Chapter 8

What's Next?

The Santa Cruz County Regional Transportation Plan is updated approximately every four years to reflect new initiatives, priorities, and requirements. It builds upon the work of previous initiatives, complements ongoing work, and lays the groundwork for the future. This chapter identifies several considerations that will likely be discussed in more detail in future editions of the RTP.

CLIMATE ADAPTATION AND RESILIENCE

Santa Cruz County is susceptible to a wide range of climate change effects including increased temperatures, changing precipitation patterns, increased number and severity of wildfires, sea-level rise, extreme weather events, and numerous effects on biodiversity and habitats. The transportation sector has been identified as a major contributor of climate impacting greenhouse gas emissions, and in return the transportation system is impacted by increased flooding, landslides or mudslides, sea level rise, coastal and other erosion, and more frequent and intense heat waves or fires that cause roadways to buckle. Communities and people across our region will have to adjust how they respond to the impacts of climate change today and become more resilient as they face future impacts.

Since the previous RTP, the RTC has undertaken a planning-level vulnerability assessment, and is in the process of developing next steps for the most at-risk portions of its Santa Cruz Branch Rail Line as well as portions of Highway 1. More discussion about climate resiliency is provided in Chapter 1.

EMERGING TRANSPORTATION TECHNOLOGY

Intelligent Transportation Systems (ITS) and emerging mobility technologies provide opportunities to Santa Cruz County to optimize mobility solutions and the transportation network. Versions of ITS solutions have been implemented and also studied in previous project plans. With limited geographic capacity remaining for the growth of the transportation network, we must turn to ITS to assist in improving our mobility experiences.

Establishing a Transportation Technology Strategic Plan to evaluate and implement ideal solutions is a direct pathway to optimizing the transportation network. The following section highlights several transportation technologies that could potentially be implemented within Santa Cruz County's future.

Smart Traffic Management and Ramp Metering

Coordinating all traffic signal management throughout the county is achievable and allows for corridor management between jurisdictions to operate seamlessly. Signal coordination also can benefit transit signal priority or emergency vehicle pre-emption. Contemporary systems are implementable within jurisdictional traffic management centers and fully operational from the cloud. The City of San José and the Santa Clara Valley Transportation Authority have realized tremendous travel time improvements with cloud-based transit signal priority.[1]

Previously studied in Santa Cruz County, ramp metering is a form of traffic management strategy that has been used to control the rate of vehicles entering the highway through traffic signals. Its main goal is to ease congestion on merging lanes by spacing out vehicles and maintaining steady traffic flow. Today, modern ramp metering systems use tools such as sensors, cameras, and predictive algorithms to help monitor real-time traffic conditions and adjust its signal timing automatically. Ramp metering requires sufficient queuing space, meaning on-ramps may need widening.

For Santa Cruz County, the use of ramp metering could be effective along Highway 1, where recurring congestion takes place during the morning and evening commute hours. Adaptive ramp metering, as seen in the Bay Area, it would help smooth traffic flow, improve travel time reliability, and potentially reduce greenhouse gas emissions. As shown throughout the Bay Area and in other congested regions in California ramp metering can be an effective tool to manage congestion.

Integration with Automated and Connected Vehicle Systems

Connected vehicle technology would allow Santa Cruz County vehicles to communicate with infrastructure, other vehicles, and pedestrians through the use of wireless networks. Connected vehicle tech would support safer and more efficient driving by providing real-time alerts for traffic signals, construction zones, or even potential collision hazards. Combined with current automated vehicle systems, connected vehicle technology could support the flow of traffic, reduce human error, and include shared mobility models.

Santa Cruz County would benefit from coordinating with Caltrans to establish the use of data specifications including but not limited to the Work Zone Data Specification to assist connected vehicles' awareness of construction zones. Pilot programs would greatly improve and introduce automated shuttles, shared electric vehicles, and the communication systems that are on more isolated roads. Long term, vehicle-

to-infrastructure technology would allow for smarter intersections, that would give Santa Cruz METRO and emergency vehicles signal priority which will allow for improved pedestrian safety. This program would align with current California zero-emission and data-driven transportation goals.

High Occupancy Vehicles and Express Lanes

High-occupancy vehicle (HOV) lanes are managed lanes that allow for multiple-occupancy vehicles to use a specific lane without restrictions. HOV lanes are not to be used by single occupant vehicles (SOV). Express lanes (also called High Occupancy Toll or HOT lanes) are an advanced version of the HOV lane. HOVs may still travel for free but SOVs may pay a toll to travel in the lane for a faster travel time. The prices of Express lanes would change based on real-time traffic conditions, to typically provide a minimum threshold for travel speeds for buses, carpools, other high-occupancy vehicles and toll paying SOVs. Revenues from the Express lanes could be used to further improve transit services, expand the County's park-and-ride facilities, and fund other multimodal improvements.

An express lane in the San Francisco Bay Area
Photo: Noah Berger, Metropolitan Transportation Commission

Aerial Delivery and Vertical Take off and Landing (VTOL)

Unmanned aerial systems (UAS), which usually take the form of drones, recently have been explored for local deliveries and logistics. These aircraft can transport lighter goods like medical supplies, groceries, and even smaller packages. This method is considered to be more efficient than goods that are delivered by trucks and other similar vehicles. With technology advancing, electric vertical takeoff and landing (VTOL) aircraft are continuously being developed for everyday public use. These types of solutions are applicable for more densely populated urban centers.

