The UCIS includes many tables and comments that make it clear that Option B is the best choice for our county:

**Safety**

p 83, fig 29 Shows that Scenario B is the only scenario that reduces collisions from current numbers despite anticipated increase in population.

p 114 “Scenario B shows the greatest savings in cost associated with a reduction in collisions due to Scenario B having the least amount of traffic volume increase and the greatest number of projects that have anticipated safety benefits.”

**Efficiency**

p 36 UCIS “Excluding UCSC trips, a significant portion of transit ridership is driven by long distance trips between Santa Cruz and Watsonville, with local circulation trips making up a much smaller proportion of transit use.” This is a case for time-certain transit (i.e. train) on the ROW.

p 37, Table 17 This table indicates that in our current configuration, people can move more quickly in private cars than in transit. If we agree that shifting more people to transit will decrease our GHG emissions, we must cease preferencing car travel and provide a transit option that is preferred over private cars and uncoupled from the traffic (train).

p 87, table 35 Shows that the train is the fastest option for public transit between Watsonville and Santa Cruz. In some cases by a significant amount. And it’s the most reliable. Whatever the problems on Hwy 1, the train keeps going.

**Ecology**

p 57 “Vehicle emissions are the greatest contributor of greenhouse gas emissions in Santa Cruz County,” So our goal should be to eliminate as many VMT as possible. This means we stop preferencing the private car and instead preference transit. This also makes it safer and more appealing for pedestrians and bikes.

p 112 “Strong transit corridors can help focus development in more concentrated areas, which supports infill development and provides an important counterbalance to employment sprawl.” Less sprawl means less GHG emissions.

p 117 “Scenario B with the lowest level of VMT.” Very important because this means the lowest GHG.
Economy
p 89 “Scenarios B and E with rail transit have the lowest percentage of drive alone trips and with bike improvements on both.” But since B is cheaper, it makes sense to take that option.

p 113 “Of the four scenarios, Scenario B has the highest concentration of projects shown to help attract and enable new, higher intensity development, support higher property values, and contribute to business performance, thus contributing to local tax revenues.”

p 114, table 41 Clearly shows that scenario B has the most positive economic impact on our county.

Expediency
p 58 “Environmental review for the Highway 1 Improvement Project, the Monterey Bay Scenic Sanctuary Trail Master Plan (MBSST), and the North Coast Rail Trail are either completed or underway.” This means the trail as planned, beside the tracks, can move forward more quickly, than a new plan (tearing up the tracks and relocating the proposed trail on the rail bed.) Even if a person favors trail only, they should support keeping the tracks for now because it gets us a trail sooner.

Option B is good, but could be made better with these suggested changes:

Highway One
Forget on ramp metering, it just backs up the traffic in the neighborhoods and will cost a lot of money.
Forget the Aux Lanes. Induced traffic will make them obsolete. Our money can be better spent elsewhere.
p 84 table 32 Shows that the commute time on Highway One remains essentially the same no matter which scenario is chosen. Looks like no matter what you do, you can’t significantly improve commute times on the freeway. So why throw more money at that problem?

Shift focus on Mission St from moving cars faster to making it safer and more pleasant for pedestrians and cyclists. Mission Street will never support freeway speeds so give that up. Instead make it a pleasant 2 miles where drivers are traveling slow enough to be safe and to see the local businesses they could patronize.

p 111 “Traffic calming” or “sustainable streets” improvements that maintain automobile access while prioritizing pedestrian and bicycle traffic – such as reduced speed limits, narrowed lanes, and new bike lanes – have been shown to increase retail sales.”
This is what needs to happen on Mission St. It's a commercial district surrounded by residential neighborhoods, but it's unpleasant to walk along and scary to cross. The "Mission St improvements" proposed should be to help pedestrians and cyclists, not cars.

p12 "Segments of SR 1 with more collisions than expected ...are most common along the arterial section (Mission Street) through the City of Santa Cruz ..." For everyone's safety, we need to slow down the traffic on Mission Street.

