

Transportation Planning Implications of Automated/Connected Vehicles on Texas Highways


Project 0-6848
AV/CV Symposium
Thompson Center, Austin Texas
August 2015





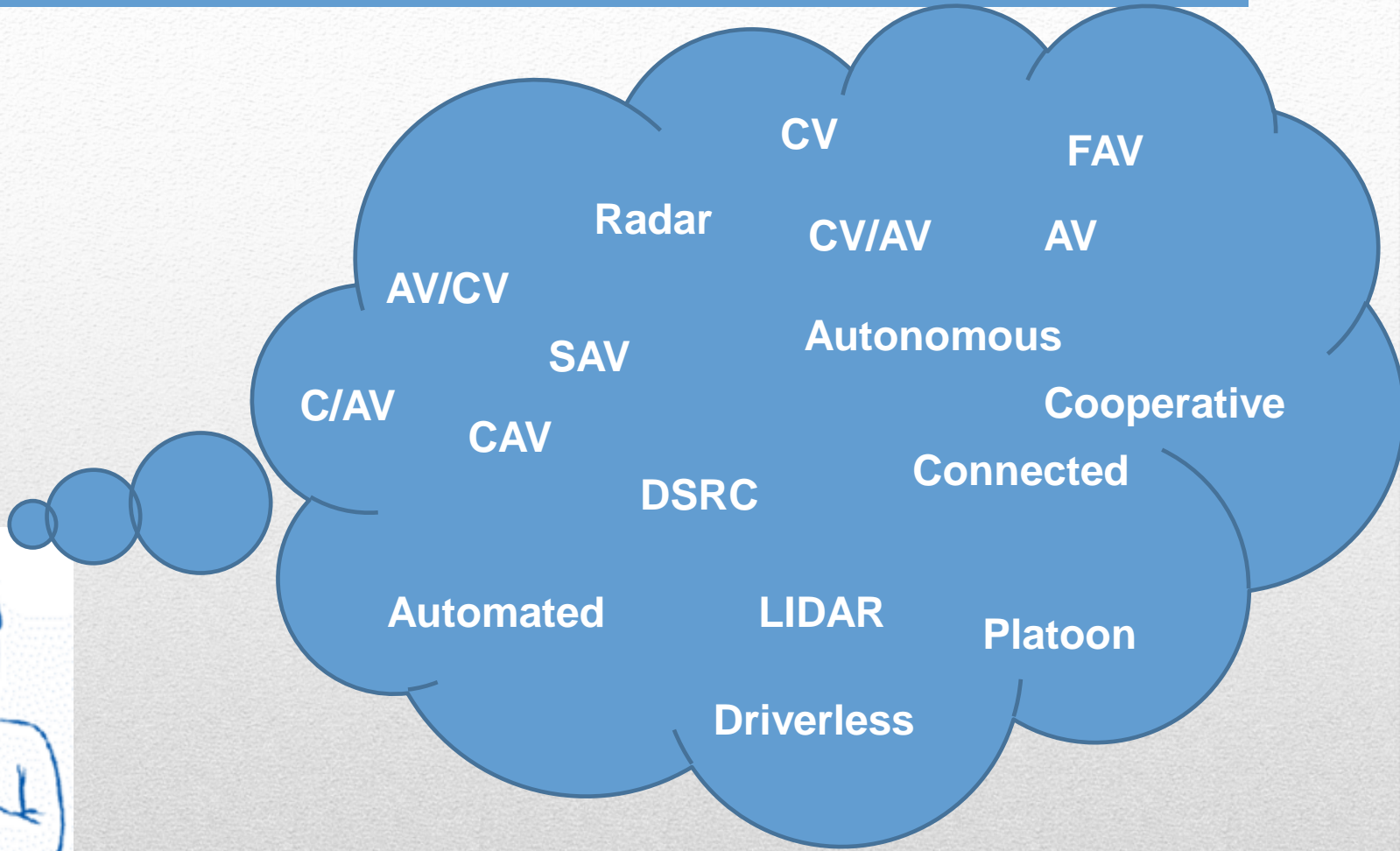
Transportation Planning Implications of Automated/Connected Vehicles

Assess how the potentially transformative automated/connected vehicle technology can be included in the Texas transportation planning process by defining the technology, surveying potential behavioral response, testing scenarios with travel modeling, and sharing ideas with the transportation planning community.

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1. Define Current and Future Technology
 2. Potential Impacts to Personal Travel
 3. Potential Impacts to Commercial Travel
 4. Potential Impacts to Travel Forecasting Process
 5. Behavioral Preferences Survey
 6. Stakeholder Workshops (3)
 7. Evaluate Impacts to Transportation Planning Process

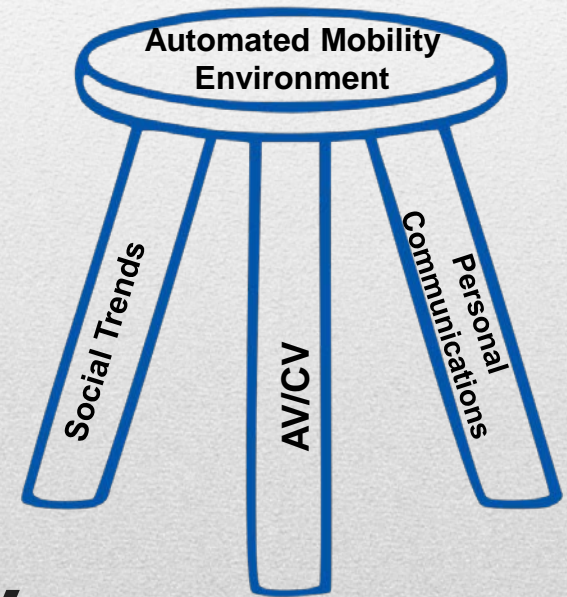
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Task Overview



Terminology

- An **Automated Mobility Environment** might include elements of current trends in:
 - AV/CV and integrated, sensing infrastructure
 - Social/employment Trends
 - Shared Economy
 - Gig Economy
 - Personal Communications



Not just AV/CV

- Increased System Efficiency
- More Travel Options
- Better Traveler Information
- Trip Reduction
- More Efficient Pricing and Payments

“Smart Mobility for a 21st Century America”

Transportation for America, ITS America, the Association for Commuter Transportation and the University of Michigan’s SMART Initiative.