VTOL solutions are very promising and in particular a local Santa Cruz startup, Joby Aviation is among the leading mobility solution providers. Coordinating pilot projects with Joby to demonstrate their VTOL vehicles for mobility services could revolutionize mobility around the county. Many of these solution providers also operate using electric vehicles, thus aiming to reduce GHG emissions.

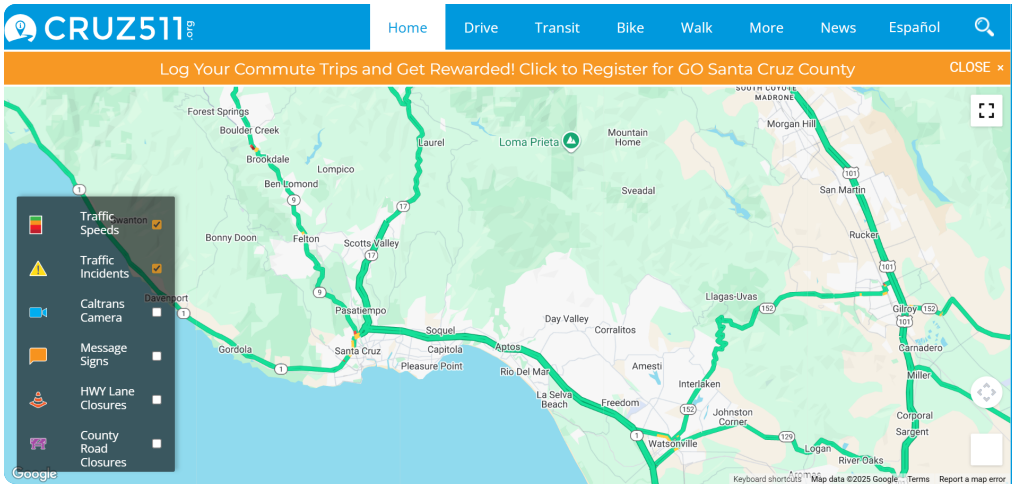
Advanced Air Mobility Services

In addition to the Advanced Air Mobility National Strategy: A Bold Vision for 2026-2036 plan, the federal government will invest in the development of Advanced Air Mobility (AAM) technologies (Advanced Air Mobility National Strategy 2025). AAM has many applications including providing emergency response to rural areas, connecting smaller airports to larger networks, being used to transport priority cargo shipments, and being used as an air taxi for shorter distances within communities. The goal is to integrate future aviation technologies like electric VTOL and drones while still following the current safety standards of aviation to make travel and other uses more efficient.

For Santa Cruz County, the potential of incorporating AAM can lead to addressing current mobility challenges that are related to the community's coastal location, highway capacity limitations, and environmental vulnerability. AAM would allow for better connectivity between the county's more rural and urban areas, provide faster emergency support during crises like wildfires and landslides, and prioritize medical transport and disaster response. AAM would also lead to strengthening the connection to other areas like the Silicon Valley to make travel easier for commuters, while emphasizing sustainability and easing current travel constraints.

Data-Driven Planning and Mobility Integration

With advances in data analytics and mobility technology, reshaping Santa Cruz County's transportation system planning would be beneficial to its residents. Data-driven planning relies on collecting and analyzing information that is gathered from sensors, connected vehicles, transit systems, and even mobile devices in order to better understand real-time travel patterns and infrastructure needs. These insights can lead to improving agency operations, planning more effectively, and quicker response times to incidents. Much of this data can be used to validate and augment the existing transportation modeling tools we use today.



Mobility-as-a-Service (MaaS) is an ideal platform primarily for dense urban areas. This is where all mobility services are available within a single integrated platform typically available via a smartphone. Santa Cruz County has implemented parts of a larger MaaS ecosystem and has opportunity for more implementations. The RTC can review current practices for the Travel Demand Management platform Go Santa Cruz County, and information portal Cruz511 for potential upgrades or enhancements. Coordination with Santa Cruz METRO to actualize the availability of real time transit information is a top priority and will assist in meeting goals for mobility data integration.

Autonomous Vehicles and Personal Rapid Transit (PRT)

With various Autonomous Vehicle (AV) demonstrations around the country and primarily in dense urban areas, our society seems to be on a pathway towards seeing AV adoption more widespread. However, there seems to be an economic scale and threshold that an area must meet in order to support these types of services. Therefore, it may take a bit more time to see these services in smaller areas. Additionally, there are regulatory hurdles to meet and public buy-in. AV taxi or rideshares may be an option in the near future, but personalized AVs will likely be further out. We should be preparing our infrastructure for these vehicles to be on our streets and in our communities. As previously mentioned certain data specifications help to establish an environment that can support these vehicles in an idealized manner.

Personal Rapid Transit (PRT) is an experimental mobility option that typically uses a dedicated guideway to provide mobility services. These solutions are normally battery operated, autonomous, and agile in size. To date there have not been any widespread PRT solutions deployed in communities similar to Santa Cruz. This could be a viable alternative to operate a mobility service in Santa Cruz County. Costs for implementation and operations are unclear as no operational examples exist as a model.[2,3]

Notes for Chapter 8

1 https://lyt.ai/customer-success-stories/delivering-faster-bus-rides-through-downtown-san-jose/

2 https://www.cpuc.ca.gov/regulatory-services/licensing/transportation-licensing-and-analysis-branch/autonomous-vehicle-programs

3 https://www.sf.gov/news-mayor-lurie-takes-key-step-toward-launching-waymo-at-sfo