Run freight at night on the tracks, as was proposed in Scenario E. If we are preserving the tracks, why not use them as much as possible? Especially given all the economic, environmental, and safety benefits the UCIS claims for freight transport. Aren't the easements dependent upon running freight? If we eliminate freight, don't we have additional expense of re-buying the easement? Has that been accounted for?

p 113 "Research indicates that freight rail can reduce costs for consumers. Some estimates show freight rail costing 1/10th as much as trucking goods..."

p 127 "Shifting goods movement from trucks on the roadway system to freight service on the rail right of way would reduce GHG and criteria pollutant emissions."

**Money Questions**

Won't any plan that includes tearing up the tracks (scenarios A & C) void the rail easements and require us to re-purchase those easements from adjacent landowners? I didn't see that expense accounted for in the UCIS.

p 213 When considering the funding potential for these projects, was the state rail plan money included?
Transcend Traffic with a PRT Scenario

Personal Rapid Transit is a transportation solution that can satisfy transit advocates and trail-only proponents. This scenario can potentially produce better results for every UCS goal while saving almost $200 million compared to the lowest-cost UCS scenario.

We propose a Personal Rapid Transit system that covers Santa Cruz to Aptos with at least 40 stations and 20 miles of guideway, including the Rail Corridor, Soquel Avenue, and Soquel Drive, plus 17th Ave and 41st Ave. The system is located in areas with severe traffic congestion, providing substantial benefits for all who live or work near Santa Cruz.

In this scenario, the freeway bus need only serve Watsonville to Aptos. The north county freeway bus service is unnecessary because the PRT travel time between Aptos and Santa Cruz is under 14 minutes (assuming 35 mph), regardless of traffic conditions.

Personal Rapid Transit Examples

- **Morgantown "PRT"**
  Since 1975, this Group Rapid Transit system has provided convenient and safe transportation for West Virginia University students and employees. It was recently upgraded with new technology.

- **Futran (Personal Rapid Transit)**
  Futran is currently building a prototype system in South Africa, and expects to provide passenger service by 2020. Santa Cruz resident Ron Swenson is involved with this project along with the Spartan Superway group at SJSU.

- **CyberTran (Group Rapid Transit)**
  Based in Richmond, California, CyberTran expects to launch a prototype system operating at 60 mph. The integrated solar panels are said to generate eight times the energy needed to operate the system.

- **skyTran (Personal Rapid Transit)**
  The skyTran system promises speeds up to 200 mph. Prototypes are being built in Israel, and actual service is expected by 2020. There is a skyTran office at NASA Ames in Mountain View.

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRT system: Santa Cruz - Aptos (est $15/mile)</td>
<td>$300.0 million</td>
</tr>
<tr>
<td>Soquel / Freedom Buffered Bike Lanes</td>
<td>$11.7 million</td>
</tr>
<tr>
<td>Soquel / Freedom Intersection Improvements</td>
<td>$30.8 million</td>
</tr>
<tr>
<td>Bike and Pedestrian Trail</td>
<td>$219.0 million</td>
</tr>
<tr>
<td>Optimize Bus Service to complement PRT</td>
<td>Use existing buses</td>
</tr>
</tbody>
</table>

Total cost of PRT Scenario: $561.5 million

Reminder: The lowest-cost UCS Scenario is Scenario C at $740 million. Scenario B is $833 million (including $339.8 million for diesel train), or $1.04 billion (including $549.5 million for electric train).

PRT operating costs are a small fraction of typical transit cost, in pennies per passenger-mile.

For more information: WatsonvillePRT.org SantaCruzPRT.com

Please contact me to discuss in detail:
Brett Garrett, 831-316-4678, brett@colphyn.com
The artist’s renderings of PRT in Santa Cruz were produced for the UCSC Comprehensive Settlement 4.14 Committee.

Climate change requires radically sustainable transportation.

The Unified Corridor Study Step 2 draft shows the existing UCS scenarios provide only minor improvements in traffic and safety, compared to no-build, and some of these scenarios actually increase greenhouse gases and pollutants. Our community needs a better solution.

