

# State of the Art in Automated Shuttles

Prepared for SIP-adus Workshop  
FOTS & Next Generation Transport

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# Who We Are

- CCTA is a public agency formed by voters in 1988 to **manage the county's transportation sales tax program and to lead transportation planning efforts.**
- We are **responsible for maintaining and improving the county's transportation system** by delivering critical transportation infrastructure projects **to safely and efficiently get people where they need to go.**
- **Managing entity of autonomous vehicle (AV) testing site: GoMentum Station.**



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# Contra Costa County, California

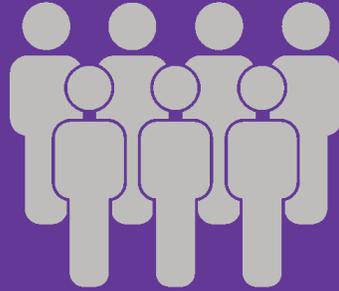
## Location

Eastern suburb  
of the  
San  
Francisco  
Bay Area



## Population

1 Million+



## Thriving Commerce

Businesses headquartered in  
Contra Costa County include:



## Diverse

Demographically, economically  
and geographically



# What We Do



## PEDESTRIAN

Make improvements to sidewalks, crosswalks, trails, and paths



## LOCAL STREETS

Smooth traffic flow on major roads and invest in improvements such as repairing potholes and road surfaces



## BUSES

Invest in a reliable, comfortable and convenient bus network



## SAFE ROUTES TO SCHOOLS

Focus on programs and projects aimed at bicycle and pedestrian safety for K-12 students



## FERRIES

Expand the Bay Area ferry system by looking to ferries as an alternate commute method between West County and San Francisco



## BICYCLE

Invest in safe routes and infrastructure improvements for bicyclists



## BART

Improve BART service and stations, extend routes and increase parking at stations



## HIGHWAYS

Complete Contra Costa's highway system, and improve air quality and noise protection along these corridors



## CARPPOOL/RIDESHARE

Implement programs to reduce traffic congestion by encouraging carpooling and ridesharing



## PROGRAMS FOR SENIORS AND PEOPLE WITH DISABILITIES

Enhance transit options to improve mobility for seniors and people with disabilities

The background image shows a GoMentum station, a small white autonomous vehicle parked in front of a building. The building has a sign that says "Drive the Future" and "GoMentum Station". There are also some utility boxes and a Honda generator in the foreground. The entire image has a blue tint.

# GoMentum Station

# GoMentum is a Global AV Testbed



GoMentum Station is an International Entity

# Goals of GoMentum

ECONOMIC GROWTH  
& JOB CREATION

EFFICIENT MOBILITY

ENHANCED SAFETY

HEALTHIER ENVIRONMENTS

**21<sup>st</sup> CENTURY  
TRANSPORTATION**



# Recent Improvements at GoMentum Station

## LANE VARIETY



## ROADWAY INFRASTRUCTURE



## TRAFFIC CONTROL



# Site Experience



# Offers Strong Partnerships with Influencers

- Regulatory agencies such as DMV, NHTSA, and USDOT
- Federal, state, regional, and local funding agencies
- Local jurisdictions and transit agencies
- OEMs testing near capacity
- Private sector tech companies
- International entities

# Public/Private Collaborative Environment



# GoMentum V2X Signal Lab



The background image shows an autonomous vehicle testing facility. In the foreground, there is a utility pole with a hand-shaped sensor and a rack of electronic equipment. A white van is parked in the middle ground. In the background, a building has a sign that reads "Drive the Future" with a logo. The entire scene is overlaid with a semi-transparent blue filter.

