

# CONNECTED & AUTONOMOUS VEHICLES

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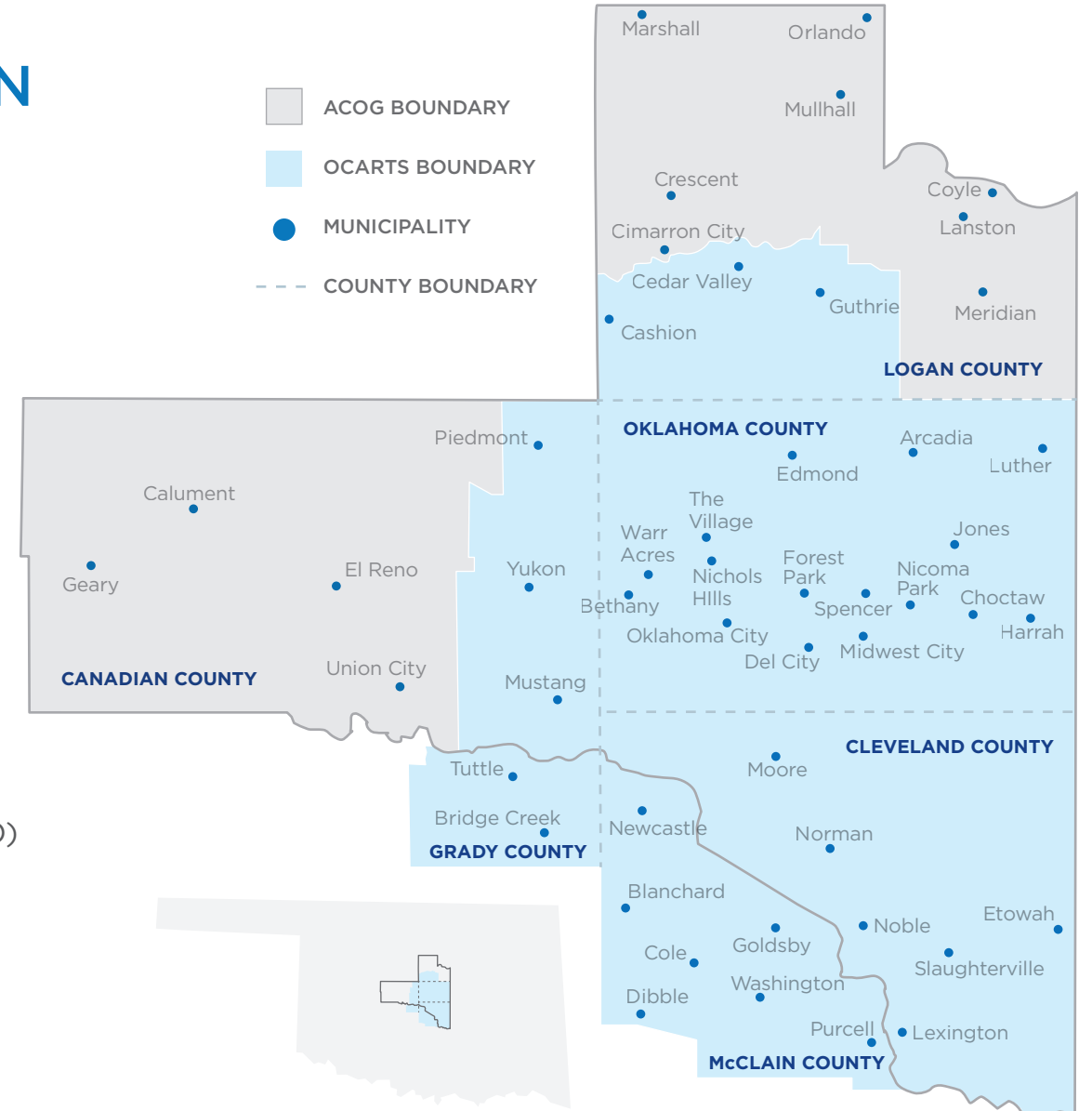
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# ACOG AND THE OCARTS REGION

- 2,085 square miles
- 47 Cities
- 6 Counties (some partial)
- 2010 Population - 1.1 Million
- 2040 Projected population - 1.6 Million

## ACOG staff work on four missions:

- Economic Development
- 9-1-1 Administration
- Transportation and Planning Services (MPO)
- Water Resources





