Unified Corridor Investment Study

Step 1 Scenario Analysis

The objective of the Unified Corridor Investment Study (UCS) is to identify multimodal transportation investments that provide the greatest potential benefit and most effective use of Highway 1, Soquel Avenue/Drive and Freedom Blvd, and the Santa Cruz Branch Rail Line. See the project area map in **Attachment 1**. The Step 1 analysis aims to evaluate the feasibility of the various projects and scenarios (Step 1 Criteria is shown in **Attachment 2**) in order to help direct the discussion on what projects will provide the greatest potential benefit and if there is benefit from the project, indicate if there are barriers that would make this project infeasible.

Questions that are posed in this step of the analysis include:

- Will this project help Santa Cruz County address its transportation challenges? For example, will it reduce congestion on Highway 1, will it help to meet the requirements for GHG emission reductions, will it improve safety, will it improve access for people who do not drive, will it improve health, social equity and economic vitality.
- Is there community support for the project? Have agencies previously conducted planning efforts in support of this project?
- How much will it cost the residents of Santa Cruz County to implement this project? What is the potential for other funding sources to be available?
- What are the right-of-way needs?
- Are there potential environmental impacts that may make the project less feasible?
- Are there regulatory requirements for this project that will be challenging to meet? Or, how does this project help to address regulatory requirements?

The projects were evaluated using a standard set of indicators that were developed for each criterion as well as a narrative providing an explanation of the opportunities and challenges that affect the feasibility of the project (**Attachment 3**). Each project was given a rating for each criterion based on a five level rating system as shown in Table 2. An overall rating was also given for each project.

Ratings	***Rating Definition***
	Indicates a greater level of potential opportunities within the criteria
	Indicates more potential opportunities than challenges within the criteria
Neutral	Indicates a balance of opportunities and challenges within the criteria
	Indicates more potential challenges than opportunities within the criteria
	Indicates a greater level of potential challenges within the criteria

Table 2. Step 1 Project Rating System

The cost information provided on the project tables (**Attachment 3**) is order of magnitude estimates that will be further refined in Step 2. Minor cost is considered < $50 million, moderate cost is $50 million to $200 million, and major cost is greater than $200 million. **Attachment 4** includes a summary of the feasibility and transportation benefits and challenges of each scenario based on the project evaluations and the grouping of projects within each scenario. **Attachment 5** is the projects and scenarios approved by the RTC on December 7, 2017 to be evaluated in Step 2 of the scenario analysis.


Davenport
9
17
Soquel Dr
Soquel Ave
Santa Cruz
Aptos
Freedom Blvd
1
Capitola
SC Branch Rail Line
Pacific
Ocean
Monterey Bay
1
Watsonville
Unified Corridor Investment Study
Project Limits

Unified Corridor Investment Study

Highway 1, Soquel Ave/Drive & Freedom Blvd, and the Santa Cruz Branch Rail Line

Goals, Criteria and Performance Measures

(RTC Approved - May 4, 2017)

The goals, criteria and performance measures below support a vision for an integrated, multimodal transportation network based on a triple bottom line approach that maximizes the environmental, economic and equity benefits.

Goal	Step 1 Criteria
Promote feasible solutions that address transportation challenges.	Community support and coordination/consistency with local, regional, state and federal plans
	Potential to address transportation challenges and advance environmental, economic and equity goals
	Compatibility with regulatory requirements
	Level of public investment
	Right of way and constructability constraints
	Technological feasibility

Goals	Step 2 Performance Measures
Safer transportation for all modes	Injury and fatal collisions by mode
Reliable and efficient transportation choices that serve the most people and facilitate the transport of goods	Peak period mean automobile travel time
	Peak period mean transit travel time
	Peak period travel time reliability
	Mode share
	Person trips across N-S screenline
Develop a well-integrated transportation system that supports economic vitality	Level of public investment
	Visitor tax revenues
	Cost associated with fatalities and injuries
Minimize environmental concerns and reduce adverse health impacts	Automobile vehicle miles traveled
	Environmentally sensitive areas
	Criteria pollutants
	Greenhouse gas emissions
Accessible and equitable transportation system that is responsive to the needs of all users	Transit Vehicle Miles Traveled
	Household transportation costs
	Benefits and impacts to transportation disadvantaged communities

Route	**Highway 1**
Project Title	Bus On Shoulders
Project Description	A Bus on Shoulders Feasibility Study is currently underway to investigate the possibility of express bus service utilizing the shoulders on Highway 1 between Santa Cruz Metro Center and Watsonville Transit Center. Options being considered include use of either inside or outside shoulders and potential use of the existing/future (funded by Measure D) auxiliary lanes between Morrissey Blvd and State Park Dr (approximately 6 miles). The Bus on Shoulders Feasibility Study is scheduled to be finalized in spring 2018. Frequency of transit service on Highway 1 would remain the same as existing service but would utilize the shoulders/auxiliary lanes and therefore would require minor or no change in operating costs.
Overall Rating	
Summary	Bus on Shoulders is a potentially low (minor) cost option that could improve transit travel time and reliability. Decreases in transit travel time could increase transit ridership, reducing VMT and therefore greenhouse gas emissions. The available right-of-way along shoulders is being investigated in the BOS Feasibility Study.

Step 1 Criteria		Rating	Evaluation	Narrative
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Project specific planning effort (Bus on Shoulders Feasibility Study) ✓ Consistent with long range planning effort with public input (approved draft 2040 RTP project list)	▫ Monterey Salinas Transit/Metro/Caltrans District 5/CHP are working in cooperation on a feasibility study for bus on shoulders. The feasibility study is scheduled to be finalized in spring 2018. ▫ The approved draft project list for the 2040 Regional Transportation Plan (RTP) includes the bus on shoulders project. Partner agency, public and stakeholder input are solicited at key milestones of the RTP development.
	Negatives			
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs, education and services Environmental ✓ Mode shift to transit ✓ Reduces VMT and GHG Health & Equity ✓ Improves access for people who do not drive ✓ Reduces household transportation costs	▫ Bus on shoulders has the potential to improve transit travel times and travel time reliability between Watsonville and Santa Cruz Metro Center providing improved access to jobs, education centers, and services. ▫ Transit in the auxiliary lanes (with minimal time on shoulders) may still provide operational improvements but may not improve travel times as significantly as transit travel on a dedicated shoulder. ▫ Bus on shoulders could improve travel time for local service if use outside shoulders or auxiliary lanes with direct access to on- and off-ramps. ▫ Faster and more reliable transit service could encourage people to shift from driving to transit, reducing VMT and GHG emissions. Transit improvements support lower cost transportation options which can reduce household transportation costs and benefit people who do not drive including youth, seniors, people with disabilities, low income, and minorities. ▫ Bus on shoulders may have additional safety and transit travel time benefits when combined with ramp metering on Highway 1.

Step 1 Criteria		Rating	Evaluation	Narrative
	Negatives		Economic × Increases auto travel time (on ramps) Environmental × Environmentally sensitive areas may be impacted × Traffic impacts (at highway ramps due to bus priority) Equity × Potential Safety conflicts (with emergency response vehicles, law enforcement and disabled vehicles) × Potential Safety conflicts (between buses and autos at entry and exit ramps)	▫ Highway shoulders have typically been used for emergency and traffic law enforcement. As required by legislation (AB 1746) emergency and traffic law enforcement use is still the priority for highway shoulders. ▫ Highway 1 ramp metering to benefit transit may have a negative effect on auto travel time as transit would be given priority over autos. ▫ Potential conflict points between buses and autos at entry and exit ramps could affect motorist safety
Compatible with Regulatory Requirements	Positives/ Neutral		✓Consistent with legislation (AB 1746, SB 375, SB 32) ✓Consistent with design standards (Caltrans)	▫ AB 1746 provides the authority for Metro to use highway shoulders for bus-only traffic during congested periods with approval from Caltrans and CHP. ▫ Greenhouse gas reduction legislation (SB 375, SB 32) requires reductions in GHG from transportation in order to slow climate change.
	Negatives		× Approvals required (Caltrans and CHP)	▫ Approvals will be required from Caltrans and CHP to assess any increase in conflict points between buses and autos at entry and exit ramps and affects on motorist safety
Level of Public Investment	Positives/ Neutral		✓ Minor new investment for capital costs may be required ✓ Minor new investment for operations required ✓ Existing funding sources could cover cost of operations ✓ Some funding sources (federal, state or local) may be available for capital costs	▫ Once the auxiliary lane projects between State Park Dr and Soquel that have been funded by Measure D have been constructed, the cost for BOS on the auxiliary lanes will be minor. Minimal amounts of paving may be required near the interchanges where bus will travel on shoulders. ▫ Frequency of transit service on Highway 1 would remain the same as existing service but would utilize the shoulders/auxiliary lanes, and therefore would require minor or no change in operating costs. Some new investment in buses and operations would be needed if transit service is expanded as a result of this project.
	Negatives			
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓Minor amounts of right-of-way may need to be acquired	▫ Bus on shoulder transit services are expected to be accommodated primarily within existing Highway 1 right-of-way. Some additional right-of-way may need to be acquired for widening at ramps and widening of over and under-crossings.
	Negatives		× Construction challenges may require significant additional funds or alternative designs	▫ Limited shoulder width at a number of over-crossings and under-crossings along Highway 1 may make project infeasible in the near term due to cost required to widen these structures. Any widening necessary for BOS would be consistent with the Highway 1

Step 1 Criteria		Rating	Evaluation	Narrative
				Corridor Investment Program DEIR. The BOS Feasibility Study is scheduled to be final in spring 2018 which will provide information on feasibility and cost.
Technological Feasibility	**Positives/ Neutral**		✓Technologically feasible ✓Could accommodate future technologies	▫ BOS and any associated widening requirements are all technologically feasible. New technologies could be implemented to improve bus flow through ramp meters. Design could allow for implementation of self-driving buses in future.
	Negatives			

Route	**Highway 1**
Project Title	Additional lanes for high occupancy vehicles (HOV) and increased transit frequency
Project Description	The project would construct HOV lanes for a nine mile section between San Andreas Rd and Morrissey Blvd in both the north and southbound directions. Project includes construction of new HOV lanes, auxiliary lanes (in addition to those included in Measure D) and reconstruction of the interchanges and ramps, and over and under-crossings along this nine mile section. Interchange improvements include enhanced bicycle and pedestrian treatments. Express transit service in the HOV lanes is also considered here with 15 minute headways between Watsonville and Santa Cruz. Stops at Cabrillo and Capitola will be more limited.
Overall Rating	
Summary	Highway 1 is a principle transportation route for Santa Cruz County residents with traffic volumes as high as approximately 97,000 vehicles per day. Commuters, visitors, residents and businesses rely on Highway 1 for accessing their destinations. The HOV lanes project is a major cost capacity increasing project which could relieve congestion on Highway 1 and may provide travel time improvements for transit, carpooling and single occupancy vehicle (SOV) motorists. Project could promote carpooling and transit use as a means to further increase transportation system capacity. Economic vitality of the region could be increased and access between north and south county could be improved. There could be potentially significant environmental impacts for all interchange improvements and over and under-crossings along this 9 mile stretch of Highway 1.

Step 1 Criteria		Rating	Evaluation	Narrative
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Project specific planning effort with public input (Hwy 1 Corridor Investment Program Draft EIR) ✓ Consistent with long range planning effort (2014 RTP) ✓ Multi-agency support (RTC, City of Capitola General Plan)	▫ The RTC is working in cooperation with Caltrans and FHWA on the draft Highway 1 Corridor Investment Program environmental review. The draft EIR has gone through the public comment period and responses to comments are being generated. ▫ The HOV Lane Project is included in the 2014 Regional Transportation Plan. Partner agency, public and stakeholder input are solicited at key milestones of the RTP development.
	Negatives		× May have some public opposition	▫ Concern has been expressed that increasing highway capacity will make traveling by automobile easier, increasing the number or length of trips people take, and thus will increase VMT and GHG emissions. Some members of the public are represented by advocacy groups that oppose improvements to Highway 1.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves auto travel time ✓ Improves auto travel time reliability ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs,	▫ Travel time for HOV, SOV and transit could be reduced which could improve access to jobs, education centers and services and promoting business development and associated economic vitality for the region. Travel time improvements could also benefit emergency vehicles. ▫ Faster and more reliable transit travel times could increase transit ridership although transit in HOV lanes would primarily be beneficial for express services due to time it takes to move in and out of the HOV lanes when entering and exiting highway for local service. ▫ HOV lane travel times could increase carpooling. HOV lanes would help to decrease the

Step 1 Criteria		Rating	Evaluation	Narrative
			education and services ✓ Potential to increase land use development, business activity, employment and tax revenues Environmental ✓ Mode shift to transit ✓ Mode shift to carpooling Health & Equity ✓ Improves access for people who do not drive (transit) ✓ Improves safety	"cut-through" traffic on local streets by adding capacity to the highway. Auxiliary lanes can improve traffic flow and safety of the highway by extending the merging area between off and on ramps.
	Negatives		Environmental × Environmentally sensitive areas may be impacted × Potential to increase GHG emissions Health & Equity × Potential for safety conflicts (between HOVs/buses and SOVs)	▫ The HOV lane project extending over a 9 mile section of highway with reconfiguration of the interchanges may impact environmentally sensitive areas. ▫ The goal of adding HOV lanes is to reduce congestion and increase the speed of travel. Increasing travel speeds and making it easier to travel can increase the number or length of trips but the extent of any induced demand would need to be evaluated. GHG could be increased if the number or length of trips is increased due to induced demand. Alternatively, GHG could be reduced if speeds are in the most optimal range (30-50 mph) for GHG emission reductions. ▫ Safety conflicts could arise as high occupant vehicles and buses entering and exiting the HOV lanes and general purpose lanes as HOVs enter and exit the highway
Compatible with Regulatory Requirements	**Positives/ Neutral**		✓ Standard permitting process ✓ Consistent with legislation (FAST Act)	▫ Permitting of any roadway project can be a time and resource intensive endeavor. Hwy 1 HOV lanes will be required to go through the standard permitting process although the large scale of the project, geography and natural resources potentially within the project area, may increase the amount of coordination needed with federal and state agencies may require significant effort to obtain the required permits. However, the length of the project (9 miles), geography and natural resources potentially in the area may increase the amount of coordination with federal and state agencies and increase the level of effort required to obtain the necessary permits. ▫ FAST Act legislation will require AMBAG to meet regional targets for safety and travel time reliability. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. HOV lanes and associated auxiliary lanes may improve safety and travel time reliability to help meet regional targets.
	Negatives		× Design exceptions required	▫ Requests for design exceptions are anticipated on the HOV Lane project to avoid sensitive resources such as protected plant, animal and wetland habitat areas and to minimize impacts to residential, commercial and existing infrastructure.
Level of Public Investment	**Positives/ Neutral**		✓ Some funding sources may be available for capital costs (STIP, STBG, SB1 -LPP & CC, TIGER, trade corridor funds but	▫ With the passage of Senate Bill 1 (SB 1) earlier this year, additional funds for transportation investments in Santa Cruz County may be available through both formula funding and grant programs. The congested corridors program, a grant program through SB 1 designed to provide funds for congested commute corridors could provide funds for Highway 1 HOV

Step 1 Criteria		Rating	Evaluation	Narrative
			unlikely) ✓ Minor new investment for operations required ✓ Existing funding sources could cover cost of operations (Caltrans SHOPP and maintenance budget)	lanes. STIP funds have been a source of funds for SCC over the years although even the STIP funds dropped within the last few years. STIP funds will be restored by SB 1 although they still may be lower than historic levels. ▫ Opportunities arise from time to time from federal infrastructure investment programs, road user fees, and special grants to fund projects that are essentially "one-time" events. ▫ Currently, highway maintenance operation costs are paid for by the state. In future, Caltrans may require local agencies to cover costs of maintenance for projects that increase capacity.
	Negatives		× Major new investment for capital costs required	▫ Cost to implement HOV lanes on Highway 1 is significant (major) due to the interchange and crossing improvements that are needed to eliminate the constrictions that limit widening of the highway.
Right of Way and Constructability Constraints	**Positives/ Neutral**		✓ Can be built in phases	▫ Project can be implemented in phases with independent utility as funding becomes available. One of the several auxiliary lane projects that are needed to accommodate the additional HOV lane has already been built and three more are funded through Measure D.
	Negatives		× Moderate amounts of ROW will need to be acquired × Construction challenges may require significant additional funds or alternative design	▫ The project can generally be accomplished within the existing Caltrans highway right-of way, but some additional right-of-way acquisition will be required to expand some interchanges to accommodate HOV lanes. Geometrically challenged structures at interchanges and bridges may require additional funds or alternative designs.
Technological Feasibility	**Positives/ Neutral**		✓ Technologically feasible ✓ Could accommodate future technologies	▫ The HOV lanes project is feasible with current day technology. Technologies such as autonomous vehicles could be accommodated in future that may increase the capacity of the facility, safety and operational efficiencies such as fuel economies and emissions
	Negatives		x Planning for future technologies has not been initiated	▫ The effect of automated vehicles on the future transportation system is still unknown. Roadway capacity may increase as vehicles can travel more closely together but there will likely be increases in travel due to ease of taking more and longer trips. Regulations related to automated vehicles are still in their infancy. Larger MPOs are beginning to take steps to plan for future technologies. The smaller RTPAs such as RTC will be following their lead in planning for future technologies.