# Autonomous Vehicle Testing Projects

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# We've Celebrated Many "Firsts"



BILL  
1592



**DMV**  
AUTHORIZATION



# Phase I - SAV Testing at GoMentum Station





# Successful testing and verification of V2I communication with traffic signal

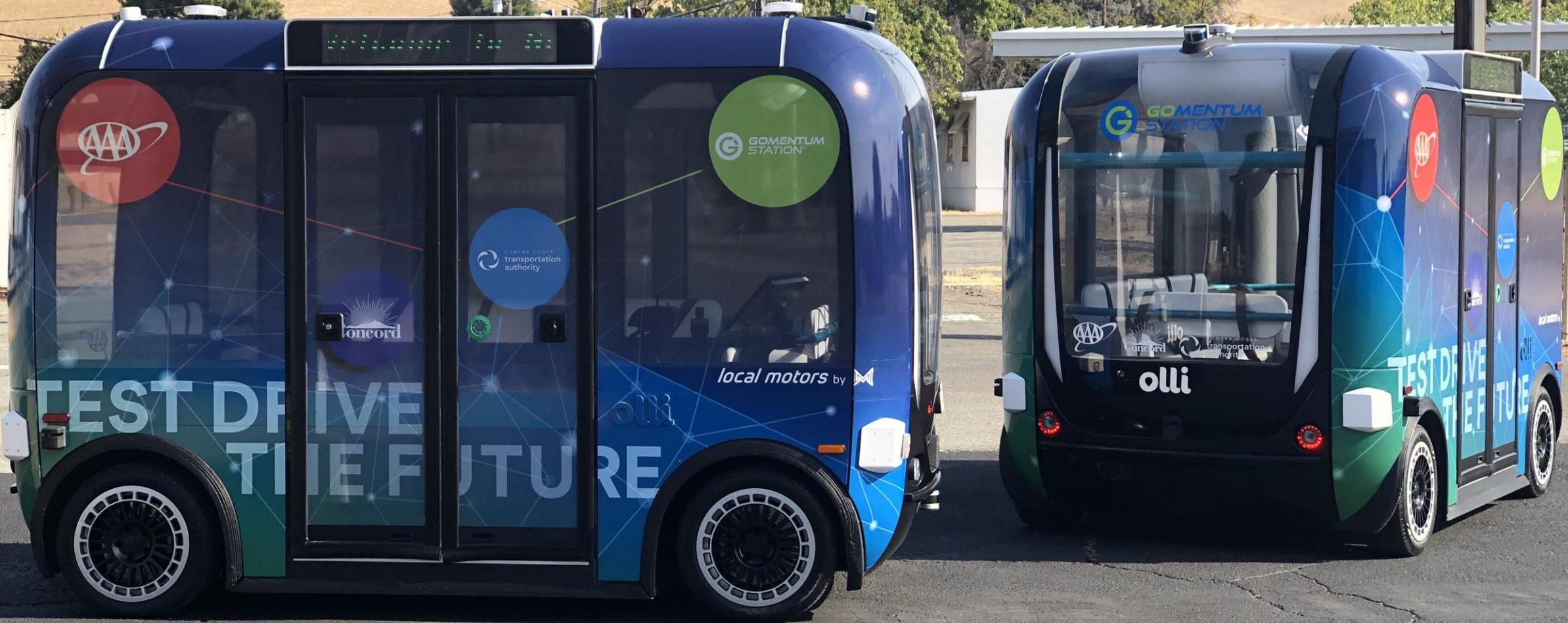


# Phase II: Fixed Route Private and Public Roadways



First to test on public roadways at Bishop Ranch.

