

CONNECTED & AUTONOMOUS VEHICLES

Preparing together

Stacy Cook
TPB Transportation Planner

Citizens Advisory Committee
March 12, 2020



Presentation Outline

- Upcoming CAV related activities
- CAV Overview
- Questionnaire response: What we heard from you
- Discussion

How is the TPB preparing for CAV?

- Evaluating how to address CAV in next long-range plan (due 2022), including public outreach (anticipated in 2021)
- Consultant White Paper
- Autonomous & Connected Vehicles Workshops:
 - Workshop 1 (Technician Focused 3/31/20): Panelist and presentations on key issues, federal, state activities (from our region)
 - Workshop 2 (Technician Focused 5/14/20): MPO role, perspectives from the region
 - Workshop 3: (Board focused, June 2020)



Automation Technologies



Connected Vehicles (CV) combine advanced technologies (like advanced vehicle sensors, wireless communications, GPS, smart infrastructure, and others) to identify hazards and delays on the roadway and to provide drivers with warnings and real-time traveler information. CV technology can be used in vehicles with or without automated functions, and will play a significant role in the evolution of automated vehicles.

Example CV Functions: Curve speed warnings, forward collision warnings, advisories and warnings of deteriorating/hazardous driving conditions.

Automated Vehicles (AV) encompass a spectrum of vehicles at progressing levels of automation. AVs at lower levels perform some driving functions but require a human to monitor the road. AVs at higher levels perform some to all driving functions as well as monitor the road in some to all situations.

Example AV Functions: Preemptive braking systems, parking assist systems, adaptive cruise control, lane centering systems.

SAE Levels of Automation



Highly Automated Vehicles (HAV) refer to automated vehicles at higher levels of automation, and are distinguished by the capability to monitor the driving environment. HAVs monitor the road in some to all situations and conduct some to all driving functions.

Example HAV Functions: Performs all driving tasks in specific situations; performs all driving tasks in all situations/ no steering wheel or pedals.

SAE Levels of Automation

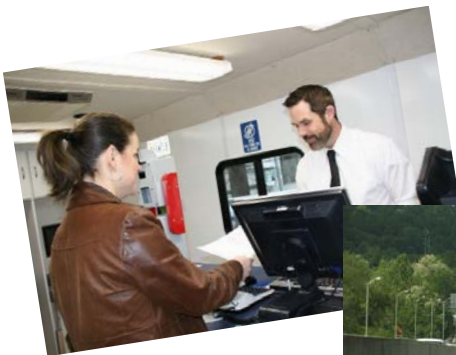


Source: CCOG ACV Roadmap



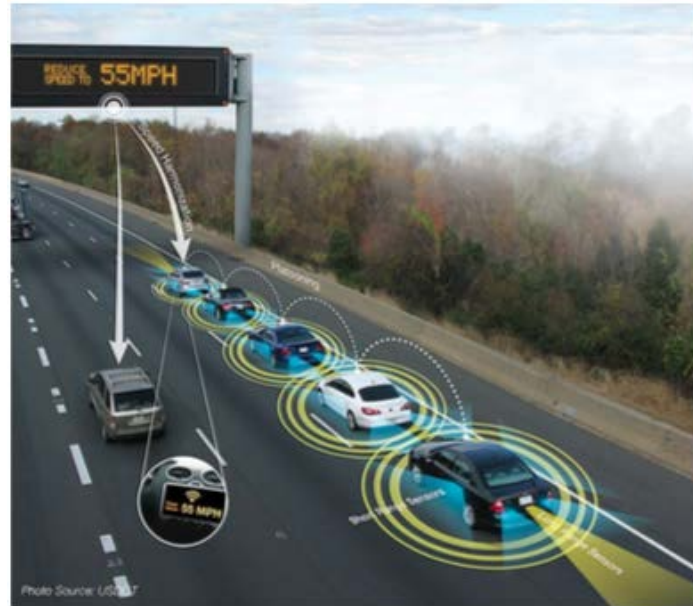
What Impacts will CAV have?

