Policy and Legal Opportunities and Obstacles for Connected and Automated Vehicles: Lessons from South of the Border?

Frank Douma
State and Local Policy Program

HUMPHREY SCHOOL OF PUBLIC AFFAIRS
UNIVERSITY OF MINNESOTA

Vehicle Automation

HUMPHREY SCHOOL OF PUBLIC AFFAIRS
UNIVERSITY OF MINNESOTA

Why Study CAV?

- Safety Improvement
- Massive private investment in developing the technology
- Potential to disrupt many accepted assumptions:
  - Land use (parking)
  - Definition of transit
  - Modal integration
  - Pay for vehicle or ride
  - Finance
  - Equity
  - And more . . .

MnDOT Automated Bus Shuttle Pilot Project Demonstration
University of Minnesota

SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	*Monitoring* of Driving Environment	Fallback Performance of *Dynamic Driving Task*	System Capability *(Driving Modes)*
***Human driver* monitors the driving environment**						
0	**No Automation**	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	**Driver Assistance**	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes
2	**Partial Automation**	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	**System**	Human driver	Human driver	Some driving modes
***Automated driving system* ("system") monitors the driving environment**						
3	**Conditional Automation**	the *driving mode*-specific performance by an *automated driving system* of all aspects of the dynamic driving task with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	**System**	Human driver	Some driving modes
4	**High Automation**	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a *request to intervene*	System	System	**System**	Some driving modes
5	**Full Automation**	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environmental conditions that can be managed by a *human driver*	System	System	System	**All driving modes**

Vehicle Automation

Safety First

United States

40,100 traffic fatalities in USA in 2016

Worldwide

1.25 Million Deaths in 2013

50+ million Injuries

65+ Million Deaths in 20th Century

Economic Cost > $500 Billion/year

More than 90% percent of accidents caused by driver's error

Accessible

http://www.autocar.co.uk/car-news/motor-shows-geneva-motor-show/volkswagen-sedric-concept-previews-self-driving-pod-vehicle
http://www.dailymail.co.uk/sciencetech/article-4287010/VW-unveil-self-driving-car-post-dieselgate-shift.html
http://www.telegraph.co.uk/cars/news/geneva-motor-show-2017-vw-group-unveils-sedric-prototype-driverless/

Vehicle Automation

Access

Americans with Disabilities Act

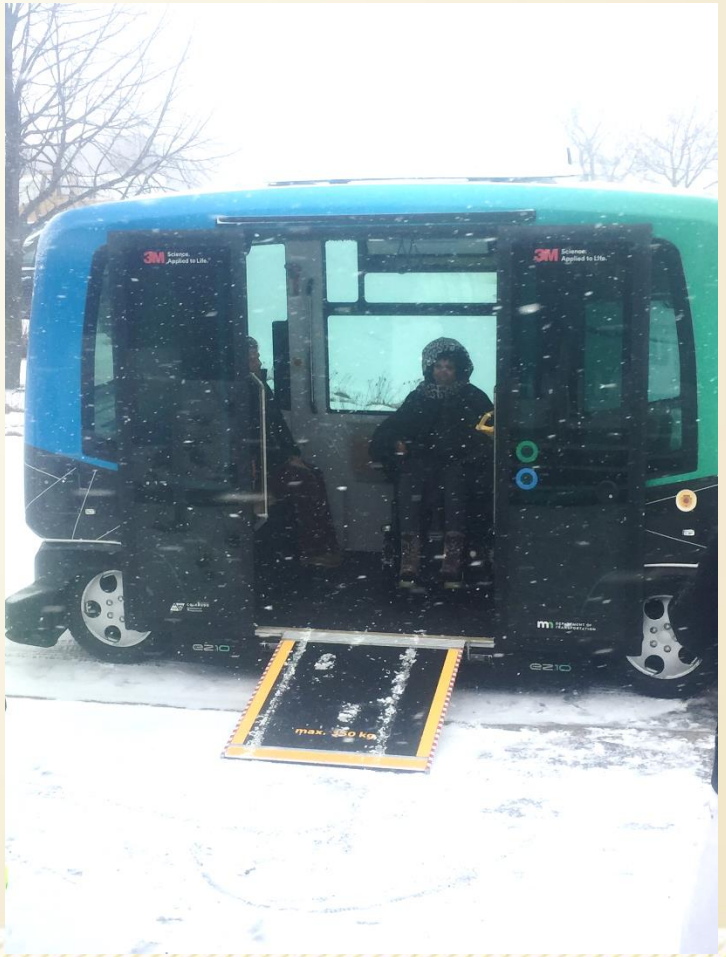
- Requires public transit service to people with disabilities

