Mobility on Demand

Robert Sheehan, P.E., PTOE
Program Manager Multimodal Research
Intelligent Transportation Systems Joint Program Office
US Department of Transportation

What is Mobility on Demand (MOD)?

- Long term strategic vision for a multimodal, integrated and connected transportation network system.
- A concept which imagines mobility as a commodity and a service.
- Conceptual Notions of MOD:
  - Promotes choice in personal mobility
  - Promotes Intelligent Transportation Systems
  - Advances connected vehicles
  - Advances vehicle automation
  - Leverages emerging technologies
  - Leverages data exchange
  - Encourages multimodal connectivity
  - Encourages system interoperability

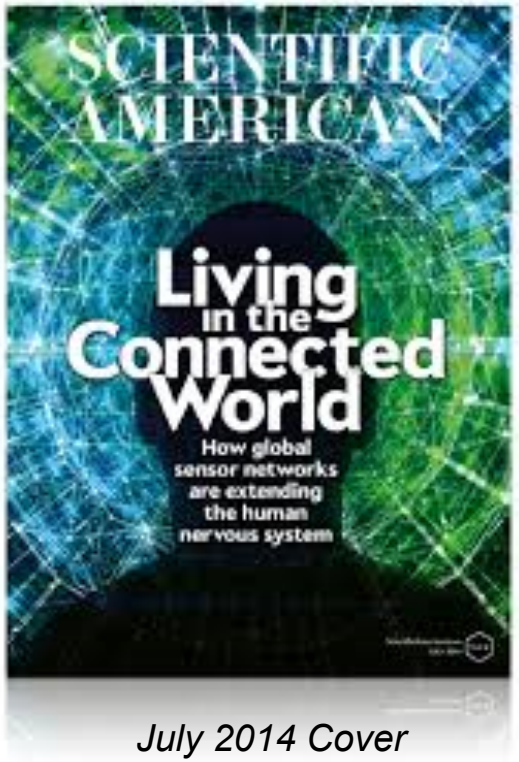
A New ~~Transit~~ Intermodal Mobility Concept

What's Driving MOD?

- **Aging Americans <u>Require</u> Mobility Choice**
  - Aging Americans on the rise
  - From 2005 to 2020 there will be 30 million additional people age 60 or older
  - "Aging in place" requires unique mobility options
- **Millennial Americans <u>Want</u> Mobility Choice**
  - Public transportation utilization is on the rise
  - Younger generations want both convenience and cost savings
  - 66% of Millennials consider transportation alongside housing decisions
- **All Travelers <u>Need</u> Mobility Choice**
  - Wounded Warriors
  - Travelers with disabilities
  - Low income individuals & Minors

Technologies Enabling MOD

- Technology serves and enables mobility
  - "Big Data" and New Analytics
  - Smart Cities and the "Internet of Things"
  - Connected Vehicles
  - Automation and Automated Vehicles
  - Social media
  - Smartphone technology and new payment apps



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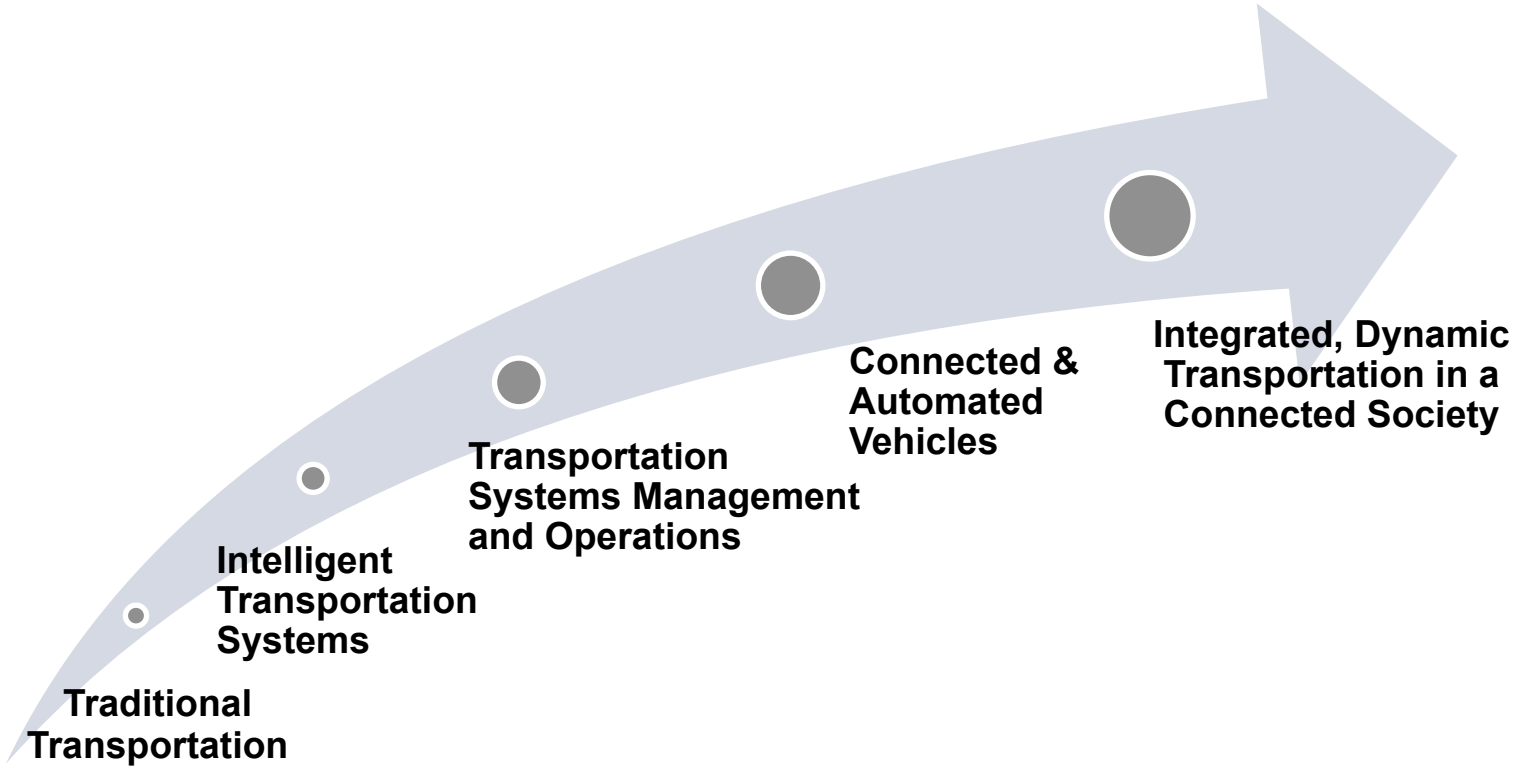
Conditions Encouraging MOD

