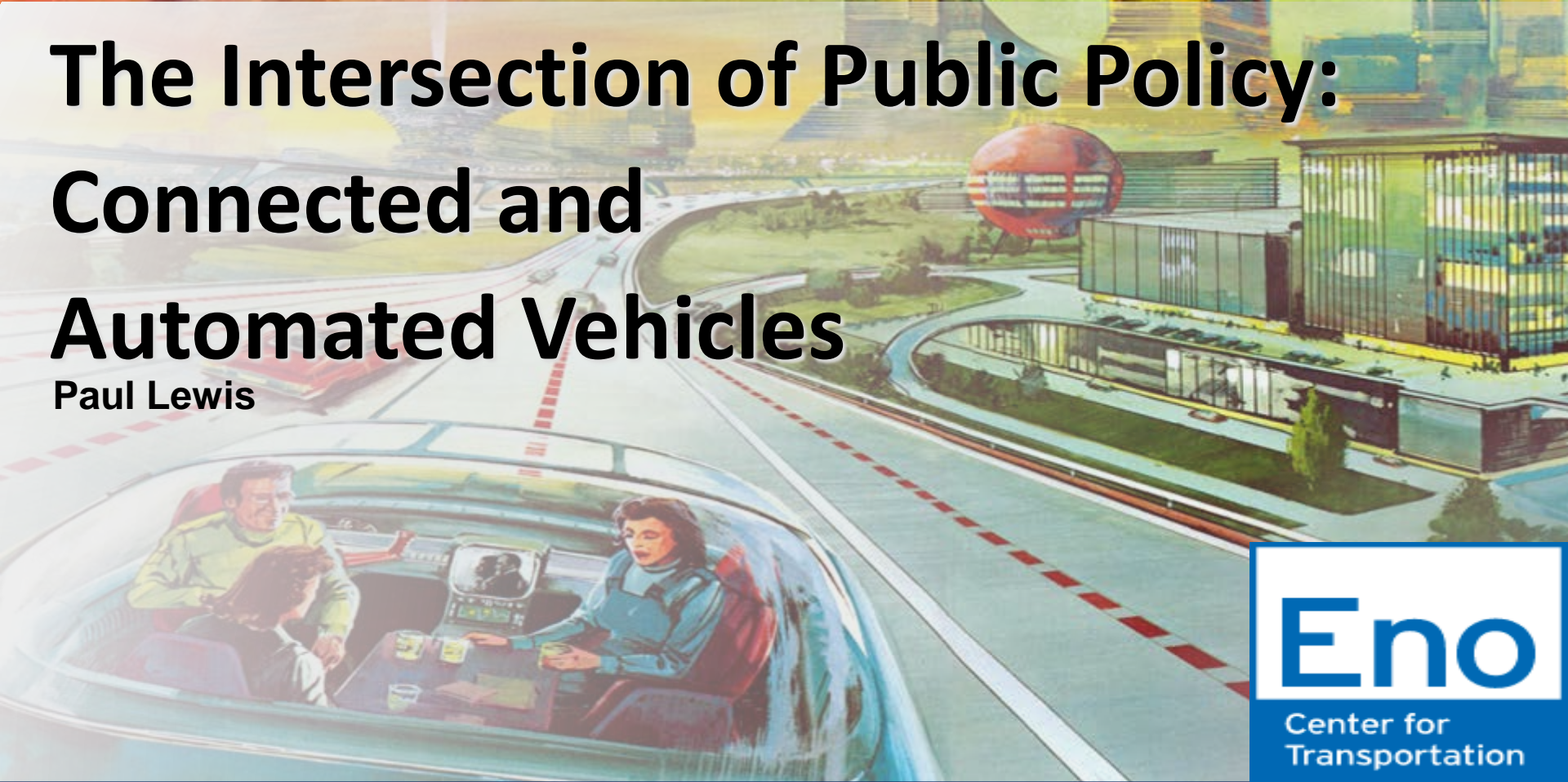


The Intersection of Public Policy: Connected and Automated Vehicles

Paul Lewis



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@paulrslewis
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#EnoAV

