U.S. DOT Automation Program

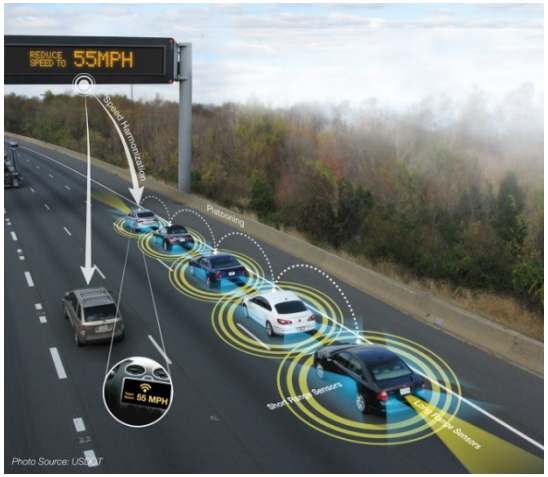
TRB Session 412

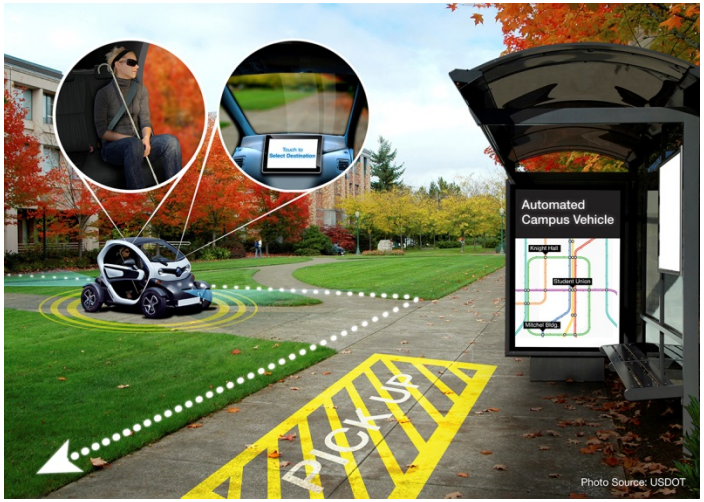
Kevin Dopart
ITS Joint Program Office, OST-R
U.S. Department of Transportation
January 12, 2015

Automation in Transportation

Looking Ahead

- Full automation has the potential to revolutionize the transportation system but requires careful study
- Partial automation will likely provide significant transportation system benefits
- Connectivity is critical to safe and efficient operations





Potential Automation Impacts

- Positive Impacts
  - Crash avoidance
  - Reduced congestion
  - Reduced energy consumption and vehicle emissions
  - Improved travel time reliability and multi-modal connectivity
  - Improved personal mobility for the disabled and aging population