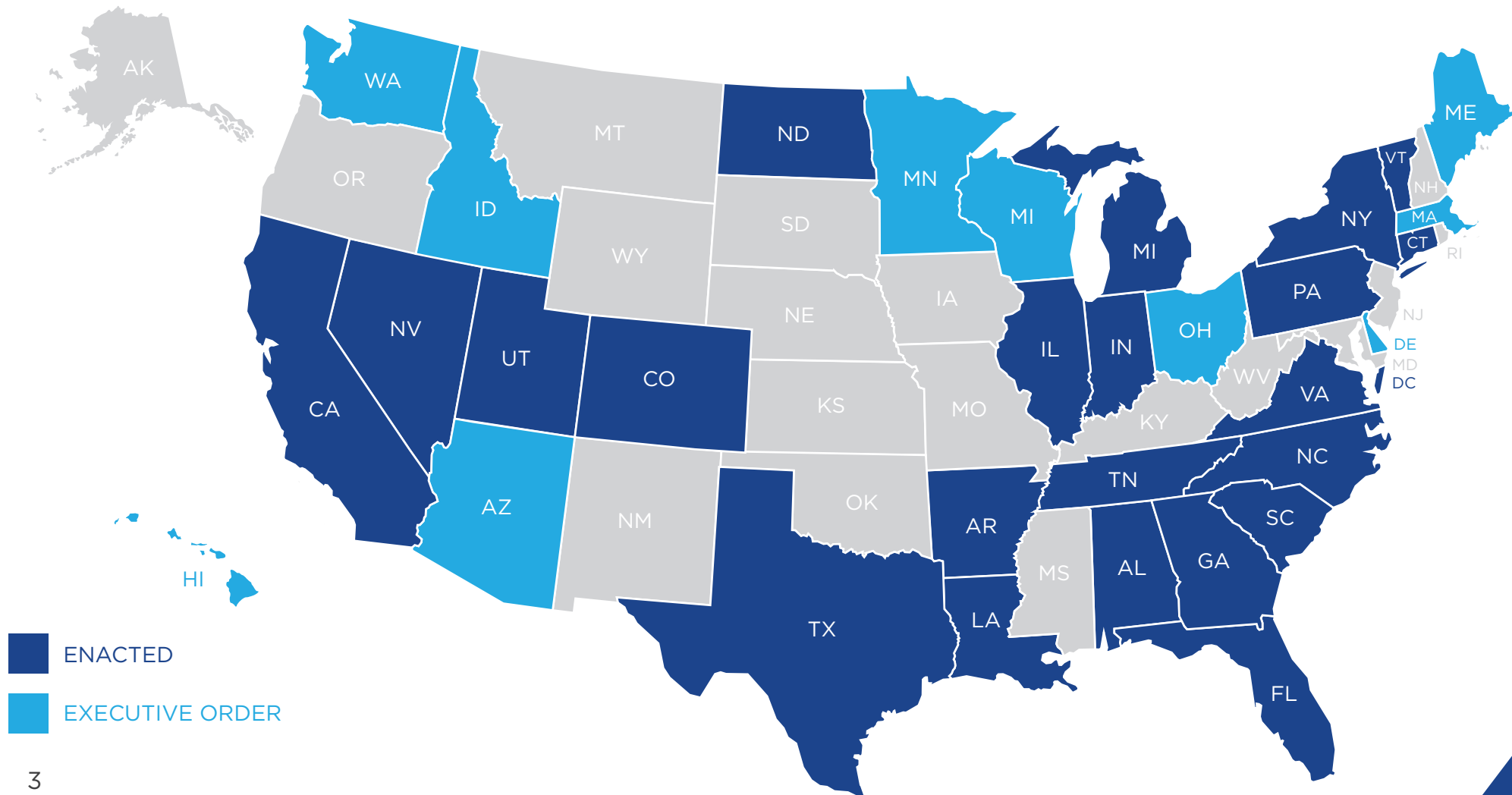
## NOT A NEW IDEA...



2025  
Autonomous  
vehicles



# STATES WITH ENACTED AUTONOMOUS VEHICLES LEGISLATION

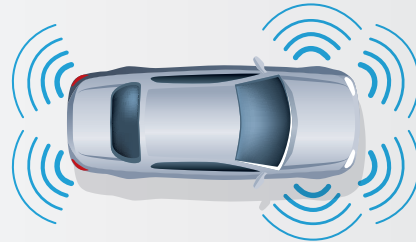




# CONNECTED VS. AUTONOMOUS VEHICLES

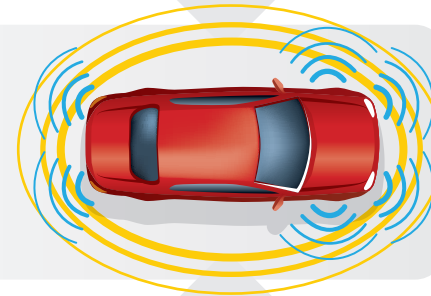
## AUTONOMOUS VEHICLE

Operates in isolation from other vehicles using internal sensors.



