



Infrastructure for a Transformed Future



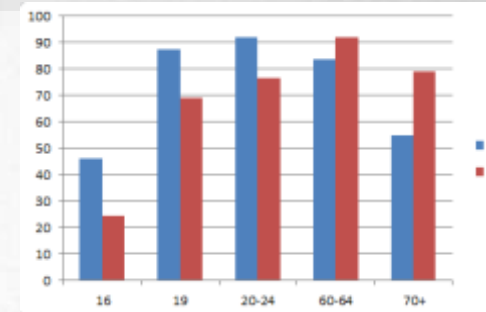
NCSL State Transportation
Leaders Symposium
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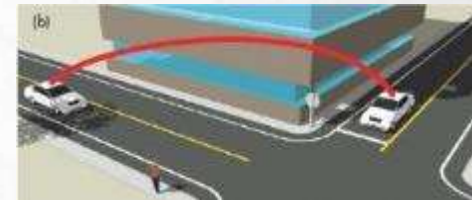
Six Trends Transforming Transportation

- **Demographic Shifts**
 - Aging Population
 - Millennial Attitudes toward Driving
- **Big Data**
 - Traditional Agency-Generated Data
 - Outside Data Sources – Aggregated Data
- **Mobility as a Service**
 - Ride Sharing
 - On-demand Vehicle Rental



Six Trends Transforming Transportation

- **Vehicle Propulsion**
 - Electrification / Wireless Charging
 - Hydrogen & Other Sources
- **Connected Vehicles**
 - Vehicle to Vehicle (V2V)
 - Vehicle to Infrastructure (V2I)
 - Vehicle to Other (V2X)
- **Automated Vehicles**
 - Partial Automation
 - Full Automation (Autonomy)



Connectivity vs Automation

- **Automated Vehicles**

- On-board sensors

- LiDar, Radar, Digital Photo Imagery

- What it can “see”

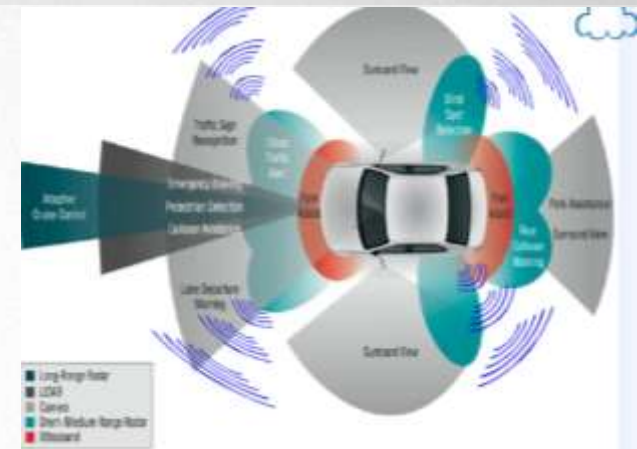
- **Connected Vehicles**

- External Communication

- 5.9GHz DSRC
- Cellular 4G / 5G

- What it can “learn”

- **Connected / Automated Vehicle – best of both worlds**



Infrastructure Needs - Electrification

- **Charging Infrastructure**

- Retail / Business Locations
- Residential – Suburban and Urban
- Inter-city Corridors
 - Solve range problem
 - Alleviate Range Anxiety

- **Corridor Designations**

- Utah EV Corridor
- Western States EV Corridors (7 Governors)

- **Wireless Charging**

- In-place and In-motion



Infrastructure Needs - Automation

- **Significant Infrastructure NOT required**

- Lane striping
- Improved / Consistent Signage
- Real-time Information on Lane Closures

- **Policy Issues**

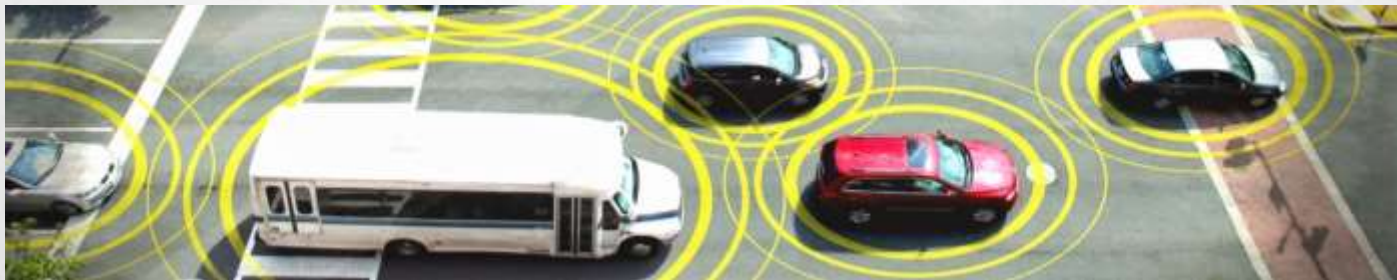
- Definitions of Automation
- Regulation of Testing
- Registration and Licensing
- Example: Platooning