- Driver Licensing
- Vehicle Registration
- Vehicle Inspection
- Vehicle Insurance
- Traffic Laws and Regulations
- Commercial Vehicle Regulation
- Traffic Engineering and Operations
- Public Transportation
- Non-Motorized Transportation
- Transportation Research
- System Security and Privacy
- Land Use and Zoning Control
- Transportation Planning
- Transportation Capital Investment
- Data Management



Why CAV?

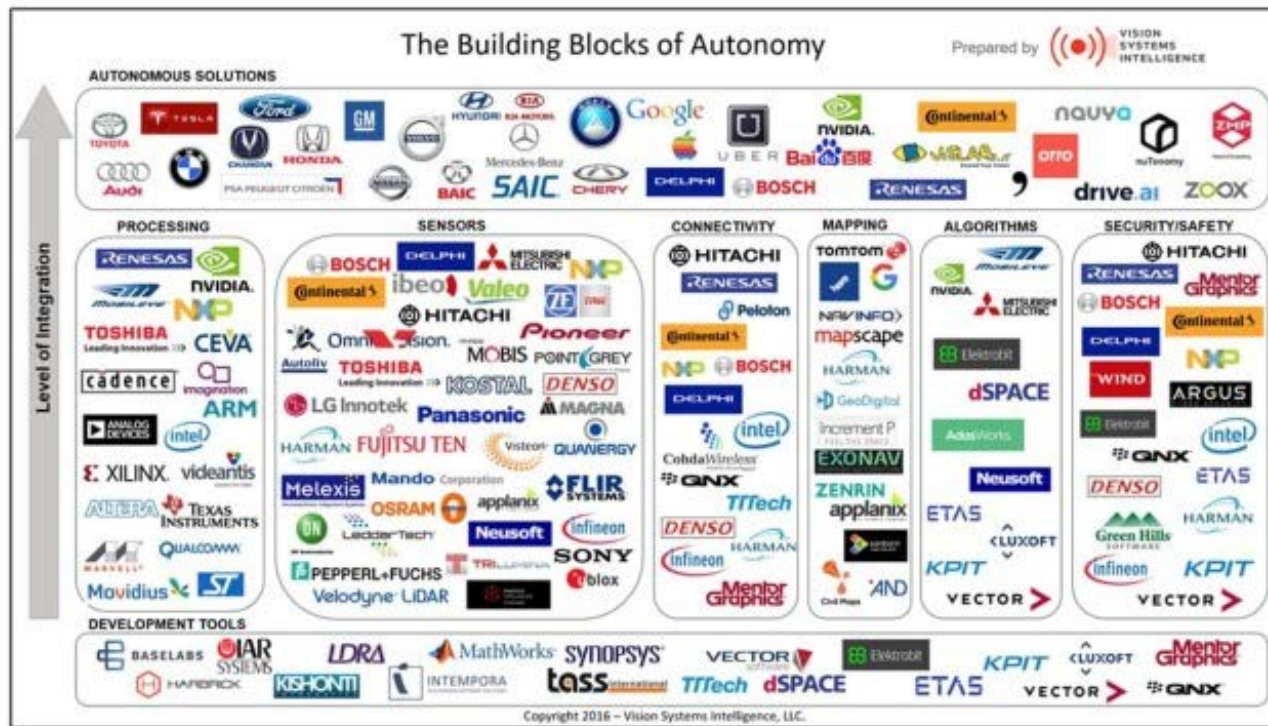
- Safety and Security
- Efficiency
- Environmental benefits
- Equity



What to do about it?