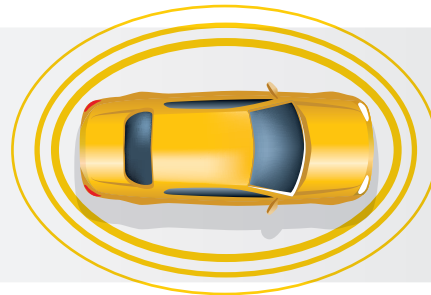
## CONNECTED AUTOMATED VEHICLE

Leverages autonomous and connected vehicle capabilities.

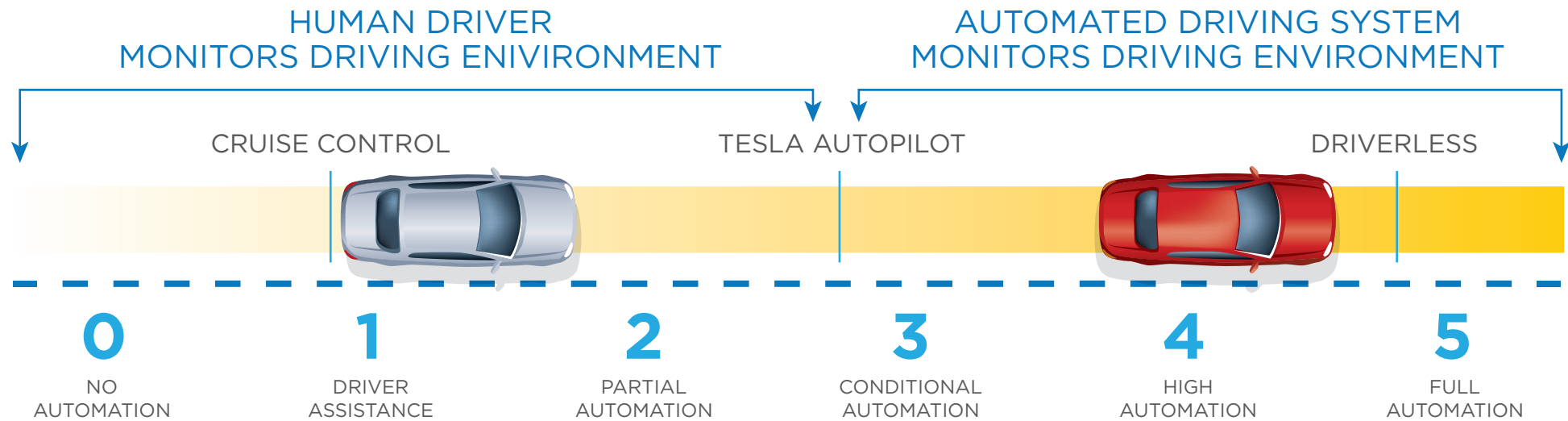


## CONNECTED VEHICLE

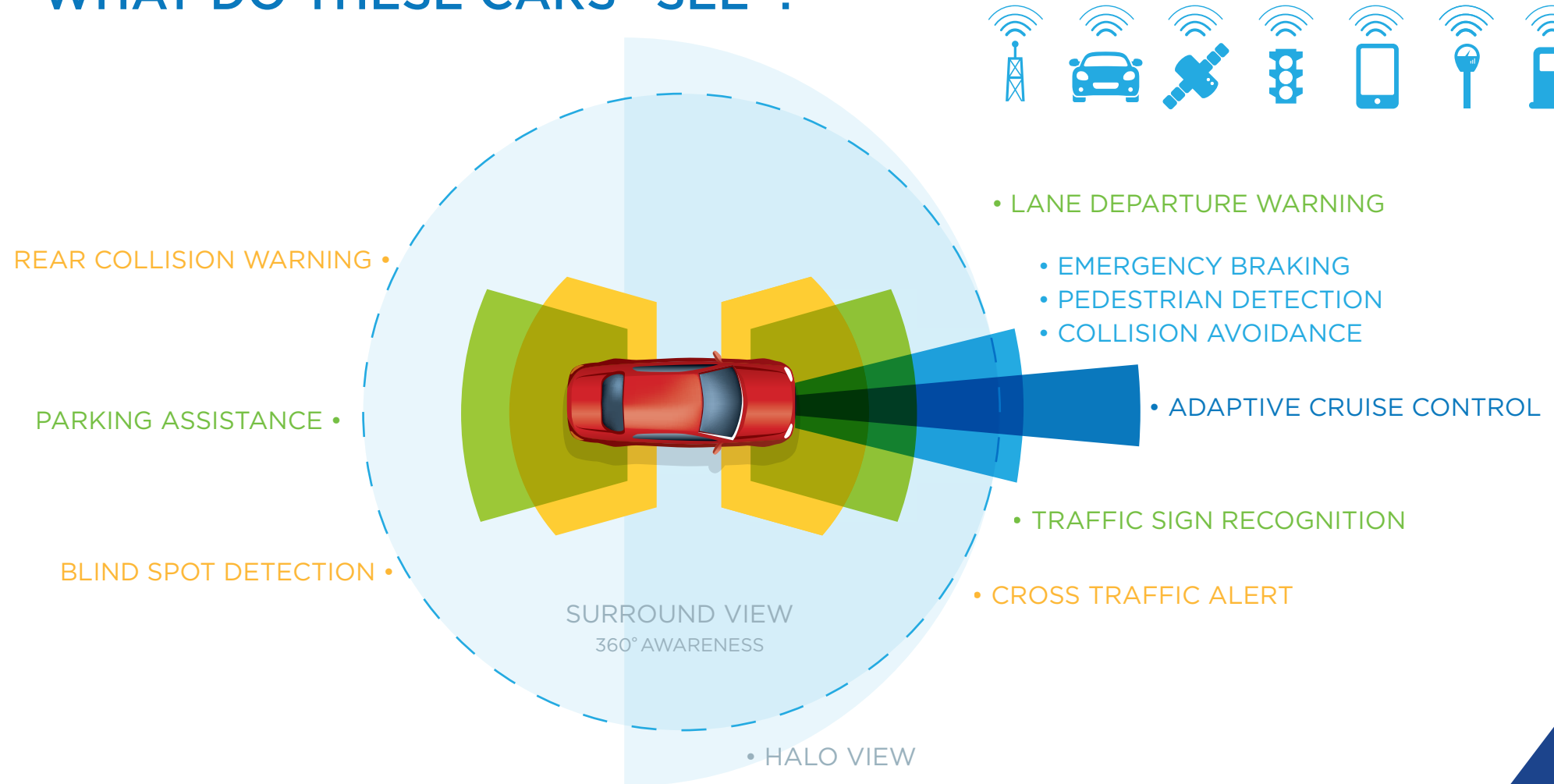
Communicates with nearby vehicles and infrastructure.



# LEVELS OF AUTOMATION FOR ON-ROAD VEHICLES

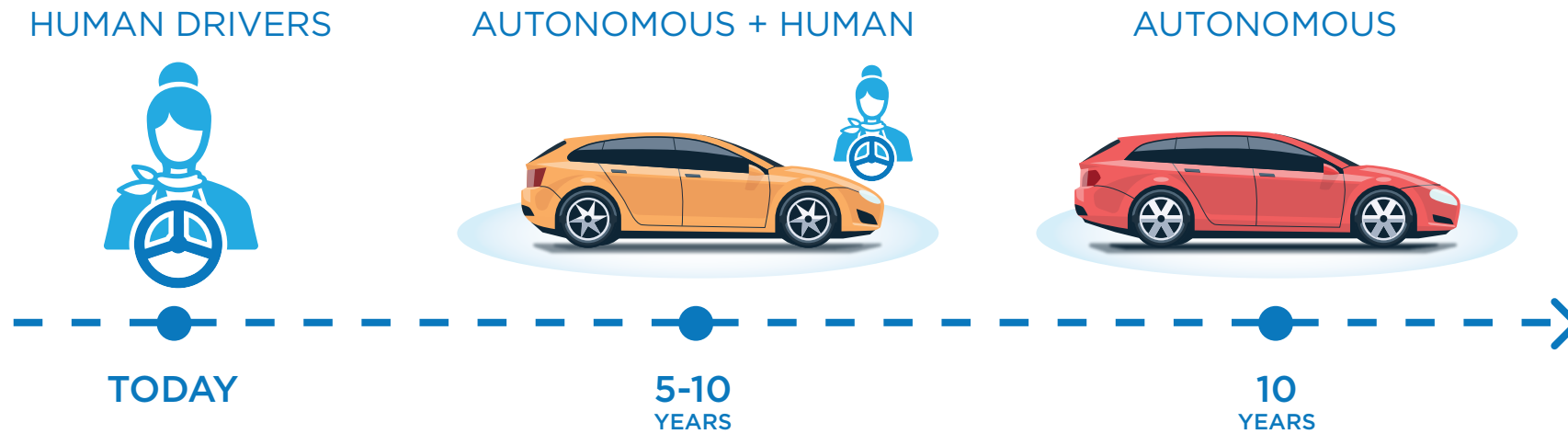


# WHAT DO THESE CARS “SEE”?





# POSSIBLE TIMELINE FOR TRANSITION









**DETOUR**



**NO  
THRU  
TRAFFIC**

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## RECENT NEWS

- Sunday 10pm, March 18, 2018 in Tempe, AZ
- Woman walking her bike across the street was struck and killed by an autonomous vehicle operated by Uber
- The driver was distracted, looking down from the road
- The pedestrian was not crossing at a crosswalk
- Regardless, the vehicle did not detect the pedestrian, despite being equipped with LiDAR

