Item: 25

AGENDA: October 6, 2016

TO: Regional Transportation Commission

FROM: George Dondero, Executive Director

RE: Director's Report

THIS ITEM FOR INFORMATION ONLY

SB 32 and AB 197 Signed by Governor Brown

On September 8 Governor Jerry Brown signed two bills that will affect transportation in years to come. S.B. 32 sets targets for greenhouse gas emission reductions, while A.B. 197 creates more oversight and requirements for the Air Resources Board, the agency in charge of defining and regulating emission reduction methods. These bills are expected to enable the state to continue and strengthen the state's cap-and-trade programs, which fund transit capital, transit-oriented affordable housing, high-speed rail, and other programs designed to reduce harmful emissions. Though Governor Brown did not call out big oil by name this time, he made clear today that this approval had been "a fight" against "the biggies" who pressed to defeat these "far-sighted and far-reaching" bills.

Frazier-Beall Transportation Funding Bill

On August 17 Assemblyman Jim Frazier (D-Oakley) and Sen. Jim Beall (D-San Jose) released a $7.4 billion transportation funding package to repair and maintain state and local roads, stabilize the State Transportation Improvement Program (STIP), improve trade corridors, and support public transit and active transportation. If approved by 2/3rd of the state legislature and the governor, the plan would be funded through a range of revenues, including gas and diesel taxes and vehicle registration fees. Last summer, Brown called a special session of the Legislature to highlight the backlog in state and local road repairs and other transportation budget deficits, but with the FY15/16 Legislative Session coming to a close on August 31, action on this major transportation funding package is on hold. The special session on transportation was convened briefly on the Assembly floor Tuesday, but **no action was taken and none is likely unless lawmakers return to the Capitol after the November election and vote on the proposal before November 30.**

Governor Jerry Brown and Democratic legislative leaders announced they did reach a deal to spend $900 million in cap-and-trade revenue. The agreement, which has been in the works for months, directs $135 million to the competitive Transit and Intercity Rail Program and $10 million to the California Transportation Commission's Active Transportation Program. The remaining funds are directed to the Air Resources Board and other non-transportation programs. The money comes from a system in which businesses buy permits to offset the climate-altering emissions of burning fossil fuels.

City of Santa Cruz Coastal Rail Trail Progress

The City of Santa Cruz and design firm RRM will be presenting the Final Schematic Plan to the City Transportation and Public Works Commission (TPWC) on Monday September 19 for the City's 2.1 mile Coastal Rail Trail project. The City of Santa Cruz is implementing the project in partnership with the RTC. The Final Schematic Plans will show the progress to date including moving the trail to the coastal side of the tracks between Swift St. and Almar Ave. after successful negotiation with New Leaf Market to grant an easement, and widening of the trail to a 14-16 foot paved width between California St. and Pacific Ave. The Final Schematic Plans will be used as the basis of the construction plans. In early to middle 2017, the construction plans will be brought to Council for final approval after the environmental, permitting, and right-of-way phases are complete. In total, over 11 miles of the Coastal Rail Trail are in progress with construction scheduled to occur for nine of those miles by 2018. Over $19M has been secured or committed to date including $14.5M in public funds and $4.5M in private donations. Additional funding has been committed pending grant applications award selections.

Measure D is on the Ballot

The Commissioners and RTC staff continued public information activities for Transportation Improvement Plan, now designated as Measure D, to be on the November 8 ballot. RTC and legal staff met with all the cities and the county, Metro and Community Bridges to discuss outreach about pothole repair, road maintenance, improvements to routes to schools, transit and paratransit services that will be preserved with funding from the measure, and the state and federal funds that will be available by having local match funding. More information is on the RTC website (which will be continually updated): www.sccrtc.org/move

DEPARTMENT OF TRANSPORTATION
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3161
FAX (805) 549-3077
TTY 711
http://www.dot.ca.gov/dist05/

Serious drought
Help save water!

October 4, 2016

Mr. George Dondero
Executive Director
Santa Cruz County Regional Transportation Commission
1523 Pacific Avenue
Santa Cruz, CA 95060

Dear Mr. Dondero:

This letter addresses items raised during the September 1, 2016 Commission meeting:

1. **Signal Synchronization on 41st Avenue and Highway 1 - Capitola:** The signalization for the Highway 1/41st Avenue interchange includes the intersection of the southbound ramps and Gross Road. This is a very complex intersection with one traffic signal controlling five approach legs. There are overlaps and sequencing of the signal operation that cannot vary. The signal also helps traffic flow on Highway 1 by controlling southbound vehicles entering the freeway. To protect the security and integrity of the electrical system, only authorized Caltrans personnel may access the controller cabinets.

2. **Sidewalk improvement projects near Watsonville:** The information about projects funded in the State Highway Operations and Protection Program provided in February, 2016 is still current. Enclosed are the description of SHOPP Projects in and near Watsonville as of February 18, 2016 and Highway 152 ADA Improvements fact sheet.