# Local Motors Olli SAV Shuttles are GoMentum's newest arrival



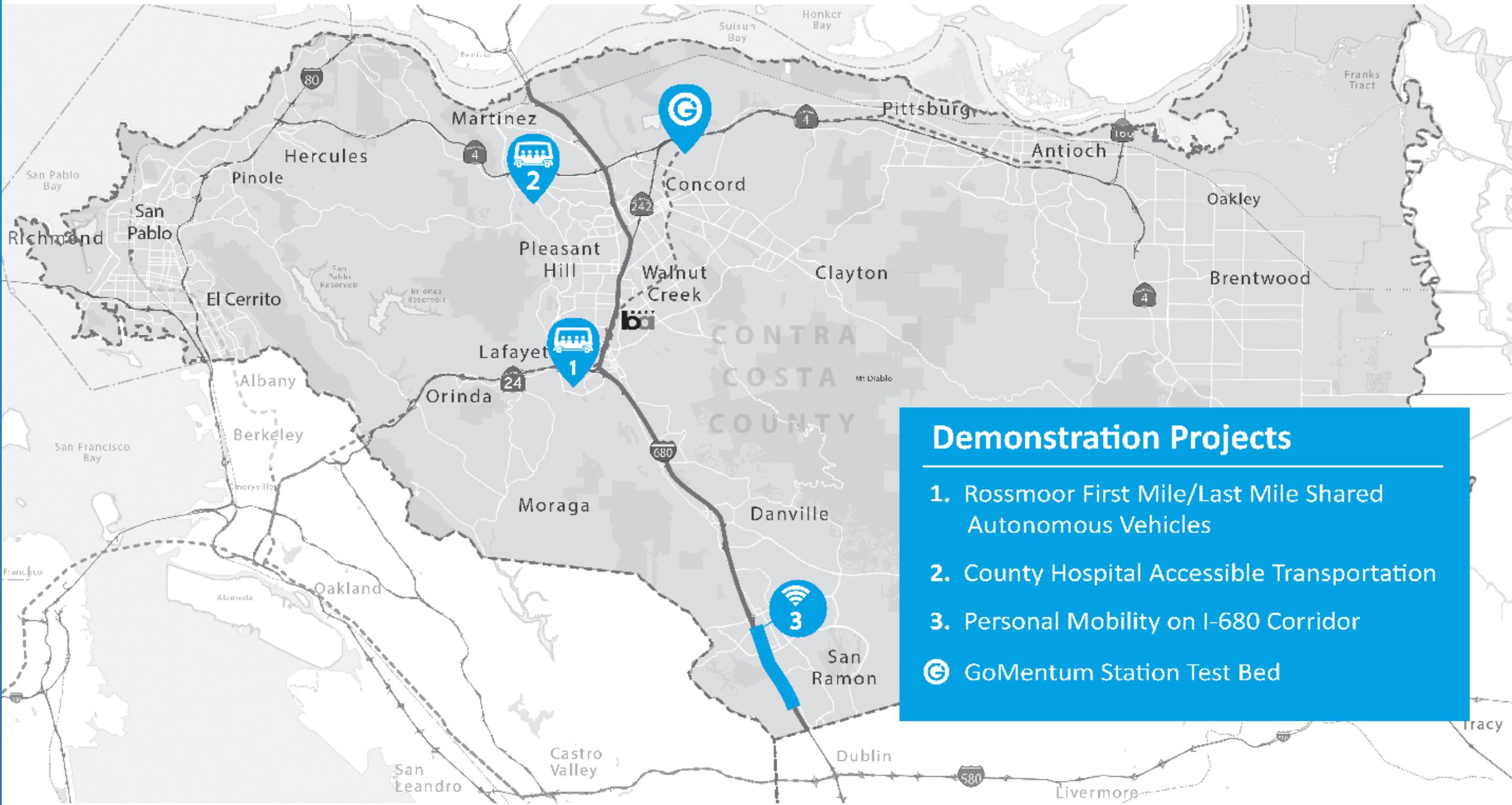
# Automated Driving System (ADS) Demonstration

## GOALS

- **Advance safety** of automated driving systems
- Facilitate data collection to **support rulemaking and development of ADS safety performance standards**
- Provide unprecedented **mobility choices to transportation-challenged, underserved communities**
- **Expand shared mobility options**



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## Demonstration Projects

- 1. Rossmoor First Mile/Last Mile Shared Autonomous Vehicles
- 2. County Hospital Accessible Transportation
- 3. Personal Mobility on I-680 Corridor
- Ⓞ GoMentum Station Test Bed