National Transportation Safety Board investigates the car involved in the crash

**Image credit:** Reuters





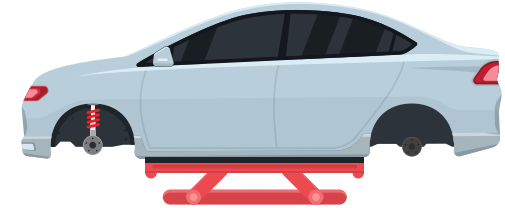
## AAA OKLAHOMA – AUTONOMOUS VEHICLE POLL (MARCH 27-28, 2018)



Even if available in their area, **75 percent** of respondents would not ride in an autonomous (driverless) vehicle



**59 percent** of respondents said safety and reliability of autonomous vehicles are their greatest concerns



**34 percent** believe the vehicle manufacturer is responsible for liability while riding in an autonomous vehicle

## CONNECTED & AUTONOMOUS VEHICLES (CAV) CONSIDERATIONS FOR . . .



PLANNERS



ENGINEERS



PUBLIC SAFETY OFFICIALS

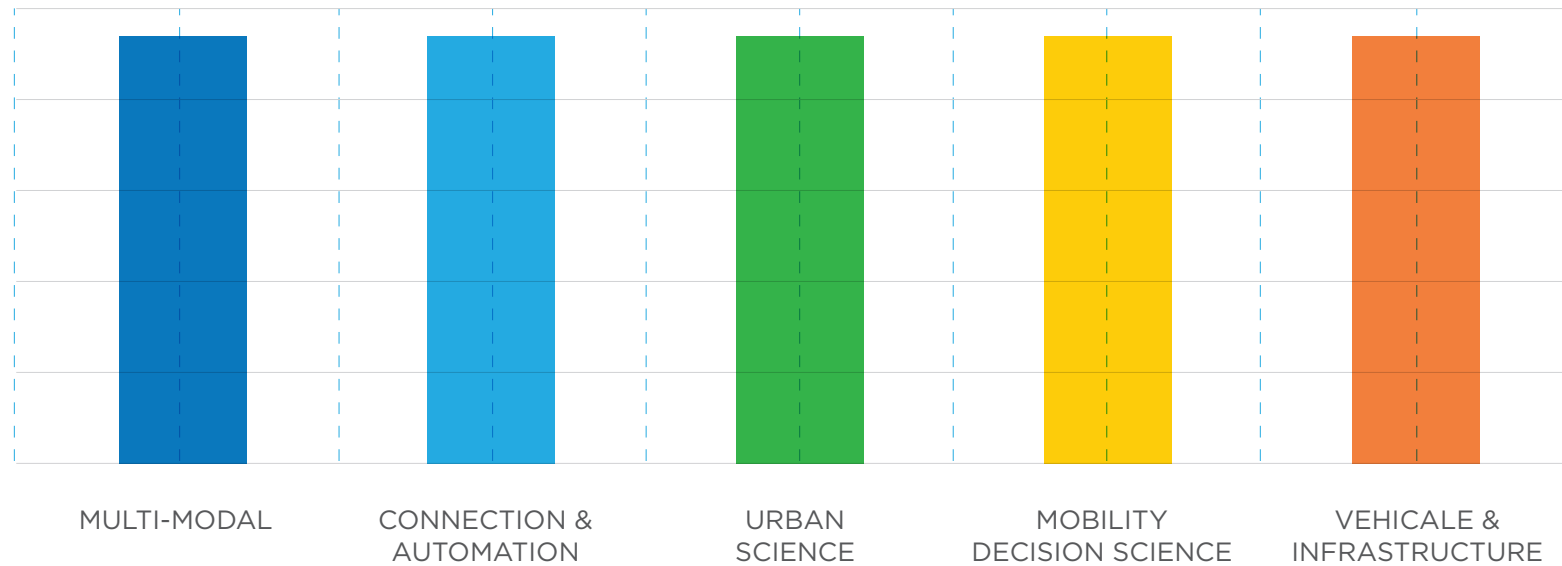
# US DOT AUTOMATED VEHICLE POLICY SAFETY ASSESSMENT CRITERIA

- Data Recording & Sharing
- Privacy
- System Safety
- Vehicle Cybersecurity
- Human Machine Interface
- Crashworthiness
- Consumer Education and Training
- Registration and Certification
- Post-Crash Behavior
- Federal, State and Local Laws
- Ethical Considerations
- Operational Design Domain
- Object and Event Detection and Response
- Fall Back (Minimal Risk Condition)
- Validation Methods