- Conditions setting stage for disruptive change
  - Declining car ownership (RideScout, Uber)
  - Shared economy model is growing (Lyft, RelayRides)
  - Peer to peer transactions (airbnb, Peerby)
  - Increased urbanization and changing demographics
  - Preference growing for alternative transportation

Guiding Principles

- **Traveler Centric/Consumer Driven**
  - MOD is defined by performance
  - Quality and Carefree personal mobility choice for individuals.
- **Data Connected/Platform Independent**
  - MOD (the end state) drives the technology.
  - Technology doesn't change the MOD vision, it provides the capability to realize in an interoperable fashion.
- **Mode Agnostic/Multimodal**
  - MOD embraces all modes and resources to support personal mobility choice in an integrated, connected and multimodal manner.

JPO Research Has and Will Follow a Logical Progression Enabling Better Integrated and Effective Transportation

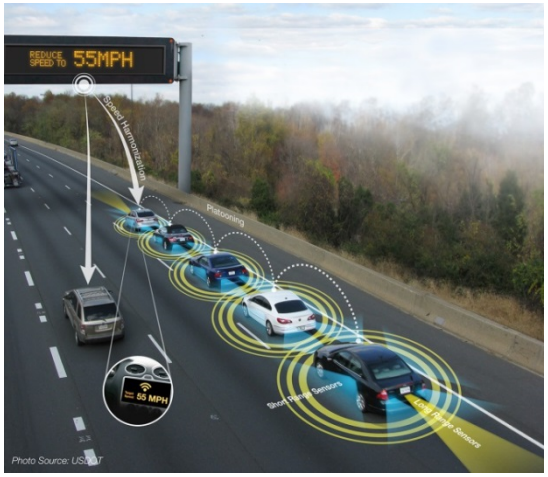


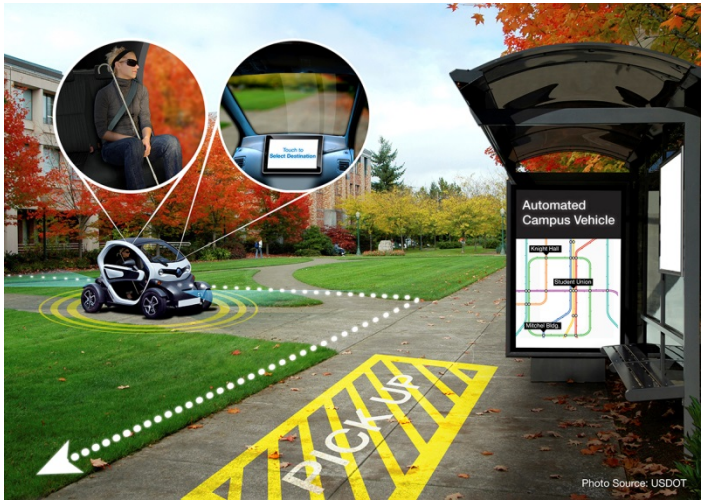
Low → High

Focus on customer
Volume & diversity of data
Diversity of operational objectives
Coordination among modes, jurisdictions and sectors
Speed and complexity of decision-making
Private sector provision of mobility services

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
- <u>Connectivity is critical to safe and efficient operations</u>





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

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

For More Information

www.its.dot.gov

Robert Sheehan
US DOT / ITS JPO
Robert.Sheehan@dot.gov

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