May 5, 2020

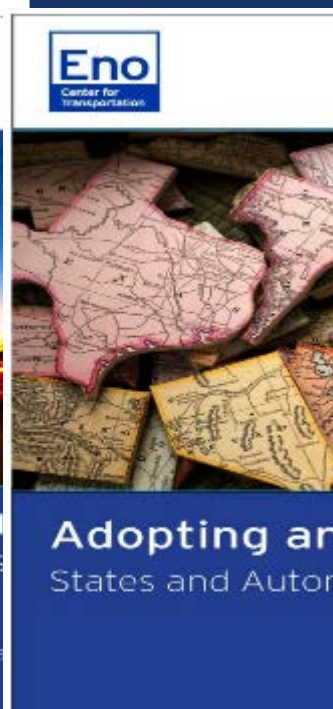
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About the Eno Center for Transportation

Founded in 1921 by William Phelps Eno, inventor of the stop sign



Only think tank focused:
On all modes of transportation
Up and down the federalist chain
With public, private, non-profit sectors



Plus emerging transportation trends:

Ride hailing

Technology and transit

Sharing economy

OUTLINE

- 1 Context for discussion about connected and automated vehicles
- 2 Outstanding transportation implications
- 3 What should policymakers do?

Expectation vs Reality

****No Sound****



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****No Sound****



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****No Sound****



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What does the future look like?

Automated vehicles offer compelling “heaven” and “hell” scenarios

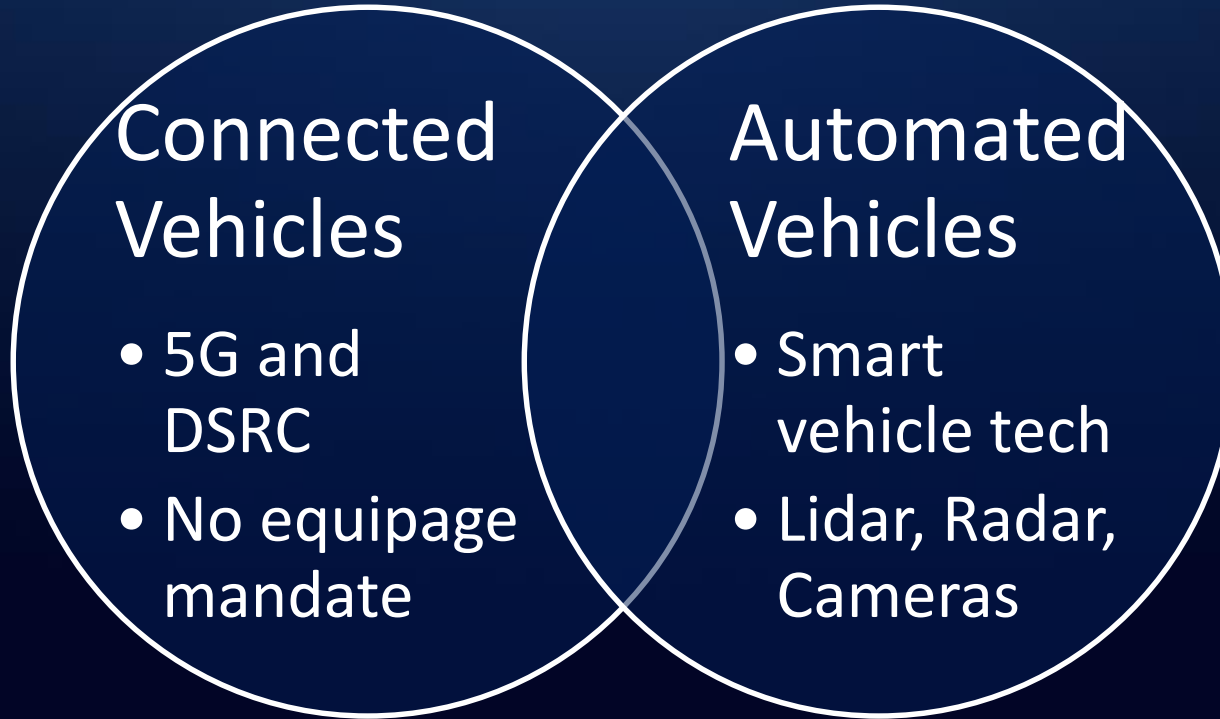


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We've lived through unprecedented transportation revolutions before