# Rossmoor First Mile/Last Mile Shared Autonomous Vehicles

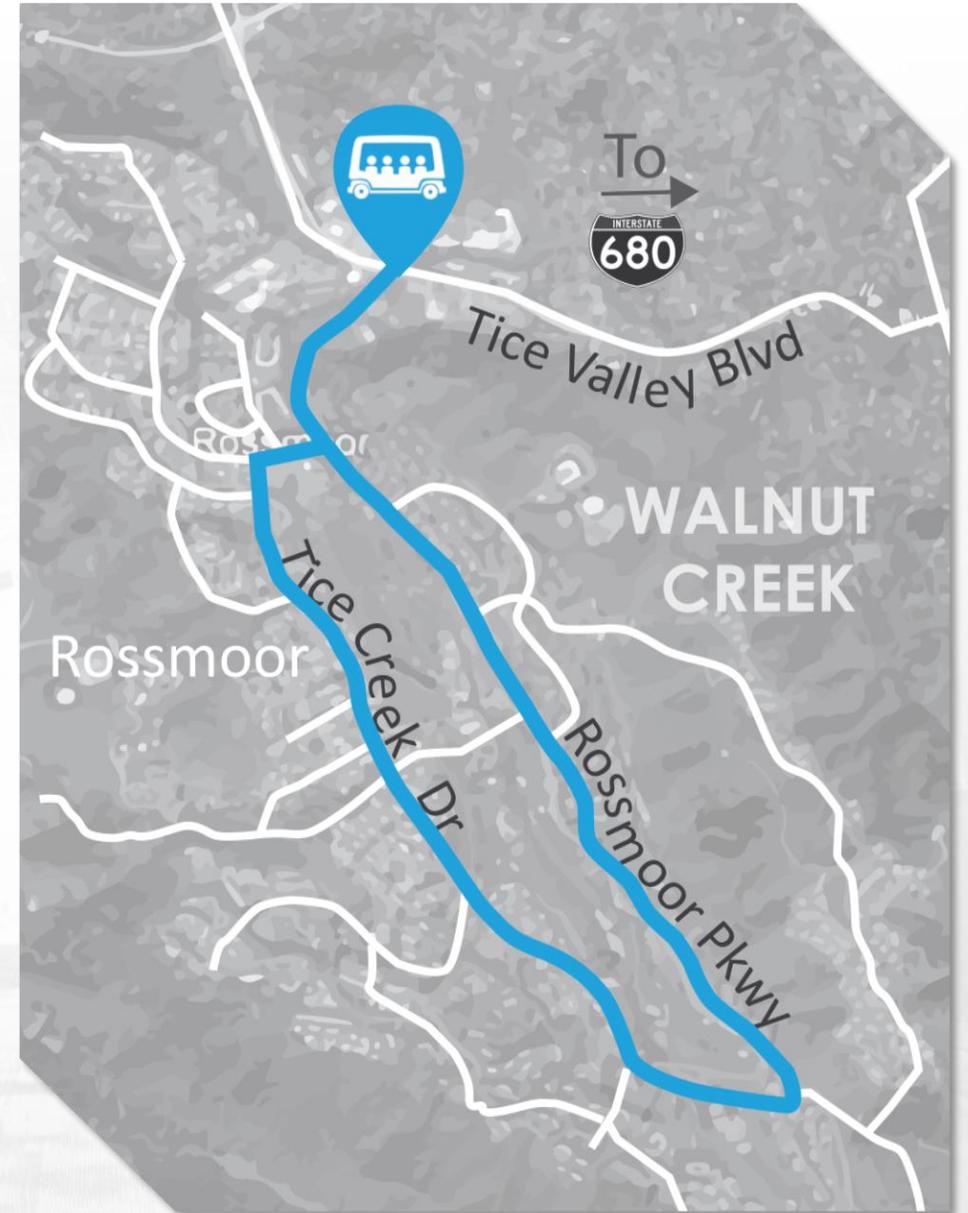
Walnut Creek, California

- **Increase transit accessibility for the elderly community** using shared autonomous vehicles (SAVs)
- Data gathered will be used to **develop safety performance measures**