Minnesota's Olmstead Plan:

- People with disabilities will have access to reliable, cost-effective, and accessible transportation choices

However, the inability to drive still reduces access

Seniors in Minnesota. By 2030 will grow to 24% of Minnesota's population (1.2 million) will be 65+



Recent progress . . .

- Ruderman / Securing America's Energy Future
- National Council on Disabilities

Improved Transit

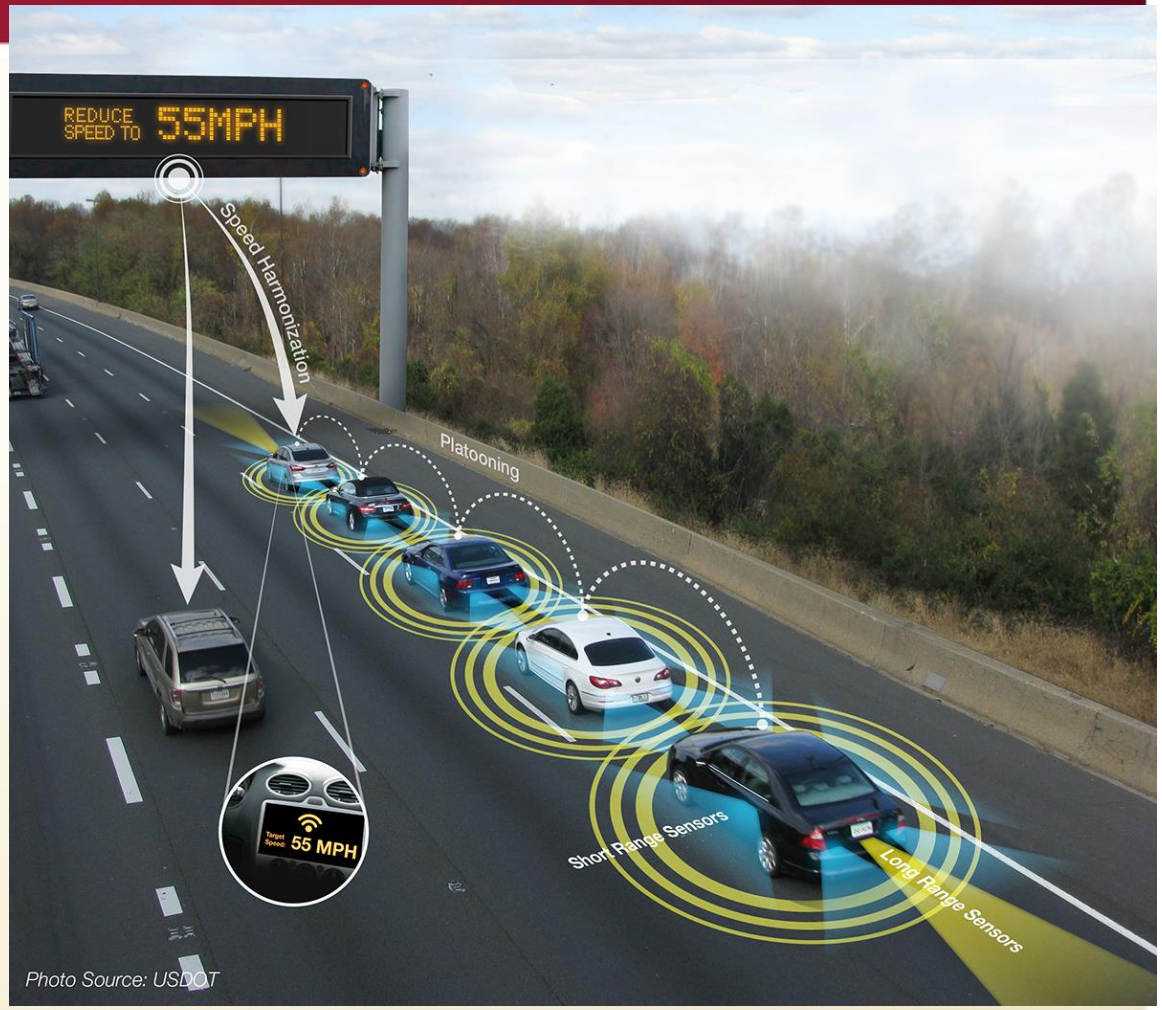
- Seniors, Poor, Children?
- First and Last Mile Solution for Transit
- Complement to existing service
- Increase the impact of transit stations on adjoining properties
- Greater efficiency in low density
- From few blocks to maybe a mile?

