Overview of Minnesota and National Trends in CAV

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CAV Industry Context
Ideally electric or other future energy source

Increased interest in shared fleets and use of “mobility as a service”

FULLY automated – can move when empty

HIGHLY automated – needs a “driver”

Connected
Moves as part of system...in time, multi-modal

DATA: The key to new network management – people and freight

Automated

Pricing

Shared

Electric
Ideally electric or other future energy source

FIVE PILLARS
Technology Research and Deployment

- Connected vehicle systems deployment
- On- and off-road AV testing
- Connected vehicle systems
- Data management and sharing
- Charging infrastructure solutions

Source: National Transportation Operations Center of Excellence
C/AV Planning and Policy

- Regional/project-specific travel demand forecasting for CAV
- Regulations and policies
- Economic impacts/workforce displacement
- Impact on traditional infrastructure
New Mobility

New vehicle types, services and business models redefining how we move as a society

- Mobility as a Service (MaaS)
- New private vs. public mobility models
- Pilot planning and development for new travel modes and services
- Transit agency policy and planning frameworks for mobility services
CAV Activities in Minnesota
The Shared Mobility Ecosystem is Here

- Dockless Bikesharing
- Scooter Sharing?
- Car Share
- TNCs
- SW Prime
Automated Shuttle Pilots

Combining cold-weather testing of AV technology with an opportunity for citizens to gain first-hand experience with automated vehicles
- MnROAD testing
- Twin Cities demonstration
- Rochester Accessible Olli
Connected Corridor Program

Connected vehicle technology pilot aimed at delivering value to Minnesotans:

- Arrive Safely
- Better Information for a Better Trip through data sharing
- More Efficient Operations
- Building for the Future
Action plan developed to guide adoption and management of shared mobility in the region.
As part of an MBUF pilot effort, MnDOT is considering the impact of AVs and shared mobility on revenue and road use charging.
CAV Strategic Planning

Developing a strategy for CAV adoption within Minnesota, using scenario planning to consider policies and actions to address multiple futures.

Includes survey of Minnesota transportation agencies to identify on-going CAV activities.
Surveys sent to over 300 local and county agencies and MPOs identified a significant number of CAV activities around the state.
CAV Executive Order

— Signed by Governor Dayton in March 2018
— Establishes Advisory Council on CAV
  — “Study, assess and prepare for the transformation and opportunities associated with the widespread adoption of automated and connected vehicles”
— Report to Governor and Legislature by December 1, 2018
— To include recommendations regarding:
  — Transportation infrastructure and network
  — Cyber security and privacy
  — Vehicle registration, insurance, traffic regulations
  — Economic development opportunities and workforce preparation
  — Accessibility of technologies to all Minnesotans
MnDOT CAV-X Office

- Established as a new office within MnDOT in April 2018
- Oversees CAV activities and strategy within the department
- Coordinates and fulfills reporting requirements under Governor Dayton’s Executive Order
Research and Innovation

- Academic technology and policy research
- Private-sector research and development
- MnDOT Innovative Ideas Solicitation
Overview of National CAV Activities
Connectivity

- CV Pilot Program
- Communications technology debate (DSRC vs. cellular)
- Smart Cities and data

Source: U.S. Department of Transportation
Automation

- Commercial availability of Level 2 technologies
- Truck platooning and AV freight
- AV proving grounds
- AV shuttle deployments
- Drones, delivery robots
Shared Mobility

- Planned launches of AV taxi services
- Transit/TNC partnerships
- Carpool/vanpool programs
- Bikeshare/ scooters/ personal carshare, etc.
Electrification

- EV in the AV ecosystem
- EV infrastructure (fixed and inductive charging)
- Electrification initiatives and incentives
- Shifts in OEM development and production (e.g. Volvo)
Strategy, Guidance and Organization

- Strategic planning for CAV/New Mobility
- Best practices and guidance documents through national organizations
- Establishment of CAV-specific offices within organizations
- Multi-agency work groups
States with Autonomous Vehicles
Enacted Legislation and Executive Orders

Policy and Legislation

- State legislation and executive actions
- AV START act update
- Emerging policy issues (parking, curb space, enforcement)

Source: National Conference of State Legislatures
Federal Legislation

— House (H 3388 SELF DRIVE Act) passed the full House and awaits Senate action

— Senate Bill (S 1885 AV START Act) passed the Committee on Commerce, Science, and Transportation, but hasn’t been brought to full vote of Senate yet

• Open debate on various items, including:
  • Truck inclusion
  • FMVSS exemptions
  • Pre-emption language
Federal Guidance

- 2016 – Federal Automated Vehicles Policy
- 2018 – version 3.0 will reportedly go beyond by incorporating other modes
International CAV Hot Topics
Canada

— Ontario investing heavily in CV trials and technology incubation

— Extensive scenario planning efforts continue in Toronto region

— Focus on AV role in transit, including AV shuttle pilot in Edmonton, and “trackless LRV” study
Europe

- Focus on truck/bus automation
- Significant emphasis on electric - infrastructure and pricing policies
- Transit authorities opening for third-party selling of tickets, resulting in new MaaS platforms
- Helsinki sets goal of no car ownership within city limits
Middle East

- UAE making aggressive push towards AV testing and adoption through regulation
- Dubai RTA testing AV pods
- Dubai Autonomous Transport Strategy aims for 25% AV trips by 2030
Australia/New Zealand

- Australia Integrated Multimodal Ecosystem (AIMES) program in New South Wales - low-level AV shuttle pilots
- CAVI pilot testing in Queensland
- Heavy vehicle safety pilot focus
Asia

- Significant CV deployments in Japan using DSRC
- China holds 40% of global market share of EV production, driven by local market demand
- Goals of EV-only sales in India (2025) and China (2030)
- Singapore is leading AV testing, with mobility-on-demand trials
Questions?

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