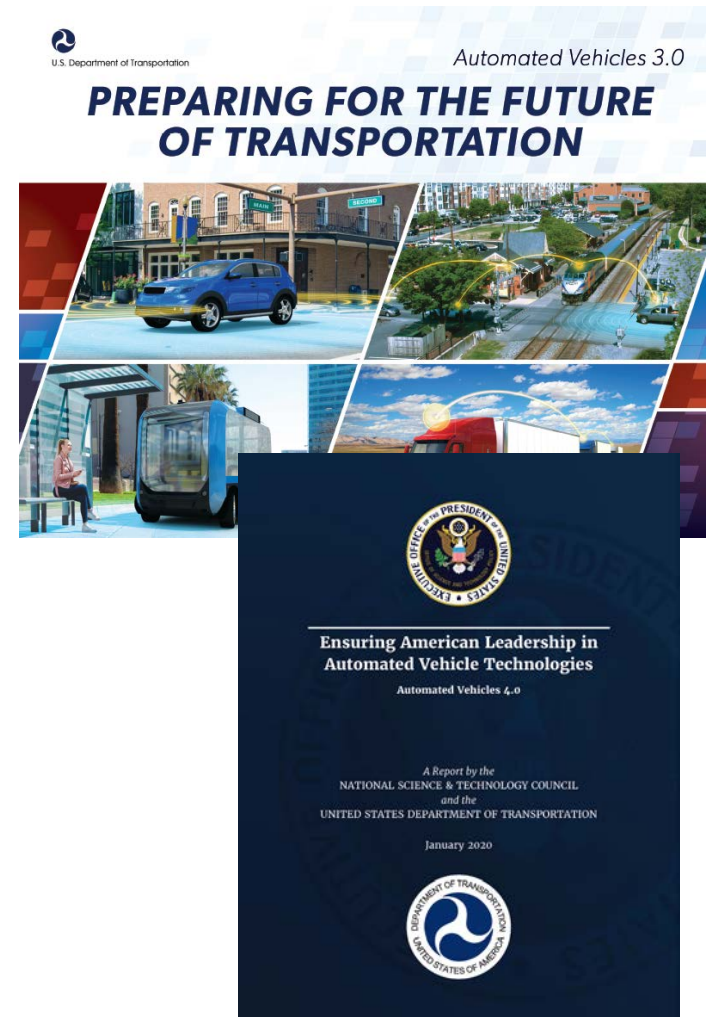
Private sector role:

- Automakers and other device companies will drive design, innovation, and equipment



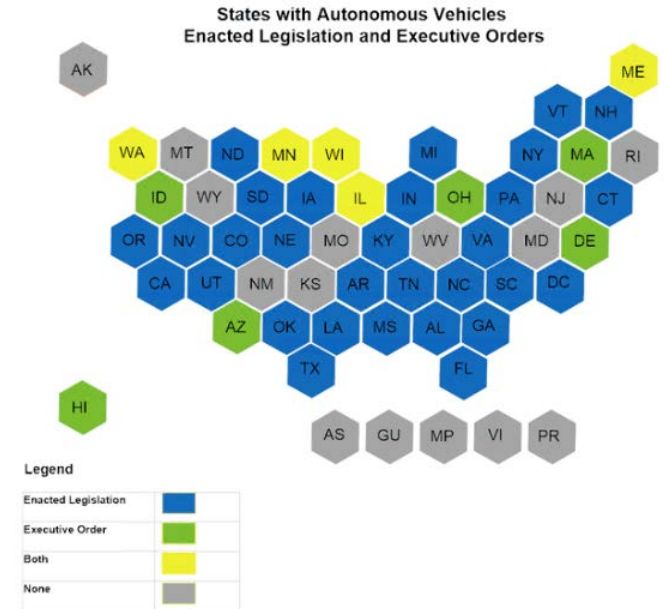
Federal Role

- Research and pilots
 - USDOT Connected Vehicle Safety Pilot Program
 - Smart Cities Grant – Columbus Ohio
- Laws and Guidance
 - Vehicle to Vehicle (V2V) advanced rulemaking
 - National Highway Traffic Safety Administration (NHTSA)
- Address Cyber Security and Data Platforms, Data Management