Route	**Highway 1**
Project Title	Auxiliary lanes to extend merging distance *(in addition to Measure D auxiliary lanes)*
Project Description	This project would construct auxiliary lanes along Highway 1 between interchanges from State Park Dr to San Andreas Rd. The three sets of auxiliary lanes are State Park Dr to Rio Del Mar Blvd, Rio Del Mar to Freedom, Freedom to San Andreas Rd (northbound only as southbound auxiliary is already in place). The auxiliary lanes between State Park Dr and Rio Del Mar Blvd would require reconstruction of the two overcrossings of the Santa Cruz Branch Rail Line in Aptos, and widening of the Aptos Creek Bridge. Measure D provides funds for 3 sets of auxiliary lanes between Soquel and 41st Ave, Bay-Porter and Park Ave, and Park to State Park Dr not included in this project. The Measure D projects with identified funding will be assumed in all scenarios.
Overall Rating	
Summary	Moderate cost operational improvement to improve traffic flow and safety of the highway by extending the merging area between off and on ramps.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Project specific planning effort with public input (Highway 1 Corridor Investment Program and DEIR) ✓ Consistent with long range planning effort with public input (2014 RTP)	▫ The RTC is working in cooperation with Caltrans and FHWA on the draft Highway 1 Corridor Investment Program Environmental Documents. The draft EIR has gone through the public comment period and responses to comments are being generated. The auxiliary lane projects being considered here between State Park Dr and San Andreas are included in the Highway 1 Corridor Investment Program. Other auxiliary lane projects along Highway 1 (between Soquel and State Park Dr) have been supported by voters through passage of Measure D. ▫ Auxiliary lanes projects are included in the 2014 Regional Transportation Plan as stand-alone projects with independent utility. Partner agency, public and stakeholder input are solicited at key milestones of the RTP development.
	Negatives		× May have some public opposition	▫ Concern has been expressed that increasing highway capacity will make traveling by automobile easier, increasing the number or length of trips people take, and thus will increase VMT and GHG emissions. Some members of the public are represented by advocacy groups that oppose improvements to Highway 1.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves auto travel time ✓ Improves auto travel time reliability Health & Equity × Improves safety	▫ The auxiliary lanes projects could improve traffic flow and safety of the highway by extending the merging area between off and on ramps. Some travel time benefits may be realized due to improvements in traffic flow and fewer traffic incidents.
	Negatives		× Environmentally sensitive areas may be impacted	▫ The auxiliary lane project extending a 3 mile section from State Park Dr to San Andreas Rd may impact environmentally sensitive areas.

Step 1 Criteria		Rating	Evaluation	Narrative
Compatible with Regulatory Requirements	Positives/ Neutral		✓ Consistent with legislation (FAST Act) ✓ Consistent with design standards (Caltrans) ✓ Standard permitting process	▫ Permitting of any roadway project can be a time and resource intensive endeavor. Auxiliary lanes will be required to go through the standard permitting process however the length of the project (3 miles), geography and natural resources potentially in the area, may increase the amount of coordination with federal and state agencies and increase the level of effort require to obtain the necessary permits. ▫ FAST Act legislation will require AMBAG to meet regional targets for safety and travel time reliability. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. Auxiliary lanes could improve safety and travel time reliability to help meet regional targets.
	Negatives			
Level of Public Investment	Positives/ Neutral		✓ Moderate new investment for capital costs required ✓ Some funding sources may be available for capital costs (STIP, STBG, SB1 -LPP & CC, TIGER, trade corridor funds but unlikely) ✓ Minor new investment for operations required ✓ Existing funding sources could cover cost of operations (Caltrans SHOPP and maintenance budget)	▫ Amoderate amount of funds are needed to implement auxiliary lanes on Highway 1. The cost of constructing auxiliary lanes between State Park and Rio Del Mar is greater due to the need to replace two rail road bridges in Aptos. With the passage of Senate Bill 1 (SB 1) earlier this year, additional funds for transportation investments in Santa Cruz County will be available through both formula funding and grant programs. The congested corridors program, a grant program through SB 1 designed to provide funds for congested commute corridors, could provide funds for Highway 1 auxiliary lanes, although it is uncertain at this time whether Highway 1 will be competitive for these funds. STIP and STBG funds have been a source of formula funds for SCC over the years although even the STIP funds dropped within the last few years. STIP funds will be restored by SB 1 although they still may be lower than historic levels. ▫ Opportunities arise from time to time from federal infrastructure investment programs, road user fees, and special grants to fund projects that are essentially “one-time” events. ▫ Currently, highway maintenance operation costs are paid for by the state. In future, Caltrans may require local agencies to cover costs of maintenance for projects that increase capacity.
	Negatives			
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓ Can be built in phases ✓ Minor amounts of ROW may need to be acquired	▫ Project can be implemented in phases with independent utility as funding becomes available. One auxiliary lane project has already been built on Highway 1 and three more are funded through Measure D. This project would construct 3 more sets of auxiliary lanes phased over time. The project can generally be accomplished within the existing Caltrans highway right-of-way, but some additional right-of-way acquisition may be required to for under and over-crossings through this area.
	Negatives		× Design exceptions required	▫ Requests for design exceptions are anticipated on the Auxiliary Lane project to avoid sensitive resources such as protected plant, animal and wetland habitat areas and to minimize impacts to residential, commercial and existing infrastructure.
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible ✓ Could accommodate future technologies	▫ The auxiliary lanes project is feasible with current day technology. Technologies such as autonomous vehicles could be accommodated in future.
	Negatives			

Route	**Highway 1**
Project Title	Ramp Metering
Project Description	Reconfiguration of on-ramps and local streets to allow for ramp metering and installation of ramp meters at interchanges between San Andreas Rd and Morrissey Blvd. Ramp metering will control entry onto the highway through use of meter lights during peak periods. The metering rate will be traffic responsive based on actual traffic conditions of the mainline flow in the vicinity of the ramp. Reconfiguration of on-ramps may require widening and/or lengthening of the on-ramps to allow room for queuing to limit backup onto local streets. Separate lanes for SOV and HOV would be installed with faster metering rates for HOV.
Overall Rating	
Summary	Highway 1 is a principle transportation route that serves Santa Cruz County residents with traffic volumes up to approximately 97,000 vehicles per day. Commuters, visitors, residents making local trips and businesses rely on Highway 1 for accessing their destinations. The economy of Santa Cruz County is dependent on a functioning transportation system where Highway 1 is the backbone. Ramp metering on Highway 1 has the potential to make significant near term operational efficiencies at a relatively minor project cost. Benefits from ramp metering include safety improvements from spacing vehicles as they merge onto highway and less stop and go traffic; improvements to travel time and travel time reliability; and reductions in GHG emissions. With the improved efficiencies of the highway, cut through traffic through the neighborhoods will be reduced. Ramp metering loses effectiveness when demand is significantly greater than capacity.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓Project specific planning effort with public input (Highway 1 Corridor Investment Program DEIR) ✓Consistent with long term planning effort (2014 RTP)	▫ The RTC is working in cooperation with Caltrans and FHWA on the draft Highway 1 Corridor Investment Program Environmental Documents. The Highway 1 Corridor Program includes ramp metering in both alternatives being evaluated. The draft EIR has gone through the public comment period and responses to comments are being generated. The ramp metering project being considered here between Morrissey Blvd and San Andreas Rd are included in the 2014 Regional Transportation Plan as a stand-alone project with independent utility.
	Negatives		× May have some public opposition	▫ Ramp metering could result in queue overflow on local streets impacting traffic but this could be limited with ramp design, detector placement and timing design. Motoring public and businesses could express opposition.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		<u>Economic</u> ✓Improves auto travel time ✓Improves auto travel time reliability ✓Improves access to jobs, education and services ✓Potential to increase land use development, business activity, employment and tax revenues	▫ The ramp metering project could improve operational efficiencies by metering the flow of vehicles onto the highway during peak periods. Ramp metering has also been shown to increase capacity of the highway. Speeds could increase on the freeway and congestion could be reduced, decreasing travel time and improving travel time reliability. A short wait on the on-ramp could allow motorists to increase their average freeway speed and shorten overall freeway travel times. Ramp metering loses effectiveness when demand is significantly greater than capacity. ▫ Greater operational efficiencies on the highway will relieve cut through traffic through the neighborhoods.

Step 1 Criteria		Rating	Evaluation	Narrative
			Environmental ✓Potential to reduce GHG Equity ✓Improves safety	▫ Ramp metering has also been shown to improve safety by spacing the vehicles as they merge onto the highway and by reducing the stop and go traffic thereby reducing the number of collisions. ▫ Vehicles traveling at speeds between 30 to 50 mph emit fewer GHG emissions per mile than vehicles in stop and go traffic.
	Negatives		Environmental × Environmentally sensitive areas may be impacted × Traffic Impacts (on local streets)	▫ Widening of ramps where needed for queuing capacity may have an impact on environmentally sensitive areas ▫ Ramp metering could result in queue overflow on local streets impacting traffic but this could be managed with detector placement and timing design.
Compatible with Regulatory Requirements	Positives/ Neutral		✓Consistent with legislation (FAST Act, SB 375, SB 32) ✓Consistent with design standards (Caltrans) ✓Standard permitting process	▫ FAST Act legislation requires AMBAG to meet regional targets for safety and travel time reliability. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. Ramp metering can improve both safety and travel time reliability. ▫ Greenhouse gas reduction legislation (SB 375, SB 32) requires reductions in GHG from transportation in order to slow climate change.
	Negatives			
Level of Public Investment	Positives/ Neutral		✓Minor new investment for capital costs required ✓Minor new investment for operations required ✓Some funding sources may be available for capital costs (STIP, STBG, SB1 -LPP & CC, TIGER, trade corridor funds but unlikely) ✓Some funding sources may be available for operations (Caltrans SHOPP and maintenance budget)	▫ The level of investment needed for ramp metering still needs to be determined in detail based on how much effort will be needed to provide the queuing capacity on the on-ramps. The amount of investment may be relatively small compared to increase in operational efficiencies and the safety benefits. The 3 sets of auxiliary lane projects funded through Measure D could potentially include reconfiguration of on-ramps for ramp metering which would reduce the amount of additional funds needed for this project.
	Negatives			
Right-of-way and Constructability Constraints	Positives/ Neutral		✓Some right-of-way may need to be acquired	▫ Some additional right-of-way may need to be acquired for widening at ramps to accommodate queuing as shoulder widths may be limited.
	Negatives		× Design exceptions required	▫ Requests for design exceptions are anticipated on the ramp metering project to minimize impacts to residential, commercial and existing infrastructure.
Technological Feasibility	Positives/ Neutral		✓Technologically feasible ✓Could accommodate future technologies	▫ Current technology exists for implementation that would allow the metering rate to be responsive to actual traffic conditions of the mainline flow in the vicinity of ramp. Additional technology also exists to determine the metering rate based on overall traffic conditions of highway and major arterials which will likely improve over time.

Step 1 Criteria		Rating	Evaluation	Narrative
	Negatives			

Route	**Highway 1**
Project Title	Additional lanes on Highway 1 bridge over San Lorenzo River
Project Description	The project would widen the bridge at the San Lorenzo River overcrossing from 2 lanes in each direction to 3 lanes southbound and 4 lanes northbound to improve traffic flow through the Highway 1/9 intersection and bring the bridge up to seismic safety standards.
Overall Rating	
Summary	The project could help to improve traffic flow through the Hwy 1/9 intersection, one of the most utilized intersections in the county at a moderate cost. Safety improvements include increasing the distance for automobiles to merge on/off Highway 1 from Ocean Street and River Street/Highway 9. Bridge replacement would be completed to meet seismic safety standards and could also decrease environmental impacts by removing the center pier from the middle of the river channel.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with long range planning effort (2014 RTP) ✓ Consistent with other planning efforts (City of Santa Cruz CIP and General Plan)	▫ Project is included in the 2014 RTP. Partner agency, public and stakeholder input are solicited at key milestones of the RTP development. ▫ Approved Caltrans Project Study Report
	Negatives			
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves auto travel time ✓ Improves auto travel time reliability ✓ Improves access to jobs, education and services ✓ Potential to increase land use development, business activity, employment and tax revenues Health & Equity ✓ Improves safety Environmental ✓ Impacts to environmentally sensitive areas may be reduced	▫ The Highway 1 bridge over the San Lorenzo River is part of the bottleneck for automobiles accessing the west side of the City of Santa Cruz and the Harvey West business area. Widening San Lorenzo Bridge in coordination with the Highway 1/9 intersection improvements will improve traffic operations in this area. The degree to which travel time and reliability improve may not be significant. ▫ Safety may improve by increasing length of merge lanes northbound from Ocean St onto Highway 1 and southbound from River Street/Hwy 9 onto Highway 1 and providing a shoulder for increased maneuverability to avoid collisions. ▫ Widening the bridge over San Lorenzo River may improve the riverine habitat, reduce impacts to associated species, and reduce flooding. ▫ Bridge replacement would improve seismic resistance and upgrade substandard structure.
	Negatives			
Compatible with Regulatory	**Positives/ Neutral**		✓ Consistent with design standards ✓ Standard permitting process	▫ Project includes seismic retrofit of bridge as required by the Caltrans Seismic Retrofit Program. ▫ The San Lorenzo Bridge Widening will be required to go through the standard permitting process although the need for construction near the waterway may require significant effort

Step 1 Criteria		Rating	Evaluation	Narrative
Requirements				to obtain the required permits.
	Negatives			
Level of Public Investment	Positives/ Neutral		✓ Existing funding sources could cover cost of operations ✓ Moderate new investment for capital costs required ✓ Some funding sources may be available for capital costs (HBRR, STIP, STBG, CC, Measure D – local)	▫ Currently, highway maintenance operation costs are paid for by the state. In future, Caltrans may require local agencies to cover costs of maintenance for projects that increase capacity. ▫ Funding sources available for capital costs of project include the Highway Bridge replacement and Rehabilitation Program
	Negatives			
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓ Right of way is sufficient	
	Negatives		× Construction challenges due to environmentally sensitive areas	▫ Designs will consider impacts on traffic during construction and impacts to environmentally sensitive areas.
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible ✓ Could accommodate future technologies	
	Negatives			

Route	**Highway 1**
Project Title	Mission Street Intersection Improvements
Project Description	The project would improve intersections along Mission Street in Santa Cruz including modifying design and adding lanes at Hwy1/Mission/Chestnut/King intersection, widening at Mission and Bay, right turn lanes at Swift and Laurel, and installation of a traffic signal at Shaffer Rd. Intersection improvements are needed to reduce conflicts between autos, transit, bicyclists and pedestrians and to improve traffic flow.
Overall Rating	
Summary	Mission Street on the west side of Santa Cruz has many roles to perform. It functions as State Route 1 for through traffic connecting the north coast to the City of Santa Cruz and destinations to the south. It also serves as the "main street" for the City of Santa Cruz's upper and lower westside neighborhoods and is the primary automobile and transit route serving UCSC. The Mission Street intersection improvements could improve access for through traffic and local destinations, improve traffic operations and travel time reliability and improve safety for autos, bicyclists and pedestrians.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with long range planning effort (2014 RTP, City of SC General Plan and 2015-2017 CIP) ✓ Multi-agency support (City of SC, RTC)	▫ Intersection improvement projects on Mission Street are included in the 2014 RTP. Partner agency, public and stakeholder input are solicited at key milestones of the RTP development. ▫ Hwy 1/Mission/Chestnut/King and Mission/Bay projects are listed in the most recent City of Santa Cruz CIP. ▫ Improving safety for bicyclists on Mission Street was the focus of recent bicycle safety campaigns.
	Negatives			
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves auto travel time ✓ Improves auto travel time reliability ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs, education and services ✓ Potential to increase land use development, business activity, employment and tax revenues Equity ✓ Improves safety	▫ The intersection improvements could improve traffic flow on Mission Street to destinations on the westside of SC including UCSC, commercial areas and residences. Safety, travel time and travel time reliability for autos and transit could be improved. Commuters, businesses, residents making local trips, visitors and students could benefit from these improvements. ▫ Improvements for auto and transit must consider effects on bicyclists and pedestrians and their ability to navigate safely through intersections.
	Negatives			

Step 1 Criteria		Rating	Evaluation	Narrative
Compatible with Regulatory Requirements	Positives/ Neutral		✓ Consistent with design standards (Caltrans) ✓ Consistent with legislation (FAST Act)	▫ Coordination with Caltrans required for work on state highways. ▫ FAST Act legislation requires AMBAG to meet regional targets for safety and travel time reliability. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. Mission St. intersection improvements can improve both safety and travel time reliability.
	Negatives		× Design exceptions required	▫ Request for design exceptions are anticipated for intersection improvements on Mission St. to minimize impacts to residential, commercial and existing infrastructure.
Level of Public Investment	Positives/ Neutral		✓ Minor new investment for capital costs required ✓ No new investment for operational costs required ✓ Some funding may be available for capital costs (STIP, STBG, SB1 -LPP & CC, TIGER, trade corridor funds but unlikely)	▫ Funding may be available for these projects from a number of different sources including the traditional sources (STIP, STBG) and a couple of new sources of funds due to passage of SB 1 (LPP and CC). Operational costs would not likely need to be increased based on these intersection improvements.
	Negatives			
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓ Minor amounts of ROW may need to be acquired	▫ Intersection improvements to accommodate all modes (auto, transit, biking and walking) may require some additional right-of-way.
	Negatives			
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible	▫ Intersection improvements can be designed to accommodate future technologies.
	Negatives			