https://meetolli.auto/manual.html

https://www.autoblog.com/photos/2014-challenge-bibendum-ez-mile-ez10/

Roadway Impacts

- Narrower Roads (probably?)
  - No need to design for human reactions
- More capacity on existing roads
  - So, fewer roads needed, right? Well, maybe…
- More VMT or Less VMT?
  - That is the question
  - Historically, “excess” capacity tends to be filled by growth in demand
    - Induced demand
- Will SDV and human-driven vehicles be able to co-exist?



Heavy Duty

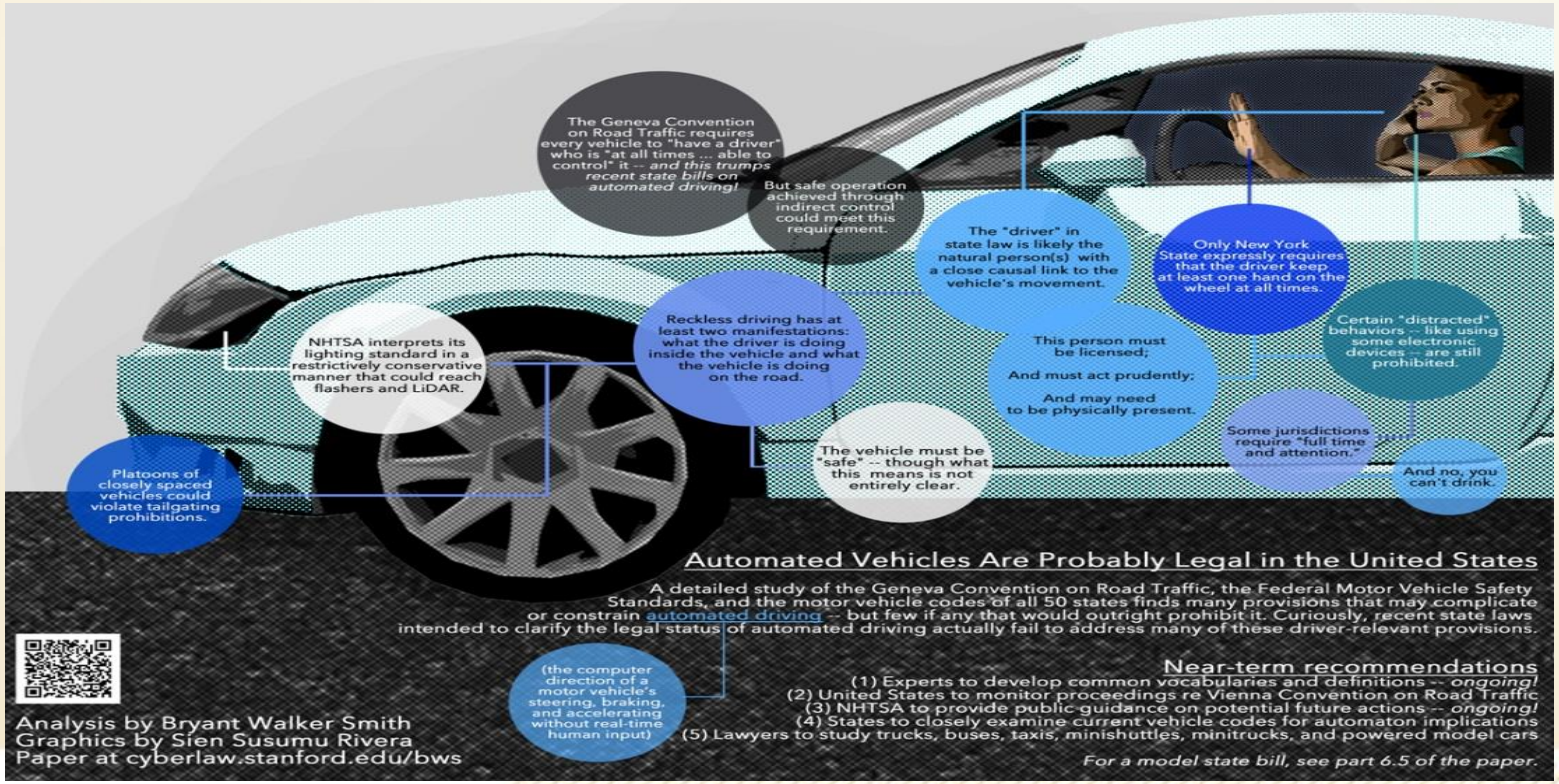
HUMPHREY SCHOOL OF PUBLIC AFFAIRS
UNIVERSITY OF MINNESOTA

- ABC: “Deploy full size, full speed automated buses in a variety of geographies and applications to advance the industry understanding of the technology.
- http://www.automatedbusconsortium.com/
- “The bigger point is that as technology gets better, it will start replacing [trucking] jobs”
- https://www.nytimes.com/2017/11/13/business/self-driving-trucks.html
- Ag: Mankato interview: “My guys won’t go out in the field without this technology.”

REGULATORY / LEGAL ISSUES

SDVs might already be legal…

Bryant Walker Smith,
Automated Vehicles are Probably Legal in the United States



Not explicitly prohibited equals *probably* permitted

The Federal Government Weighs In

HUMPHREY SCHOOL OF PUBLIC AFFAIRS
UNIVERSITY OF MINNESOTA

- 2016 Federal Automated Vehicle Policy
  - 15 point Safety Assessment
  - Recommendations, not requirements
  - Distinguished Federal and State responsibilities
