,500	141,3000	1,509,000	1,509,000	528,000	420,000
Cost per boarding	<b>\$8</b>	<b>\$14</b>	<b>\$5</b>	<b>\$7</b>	<b>\$9</b>	<b>\$7</b>	<b>\$13</b>
Weekday Ridership High	3,400	1,350	5,150	5,500	5,500	1,950	1,600
Annual Ridership High Estimate <sup>1</sup>	1,005,000	342,500	1,539,000	1,650,000	1,650,000	585,000	480,000
Cost per boarding	<b>\$7</b>	<b>\$11</b>	<b>\$5</b>	<b>\$6</b>	<b>\$8</b>	<b>\$6</b>	<b>\$11</b>

<sup>1</sup>Annual ridership is for baseline (2010) and is based on 250 weekdays x weekday ridership + 115 weekend days x 0.5 x weekday ridership (Weekend ridership is estimated at 50% of weekday based on SC Metro April 2013 ridership analysis showing Saturday as 55% of weekday ridership and Sunday as 45% of weekday ridership)



Top Score: Scenario E, Westside to Aptos Village. Low cost, high ridership. However, we need to include Watsonville. (Scenarios D, G, J)

- 60 trains/day? 12, 24, 36, and 60 were studied.
- HORNS? No, quiet zones eliminate need for horns.
- Diesel locomotives? No, diesel-electric light DMUs.
- Five of seven scenarios used “Light DMUs”.
- Smaller electric LRT or rapid streetcars might work.

**Figure 2-2: Example Rail Vehicle Technology Systems**



Light DMU/Light Rail - Sprinter (NCTD, San Diego, CA)



Light DMU – MetroRail (Austin, TX)



Transit LRT – Sac LRT (SACRT, Sacramento, CA)



Railroad DMU - WES (TriMet, Portland, OR)



Railroad DMU- SMART  
(Sonoma-Marín Transit District, CA)



Portland Streetcar (TriMet, Portland, OR)



Locomotive - South Coast Rail (MBTA, MA)



Railroad Diesel-Electric Locomotive -  
Cal (Peninsula Corridor Joint Powers, CA)



Railroad EMU - Caltrain Electrified (proposed)

# Explosion of new options:

Battery electric, regenerative braking, “rapid streetcar”.



Light Rail with Streetcar feel-  
Low boarding just 8 inches  
Rapid acceleration  
Rapid entry/exit

Streetcar with Light Rail Feel:  
Top Speed 65 mph  
Room for wheelchairs and bikes



## **I heard subsidies for trips were very high.**

- All transportation is subsidized, highways require subsidy > 50%
- Top scored Scenario E: \$5.00 cost/trip, \$2.50 fare, 50% subsidy

## **What about Bus Rapid Transit?**

- BRT is still part of the motor vehicle mindset.
- Higher maintenance Costs
- Less energy efficient
- BRT less conducive to Transit Oriented Development

## **What about self-driving cars and V2V?**

- Still stuck in and adding to congestion
- Not an option to all income levels
- Less energy efficient
- Not yet fully proven, decades for deployment

**Uber? Lyft?** Watsonville to Boardwalk costs over \$32.00, each way

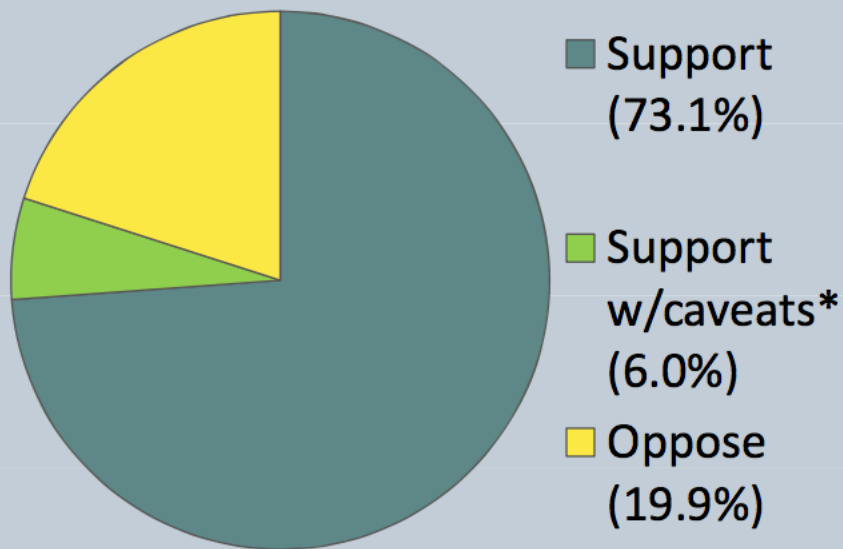
Rail transit on a dedicated line is immune to traffic, doesn't contribute to congestion, and is available to a very broad range of users.