Route	**Highway 1**
Project Title	Provide rail transit along the Highway 1 alignment
Project Description	Rail transit service would travel primarily along Highway 1 between Santa Cruz and Watsonville. Rail transit service would be bidirectional and extend from Depot Park in Santa Cruz along Chestnut St to Highway 1 at Mission St, continue on Highway 1 until north of Beach St in Watsonville where rail transit service would continue on the Santa Cruz Branch Rail Line to Pajaro Station. Rail transit along Highway 1 would occur in the median in order to limit the number of points where the highway and rail cross. Portions of the rail transit service are expected to be elevated and other sections constructed in tunnels as a result of insufficient space in the median for bidirectional tracks and platforms, proximity of the project to the built environment, and changes in grade along Highway 1. Station locations would include Depot Park, Emeline Ave, Soquel Ave, 41st Ave, Park Ave and downtown Watsonville. Parking would be needed to serve the station stops.
Overall Rating	
Summary	Rail transit service on a combination of new rail transit facilities along Highway 1 and existing Santa Cruz Branch Line rail ROW and Roaring Camp ROW is a major cost capacity increasing improvement that would provide a new transit route along Santa Cruz County's most heavily traveled route connecting north and south county. Rail transit service along Highway 1 would improve transit travel time and transit travel time reliability and provide an alternative to congestion on Highway 1 and Soquel/Freedom. By improving travel time and travel time reliability, transit ridership could increase, reducing VMT and therefore greenhouse gas emissions. Rail transit increases options for those who do not drive including seniors, youth, people with disabilities, and low-income.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**			
	Negatives		× Project is not included in any planning document.	▫ A rail transit service alignment along Highway 1 has not previously been investigated by the RTC and community input has not been solicited on project concepts. However, RTC policy supports consideration of passenger rail service.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**	Neutral	<u>Economic</u> ✓Improves transit travel time ✓Improves transit travel time reliability ✓ Improves access to jobs, education and services ✓ Potential to increase land use development, business activity, employment and tax revenues <u>Environmental</u> ✓Mode shift to transit ✓Improves safety ✓Reduces VMT and GHG	▫ Rail transit service on Highway 1 between Watsonville and Santa Cruz has the potential to significantly improve transit travel times and travel time reliability between Santa Cruz and Watsonville by providing a separate continuous right of way dedicated to rail transit along Highway 1. This new direct transit connection between Watsonville and Santa Cruz will improve access to jobs, education centers and services and promote business development and associated economic vitality for the region. A new transit alternative to congested automobile travel on Highway 1 may increase ridership, encourage people to shift from driving to transit, reducing VMT and GHG emissions. ▫ Access to jobs, education and services may improve but may be limited. Rail ridership has been shown to correlate with the number of jobs within ¼ mile of rail stops (approximately a 5 minute walk) and the intensity of land use near the stations. Much of this ¼ mile distance (approximately 1/10 mile) is taken up by the highway/interchange structure limiting the amount of jobs that can be accessed within a 5 minute walk from the stations. The distance between rail stations along this rail line will also limit ridership.

Step 1 Criteria		Rating	Evaluation	Narrative
			Health & Equity ✓ Improves access for people who do not drive	▫ Access for people who do not drive (youth, seniors, people with disabilities, low income, minority) can be improved by a rail transit option. Although rail transit on Highway 1 does not provide easy access to UCSC for staff and students but does provide direct access to Cabrillo College. UCSC student ridership currently accounts for approximately 50% of Metro ridership when school is in session.
	Negatives		Environmental × Environmentally sensitive areas may be impacted × Traffic impacts (near rail stations)	▫ A passenger rail project extending approximately 20 miles and requiring construction of new structures along the route may impact environmentally sensitive areas. Elevating or tunneling rail service would have more extensive environmental impacts. ▫ Traffic impacts near rail stations will be significant as station locations will be located in areas that are already congested during peak periods. Alternatively, rail along highway will not cross roadways at grade and thus will not have traffic or safety impacts at roadway intersections.
Compatible with Regulatory Requirements	**Positives/ Neutral**	Neutral	✓ Consistent with legislation (SB 375, SB 32) ✓ Consistent with design standards (Caltrans, CPUC, and rail operator)	▫ Greenhouse gas reduction legislation (SB 375, SB 32) requires reductions in GHG from transportation in order to slow climate change. Rail on Highway 1 could result in a significant mode shift to transit, thereby reducing VMT and GHG emissions.
	Negatives		× Complex permitting process	× Federal regulatory requirements for rail are challenging to meet
Level of Public Investment	**Positives/ Neutral**	👎👎	✓ Some funding sources may be available for capital costs (FTA5309-New/Small Starts, TIGER, STIP, STBG, SB 1-LPP & CC, LCTOP, TIRCP, Section 130)	▫ Capital funds may be available from Federal Transit Agency New/Small Starts program and other federal, state and local sources.
	Negatives		× Major new investment for capital costs required × Major new investment for operations required × New funding source required for operations	▫ Significant expense related to construction, provision of stations and rail operations. Costs would include interchange improvements to make room for rail transit in the median as well as parking requirements. A rail transit system that includes elevated sections as well as tunneled sections would require a major cost investment.
Right of Way and Constructability Constraints	**Positives/ Neutral**	👎		
	Negatives		✓ Moderate amounts of ROW may need to be acquired ✓ Construction challenges may require significant additional funds or alternative design	▫ The project can generally be accomplished within the existing Caltrans highway right-of way, but some additional right-of-way acquisition may be required to reconstruct interchanges to accommodate station stops. ▫ A design for rail transit along Highway 1 has not been initiated. An initial project design would need to consider right of way, terrain and station locations. Building new structures in locations where Highway 1 right of way is already constrained may present construction challenges. Interchanges would need to be reconstructed to remove column structures in median to allow for rail transit travel. Elevating or tunneling rail transit service along Highway 1 may be required due to geographical constraints and result in significant

Step 1 Criteria		Rating	Evaluation	Narrative
				construction challenges.
Technological Feasibility	**Positives/ Neutral**		✓ Technologically feasible ✓ Could accommodate future technologies (battery electric multiple units)	▫ Future technologies could provide battery electric multiple units for noise reduction and for reduced GHG.
	Negatives			

Route	**Highway 1**
Project Title	Automated vehicles
Project Description	Automated vehicles (AVs) are defined by the ability of the vehicle to control a safety-critical function such as steering, throttle, or braking without direct driver input. Driver-assistance automation is already included in many vehicles where the driver is assisted with acceleration through adaptive cruise control, assisted parking and other features. Improvements in these technologies are rapidly advancing. There is much debate in the field about the timeline for implementation of fully automated vehicles. The need for regulatory agencies to address ethical questions on maneuvering around obstacles including other vehicles, bicyclists, pedestrians, and animals is an area of uncertainty that may delay introduction of fully automated vehicles onto our roadways even after the technology is readily available. Based on historic vehicle purchasing and turnover rates as well as the infancy of the regulatory decision making process for automated vehicles, market saturation of fully automated vehicles are estimated for around the years 2050 - 2060. It is assumed that by 2035, the horizon for this study, fully automated vehicles with human presence (auto and transit) will be operating on the roadways, but they will constitute less than 20 percent of the fleet vehicle mix. This assumption relies on a number of factors including the adoption of state regulatory guidance, the realization of cost efficiencies, and consumer acceptance. Roadway infrastructure to support automated vehicles will be minimal in 2035. Traffic signals will include technology for detecting the presence of vehicles at intersections and communicating some data, but will not fully replace present day loop-detectors. Additional infrastructure that may be implemented prior to 2035 would include devices to provide vehicles with safety information such as warnings about work zones, sharp curves, or other hazards. As fully automated vehicles become a larger portion of the fleet vehicle mix, smart infrastructure such as traffic signals with wifi communication to vehicles, pedestrians, and bicyclists will be required.
Overall Rating	
Summary	The effects of automated vehicles on future transportation systems are under much debate. This new technology has the ability to make vast improvements to safety, access and mobility or conversely, the potential to drastically increase traffic congestion and vehicle miles traveled. The effect of AV technology on the transportation system is dependent on the regulatory system that is developed and the ability of government agencies to implement equitable solutions that serve the community's mobility needs and simultaneously reduce vehicle miles traveled. The cost for automated vehicles is mostly taken on by the individual consumer as the public infrastructure needs for AV will be minimal by 2035. By 2035, automated vehicles, including transit, may still be mixed with conventional vehicles on all roadways. Improvements to travel time and travel time reliability for autos and transit will likely be slight as the increased density at which vehicles can operate only becomes significant when there is at least 40% AVs in the flow. More significant traffic flow benefits could be achieved once there is 75% or greater AVs in the flow which may not occur prior to 2035. Safety benefits could be significant with AV technology, reducing the number of collisions on roadways which in turn reduces non-recurring congestion.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency	**Positives/ Neutral**		✓Consistent with other planning efforts (Federal and State)	▫ The research, development and manufacturing of automated vehicle technology have increased substantially over the last decade. Efforts at the state and federal level to regulate manufacturing and use of AVs on roadways are challenged to keep pace with advancements in technology.

Step 1 Criteria		Rating	Evaluation	Narrative
with Applicable Plans				▫ Community support can be shown by individual purchasing of these vehicles.
	Negatives		× May have some public opposition	▫ Lower income individuals may not support government expenditures on infrastructure for AVs. Results from the UCS survey expressed significant concern from a number of survey responders that AVs are for the wealthy and they do not see benefit for themselves or the community.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	Positives/ Neutral		<u>Economic</u> ✓Improves auto travel time ✓Improves auto travel time reliability ✓Improves transit travel time ✓Improves transit travel time reliability <u>Environmental</u> ✓Reduces GHG <u>Health & Equity</u> ✓Improves safety	▫ Improvements to safety from level 5 automated vehicles (AV5s) can be realized through use of sensing technology to detect obstructions in vehicle path and respond efficiently. Concerns have been raised about reliance on programmed systems rather than human response but overall safety is considered one of the main benefits to AV5s. ▫ Improvements to travel time and reliability for both autos and transit may occur as simulations have found that a small percentage of HAVs among human-driven cars on a lane reduces congestion. An AV5 will not sit idle after the car in front has started moving improving the traffic flow. AV5s will also systematically adhere to a closer distance to the car in front in comparison to human-driven which significantly increases the density of vehicles. This improvement will become more significant as the number of AV5s increases and human-driven vehicles are decreased. Others debate that any significant improvements to increased capacity and thus travel time improvements will only be realized in lanes dedicated to HAVs as mixed flows will not show much improvement to roadway capacity. ▫ Once AV technology is advanced to the point where human presence is not required in vehicles, vehicle miles traveled and thus travel time will likely increase substantially as vehicles will be sent to run errands and take other trips without regard for costs of travel time on people. This assumption is not being made here as this will likely occur after 2035. ▫ AV5s in 2035 will likely be primarily electric vehicles and thus will reduce GHG. Improved driving efficiencies from fuel powered AV5s will also reduce GHG. ▫ Fully autonomous vehicles may be able to operate much earlier on a dedicated facility but limited land and resources will limit the feasibility of this occurring by 2035. Once the market is saturated with HAVs, transit HAVs could provide increased local mobility at a low cost, for which private vehicles may be forfeited but this occurrence is likely further in the future than 2035.
	Negatives		<u>Health & Equity</u> × Increases household transportation costs	▫ The expense of purchasing AVs is greater than the average costs for automobiles and thus will increase household transportation costs. Many people may not be able to afford AVs prior to 2035.
Compatible with Regulatory Requirements	Positives/ Neutral		✓Consistent with legislation (FAST Act)	▫ FAST Act legislation requires AMBAG to meet regional targets for safety and travel time reliability. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. Automated vehicles can improve safety and potentially travel time reliability.
	Negatives		× Standards currently under development	▫ Federal and State regulations determining the new requirements for both auto manufacturers and roadway users may take a while to catch up with the advancements in

Step 1 Criteria		Rating	Evaluation	Narrative
				AV technology.
Level of Public Investment	**Positives/ Neutral**		✓Minor new investment for capital costs required ✓Minor new investment for operations required	▫ The amount of public infrastructure needed in the short term for vehicle-to-vehicle technology for AVs will be minimal since AVs can operate in mixed traffic on existing roadways shared with conventional vehicles. Vehicle-to-infrastructure technology would require more significant investments but will likely not be utilized on a large scale until there is market saturation of HAVs. Examples include curve speed warning to vehicles that speed is too high to safely negotiate the curve; pedestrian in crosswalk warning that alerts vehicles that a pedestrian is in a crosswalk; work zone warnings to alert vehicles that a work zone is approaching; and transit signal requests for extended green when approaching intersection.
	Negatives		× Unknown sources of funding for capital and operational costs	▫ Sources of funding for capital and operational costs for infrastructure technology associated with AVs are unknown at this time but will likely become available over time as more AVs are on the roadways.
Right of Way and Constructability Constraints	**Positives/ Neutral**		✓Right of way is sufficient	▫ The right of way is sufficient in the near term for AVs but if dedicated facilities are required for HAVs in future, ROW needs will be substantial particularly while there is a shift from conventional vehicles to AVs.
	Negatives			
Technological Feasibility	**Positives/ Neutral**		✓Emerging technology	▫ Automated vehicles are an emerging technology that is rapidly advancing. The debate for when and exactly how HAVs will affect the transportation system is ongoing with large differences in opinions. Despite these differences, it is clear that highly automated vehicles will become an integral part of the transportation system in the future.
	Negatives			

Route	**Soquel Ave/Dr and Freedom Blvd**
Project Title	Bus Rapid Transit lite (BRT lite)
Project Description	A branded bus rapid transit lite on Soquel Ave/Dr and Freedom Blvd would reconfigure intersections where feasible for transit queue jumps and transit signal priority to provide faster and more reliable service. Faster boarding could also be implemented through platform level boarding and electronic or off-board fare collection. Frequency of buses would remain same as existing service. Bus stops would be located to promote fast bus service and travel time, preferably at the far side of intersections.
Overall Rating	
Summary	BRT lite is a low (minor) cost operational improvement to improve transit travel time along Soquel Ave/Dr and Freedom Blvd, two of the main arterials through Santa Cruz County. By improving transit travel time and travel time reliability, transit ridership could increase, reducing VMT and therefore greenhouse gas emissions. BRT lite can be implemented incrementally as each intersection that is reconfigured for BRT lite can reduce transit travel times. As transit is prioritized, auto travel time may be increased.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with long range planning effort (2014 RTP) ✓ Agency support (Metro staff) ✓ Consistent with other planning efforts (2015 Sustainable Santa Cruz County, Santa Cruz Corridors Plan)	▫ This project is consistent with recent planning efforts focused on improving transportation options on Soquel Ave/Dr by the County and City of Santa Cruz and is listed in the 2014 Regional Transportation Plan.
	Negatives		× May have some public opposition	▫ Traffic impacts due to transit priority at intersections and moving on-street parking to alternate locations in some sections could be opposed by motoring public and some businesses. ▫ Members of the public, some represented by advocacy groups, oppose parking being relocated from Soquel Ave and have signature gathering efforts in progress.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		<u>Economic</u> ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs, education and services <u>Environmental</u> ✓ Mode shift to transit ✓ Reduces VMT and GHG.	▫ The reason for implementing bus rapid transit lite would be to decrease transit travel times and improve transit travel time reliability by allowing transit to have priority at intersections and decrease boarding times. Faster and more reliable transit travel times will promote increased ridership, reducing VMT and GHG emissions. Transit improvements enhance lower cost transportation options which can reduce household transportation costs and benefit people who don't drive including, but not limited to, youth, seniors, people with disabilities, low income, and minorities.

