



Emerging Transportation Innovations and their Financial Implications for State DOTs

Summary Report

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Introduction

The transportation sector is being radically transformed by emerging technologies. App-based ride-hailing, car-sharing, autonomous vehicles, drones and electrification are just some of the many developments rapidly changing not only traditional travel patterns but also traditional revenue streams for state and local transportation agencies. This invitation-only session was held for members of AASHTO's Committee on Funding and Finance to provide a briefing on these emerging technologies and allow discussion of key questions for DOT officials.

Overview of Emerging Trends

Garrett Eucalitto, author of the recently-released NGA Report *Governors Staying Ahead of the Transportation Innovation Curve: A Policy Roadmap for States*, briefed the group on emerging trends in transportation technology.

The United States is experiencing a transportation technology revolution that is moving us toward a future that is increasingly autonomous, connected, electric and shared. The revolution promises many benefits but also raises challenges and concerns. Governors have a key role to play in preparing their states for a smooth transition to this new world of transportation. They can work alongside other state officials, federal and local governments, technology providers and others to advance innovation and stay “ahead of the curve”.

Several new technologies and technology applications are becoming widespread across the country: ride-hailing and car-sharing activated by smartphone applications; electrified transportation, including vehicles, ferries, bicycles and scooters; connected and autonomous vehicles (AVs); tractor-trailing “platooning”; and unmanned aerial vehicles (UAVs), or drones. In addition, advanced communications networks are facilitating connected systems and the use of big data and analytics to support new transportation technologies.

NGA's report, available here: <https://www.nga.org/wp-content/uploads/2018/07/Transportation-Innovation-Roadmap-Final-Hi-Res-for-Posting-Online.pdf>, explores potential benefits, challenges, and issues associated with each of these new technologies.

Interactive Financial Policy Discussion

Following a presentation by Garrett Eucalitto on emerging technologies focused on ride-hailing and car-sharing activated by smartphone applications, electrified transportation, connected and autonomous vehicles (AVs), tractor-trailing “platooning”, and unmanned aerial vehicles (UAVs) or drones. The invited members of AASHTO's Committee on Funding and Finance participated in an interactive policy discussion with the goal of discussing of key issues and questions for DOT officials resulting from these new technologies. Garrett was joined by an expert panel, moderated by David Seltzer of Mercator Advisors, which initiated a discussion with the participants about the implications of these technological innovations on funding and financing strategies for projects and on financial policy and operations within state DOTs.

PANELISTS

- Pete Rahn, Maryland DOT
- Garrett Eucalitto, National Governors Association
- Paula Hammond, WSP
- Michael DeMers, Missouri DOT

How do you see the innovations we just discussed impacting the financial operations of state DOTs?

The panelists agreed that we don't really know how demand will change under new models of personal transportation and vehicle ownership such as transportation network companies (TNCs), ride sharing, or a subscription model for vehicles. And it's still too early to see a dramatic financial impact from electrified vehicles or many of these technologies. It's likely that we still have a decade or so where we can potentially prolong the twilight of the gas tax, depending on the state.

In the interim, states will need to explore how demand for assets and services will change and how those changes should impact their asset management priorities. For example, automated agricultural facilities are changing demand for transportation and telecom in rural areas, and we have no funding model for managing the maintenance of waterways to accommodate demand for freight on inland waterways.

Finally, many stakeholders (including legislators, governors, and the private sector) are interested in and excited about advancing new technologies. However, many of those same stakeholders have not yet adequately addressed funding basic preservation and maintenance of existing assets.

Have states seen any reduction in revenues from EVs?

Attendees varied widely in their views on the level of lost revenues attributed to reduced fuel consumption due to electric vehicle adoption, with estimates ranging from \$0-80 million annually. In all cases the reported losses amounted to a very small percentage of total motor fuel tax revenues. Some

states attributed any increases in consumption to diesel use and positive economic conditions. Concerns were expressed about the increased use of heavier electric vehicles such as trucks doing damage to the highway system, but not contributing to its maintenance through fuel taxes.

The general consensus is that gas tax revenues are not growing as fast as personal VMT and recent tax increases implemented in many states really only had the effect of stabilizing revenues, but have not fully addressed the structural imbalance in needs and funding.

Recent data on public transportation ridership nationally has revealed marked declines in local bus patronage as TNC's (ride sharing and ride hailing) attract local trips. Have the local public transit agencies in your state experienced ridership declines due to siphoning off of trips? Are there State subsidies of transit operations that are being drawn upon to cover impaired farebox recovery ratios?

Nationally there has been an approximately 9% decline in transit ridership, with bus transportation facing the steepest declines. Although many states point to this trend being driven more by the declining price of gas, all agree that taxis are the biggest losers from increased TNC use. The availability of ride hailing for first/ last mile trips can actually serve to increase longer-distance transit use. Many states and localities are implementing fees on TNC rides, airport access, etc., and are exploring new mechanisms like curb/ drop off pricing.

With the looming approach of self-driving Autonomous Vehicles (AV), are there financial demands being placed upon your State DOT to provide "connected" roads—that is, telematic systems that transmit data not just from vehicle-to-vehicle ("V2V") but also Vehicle-to-Infrastructure ("V2I")?

There is ongoing discussion about what will be the dominant technology: DSRC/ 5.9 gigahertz, 5G, etc. Several DOTs have sent letters to the FCC on related issues. However, many states recognize that they can't possibly keep up with technology, and any major public investments in this space would likely end up being behind the curve. Manufacturers recognize this too and are increasingly advancing technologies that will not require connection to the highway infrastructure. The system of the future is vehicle-to-vehicle and GPS based (not based on striping or communication with the infrastructure). This evolution, unchecked, could shut DOTs out of potential safety and cost and efficiencies.

To what extent is your state forecasting declines in State Highway Fund revenues that are attributable to new technologies, such as reduced fuel consumption (and reduced fuel tax collections) due to hybrid and Plug-in Electric Vehicles (PEVs), or reduced auto excise taxes and registration fees due to increased usage of TNCs such as Lyft and Uber?

The participating states indicated that they are not yet explicitly building such factors into their revenue forecasts. Most are reflecting the likely negative impact via a diminished growth factor in traditional sources; some states note these trends in their narrative explanation of forecasts. Bond rating agencies are not yet asking about these issues. A more immediate concern is the potential for a recession following full employment and the resulting impact on vehicle sales, gas tax revenues, etc. Many states have yet to recover to pre-Great Recession levels of motor fuel tax revenues.

The group concluded that there are many factors that impact their transportation revenues and motor fuel taxes specifically. The new challenges on the horizon will affect states differently. California noted that half of all EVs sold in the US are sold in California; whereas Louisiana predicted that in their state that future is much further away.

Future Capacity Building Needs

To conclude the discussion, Jen Brickett solicited feedback from the group regarding future capacity building needs. *The Build America Transportation Investment Center (BATIC) Institute: An AASHTO Center for Excellence* enhances taxpayer value from transportation investment by helping build public sector capacity in project finance. This occurs through a variety of activities, including trainings, sharing of best practices, webinars, and technical assistance to all State Departments of Transportation (DOTs) and their local partner agencies.

The group highlighted a few topics where the BATIC Institute could provide additional assistance:

- Developing communication materials on key funding and finance issues that are suitable for use with legislative and other stakeholders
- Assistance in using federal funds more efficiently across programs
- Assistance handling interaction with federal systems (FMIS) and division offices, including handling inactive projects, project closeout, and FIRE metrics

Participants

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