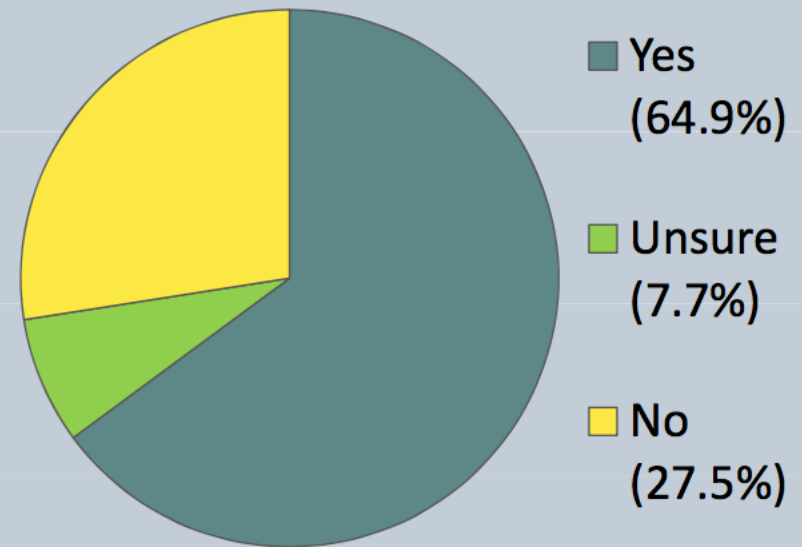
# 2015 Survey Results:

## 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: Possible Corridor Uses

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



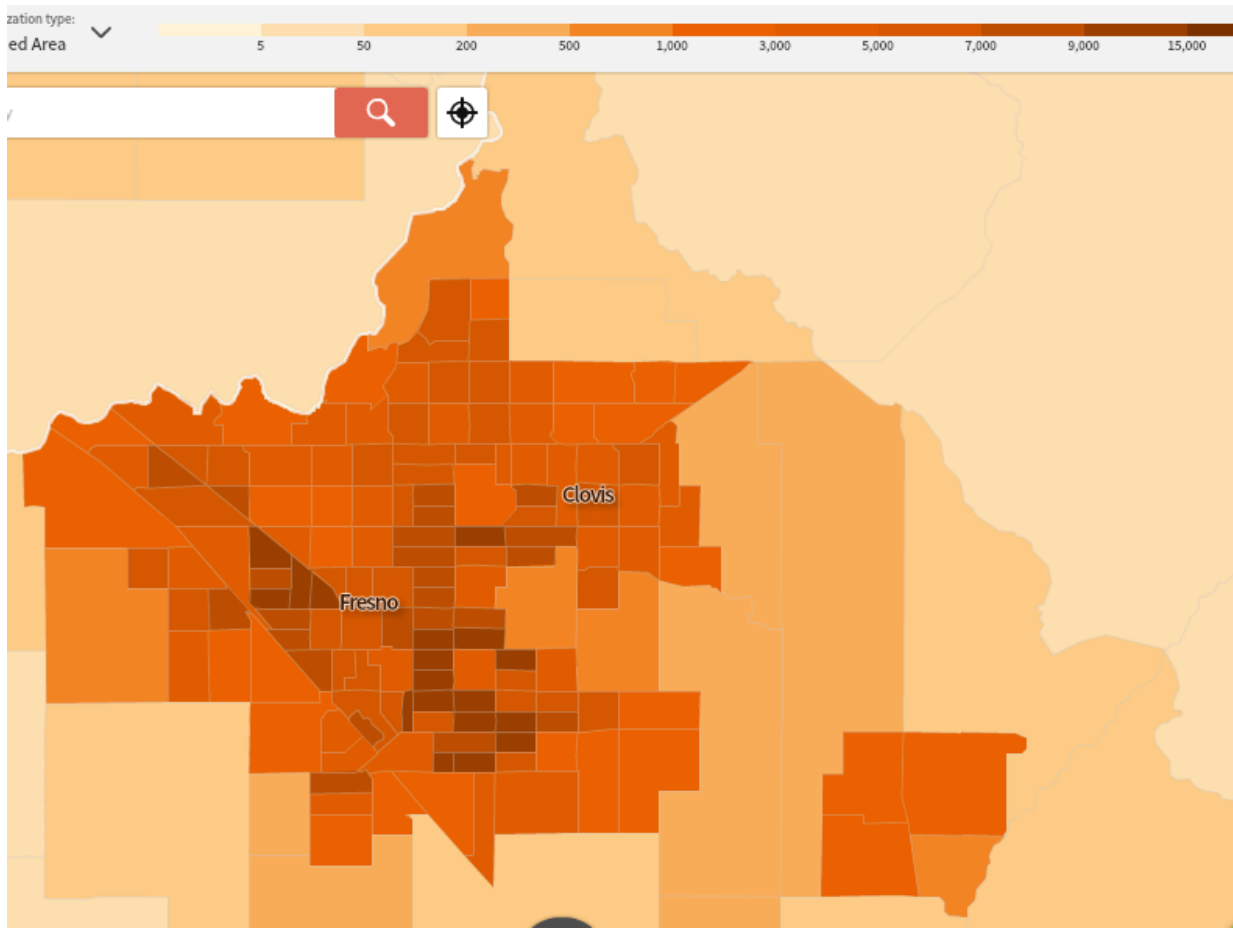
# DENSITY?