State Role

- Policy Setting
 - Approximately 90% of the states have developed some sort of legislation
- Pilot tests
 - DOTs working with federal, local, academic and private partners
- Research and planning
 - Wide impacts on DOT practices and activities
 - Consumer response
- Coordination through AASHTO and AMPO Committees and Pooled Fund Studies



Regional Role

Policy Recommendations

- Establish regional principles for CAV
- Have a voice at the table

Regional Coordination

- Conduct workshops and share information Convene Stakeholders
- Monitor regional activities

Research local impacts

- Strategic plans
- Impact/opportunity assessment
- Modeling needs, data and adapt assumptions
- Scenario planning to understand capacity impacts and impacts on mode choice
- Address CAV in long-range plan



What is already happening in the metropolitan Washington region?

- Olli pilots in Merrifield (VA), National Harbor (MD), Clarksburg, (MD)
- Virginia Connected Corridors
- US 1 Innovative Technology Deployment Corridor
- State and local plans are addressing CAV, addition positions specific to CAV
- Scenario Planning (2019 DCST study)
- MDOT is testing automated valet parking (STEER) in BWI Marshall Airport and Dorsey Run MARC parking lots
- Halley Rise (private residential) development automated shuttle
- Connected DMV



Source: WTOP

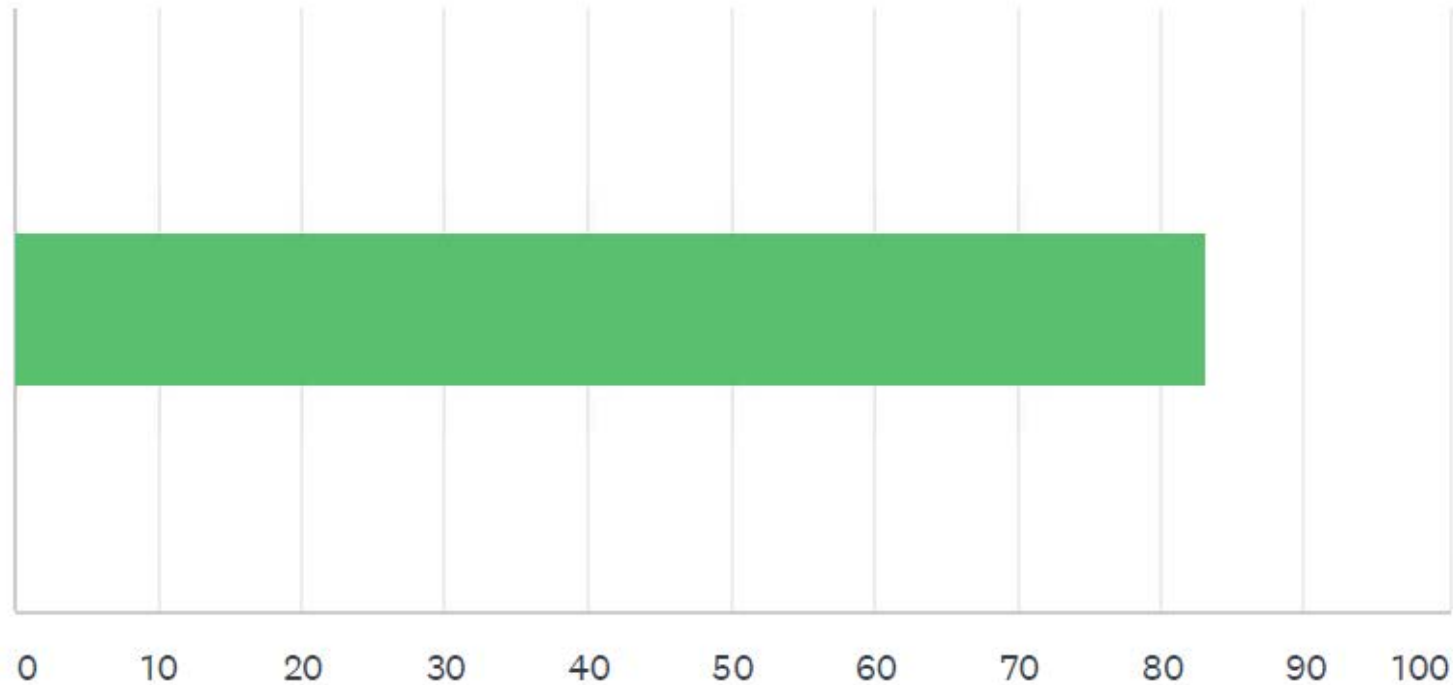


What can you do about it?

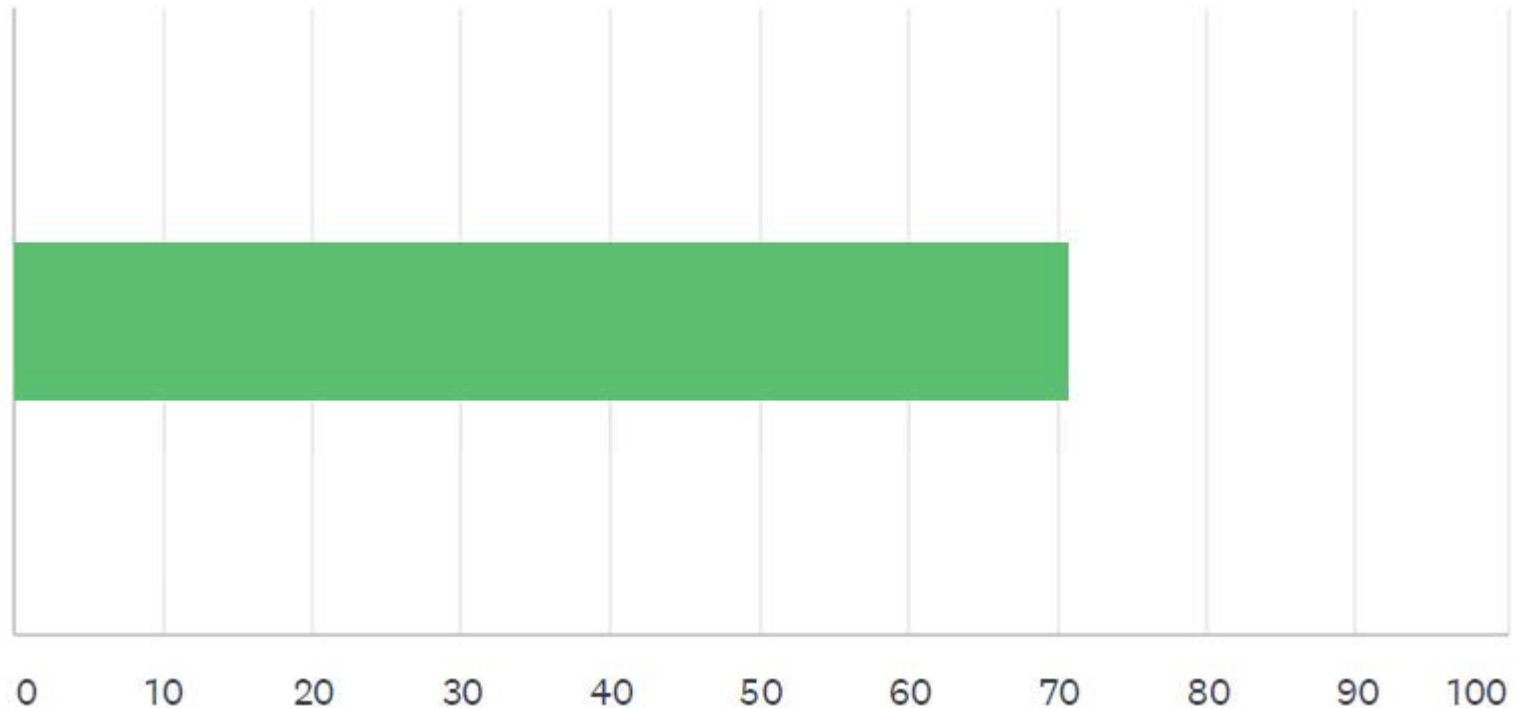
- Educate yourself
- Start the discussion
- Provide input during federal comment periods and listening sessions
- Provide learning opportunities for people in your environment
 - Brown-bags/'lunch and learn'
 - Workshops
 - Invite speakers
- Consider impacts on your professional role and responsibilities