3. **Highway 1/Highway 9 Intersection Improvements:** The Caltrans Project Manager for this city-sponsored project has been in contact with the owner of Central Home Supply. Decisions regarding project design on this locally-sponsored project are determined by a multidisciplinary team that includes Santa Cruz city staff.

We appreciate our partnership and the opportunity to clarify this information.

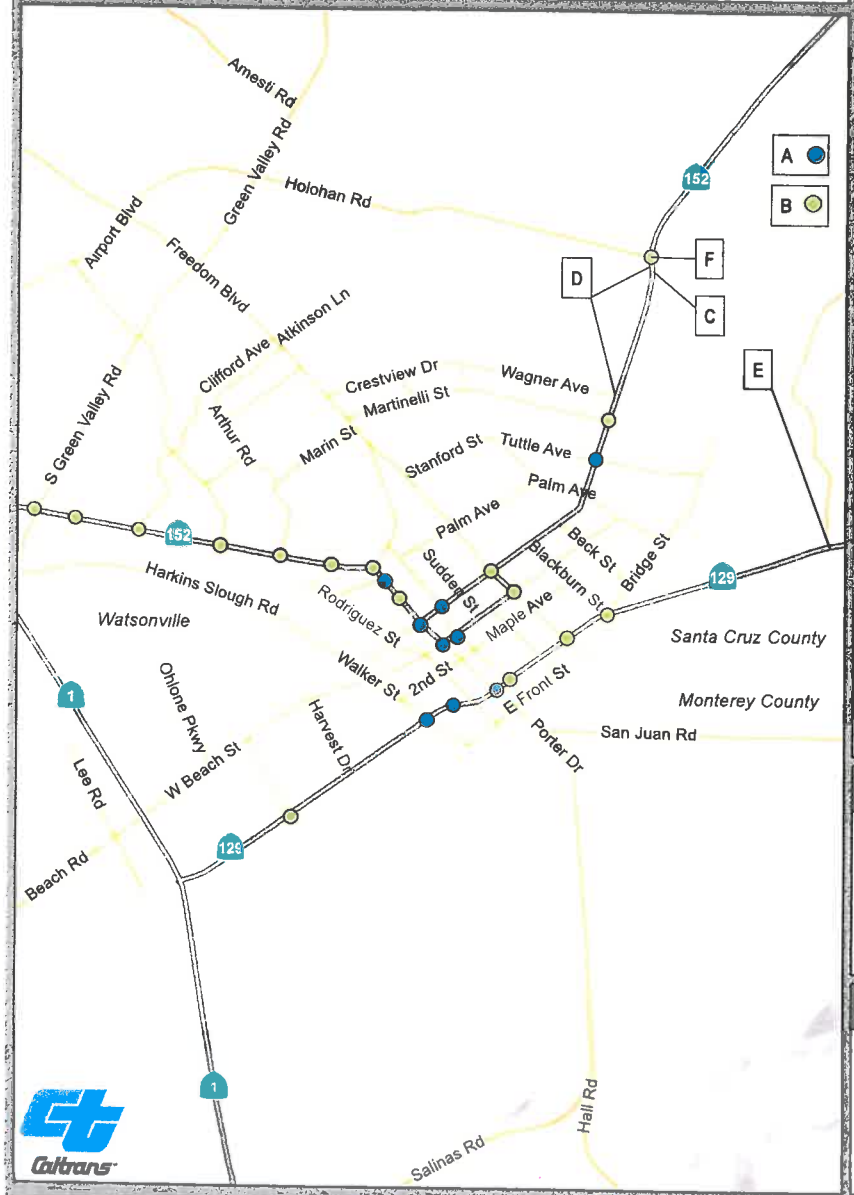
Sincerely,

TIMOTHY M. GUBBINS
District Director

Enclosures

SHOPP PROJECTS IN AND NEAR WATSONVILLE

FEBRUARY 18, 2016



A ACCESSIBLE PEDESTRIAN SIGNALS

EA: 05-1G280
AT: VARIOUS INTERSECTIONS
DESC: UPGRADE PED SIGNAL SYSTEMS
SHOPP: PROGRAMMED IN 2014 FOR CON IN 15/16
PHASE: CONSTRUCTION
COST: $1,374,000
PM: KATHY DIGRAZIA, PE (805-542-4718)

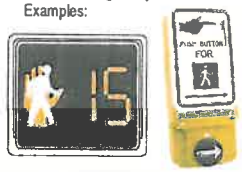
PURPOSE: Upgrade selected signalized intersections to include countdown pedestrian signal heads and accessible pedestrian signal pushbuttons

NEED: ADA Compliant pedestrian signal systems

PROPOSED WORK:
-Install countdown pedestrian signal heads
-Install accessible pedestrian signal pushbuttons
-Overall project includes similar upgrades for ADA compliance at 51 intersections across District 5

