



U.S. DOT Automation Program

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U.S. Department of Transportation
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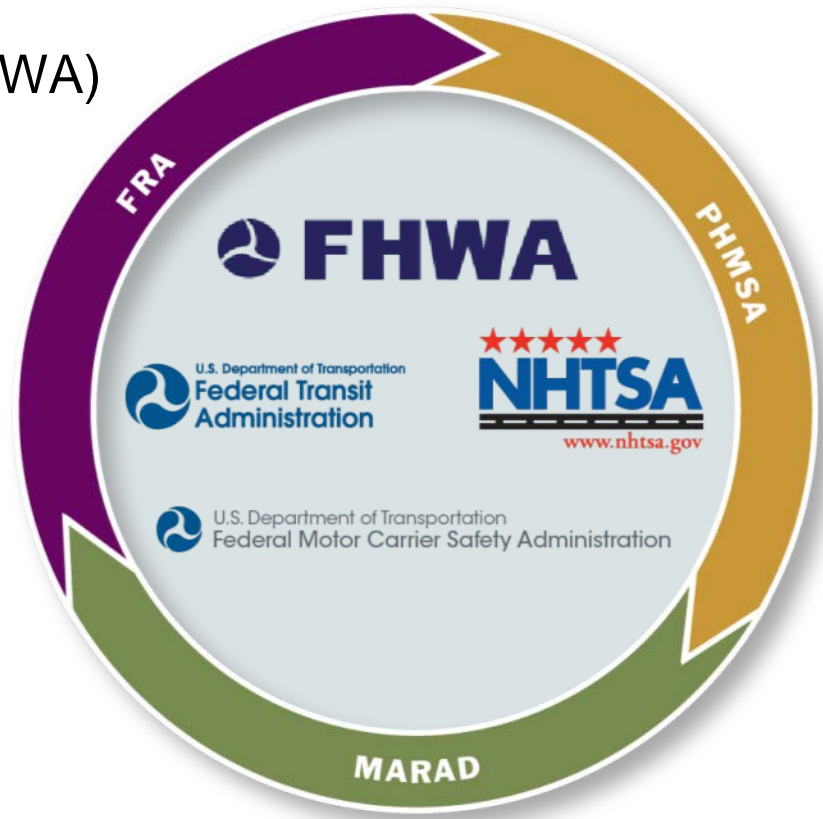
Automation within DOT