## Does rail transit make sense here?

- Not to be confused with **population**
- A large population can be very spread out (Jacksonville, Fresno)—both over 1M people, very unsuitable for local rail transit
- Need dense population near a rail line **PLUS**
- Places to go near a rail line **PLUS**
- Ways to get to the rail line **AND**
- A long skinny settlement pattern really helps
- FTA now realizes difference between population and density, adjusts scoring accordingly

# Density Maps ( Fresno)

## 972,000 people in picture

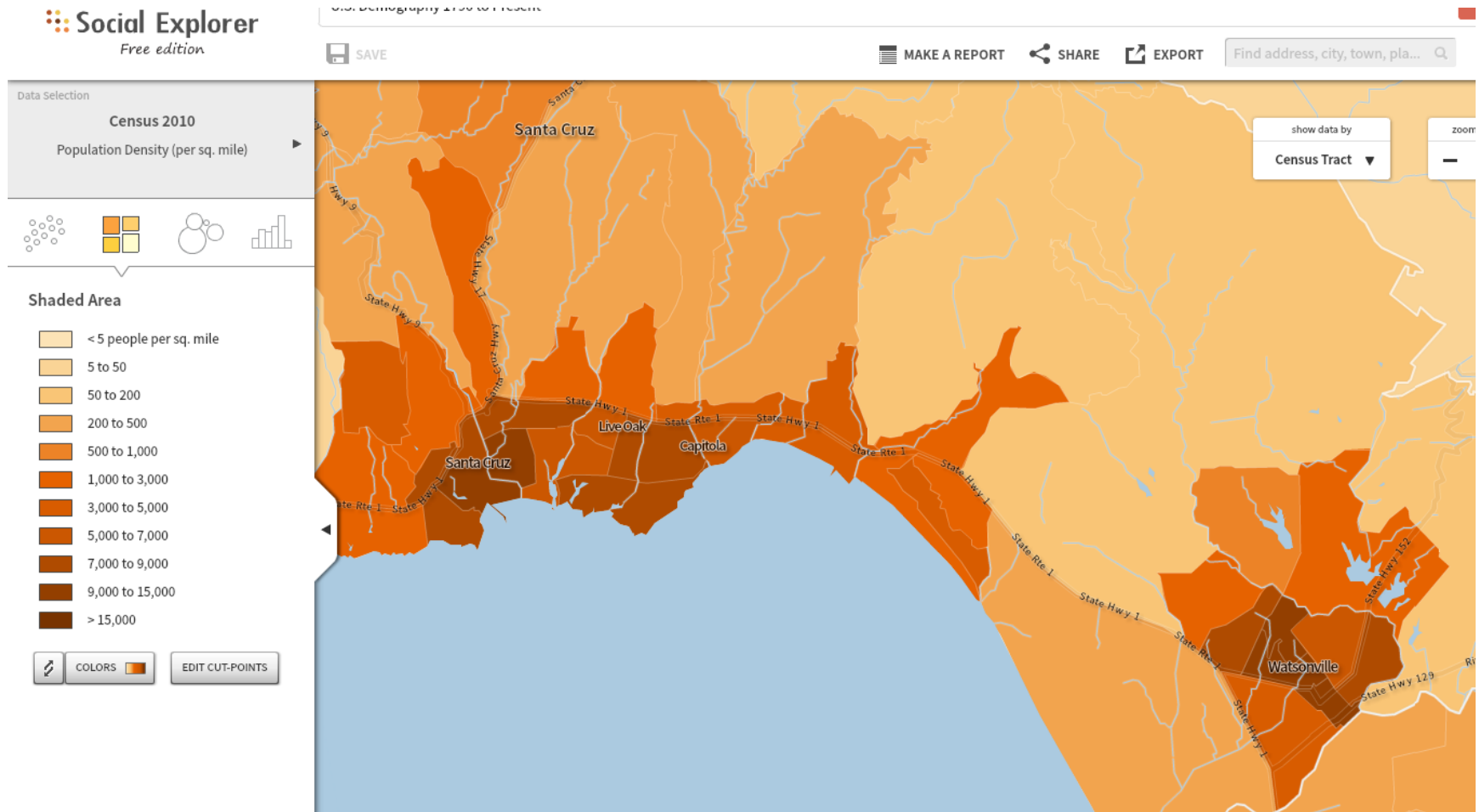


Lots of people, but low density and not a linear pattern  
Hard to make rail work except for very short distance



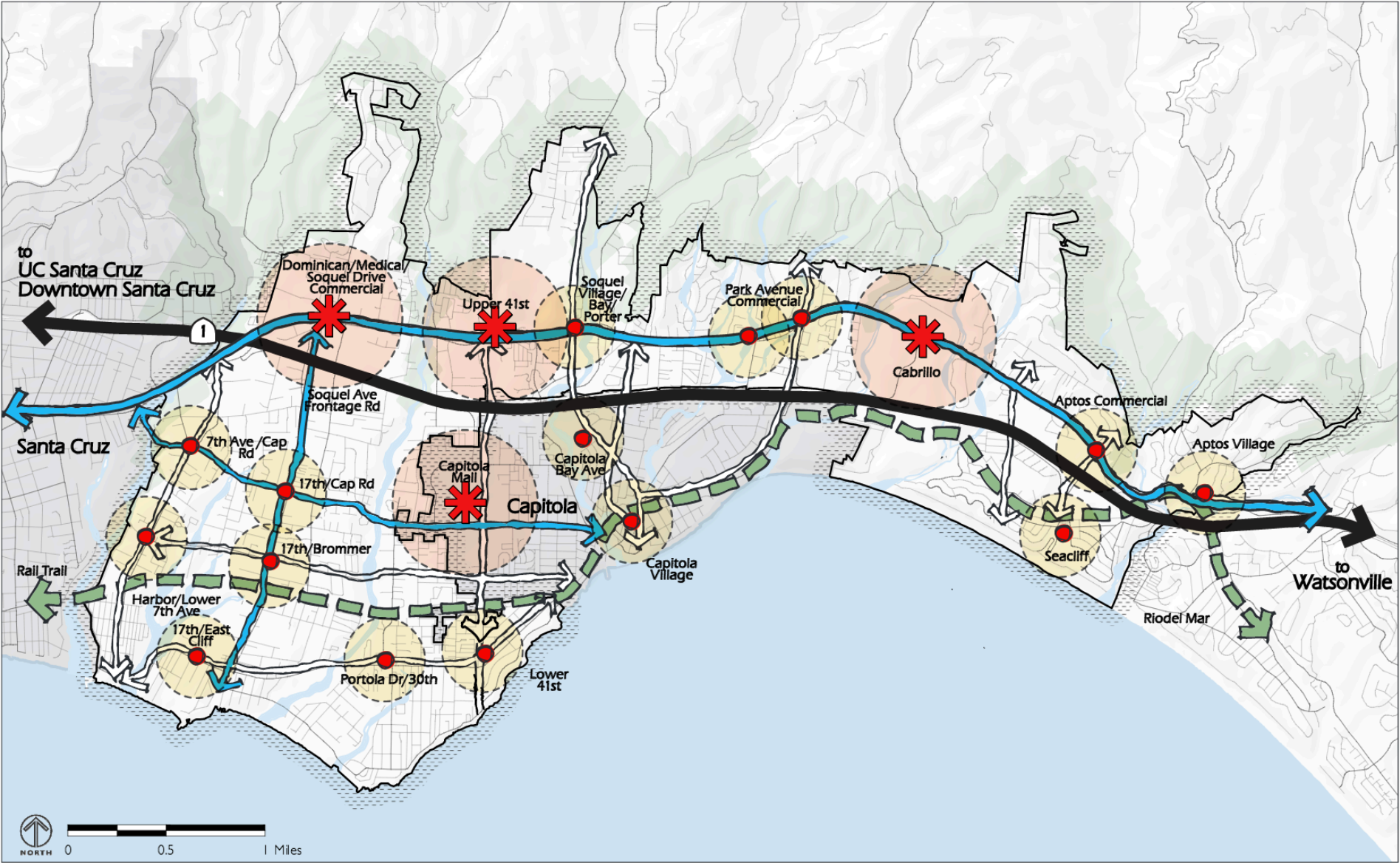
# Density Maps (Santa Cruz)

