Photo Source: USDOT

PLANNING FOR THE FUTURE OF TRANSPORTATION: CONNECTED VEHICLES AND ITS

LIMIT 35 SAFETY

MOBILITY

ENVIRONMENT

For the past decade, the U.S. Department of Transportation (USDOT) has been researching and testing a system of vehicles that can sense the environment around them and communicate with other vehicles and with infrastructure. This vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications will enable safety, mobility, and environmental advancements that current technologies are unable to provide. The technology is expected to reduce unimpaired vehicle crashes by 80 percent, while also reducing the 4.8 billion hours that Americans spend in traffic annually.

In August of 2014, the National Highway Traffic Safety Administration (NHTSA) gave V2V communications technology the green light and is working on a regulatory rulemaking that will require the technology to be installed in all new light vehicles in the coming years.

In May 2015, Secretary Foxx announced the USDOT would accelerate the deployment of connected vehicles. NHTSA will move ahead of its timetable for the proposed V2V rule. The proposal is expected in 2016.

In 2015, the Federal Highway Administration (FHWA) will release a V2I guidance document to assist transportation managers and operators interested in adapting their traffic signals and other roadside devices so they are compatible with the new connected vehicles.

New cars with USDOT-mandated connected vehicle technology should be available by 2019.

Planning for the Future of Transportation

Now is the time to start planning for the inevitability of this life-saving innovation. Planning agencies should begin to consider how their local transportation systems will function in a connected vehicle environment.

The biggest trend in transportation right now is connectivity. Wirelessly connecting our vehicles, roads, and mobile devices will provide tremendous benefits in the improved safety, mobility, and environmental sustainability of our transportation system. When defining the goals and objectives that will drive decision making, planners should be aware of and consider the impact of connected vehicles.

Connected Vehicles and the Planning Process

Transportation agencies have increasingly embraced Performance-based Planning and Programming (PBPP). PBPP attempts to ensure that transportation investment decisions are made—both in long-term planning and short-term programming of projects—based on their ability to meet established goals. The following key elements of PBPP present opportunities for addressing this connected vehicle environment.

www.fhwa.dot.gov/planning/performance_based_planning/

Maturing Transportation Technology through Connected Vehicle Research Planning

Connected Vehicle Pilot Deployment Program: To advance the deployment of connected vehicles, the USDOT is funding regional connected vehicle pilots around the country. The USDOT awarded up to $42 million to New York City; Tampa, FL; and Wyoming for the initial wave of pilots.

- **New York City, NY:** This pilot will install vehicle-to-vehicle (V2V) technology in 10,000 city-owned vehicles, including cars, buses, and limousines, that frequently travel in Midtown Manhattan, as well as vehicle-to-infrastructure (V2I) technology throughout Midtown. This includes upgrading traffic signals with V2I technology along avenues between 14th Street and 66th Street in Manhattan and throughout Brooklyn. Additionally, roadside units will be equipped with connected vehicle technology along the FDR Drive between 50th Street and 90th Street.
- **Tampa, FL:** This pilot will focus on solving peak rush-hour congestion in downtown Tampa and protecting the city's pedestrians by equipping their smart phones with the same connected technology being put into the vehicles. Tampa will also measure the environmental benefits of using this technology.
- **Wyoming:** This pilot will focus on the efficient and safe movement of freight through the I-80 east-west corridor, which is critical to commercial heavy-duty vehicles moving across the northern portion of our country. Approximately 11,000 to 16,000 vehicles travel this corridor every day, and by using V2V and V2I, the Wyoming Department of Transportation will both collect and disseminate information to vehicles not equipped with the new technologies.

For more information on the connected vehicle pilots, visit: www.its.dot.gov/pilots.

U.S. Department of Transportation

Strategic Direction (Where do we want to go?)

The Intelligent Transportation Systems Joint Program Office (ITS JPO) has developed the new *ITS Strategic Plan 2015-2019*, which focuses on six priority areas—Connected Vehicles, Automation, Enterprise Data, Emerging Capabilities, Interoperability, and Accelerating Deployment. In the transportation planning process, strategic direction is based on a vision for the future, as articulated by the public and stakeholders. This includes:

Goals and Objectives – Stemming from a state or region's vision, goals address key desired outcomes; supporting objectives play a key role in shaping planning priorities.

Performance Measures – Performance measures support objectives and serve as a basis for comparing alternative improvement strategies (investment and policy approaches) and for tracking results over time.

The objectives and goals related to safety, congestion, reliability, environment, freight movement, economic vitality, and other regionally important considerations (e.g., multi-modal travel options, real-time traveler information) need to be framed with consideration of how connected vehicles will impact possible outcomes.

Planning Analysis (How are we going to get there?)

Driven by data on performance, along with public involvement and policy considerations, agencies conduct analysis to develop investment and policy priorities:

Identify Trends and Targets – Connected vehicle technology will impact data, public involvement, and policy considerations.

Identify Strategies and Analyze Alternatives – The analysis an agency conducts should consider the technology's implications to identify their long- and short-term targets and develop and analyze alternatives that impact their investment and policy decisions (e.g., the impact on significant roadway capacity, travel demand models, roadway design width, and safety).

Develop Investment Priorities – Agencies should choose strategies as part of their Long Range Transportation Plan (LRTP) that will help achieve targets and consider tradeoffs between different goal areas, as well as policy priorities. Investments should consider the long-term possibilities of a connected vehicle environment.

Programming (What will it take?)

Programming involves selecting specific investments to include in an agency capital plan and/or a transportation improvement program (TIP) or statewide TIP. Programming decisions are made based on their ability to support the achievement of performance targets or contribute to desired trends, and account for a range of factors.

Implementation and Evaluation (How did we do?)

These activities occur throughout implementation on an ongoing basis, and include:

Monitoring – Gathering information on actual conditions

Evaluation – Conducting analysis to understand to what extent implemented strategies have been effective

Reporting – Communicating information about system performance and the effectiveness of plans and programs to policymakers, stakeholders, and the public.

Monitoring, evaluation, and reporting are key elements to ensure that there is proof of concept to add to the case for connected vehicle deployment.

Connected vehicle technology will help address many of the transportation challenges facing communities today:

- Reduce traffic congestion
- Make intersections safer
- Curb vehicle pollution
- Make truck corridors move more efficiently
- Make crosswalks safer for pedestrians and the disabled
- Make public bus transfers move more smoothly
- Make work zones safer for roadside personnel
- Make high-incident management safer for first responders.

ITS and Strategic Planning

The USDOT's ITS JPO fosters the development and future deployment of connected vehicle planning and technology deployment. To achieve this goal, the ITS JPO coordinates connected vehicle research with agencies within the USDOT, including NHTSA, the Federal Highway Administration, FHWA, the Federal Transit Administration, and the Federal Railroad Administration.

Visit the ITS JPO web site to access planning tools and learn more about connected vehicles and ITS.

Planning Tools

- Read the ITS JPO's *ITS Strategic Plan 2015-2019*
- Use the Asset Viewer and Peer-to-Peer Exchange
- View technical publications
- Access economic data and evaluation results
- Read the *V2I Deployment Guidance* (coming in 2015)

ITS News

- View an award-winning animation showing how connected vehicles work
- Sign up for email alerts
- Download connected vehicle fact sheets, infographics, presentations, and more.

For more information about this initiative, please contact:
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