CONNECTED AND AUTOMATED VEHICLES – UPDATE

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TPB Community Advisory Committee
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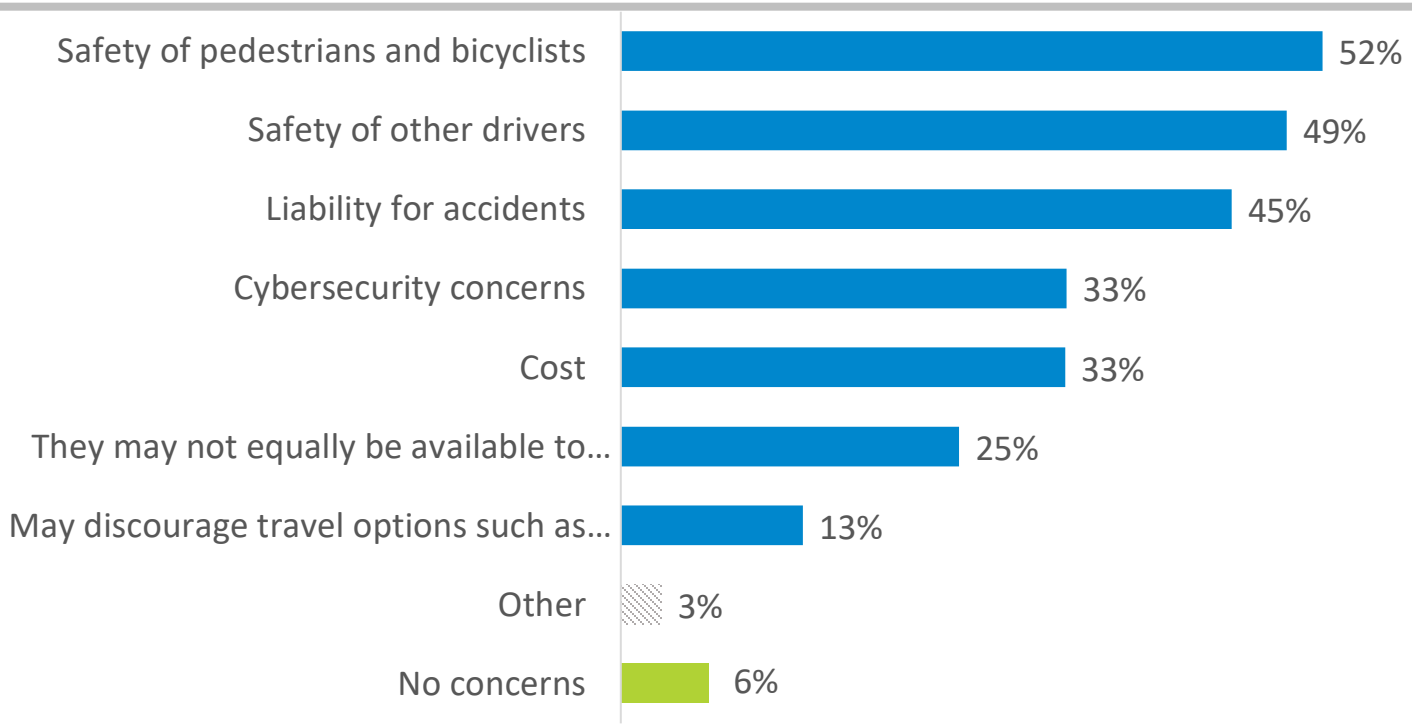
Connected Intersection (USDOT/Getty Images)

Today's Discussion

- Background on CAV Principles Development
  - Voices of the Region Survey Question
  - Consultant White Paper (2020)
    - Strengthening Our Regional Understanding of CAVs
    - Potential Impacts of CAVs
- Principles Approach and Structure
- Review of Draft Principles (1 through 17)
- Schedule

Voices of the Region – 2020 Public Opinion Survey: Concerns about Driverless Cars



S3Q5. What concerns, if any, do you have about driverless cars? (Choose up to 3 options)

Potential Impacts of CAVs on Metropolitan Transportation Planning

The White Paper* (June 2020) identifies 18 types of CAV impacts that relate to the goals, policies, and activities of TPB and those of transportation agencies, grouped broadly into the following three categories:

- **Travel:** includes impacts that directly relate to the mobility of the traveling public, motor carriers, and other road users
- **Societal:** includes impacts of broad societal concern
- **Organizational:** includes impacts directly related to the activities and responsibilities of infrastructure owner/operators and transportation planning agencies

*Link to white paper

White Paper: Potential Impacts of CAVs

Travel Impacts	Societal Impacts	Organizational Impacts
Access	Equity	Data Coordination
Active Transportation	Employment / Economic Development	Emergency Preparedness
Public Transportation	Environment	Funding
Goods Movement	Land Use / Urban Form	Infrastructure
Safety		Operations
Travel Behavior		Reliability
		Security/Privacy
		Travel Forecasting

CAV Impacts and Corresponding Agency Roles

Each of the 18 CAV impact areas were analyzed to determine:

- The nature of the issue and its associated challenges and opportunities
- Roles for governments/agencies across jurisdictional levels
- Roles for private sector entities (automotive industry, tech companies, etc.)
- Coordination opportunities between these stakeholders

Impacts			Governmental Roles				Nongovernmental Roles
Issues	Challenges	Opportunities	Federal	State	MPO	Local	Private Sector
Active Transportation: Mobility	Fragmentation and disruption of bicycle/pedestrian networks (e.g., increased curbside pick-ups/drop-offs, unsafe crossing with platooned and free-flowing traffic)	Repurpose public right-of-way for active travel	Secondary: technical assistance/guidance on complete street design	Primary: design standards for state-owned roadways	Collaborative: regional bike/pedestrian planning, promotion of complete street policies	Primary: design standards and engineering of locally owned street networks	Secondary

White Paper: Potential TPB CAV Roles

- Information sharing, engagement, and coordination
- Integrating CAV considerations into planning and programs
- Regional policy development and collaboration
    - Development of regional principles

Principles Approach and Structure

Staff's approach to the draft principles was based on:

- Similarity to previous documents (e.g. 2016 Freight Plan)
- Brevity; positive phrasing
- Focus areas within TPB's purview
- Avoidance of promotion/endorsement or prohibition language
- Emphasis on evergreen principles
- Emphasis on policies and outcomes, not strategies or tactics
- Reflection of input received from committees/stakeholders

Preamble to all principles:

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should … followed by each principle statement (the current draft has 17 such statements)

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

1. **increase the safety of everyone on or near transportation facilities.**

Notes:

- Addresses all 3 white paper categories: travel, social, and organizational
- CAV safety benefits are often cited – but there are also risks
- Worded to include not just vehicle drivers and occupants

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

2. increase mobility options for all.

Notes:

- Fair access/mobility for persons with accessibility needs
- Interconnected multimodal transportation system that provides convenient access with reduced automobile reliance
- Comprehensive range of choices for regional travelers
- Accurate and user-friendly real-time transportation system info available to all regardless of traveler's mode or language
- Deployment as CASE vehicles (Connected, Automated/Accessible, Shared, Electric/Decarbonized) would be critical to enhancing these goals

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

3. increase opportunities for and quality of accessible transportation, including for persons with disabilities.

Notes:

- Fair access/mobility for persons with accessibility needs
- Interconnected multimodal transportation system that provides convenient access with reduced automobile reliance
- Comprehensive range of choices for regional travelers
- Accurate and user-friendly real-time transportation system info available to all regardless of traveler's mode or language
- Deployment as CASE vehicles (Connected, Automated/Accessible, Shared, Electric/Decarbonized) would be critical to enhancing these goals

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

4. **maintain and enhance opportunities for and the quality of bicycling and walking in the region.**

Notes:

- Opportunities for reduced motor vehicle reliance, but also risks of mixed operations, or exclusion from dedicated CAV facilities
- Deployment of CAVs in the region should be done only in ways that maintain or increase availability of bicycle and pedestrian infrastructure, and safety of bicyclists and pedestrians

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

5. **interoperate safely with non-automated vehicles, vehicles with differing levels of automation, and all other transportation system users.**

Notes:

- Scenarios for deployment vary, but some anticipate mixes of automated vehicles (automated at differing levels of capability and human driver involvement) and non-automated vehicles
- CAV technology must be able to recognize and ensure safety of all pedestrians, regardless of skin color or mobility/ability levels
- Though vehicle technology is a national/international issue rather than regional, this will still be critical for our unique region

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

6. support the priority of transit on the region's roadways.

