U.S. DOT Automation Program

Kevin Dopart
ITS Joint Program Office, OST-R
U.S. Department of Transportation
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Automation within DOT

CONTEXT
Context: ITS Joint Program Office

The ITS JPO has Department-wide authority in coordinating the ITS program and initiatives among the following DOT Offices:

- Federal Highway Administration (FHWA)
- Federal Motor Carrier Safety Administration (FMCSA)
- Federal Transit Administration (FTA)
- Federal Railroad Administration (FRA)
- National Highway Traffic Safety Administration (NHTSA)
- Maritime Administration (MARAD).
Context: ITS Strategic Plan Framework

- **Performance Management**
- **Technology Tracking**

**Two Program Priorities**
- Realizing Connected Vehicle Implementation and Advancing Automation

**Five Strategic Themes**

**Six Program Categories**

- **Research**
  - Goals
- **Development**
  - Goals
- **Adoption**
  - Goals
Trends: How We Move ...

**Population Increase**
2015: 320 million people
2045: 390 million people

In 30 years our population is expected to grow by about 70 million... that's more than the current populations of NY + TX + FL

**Older Americans — Redefining Longevity**
By 2045, the number of Americans over age 65 will increase by 77%.

About one-third of people over 65 have a disability that limits mobility. Their access to critical services will be more important than ever.

**Millennials — Shaped by Technology**
There are 73 million Millennials aged 18 to 34. They are the first to have access to the internet during their formative years and will be an important engine of our future economy.

Millennials are driving less. By the end of the 2000s, they drove over 20% fewer miles than at the start of the decade.

**Income Inequality**
10% of the population takes home one-third of our national income.

Transportation is the second-largest expense for U.S. households.

**Megaregions and Shifts in Population Centers**
11 megaregions are linked by transportation, economics, and other factors.

They represent over 75% of our population and employment.

In 2014, 365,000 people moved to the South—up 25% from 2013—and moves to the West doubled.
Context: Automation in Beyond Traffic

Automation will have a potentially transformative impact across all transportation modes, increasing productivity, improving safety, and enhancing the capacity of existing infrastructure. It may also have a profound impact on the transportation workforce, changing the skills required to manage, operate, and maintain transportation vehicles and systems.
Foundation

CONNECTED AUTOMATION
Automation Can Be a Tool for Solving Transportation Problems

- Improving safety
  - Reduce and mitigate crashes

- Increasing mobility and accessibility
  - Expand capacity of roadway infrastructure
  - Enhance traffic flow dynamics
  - More personal mobility options for disabled and aging population

- Reducing energy use and emissions
  - Aerodynamic “drafting”
  - Improve traffic flow dynamics

…but connectivity is critical to achieving the greatest benefits
Connected Automation for Greatest Benefits

Autonomous Vehicle
Operates in isolation from other vehicles using internal sensors

Connected Vehicle
Communicates with nearby vehicles and infrastructure

Connected Automated Vehicle
Leverages autonomous and connected vehicle capabilities
Connected Vehicle Milestones

- August 2014: NHTSA ANPRM on vehicle-to-vehicle communications
- May 2015: Secretary Foxx V2V announces V2V rulemaking acceleration
- Summer 2015: FHWA V2I guidance document
- Fall 2015: First wave of CV Pilots to begin
- End of 2015: V2V NPRM interagency review
- New cars with connected vehicle technology are expected to be available by 2017.
Connected Vehicle Pilot Deployment Program

CV Pilot Program Goals

- Spur Early CV Tech Deployment
- Measure Deployment Benefits
- Resolve Deployment Issues

Proposed Program Schedule

- September 2015 - Wave 1 Pilot Deployments Award(s)
- Early 2017 - Solicitation for Wave 2 Pilot Deployment Concepts
- September 2017 - Wave 2 Pilot Deployments Award(s)
- September 2020 - Pilot Deployments Complete

Resources

- ITS JPO Website: http://www.its.dot.gov/
- CV Pilots Program Website: http://www.its.dot.gov/pilots
2015 FHWA Guidance Will Help Communities Prepare for Connected Vehicles

- The FHWA is developing policy positions, guidance, guidelines, whitepapers, and practitioner tools to promote the smooth deployment of V2I technology by transportation system owners/operators.

- The FHWA will issue initial guidance in late 2015. This initial guidance is intended to assist in planning for future investments and deployment of V2I systems.

- The guidance does not impose any new requirements on local governments.

- This work will be harmonized with related efforts by other USDOT modal agencies.

- Subsequent guidance updates will also incorporate ITS research findings.
5.9 GHz Spectrum Sharing

• **Federal Communication Commission (FCC) Notice of Proposed Rulemaking:** The FCC is seeking to open up additional spectrum for unlicensed Wi-Fi devices within the 5.9 GHz band, which serves as the platform for connected vehicle technology.

• **5.9 GHz Spectrum:** The connected vehicle environment that is being researched is based on reliable access to the 5.9 GHz wireless spectrum.

• **Spectrum Sharing:** Any changes to the 5.9 GHz spectrum may jeopardize crash avoidance capabilities.
Overview

U.S. DOT AUTOMATION PROGRAM
U.S. DOT Automation Program

**Goal:** Enable safe, efficient, and equitable integration of automation into the transportation system

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<th>Area</th>
<th>Example Applications</th>
<th>Research Emphasis</th>
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<tr>
<td><strong>Connected Driving Assistance</strong></td>
<td>Platooning, merge/weave assist, speed harmonization, and eco-approach and departure</td>
<td>Benefits (safety, mobility, sustainability) and Application Development</td>
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<td><strong>Level 1-2</strong></td>
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<tr>
<td><strong>Conditional Automation</strong></td>
<td>Highway autopilot, traffic jam assist, etc.</td>
<td>Safety Assurance (human factors, control system reliability, testing procedures, and cybersecurity)</td>
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<td><strong>Level 2-3</strong></td>
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<td><strong>Limited Driverless Vehicle Operations</strong></td>
<td>Low-speed automated shuttles, first-last mile transportation</td>
<td>Feasibility (concept development, testing, evaluation)</td>
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<td><strong>Level 4</strong></td>
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## Research Tracks

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<td>CACC, Speed Harmonization, and Platooning</td>
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<td>Lateral Control</td>
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<td>First/Last Mile and Transit Operations</td>
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<td>Transportation Planning</td>
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Stakeholder Engagement

- Automated Vehicle Symposium
  - Proud supporter (2012-present)
  - USDOT Listening Session - Thursday 1:30-3:00 PM
- Roundtable Discussions
  - Early Adopter States
- Webinars
  - ITS JPO and ITS America Webinar: Fundamental Issues for Road Transport Automation
  - ITS PCB Talking Transportation and Technology (T3) Webinar Series
    - [https://www.pcb.its.dot.gov/t3_webinars.aspx](https://www.pcb.its.dot.gov/t3_webinars.aspx)
- NCHRP 20-102
- Coordination with associations (e.g. AASHTO, AAMVA)
- Inviting external research briefings into DOT
- ….and more to come!
International Coordination

- Trilateral Working Group on Automation in Road Transportation
  - European Union
  - Japan
  - United States
- Complementary EU-US Research Programming on selected issues of shared interest.
For More Information

www.its.dot.gov

Kevin Dopart
US DOT / ITS JPO
Kevin.Dopart@dot.gov