



## **NORTH CAROLINA**

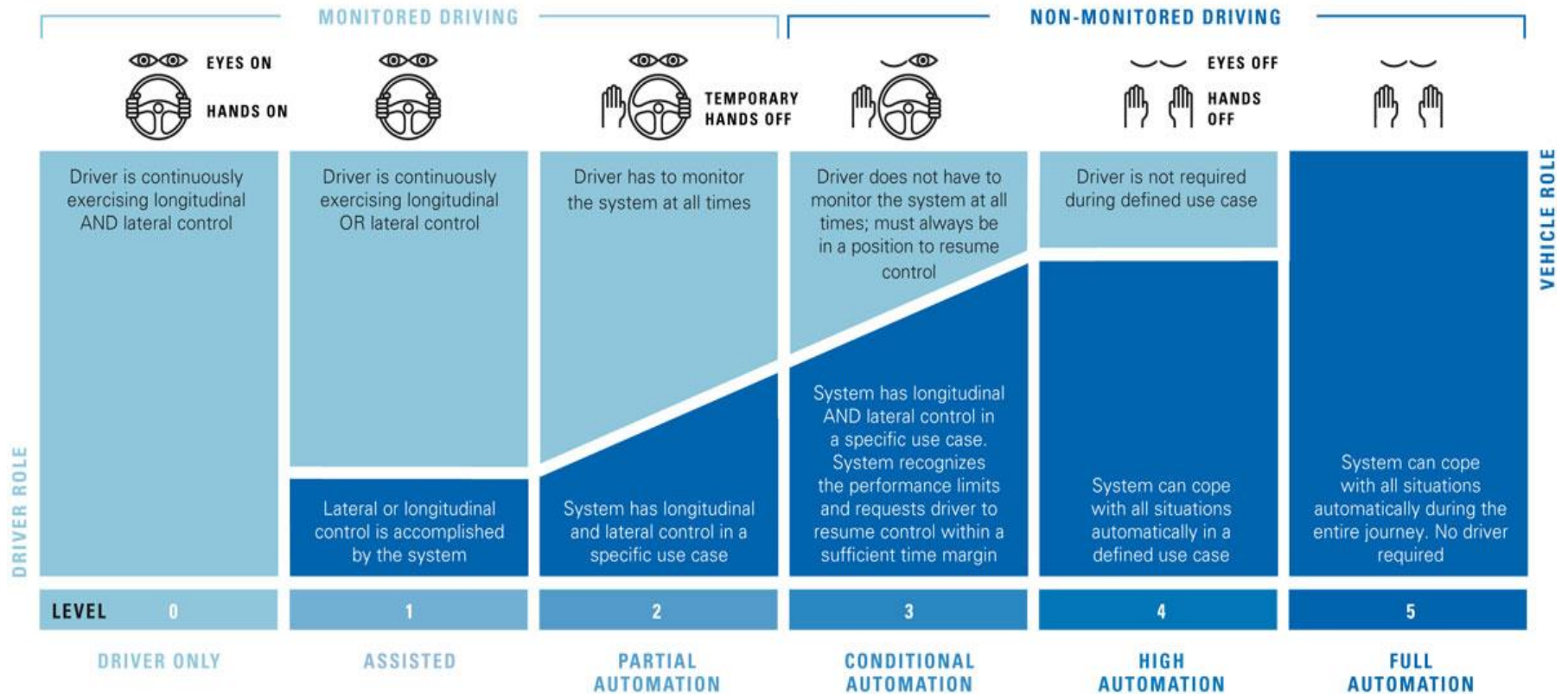
Department of Transportation



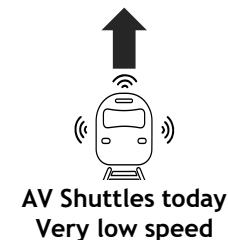
# Preparing NC Roads for Automated and Connected Vehicles

Kevin Lacy, PE, State Traffic Engineer

Vehicle Technology Day, December 4, 2017



*These are available today*



# Certainties with Autonomous Vehicles

**The Car** – will grow smarter and more efficient, with high-efficient engines, lighter materials and autonomous driving vehicles