- Only Possible with Connectivity and Automation



Infrastructure Needs - Connectivity

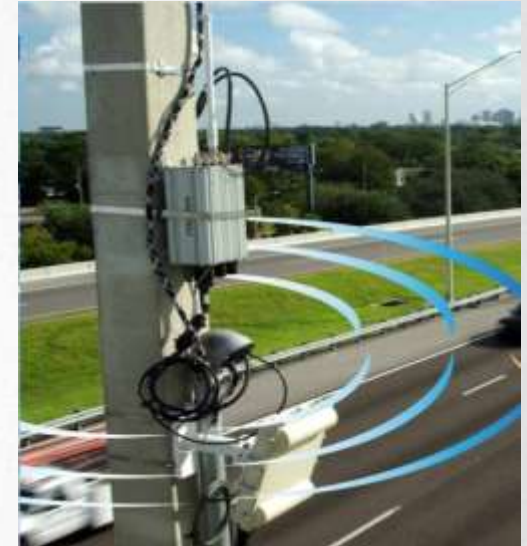
- **V2V Connectivity is ALL Vehicle-based**
 - DSRC Needed for Crash Avoidance Applications (Low Latency)
- **V2I Connectivity Needs Infrastructure**
 - Communication (Fiber Optics)
 - Advanced Traffic Signal Systems
 - DSRC Deployment



National SPaT Challenge

Challenge state and local public sector transportation Infrastructure Owners & Operators (IO&Os) to **deploy DSRC infrastructure with SPaT (signal phase and timing) broadcasts** in at least one coordinated corridor or network (approximately 20 signalized intersections) in each state by January 2020.

Begins the move toward Connected Vehicle Infrastructure deployment



AASHTO

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20 Intersections in 50 states by 2020!

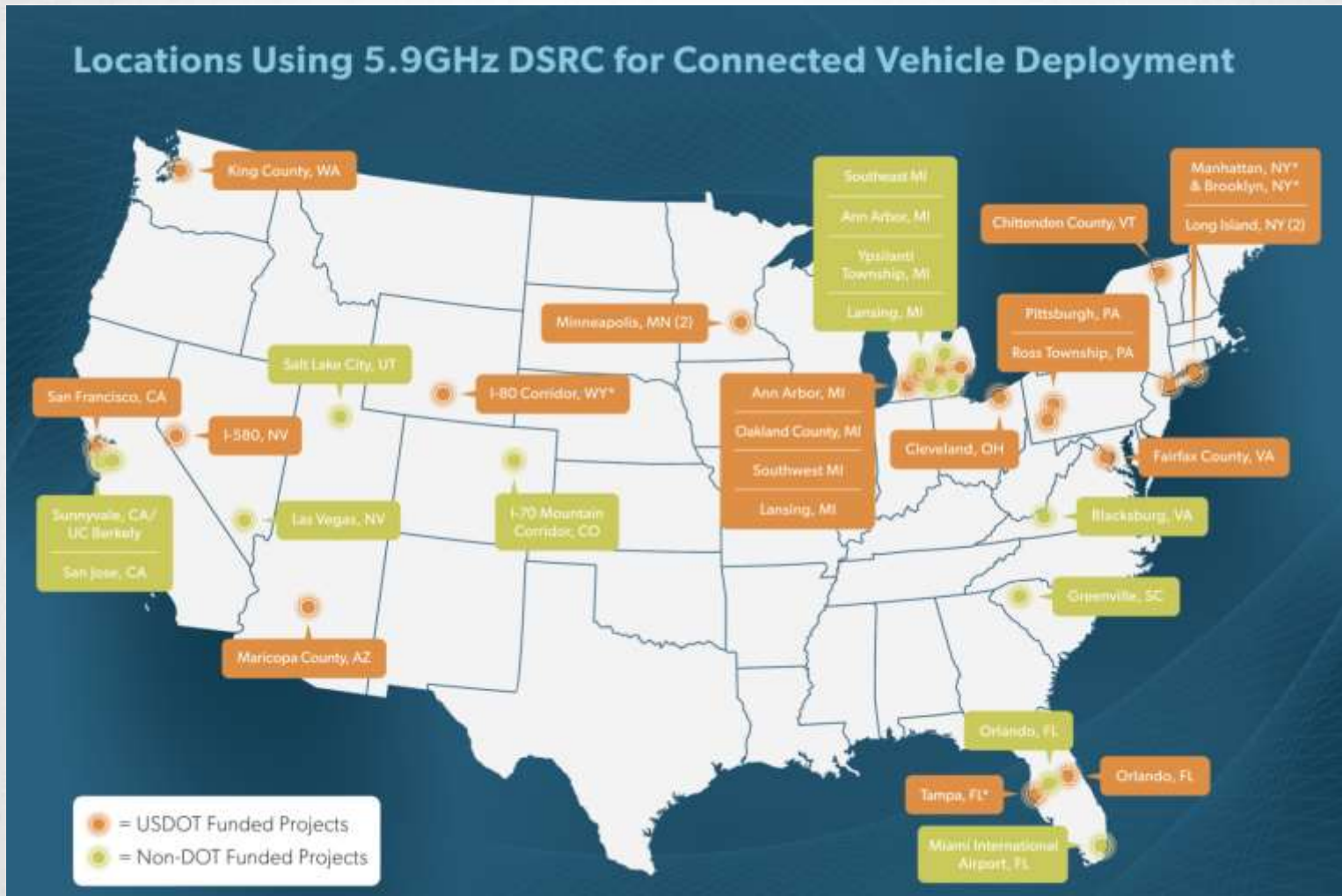
National SPaT Challenge



National Operations Center of Excellence (NOCoE)
www.transportationops.org/spatchallenge

DSRC Test Beds and Deployments

Locations Using 5.9GHz DSRC for Connected Vehicle Deployment



UDOT V2I Deployment

- Transit Signal Priority for Improved Schedule Reliability
 - UTA Bus Route 217 (Redwood Road)
 - Goal: increase from 86% to 94%
 - Minimal impact to other traffic
- Full DSRC Corridor
 - Future testing / deployment
 - Prepare for equipped vehicles
- Meet the SPaT Challenge



Questions / Discussion