WATSONVILLE LOCATIONS:
-MAIN ST/FORD ST
-MAIN ST/LAKE AVE
-MAIN ST/BEACH ST
-BEACH ST/UNION ST
-LAKE AVE/BRENNAN ST
-LAKE AVE/TUTTLE AVE
-RIVERSIDE DR/WALKER ST
-RIVERSIDE DR/GROVE ST
-RIVERSIDE DR/MAIN ST

Pedestrian Signal Systems Examples:



B ACCESSIBLE PEDESTRIAN SIGNALS

EA: 05-1G160
AT: VARIOUS INTERSECTIONS
DESC: UPGRADE PED SIGNAL SYSTEMS
SHOPP: PROPOSED IN 2016 FOR CON IN 18/19
PHASE: PROJECT INITIATION DOCUMENT
COST: $1,337,000
PM: KATHY DIGRAZIA, PE (805-542-4718)

PURPOSE: Upgrade selected signalized intersections to include countdown pedestrian signal heads and accessible pedestrian signal pushbuttons

NEED: ADA Compliant pedestrian signal systems

PROPOSED WORK:
-Install countdown pedestrian signal heads
-Install accessible pedestrian signal pushbuttons
-Overall project includes similar upgrades for ADA compliance at 44 intersections across Santa Cruz County

WATSONVILLE LOCATIONS:
-RIVERSIDE DR/INDUSTRIAL RD
-RIVERSIDE DR/UNION ST
-RIVERSIDE DR/LINCOLN ST
-RIVERSIDE DR/BLACKBURN ST
-MAIN ST/GREEN VLY RD
-MAIN ST/SHOPPING WAY
-MAIN ST/OHLONE PKWY
-MAIN ST/PENNSYLVANIA DR
-MAIN ST/AUTO CENTER DR
-MAIN ST/RODRIGUEZ ST
-MAIN ST/FREEDOM BLVD
-MAIN ST/5TH ST
-BEACH ST/LINCOLN ST
-LAKE AVE/LINCOLN ST
-LAKE AVE/MARTINELLI ST
-LAKE AVE/HOLOHAN RD

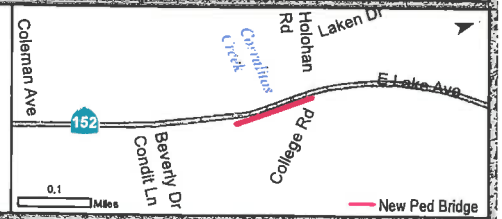
C CORRALITOS CREEK BRIDGE ADA

EA: 05-1F620
FROM: CORRALITOS CREEK BRIDGE
TO: HOLOHAN RD
DESC: PROVIDE PED ACCESS ALONG EAST SIDE
SHOPP: NOT SELECTED FOR 2016 SHOPP
PHASE: UNFUNDED (CANDIDATE FOR 2018)
COST: $3,000,000
PM: KATHY DIGRAZIA, PE (805-542-4718)

PURPOSE: Improve pedestrian infrastructure along the eastbound side of SR 152 across Corralitos Creek

NEED: ADA Compliant pedestrian path

PROPOSED WORK:
-New pedestrian bridge



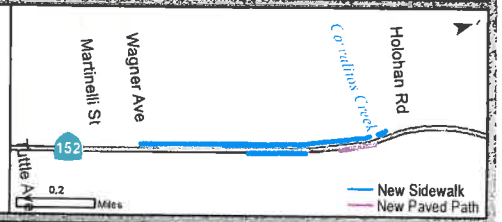
D SCR 152 ADA

EA: 05-1E020
FROM: WAGNER RD
TO: SOUTH OF HOLOHAN RD
DESC: INSTALL SIDEWALK, CURB RAMPS
SHOPP: PROGRAMMED IN 2014 FOR CON IN 17/18
PHASE: PLANS/SPECIFICATIONS/ESTIMATE
COST: $1,565,000
PM: KATHY DIGRAZIA, PE (805-542-4718)

PURPOSE: Comply with ADA by removing obstructions to pedestrian access on SR 152 from Wagner Ave to the Corralitos Crk Bridge

NEED: ADA Compliant pedestrian path

PROPOSED WORK:
-New sidewalk (west)
-New sidewalk/paved pathway (east)



E SR 129/LAKEVIEW RD

EA: 05-1G990
AT: SR 129/LAKEVIEW RD
DESC: CONSTRUCT INTERSECTION SAFETY IMPROVEMENTS
SHOPP: CANDIDATE FOR 2018
PHASE: PROJECT INITIATION DOCUMENT
COST: $3,650,000
PM: LUIS DUAZO, PE (805-542-4678)

PURPOSE: Construct intersection improvements

NEED: Improve safety; reduce conflicts

PROPOSED WORK:
-Modify intersection
-Alternatives include a one-lane roundabout with two eastbound lanes