Vehicle Connectivity vs Automation



AV Definition?

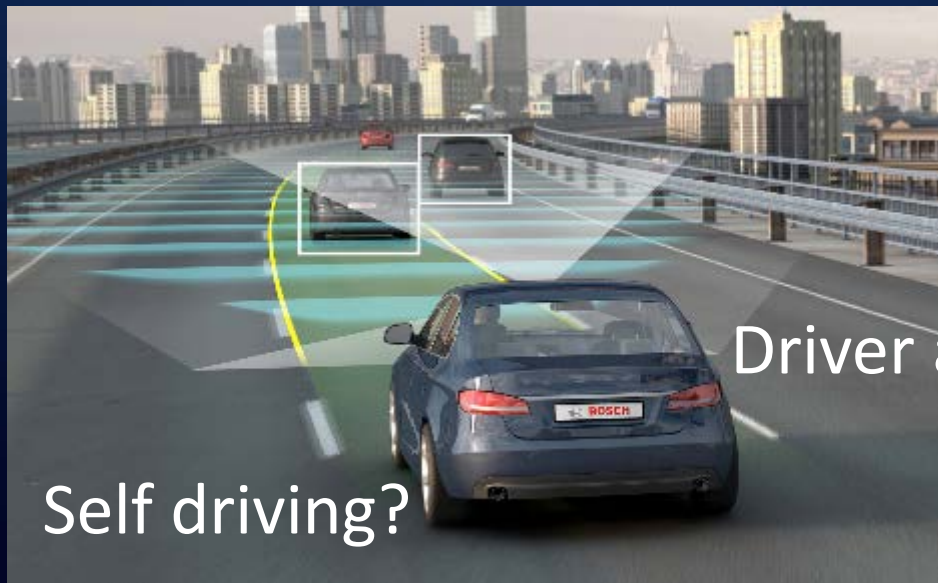
Automated?

Autonomous?

Driverless?

Driver assist?

Self driving?



Level 2, Level 3?

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Levels of Automation

Level		System Role	Human Role
0	No automation	None	All functions
1	Driver assistance	Adaptive cruise control, lane centering	All core functions
2	Partial automation	Steering, acceleration, braking, signaling	Ready to control w/o warning

Human monitors driving environment
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Source: Adapted from SAE Levels of Automation

Levels of Automation 0 -2

- Currently available on the market today
- Tesla, Mercedes-Benz, Cadillac, others offer Level 2
- Inconsistent naming and operation of features
 - In a survey of 34 car brands, AAA found 40 different names to describe automatic emergency braking, 20 names for adaptive cruise control, 19 terms for lane-keeping assistance
- Early evidence shows mixed safety results
 - Systems can avoid certain crashes, but consumers do not understand capabilities

Levels of Automation

Level		System Role	Human Role
3	Conditional automation	Most driving functions	Ready to control with warning
4	High automation	All driving functions only conditions like defined route shuttle	No control
5	Full automation	All functions, all conditions	Navigation input

