

Automated Vehicles

Presentation for the Cities
Association of Santa Clara County

Overview

- What are AVs, Anyway?
- When are AVs Coming?
- The Role for Cities – Clear Vision and Proactive
- Two Common Questions
- Possible Challenges & Public-Private Partnerships
- Examples of AVs Working in and with Communities

What are AVs?

- SAE has identified 6 levels of vehicle automation
 - Level 0: Fully manual vehicle
 - Level 1: Driver assistance
 - Level 2: Partial automation
 - Level 3: Conditional automation
 - Level 4: High automation
 - Level 5: Full automation



Automated
Vehicles

What are AVs? - Level 0

Zero automation; the driver performs all driving tasks



What are AVs? - Level 1



Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design

What are AVs? - Level 2

Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times



What are AVs? - Level 3

Driver is a necessity, but is not required to monitor the highway environment. The driver must be ready to take control of the vehicle at all times with notice.



What are AVs? - Level 4



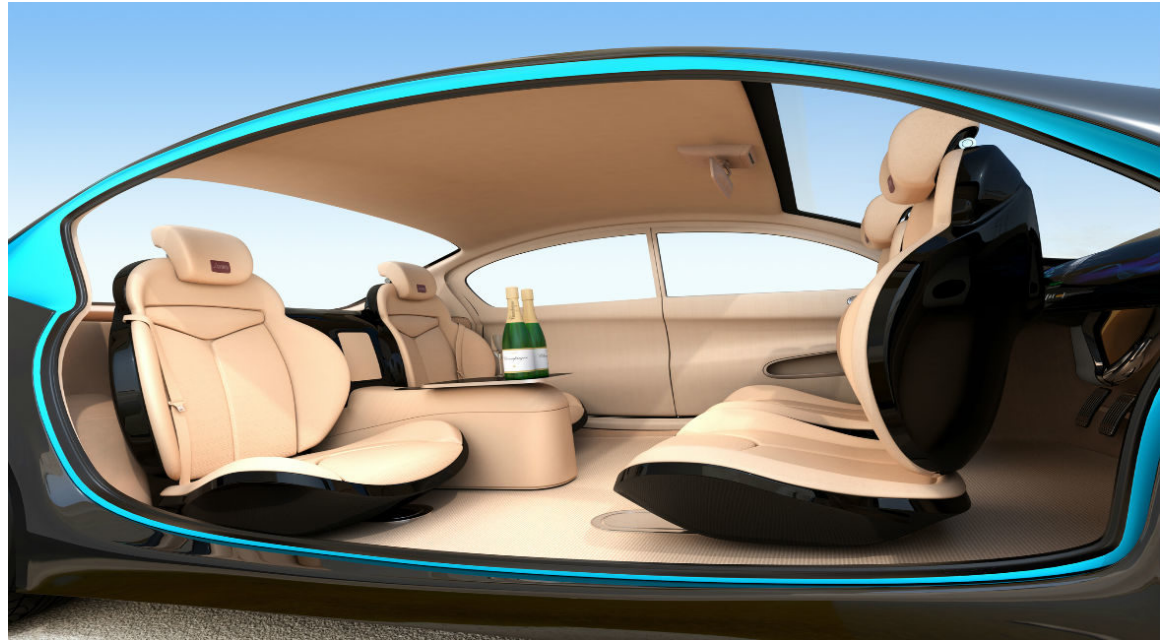
ELECTRICITY MAY BE THE DRIVER. One day your car may speed along an electric super-highway, its speed and steering automatically controlled by

electronic devices embedded in the road. Highways will be made safe — by electricity! No traffic jams . . . no collisions . . . no driver fatigue.

The vehicle is capable of performing all driving functions under certain conditions and in environments of which it has preexisting knowledge. The driver may have the option to control the vehicle.

What are AVs? - Level 5

The vehicle is capable of performing all driving functions under all conditions.

