CENTER FOR TRANSPORTATION RESEARCH

PROJECT SUMMARY

Texas Department of Transportation

0-6803: Technology Task Force

Background

Texas' 83rd Legislature charged the Texas Department of Transportation (TxDOT) with examining and evaluating innovative transportation technologies to decrease costs, reduce traffic congestion, enhance safety, and increase economic productivity. As a result, the Texas Transportation Task Force (TTTF) was formed, encompassing a group of experts who considered four types of emerging transportation technologies: connected vehicles, autonomous vehicles, electric systems, and cloud computing/crowdsourcing technologies.

The initial task was to assemble a panel of subject matter experts drawn from industry and the public sector who could identify key emerging technologies likely to impact transportation over the next 5 to 20 years.

Once formed, TTTF was asked to identify key emerging technologies and outline a path to implementation, which would address policy, economic, and institutional barriers. Ultimately, a menu was developed of the key emerging technologies the state should immediately investigate. TTTF was asked to analyze the identified barriers in order to enable and encourage development and adoption of the emerging technologies while minimizing potential negative impacts. The goal of this task was to ultimately help TxDOT develop strategies to implement technology that makes transportation safer and more efficient.

TTTF's final charge was to consider recommendations and an initial program of work for a public-private consortium and a technology test bed—both collaborative efforts between private industry professionals and public agencies.

Research and analyses were essential for laying the groundwork for the establishment of a strategic plan that will guide decision making for investments and actions in support of the adoption of emerging technologies.

What the Researchers Did

TTTF took a multifaceted approach to summarize four areas of emerging technologies:

- Connected vehicles—vehicles able to communicate with other vehicles and roadway infrastructure through wireless communication technologies.
- Autonomous vehicles—also known as automated or self-driving vehicles.
- Electric systems—the charging system innovations for electric vehicles such as DC fast-charging and in-road inductive charging stations for electric vehicles.
- Cloud computing/crowdsourcing technologies—transportation data and information collection, processing, and dissemination technologies taking advantage of the superior computational and storage power of commercial cloud systems and social media services.

More specifically, TTTF characterized individual emerging technologies in five development stages: prototype development and close-environment testing, open-road and large-scale field testing, initial field

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deployment, system transition, and market domination. Technologies were evaluated at each stage with respect to associated government, industry, and consumer activities. The research illustrated how the adoption and diffusion of new technologies may further TxDOT's goals and other national transportation goals. TTTF identified barriers to new technology adoption and dispersion, and ultimately provided a vision for the future of the Texas transportation system with recommendations for steps to implementation.

In additional to a final report on the evaluation of the technologies and a vision for the future, TTTF completed three white papers on autonomous vehicles, connected vehicles, and cloud computing and crowdsourcing; and two work plans (one for a public-private consortium and the other for a technology test bed in Texas).

What They Found

TTTF identified five key enablers to help eliminate non-technical barriers and promote technology development:

- Data environment—TxDOT may be positioned to help provide a rich data environment to technology developers, allowing them to harness data in order to accelerate service delivery.
- Test environment—A supportive testing environment should be fostered, including the potential temporary provision of infrastructure to technology developers for testing on closed systems.
- Public relations—Public relations efforts would likely be necessary to attract new companies involved in emerging transportation technologies, as well as private capital to fund such efforts and public outreach to garner valuable public input.
- Funding—Limited funding for these efforts will also be necessary, though TTTF anticipates that private entities will fund and conduct the majority of technology development and deployment.
- Public-private partnership—TTTF envisions that these efforts could be spearheaded by a public-private partnership involving government agencies, research institutes, and industry.

What This Means

Based on findings, TTTF developed a vision for moving forward, identifying four implementation strategies that could be conducted over the next 5 years:

- Incubator—Create an organization using public-private partnerships to attract technology developers, investors, and interest groups from the private sector.
- Research consortia—Create a structure to facilitate economic development via collaboration among public, private, and academic/not-for-profit sectors.
- Pilot program—Conduct a pilot program within Texas to demonstrate the proposed vision on a public-private partnership.
- Legislative and regulatory changes—Identify regulatory and legislative barriers to emerging transportation technologies, and help address them.

If pursued, these actions should help make Texas a leader in the development and commercialization of emerging and ultimately disruptive transportation technologies. These actions should further the state's economic development, and ultimately lead to a safe, efficient, and sustainable transportation system.

For More Information

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