

# AUTONOMOUS VEHICLES/ TECHNOLOGIES AND THE TPB

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# Technology and Transportation

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- 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

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## 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

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## 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

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- *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...

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- *Waymo obtains California's first fully driverless car permit ([www.Bloomberg.com](http://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](http://www.washingtonpost.com) 10/20/2018)*
- *Report: More major US cities embracing autonomous vehicles ([www.routefifty.com](http://www.routefifty.com) via [www.itsa.org](http://www.itsa.org) 10/17/2018)*
- *Self-driving truck makes first trip – a 120-mile beer run ([www.usatoday.com](http://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

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- 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*



## 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

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- 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)**



# Next Steps in a Long Journey

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- 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
- Staff looks forward to ongoing discussion on whether and how to expand activities
  - Scenario planning
  - UPWP considerations; committee changes or create new
  - Policy-level engagement



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