Notes:

- Regional plans and programs have long emphasized multi-occupant vehicle travel over single-occupant vehicle travel
- Supporting transit is a core TPB goal, and should remain a priority
- Risks include facilitating low density living that may reduce transit ridership, and a negative spiral of transit revenues and service level reductions

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

7. **enhance the provision of transit, including providing opportunities for microtransit access to the region's high-capacity transit (HCT) stations.**

Notes:

- Opportunities include operational benefits of technology, especially connectivity (e.g. Transit Signal Priority); last-mile shuttles; repurposing parking space for transit uses

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

8. **prioritize reduction of vehicle miles of travel and minimize zero occupant vehicle miles of travel.**

Notes:

- Opportunities include that shared vehicles (if "CASE") may reduce auto ownership, facilitating non-auto modes; bolster Mobility As a Service
- Risks include increased travel due to willingness to travel further or "zombie" zero-occupant-vehicle (ZOV) VMT

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

9. **ensure CAVs' benefits are available equitably to all people in the region and avoid disproportionate negative impacts to any group or community.**

Notes:

- Market forces may cause CAVs and benefits to be deployed inequitably
- Special efforts to provide CAV benefits to underserved communities
- Reasonable access/cost for all in region

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

10. bolster regional environmental and land use objectives, including prioritizing shared vehicles and advancing decarbonization of the transportation system.

Notes:

- Language adapted from NVTA
- Deployment as CASE vehicles (Connected, Automated/Accessible, Shared, Electric/Decarbonized) would be critical to enhancing these goals

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

11. ensure security (including cybersecurity) and privacy and prevent risks to people and infrastructure

Notes:

- Opportunities include increased operational information which, in turn, may increase security
- Risks include cybersecurity (e.g., breaches of privacy infrastructure and vehicle vulnerabilities to attack); vulnerabilities of electric and communications infrastructure and batteries (e.g. electromagnetic pulse, battery fire hazards, electrocution hazards for first responders)
- Security will be an ongoing (operational) challenge – security work will never be "finished"

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

12. ensure freight and goods movements that help minimize disruptions and facilitate livability of the region's communities.

Notes:

- Opportunities include economic benefits of freight efficiency; addressing driver shortages; efficiencies in freight delivery parking
- Risks include jobs disruptions; net increases in congestion/ VMT/ emissions; last-mile freight delivery vehicles using/crowding urban infrastructure

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

13. bolster effectiveness of emergency and incident response, systems management by traffic operations centers, and information sharing among agencies and the public.

Notes:

- CAV data could help transportation operations and emergency/incident response
- Risk of new operations uncertainties
- Risks regarding CAV behavior in unusual, unexpected, or incident situations (e.g. temporary lane closures, direction from traffic control officers)

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

14. bolster interjurisdictional coordination and technical interoperability among TPB member agencies, in conjunction with relevant national efforts and standards.

Notes:

- Regionally collaborate on infrastructure and operations considering CAVs

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

15. provide public revenues that are no less than the costs they impose on infrastructure, transportation systems management, and communities.

Notes:

- Opportunities include potential willingness to invest in infrastructure improvements to realize CAV benefits
- Risks include new infrastructure demands/costs outstripping ability to serve those demands
- CAV deployment must be done in ways to generate sufficient revenue to cover both infrastructure and equity impacts costs

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

16. **make data freely available to TPB member agencies to enhance planning, operations, and emergency preparedness and response.**

Notes:

- CAVs may provide new/more data for transportation operations, but transportation operations centers will need investments to take full advantage

Draft CAV Principles for Discussion

The deployment, use, or operation of Connected and Automated Vehicles (CAVs) in the National Capital Region should…

17. **be accompanied by robust efforts by TPB and member agencies to keep abreast of evolving technology to enhance support of TPB's goals.**

Notes:

- CAV deployment will continue to evolve, staffs must keep up on the latest information
- Will remain an important emerging consideration for regional travel forecasting

Schedule

- July 8 and September 9 – presented initial and revised drafts of CAV principles to Systems Performance, Operations, and Technology Subcommittee (SPOTS)
- September 10 – presented (revised) draft to TPB Technical Committee
- September 24 – presented to TPB Access for All Advisory Committee
- **October 14 – present to Community Advisory Committee**
- October/November – further committee presentations as needed
- November/December – scheduled for TPB review and approval
- Late 2021/Early 2022 – incorporation into Visualize 2045 text

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