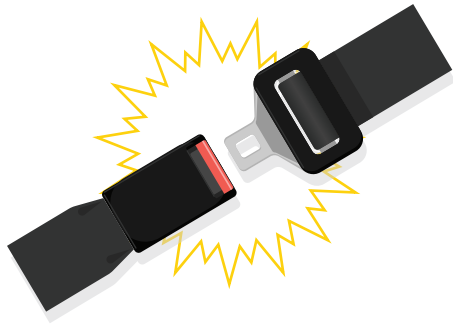


# U.S. DEPARTMENT OF ENERGY SMART MOBILITY SYSTEMS AND MODELING FOR ACCELERATED RESEARCH IN TRANSPORTATION CONSORTIUM

FIVE PILLARS OF PROPOSED DOE TRANSPORTATION-AS-A-SYSTEM FRAMEWOK



## SAFETY



SEATBELTS



DRUNK & IMPAIRED DRIVING

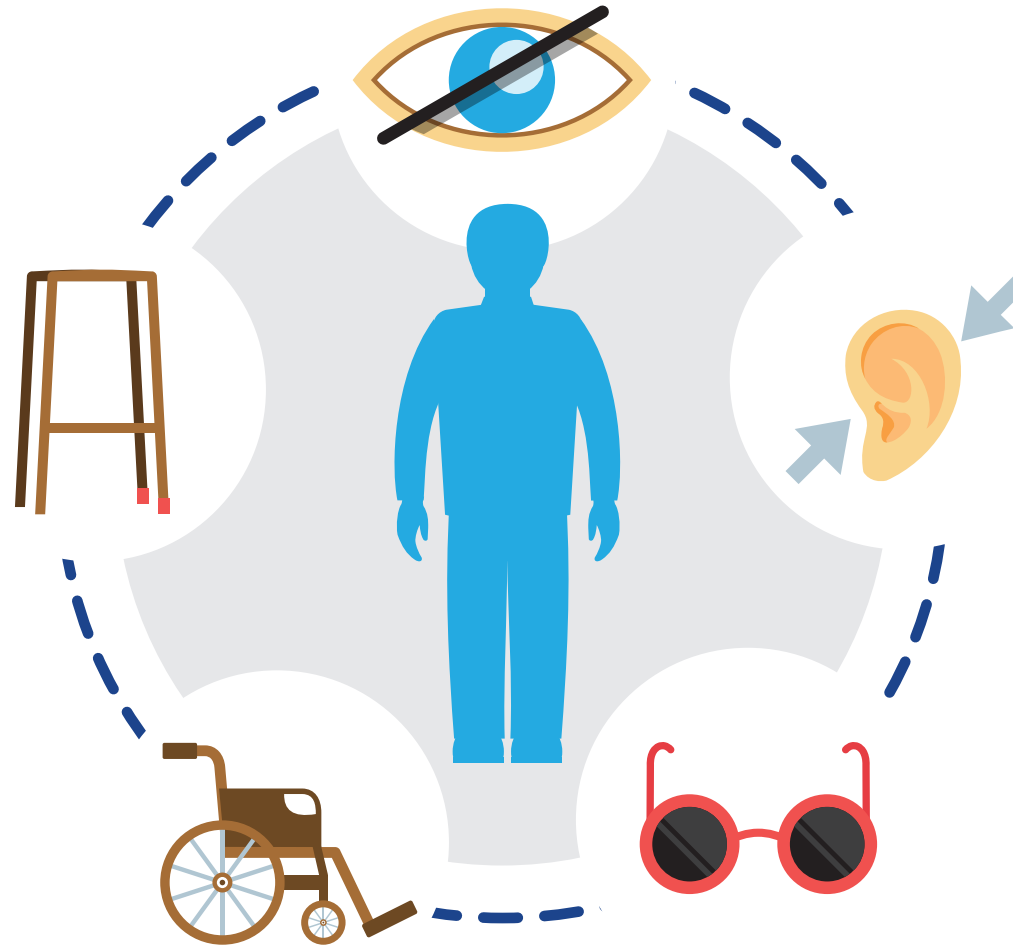


TEXTING WHILE DRIVING

- DISTRACTED DRIVING -

CAV's will ideally limit poor driving behaviors and improve transportation safety. CAV technologies could reduce dangers of distracted driving; some estimate 80 percent vehicle crash reduction by 2040.