F SR 152/HOLOHAN INTERSECTION

(COUNTY LEAD)
EA: 05-0T770
AT: SR 152/HOLOHAN RD
DESC: OPERATIONAL MULTIMODAL IMPROVEMENTS
SHOPP: MINOR A FINANCIAL CONTRIBUTION ONLY
PHASE: PROJECT APPROVAL/ENVIRONMENTAL DOC
COST: $1,600,000
PM: LUIS DUAZO, PE (805-542-4678)

PURPOSE: Alleviate traffic congestion; operational improvements
NEED: Improvements for vehicles, bikes, and peds
PROPOSED WORK:
-Signal upgrades
-Add left turn lane on Holohan Rd
-Add shared left turn/through lane on Holohan Rd
-Add right turn lane on Holohan Rd
-Add merge lane on SR 152
-Bike/ped improvements

Highway 152 ADA Improvements East of Watsonville

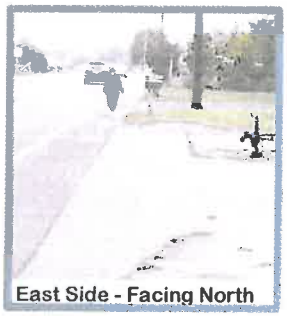
Project Purpose

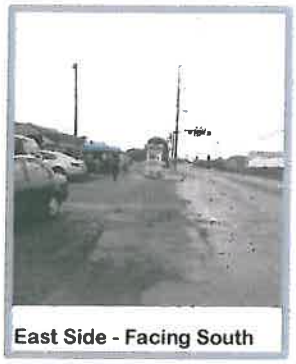
- To comply with the Americans with Disability Act (ADA) by removing obstructions to pedestrian access on Highway 152 from Wagner Avenue to the Corralitos Creek Bridge.

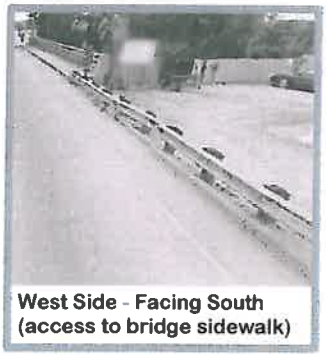

West Side -Facing North

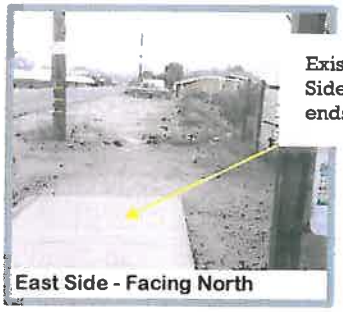
Project Need

Non-ADA Compliant Pedestrian Path


East Side - Facing North


East Side - Facing South

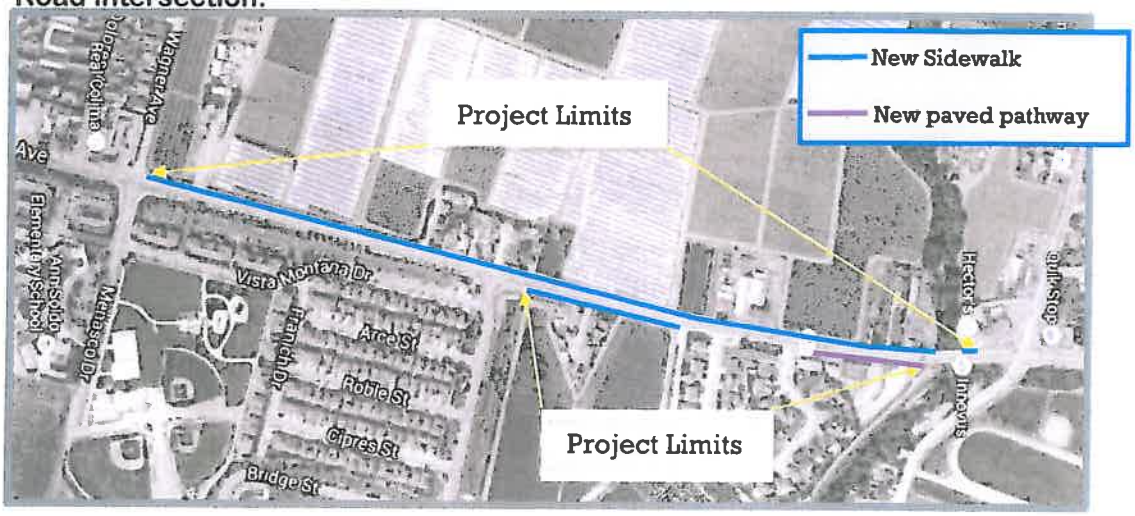

West Side - Facing South (access to bridge sidewalk)



East Side - Facing North

Proposed Work

- West side (southbound) – New sidewalk from Wagner Avenue to Corralitos Creek Bridge. New access to the bridge sidewalk on both ends.
- East side (northbound) – New sidewalk or paved pathway from Bridge Street to the Levee Path
- This project does not include improvements to the bridge nor to the Holohan/College Road intersection.