## 250k people, 1/2 in mid-County



Fewer people, but linear settlement pattern, high density close to rail line. (Densities comparable to Seattle/Oakland/Portland)

FIGURE 3 - 1 FUTURE LAND USE AND TRANSPORTATION PATTERN



# The Last Mile

- 28% SC pop ½ mile from RR, 50% 1 mile
  - UCSC
  - Marine Sciences Campus
  - Cabrillo College
  - Dominican
  - Harvey West

## Solutions:

- Bikes on trains, Bikeshare
- Shuttles (UCSC, hospital, Harvey West)

Best to serve a smaller number of people well than many poorly 😊





Bikes and modern rail transit—  
—a great match!



Bikes ride along!

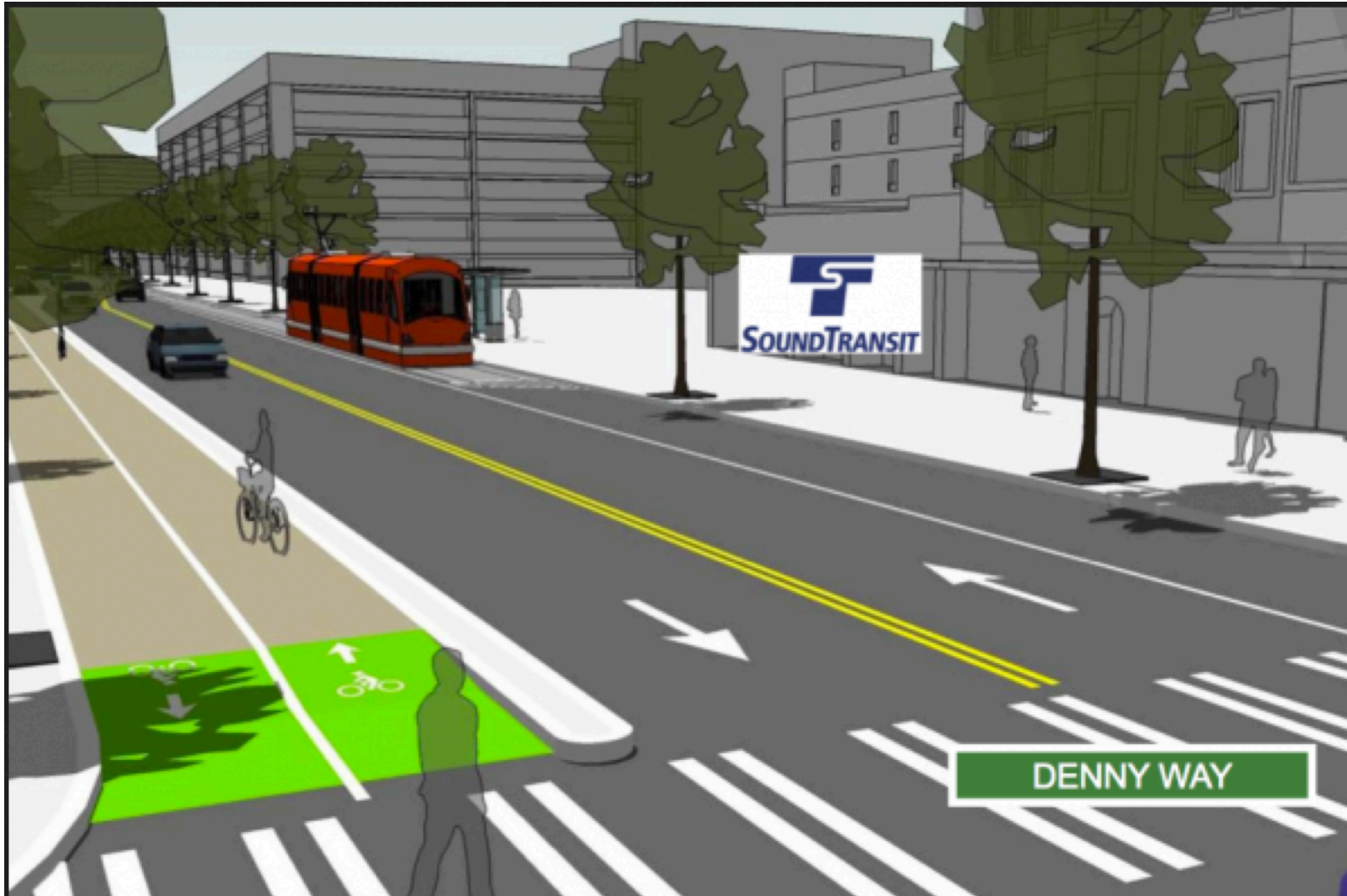
Bikeshare at rail stops!





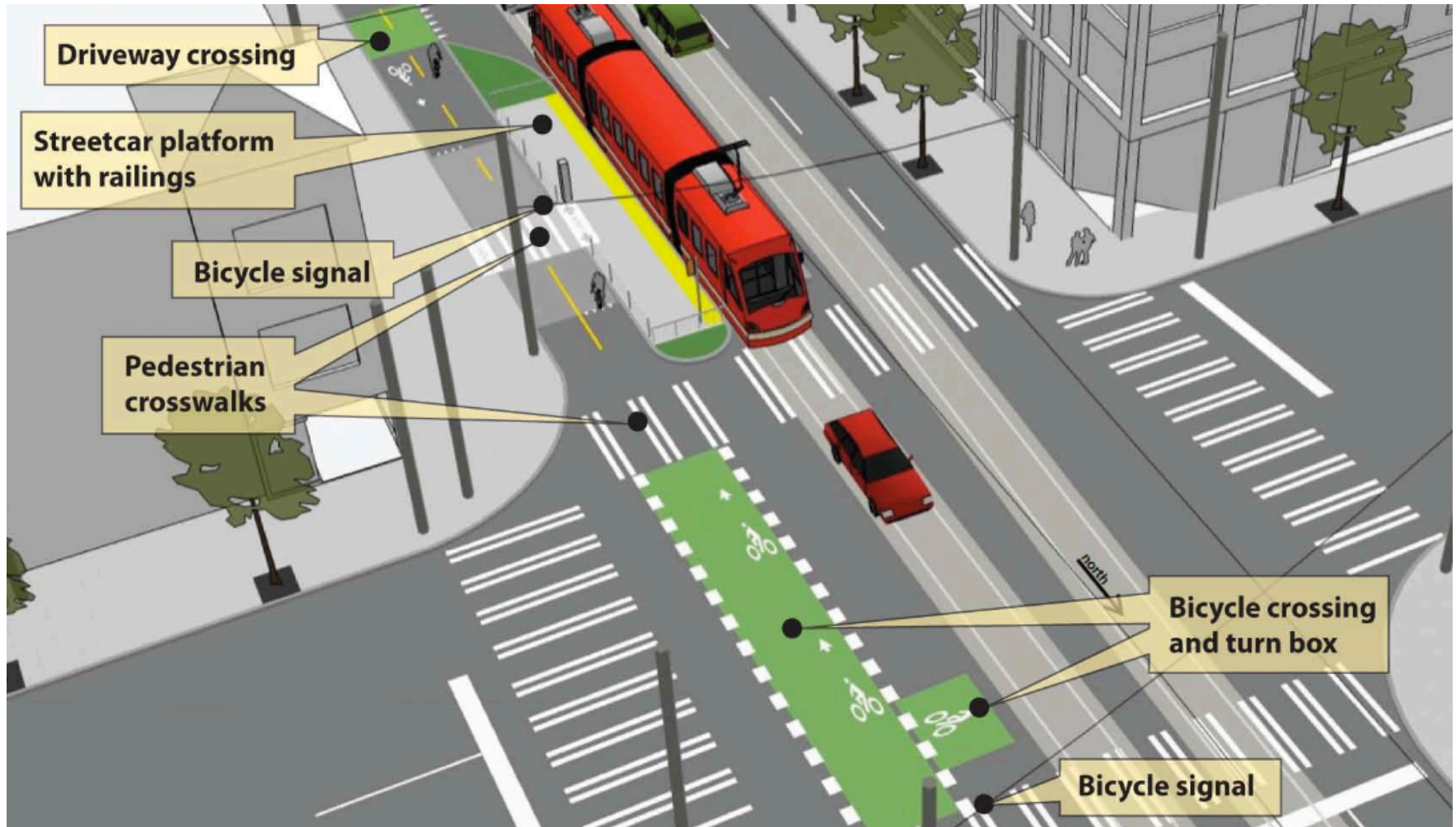
# Complete Streets!