## ACCESSIBILITY AND MOBILITY

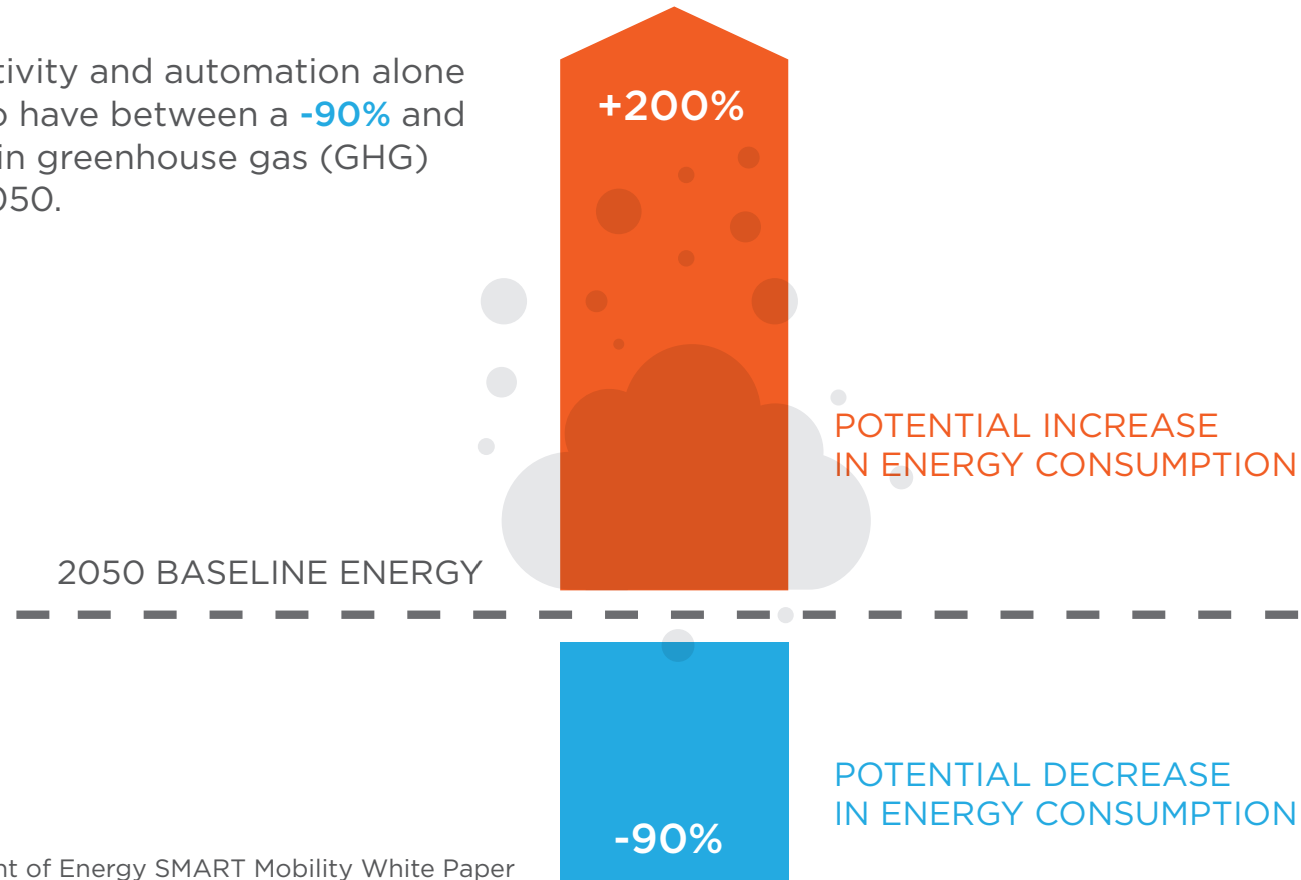


# CONGESTION MITIGATION



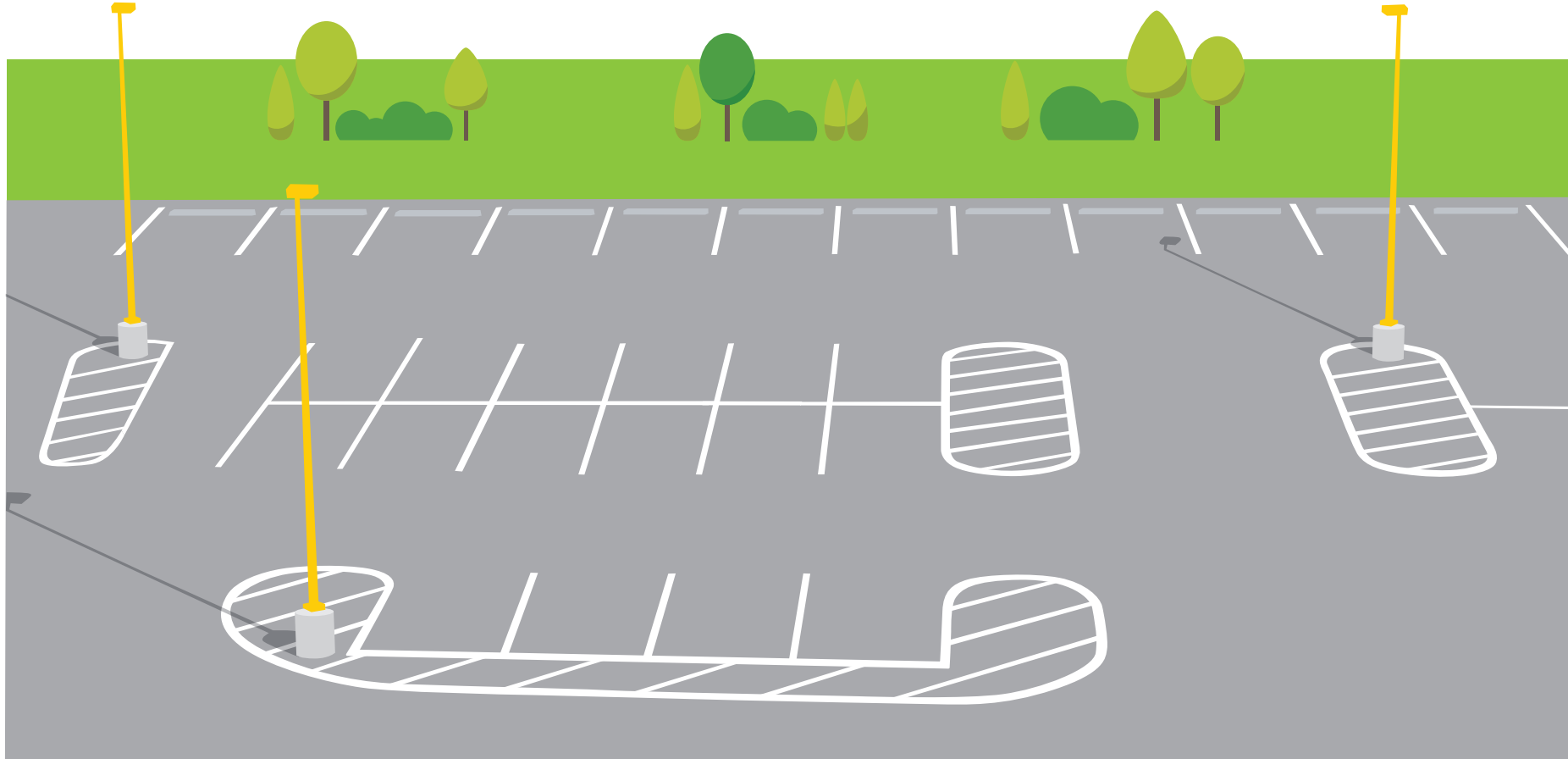
## AIR QUALITY IMPACT

Vehicle connectivity and automation alone are projected to have between a **-90%** and **+200%** impact in greenhouse gas (GHG) emissions by 2050.



Source: U.S. Department of Energy SMART Mobility White Paper

## URBAN DEVELOPMENT IMPLICATIONS





## DATA REVOLUTION IN TRANSPORTATION

- Smart streets create lower incidents of conflict by increasing traveler information
  - Notification of hazardous road condition
- Today's crash data tells us when and where crash occur
  - Better identification of causes of crashes
  - In the future, we will know more about what happened BEFORE the accident as well
- Accurate, real-time information to first responders
- Increased parental monitoring of teen drivers

# DATA REVOLUTION IN TRANSPORTATION

- Planning – roadside infrastructure improvements based on data from vehicles
  - Infrastructure and behavioral safety specialists will need to plan differently
  - CAVs could dramatically reduce need for safety infrastructure
  - Misplaced planning emphasis
- Security and Privacy

## ...BUT IT WON'T HAPPEN OVERNIGHT

- C/AVs will not take over America's roads overnight. Deployment will occur in four phases:
  - Existing Technology - Research & Development
  - Initial deployment - Likely Freight
  - Mixed fleet
  - High penetration rate

## NEXT STEPS FOR ACOG MEMBERS

- Reviewing U.S. DOT & FHWA guidance and resources
  - Strategy
  - Performance measurement and evaluation
  - Infrastructure investment
  - Planning products
  - Data collection, processing, and analysis
  - Education and Training
- Follow technology developments and pilot projects as they emerge
- Identify opportunities and barriers
- Collaborate to maximize efficient and effective implementation of CAV practices and policies

# CONNECTED & AUTONOMOUS VEHICLES

ASSOCIATION OF CENTRAL OKLAHOMA GOVERNMENTS

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