Schedule

Env Determination: February 2016
Final Design Complete: early-2018
Begin Construction: mid-2018

Other Nearby Projects

Ped Signal upgrades on State Highways - 2016 SHOPP (2019)
Holohan Road Intersection Improvements – County Lead
Corralitos Creek Ped Bridge – Not programmed

Caltrans District 5, 50 Higuera Street, San Luis Obispo, CA 93401
Kathy DiGrazia, Project Manager (805) 542-4718 kathy.digrazia@dot.ca.gov
February 2016

Caltrans

Stanley M. Sokolow

Santa Cruz, CA 95060

October 4, 2016

TO: Santa Cruz County Regional Transportation Board (RTC)

RE: Guided busway as bus rapid transit (BRT)

FOR MEETING ON OCTOBER 6, 2016.

Dear Commissioners:

I notice in the minutes of September 1, 2016, that:

> Commissioner Friend moved and Commissioner Chase seconded the motion to direct staff to come back to the Commission on their first meeting after the November election with an outline for the possible uses of the rail corridor: a rail with trail, trail only, and **bus rapid transit (BRT)**, … The motion passed unanimously ….

Since it was not specifically mentioned, **I am writing to request that the specific type of BRT called a guided busway be included by staff in their study of BRT.**

I believe that the guided busway system I'm describing here could be the most effective means of relieving congestion on Highway 1 during commute hours, at lower construction and operating costs than a light-rail system in the rail corridor or HOV lanes on Highway 1. When combined with the new battery-powered buses, greenhouse gas emissions during operation would be zero. If the RTC reallocates the Measure D revenues by eliminated the auxiliary lanes on Highway 1 and instead invests that money into a guided busway system, it would make real progress in reducing congestion on the freeway.

The term "bus rapid transit" usually is thought of as a network of bus-only lanes on streets upon which single, dual-tandem, or triple-tandem (articulated) buses travel without being delayed by traffic. BRT has been enjoying increasing popularity among urban transit systems in recent years. The first and most well developed BRT system began decades ago in South America, but that is not a guided busway system. The curb-guided busway was developed in Germany and installed there in 1980 and subsequently in Australia, Japan, and the UK.

A **guided busway (or guideway) system** involves two parallel concrete tracks on concrete ties (or "sleepers") sitting on a gravel bed (ballast) like railroad tracks do. Some installations used concrete posts and beams to support the track. Together the tracks are called the busway or guideway, upon which modified buses can travel safely within a very narrow lane corridor at speeds up to 60 mph. The busway can be thought of as a concrete railway track for rubber-tire buses which are guided either by simple mechanical rollers linked to the bus steering (Figure 1) which steer the bus very precisely between the curbs on the sides of the busway, or by electronic means involving a wire or magnets in a lane with no curbs. The buses are able to exit the busway at intersections with city streets and travel

like any ordinary bus since they are identical to ordinary buses except for the auxiliary steering mechanism.

Guided Bus Technology

A research report done at UC Berkeley in 2007 evaluated the various guidance and guideway systems. It reported that the mechanical guidance technology developed 25 years prior to the study had demonstrated effectiveness for its designed purpose. The most remarkable experience about the guideway system was the lack of wear and tear on the running surfaces. These surfaces had been exposed to constant bus traffic for 25 years and there were no visible signs of deterioration. Construction of the guideway has been done in several ways: pre-cast concrete sections, conventional poured-in-place concrete, and continuous slip-mold concrete technology using machines manufactured by Gomaco, a US based manufacturer of advanced concrete machines. The continuous slip-mold track built in one city in the UK had problems of contractor quality control, resulting in too much vibration due to lack of smoothness, but that was corrected by grinding. Vibration was also a problem in some cases with the pre-cast method due to imperfect alignment of the sections. The latest Gomaco slip-mold machines now use advanced GPS and laser guidance that produces high accuracy, whereas the earlier machines used guide strings set by hand which was not as precise. (During the widening of Mission Street, I saw that the curb and gutter along Santa Cruz Mission Street were formed with this string-guided technology.)

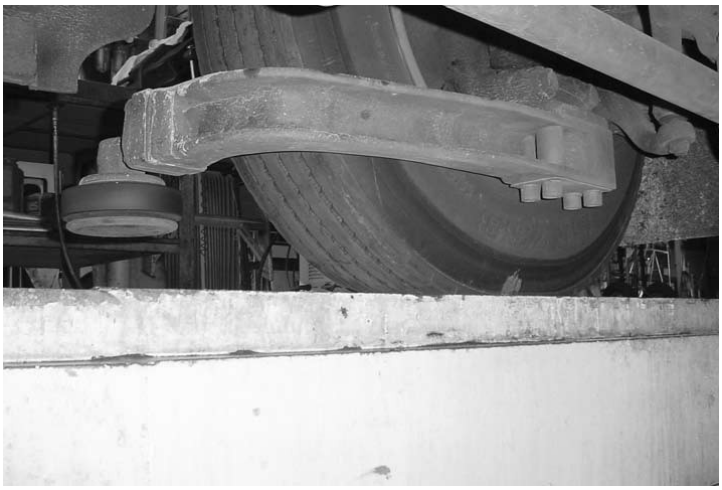


Illustration 1: Guide arm viewed from under the bus.