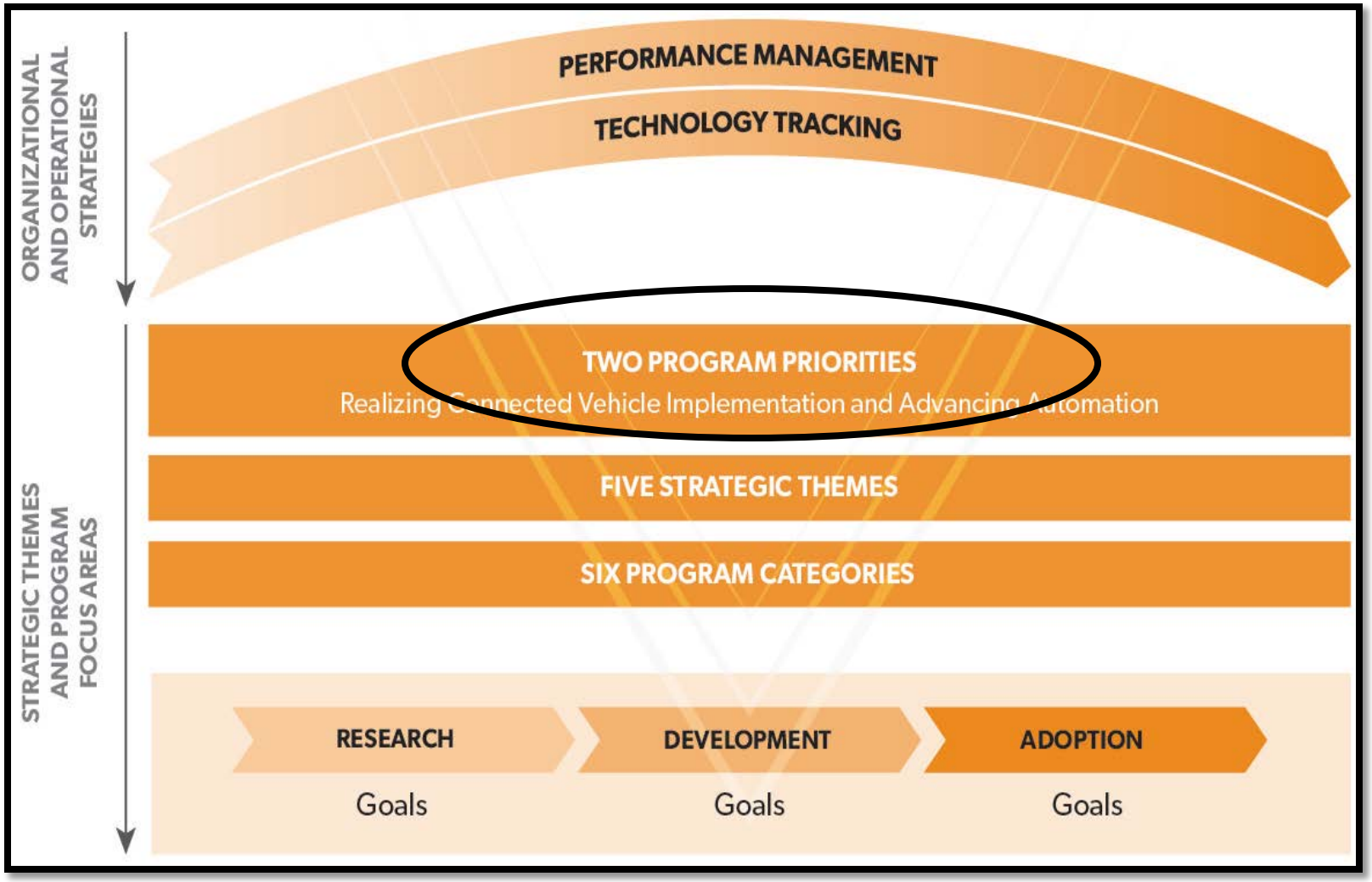
- Uncertain Impacts
  - Network effects
  - Distribution of benefits
  - VMT changes
  - Land use patterns
  - New crash scenarios
  - Vehicle ownership models

Challenges for Automation

- Technical Challenges
  - Transfer of control between driver and vehicle
  - Safe reliability
  - Cybersecurity
  - Testing and certification of automated vehicles
  - Mixed modal operations

- Policy Challenges
  - Harmonized state regulatory frameworks
  - Data ownership and privacy
  - Evaluation of societal and operational impact
  - Standards and interoperability
  - Digital infrastructure

ITS Strategic Plan's Framework



Program Goal

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

Objectives

1. Facilitate development and deployment of connected automated transportation systems that enhance safety, mobility, and sustainability
2. Assess implications of emerging enabling technologies
3. Research transportation system-level operational impacts of automation applications
4. Assess the need for new vehicle performance guidelines and requirements
5. Develop stakeholder guidance for automated vehicle operations
6. Develop appropriate testing methods and objective test procedures
7. Estimate the potential safety, mobility, energy, and environmental benefits of automation technologies
8. Identify and address policy, institutional, and regulatory challenges to safe automated vehicle operations

Research Tracks

Enabling Technologies		
Digital Infrastructure	Communications	Technology Research

