



Institutional Obstacles to New Transportation Technology Adoption

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Project Objective

Institutions, the rules guiding transportation planning and investments, are difficult and slow to change. The goal of this white paper was to provide public, private, and non-profit sectors an overview of why change is difficult and concrete ways in which policymakers can support and guide changing the rules to leverage innovations for a safer, cleaner and more equitable transportation sector.

Problem Statement

New transportation technologies, like shared mobility and connected and autonomous vehicles are advancing rapidly, often more rapidly than governments can adapt and plan regulations. Yet, governments must be proactive if new technologies are to significantly contribute to reducing greenhouse gas emissions and expand people's access to opportunities. There is a significant need to understand how governments can intervene, and the steps they can take to increase responsiveness to change.

Research Methodology

The white paper extensively reviews the academic and applied literature on the deployment of new transportation technologies with a focus on four areas of innovation.

Area of innovation	Purpose	Obstacles
Shared Mobility	the ability to share vehicles across users	Curb space management and data governance
Integrated Payment System	the ability to pay for multiple mobility services with a single method	Data and transit infrastructure. Coordination between service providers
Congestion or Road Pricing	levying a fee on drivers based on congestion level or distance travelled	Data collection and link to integrated payment system.
Connected and Autonomous Vehicles	vehicles that are self-driving through either connected or autonomous technology	Land use reform. Data and algorithm governance.

The review identifies critical needs for each technology and discusses the important areas for governmental intervention. The paper highlights two sources of institutional obstacles from which it derives insights for practice:

- jurisdictional fragmentation – how governments have overcome obstacles tied the division of decision making authority among multiple levels and types of government, as well as private sector and non-governmental organizations.

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- Path dependency – the persistence of rules designed for a system that was not meant to accommodate new forms of transportation.

Results

Technical limitations are rarely the issue in innovating within the transportation system. All reviewed technologies have the know-how to deploy at large scales. Research emphasizes data management and governance as an important bottleneck. How data is collected, shared, and protected between private and public entities is an area of ongoing institutional development that needs more research to encourage collaboration and transparency. In contrast to the frontier of data governance, the other bottleneck is more traditional. Investments in transit connectivity and reliability, and reform to land use are the foundations of innovative transportation solutions.

Multiple paths are available for governing new transportation technologies. This white paper highlights some of the technical and institutional options that have emerged in the recent literature. While there is no obvious superior choice, the review shows that establishing collaborations between the public sector and innovators, broadening communication to and participation of the public, and strategically investing in pilot programs are essential to enabling change.

Recommendations	Strategies
Use the California Transportation Plan to spur cooperation between technology developers and communicate benefits to the public	Prioritize strategies that leverage multiple technologies to increase benefits to users. Create awareness of programs among underserved communities.
Assess options for strengthening data governance and building local data-management capacity	Assess levels of decentralization for data management with capacity, transparency, and accountability as focus.
Invest in developing a versatile mobility wallet that will accommodate new technologies and efficient pricing	Research data and equity-based solutions. Coordinate government agencies to facilitate administrative data integration for discounts and subsidies.
Further curb space management reforms and integrate the use of connected infrastructure	Cooperate with shared vehicle services to pilot connected infrastructure. Convene forum of local governments to encourage coordination.
Encourage wider scheduling and fare coordination at the megaregional and state scales	Expand the California Integrated Payment Project. Invest in data management capacity of smaller transit agencies and anticipate integration at state level.
Pilot Transportation Network Company congestion pricing to investigate integration with location-based tolls	Make use of technology already integrated in ride hailing services to gather data and evaluate congestion pricing
Develop rules for in-vehicle data collection	Research on pros and cons of available technologies. Coordinate with Federal Government.
Establish a land use governance initiative to anticipate the introduction of automated vehicles	Develop a robust framework to inform and include residents, developers, and governments. Publicize pilots widely and gather feedback.