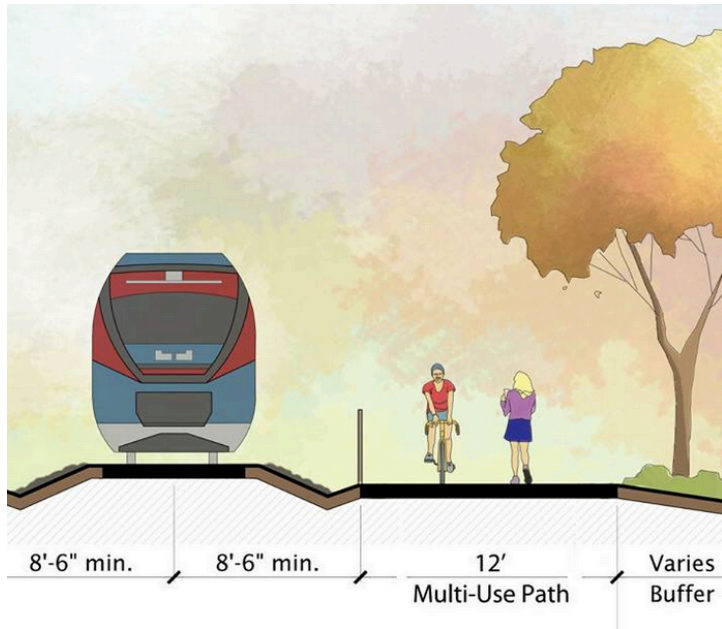
Who said rail and bikes can't coexist?



# Complete Streets!

Who said rail and bikes can't coexist?





Passenger rail:  
 Efficient.  
 Clean.  
 Economical.  
 Equitable.

<b>Current RTC Rail w Trail Plan</b>
<i>Has construction funding?</i>
<i>Will be useable soon?</i>
<i>Public input survey conducted?</i>
<i>Has a final EIR adopted?</i>
<i>Qualifies for federal funding?</i>
<i>Adopted by 3 city councils?</i>
<i>Adopted by Board of Supervisors?</i>
<i>Chamber of Commerce support?</i>
<i>Santa Cruz Co. Business Council support?</i>
<i>Friends of the Rail + Trail support?</i>
<i>Santa Cruz Co. Land Trust support?</i>
<i>Caltrans support?</i>
<i>Sierra Club endorsement?</i>
<i>Coastal Commission endorsement?</i>
<i>Award Winning Design?</i>

We have just **one** chance to get this right.



[www.coastalrail.org](http://www.coastalrail.org)