Step 1 Criteria		Rating	Evaluation	Narrative
			Health & Equity ✓ Improves access for people who do not drive ✓ Reduces household transportation costs	
	Negatives		Economic × Increases auto travel time Environmental × Traffic impacts (at intersections)	▫ Intersection improvements for transit may have a negative effect on auto travel time as autos will need to wait for transit to move through the intersection.
Compatible with Regulatory Requirements	Positives/ Neutral		✓ Consistent with legislation (SB 375, SB 32) ✓ Consistent with design standards (local transit standards)	▫ SB 375 and SB 32 require reductions in GHG emissions. Faster transit travel times could make transit a more convenient alternative to driving and encourage a shift from driving to transit.
	Negatives			
Level of Public Investment	Positives/ Neutral		✓ Minor new investment for capital costs required ✓ No new investment for operations costs required ✓ Some funding sources may be available for capital costs (FTA5309-New/Small Starts, TIGER, STIP, STBG, SB 1-LPP & CC, LCTOP, TIRCP)	▫ Capital costs include new traffic signals with transit signal priority, reconfiguration of the intersection for a transit queue jump lane and electronic board payment or boarding platforms. ▫ Existing transit services on Soquel Ave/Dr and Freedom Blvd would continue and benefit from faster travel times. No additional transit service is planned as part of the BRT lite project and thus no additional operational costs are required.
	Negatives			
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓ Minor amounts of right of way may need to be acquired ✓ Project is readily constructible ✓ Could be built in phases	▫ BRT lite could be built in phases to work towards a continuous BRT lite system for the entire Soquel and Freedom route. Intersections with enough right of way could be reconfigured to incorporate transit priority initially. Intersections with limited right of way could be reconfigured over time as right of way is acquired.
	Negatives		× Parking may need to be moved	▫ On-street parking still exists on certain areas of Soquel Ave/Dr & Freedom Blvd. Prioritizing transit on the current right of way may require moving parking to alternate locations.
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible	▫ Transit signal priority, transit queue jumps and faster boarding strategies are common uses of technology applied as a means for improving transit travel times.
	Negatives			

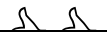
Route	**Soquel Ave/Dr and Freedom Blvd**
Project Title	Dedicated Lanes for Bus Rapid Transit and Biking
Project Description	A branded bus rapid transit system on Soquel Ave/Dr and Freedom Blvd with dedicated lanes in each direction where feasible shared with biking. The dedicated lanes would occupy the existing right hand general purpose lane at the expense of car lanes in segments where there are a minimum of 2 lanes in each direction. The existing bike lanes would also be eliminated where the dedicated bus-bike lanes are feasible. Intersections would be reconfigured for transit signal priority. Transit queue jumps would be provided where dedicated lanes are not feasible. Faster boarding would also be implemented through platform level boarding and electronic or off-board fare collection. Frequency of buses would be increased to 10 minute headways. Bus stops would be located to promote fast bus service and travel time, preferably at the far side of intersections.
Overall Rating	Neutral
Summary	BRT on dedicated lanes could significantly improve transit travel time along Soquel Ave/Dr and Freedom Blvd, two of the main arterials through Santa Cruz County. By improving travel time and travel time reliability, transit ridership could increase, reducing VMT and therefore greenhouse gas emissions. BRT can be implemented in phases with priority in sections with the greatest congestion. A dedicated lane shared between buses and bikes exists in some communities although there is potential conflict between these modes. Research on the safety of bicyclists in these facilities has not been found. As transit is prioritized, auto travel time will be increased.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with long range planning effort (2014 RTP) ✓ Agency support (Metro staff) ✓ Consistent with other planning efforts (2015 Sustainable Santa Cruz County, Santa Cruz Corridors Plan)	▫ This project is consistent with recent planning efforts focused on improving transportation options on Soquel Ave/Dr by the County and City of Santa Cruz and is listed in the 2014 Regional Transportation Plan.
	Negatives		× May have some public opposition	▫ Traffic impacts due to transit priority at intersections, reducing the existing two general purpose travel lanes to one travel lane and moving on-street parking to alternate locations in some sections could be opposed by motoring public and some businesses.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**	Neutral	<u>Economic</u> ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs, education and services <u>Environmental</u> ✓ Mode shift to transit ✓ Reduces VMT and GHG. <u>Health & Equity</u>	▫ The reason for implementing bus rapid transit is to decrease transit travel times and improve transit travel time reliability by allowing transit to travel unrestricted by auto traffic. Faster and more reliable transit travel times will promote increased ridership, reducing VMT and GHG emissions. Transit improvements support lower cost transportation options which can reduce household transportation costs and benefit people who don't drive including youth, seniors, people with disabilities, low income, and minorities. Access to jobs, education and services would be improved for transit riders but decreased for autos.

Step 1 Criteria		Rating	Evaluation	Narrative
			✓ Improves access for people who do not drive ✓ Reduces household transportation costs	
	Negatives		Economic × Increases auto travel time Environmental × Traffic impacts ealth & Equity × Potential for conflicts between modes (bus and bike)	▫ Converting a general purpose lane to a dedicated lane for transit and biking will have significant traffic impacts and a substantial negative effect on auto travel time and travel time reliability. ▫ A dedicated lane shared between buses and bikes exists in some communities although research on the safety of bicyclists in these facilities has not been found.
Compatible with Regulatory Requirements	Positives/ Neutral		✓ Consistent with legislation (SB 375, SB 32, FAST Act) ✓ Consistent with design standards (local transit standards)	▫ SB 375 and SB 32 require reductions in GHG emissions. Faster transit travel times could make transit a more convenient alternative to driving and encourage a shift from driving to transit. Increased bicycle ridership will also contribute to reductions in VMT. ▫ FAST Act legislation will require AMBAG to meet regional targets for safety. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. A designated lane shared between buses and bicyclists can improve safety to help meet regional targets.
	Negatives			
Level of Public Investment	Positives/ Neutral		✓ Minor new investment for capital costs required ✓ Minor new investment for operational costs required ✓ Some funding sources may be available for capital costs (FTA5309-New/Small Starts, TIGER, STIP, STBG, SB 1-LPP & CC, LCTOP, TIRCP, ATP) ✓ Some funding sources may be available for operational cost (Fares, STA, TDA, LCTOP, TIRCP)	▫ Capital costs include new traffic signals with transit signal priority, reconfiguration of the intersection for a transit queue jump lane, electronic board payment or boarding platforms and restriping dedicated lanes. Frequency of transit services on Soquel and Freedom would increase and benefit from faster travel times.
	Negatives			
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓ Minor amounts of right-of-way may need to be acquired ✓ Project is readily constructible ✓ Could be built in phases	▫ BRT could be built incrementally over time to work towards a more complete BRT system. Roadway segments with 2 general purpose lanes in each direction in congested areas could be prioritized first for converting to BRT. Intersections with enough right-of-way could be reconfigured to incorporate transit priority initially. ▫ For a dedicated bus-bike lane the length of Soquel and Freedom, significant amounts of right of way would be needed which is not being considered as part of this project.

Step 1 Criteria		Rating	Evaluation	Narrative
	Negatives		× Parking may need to be moved	▫ On-street parking still exists along certain areas of Soquel Ave/Dr and Freedom Blvd. Utilizing the current right of way for dedicated lanes for transit and bicyclists may require moving parking to alternate locations.
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible ✓ Could accommodate future technologies	▫ Dedicated transit lanes, transit signal priority, transit queue jumps and faster boarding strategies are common uses of technology as a means for improving transit travel times. Autonomous transit could utilize dedicated lanes in future.
	Negatives			

Route	**Soquel Ave/Dr and Freedom Blvd**
Project Title	Increased Transit Frequency with Express Service
Project Description	Increased bus frequency on Soquel Ave/Dr and Freedom Blvd to increase headways to every 10 minutes along Soquel Ave/Dr, every 10 minutes along Freedom Blvd within the City of Watsonville and every 15 minutes on Freedom Blvd in rural areas.
Overall Rating	
Summary	Increased frequency of transit service along Soquel Ave/Dr and Freedom Blvd is a minor cost operational improvement to increase transit ridership along two of the major arterials connecting Watsonville to City of Santa Cruz. Increased frequency of service has been shown to increase ridership although without reductions in transit travel time, the increase in ridership may not be significant. Increased transit frequency will improve access for people who do not drive including youth, seniors, people with disabilities, low income and minorities. An increase in ridership will reduce VMT and therefore greenhouse gas emissions.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with long range planning effort (2014 RTP) ✓ Agency support (Metro staff) ✓ Consistent with other planning efforts (2015 Sustainable Santa Cruz County, Santa Cruz Corridors Plan)	▫ Public expressed support for increases in transit service when Metro restructured service in 2016 due to budget shortfalls. ▫ Increasing transit frequency is included in the 2014 Regional Transportation Plan. Partner agency, public and stakeholder input are solicited at key milestones of the RTP development. ▫ This project is consistent with recent planning efforts focused on improving transportation options on Soquel Ave/Dr by the County and City of Santa Cruz.
	Negatives			
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**	Neutral	<u>Economic</u> ✓ Improves access to jobs, education and services <u>Environmental</u> ✓ Mode shift to transit ✓ Reduces VMT and GHG. <u>Health & Equity</u> ✓ Improves access for people who do not drive ✓ Reduces household transportation costs	▫ Increasing transit frequency makes it easier for people to take transit and thus could promote increased ridership, reducing VMT and GHG emissions. However, increasing frequency may attract few new riders if transit travel times are not also improved in congested areas. Transit improvements enhance lower cost transportation options which can reduce household transportation costs and benefit people who don't drive including youth, seniors, people with disabilities, low income, and minorities.
	Negatives			
Compatible	**Positives/**		✓ Consistent with legislation (SB	▫ SB 375 and SB 32 require reductions in GHG emissions. More frequent transit service could

Step 1 Criteria		Rating	Evaluation	Narrative
with Regulatory Requirements	Neutral		375, SB 32)	encourage a shift from driving to transit.
	Negatives			
Level of Public Investment	Positives/ Neutral		✓ Minor new investment for capital costs required ✓ Minor new investment for operations costs required ✓ Some funding sources may be available for capital costs (STIP, STBG, LCTOP)	▫ Capital costs include new buses to support more frequent service. Capital costs could be funded from a number of sources including STIP, STBG and LCTOP).
	Negatives		× Few funding sources may be available for operational costs (Fares, STA, TDA, LCTOP, TIRCP)	▫ Operational costs could be funded from a number of sources including Fares, STA, TDA, LCTOP, and TIRCP although recent budget cuts reduced the level of transit service in 2016.
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓ Right of way is sufficient ✓ Project is readily implemented ✓ Could be implemented in phases	▫ There are no ROW or constructability constraints for this project.
	Negatives			
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible ✓ Could accommodate future technologies	▫ Autonomous vehicles could be accommodated in future.
	Negatives			

Route	**Soquel Ave/Dr and Freedom Blvd**
Project Title	Buffered/protected bike lanes
Project Description	Bike lanes currently exist along much of Soquel Ave/Dr and Freedom Blvd. Where feasible, this project would eliminate the gaps in the existing bike lane network and widen the bicycle lanes up to 5 feet and if possible provide up to a 2 feet buffer zone next to the lanes with either striping or a physical barrier to clearly mark the area for bicycle travel. Bike boxes can be provided at signalized intersections where shared lanes are required.
Overall Rating	
Summary	Buffered/protected bike lanes are a low (minor) cost solution to improve safety for bicyclists if the right-of-way is available. The added width of the bicycle lanes with the additional buffer from high volume and high speed traffic would likely increase bicycle ridership as people feel more comfortable with the increased spacing from fast moving traffic. The right-of-way on Soquel and Freedom is limited and thus the feasibility to reconfigure the roadway design to accommodate buffered/protected bike lanes still needs to be determined. If right-of-way needs are substantial, environmentally sensitive areas may be impacted and permits may be required.

Step 1 Criteria		Rating	Evaluation	Narrative
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with other planning efforts (2015 Sustainable Santa Cruz County) ✓ Consistent with long range planning effort (2014 RTP)	▫ There is considerable support for bicycle facilities throughout Santa Cruz County, especially protected ones. RTC policy supports safe multimodal transportation options especially for the most vulnerable users.
	Negatives		× May have some public opposition	▫ Right-of-way may be a challenge to accommodate the motor vehicle general purpose lanes and the additional width required for a protected bicycle lane. Parking may need to be moved to alternate locations to accommodate improved bicycle facilities. ▫ Members of the public, some represented by advocacy groups, oppose parking being relocated from Soquel Ave and have signature gathering efforts in progress. ▫ Some members of the public may oppose buffered bike lanes if there are impacts to auto travel.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic × Improves access to jobs, education and services × Potential to decrease individual and community health care costs Environment × Mode shift to biking × Reduces VMT and GHG	▫ A buffered/protected bike lane on Soquel Ave/Dr and Freedom Blvd will provide a more comfortable and safer facility for bicyclists. Buffered/protected bike lanes could encourage people to shift from driving to biking, reducing VMT and GHG emissions. Additional benefits include increased physical activity (resulting in decreased health care costs) and improved access using active transportation, which can reduce transportation costs, and benefit people who don't drive including youth, some seniors, and low income individuals.

Step 1 Criteria		Rating	Evaluation	Narrative
			Health & Equity × Improves health × Improves safety × Improves access for people who do not drive × Reduces household transportation costs	
	Negatives		Environmental × Traffic Impacts	▫ Traffic may be impacted by reducing the width of the general purpose lanes slightly to accommodate the wider bicycle facilities. ▫ Moving parking to alternate locations to accommodate a wider bicycling facility may impact nearby businesses ▫ If right-of way is required, environmentally sensitive areas may be impacted including agricultural lands and soil characterization and remediation may be required
Compatible with Regulatory Requirements	**Positives/ Neutral**		✓ Consistent with legislation (SB 375, SB 32, FAST Act) ✓ Consistent with design standards (Caltrans standards, NACTO and AASHTO guidelines)	▫ SB 375 and SB 32 require reductions in GHG emissions. A comfortable and safer active transportation facility could encourage people to shift from driving to biking, reducing VMT and GHG emissions. ▫ The buffered/protected bike lanes can be designed to Caltrans standards and AASHTO best practices. The new tools available within the regulatory context encourage this application. ▫ FAST Act legislation will require AMBAG to meet regional targets for safety. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. Protected bike lanes can improve safety to help meet regional targets.
	Negatives			
Level of Public Investment	**Positives/ Neutral**		✓ Minor new investment for capital costs required ✓ Minor new investment for operational costs required ✓ Several funding sources may be available for capital costs (ATP, Measure D LJ allocation, SRTS) ✓ Some funding sources may be available for operating costs (STIP, STBG, Measure D -local, ATP, HUTA)	▫ Funding may be available for capital costs through several sources including ATP, Measure D allocation to local jurisdictions, HUTA, SRTS, STIP and STBG. If right-of-way needs are substantial, cost for project will escalate.
	Negatives			
Right-of-Way and Constructability Constraints	**Positives/ Neutral**	Neutral	✓ Minor amounts of right-of-way may need to be acquired ✓ Could be built in phases ✓ Project is readily constructible	▫ Additional right-of-way may be needed to accommodate a fully protected bike lane. Project could be built incrementally since there are significant benefits as incremental improvements are made. ▫ If right-of-way needs are substantial, cost for project will escalate, environmentally sensitive

Step 1 Criteria		Rating	Evaluation	Narrative
				areas may be impacted and associated permits may be required
	Negatives		× Parking may need to be moved	▫ On-street parking still exists along segments of Soquel Ave/Dr and Freedom Blvd. Utilizing the current right-of-way to include a wider bicycling facility may require moving parking to alternate locations.
Technological Feasibility	Positives/ Neutral		✓Technologically feasible	▫ Buffered/protected bicycle facilities are currently technologically feasible and are becoming more and more common throughout the country.
	Negatives			

Route	**Soquel Ave/Dr and Freedom Blvd**
Project Title	Intersection Improvements for autos
Project Description	The project would improve intersections along Soquel Ave/Dr and Freedom Blvd for auto travel. Improvements include modifying design and adding turn lanes in numerous locations including Soquel/Morrissey/Poplar and Soquel/Frederick in the City of SC and Soquel/41st, Soquel/Bay-Porter, and Soquel/Robertson in the county. Intersection improvements along Freedom Blvd in the City of Watsonville include Freedom/Green Valley, Freedom/Airport and Freedom/Buena Vista. Widening of Soquel between Branciforte and Morrissey is also being considered here.
Overall Rating	
Summary	The intersection improvements are a low (minor) cost option that will improve traffic operations, travel time and reliability, safety, and access to local destinations.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with long range planning effort (2014 RTP, City of SC General Plan, County of SC General Plan, Watsonville General Plan) ✓ Multi-agency support (City of Santa Cruz, County of Santa Cruz, Watsonville, RTC)	▫ Numerous intersection improvement projects on Soquel and Freedom are included in the 2014 RTP. These projects are consistent with local planning goals and policies.
	Negatives			
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		<u>Economic</u> ✓ Improves auto travel time ✓ Improves auto travel time reliability ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs, education and services ✓ Potential to increase land use development, business activity, employment and visitor tax revenues <u>Health & Equity</u> ✓ Improves safety	▫ The intersection improvements will improve traffic flow on Soquel Ave/Dr and Freedom Blvd improving safety, travel time and travel time reliability to destinations all along the route. Commuters, commerce, and emergency vehicles will benefit from these improvements.
	Negatives			
Compatible	**Positives/**		✓ Consistent with design	▫ FAST Act legislation will require AMBAG to meet regional targets for safety and travel time

Step 1 Criteria		Rating	Evaluation	Narrative
with Regulatory Requirements	Neutral		standards (Caltrans) ✓ Standard permitting process ✓ Consistent with legislation (FAST Act)	reliability. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. Auto intersection improvements can improve safety and travel time reliability for motorists to help meet regional targets.
	Negatives			
Level of Public Investment	Positives/ Neutral		✓ Minor new investment for capital costs required ✓ No new investment for operational costs required ✓ Some funding may be available for capital costs (STIP, STBG, Measure D -local, HUTA)	▫ Funding may be available for capital costs through a number of sources including the Measure D allocation to local jurisdictions, HUTA, STIP and STBG.
	Negatives			
Right-of-Way and Constructability Constraints	Positives/ Neutral		✓ Minor amounts of ROW may need to be acquired ✓ Project is readily constructible	▫ Intersection improvements to add turn lanes may need additional ROW.
	Negatives			
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible	▫ Improvements are technologically feasible
	Negatives			

Route	**Soquel Ave/Dr and Freedom Blvd**
Project Title	Bike and Pedestrian Intersection Improvements
Project Description	Project would improve intersections for bicyclists and pedestrians along Soquel Ave/Dr and Freedom Blvd using a variety of best practices including bike boxes, green lane treatments, bulb outs, islands, crosswalks, flashing beacons, and bicycle and pedestrian priority at intersections.
Overall Rating	
Summary	Bicycle and pedestrian improvements at intersections are a low (minor) cost solution to improve safety for the most vulnerable transportation users. Safety improvements at intersections are the most critical as the majority of collisions occur at intersections. As safety for bicyclists and pedestrians is improved, people become more comfortable with choosing walking or biking as a way to access their destinations.