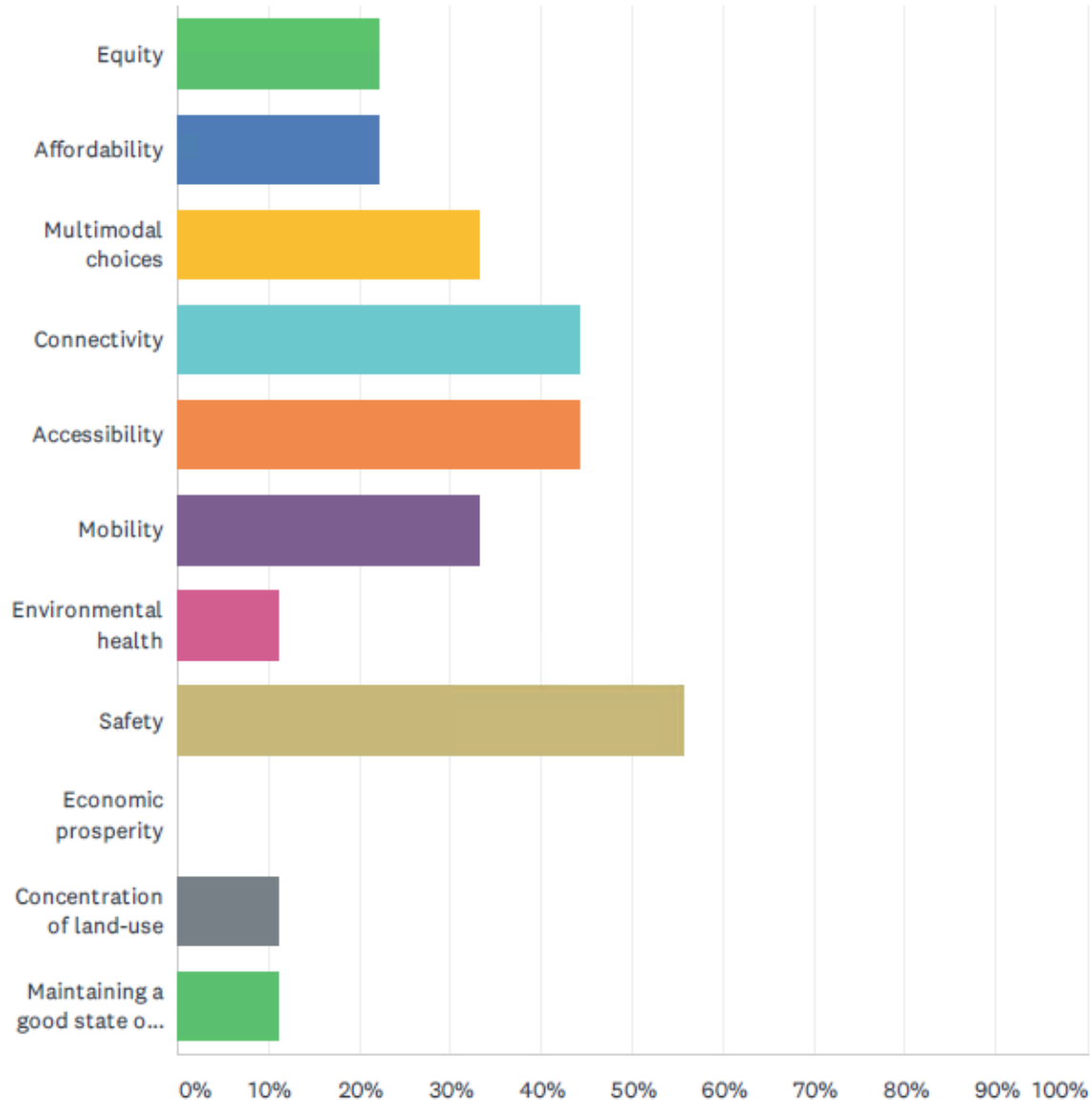
Q1 How would you rate your personal interest in CAV?