Personal Rapid Transit is a podcar system providing direct on-demand service between any two stations. It is a superior transit system that:
- exceeds the benefits of conventional rail or bus rapid transit,
- improves safety for all transportation modes,
- exceeds highway lane capacity in passengers or vehicles per hour,
- substantially reduces or eliminates greenhouse gas emissions,
- is not constrained to serve only the rail corridor, and
- allows for any use of the rail corridor.

In this document, we present an alternative scenario using modern technology that is likely to be readily available long before 2035, the target year for the Unified Corridor Investment Study.

We encourage the Regional Transportation Commission’s consultants to model our scenario for comparison with the existing UCS scenarios. We expect the results will show that PRT offers clear advantages in safety, equity, climate, cost savings and other financial benefits.
What is Personal Rapid Transit?

PRT is a transportation system consisting of automated pods, traveling on a dedicated network of guideways.

Elevated guideways enable the transit system to operate with no interference to drivers, cyclists, or pedestrians — and no traffic delays.

PRT stations are “offline,” meaning off the main guideway. Like an automobile, a podcar needing to pick up or drop off passengers will pull off to the side. Every podcar to provides express service, stopping only where necessary instead of stopping at every station.

On-demand service is a key benefit of PRT. Instead of lines of people waiting for a bus or train, a PRT station could have a line of podcars waiting for people.

PRT technology allows for many variations.

The guideways can be one-way, bidirectional, or a mixture of both. One-way loops often provide the simplest and most efficient service. Podcasts may vary within a system, with special podcasts designed for large (or small) groups, disabled passengers, or freight. Alternatively, a system can employ just one versatile podcar design to serve all needs.

Most existing PRT systems use rubber-tired pods on a road-like surface or on a rail track similar to a roller coaster, but some of the newer designs use a lightweight monorail with suspended pods. Rolling resistance can be reduced with steel wheels or maglev technology.

A PRT system can include a canopy of solar panels to provide power.

A traditional PRT system would always deliver passengers directly to their destination station without any stops, but ridesharing can further improve energy efficiency and capacity. A ridesharing system may allow several stops to pick up or drop off other passengers, but fewer stops than conventional transit. A premium service can be offered for passengers who prefer guaranteed nonstop solo travel.

PRT speeds and headways (time between vehicles) vary substantially. Modern systems can achieve a headway of one second or better, transporting up to 21,600 passengers per hour for 6-person podcars.

Group Rapid Transit (GRT) uses similar technology with larger vehicles, carrying up to 18-20 people.

Personal Rapid Transit Benefits Everyone

PRT Benefits Transit Riders
PRT provides fast, direct, on-demand service within the system.
PRT provides a quiet, smooth, relaxing ride, never stuck in traffic.
Transfers from bus to PRT will be quick and easy. And PRT is fun!

PRT Benefits Drivers
PRT is an elevated transit system, improving safety and reducing the number of transit vehicles that compete with drivers for road space.
PRT benefits drivers by providing an attractive alternative to driving!

PRT Benefits Walkers and Bicycle Riders
PRT is an elevated transit system, improving safety and reducing the number of large vehicles on the road. And bicycles will be welcome aboard PRT.

PRT Benefits Children, Elderly, and Disabled
The system is easy to use, as passengers only need to know the name of their destination station. There is no need to keep track of schedules or transfers within the system.
We expect that every PRT station will be ADA compliant, providing convenient service for riders with mobility challenges, low vision, or hearing loss.

PRT Benefits Climate and Community
PRT uses less energy (per passenger-mile) than a bus or train. Its energy usage is more like an electric bicycle, because the podcars can be very lightweight, and they typically move at a steady speed with low wind resistance. PRT is gentle for sensitive habitats, and a system with solar panels is likely to produce more energy than it uses.
The financial benefits of PRT include tourist tax revenues, lower capital cost than conventional rail, and likely saving at least 90% of the operating cost of bus or train.
PRT makes transportation safer and more convenient for everyone, creating a happier community with fewer collision-related costs.
An existing PRT system can always be expanded with additional guideway. That means Santa Cruz County could start with a small single-loop system, then gradually expand to a larger system, which could include UCSC and extend to Watsonville and beyond.