Step 1 Criteria		Rating	**Evaluation**	**Narrative**
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with other planning efforts (2015 Sustainable Santa Cruz County) ✓ Consistent with long range planning effort (2014 RTP)	▫ There is considerable support for bicycle facilities throughout Santa Cruz County, especially improvements that promote safety of bicyclists and pedestrians. RTC policy supports safe multimodal transportation options especially for the most vulnerable users.
	Negatives			
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves job and education access ✓ Decreases individual and community health care costs Environment ✓ Mode shift to biking ✓ Mode shift to walking ✓ Reduces VMT and GHG Equity ✓ Improves access for people who do not drive ✓ Reduces household transportation costs ✓ Improves safety ✓ Improves health	▫ Intersection improvements for bicyclists and pedestrians on Soquel Ave/Dr and Freedom Blvd will have the ability to greatly improve safety and help to shift people from driving to biking and walking. This in turn reduces VMT and GHG emissions. Additional benefits include decreased health care costs; improved active transportation access for youth, some seniors and people who do not drive a car; and a reduction in transportation costs.
	Negatives		Environmental × Traffic Impacts	▫ Traffic may be impacted by reconfiguring intersections to accommodate bicycle and pedestrian safety improvements.

Compatible with Regulatory Requirements	**Positives/ Neutral**		✓ Consistent with legislation (SB 375, SB 32) ✓ Consistent with design standards (Caltrans standards, NACTO and AASHTO guidelines) ✓ No additional permits required	▫ SB 375 and SB 32 require reductions in GHG emissions. Intersection improvements for bicyclists and pedestrians on Soquel Ave/Dr and Freedom Blvd would help reduce GHG by providing safer active transportation facilities. ▫ Bike and pedestrian intersection improvements will follow design standards or best practices although some treatments for bicycles and pedestrians at intersections are newer to the county, though many neighboring regions employ them extensively.
	Negatives			
Level of Public Investment	**Positives/ Neutral**		✓ Minor new investment for capital costs required ✓ Minor new investment for operational costs required ✓ Several funding sources may be available for capital costs (STIP, STBG, Measure D -local, ATP, HUTA, SRTS) ✓ Some funding sources may be available for operating costs (Measure D-local, HUTA, general funds)	▫ Funding may be available for capital costs through a number of sources including the ATP, Measure D allocation to local jurisdictions, HUTA, SRTS, STIP and STBG.
	Negatives			
Right of Way and Constructability Constraints	**Positives/ Neutral**		✓ Minor amounts of right of way may need to be acquired ✓ Could be built incrementally ✓ Project is readily constructible	▫ Additional right of way may be needed to accommodate intersection improvements. Project could be built incrementally since there are significant benefits as incremental improvements are made.
	Negatives			
Technological Feasibility	**Positives/ Neutral**		✓ Technologically feasible ✓ Could accommodate future technologies	▫ Bicycle and pedestrian intersection improvements are currently technologically feasible and are becoming more and more common throughout the country.
	Negatives			

Route	Rail Right-of-Way (ROW)
Project Title	Bike and Pedestrian Trail
Project Description	A bicycling and pedestrian trail along the rail right-of-way will span the 32-mile distance from Davenport on the north coast to Watsonville in south county and across the county line to Pajaro Station. Exceptions to the trail location when combined with transit in the rail ROW will occur at the Capitola trestle that crosses Soquel Creek. Bicyclists and pedestrians will be routed onto bike lanes and sidewalks in the local street network to cross the creek over the Stockton Ave Bridge. Two trail alignments for all options will be evaluated for Segment 17 with one alignment along the rail ROW and an alternate alignment where bicyclists/pedestrians will be routed along San Andreas Rd and West Beach St to Lee Rd. The trail will serve transportation, recreation and interpretive uses for walkers, joggers, bicyclists, people with mobility impairments, and families. Bicyclists on pedal assist electric bikes will be included in the analysis of the trail. The trail will pass within 1 mile of half of the County's population and will provide access to 44 schools and 92 parks including several beaches along the Monterey Bay. For the purpose of the UCS analysis, the width of the trail will vary depending on if the trail is the only transportation facility on the rail right of way, if the trail is alongside rail transit or if the trail is alongside bus rapid transit. Rail transit requires between 17 and 20 feet of right of way (including buffers). Width requirements for bus rapid transit will be assumed to be 16 feet of right of way for one lane and 28 feet of right of way for 2 lanes (including buffers). The width of the trail in the various options will also depend on the available right of way (ROW), the grade constraints (grade of slope either up or down perpendicular to the tracks) within the ROW, and construction assumptions. A 12-15 foot wide trail (including 2 ft buffers that are paved or unpaved) will be assumed a shared "multiuse" trail for bicyclists and pedestrians. A 16 foot wide trail or greater (including buffers) will allow for separation of bicyclists and pedestrians. For trail alignments along street network, bike lanes will be assumed to be 4-5 ft wide with sidewalks for pedestrian access in Capitola but no sidewalks along San Andreas Rd and West Beach St. The "urban area" of the rail right of way is defined as between Shaffer Rd in the City of Santa Cruz to San Andreas Rd at Manresa State Beach and between Lee Rd in Watsonville and Pajaro Station. "Rural area" is defined as north of Shaffer Rd in the City of Santa Cruz to Davenport and between Manresa State Beach and Lee Rd in Watsonville. All widths discussed below include buffers which could be paved or unpaved. The assumptions for the widths of the trail used for this study are described below. These assumptions will be used to determine how the projects/scenarios advance the goals of the UCS including cost, mode share, economic benefit etc. as shown through the performance measures. Design solutions for implementation of any of these trail projects will depend on more detailed evaluation of constraints, engineering solutions, and the amount of funding available. **Trail alongside Rail:** In urban areas, where the grade is flat and the right of way allows, the width of the trail alongside the rail will be assumed to be 16 feet wide. This includes from Natural Bridges Dr to California Ave where the trail will be 16 feet wide based on completion of final design. In urban areas, where the grade is sloped either up or down perpendicular to the tracks or the ROW is constrained, the trail will be assumed to be 12 – 15 feet in width. This may require curbs or retaining walls in sections where the flat grade available for the trail is less than 12 feet wide. This includes from California Ave to the Santa Cruz Wharf, where the trail

	will be 12 feet wide based on preliminary design and from Lee Rd to Walker St, where the trail will be 12 ft wide based on preliminary design. In the rural areas, the trail width is assumed to be 12 feet wide with the exception of the rural area north of Wilder Ranch, the trail will be assumed to be 16-20 feet wide based on preliminary design. Over the bridges, trail will be assumed to be 12 feet wide (including buffers). For trail alignments in street, width of trail will be **Trail Only**: In urban areas, where the grade is flat and the right of way allows, the trail will be assumed to be 26 feet wide (including the buffers). In the urban areas, where the grade is sloped either up or down perpendicular to the tracks, the trail will be assumed to be a minimum of 16 feet wide. This may require curbs or retaining walls in sections where the flat grade is less than 16 feet wide. In urban areas, where flat grade of the rail right of way is between 16 feet and 26 feet, trail width will be defined by the width of the flat area. In rural areas, this study will assume a trail width of 12-15 feet (including buffers). Over the rail bridges, the width will be assumed to be the width of the existing rail bridges. **Trail alongside BRT:** In the scenario where the rail right-of-way is shared between trail and BRT, BRT is utilizing the ROW between Shaffer Rd on the west side of Santa Cruz and State Park Dr. in Aptos and the remaining segments on rail ROW north and south of this urban area are trail only. In urban areas, where the grade is flat and the right of way allows, the width of the trail alongside BRT will be assumed to be 16 feet wide. In urban areas, where the grade is sloped either up or down perpendicular to the tracks or the ROW is constrained, the trail will be assumed to be 12 – 15 feet wide. This may require curbs or retaining walls in sections where the flat grade available for the trail is less than 12 feet wide. In the urban area of the City of Watsonville from Lee Road to Walker Rd, the trail will be 12 feet wide next to rail that will accommodate freight service. In rural areas, this study will assume a trail width of 12-15 feet (including buffers). Over the bridges, trail will be assumed to be 12 feet wide (including buffers).
Overall Rating	
Summary	A biking and walking trail along the rail corridor, separated from motor vehicle traffic, will provide a new, safe, and more comfortable active transportation facility which could encourage people to shift from driving to biking and walking. Benefits include safety and health improvements, greenhouse gas emission reductions, and economic benefits from a trail facility that will attract both residents and visitors. A trail will improve access for people who do not drive including youth, low income, and minorities as well as some seniors and people with disabilities. A bike and pedestrian trail could be combined with rail or bus transit on the rail right-of-way or the trail could be the only facility in the rail right-of-way. Walking and biking are typically travel options for shorter trips but if combined with transit can extend travel distances significantly.

Step 1 Criteria		Rating	Evaluation	Narrative
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ RTC policy ✓ Project specific planning effort with public input (Monterey Bay Sanctuary Scenic Trail Master Plan (MBSST)) ✓ Project specific planning	▫ Voters approved Measure D in November 2016 which allocates funds for trail within the rail right-of-way. <u>Trail with Rail</u> ▫ The Monterey Bay Sanctuary Scenic Trail (MBSST) Master Plan establishes the alignment and a set of design standards for a bike and pedestrian trail within the rail right-of-way alongside the existing railroad track. The MBSST Master Plan went through a 3 year

Step 1 Criteria		Rating	Evaluation	Narrative
			effort (Completing the California Coastal Trail) ✓ Consistent with long range planning effort (2014 RTP) ✓ Environmental Impact Report completed (MBSST EIR) ✓ Multi-agency support (Cities of Santa Cruz, Capitola and Watsonville; County of Santa Cruz; Coastal Conservancy) ✓ Supported by voters through passage of Measure D	comprehensive and inclusive public and stakeholder outreach process and was adopted by the RTC in November 2013 and a revision in February 2014. Each of the local jurisdictions that the trail passes through (Cities of Watsonville, Santa Cruz, Capitola and Santa Cruz County) also adopted the MBSST Master Plan. A policy that was adopted in the Master Plan states "Develop trails in such a way so that future rail transit services along the corridor are not precluded." Trail Only ▫ Members of the public, some represented by advocacy groups, support a trail only option and have campaigns and/or signature gathering efforts in progress.
	Negatives		× May have some public opposition	▫ Some farmers in the vicinity of Harkins Slough are concerned about the impacts of a trail on crop production. Restrictions on spraying of crops to times when people are not in the vicinity, fecal matter from pets, farm equipment restrictions over the trail and other issues have raised concerns. Trail with Rail ▫ Farmers on north coast oppose trail if trail is not located in rail bed. Trail-Only or Trail with BRT ▫ Trail-only and trail with BRT options have not gone through a comprehensive public process. If the community decides to use the rail right-of-way only for a trail or for trail with BRT, it would require a new planning effort to solicit public input and more fully assess impacts and costs.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves access to jobs, education and services ✓ Decreases individual and community health care costs ✓ Potential to increase property values ✓ Recreational asset with potential to increase business activity and visitor tax revenues Environmental ✓ Mode shift to biking ✓ Mode shift to walking ✓ Reduces VMT and GHG Health & Equity	▫ A trail separated from motor vehicles will provide a more comfortable and safer facility for people to ride bicycles and walk. This in turn encourages people to shift from driving to biking and walking for transportation, reducing VMT and GHG emissions. Novice bicycle riders and people who are interested in bicycling but concerned about safety will be more apt to shift their trips from driving to bicycling. Additional benefits include increased physical activity (resulting in decreased health care costs) and increased visitor revenues associated with recreation on the trail. Properties along a trail separated from automobiles have been shown in other communities to increase in value. A trail on the rail right-of-way will provide new access to a low cost transportation option for shorter trips, which can reduce transportation costs and benefit people who don't drive including, youth, seniors, people with disabilities, low income, and minorities. Trail with Rail or Trail with BRT ▫ If trail use is combined with transit, the new facility will support longer trips for communities of south county who work in the Santa Cruz area or for north county commuters who work in Aptos or Watsonville.

Step 1 Criteria		Rating	Evaluation	Narrative
			✓ Improves health ✓ Improves safety ✓ Improves access for people who do not drive ✓ Reduces household transportation costs	
	Negatives		Economic × Potential agricultural impacts Environmental × Environmentally sensitive areas may be impacted × Soil sampling, testing and/or remediation of contaminated soils may be needed × Traffic impacts (at roadway crossings) Health & Equity × Potential conflicts between modes (BRT and trail users- fencing could reduce conflicts; people riding bikes and people walking - separation could reduce the potential conflicts). × Potential conflicts between modes (bicyclists/pedestrians and motor vehicles where routes other than rail ROW are utilized)	▫ Increased rail corridor use may impact agricultural lands that have been encroaching on the ROW. ▫ The trail may impact environmentally sensitive areas that have been found along the rail corridor as part of the MBSST EIR. ▫ Soil contaminants have been found along the rail corridor. Soil along rail corridor may need to be assessed for contaminants and possibly remediated. Construction of a paved surface over the bare soil could serve as the remediation for some of the contaminants. Trail with Rail or Trail with BRT ▫ A trail alongside transit in the rail corridor will provide numerous opportunities for separating biking and walking. If trail is not separated by use, potential safety conflicts could occur between bicyclists and pedestrians. ▫ Potential safety conflicts with autos where bicyclists and pedestrians are routed off trail onto the street network ▫ More vegetation would likely need to be removed to accommodate a trail next to transit. ▫ Fencing between trail and rail is included in the MBSST trail design to reduce conflicts and utilize best practices for safety. Fencing may be recommended between trail and BRT for reducing conflicts and best practices for safety. Fencing between trail and transit may limit access to some destinations along the rail ROW. Trail Only ▫ A trail-only option will allow for separation of bicyclists and pedestrians along a greater portion of the rail line. The rail bridges and other constrained locations may not allow separation. ▫ Fencing may not be needed for a trail only option. ▫ Less vegetation would need to be removed for trail-only option and may be able to avoid environmentally sensitive areas.
Compatible with Regulatory Requirements	**Positives/ Neutral**		✓ Consistent with legislation (SB 908, SB 375, SB 32, FAST Act) ✓ Consistent with state law (Trail and Rail -Proposition 116) ✓ Consistent with design standards (Caltrans, AASHTO,	▫ Senate Bill 908 requires the State Coastal Conservancy to complete a plan to develop the California Coastal Trail. The entire MBSST project and trail along the rail right-of-way will serve as the California Coastal Trail through Santa Cruz County, as agreed to by the California Coastal Commission and the California Coastal Conservancy. ▫ SB 375 and SB 32 require reductions in GHG emissions. A comfortable and safer active transportation facility could encourage people to shift from driving to biking and walking, reducing VMT and GHG emissions.

Step 1 Criteria		Rating	Evaluation	Narrative
			MUTCD) ✓ Standard permitting process	▫ FAST Act legislation will require AMBAG to meet regional targets for safety. Targets are currently being determined by the state for the MPOs and may need to be met in the next few years. A bike and pedestrian trail separated from auto traffic can improve safety to help meet regional targets. ▫ Any trail that is designed for the rail corridor can be designed to meet trail design standards. Trail with Rail ▫ The Santa Cruz Branch Rail Line was purchased using Proposition 116 funds which were allocated for passenger rail capital projects. Trail with rail would meet these requirements.
	Negatives		× Not consistent with state law (Trail Only and Trail with BRT - Proposition 116)	Trail Only or Trail with BRT ▫ If rail right-of-way will not be used for passenger rail service, at least $11 million and possibly up to $25 million or more in funds will need to be returned to CTC because Proposition 116 requirements will not be met and the project will not be consistent with the funding application for purchase and rehabilitation of right-of-way.
Level of Public Investment	**Positives/ Neutral**		✓ Some funding already allocated for capital costs (Measure D – all Trail options) ✓ Some funding already allocated for capital costs (FLAP, ATP, Land Trust – Trail with Rail) ✓ Some funding sources may be available for capital costs (Measure D, ATP, STIP, STBG, FLAP, HSIP) ✓ Some funding already allocated for maintenance costs (Measure D) ✓ Some funding sources may be available for maintenance costs (HUTA, general funds) ✓ Minor new investment for maintenance required ✓ Moderate new investment for capital costs required	Trail with Rail ▫ Funding that has been acquired from FLAP, ATP and Land Trust for capital costs initially assumed the trail alongside rail tracks. It is unknown how funding will be affected if decision is made for a trail only or a trail with BRT. Trail Only ▫ Constructing the trail-only option could potentially require less capital costs than trail with transit due to ability to use current rail bridges and need for less retaining walls.
	Negatives		× Potential to lose funds (FLAP, ATP, Land Trust – Trail Only or Trail with BRT) × Additional funds/time needed	Trail Only or Trail with BRT ▫ If rail right-of-way will not be used for passenger rail service, at least $11 million and possibly up to $25 million or more in funds may need to be returned to CTC because Proposition 116 requirements are not met and the project will not be consistent with the

Step 1 Criteria		Rating	Evaluation	Narrative
			(to revise current direction – Trail Only and Trail with BRT)	funding application for purchase and rehabilitation of right-of-way. ▫ Funds currently allocated for trail from FLAP and ATP will not meet deadline for use of funds and thus will likely be lost. ▫ Costs and time to revise current direction are unknown (additional costs include new public outreach process, negotiations with CTC and Iowa Pacific, applying for abandonment of rail to Surface Transportation Board, soil contaminants assessment and mitigation, legal fees)
Right-of-way and Constructability Constraints	**Positives/ Neutral**		✓ ROW is sufficient (for Trail Only) ✓ Can be constructed in phases	▫ Project can be implemented in phases with independent utility as funding becomes available. ▫ A trail only option for the rail right-of-way can be accommodated within the existing right-of-way.
	Negatives		× Construction challenges may require additional funds or alternative design × Minor amounts of ROW may need to be acquired (trail with transit)	<u>Trail with Rail or Trail with BRT</u> ▫ Trail with transit will require more retaining walls than a trail only option. ▫ Additional ROW may be needed for stations and rail sidings when trail is combined with rail. ▫ Some ROW may be needed from adjacent properties that are publicly owned. ▫ Alternative alignments to on-street facilities may be required where the rail right-of-way is constrained or at rail bridges. <u>Trail Only</u> ▫ Rock ballast under rails may need to be removed or leveled in order to construct a trail in rail right-of-way as ballast does not provide compaction or gradation requirements for a base layer under pavement.
Technological Feasibility	**Positives/ Neutral**		✓ Technologically feasible ✓ Could accommodate future technologies	▫ Construction of trail is technologically feasible. ▫ Present and future pedal assist electric bicycle technologies could potentially be accommodated based on speed limitations.
	Negatives			

Route	**Rail Right-of-Way**
Project Title	Local rail transit with inter-regional connections
Project Description	Rail transit along the rail right-of-way would provide passenger rail transit service between the Westside of Santa Cruz and downtown Watsonville with service to approximately 10 stations along the corridor. Service would run on a frequency of every 30 minutes during the weekdays in each direction. Additional sidings will be needed to accommodate passing of trains due to single set of tracks. Recreational rail service would also be provided between the Westside of Santa Cruz and Davenport seasonally on weekends and holidays. Freight vehicles analyzed will include both diesel multiple units (DMUs) and electric multiple units (EMUs).
Overall Rating	
Summary	Rail transit would increase transportation choices, provide an alternative to congestion, and has the potential to shift people from driving to taking transit, thereby reducing vehicle miles traveled (VMT) and greenhouse gas emissions. Rail transit increases options for seniors, youth, people with disabilities, low-income, and those who cannot or do not drive. Rail transit is a major operational cost option that can improve transit travel time and travel time reliability. Rail transit can carry many bicycles to help increase the range for bicyclists and encourage greater bicycle use for longer trips in combination with transit. Rail transit also encourages more intensive and compact use of land surrounding stations (transit oriented development) making more efficient use of limited land, ensuring greater levels of open space and helping to reduce automobile traffic, environmental impacts and GHG emissions.