**The Industry** – will evolve with new competition from tech companies, and suppliers capable of producing high-tech parts at low prices

**The Passenger** – will look at cars differently; sharing cars and using them as a space to consume media and make calls

**Roadway** - Many and most characteristics about the transportation infrastructure will not change for a long time; pavement and bridges must be maintained

**DOT/DMV** - The role will evolve, but how and when is uncertain



# Uncertainties with Autonomous Vehicles

**Rate of Acceptance** - How fast AV services will be accepted, safe, useful, and successful

**Infrastructure Requirements** – may change in response to CV/AV

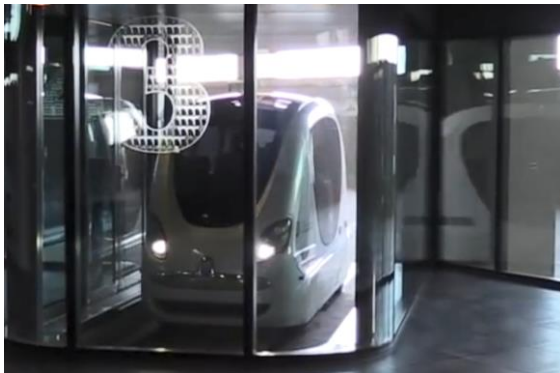
**Migration to electric vehicles** – may change revenue collection method