System *monitors driving environment*

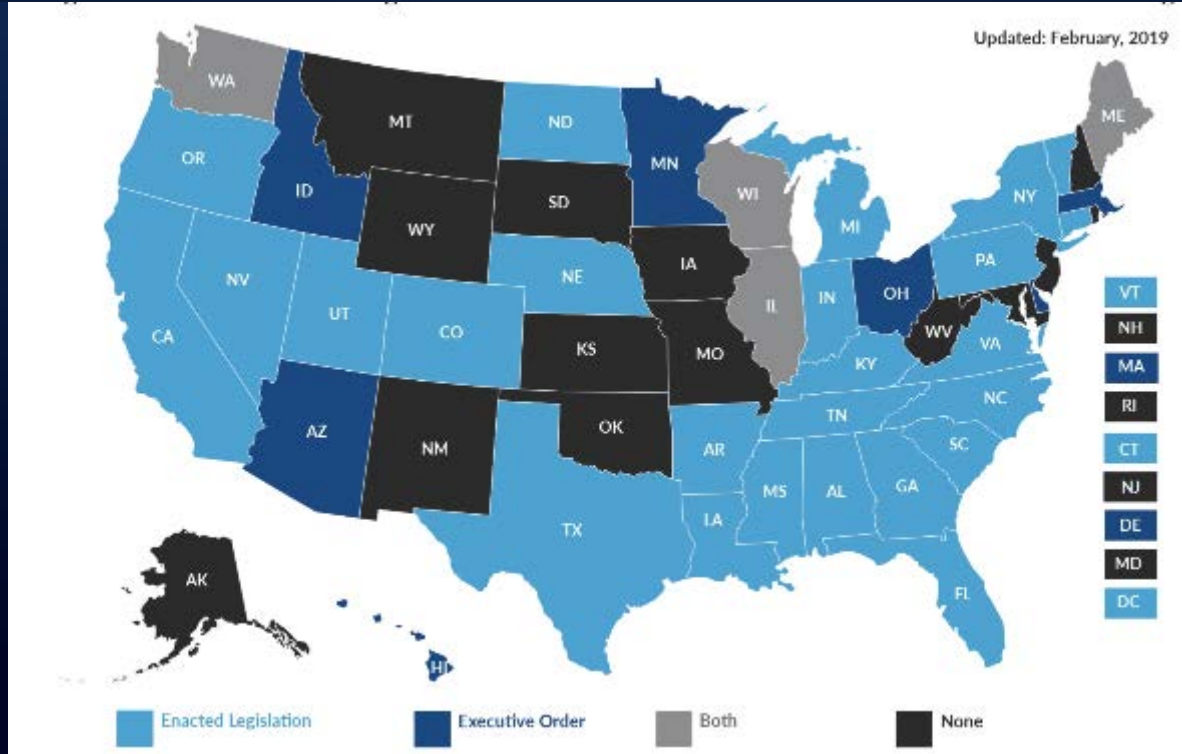
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Source: Adapted from SAE Levels of Automation

Levels of Automation 3 -5

- By definition, key shift in liability
- Not commercially available today
- Widespread testing in US, mostly in California, Arizona, and Michigan
- Timelines are consistently pushed back
- Release timelines are for “minimum viable product” not widespread deployment
- Could be huge revenue source for companies that successfully deploy

States are developing a patchwork of laws, regs





State AV Policy

- States are setting different standards for
 - Licensing, registration, definitions, fees, etc
- Testing remains concentrated in a few states
 - California, Arizona, Michigan
 - Growing in Massachusetts, Florida, Nevada
- European Union is also facing similar patchwork of laws and regulations