One advantage of a guided busway over a bus-only BRT lane with driver-steered buses is that the guided bus can be safely operated in narrow corridors which were formerly railway lines with narrow passages under road overcrossings and narrow trestles and bridges, or close to a pedestrian/bicycle path. The width of a guideway for US standard-width buses is only 10 feet from outside of curb to outside of the other curb. Due to the precision steering, the buses can fit within a tight clearance much like a train on steel tracks. This makes it well suited to our rail-trail corridor where the bicycle/pedestrian path will be in close proximity and where the steep banks on one or both sides of the tracks in some places would require large cutbacks and tall retaining walls. The narrow busway minimizes those costs. In the UK and in Eugene (Oregon), many of their guided busways run

alongside a similar path with no dividing fence, but a simple fence to separate them from the path is recommended.

Because the bus is much lighter than even a light-rail train, it can stop much quicker, within 2 bus lengths from freeway speed. They don't require the crossing boom devices that are used to stop street traffic when a train is approaching an intersection. A simple traffic signal is sufficient, just as with buses on city streets. Signals can give preference to the bus by sensing an approaching bus and holding the green light for the bus longer to allow its non-stop progress on the busway. A boom or gate may be used to keep unauthorized vehicles from entering the busway, although the UK systems use a car trap instead. Horn blasting is not required at intersections, making it quiet within residential neighborhoods. On the busway, the driver keeps hands off of the steering wheel since the curb-guidance steers the bus while the driver controls the speed and braking. On a city street, the driver steers as usual. Because the station platforms are at the same height as the bus floor and the guide wheels allow precise docking, wheelchairs, strollers, and bicycles can roll onto the bus without a step up or ramp.

Train proponents will argue that a light-rail train can carry more passengers than a bus system because trains can link 8 to 12 railcars. However, it's important to consider what size of mass transit system is appropriate for our county's population. If we were considering building an airport here, it would not make sense to build one that can handle intercontinental jumbo jets. A light-rail or heavy-rail system certainly can have more capacity than a bus system, but what's the right size for us? Moreover, BRT systems often use tandem buses to increase capacity. The passenger train feasibility study has data that should let the planners estimate the ridership and determine the capacity and number of buses required.

The BRT systems in Curitiba (Brazil) and Bogota (Colombia) have proven that they can move very large numbers of people per day by having high-capacity tandem buses at frequent intervals and innovative in-station ticketing systems to allow rapid boarding of buses. Curitiba's designers innovated a unique station that speeds up loading and unloading. The passenger pays to enter a “tube station”, not on the bus, which allows rapid passenger loading through all doors without having to stop and pay at the paystation near the driver. This shortens the loading delay at stops, which in effect increases the number of passenger-miles that can be traveled per hour of bus operation. Front-loading/rear-exiting buses take longer at each stop since passengers queue up to enter single-file and pay onboard. Guided buses have been scheduled as closely as 1 minute intervals during peak commute demand in dense locations.

Guided Busway in Eugene, Oregon

The city of Eugene, Oregon, has a population of roughly 156,000. The nearby city of Springfield has a population of 56,000. These two cities have joined to create a bus rapid transit system for Lane County Transit District which incorporates curb-guided busways along parts of the main backbone route between them. Known as the “EmX” line, the system runs advanced tandem buses on bus-only lanes in existing streets, on curb-guided busway sections, and on ordinary street lanes. Some sections have an adjacent bicycle/pedestrian path. Watch this video showing the planners' animation of how the system is configured: Eugene, Oregon BRT implementation.

This video compares the animation with the real system in operation:
Eugene, Oregon BRT: Project Visualizations and Reality

How well has it worked? Video: About EmX

In 2013, buses guided by magnets in the pavement with sensors on the bus providing input to an automated steering system were placed into service. This allows the bus to be guided even on segments of the route without curbs, which are in bus-only lanes of the existing streets. Watch the test drive: An articulated bus under automated steering control on EmX Route at Eugene, OR

Santa Cruz County Busway

I envision a system for Santa Cruz County involving curb-guided Metro buses making a circuit from Watsonville to the existing Santa Cruz Metro downtown transit center and back again to Watsonville, using the busway to avoid the congestion on Highway 1. In the morning, buses would depart from Watsonville, travel on the busway northward making stops at stations along the route or non-stop as express buses for end-to-end trips. When a local-route bus reaches a city or village, it would either dock at a bus stop along the busway, or it would exit the busway onto a street and travel to a nearby station or neighborhood bus stop, possibly making a local loop through the town, and then after dropping off and picking up passengers it would return to the busway for a rapid hop to the next interchange or station.