PRT meets or exceeds UCS Goals

Our PRT scenario is likely to produce better results for all UCS performance measures, compared to the four UCS scenarios.

UCS Goal: Safer Transportation for All Modes
The safest transportation occurs when each mode has its own dedicated space. PRT elevates transit to a higher plane, removing any possible conflict with cyclists and drivers, improving safety for all modes.

UCS Goal: Reliable and efficient transportation choices
PRT ensures fast and reliable transit travel times anywhere in the system. Passengers can travel from Aptos to Santa Cruz within 14 minutes, even during the height of rush our traffic.
The principle of induced demand (also known as induced travel) means that no amount of transit or highway construction is guaranteed to permanently relieve congested highways, but PRT is a superior solution for coaxing drivers out of their cars.

UCS Goal: Economic Benefits
Our PRT Scenario saves almost $200,000 in up-front costs, compared to the lowest cost UCS scenario, and PRT may even attract private investors due to low operating costs. Unlike conventional transit, a PRT system can thrive with little or no ongoing subsidies.
State programs such as TIRCP and LCTOP can fund innovative transit. Monterey Bay Community Power can supply solar panels.
PRT attracts tourism revenues and reduces collision-related expenses.

UCS Goal: Environment and Health
Convenient PRT may help convince drivers to use transit instead. Elevated PRT has minimal impact on environmentally sensitive areas.
Solar-powered PRT eliminates criteria pollutants and GHG emissions.
Even without solar, PRT uses much less energy than other transit, due to low wind resistance, lightweight vehicle, and fewer starts and stops.

UCS Goal: Accessible and Equitable Transportation
Our proposed system is designed to ease the commute and lower transportation costs for all county residents who work in or near Santa Cruz. We expect it will result in significantly more transit passenger miles traveled, at lower cost than other systems.
To: Santa Cruz Greenway

From: Alta Planning + Design

Date: October 18, 2018

Re: Proposed Modifications to the Unified Corridor Investment Study's Analysis Methods

Introduction

This memorandum outlines potential modifications to the Unified Corridor Investment Study: Step 2 Analysis Results based on a review of the methods used for the analysis.

Scenario Development

The Unified Corridor Investment Study: Step 2 Analysis Results studied seven scenarios (including a no build scenario), covering the most readily available corridor combinations. While it is cost prohibitive to analyze - especially at the level of detail provided in the study - every potential scenario, analysis of additional combinations may help identify new opportunities that meld the best of multiple options. An even more refined approach could evaluate each presented option for each segment (e.g., Highway 1, Soquel Avenue/Drive and Freedom Blvd, and Rail Corridor) and show the resulting combinations in a matrix. Or, short of a full matrix, one additional combination that should be analyzed is listed below:

- Scenario G:
  - Highway 1
    - Bus shoulders, ramp metering, Mission Street intersection improvements
  - Soquel Avenue/Drive and Freedom Boulevard
    - BRT Lite with increased transit frequency, buffered/protected bike lanes, bike/ped intersection improvements
  - Rail Corridor
    - Bike and pedestrian trail

This proposed approach combines project components that have existing funding available, are relatively low-cost compared to the alternatives (as shown in the following section, the estimated costs for the Trail Only Option along the rail corridor may have been overstated in the UCS and revised estimated costs are presented on Page 4 of this memorandum), and can be implemented progressively so that residents can experience the benefits of the scenario more quickly.