CONTEXT

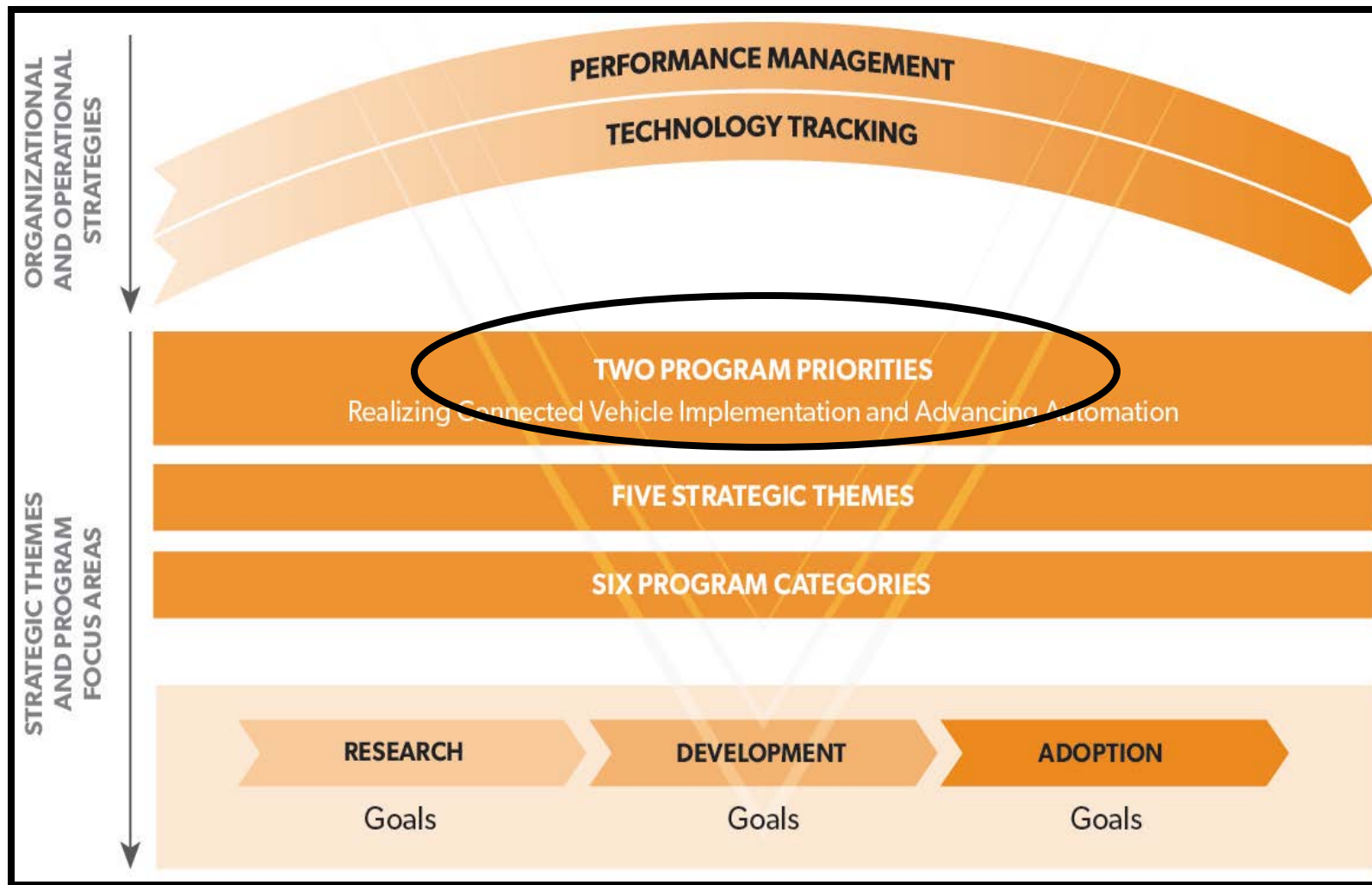
Context: ITS Joint Program Office

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





Beyond Traffic

2045

TRENDS AND CHOICES



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



Bumper-to-Bumper

On average, we spend

over 40 hours



stuck in traffic each year

The annual financial cost of congestion is

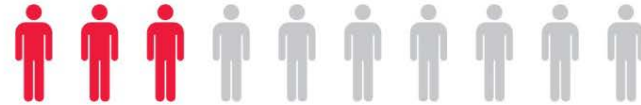
\$121 billion



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.

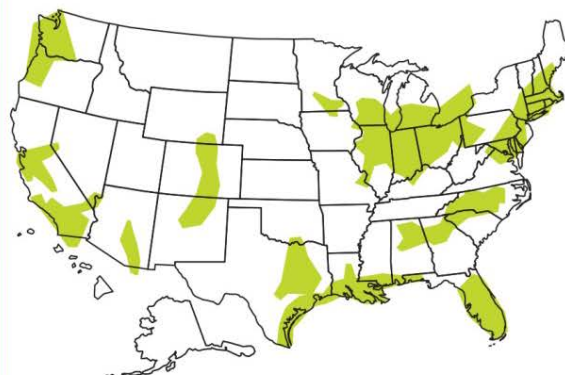
Millennials are driving less. By the end of the 2000s, they drove over **20% fewer miles** than at the start of the decade.



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.



