AUTONOMOUS VEHICLES/ TECHNOLOGIES AND THE TPB

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National Capital Region
Transportation Planning Board

Technology and Transportation

- 2007 introduction of first iPhone which along with the Google Android operating system put an always-connected computing device in the consumer's pocket

- Rapid advances in technology have affected all aspects of transportation

- Challenges current long-range planning practices

    - It is hard to predict what breakthroughs can happen between now and years down the road

- There are calls for flexibility and need to be able to adapt to changes

Emerging Technologies

Connected and Automated Vehicles
- Infrastructure needs
- Land use issues
- Myriad of other issues

Shared Mobility
- Ridesourcing (TNC's)
- Bike Sharing
- Scooter sharing
- Carsharing

High Speed Rail
- Maglev
- Hyperloop

Alternate Fuels
- Electric
- Fuel Cell

Intelligent Transportation Systems (ITS)
- Big Data
- Vehicle Probe Data
- "Smart" Infrastructure

UAV/UAS (Drones)
- Accident Reconstruction
- Surveillance
- Delivery

Robots (delivery)

Levels of Vehicle Automation

0 – No Automation
- Absence of any assistive features (e.g. adaptive cruise control)

1 – Driver Assistance
- Stay-in-lane assist
- Adaptive speed control
- Driver must maintain control

2 – Partial Automation
- Speed and steering control
- Driver can relinquish control but must monitor driving environment

3 – Conditional Automation
- Vehicle can monitor environment
- Driver must be ready

4 – High Automation
- Vehicles do everything – but only in limited circumstances

5 – Full Automation
- Vehicles do everything in all circumstances, never a need for human backup

A/V: Already Here

- *Virginia Creates Automated Vehicles Testing Corridor* (auvsi.org, 6/4/2015)

  - 70 miles of I-66, I-95, I-495, US 29, and US 50

- *Meet Olli, The Driverless Vehicle Cruising Around National Harbor* (dcist.com, 6/14/2016)

- *Ford's Self-Driving Vehicle Fleet Hits Streets Of Washington, D.C.* (forbes.com, 10/22/2018)
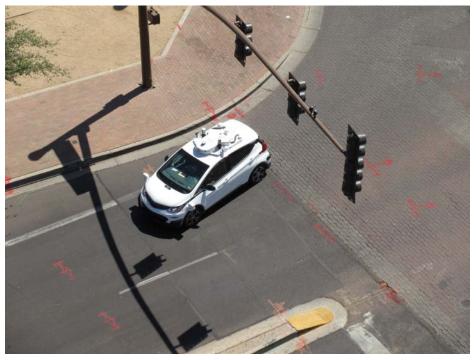

(VDOT/Flickr)

And Nationally…

- *Waymo obtains California's first fully driverless car permit* (www.Bloomberg.com 10/31/2018)

- *Drink too much beer at a Dallas Cowboys game? Now a free robot-driven van will scoop you up afterward* (www.washingtonpost.com 10/20/2018)

- *Report: More major US cities embracing autonomous vehicles* (www.routefifty.com via www.itsa.org 10/17/2018)

- *Self-driving truck makes first trip — a 120-mile beer run* (www.usatoday.com 10/25/2016)

Key Unknowns of Automated Vehicles

- Speed of technological advancement

- Market-driven preference for (self-) owned vehicles versus shared vehicles

- Economics

- Political support

- Public acceptance

(Zombieite/Flickr)

Source: Adapted from Stephen Buckley, WSP, presentation to SPOTS, June 14, 2017.

Unknown Interaction of Technology and Vehicle Ownership

Waymo Jaguar I-Pace (Elisfkc/Flickr)

- Emergence of "shared mobility"

- Some see shared mobility going hand-in-hand with automated vehicle technology

- Will we see a shift away from personal ownership of motor vehicles?

Mixed Potential Impacts of Automated Vehicles

- Trip making; trip length; congestion:

  - Ease of riding instead of driving could make these increase

  - Efficiency of shared vehicles could cause decreases

- Transit

  - Enabling zero-car lifestyles could bolster transit

  - Ease of point-to-point travel could lower transit ridership

- "Non-transportation" impacts

  - Land use

  - Employment

Selected Peer Agency Activities

North Central Texas Council of Governments

- Staff person assigned to Automated Vehicles
- Grant Programs:
  - *Traffic Signal Data Sharing Program*
  - *511DFW/Waze Program*

ARC

Atlanta Regional Commission (ARC)

- Scenario planning used to guide future policy discussions and development of The Atlanta Region's Plan
- Regional Transportation Technology Policy Document

Northern Virginia Transportation Authority

- Scenario testing of future technology as part of Transaction Plan
- Northern Virginia Transportation Roundtable discussions that focus on new technologies and transportation trends

COG's Institute for Regional Excellence (IRE) C/AV Project

- IRE is a Certified Public Manager (CPM) program housed at COG

- One of 2018 cohort group projects was to look at C/AV's in the NCR

- The group, made up of staff from local, state and federal agencies, recommended that the TPB take a lead role regionally to ensure a consistent approach to C/AV's in the future; they also identified 4 priority areas that should be addressed:

1. Safety and Security
2. Environment impacts
3. Economic Impacts
4. Planning and Investment

Potential Interaction with TPB Programs

- Visualize 2045/Long-Range Planning (how to reflect)
- Congestion Management Process (CMP) (monitoring congestion impacts)
- Performance Based Planning and Programing (PBPP) (target-setting)
- Systems Performance Operations Technology Subcommittee & Traffic Signals Subcommittee (multiple impacts)
- Freight Subcommittee (freight/delivery could be early adopters)
- Regional Public Transportation Subcommittee (ridership and operations)
- Transportation Safety Subcommittee (safety benefits and challenges)
- Transportation Emergency Preparedness Committee (RESF-1) (security)
- Travel Forecasting Subcommittee (how will trends change?)
- Commuter Connections Subcommittee (owned vs. shared mobility)
- Access for All Committee (will needs be met?)
- Citizens Advisory Committee (are we on the right track?)
- **TPB (overall)**

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Next Steps in a Long Journey

- Staff plans to proceed/continue with activities including

  - Using the existing SPOT Subcommittee to host technology topics/presentations or themed meetings; coordinate with and cross-brief Tech Committee and others as necessary

  - Compiling information on related member agency activities; field visits; white papers

  - Monitoring literature; attending outside events; skills building

- Potential activities

  - Scenario planning

  - UPWP considerations / long-range plan development

  - Policy-level engagement

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