Step 1 Criteria		Rating	Evaluation	Narrative
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Project specific planning effort with public input (Rail Transit Feasibility Study) ✓ Consistent with RTC policy (MBSST, policy 1.2.4) ✓ Consistent with long range planning effort (2014 RTP) ✓ Consistent with other planning efforts (MBSST Master Plan, 2013 California State Rail Plan) ✓ Advocacy groups in support of project	▫ The current RTC policy is for a trail to be developed along the rail corridor so that future rail transit is not precluded. Rail transit along the Santa Cruz Branch Rail Line could provide not only local transit but also interregional connections through Pajaro Station to Gilroy to connect to the high speed rail line that is currently being developed as well as the planned extension of Capitol Corridor service to Salinas and planned extension of the Coast Daylight to run between Los Angeles and San Francisco along the coast. ▫ Members of the public, some represented by advocacy groups, support rail with trail and have campaigns and/or signature gathering efforts in progress.
	Negatives		× May have some public opposition	▫ Horn noise from trains as required at roadway crossings has raised concerns. Horn noise could be mitigated with “quiet zone” designations that provide adequate crossing improvements and approval by the Federal Railroad Administration (FRA.) ▫ Members of the public, some represented by advocacy groups, support a trail only option

Step 1 Criteria		Rating	Evaluation	Narrative
				and have campaigns and/or signature gathering efforts in progress.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs, education and services ✓ Potential to increase land use development, business activity, employment and tax revenues ✓ Recreational asset with potential to increase visitor tax revenues and benefit businesses (north coast section) Environmental ✓ Mode shift to transit ✓ Reduces VMT and GHG Health & Equity ✓ Improves access for people who do not drive ✓ Reduces household transportation costs	▫ Rail transit on the rail corridor could provide another option for how Santa Cruz County residents and visitors travel through the county. It could improve access to jobs and education centers by providing an alternative to congested roadways and provide a faster transit connection between Santa Cruz and Watsonville. Rail transit could increase the transit mode share which will reduce VMT and GHG emissions. Transit oriented developments will likely occur along the rail corridor that will help to reduce VMT. ▫ Rail transit service could provide both local and express service within the county and regional service to the Bay Area via Gilroy and beyond bringing economic benefits to the county. ▫ Recreational rail transit on the north coast could be used by residents and visitors to access the newly acquired San Vicente Redwoods and Cotoni Coast Dairies National Monument as well as provide economic vitality to the town of Davenport. ▫ Rail transit also encourages more intensive and compact use of land surrounding stations making more efficient use of limited land, ensuring greater levels of open space and helping to reduce automobile traffic, environmental impacts and GHG emissions. ▫ Transit improvements support lower cost transportation options which can reduce household transportation costs and benefit people who don't drive including youth, seniors, people with disabilities, low income, and minorities.
	Negatives		Environmental × Environmentally sensitive areas may be impacted (biological, cultural, aesthetic - noise) × Soil sampling, testing and/or remediation of contaminated soil may be needed × Traffic impacts at roadway crossings × Less adaptable to flooding from climate change Health & Equity × Potential for conflicts between modes (rail with bikes and pedestrians and with autos at	▫ Increased rail service along the rail corridor could impact environmentally sensitive areas. Noise from horns could impact neighborhoods but quiet zones could be pursued that would reduce this impact. ▫ Any change in use of rail corridor will require characterization and possibly remediation of any soil contaminants. ▫ There may be increased safety conflicts between rail transit and autos at intersections and between rail transit and bikers/pedestrians on corridor that reduce comfort. Fencing can be constructed to minimize these safety concerns. There are greater opportunities to eliminate crossing conflicts at railroad rights-of-way than at roadways by making improvements that prevent automobiles, bicyclist and pedestrians from entering the railroad right-of-way when trains are coming. Fencing between trail and transit may limit access through neighborhoods. ▫ Rail right-of-way crosses areas that may be impacted by flooding due to climate change such as Harkins Slough area in south county. Rail is less adaptable to flooding from climate change as trains cannot readily shift onto alternate roadways where and when necessary

Step 1 Criteria		Rating	Evaluation	Narrative
			intersections)	due to temporary or permanent flooding on rail corridor. Railbed may need to be raised in areas that could be affected by climate change.
Compatible with Regulatory Requirements	**Positives/ Neutral**		✓ Consistent with legislation (Proposition 116, SB 375, SB 32) ✓ Consistent with design standards (CPUC) ✓ Standard permitting process	▫ The Santa Cruz Branch Rail Line was purchased using Proposition 116 funds which were allocated for passenger rail capital projects. Rail transit on the rail corridor would meet Prop 116 requirements. ▫ Rail transit is consistent with requirements of SB 375 and SB 32 to reduce greenhouse gas emissions.
	Negatives			
Level of Public Investment	**Positives/ Neutral**		✓ Moderate new investment for capital costs required ✓ Some funding sources may be available for capital costs (FTA5309-New/Small Starts, TIGER, STIP, STBG, SB 1-LPP & CC, LCTOP, TIRCP, Prop 1A)	▫ Capital funds may be available from Federal Transit Agency New/Small Starts program and other federal, state and local sources as identified in the Rail Transit Feasibility Study. ▫ New capital funding for both inter-city and commuter rail was created by the state in passage of SB-1.
	Negatives		× Major new investment for operations required × New funding source required for operations	▫ Operational costs may be high and funding sources are limited. A tax measure would likely be needed to cover operational costs.
Right-of-way and Constructability Constraints	**Positives/ Neutral**		✓ Minor amounts of ROW may need to be acquired	▫ The existing estimates of the ROW can accommodate a rail way track with a trail along most of the rail right of way. Standard ROW requirements for the rail line are 20 feet in width with an absolute minimum of 17 feet in width or 8.5 ft in both directions from the centerline of the tracks. ▫ Additional ROW may be needed for sidings for the trains to pass and for some station locations. The number and locations of sidings will depend on the desired rail transit service frequency. ▫ Tracks may need to be laid for some sidings
	Negatives			
Technological Feasibility	**Positives/ Neutral**		✓ Technologically feasible ✓ Could accommodate future technologies (battery electric multiple units)	▫ Future technologies could provide battery electric multiple units for noise reduction and for reduced GHG emissions.
	Negatives			

Route	**Rail Right-of-Way**
Project Title	Freight service on the rail line
Project Description	Freight service on the rail line between Davenport and Pajaro Station, with connection to the Harvey West industrial area and Felton via the Big Trees line, as needed primarily during nighttime to not conflict with weekday and weekend passenger rail schedules.
Overall Rating	
Summary	Freight service is a moderate cost option that has been occurring on the rail line for nearly 140 years although currently not many businesses are utilizing this service. Rail freight provides an alternative option for goods movement as opposed to travel on a congested highway, reduces GHG emissions, and can increase safety by reducing the number of trucks on the highway. Noise impacts from freight can be challenging for residents in the vicinity of the rail corridor especially if freight occurs during night time to avoid a passenger rail schedule.

Step 1 Criteria		Rating	Evaluation	Narrative
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ RTC policy ✓ Consistent with long range planning effort (2014 RTP) ✓ Supported by voters through passage of Measure D	▫ Freight service on the rail line has been more or less active since its inception. Freight service is the current RTC policy and is included in the agreement with the rail operator, Iowa Pacific. Upgrades to the rail line for freight service are included in the 2014 RTP. Voters approved Measure D in November 2016 which allocates funds for rail corridor infrastructure preservation.
	Negatives		× May have some public opposition	▫ Horn noise from trains as required at roadway crossings has raised concerns although horn noise can be mitigated with “quiet zone” designations that provide adequate crossing improvements and approval by the Federal Railroad Administration (FRA.) ▫ Members of the public, some represented by advocacy groups, support a trail only option and have campaigns and/or signature gathering efforts in progress.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Alternative option for goods movement to/from businesses Environmental ✓ Reduces GHG Health & Equity ✓ Improves safety (by removing trucks off roadways)	▫ Freight service on the rail line would provide an alternative option for goods movement in SCC with less congestion and reduce the number of trucks on Highway 1, improving safety. Rail freight uses significantly less fuel and thus reduces GHG emissions. ▫ Environmental impact assessment is not required since freight service has been ongoing for decades and there has not been a change in use.
	Negatives			
Compatible with Regulatory	**Positives/ Neutral**		✓ Consistent with legislation (SB 32) ✓ Consistent with design standards	▫ Rail freight is consistent with SB 32 to reduce GHG emissions.

Step 1 Criteria		Rating	Evaluation	Narrative
Requirements			✓ No additional permits required	
	Negatives			
Level of Public Investment	Positives/ Neutral		✓ Minor new investment for capital costs required ✓ Some funding sources may be available for capital costs (Trade corridor grants, TIGER, leases, operator funds, Section 130/crossing, RRIF) ✓ Minor new investment for operations required ✓ Some funding sources may be available for operations (Measure D, leases, operator funds/fees)	▫ Rail freight due to increased weight of loads, may require a greater level of bridge repair and maintenance if passenger rail service is not also provided. Measure D provides some funds for maintenance costs of tracks for good movements of the rail line. Private businesses who utilize rail corridor for freight can pay for use providing funds for rail operations.
	Negatives			
Right-of-way and Constructability Constraints	Positives/ Neutral		✓ ROW is sufficient ✓ Project is readily constructible	▫ The existing ROW is sufficient for freight service and can accommodate a rail way track and a trail. Standard ROW requirements for the rail line are 20 feet in width or 10 feet in both directions from the centerline of tracks although exceptions can be made to reduce requirements to 17 feet in width or 8.5 ft in both directions from the centerline of the tracks on straight track. A 20 foot ROW width is required at curves. ▫ Additional ROW may be needed for sidings for trains to pass if freight service increases significantly. ▫ Freight has been operational since inception of rail service and thus only maintenance of tracks is required.
	Negatives			
Technological Feasibility	Positives/ Neutral		✓ Technologically feasible ✓ Could accommodate future technologies (autonomous trains for goods movement)	▫ Future technologies for improved goods movement could be accommodated.
	Negatives			

Route	**Rail Right-of-Way**
Project Title	Bus rapid transit (BRT)
Project Description	Two-directional bus rapid transit between Watsonville Transit Center and Shaffer Rd on Westside of Santa Cruz could utilize a combination of the rail right-of-way, Highway 1, and local streets. Buses could travel on Highway 1 or the local street network between Watsonville Transit Center and State Park Drive, utilize the rail ROW between State Park Dr and Shaffer Rd for two-directional travel where feasible or one-directional travel on rail ROW with reverse direction on parallel local streets. The local street network that could be used for BRT in combination with the rail ROW include McGregor Dr, Park Ave, Brommer St, Murray St, and Bay St. Two directional BRT could be considered on the rail ROW between Shaffer Rd and California Ave, between Seabright Ave and 7th Ave, 47th Ave and Wharf Rd, Capitola Ave to Park Ave, and Mar Vista Dr to State Park Dr. On rail bridges and other constrained sections, transit signals could be utilized to hold one direction of travel while transit in other lane travels through. Connections to Capitola Transit Center, Santa Cruz Metro Center, UCSC, Cabrillo College and other locations could be made using local streets. Rail bridges in some locations could potentially be shared between buses and bikes/pedestrians using signals. Frequency of travel between Watsonville and Santa Cruz could be as often as every 15 minutes during peak periods. Local bus service between Capitola/Live Oak and Santa Cruz could also be enhanced by bus service on the rail ROW. Electric buses could be utilized and buses would be prioritized at roadway crossings. Rail right-of-way south of State Park Drive and north of Shaffer Rd could be used solely for trail. One exception could be rail with trail from Lee Rd to Pajaro Station to continue freight service to and from Watsonville.
Overall Rating	
Summary	Bus rapid transit on a combination of the rail ROW, Highway 1 and local streets is a moderate cost capacity increasing improvement that would provide a new transit route connecting north and south county, improve transit travel time and transit travel time reliability and provide an alternative to congestion on Highway 1 and Soquel Ave/Dr. By improving travel time and travel time reliability, transit ridership could increase, reducing VMT and therefore greenhouse gas emissions. Electric vehicles would further reduce GHG emissions and reduce noise impacts along the rail right-of-way. BRT increases options for those who do not drive including seniors, youth, people with disabilities, low-income and minorities. BRT on rail right-of-way could require a shift from current RTC policy to not preclude rail transit.

Step 1 Criteria		Rating	Evaluation	Narrative
Community Support and Consistency with Applicable Plans	**Positives/ Neutral**		✓ Consistent with long range planning effort (2014 RTP) ✓ Consistent with other planning efforts (1999 MTIS) ✓ Agency support (Metro staff)	▫ Bus rapid transit for Santa Cruz County without a specified location is included in the 2014 RTP ▫ The 1999 MTIS study recommended two lane bus way between Westside Santa Cruz and Aptos next to the tracks. The 1999 MTIS report was not limited by current understanding of ROW. ▫ Residents adjacent to the rail corridor may be more supportive of bus on right-of-way as it may be a quieter option (no noise from train horns, less noise from rubber wheels and electric motor).
	Negatives		× May have some public opposition	▫ BRT on the rail corridor has not gone through a comprehensive public process. If rail corridor was used for BRT and trail, it would require a new planning effort to solicit public input. ▫ Members of the public, some represented by advocacy groups, support a trail only option and have campaigns and/or signature gathering efforts in progress.
Addresses Transportation Challenges & Environmental, Economic, and Equity Goals	**Positives/ Neutral**		Economic ✓ Improves transit travel time ✓ Improves transit travel time reliability ✓ Improves access to jobs, education and services ✓ Potential to increase land use development, business activity, employment and tax revenues Environmental ✓ Mode shift to transit ✓ Reduces VMT and GHG Health & Equity ✓ Improves access for people who do not drive ✓ Reduces household transportation costs	▫ Bus rapid transit on the rail corridor will provide a new transit route connecting north and south Santa Cruz County. A new transit connection with competitive travel times could improve access to jobs, education centers and services by providing an alternative to congested roadways. Faster transit travel times could also make transit more convenient and encourage people to shift from driving to transit, reducing VMT and GHG emissions. Utilizing electric buses could decrease GHG emissions further. BRT would allow more flexibility in route and network structure than rail transit service on the rail ROW with potential to have greater ridership. ▫ The potential to encourage more intensive land use development as a result of investment in bus rapid transit is less than rail transit service due to the limited capacity of BRT when compared to rail transit, and the potential for bus rapid transit routes to change, unless bus rapid transit is seen as a precursor to rail transit. ▫ Transit improvements support lower cost transportation options which can reduce household transportation costs and benefit people who don't drive including youth, seniors, people with disabilities, low income, and minorities.
	Negatives		Environmental × Environmentally sensitive areas may be impacted × Soil sampling, testing and/or remediation of contaminated soil may be needed × Traffic impacts (at roadway crossings)	▫ Improvements to support BRT on the rail right-of-way may impact environmentally sensitive areas but less so when compared to impacts of rail transit service on the rail ROW from Santa Cruz to Watsonville. This is attributed to the fact that BRT would only utilize about nine miles of the 32-mile rail right-of-way and would not utilize the rail ROW in the vicinity of the sloughs to the west of Watsonville. ▫ Noise impact from bus rapid transit will likely be less than rail due to horns not being required for BRT at intersections. ▫ Soil contaminants have been found along the rail ROW. Soil along rail ROW may need to be assessed for contaminants and possibly remediated. Construction of a paved surface over