**Public Transit and Freight** – may shift to smaller vehicles and more demand responsive

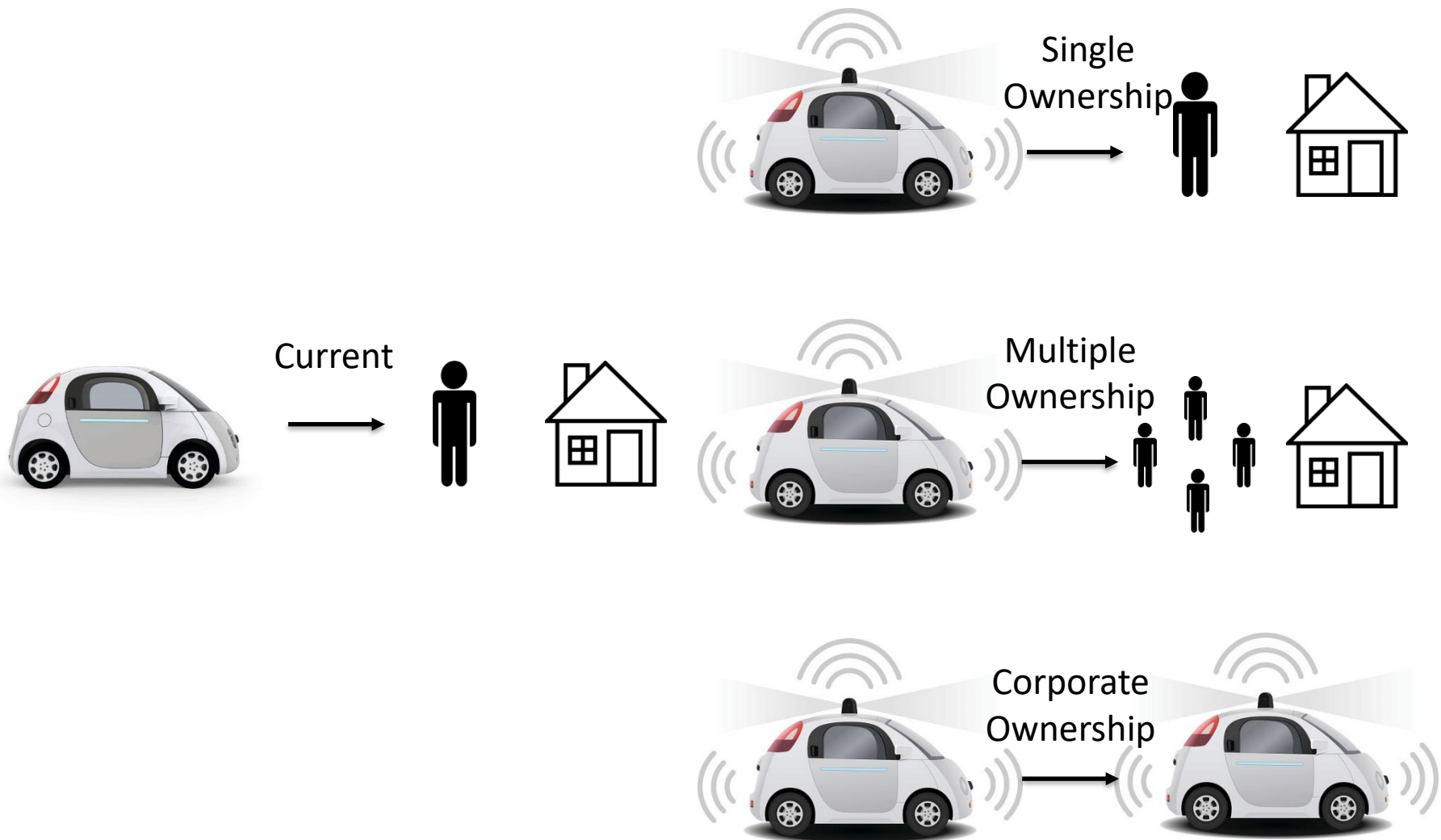
**Network Management** – may change

**Transportation Funding Model** – may evolve in anticipation of the change

**Vehicle Ownership?** – may change to transportation as a service



# Projection – Autonomous/Vehicle Ownership





# Updates to DOT Processes

- Planning – shorter planning horizons, new methods to represent AV services
- Design – new technologies – communications networks, e-Signs, special paints, EV charging
- Construction – work zone management with AVs
- Operation – potential for more PPPs, EV charging, oversight of fleet operators

# Updates to DOT Roles

- Public transit vs Private AV services
  - ADA compliant services, disadvantaged services, rural provisions
- Relationship of DMV with AV fleet owners vs private citizens' licensing and registration
- Freight owner/operators
- Charging station owner/operators
- Policing and regulation of AV fleet operators

# DOT State Revenue Sources



Motor Fuel Tax  
50%

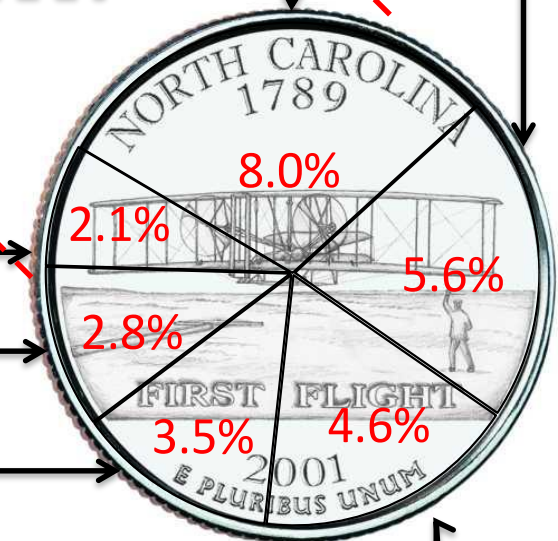
Highway  
Use  
Tax 20%

Fees  
30%

Truck  
Registration

Vehicle  
Registration

Other Fees  
International Registration Plan  
Certificate of Title  
Driver Licenses





# Revenues

- Trickle-charge taxation
  - Current model with gas tax
- Transition to bulk-charge taxation
  - Since 1980 VMT has doubled and fuel-consumption increased by only 50%
  - Transition from gas tax to VMT tax could increase revenues by ~33%
  - Buying “miles” on a yearly basis
  - Vehicle registration fees, battery taxes
  - VMT taxation – Pilots in Oregon, California, etc.

- AV will save lives and be more efficient
- Lots of uncertainty
- Change will happen
- EV and AV are not friends of the gas tax

**For More Information Contact:**

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**<http://www.ncav.org/>**