October 2010

Promising Impacts of Smart Mobility

Smart Traveler



Happening Now



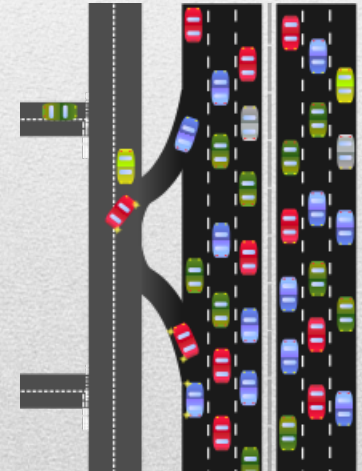
Smart Vehicles



Prototyping




Smart Infrastructure



Prototyping

Automated Mobility Environment



How Would AV/CV
and an Automated
Mobility
Environment
Impact Personal
Travel?

Travel Option	Potential AV/CV Impact (Automated Mobility Environment)
Trip/Activity Generation	Travel Cost – when & how we pay, Vehicle ownership/availability
Tour Formation	Vehicle Sharing, Cost allocation, Expanded mobile population
Trip Length/Travel Time	Urban form, In-vehicle time use, Congestion?
Mode Selection/Definition	Public transportation, Bike/Walk access, Legacy systems?
Routing and Navigation	Maximize infrastructure use, User information & daily activity planning

AV/CV Transforming Personal Travel Options/Choices

AV/CV Goals

- Improve safety
- Reduce future cost of infrastructure/equipment
- Increase comfort and convenience
- Reduce time spent driving
- Reduce user costs
- Reduce travel time
- Enhance mobility options
- Reduce traffic congestion
- Improve efficient use of infrastructure
- Reduce labor costs
- Improve fuel efficiency
- Reduce emissions

MAP-21 Goal Areas

- Safety
- Infrastructure Condition
- Congestion Reduction
- System Reliability
- Freight Movement and Economic Vitality
- Environmental Sustainability
- Reduced Project Delivery Delays

Adapted from Schladover, 2015

AV/CV and Planning Goals

- 1950's-1980's
 - Building out systems to meet growth
- 1980's-2010's
 - Funding shortfalls
 - Sustainability concerns
 - “Expect a Rough Road Ahead”
- 2020's-?
 - Achieving Desirable Goals and Objectives?

A New Era of Goal Achievement?

“While highways were the 20th century’s innovative response to an accelerated economic expansion, travel demand management is this century’s answer to increased urbanization and dramatic population growth.”

2014 TxDOT Peak-Time, Work-Trip Reduction Initiative Final Report

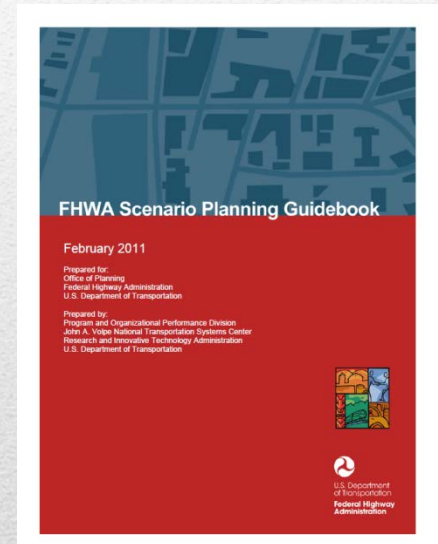


How Shall we Plan
for AV/CV?

	Driver-Assisted	Monitored Fleet	Private	Common Use Fleet
Technology	Level 3+	Level 4	Level 4	Level 4
Driver	Driver required to take over	System monitor required	No driver required	No driver required
Typical Use	Automation available- and restricted- areas	Public transit, shuttle services	Private ownership, restricted to small group of authorized users	Common use subscription or general On-demand services

Potential Use Cases

- Designed to prepare for uncertain futures
- Scenario Planning is not the same as Alternatives Analysis
- Current plans focus on a single future/alternative/scenario
- Process is driven by planning policy
 - Transportation Planning Process
 - Fiscal Constraint Requirements



Scenario Planning is Key

- Scenario Planning Process
 - Develop Alternative Scenarios
 - Determine Fundamental Impacts from all Scenarios
 - Assess both Likelihood and Magnitude of Impacts
 - Consolidate Plans to Address Most Likely and Impactful Items
 - Re-assess Less Likely and Impactful Items Periodically

Scenario Planning
is Key

- Develop Reasonable Scenarios, Timeframes
- Coordinate Common Themes across Regions
- Estimate Potential Behavioral Changes, Refining over Time with Observed Data
- Demonstrate Capacity Impacts of AV/CV
- Estimate Impacts with Existing Tools
- Develop New Tools as Deployment Occurs

Texas Transportation Planning: the Next 4 Years

Making decisions based on past certainty when faced with knowledge of an uncertain future is folly.

Adapting Transportation Plans to Uncertainty