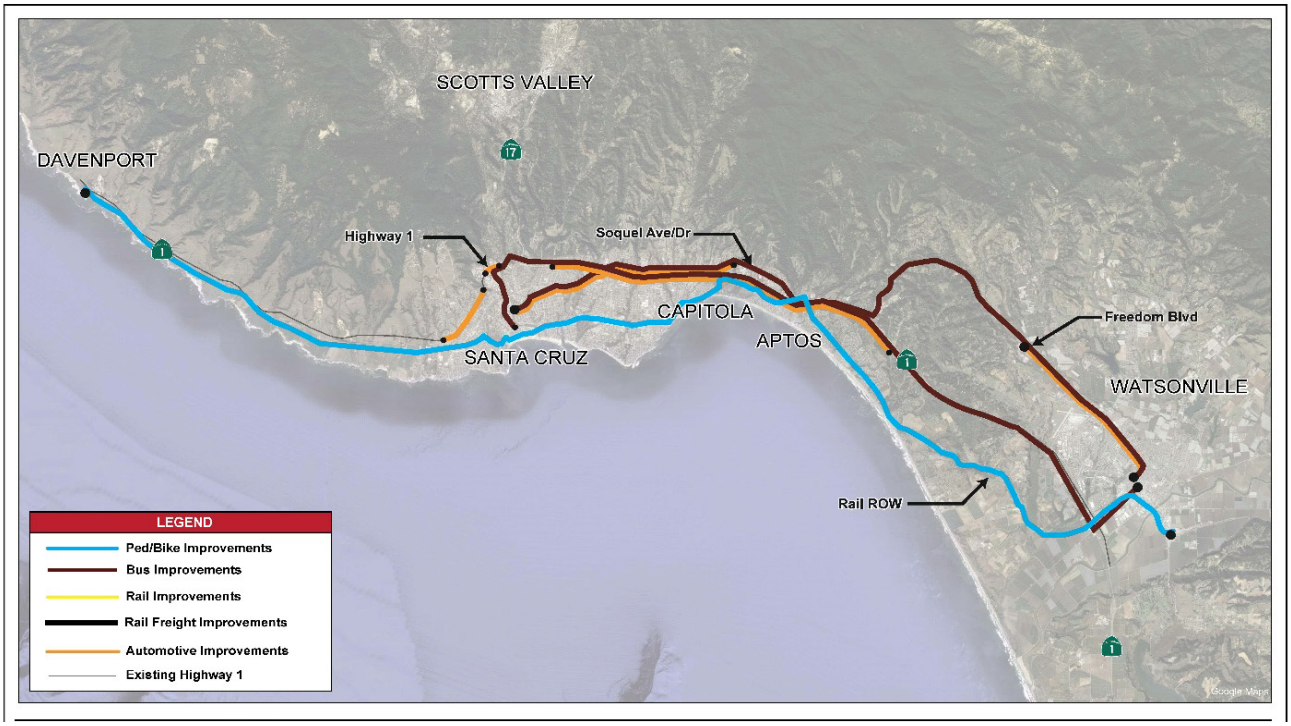
Step 1 Criteria		Rating	Evaluation	Narrative
			Health & Equity × Potential for conflicts between modes (buses with bikes and pedestrians and with autos at intersections)	the bare soil could serve as the remediation for some of the contaminants. ▫ There may be conflicts between BRT and autos at intersections and between BRT and trail on rail ROW. Fencing may be recommended between BRT and trail for safety best practices. Fencing between trail and transit may limit access through neighborhoods.
Compatible with Regulatory Requirements	**Positives/ Neutral**	Neutral	✓ Consistent with legislation (SB 375, SB 32) ✓ Consistent with design standards (AASHTO, local transit standards) ✓ Standard permitting process	▫ BRT is consistent with requirements of SB 375 and SB 32 to reduce greenhouse gas emissions. ▫ BRT would be designed to follow design standards and best practices.
	Negatives		× Not consistent with regulations (Proposition 116)	▫ The Santa Cruz Branch Rail Line was purchased using Proposition 116 funds which were allocated for passenger rail capital projects. If rail right-of-way will not be used for passenger rail service, at least $11 million and possibly up to $25 million or more in funds will need to be returned to CTC because Proposition 116 requirements will not be met and the project will not be consistent with the funding application for purchase and rehabilitation of right-of-way. ▫ It is unknown what the requirements would be if the rail line was railbanked for rail in future with BRT and trail constructed in the near term.
Level of Public Investment	**Positives/ Neutral**	Neutral	✓ Some funding sources may be available for capital costs (FTA5309-New/Small Starts, TIGER, STIP, STBG, SB 1-LPP & CC, LCTOP, TIRCP, Section 130) ✓ Some funding sources may be available for operating costs (Fares, new sales tax for transit, STA, TDA, LCTOP, TIRCP) ✓ Moderate new investment for capital costs required ✓ Moderate new investment for operations required	▫ Capital funds may be available from federal, state and local sources. BRT is a typical starter project for a light rail or heavy passenger rail project. FTA funding will support this approach. Funds available from SB 1 may also be available for this project. ▫ Could be operated by existing operator (Metro)
	Negatives		× Potential to lose funds	▫ If rail right-of-way will not be used for passenger rail service, at least $11 million and possibly up to $25 million or more in funds will need to be returned to CTC because Proposition 116 requirements will not be met and the project will not be consistent with the funding application for purchase and rehabilitation of right-of-way. A new planning effort would be needed to solicit public input. Funds currently allocated for trail from FLAP and ATP may not meet deadline for use of funds and thus may be lost. ▫ Costs and time to revise current direction are unknown (additional costs include new public

Step 1 Criteria		Rating	Evaluation	Narrative
				outreach process, negotiations with CTC and Iowa Pacific, applying for abandonment of rail to Surface Transportation Board, hazardous material assessment and mitigation, legal fees).
Right-of-way and Constructability Constraints	**Positives/ Neutral**		✓ Minor amounts of right-of-way may need to be acquired (along some constrained sections and at station stops) ✓ Could be built in phases ✓ Project is readily constructible	▫ The existing ROW could potentially accommodate two lanes for bus movement alongside a trail for the majority of the length between State Park Dr and Seabright Ave. ROW requirements for two-directional BRT are approximately 24 ft plus 2 feet buffer zones on either side. ▫ Additional ROW may be needed along constrained sections and for some station stop locations.
	Negatives		× Construction challenges may require additional funds or alternative design	▫ Rock ballast under rails may need to be removed or leveled in order to construct BRT lane in rail right-of-way as ballast does not provide compaction or gradation requirements for a base layer under pavement.
Technological Feasibility	**Positives/ Neutral**		✓ Technologically feasible ✓ Could accommodate future technologies (autonomous and evolving electric buses)	▫ Electric buses along the rail right-of-way are currently feasible and will likely become even more efficient in future. New technologies could be implemented to improve bus flow at rail ROW and roadway intersection crossings. BRT on dedicated lanes along the rail corridor could allow for implementation of self-driving buses sooner than they could be implemented in traffic mixed with conventional vehicles.
	Negatives			

Unified Corridor Investment Study

Step 1 Scenario Analysis

Scenario A



Highway 1

HOV and auxiliary lanes

Ramp metering

Widen Bridge over San Lorenzo River

Mission St Intersection Improvements

Soquel & Freedom

Bus rapid transit lite – (transit priority)

Increased frequency of transit

Intersection improvements

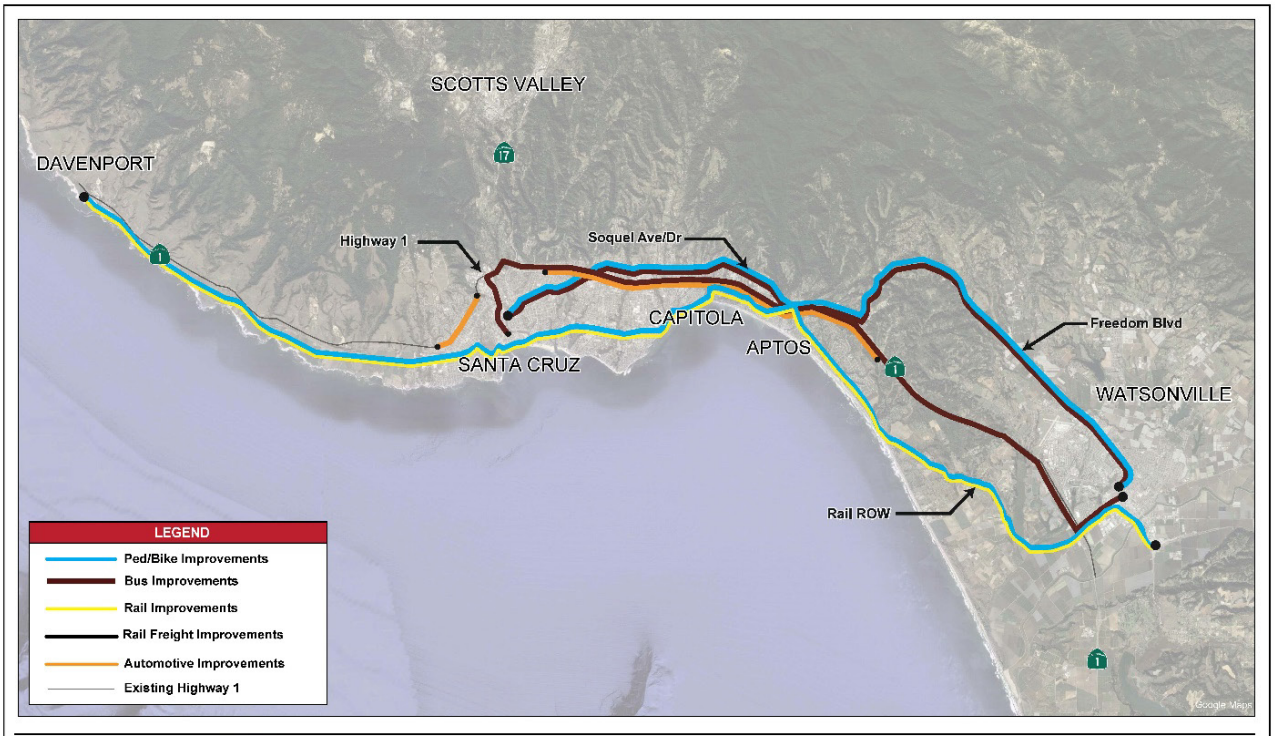
Rail Right of Way

Bike and Pedestrian Trail

Scenario A	Highway 1	Soquel/ Freedom	Rail ROW
Projects	HOV Lanes, Auxiliary Lanes, Ramp Meters, San Lorenzo Bridge Widening, Mission St. Intersection Improvements	BRT Lite, Increased Transit Frequency, Auto Intersection Improvements	Bike & Pedestrian Trail
Increasing Capacity	Auto, Express Bus Transit (using HOV)	Local Bus Transit	Biking, Walking
Operational Improvements	Auto, Bus Transit	Auto, Local Bus Transit	
Cost	Major	Minor	Moderate
Potential Significant Benefits	Auto & Transit Travel Time/Reliability and Auto Safety	Transit Travel Time/Reliability, Equity, Reduction in VMT/GHG	Bike/Ped Safety, Health, Reduction in VMT/GHG
Potential Significant Challenges	ROW, Environmental		Regulatory

Scenario A includes major transportation investments for auto and transit on Highway 1, low cost auto and transit improvements on Soquel/Freedom and a bike and pedestrian trail solely on the rail ROW. The Highway 1 projects include construction of high occupancy vehicle lanes (and associated auxiliary lanes and ramp metering) for improvements to travel time, travel time reliability and safety for carpools, transit and single occupant vehicles on Santa Cruz County's primary transportation route. Scenario A includes operational improvements on Soquel/Freedom through implementation of bus priority strategies at intersections, increased transit frequency and intersection improvements for autos. The transit investments on Soquel/Freedom will improve transit travel time, improve access, support lower cost transportation options and benefit people who don't drive. The primary improvement for bicycles and pedestrians included in Scenario A is construction of a bike and pedestrian trail only on the rail ROW, which has potential to improve safety and health and promote a shift from driving to bicycling and walking for short trips and in turn, reduce VMT and GHG emissions.

Scenario B



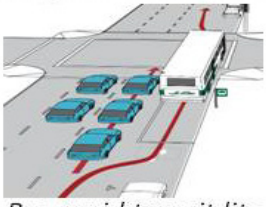
Highway 1

Bus on shoulders

Ramp metering

Mission St Intersection Improvements

Soquel & Freedom



Bus rapid transit lite (transit priority)

Increased frequency of transit

Buffered/protected bike lanes

Bike/ped Intersection improvements

Rail Right of Way

Rail Transit

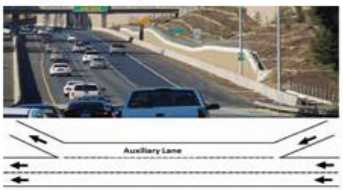
Bike and Pedestrian Trail

Scenario B	Highway 1	Soquel/ Freedom	Rail ROW
Projects	Bus On Shoulder, Ramp Metering, Mission St. Intersection Improvements	BRT Lite, Increased Transit Frequency, Buffered/ Protected Bike Lanes, Bike/Pedestrian Intersection Improvements	Bike & Pedestrian Trail, Rail Transit
Increasing Capacity		Bus Transit, Biking	Biking, Walking, Local and Regional Rail Transit
Operational Improvements	Auto, Bus Transit	Biking, Walking, Local Bus Transit	
Cost	Minor	Minor	Major
Potential Significant Benefits	Auto & Transit Travel Time/Reliability	Bike & Pedestrian Safety, Health, Transit Travel Time/Reliability, Equity, Reduction in VMT/GHG	Equity, Bike/Pedestrian Safety, Health, Transit Travel Time/Reliability Reduction in VMT/GHG, Transit Oriented Development
Potential Significant Challenges	Regulatory, Traffic Impact on local roads	Traffic & Parking Impacts	Environmental

Scenario B projects support transit improvements on each of the three routes. Projects include low cost improvements for auto and transit on Highway 1, buffered/protected bike lanes and low cost transit improvements for Soquel/Freedom and significant increases in transit capacity with a major investment in rail transit on the rail ROW, along with a bike and pedestrian trail in the rail ROW. The Highway 1 bus on shoulders and ramp metering projects could provide some operational improvements for autos and transit including travel time/reliability improvements. The feasibility of bus on shoulders is currently being investigated. The Soquel/Freedom projects will provide some improvement to transit travel time/reliability, increase transit frequency, and improve bicycle and pedestrian safety. A bike and pedestrian trail and rail transit on the rail ROW could improve access to jobs, education and services, increase the potential for shifting trips from auto to transit and biking and walking, improve safety, reduce VMT and GHG emissions, support lower cost transportation options and benefit people who don't drive. Rail transit from Watsonville to Santa Cruz also encourages more intensive and compact use of land surrounding stations and the potential for future regional transit connections to Monterey, the Bay Area and beyond. Together, the trail on the rail ROW and buffered bicycle lanes on Soquel provide significant safety improvements for bicyclists that will promote a shift from driving to bicycling and in turn, a reduction in VMT and GHG.