U.S. DOT AV Guidance



Congress has shown willingness to act

HOUSE

Safely Ensuring Lives Future

Deployment and Research In Vehicle

Evolution Act

~~SELF DRIVE Act~~

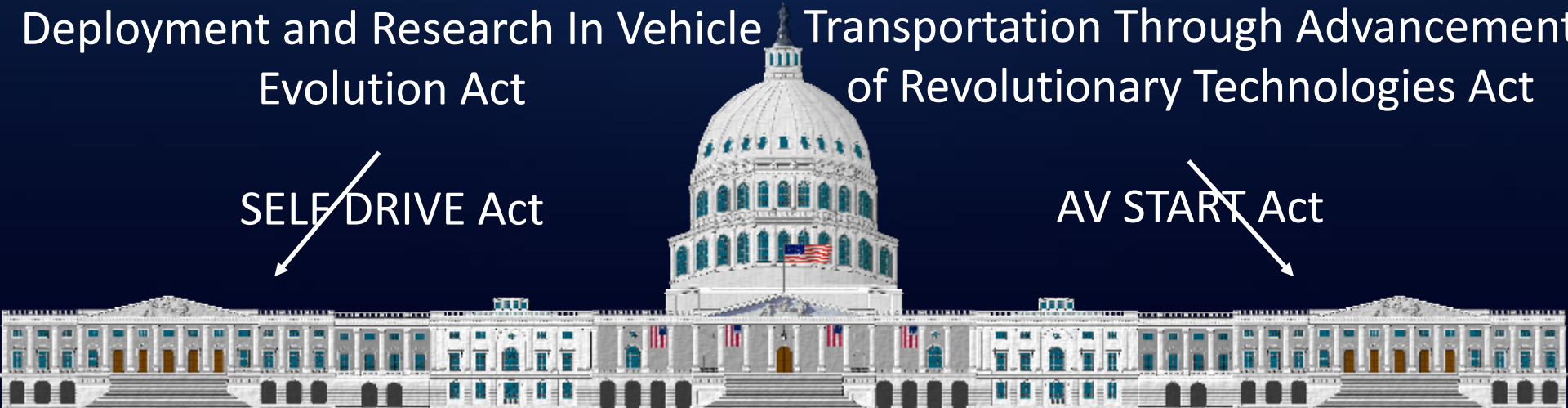
SENATE

The American Vision for Safer

Transportation Through Advancement

of Revolutionary Technologies Act

~~AV START Act~~



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OUTLINE

- 1 Context for discussion about connected vehicles and automated vehicles
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Certification, liability, insurance



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Cybersecurity



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Privacy and data

THE COMING FLOOD OF DATA IN AUTONOMOUS VEHICLES

RADAR
~10-100 KB
PER SECOND

SONAR
~10-100 KB
PER SECOND

GPS
~50KB
PER SECOND

CAMERAS
~20-40 MB
PER SECOND

LIDAR
~10-70 MB
PER SECOND

AUTONOMOUS VEHICLES
4,000 GB
PER DAY... EACH DAY



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Infrastructure and funding



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Vehicle connectivity



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Workforce



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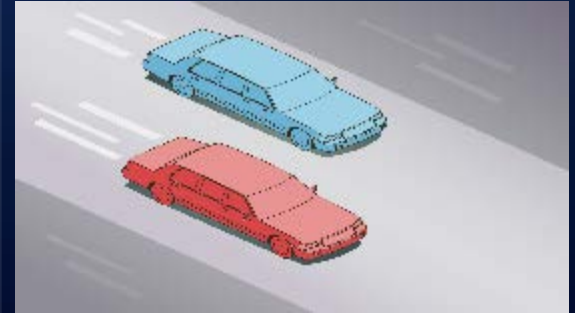
Federal government will continue to be heavily involved in some key areas



Vehicle safety



Interstate commerce



Harmonization

MAJOR ISSUES: Data, Preemption

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Invest in infrastructure

Invest in state of good repair

AV testers need smooth pavements, clear lane striping, signage

Implement AV mileage fee

Could create new revenue stream to replace losses.

Pilot connected vehicle projects

Initiate DSRC and 5G wireless pilots; Do CV & AV as public fleets turnover

Mitigate unintended consequences

Address workforce impacts

Proactively implement retraining/career development programs

Check for inconsistencies

Review and update well-meaning traffic laws (e.g. hands free, etc.)

Address social equity directly

Impacts on all segments of society should be front & center

Plan for the future - now

Conduct scenario planning

Bold planning practices (parking, zoning reform) don't need to wait

Develop robust data sharing

Work with private firms to negotiate agreements about data reporting

Statement of Principles

Lays out regional goals for privacy, cybersecurity, safety, data, etc.

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