



Autonomous Vehicle Policy and Regulations: A Discussion on the Current Landscape and Future of AVs

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The US Mobility System is Unsafe, Inequitable, and Environmentally Destructive

- Car dependence has produced:
 - Deaths and injuries
 - Inequitable access to opportunity due to high transportation costs
 - Destruction of natural ecologies
 - High levels of pollution
- In each case, people of color and people with low incomes have suffered disproportionately



New Technologies Can Help Play a Role in Improving Access in a Sustainable Fashion

What if we could:

- Improve transportation safety
- Reduce transportation costs
- Minimize use of single-occupancy cars
- Eliminate emissions from transportation

Are autonomous vehicles a path to that future?

Our Research Program

We sought to understand how AVs would impact the US transportation system, specifically in terms of social equity and the environment, and to propose regulations that might address deficiencies.

We interviewed a dozen stakeholders, reviewed dozens of research papers, and examined hundreds of proposed and enacted laws and regulations at the state and federal level.

What Do We Mean by Autonomous Vehicles?

Autonomous vehicles: Cars with some level of driving assistance. Not necessarily fully self-driving!

- Today, many cars use advanced driver assistance systems (ADAS) through adaptive cruise control. But drivers must still monitor all actions of the vehicles.
- Coming soon: automated driving systems (ADS) that can drive, unmonitored, at some or all the time.

In all cases, there is **both** a vehicle **and** an operating system that does the driving assistance.



What Are the Potential Positive and Negative Consequences of Self-Driving Vehicles?

Potential Positives

- Software that's better than humans at preventing collisions
- Reduced ride-hailing costs due to no labor costs
- As a result, better access to opportunity
- Access for people who can't drive
- Integration into the electric vehicle ecosystem, reducing emissions

Potential Negatives

- Reduced costs (monetary and non-monetary) lead to more travel by car
- More travel by car increases emissions and traffic
- People move further away from cities
- Increases ecological destruction of exurban areas, reduces central-city investment, increases jobs far from people of color and with low incomes

There Are a Few Things We're Not Quite Sure About Yet...

Will AVs actually be better than people at preventing crashes?

Will AV rides be affordable for people with low incomes?

Will AV ride-hailing providers offer equitable service to neighborhoods where people of color and households with low incomes predominate?

Will AVs actually be designed to reduce environmental harms?

Will consumer-available AVs induce more outward development?

Will AVs be electric, and if so, will those benefits outweigh the potential harms of increased VMT?

What Types of Regulations Can Help Ensure Ideal Outcomes from Autonomous Vehicles?

Vehicle Design

- Expand AV testing, but ensure AVs are safer than human-driven cars, zero-emissions, and accessible.

Consumer Standards

- Subsidize/incentivize ride pooling to discourage personal AV ownership, subsidize use by low-income people
- Provide consumers baseline information about risks of AV technology

Vehicle Operation

- Collect data on collisions and trips
- Creation liability standards
- Equitable minimum service levels

Street Standards

- Open streets for pedestrian use
- Curb standards supporting ride sharing
- Minimize over policing

What Levels of Government Should be Making Choices about Autonomous Vehicle Regulation?

Vehicle Design

- Key role for federal government, which can mandate rules through FVMSS

Consumer Standards

- Federal government can use EPA and NHTSA to provide information
- States and locals can incentivize shared rides through taxes and fees and subsidize people with low incomes

Vehicle Operation

- Federal government can collect and maintain data on collisions, develop national liability standard
- States and locals can collect trip data, consider minimum service rules

Street Standards

- Local governments can geofence key streets, better use curbs for sharing
- States can enforce policing rules



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