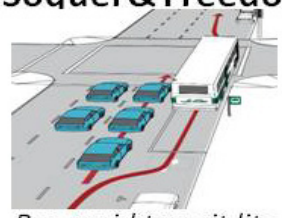
Scenario C

Highway 1



Auxiliary lanes

Soquel & Freedom



Bus rapid transit lite – (transit priority)

Increased frequency of transit

Intersection improvements for auto

Rail Right of Way

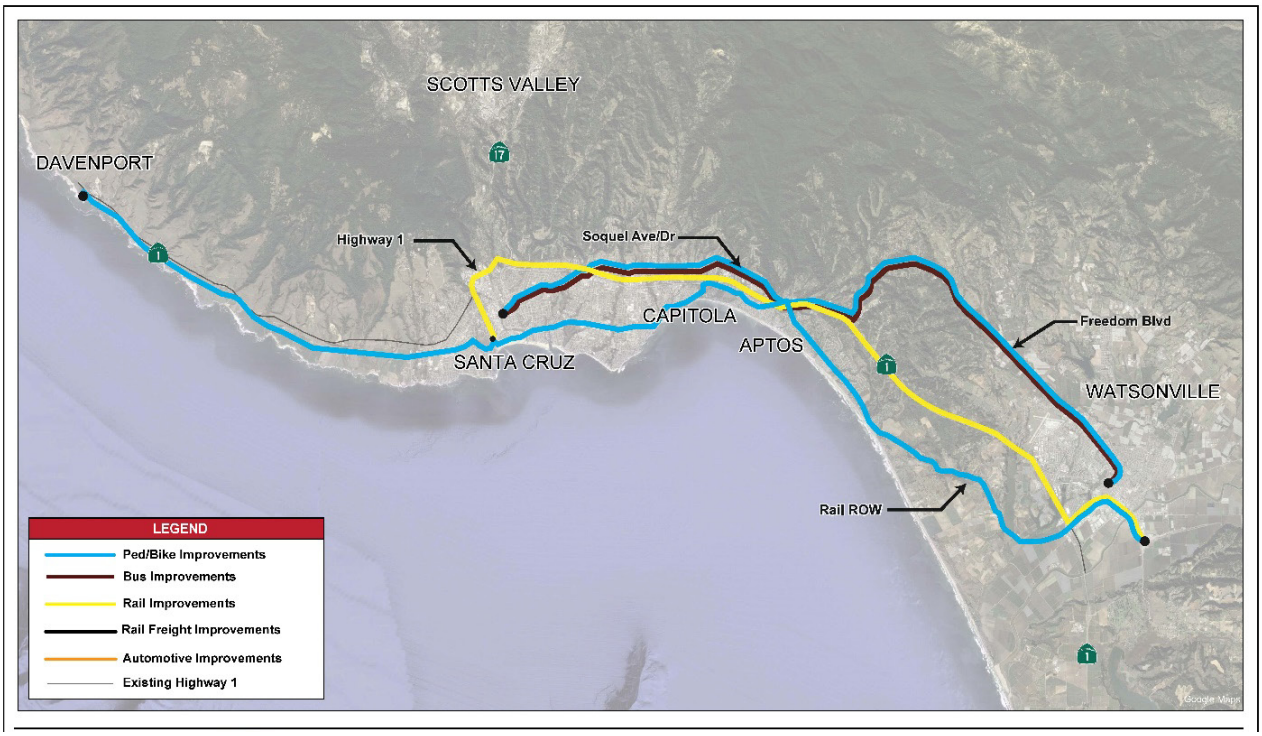
Bus Rapid Transit

Bike and Pedestrian Trail

Scenario C	Highway 1	Soquel/ Freedom	Rail ROW
Projects	Auxiliary Lanes	BRT Lite, Increased Transit Frequency, Auto Intersection Improvements	Bike & Pedestrian Trail, Bus Rapid Transit
Increasing Capacity		Local Bus Transit	Biking, Walking, Local Bus Transit
Operational Improvements	Auto	Auto, Bus Transit	
Cost	Moderate	Minor	Major
Potential Significant Benefits	Safety, Improves Traffic Flow	Transit Travel Time/Reliability, Equity, Reduction in VMT/GHG	Equity, Bike/Pedestrian Safety, Transit Travel Time/Reliability Reduction in VMT/GHG
Potential Significant Challenges	Environmental		Environmental, Regulatory

Scenario C offers a scenario with moderate auto improvements on Highway 1, transit and auto improvements on Soquel and major bus transit, bike and pedestrian improvements on the rail ROW. Construction of auxiliary lanes on Highway 1 between State Park Dr. and San Andreas Rd could improve traffic flow and safety for autos on Highway 1. Projects on Soquel/Freedom improve transit operations through implementation of bus priority strategies at intersections, an increase in transit frequency and improvements to intersections for autos. Bus rapid transit on the rail ROW is a major cost investment that significantly increases transit capacity. Bus rapid transit and a bike and pedestrian trail on the rail ROW could improve access to jobs, education and services, increase the potential for shifting trips from auto to transit and biking and walking, improve safety, reduce VMT and GHG emissions, support lower cost transportation options and benefit people who don't drive. Implementing bus rapid transit utilizing only the rail ROW north of Aptos and south of Natural Bridges Dr in the City of Santa Cruz would allow for trail and transit services between Aptos and Westside of Santa Cruz with only a bike and pedestrian trail south of Aptos (with exception of freight service in Watsonville) and north of the City of Santa Cruz up to Davenport.

Scenario D



Highway 1

Rail Transit between Santa Cruz and Watsonville

Automated vehicles (Self driving cars)

Soquel & Freedom

Dedicated lane for bus rapid transit and bikes

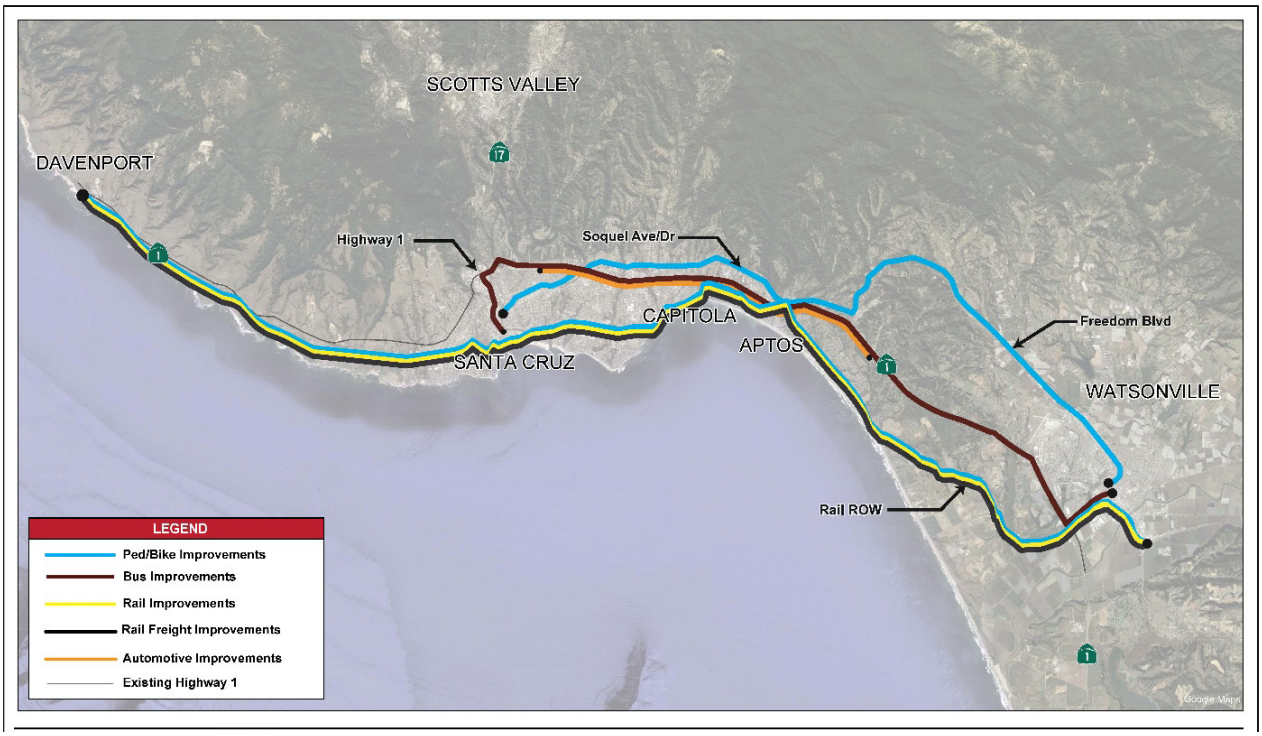
Rail Right of Way

Bike and Pedestrian Trail

Scenario D	Highway 1	Soquel/ Freedom	Rail ROW
Projects	Rail Transit, Automated Vehicles	Dedicated Lane for BRT and Bike	Bike & Pedestrian Trail
Increasing Capacity	Rail Transit	Bus Transit, Biking	Biking, Walking
Operational Improvements	Auto		
Cost	Major	Minor	Moderate
Potential Significant Benefits	Transit Travel Time/ Reliability, Auto Safety*, Reduction in VMT/GHG , Equity	Transit Travel Time/Reliability, Reduction in VMT/GHG, Equity	Bike/Pedestrian Safety, Health. Reduction in VMT/GHG
Potential Significant Challenges	ROW, Environmental, Regulatory	Traffic Impacts	Regulatory

Scenario D significantly increases transit capacity in the corridor by implementing rail transit on the highway and replacing a general purpose lane on Soquel/Freedom with dedicated lanes for bus rapid transit shared with biking. The rail ROW is used solely for a bike and pedestrian trail. The rail transit investment along the highway would require a major cost investment with limited benefits and significant environmental impacts. The percentage of highly automated vehicles on the highway by 2035 would not create a significant increase in capacity or improvements to auto travel time although safety improvements will be likely. A dedicated lane for bus rapid transit and biking that would occupy a general purpose lane will likely have substantial traffic impacts with negative effects on auto travel time but would improve transit travel time and reliability significantly. A bicycle and pedestrian trail on the rail ROW has potential to improve safety and health and promote a shift from driving to bicycling and walking for short trips and in turn, reduce VMT and GHG emissions. Together, the trail on the rail ROW and the dedicated lanes for bus and bike on Soquel/Freedom provide significant improvements for bicyclists that will promote a shift from driving to bicycling and in turn, a reduction in VMT and GHG.

Scenario E



Highway 1

High occupancy vehicle lanes

Auxiliary lanes

Ramp metering

Soquel & Freedom

Buffered/protected bike lanes

Bike/ped Intersection improvements

Rail Right of Way

Rail Transit

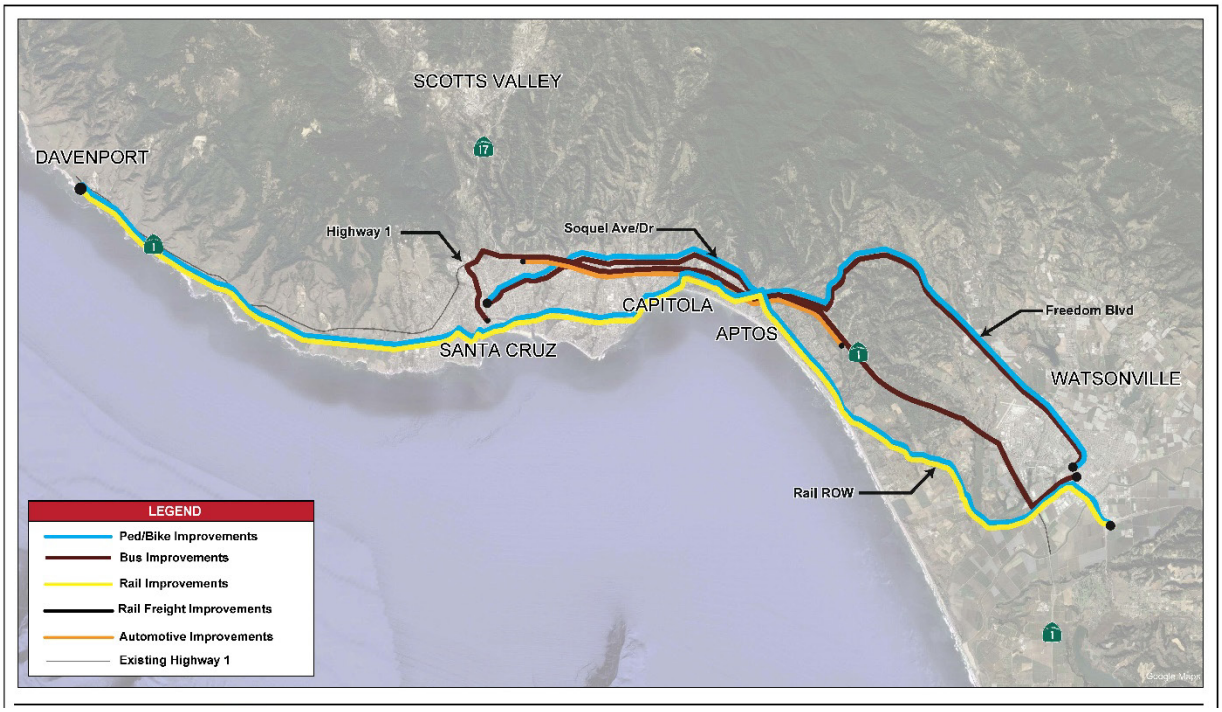
Bike and Pedestrian Trail

Freight Service

Scenario E	Highway 1	Soquel/ Freedom	Rail ROW
Projects	HOV Lanes, Auxiliary Lanes, Ramp Metering	Buffered/Protected Bike Lanes, Bike/Pedestrian Intersection Improvements	Bike & Pedestrian Trail, Rail Transit, Freight Service
Increasing Capacity	Auto, Bus Transit (using HOV lanes)	Biking	Biking, Walking, Rail Transit
Operational Improvements		Biking, Walking	Rail Freight
Cost	Major	Minor	Major
Potential Significant Benefits	Auto & Transit Travel Time/Reliability, Auto Safety , Equity	Bike/Pedestrian Safety, Health, reduction in VMT/GHG	Equity, Bike/Pedestrian Safety, Health, Transit Travel Time/Reliability Reduction in VMT/GHG, Transit Oriented Development , Goods Movement
Potential Significant Challenges	ROW, Environmental	Traffic & Parking Impacts	Environmental

Scenario E includes major transportation investments for auto and transit on Highway 1, buffered/protected bike lanes for Soquel/Freedom and significantly increases transit capacity with a major investment in rail transit, along with freight service and bike and pedestrian trail in the rail ROW. The construction of high occupancy vehicle lanes is expected to provide improvements to travel time, travel time reliability and safety for carpools, transit and single occupant vehicles. Soquel/Freedom projects prioritize bicycle and pedestrian facilities for safety benefits through buffered/protected bicycle lanes. Trail and rail transit on the rail ROW could improve access to jobs, education and services, increase the potential for shifting trips from auto to transit and biking and walking, improve safety, reduce VMT and GHG emissions, support lower cost transportation options and benefit people who don't drive. Rail transit from Watsonville to Santa Cruz also encourages more intensive and compact use of land surrounding stations and the potential for future regional transit connections to Monterey, the Bay Area and beyond. Freight service on the rail line would provide an alternative option with less congestion for goods movement in Santa Cruz County and improve safety by reducing the number of trucks on Highway 1. Together, the trail on the rail ROW and buffered bicycle lanes on Soquel provide significant safety improvements for bicyclists that will promote a shift from driving to bicycling and in turn, a reduction in VMT and GHG.

Scenario F



Highway 1

Bus on shoulders

Ramp metering

Soquel & Freedom

Dedicated lane for bus rapid transit and bikes

Bike/ped Intersection improvements

Rail Right of Way

Rail Transit

Bike and Pedestrian Trail

Scenario F	Highway 1	Soquel/Freedom	Rail ROW
Projects	Bus on Shoulders, Ramp Metering	Dedicated lane for BRT & Bike, Bike/Pedestrian Intersection Improvements	Bike & Pedestrian Trail, Rail Transit
Increasing Capacity		Bus Transit, Biking	Biking, Walking, Rail Transit
Operational Improvements	Auto, Bus Transit	Biking, Walking	
Cost	Minor	Minor	Major
Potential Significant Benefits	Auto & Transit Travel Time/Reliability, Equity	Transit Travel Time/Reliability, Health, Reduction in VMT/GHG, Equity	Equity, Bike/Pedestrian Safety, Health, Transit Travel Time/Reliability Reduction in VMT/GHG, Transit Oriented Development
Potential Significant Challenges	Regulatory, Traffic Impacts on local	Traffic Impacts	Environmental

Scenario F significantly increases transit capacity through the corridor by implementing bus on shoulders on the highway, converting a general purpose lane on Soquel/Freedom to dedicated lanes for bus rapid transit shared with biking, and with a major investment in rail transit and bike and pedestrian trail in the rail ROW. The Highway 1 bus on shoulders and ramp metering projects will provide some operational improvements for autos and transit including travel time and travel time reliability improvements. The feasibility of bus on shoulders is currently being investigated. A dedicated lane for bus rapid transit and biking on Soquel/Freedom that would occupy a general purpose lane will likely have substantial traffic impacts with negative effects on auto travel time but would improve transit travel time and reliability significantly. Trail and rail transit on the rail ROW could improve access to jobs, schools and services and supports lower cost transportation options and benefit people who don't drive. Rail transit from Watsonville to Santa Cruz also encourages more intensive and compact use of land surrounding stations and the potential for future regional transit connections to Monterey, the Bay Area and beyond. Together, the trail on the rail ROW and the dedicated lanes for bus and bike on Soquel/Freedom provide significant improvements for bicyclists that will promote a shift from driving to bicycling and in turn, a reduction in VMT and GHG.

Unified Corridor Investment Study - Step 2 Scenarios for Analysis

(Approved by RTC - December 7, 2017)

	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E	Scenario F	No Build
Highway 1 Projects							
buses on shoulders							
high occupancy vehicle lanes (HOV) and increased transit frequency							
auxiliary lanes to extend merging distance IN ADDITION TO MEASURE D							
metering of on-ramps							
additional lanes on bridge over San Lorenzo River							
Mission St intersection improvements							
rail transit on Hwy 1 between Santa Cruz and Watsonville							
Soquel Avenue/Drive and Freedom Blvd							
bus rapid transit lite (faster boarding, transit signal priority and queue jumps)							
dedicated lane for bus rapid transit and bikes							
increased frequency of transit with express services							
buffered/protected bike lanes							
intersection improvements for auto							
intersection improvements for bikes/pedestrians							
Rail Corridor							
bike and pedestrian trail*							
local rail transit with interregional connections							
bus rapid transit							
freight service on rail			Only Watsonville				
Overall Project Area/Connections between Routes							
improved bike/pedestrian facilities throughout urban area closing gaps in network	These projects will be evaluated in all scenarios.						
additional transit connections							
bike share, bike amenities, transit amenities, park and ride lots							
multimodal transportation hubs							
automated vehicles/connected vehicles**							
Transportation Demand and System Management							
employers and residences - incentive programs	These projects will be evaluated in all scenarios.						
education and enforcement - electric vehicle, motorist safety, and bike safety							

* "multiuse trail" and "bike trail separate from pedestrian trail" was combined into "bike and pedestrian trail" until more information was available to better define the ability to separate bikes from pedestrians in a trail only, a trail with rail, and a trail with BRT. See project tables in Attachment 1 for staff recommendations of the project descriptions for the various trail options.

** Qualitative evaluation for all scenarios

Oval represents projects that are recommended to be added to scenarios for analysis in Step 2

	bus transit
	rail transit
	auto
	bike/ped
	rail freight

SCCRTC Kimley»Horn