# (One) Federal Perspective on the ITS Workforce

2016 ITS UNIVERSITY WORKSHOP

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# Increasingly Complex and Intertwined Transportation Challenges



#### Safety

33,561 highway deaths in 2012 5,615,000 crashes in 2012 Leading cause of death for ages 4, 11-27







#### **Mobility**

5.5 billion hours of travel delay\$121 billion cost of urban congestion







#### **Environment**

2.9 billion gallons of wasted fuel 56 billion lbs. of additional CO<sub>2</sub>

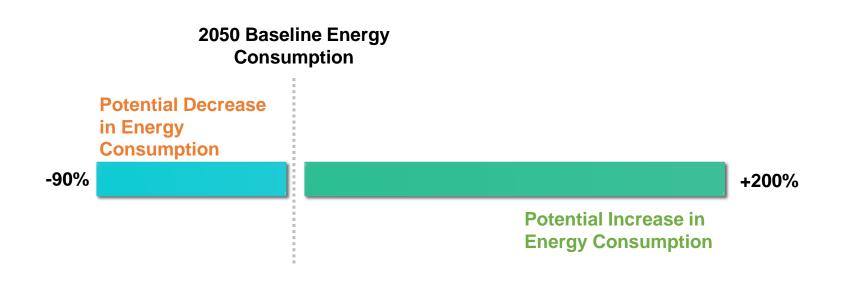




## Mobility

New mobility paradigm can have a range of impacts

#### **Potential Energy Implications of Connected and Automated Vehicles**



### **Emerging Transportation System Frameworks**

## Energy Efficient Mobility Systems (US DOE)

#### **Today:**

- Vehicle level focus
- Independent
- Unconnected
- Subject to behaviors & decisions

#### **Tomorrow:**

- System level focus
- Connected
- Automated
- In concert
- Across modes
- Managed behaviors & decisions



### **Emerging Transportation System Frameworks**

## Beyond Traffic (US DOT)

**Connected Vehicles** 

**Vehicle Automation** 

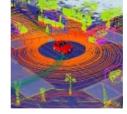
**Internet of Things** 

**Machine Learning** 

**Big Data** 

**Mobility on Demand** 





**Connected-Automated Vehicles** 



**Smart Cities** 

#### **Benefits**

- Order of magnitude safety improvements
- Reduced congestion
- Reduced emissions and use of fossil fuels
- Improved access to jobs and services
- Reduced transportation costs for gov't and users
- Improved accessibility and mobility

# US DOT Smart City Challenge

**Technology Elements (Highest Priority)** 



Vision Element #1
Urban Automation



Vision Element #2
Connected Vehicles



Vision Element #3
Intelligent, SensorBased Infrastructure

Innovative Approaches to Urban Transportation Elements (High Priority)



Vision Element#4

Jser-Focused Mobility

Services and Choices



Vision Element #5
Urban Analytics



Vision Element #6
Urban Delivery and
Logistics



Vision Element#7
Strategic Business
Models & Partnering



Vision Element #8
Smart Grid, Roadway
Electrification, & EVs



Vision Element #9 Connected, Involved Citizens

**Smart City Elements (Priority)** 



Vision Element #10
Architecture and
Standards



Vision Element #11
Low-Cost, Efficient,
Secure, & Resilient ICT



Vision Element #12
Smart Land Use

# Potential Implications for the ITS Workforce

Technology is moving rapidly and barriers to entry are greatly reduced in some areas; government and academic institutions need to keep up

#### Interdisciplinary learning and research is becoming increasingly important

- Increased need for cross-disciplinary/agency teams and skill sets
- Chief innovation officer roles/embedded technologists can add capacity and provide for enhanced learning opportunities by all parties.

Increasingly complex systems require new approaches such as machine learning, artificial intelligence, and enhanced approaches to data management and collection. These new approaches also require novel social and ethical considerations

Cybersecurity is a common theme in nearly all disciplines

Innovation is more than technology – it's also culture, process, and a practiced skill. We need to teach people these things so that they bring them to the workforce.

# QUESTIONS/DISCUSSION

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