Unlike a light-rail train on the rail-trail corridor, the bus would be able drive directly to the downtown Metro station. It would exit the busway in Santa Cruz at the Murray/Seabright intersection and travel on city streets following the existing Metro route 68 (Murray to Seabright to Broadway to Metro center). Unlike light-rail, the bus does not require passengers to get off and transfer to a connector bus to reach the Metro hub from a train station along the right-of-way. It would be a “single-seat” trip. This would not disturb the existing train infrastructure on the right-of-way to the west of the Murray/Seabright intersection, including the train bridge over the river and the tracks used by the Big Trees train. It would not annoy homeowners whose properties abut the right-of-way in downtown and the west side. The railroad bridge over the river at the Boardwalk could be used exclusively for the bike/pedestrian trail, whereas a train on the bridge would require building a cantilevered extension, wider than the existing walkway, alongside for the trail or building an additional pedestrian bridge.

After departing the downtown Metro station, the bus would then take Highway 1 in the non-congested morning southbound direction back to Watsonville to begin the loop again. In the evening commute, the direction of the buses would be reversed, traveling northbound in the non-congested counter-commute direction on the freeway and southbound on the exclusive busway while Highway 1.

An express route could also reach the Metro station and then proceed like the Highway 17 Express does to the Scotts Valley bus center, where people could catch their corporate bus (“Google Bus” or “Facebook Bus”, etc.). Passengers on the express bus originating from stations between Santa Cruz and Watsonville would not need to transfer to the Highway 17 Express to reach their corporate bus in Scotts Valley. This express option to Scotts Valley would supplement the Highway 17 Express, thus saving time and increasing the likelihood that more of the 25% of commuters who drive over Highway 17 to work in Silicon Valley will choose the convenience of the bus.

Because a bus has a wider stance between its wheels than a train does, a conventional railroad track can fit within the busway, allowing trains to share the right-of-way with a guided busway, which may be useful where the busway might share with a seasonal Polar Express train or freight train or electric trolley (see below). In Germany, this dual-use track/busway concept was employed to allow the guided busway to straddle subway tracks through a shared tunnel.

When the busway system is recognized by the public as a cost-effective, rapid, reliable, and convenient mode of travel, many people will leave their cars at home or at a park-and-ride lot, relieving congestion on Highway 1. Experience in South America has shown that 15% to 20% of the people riding the BRT actually own cars but choose the bus because it's a better way to travel.

The key to success of a rapid transit system is convenience, speed, and reliability. The guided bus system provides convenience superior to that of a light-rail system because of the “single-seat” convenience. It provides speed by avoided the congestion of Highway 1 in the commute direction. It also provides reliability since any breakdown of a train or collision on the tracks would bring the light-rail system to a halt, whereas a bus could detour off of the busway onto city streets at the interchange prior to the obstruction and return to the busway at the next interchange beyond the obstruction. A train can't do that.

I notice that the Santa Cruz Metro has acquired 4 all-electric battery-powered buses to use on Highway 17 and in Watsonville. An early employee of the electric car company Tesla has created a new company, Proterra, which has developed a battery-powered bus with a range of up to 250 miles between re-charging and that can be re-charged rapidly, in minutes, not hours. The bus is made with modern composite materials to keep weight down and still be very strong. The lighter weight and compact structure allows more space for batteries, which is one reason it can go so far on one charge. The capability to be completely self-contained and battery-powered over long distances may not be matched by light-rail trains for a very long time due to the weight of trains. Some electric light-rail trains and trolley cars have the ability to travel on battery charge “off wire” for short distances, but not the 20-mile distance from Watsonville to Santa Cruz.

Illustration 2: Proterra battery-powered bus

The RTC's passenger train feasibility study pointed out that a train maintenance facility would need to be built on land not yet purchased, tracks laid to it, railroad mechanics hired, trained, and equipped. All of that would be unnecessary for a busway system. The Metro already has a bus maintenance facility with trained and equipped mechanics who are familiar with buses. The study also explained that much of the existing rail infrastructure is in need of repairs and upgrades, including replacement of the rails with continuously welded rails, new ties, washing or replacing clogged gravel ballast, and new switches for sidings to be able to support passenger commuter service at speeds of 40 mph or higher.

Currently nearly all of the track is only suitable for light-duty freight service at speeds below 10 mph but with some repairs could be suitable for low-speed passenger excursions.

Except for the steering-roller mechanical arms or electronic steering guidance, the guided buses are in every way ordinary buses that can also travel on streets. This provides the Metro with flexibility to move buses around to different routes during the daily and weekly ebb and flow of demand, taking buses off of the busway route and onto local routes, or vice versa, as needed for smart load balancing. You can't do that with a light-rail train. It may be possible to retrofit existing buses with the guidance rollers.