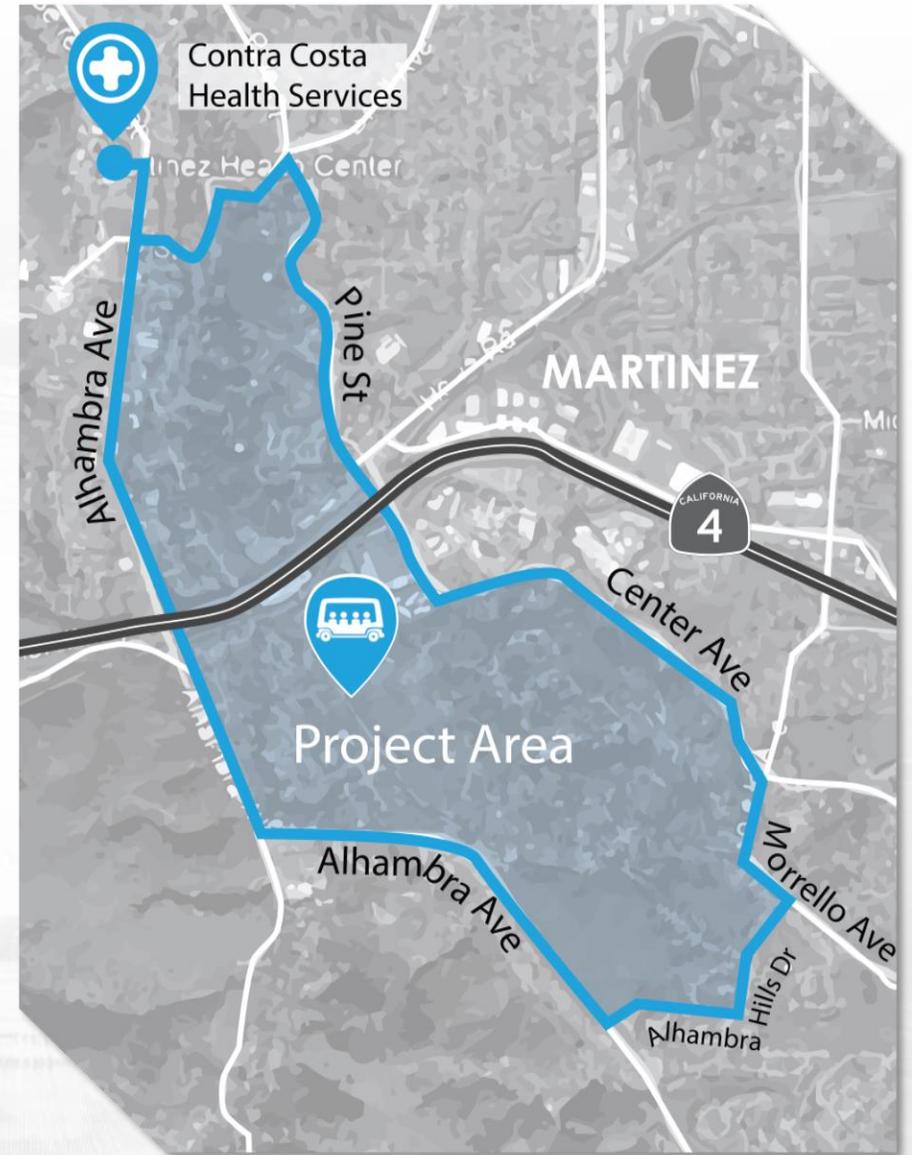
# Rossmoor First Mile/ Last Mile SAV

- **Level 4 low-speed SAV shuttles** (up to 25mph)
- **Fixed route SAV service** with multiple stop locations
- **User interface able to identify desired stop** and **Q'STRAIT automated securement and restraint systems**



# County Hospital Accessible Transportation Martinez, California

- **On-demand, wheelchair accessible**, autonomous vehicle (AV) shuttle service
- Provide **accessible transportation** to public health facility to **improve quality of life and medical appointment absenteeism**
- Gather Data to **advance ADS safety performance standards**