- 2017 Automated Driving Systems 2.0: A Vision for Safety (ADS 2.0)
  - Down to 12 point Safety Assessment
  - Reinforces advisory nature
- 2019 Preparing for the Future of Transportation: Automated Vehicles 3.0
  - Further clarification of roles
  - Safety, accessibility and other opportunities
- SELF DRIVE Act (HR 3388)
  - Passed House Unanimously
  - Never voted on in Senate

Recent Developments in Minnesota

- In 2017, automated shuttle bus tested in winter weather conditions at the MnROAD facility

- Public Demonstrations followed
  - Super Bowl
  - U of M,
  - Rochester

Recent Developments in Minnesota

2018 Governor's advisory council on connected and automated vehicles

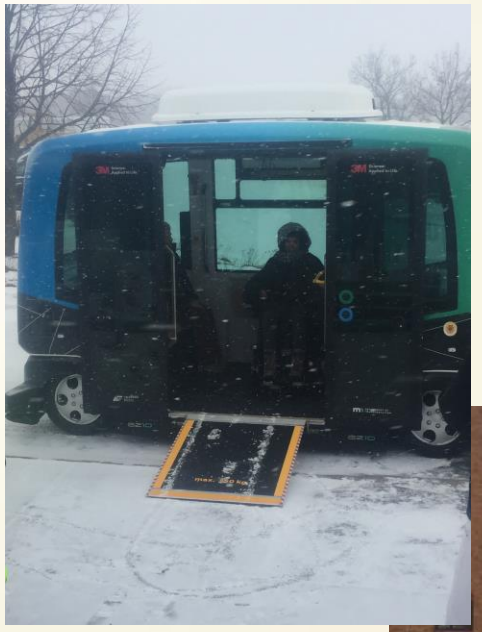
2019 Legislative Activities

- Platooning test allowed
- No further clarification on other testing or deployment

How Does It Come Together?

- Improved Transportation for all
  - Especially in Greater Minnesota
- AVs in rural transit
  - improve equity and accessibility,
  - Address driver shortages
  - provide affordable transportation options.
- Avs in the private sector
  - particular interest in the freight industry
  - Opportunities to improve supply chains?
  - Address driver shortages?

- Get CAVs in front of the general public and show people that this technology is real and viable in their communities.



THANK YOU

Frank Douma
Humphrey School of Public Affairs
University of Minnesota
612-626-9946
Fdouma@umn.edu

TITLE TO GO HERE…

- Content to go here…