Q2 Do you think that CAV should be a TPB priority now or in the near future?



Q3 TPB Goals that might most be impacted by CAV



What are your concerns regarding CAVs?

Delivery Expectations and Equity:

- Overhyped and inequitable
- Overpromises from manufacturers as to what the vehicles are actually capable of, leading to people relying more on the technology than they should.
- Who has access to the service, and training?
- Affordability

Congestion and Mode Choice

- We need to understand the requirements for infrastructure to support CAVs
- Zero occupancy vehicles that return home/increase traffic
- More traffic, more unemployment, more queuing both ways morning and night
- Discourage use of public transportation
- Absent strong policy guidance they are likely to increase congestion and sprawl.



What are your concerns regarding CAVs?

Safety

- Safety will be severely impacted during any transition to this technology
- Safety measures for pedestrians and bicyclists. Interactions between CAVs and other motorists, what are the expectations?
- One major concern is that they might not be as safe. If a person with a disability drive the vehicle, and for some reason the vehicle requires them to drive it manually will that affect safety? Will the same guidelines required to operate a vehicle in the present, still apply with these vehicles? I feel that in case the car malfunctions the person should be able to still manually drive it.

Environmental impacts

- Computerized devices already have contributed to an alarming rate of environmental waste globally. What initiatives will be undertaken to have "green" electronics, and a circular economy, thereby lessening the impacts on undeveloped countries who are currently recycling hazardous materials and putting workers at risk?



Q5 What opportunities do you think CAVs create?

Safety

- Increased safety, if people understand what the vehicles can actually do and how much attention they need to pay while in the driver's seat
- Fewer crashes by eliminating the human error factor
- Long term improvements in safety but beware of the transition period which could be long.

Accessibility and Quality of Life

- Vehicle sharing
- CAV can provide mobility to the elderly and or assist impaired persons, who are unable to drive but want independence/want to age in place
- Better connectivity from public transportation
- Better efficiency of transportation network and options
- More transportation accessibility



Q5 What opportunities do you think CAVs create?

Environment

- CAV can be the impetus for creating "green" computing and recycling systems, thus opening doors for recycling engineers who can reclaim valuable materials, and prevent further mining of resources.
- With appropriate policy support, especially congestion pricing and priority for high occupancy vehicles, they could increase access and accelerate transition to electrification.



Discussion

- What could TPB do to address CAV in its public outreach (we are planning on addressing this and other topics in spring 2021)
- When we think about the TPB Vision and Goals, do you think CAV will make it harder or easier to move toward those goals?
 - What do you think TPB should do to ensure we move toward these goals?
- Other regions and cities have established ‘CAV’ principles. Do you think our region should establish principles?



Stacy Cook

Transportation Planner

(202) 962-3335

scook@mwkog.org

mwkog.org/TPB

Metropolitan Washington Council of Governments

777 North Capitol Street NE, Suite 300

Washington, DC 20002



National Capital Region
Transportation Planning Board