# County Hospital Accessible Transportation

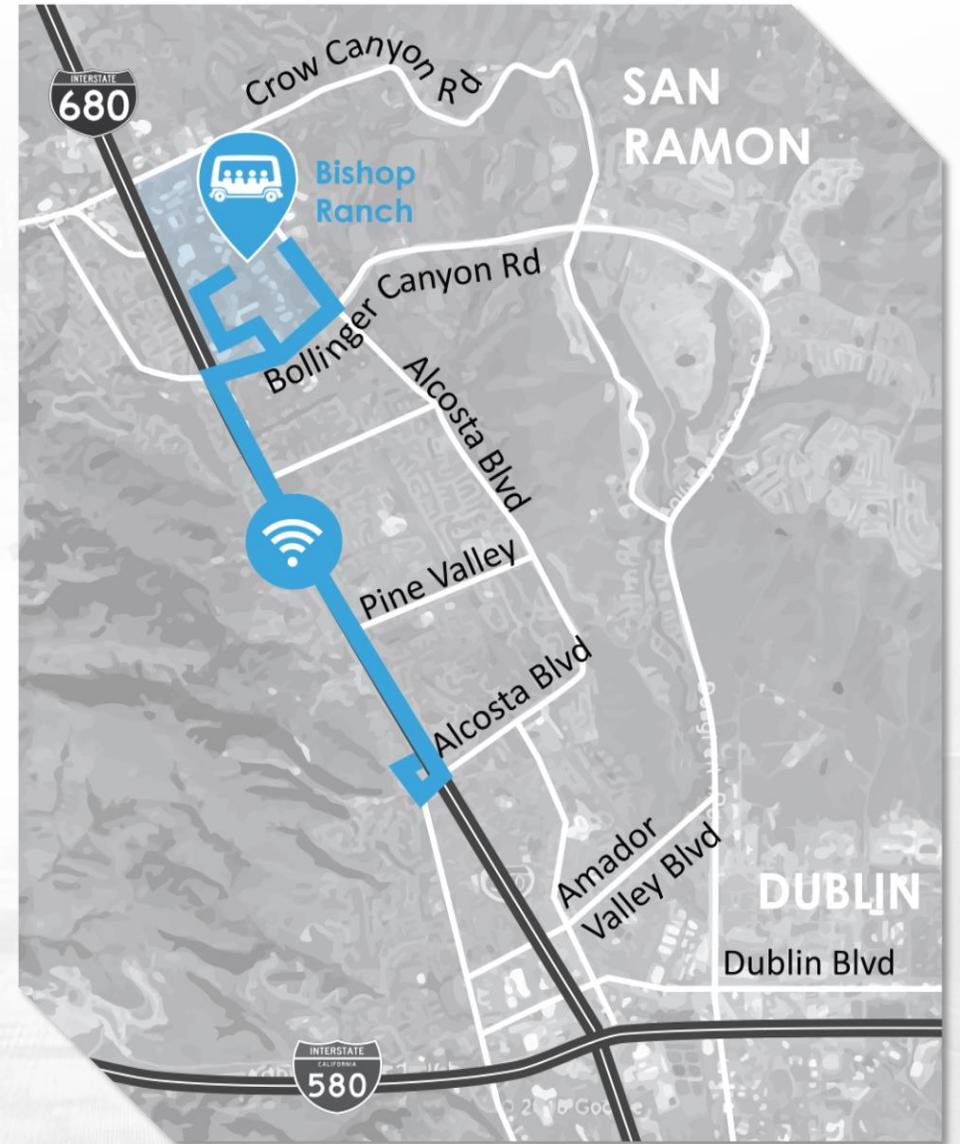
- **Level 3, Level 4 medium speed shuttles** (up to 50mph)
- **Smartphone app and dial-a-ride service**
- **Q'STRAIT automated securement and restraint systems**
- **Optional wearable device** for seniors and minimally ambulatory individuals



# Personal Mobility on I-680

San Ramon, California

- Prepare a **2-mile segment of the I-680 Corridor for future CAVs**
- Install new and upgraded **V2I and V2V 4G/5G communications** to accommodate CAV technology
- Implement **innovative operational strategies**



# Personal Mobility on I-680

- Utilize ADS technologies such as HD dynamic mapping to collect data for further development of AV technologies
- Level 3, Level 4 high-speed AVs (up to 65mph)
- Touch screens with maps which will enable the user to identify a destination and preferred route



# THANK YOU



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# SAVE THE DATE

Redefining Mobility Summit 2020  
Tuesday, March 10, 2020

# California, USA



**DRIVERLESS CARS ARE  
CLOSER THAN THEY APPEAR**