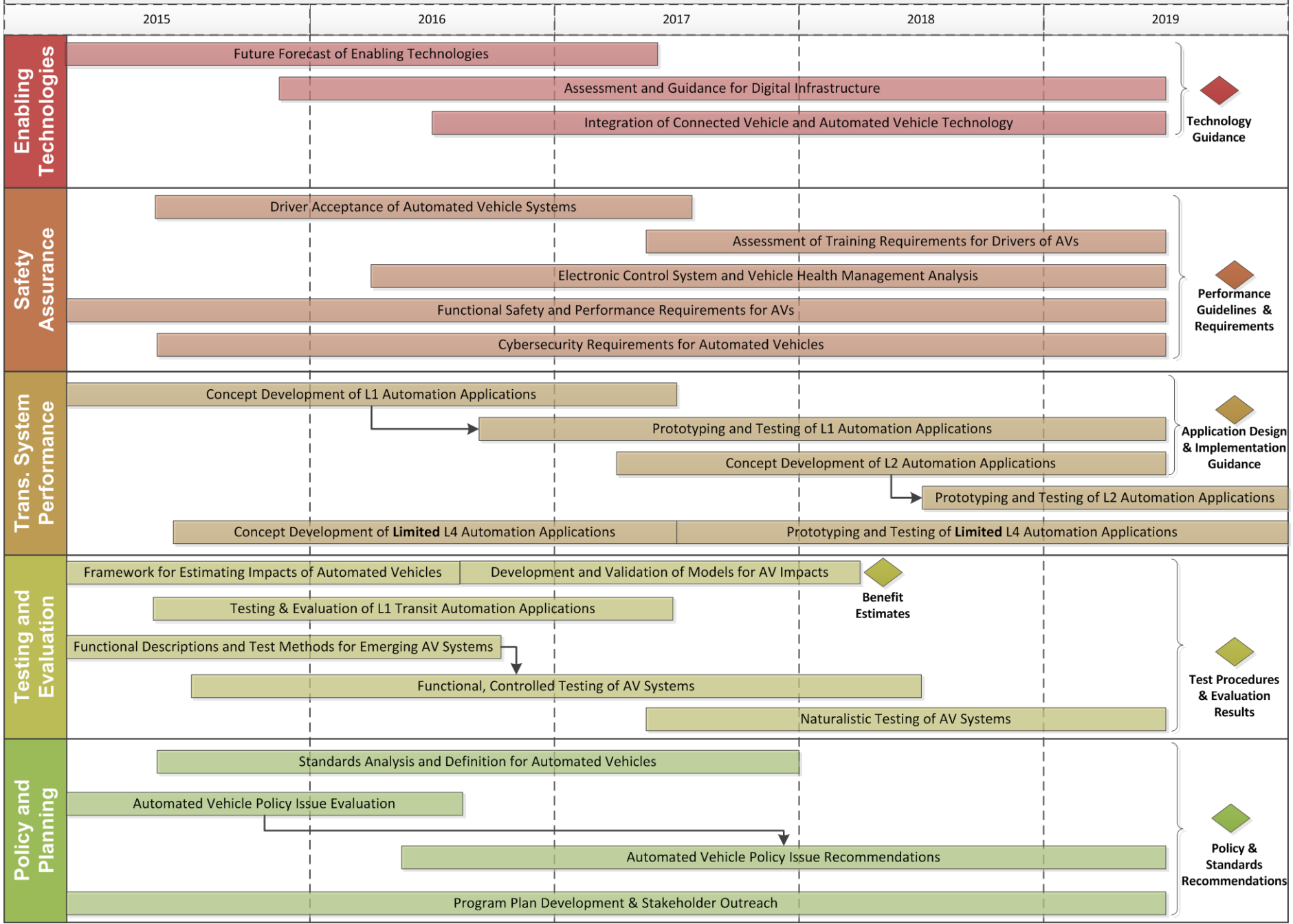
Safety Assurance			
Electronic Control Systems	Software Assurance and Reliability	Cybersecurity	Human Factors

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

U.S. DOT Automation Program Roadmap



New U.S. DOT Automation Research Projects

ITS JPO
Development and Validation of AV Benefits Model
Standards Planning for Automation
AV Policy Issue Evaluation
Stakeholder Engagement

FTA
Advanced Automated Vehicle Guidance and Precision Docking Technologies Evaluation

FTA/FHWA
First Mile / Last Mile Mobility – Concept Development

NHTSA
Functional Testing of AV Systems
Extension of Cybersecurity Guidelines to AV
Driver Acceptance Assessment of Level 2 AV

FHWA
Assessment of Digital Infrastructure for Automation
Cooperative Adaptive Cruise Control – Enabling Research
Automated Speed Harmonization – Testing and Evaluation
Driver Acceptance of Automation Applications

For More Information

www.its.dot.gov

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