Vehicles that are increasingly automated, connected, electric and shared have the potential to profoundly change personal, freight and public transportation.
What should state and local governments do?

- State, regional and local governments use policy levers:
  - to ensure safe and efficient operation of public roadways
  - to foster equity across users of the system
  - to mitigate negative effects of transportation
  - to foster economic development

- For ACES technologies, policy levers could influence private choices toward outcomes that would benefit society
Advancing Automated and Connected Vehicles: Policy and Planning Strategies for State and Local Transportation Agencies

NCHRP Report 845

Texas A&M Transportation Institute
RAND Corporation
Southwest Research Institute
Shelley Row Associates
Research Objective

Assess potential policy and planning strategies for use by state and local governments that guide the deployment of AV and CV to create positive outcomes for society.
Effects of AV and CV

• Traffic Crashes
• Congestion
• Pollution
• Land Development
• Mobility for the Underserved
Foundational Research:
Social Welfare and Market Economics

- **Externalities**: effects that impact others, yet are not accounted for in market price

- Society benefits if governments implement policy or planning strategies to internalize these externalities in decisions by consumers and producers
# Potential Benefits of Connectivity and Automation

<table>
<thead>
<tr>
<th>Driving Externality</th>
<th>Connectivity (Full V2X)</th>
<th>Autonomy* (L4,5)</th>
<th>Shared Autonomy (L4,5)**</th>
<th>Electrification***</th>
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<td>Safety</td>
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<td>Mobility</td>
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</tbody>
</table>

- **Strong benefits**
- **Some expected benefits**
- **Weakest benefits/no impact**
- **Uncertain impact**

*Autonomy is defined for this purpose as individually owned vehicle.

**Shared Autonomous Vehicles (SAV) are on-demand self-driving vehicles that operate as part of a privately or publicly managed fleet.

***While not a focus of this NCHRP research, the team provides assumptions of potential benefits of electrification based on known literature.
Importance of Strategic Goals

Decision makers identify....

- **Goals** achieved through AV and CV
- **Performance measures** that support goals
- **Business case** for CV investment
- **Economic development** implications of emerging technologies
Creating Desired Outcomes

DESIRED OUTCOMES

- Mitigate safety risks
- Encourage shared AV use
- Address liability issues that may affect market development
- Enhance safety, congestion and air quality benefits by influencing market demand

Strategic Goals

Relevant Policy and Planning Strategies
Understanding the Strategies Viability Assessments

- Effectiveness and efficiency of strategy
- Political acceptability
- Implementation considerations
- Geographic impact
- Challenges
Safety Strategies

OUTCOME: To mitigate safety risks through testing, training and public education

• Enact legislation to legalize AV testing
• Enact legislation to stimulate CV or AV testing
• Modify driver training standards and curricula
• Increase public awareness
Shared Use Strategies

OUTCOME: To encourage shared AV use (and mitigate increased VMT and vehicle emissions):

• Subsidize SAV use
• Implement transit benefits
• Implement a parking cash-out strategy
• Implement location-efficient mortgages
• Implement land use policies and parking requirements
• Apply road use charging
Liability Strategies

OUTCOME: To address liability issues that may impact market development:

• Implement a no-fault insurance approach
• Require motorists to carry more insurance
Market Demand Strategies

OUTCOME: To enhance safety, congestion, and air quality benefits by influencing market demand:

- Subsidize CV-equipped vehicles
- Invest in CV infrastructure
- Grant AV- and CV-equipped vehicles privileged access to dedicated lanes
- Grant signal priority to AV- and CV-equipped vehicles
- Grant parking access to AV- and CV-equipped vehicles
- Implement new contractual mechanisms with private service providers
Research Products

Policy Briefing Document

Research Report
Conclusions

• Strategies offer considerations for decision makers based on best information available
  – Technology direction may change
  – Consumers may not adopt certain products

• Public policy making for AV and CV will be informed through a cycle of learning

• Early-adopter agencies will support knowledge creation through support of testing, research and evaluation
Documents available at

– Or search for NCHRP Report 845

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