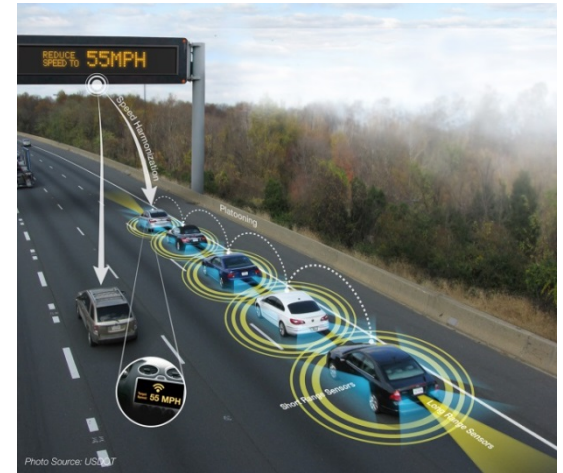


Foundation

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



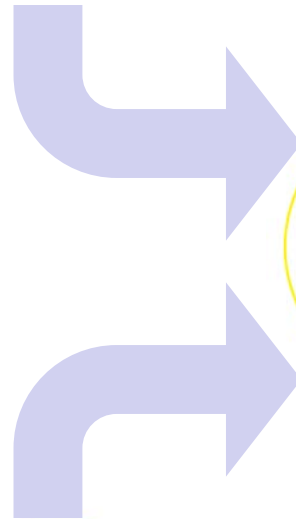
...but connectivity is critical to achieving the greatest benefits



Connected Automation for Greatest Benefits

Autonomous Vehicle

Operates in isolation from other vehicles using internal sensors



Connected Automated Vehicle

Leverages autonomous and connected vehicle capabilities

Connected Vehicle

Communicates with nearby vehicles and infrastructure



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



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.

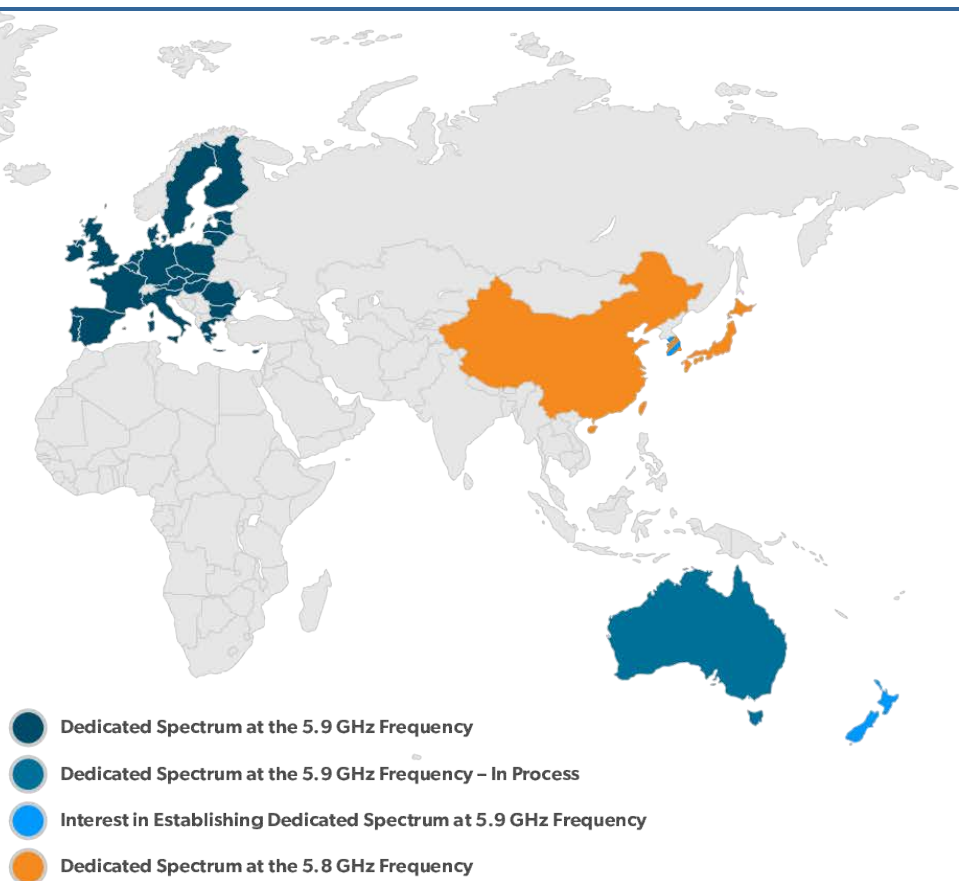


Help develop the FHWA's
2015 Guidance for
Connected Vehicles.
Add your comment.