This lower-cost scenario can be constructed in phases, allowing for quicker implementation. As currently presented, the UCS focuses only on the life-cycle costs compared to the estimated benefits in future year 2035. However, in practice, quicker implementation will allow for additional years of immediate benefits that can accumulate over the project's full useful life. In addition, the funding available for a project depreciates in value over time due to necessary adjustments for inflation. Quicker implementation will allow for reduced loss of funding in present dollars.
Cost Estimates

Scenario and individual costs are shown in Appendix A of the Unified Corridor Investment Study: Step 2 Analysis Results. They are presented as planning-level estimates with contingencies based on standard practices. Annual operating and maintenance costs are included for each scenario. The comparison of vastly different transportation options on a large scale is a challenging undertaking, and the authors have done a good job in trying to make meaningful comparisons. There were several areas where we had questions about the methods or conclusions, as identified below.

We have attempted to reproduce Table A-13: Trail Only on page 156 below. As a first step, we broke down each segment based on width, bridge, or parallel to road, and extrapolated the length in feet and miles, and the square feet of pavement.

Trail Only Scenario (Table 1A in UCS), Total Length: 30.1 miles (28.7 miles excluding bridges)

<table>
<thead>
<tr>
<th>SEGMENT</th>
<th>LENGTH MILES</th>
<th>LENGTH FEET</th>
<th>PAVED WIDTH FEET</th>
<th>PAVED SQUARE FEET</th>
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</thead>
<tbody>
<tr>
<td>SEGMENT A</td>
<td>8.6</td>
<td>45,408</td>
<td>26</td>
<td>1,180,608</td>
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<tr>
<td>SEGMENT B</td>
<td>5.4</td>
<td>28,512</td>
<td>16</td>
<td>456,192</td>
</tr>
<tr>
<td>SEGMENT C</td>
<td>14</td>
<td>73,920</td>
<td>14</td>
<td>1,034,880</td>
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<tr>
<td>SUB-TOTAL PAVED</td>
<td>28</td>
<td>147,840</td>
<td>56</td>
<td>2,671,680</td>
</tr>
<tr>
<td>SEGMENT D (BRIDGE)</td>
<td>1.4</td>
<td>7,392</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SEGMENT E (PARALLEL TO ROAD)</td>
<td>0.7</td>
<td>3,696</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>30.10</strong></td>
<td><strong>158,928</strong></td>
<td>-</td>
<td><strong>2,671,680</strong></td>
</tr>
</tbody>
</table>

Breakdown of Trail Only Scenario Costs (Table A-13 in UCS)

<table>
<thead>
<tr>
<th></th>
<th>COSTS</th>
<th>PER SQUARE FOOT</th>
<th>PER MILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EARTHWORK/PAVING</td>
<td>$35,000,000</td>
<td>$13.10</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>DRAINAGE</td>
<td>$2,000,000</td>
<td>$0.75</td>
<td>$71,429</td>
</tr>
<tr>
<td>FENCING</td>
<td>$600,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAIL REMOVAL</td>
<td>$8,300,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRAIL CROSSINGS/ROAD TREATMENTS</td>
<td>$5,600,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LANDSCAPING</td>
<td>$1,500,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMENITIES</td>
<td>$7,100,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER</td>
<td>$18,700,000</td>
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<td></td>
</tr>
<tr>
<td><strong>SUB-TOTAL HARD COSTS</strong></td>
<td><strong>$78,800,000</strong></td>
<td><strong>$29.49</strong></td>
<td><strong>$2,814,286</strong></td>
</tr>
<tr>
<td>CONTINGENCY (50%)</td>
<td>$39,400,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOFT COSTS (39%)</td>
<td>$30,732,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRIDGE STRUCTURES (INCL CONTINGENCY)</td>
<td>$14,200,000</td>
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<td></td>
</tr>
<tr>
<td><strong>SUB-TOTAL PROJECT COSTS</strong></td>
<td><strong>$163,132,000</strong></td>
<td><strong>$61.06</strong></td>
<td><strong>$5,826,143</strong></td>
</tr>
<tr>
<td>POLICY REVERSAL</td>
<td>$41,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$204,132,000</strong></td>
<td><strong>$76.41</strong></td>
<td><strong>$7,290,429</strong></td>
</tr>
</tbody>
</table>
We were not able to replicate the contingency and soft costs in Table A-13. Contingency and soft costs would always be applied against the construction figures, and not the $41 million policy reversal figure or the bridge figure, which already includes a contingency as noted. Our calculations based on the assumptions in Table A-13 are a total project cost of $204,132,000 versus $219,000,000 in the UCS report.