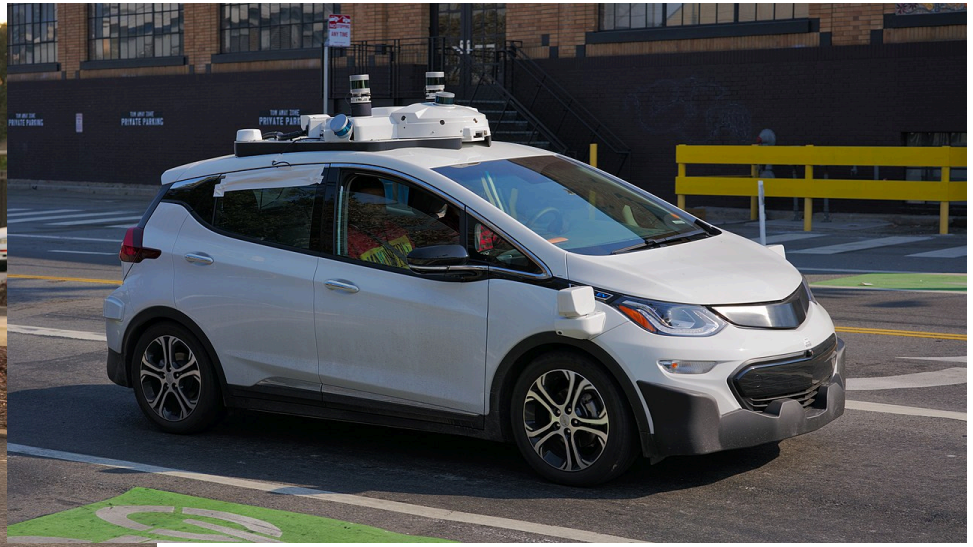


When are they coming?

They are already here, testing on CA streets!

As of April 2nd, driverless testing now permitted.*

*3 companies have applied for driverless permits, all are waiting for a response from DMV



When are they Coming?

- Deployment will vary across the nation, but CA will see deployment as early as next year—and that will only grow through the 2020s
- Level 5 vehicles very far off (some question possibility); Level 4 is sufficient
- 2 early deployment models
 1. Shared mobility in suburban and urban communities
 2. Automated highway driving for luxury, personally owned vehicles

Role for Cities

- Near-term: proactive partnerships & deployment
 - Explore alignment with city transportation goals—how can AVs be leveraged to help?
 - Be accessible, open to partnerships and flexible
 - Comfort with uncertainty; prioritize learning
 - Push to integrate shared AVs into existing infrastructure
 - **Be clear on your city's vision**
- Long-term: re-imagined communities



Potential Use Cases - Shared AVs and Sustainable Communities

- Integrated with existing mass transit infrastructure (BART, Caltrain, airports, etc.)
- First-mile, last-mile
- Leverage AVs to deploy equal access to low-income and underserved communities
- Vision Zero
- Connecting commercial centers within and across cities
- Filling gaps in existing transit services, offering a dynamic service that replicates some features of mass transit



Two Common Questions

- AV Safety
 - Just like human drivers, it takes experience; AVs need many more on-street miles to improve fleet performance and prove potential
 - Make sure your partners are getting lots of driving experience
- Infrastructure
 - Cities should think about leveraging existing infrastructure
 - Drop off/pick up and transfer points
 - Many OEMs proceeding without need for intelligent or connected infrastructure

Possible Challenges & Public/Private Solutions

- Potential challenges/open questions:
 - Infrastructure implications: Parking & EV charging
 - Curb use
 - Land use and sprawl
 - Possibilities regarding congestion (increase in VMT due to released suppressed demand and induced travel)
 - Shifting city revenues (parking, traffic tickets, etc.)
 - **In brief, how do you encourage AV sharing?**
- Initial ideas toward a collaborative approach in addressing these—how can we all benefit?

Examples of AVs Working in and with Communities

- Voyage: providing AV rides to seniors in The Villages of San Jose
 - 4,000 residents, 15 miles of self-contained road, 3 self-driving cars, low-speed (25 mph)
 - Expanding to The Villages, Florida – 125k residents, 32 square miles, 750 miles of road
- Navya self-driving shuttles in downtown Las Vegas and Paris La Defense
- Navya self-driving shuttles on fixed, regular route alongside pedestrians and regular traffic, connecting to a Helsinki sports park