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

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



Research Tracks

Enabling Technologies			
Digital Infrastructure	Communications	Technology Research	

Safety Assurance			
Electronic Control Systems	Functional Safety and Electronics Reliability	Cybersecurity	Human Factors

Transportation System Performance			
CACC, Speed Harmonization, and Platooning	Lateral Control	First/Last Mile and Transit Operations	

Testing and Evaluation			
Interoperability	Testing Methods	Benefits Assessment	

Policy and Planning			
Standards	Federal Policy Analysis	Stakeholder Engagement	Transportation Planning



Stakeholder Engagement

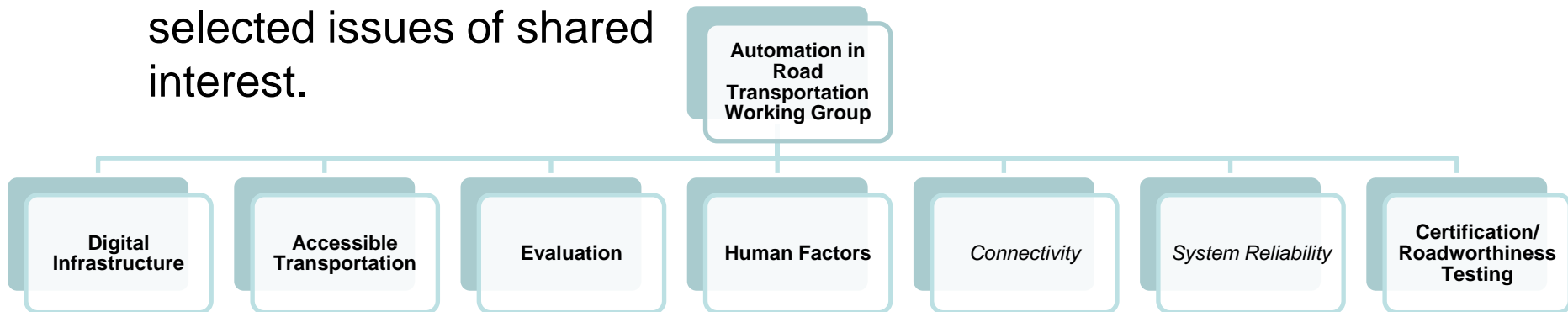
- Automated Vehicle Symposium
 - ◻ Proud supporter (2012-present)
 - ◻ USDOT Listening Session - Thursday 1:30-3:00 PM
- Roundtable Discussions
 - ◻ Early Adopter States
- Webinars
 - ◻ ITS JPO and ITS America Webinar: Fundamental Issues for Road Transport Automation
 - ◻ ITS PCB Talking Transportation and Technology (T3) Webinar Series
 - ◻ https://www.pcb.its.dot.gov/t3_webinars.aspx
- 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.

EU★US★JAPAN
ITS COOPERATION





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Planning for the Future of ITS
The U.S. Department of Transportation's plans for the future of ITS Research are available now!
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Connected Vehicle TEST BED

CV Pilots Deployment Project

ITS & YOU
S. WELL
10. HWY. 427
TRAVEL TIME 12 MIN

Current Research

- + Safety
- + Mobility
- + Environment
- + Road Weather
- + Policy
- + Connected Vehicle Technology
- + Short-Term, Intermodal Research
- + Exploratory
- + ITS Cross-Cutting Support
- + Success Stories

All Research >>

Spotlight

December 10, 2014
The U.S. Department of Transportation Plans for the Future of Intelligent Transportation Systems (ITS) ...
Read more

December 10, 2014
The Connected Vehicle Reference Implementation Architecture (CVRIA) Training Course Is Now Available ...
Read more

August 12, 2014
The USDOT Connected Vehicles Pilot Deployment Program Webinar Series Part 1: Concept, Phases, Waves, and Partnerships with Kate Hartman ...
Read more

More News >>

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www.its.dot.gov

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