In reviewing the numbers in Table A-13 more closely, we had these questions and comments:

1. **Earthwork and Pavement**
   Costs per square foot for the Trail Only Option are $13.10/SF compared to $8.10/SF for the Trail Next to Rail Option, a 62% difference. In practice, the Trail Next to Rail Option will require much more extensive earthwork than the Trail Only Option, which will be located on a pre-graded corridor with existing sub-base.
   a. Trail Only $35,000,000 / 2,671,680 SF = $13.10/SF
   b. Trail Next to Rail $16,000,000 / 1,974,720 SF = $8.10/SF

2. **Construction Costs**
   Values included differ from those in published sources and actual recent experience building Class I bike paths in California. The [PedBikeInfo Center](https://www.pedbikeinfo.org), a FHWA-funded resource based at the University of North Carolina, publishes cost data for bike paths and multi-use trails needing little grading with median costs at $1 million per mile. Costs shown in Table A-13 come in at over $5.8 million per mile (excluding policy reversal cost), or almost 600% higher. Even assuming rising construction costs and width of some of the trail, this is a very high construction cost.

3. **Updated Costs**
   We created an alternative cost table based on the best available sources and research (see the table on the next page). We made the following changes:
   a. We lowered the earthwork/pavement cost to $7.00/SF. The proposed corridor is a pre-graded corridor with existing sub-base material and some existing drainage. These figures have been confirmed with licensed civil engineers and actual costs in California.
   b. We eliminated the fencing costs because these costs are already included in the amenity costs in the MBSSST Master Plan cost estimates.
   c. We retained the landscaping, amenity, and trail crossing/roadway treatment figures even though we believe some of these could be further reduced.
   d. We lowered the ‘other’ costs from $18.7 million to $2 million because there is no ‘other’ category or unaccounted-for costs in the MBSSST Master Plan cost estimates.
   e. We lowered the contingency to 30% and soft costs to 30%, reflecting the fact that this project contains far less unknowns than the passenger rail and other large projects—which have a 30% contingency. Typically, contingencies for trails are in the 20-25% range, and depending on whether environmental is needed, soft costs between 20-30%.
   f. We eliminated the $41 million policy reversal figure. While we understand some of the logic behind this figure, this is not a true project cost for the Trail Only Option or any other option. The $41 million is not assigned to any other option including the BRT Option of Railroad Right of Way. Losing funding won by RTC is not a project cost for other options. Any moneys or staff time spent studying options or

Proposed Modifications to the Unified Corridor Investment Study's Analysis Methods | 3
even implementing improvements is not a cost to any specific alternative being considered. This cost appears to be a penalty assigned to one option only for no clear reason.

g. The resulting cost of $85 million or $2.8 million per mile still makes this an expensive project, but far less than the $219 million originally identified.

h. Note that some of these changes could also be applied to the Trail Next to Rail Option.

i. For some reason the trail next to rail option and the passenger rail service option are costed separately, as if two independent projects, when in fact the Trail Next to Rail Option would only be constructed if rail service was implemented.

j. It is unclear why the cost of bridge structures is $60.2 million for the Trail Next to Rail option, and only $5 million for the Passenger Rail Option, especially considering the Trail Next to Rail Option will be routed around the Capitola trestle and the passenger rail option requires this trestle be rebuilt. The same issue is true with the BRT On Rail ROW Option, which has a structures cost of $25 million versus $5 million for the Passenger Rail option.

k. It is not clear why the operation costs of new local bus transit connection to rail isn’t included in the Passenger Rail operating costs—which would increase this cost from $14 million to $26 million per year.

l. It is not clear why BRT operation costs, which normally are used primarily by re-routed existing transit services, are almost as high or as high as new passenger rail service.

m. The rail removal costs of $8.3 million for the Trail Only option has been reduced by $1.3 million to $7 million reflecting the salvage value of the scrap rail, assuming $250 per metric ton.