To appreciate the curb-guided busway, watch these videos and others that I have posted on the Facebook page called "Bus By Choice":
https://www.facebook.com/groups/1219604211402385/permalink/1396560707040067/

- A brief introduction: The Cambridgeshire Guided Busway https://www.youtube.com/watch?v=10UY3WC4nDY
- Take a ride on a double-deck bus on the Leigh Guided Busway https://www.youtube.com/watch?v=VJiplocRQUw. Notice that the busway is separated from the bicycle path by only a few feet with a short fence between them.
- Adelaide O-Bahn (1988) https://www.youtube.com/watch?v=9A5BCbovR9s

Here is some reference information for the staff research:

- An Update on Curb Guided Bus Technology and Deployment Trends, David Phillips TranSystems Corporation, in *Journal of Public Transportation*, 2006 BRT Special Edition, http://www.nctr.usf.edu/jpt/pdf/JPT%209-3S%20Phillips.pdf .
- Designing Bus Rapid Transit Running Ways (2010) http://www.apta.com/resources/standards/Documents/APTA-BTS-BRT-RP-003-10.pdf
- Proterra electric bus with 258 mile range and 5 minute recharge time. https://www.fastcoexist.com/3051475/meet-the-electric-bus-that-could-push-every-other-polluting-bus-off-the-road
- Videos of the Proterra bus:
  - https://www.youtube.com/watch?v=qrwdGFKC-rE
  - https://www.youtube.com/watch?v=9JpMTWdPZ6c
- Gomaco, US-based international manufacturer of slip-mold continuous-forming concrete machines used in the UK for some of its busways. https://www.gomaco.com/resources/contactus.html
- Bus rapid transit practitioner's guide (2007). Find in library: http://www.worldcat.org/title/bus-rapid-transit-practitioners-guide/oclc/155845616
- Tube stations: https://www.theguardian.com/cities/2015/may/26/curitiba-brazil-brt-transport-revolution-history-cities-50-buildings

Use of Railway Track

What could be done with the western portion of the train tracks that wouldn't be used for the commuter line? Here's an idea: a consortium of businesses to support a tourist trolley on the tracks between Capitola Village and Davenport. A self-contained, battery-powered, electric antique-replica trolley car could be run from the Municipal Wharf to the Depot Park station to Wilder Ranch State Historic Park and Davenport on the refurbished rails. This would breathe new life into Davenport businesses and further enhance Santa Cruz tourism. If the tracks between the Boardwalk and Capitola Village are preserved and the busway straddles them, as explained above, the trolley also could shuttle people between Davenport, Santa Cruz, Aptos Village, and Capitola Village. The Depot Park historic station could be a park-and-ride location since it already has a pay-parking lot. The trolley would run at low speeds, so the existing rails probably could be used, with some repairs. The clickety-clack of the non-welded rail joints would just enhance the historic feel. The same company that makes the slip-form concrete machine I mentioned, Gomaco, also has a trolley division which makes a variety of replica antique trolley cars that run on tracks. Here's a nice one in Glendale, California: Battery-Powered, Self-Propelled 7-Bench Trolley - Glendale, California. Other styles are available. The trolley is able to run nine hours on a single charge. It can also pull a non-powered trailing car for more capacity. It's gorgeous. Look at the brochure: Gomaco Battery-Powered, Seven-Bench, Open-Style Trolley with Five-Bench, Non-Powered Trailing Car.

Illustration 3: Gomaco replica streetcar in Glendale, California

Conclusion

The information I have seen about a guided busway system versus a light-rail system says that the busway system is less expensive to build, cheaper to operate, quicker to get up and running, and more versatile. I feel the system I described would be superior to the Tier I HOV project and to a light-rail train, provide better service, be sized appropriately for the population of Santa Cruz County, without the years of disrupting traffic on Highway 1 during construction, without rebuilding any freeway bridges, and at a cost the taxpayers and riders will be able to afford. I would much rather see the money that has been proposed for auxiliary lanes on the freeway be used instead toward a busway

system that will make a significant improvement to congestion by taking car commuters off of Highway 1 and onto a convenient mass transit alternative. Likewise, rather than making extensive repairs and upgrades to the rails, ties, and ballast to allow high-speed commuter rail travel, the money would be better spent toward building a bus guideway.

The special edition of the Journal of Public Transportation cited above concluded about curb-guided busways (CGB) versus light-rail transit (LRT) and conventional bus rapid transit (BRT):

> "CGB technology provides a means of providing BRT service with quality more like LRT, with fast operation and level boarding. It fits into rights-of-way where conventional BRT with dedicated lanes may not fit. It provides one-seat rides where LRT may require passengers to transfer to/from feeder buses. It can be implemented incrementally, starting in part of a corridor. Yet its installation cost is not significantly higher than conventional BRT and is significantly lower than LRT. With more awareness of this technology, its rate of growth, and geographical dispersion, may increase."

I urge the RTC to direct staff to make a careful analysis of the curb-guided busway system and the circular route I've suggested.

Sincerely,

Stanley M. Sokolow