<table>
<thead>
<tr>
<th>Revised Costs for Trail Only Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL COSTS PER SQUARE FOOT PER MILE</td>
</tr>
<tr>
<td>EARTHWORK/PAVING</td>
</tr>
<tr>
<td>DRAINAGE</td>
</tr>
<tr>
<td>FENCING</td>
</tr>
<tr>
<td>RAIL REMOVAL</td>
</tr>
<tr>
<td>TRAIL CROSSINGS/ROAD</td>
</tr>
<tr>
<td>TREATMENTS</td>
</tr>
<tr>
<td>LANDSCAPING</td>
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<tr>
<td>AMENITIES</td>
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<tr>
<td>OTHER</td>
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<tr>
<td>SUB-TOTAL</td>
</tr>
<tr>
<td>CONTINGENCY (30%)</td>
</tr>
<tr>
<td>SOFT COSTS (30%)</td>
</tr>
<tr>
<td>BRIDGE STRUCTURES (INCL CONTINGENCY)</td>
</tr>
<tr>
<td>SUB-TOTAL</td>
</tr>
<tr>
<td>POLICY REVERSAL</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>
Demand Estimates

Appendix C in the Unified Corridor Investment Study: Step 2 Analysis Results documents the steps used to forecast the number of annual bicycle and pedestrian trips for the selected scenarios. Below is a list of proposed modifications to the method:

- **Proposed Modification #1: Conduct separate bicycle and pedestrian trip forecasts.** The current analysis forecasts the number of potential bicycle trips and then estimates the number of potential pedestrian trips by assuming a set ratio of bicycle to pedestrian trips using 2016 count data near the rail right of way. This process may oversimplify the relationship between bicycle and pedestrian usage and does not necessarily account for variations between the two modes in terms of trip length, willingness for out-of-direction travel, and likelihood of mode choice by trip purpose.

- **Proposed Modification #2: Adjust buffer size around the proposed alignments.** The current analysis uses 0.5, 0.5-1.0, and 1.0-1.5-mile buffers around the proposed alignments as a study catchment area. Appendix C notes that the average bicycle trip distance according to CHTS and CTSC school bicycle counts ranged from 1.4 miles for K-12 school trips and utilitarian trips to 7.0 miles for recreational trips. Use of the average trip length to define the catchment area limits the analysis to approximately only half of potential bicycle trips. An increase of the catchment area to a 3.0- or 3.5-mile buffer area for bicycling would better capture the large number of anticipated recreational trips and would be more in-line with industry standards.1 The existing buffers of 0.5 miles to 1.5 miles is adequate for pedestrian trips.

- **Proposed Modification #3: Base “likelihood” factors on comparable facility data.** The current analysis assesses the likelihood that a given individual within the alignment’s catchment area will bicycle based on a combination of regional mode share targets and existing regional mode share estimates by trip purpose from the CHTS, ACS, and CTSC. This approach provides a good high-level assessment of an individual’s likelihood to bicycle in general but may not be sensitive to variations in the facility quality. Isolating the mode share estimates by trip purpose to identical buffer areas around existing bicycle facilities in California that are similar to those in the proposed scenarios would provide a more fine-grain analysis.

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• **Proposed Modification #4: Account for limitations in trail width.** One potentially limiting factor associated with the selected scenarios is trail capacity based on trail width. FHWA's [Shared Use Path Level of Service Calculator](#) shows that the maximum free-flow capacity for a shared-use path varies by the facility's width, as shown below:
  - 8' shared use path – 330 max users per hour
  - 10' shared use path – 420 max users per hour
  - 12' shared use path – 650 max users per hour
  - 15' shared use path – 850 max users per hour

Because the width of the proposed trail varies among the selected scenarios, accounting for limitations in capacity is necessary. The daily bicycle and pedestrian trip estimates should be converted into hour-by-hour estimates using 24-hour bicycle and pedestrian count data in the region. Where the hour-by-hour trip estimate exceeds the available capacity of the proposed trail segment, the demand estimates should be limited to a hard cap of the maximum capacity.

In addition, the selection of segment end points for each of the selected scenarios should be reviewed to account for variations in facility width and facility type, if these have not already been included.

• **Proposed Modification #5: Update reduction factors based on defensible data.** The current analysis assumes a general reduction in the number of bicycle and pedestrian trips of 10% for a trail segment with Level of Service D or less, 5% for proximity moving transit vehicles, and 20% for segments with on-street components. The current analysis also assumes a 5% general increase in the number of bicycle and pedestrian trips for facilities near transit due to increased access to transit for longer trips. No documentation is provided on the method behind these assumptions. To identify if these assumptions are sensitive to real-world conditions, a regression analysis of existing trail and on-street bikeway facilities in the region could be conducted. The regression analysis could be used to control for variations in route connectivity/directness to activity centers, continuity/overall length, proximity to transit, and proximity to moving transit vehicles to identify more defensible reduction factors and to better account for the large variation in facility quality among off-street and on-street bikeways. For examples of this direct demand modelling approach, see [NCHRP 770 - Estimating Bicycling and Walking for Planning and Project Development: A Guidebook](#).

• **Proposed Modification #6: Show a 30-year cumulative analysis.** The current analysis estimates the number of bicycle and pedestrian trips in the year 2035. To better account for variations in time needed to construct segments of each scenario, the analysis should include year-by-year estimates for the project's useful life (approximately 30 years) or another similar selected window of analysis. By including a year-by-year analysis, the cumulative number of bicycle and pedestrian trips could be assessed. This approach would help demonstrate lags in usage for scenarios that would take longer to construct.
Proposed Modification #7: Factor in future e-bike usage. Electric bicycle (e-bikes) are a growing trend around the world. Increased sales of e-bikes in the United States suggests that it may also follow this global trend. The current analysis does account for the increased average length of commute, college, and other utilitarian bicycle trips made possible by e-bikes; however, the method used is not clearly documented in Appendix C. If a year-by-year analysis is conducted per Proposed Modification #6, the ability to account for gradual growth of projected e-bike sales (and/or low-speed electric vehicles, if permitted) and the subsequent increase in average trip distance, the study catchment area, and individual bicycle likelihood factors could better be accommodated.
LETTERS

OPEN STREETS, CLOSED MINDS

Wouldn’t it be nice if our community was safe for biking, walking, and skateboarding every day instead of a few times a year? Santa Cruz County ranked first for wrecks with cyclists involving injury or death in 2015, the latest rankings from the California Office of Traffic Safety.

Considering these bicycle safety statistics, it’s disconcerting that Bike Santa Cruz County’s (BSCC) vision states, “Bicycling in Santa Cruz County is a safe, respected, convenient, and enjoyable form of transportation and recreation for people of all ages and abilities.”

Greenway acknowledges that our county is not yet safe for biking. We need to look beyond painting the street, giving helmets to children, and teaching bicycle safety, and focus on physically protecting bicyclists.

The City of Watsonville has adopted a Vision Zero goal to eliminate all traffic fatalities and severe injuries while increasing safe, healthy and equitable mobility for all. The City of Santa Cruz has considered Vision Zero but has yet to approve it.

While BSCC and Greenway both envision a climate-friendly community where more people choose bikes and public transit over cars, Greenway is advocating for more realistic, affordable, and meaningful solutions with the potential to help alleviate gridlock soon.

If we table the unfunded passenger rail idea, we could railbank the corridor, recycle the tracks, and build a greenway designed to separate faster and slower modes with money already allocated in Measure D. This wide, effective trail could become the backbone of a countywide bicycle and pedestrian network. Such a network combined with a modern, effective bus system would be a cost-effective, achievable transportation plan for our county.

Greenway was not at last Sunday’s Open Streets. We were again denied participation in this Bike Santa Cruz County (BSCC) event. The fact that BSCC, a nonprofit operating a program on public streets with grant funding from the Regional...