How Talking Cars Will Transform the Future of Driving

Automotive Aftermarket Products Expo (AAPEX)

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Connected Vehicles
Imagine a Transportation System in which VEHICLES CAN SENSE & COMMUNICATE Things That You Can’t.
How Connected Vehicles Work

1. A wireless device in a car sends basic safety messages 10 times per second
2. Other nearby cars and roadside equipment receive the messages
3. Drivers get a warning of a potential crash

*Connected vehicles have the potential to reduce non-impaired crash scenarios by 80%*

*Source: NHTSA*
Connected Vehicles

*What are they?*

Data exchange will use DSRC (Dedicated Short Range Communications) or other wireless media. SCMS (Security Credential & Management System) will be used where appropriate.
Connected Vehicles

*What can they do?*

- Save lives by significantly reducing traffic accidents
- Make travel easier, more efficient, and more enjoyable
- Help curb pollution
Connected Vehicles: *Saving Lives*

**Intersection Movement Assist:**
Warns the driver when it is not safe to enter an intersection—for example, when something is blocking the driver’s view of opposing or crossing traffic.
Queue Warning and Speed Harmonization:
Warns drivers of upcoming congestion and provides speed recommendations
Connected Vehicles: Protecting the Environment

Eco Approach and Departure at Signalized Intersections:

Presents information to drivers about traffic signal timing, allowing drivers to adapt their speed to pass the signal on green or decrease speed to a stop in the most eco-friendly way possible.
Paving the Way for Connected Vehicles

- USDOT has been conducting research and deployment efforts in Connected Vehicles.

- In May 2015, Secretary Foxx announced the USDOT would accelerate the deployment of connected vehicles.
Successfully Piloting Connected Vehicles

Safety Pilot laid the groundwork for understanding how this technology interacts in a real-world setting and how drivers respond to it

- Data collection exceeded our expectations
- Regular drivers experienced proven technology
- Connectivity was achieved across various types and modes
- Risk reductions were achieved
Paving the Way for Connected Vehicles

- In September 2015, Secretary Foxx announced that New York City, Wyoming, and Tampa, FL were selected for the Connected Vehicle Pilot Deployment Program - to pilot next-generation technology in infrastructure and in vehicles to share and communicate with each other and their surroundings in real time, reducing congestion and greenhouse gas emissions, and cutting the unimpaired vehicle crash rate.
Connected Vehicle Pilot Deployment Program

PILOT SITES

New York City

ICF/Wyoming

Tampa (THEA)

Connected Vehicle Pilot Deployment (up to 50 months)

PHASE 1
(up to 12 months)
Concept Dev.

Progress Gate
In Progress

PHASE 2
(up to 20 months)
Design/Deploy/Test

Progress Gate

PHASE 3
(minimum 18 months)
Maintain/Operate Pilot

Transition

Routine Operations (ongoing)

Post-Pilot Operations

Sept. 2016 – Sept 2017
Sept. 2017 – May 2019
May 2019 – Nov. 2020
Connected Vehicle Pilot Deployment Sites

ICF/Wyoming

- Reduce the number and severity of adverse weather-related incidents in the I-80 corridor to improve safety and reduce incident-related delays.
- Focused on the needs of commercial vehicle operators in the State of Wyoming

New York City

- Improve safety and mobility of travelers in New York City through connected vehicle technologies.
- Vehicle-to-vehicle (V2V) technology installed in up to 10,000 vehicles in Midtown Manhattan, and vehicle-to-infrastructure (V2I) technology installed along high-accident rate arterials in Manhattan and Central Brooklyn.

Tampa (THEA)

- Alleviate congestion and improve safety during morning commuting hours.
- Deploy a variety of connected vehicle technologies on and in the vicinity of reversible express lanes and three major arterials in downtown Tampa to solve the transportation challenges.
ICF/WYDOT PILOT DEPLOYMENT OVERVIEW

Objective:
- Reduce the number and severity of adverse weather-related incidents (including secondary incidents) in the I-80 Corridor in order to improve safety and reduce incident-related delays.
  - Focused on the needs of the commercial vehicle operator in the State of Wyoming

Approach:
- Equip fleet vehicles (combination of snow plows, maintenance fleet vehicles, emergency vehicles, and private trucks) that frequently travel the I-80 corridor to transmit basic safety messages (BSMs), collect vehicle and road condition data and provide it remotely to the WYDOT TMCs
- Deploy DSRC roadside equipment (RSE) to supplement existing assets and initiatives
- Road weather data shared with freight carriers who will transmit to their trucks using exiting in-vehicle systems

Deployment Team:
- Prime Consultant: ICF International; Partner State: Wyoming DOT
- Sub Consultants: Trihydro Corporation, National Center for Atmospheric Research, University of Wyoming, Catt Laboratory and McFarland Management
Objective:
- Improve safety and mobility of travelers in New York City through connected vehicle technologies
  - Aligned with the NYC’s Vision Zero initiative, which seeks to reduce crashes and pedestrian fatalities, and increase safety of travelers in all modes of transportation

Approach:
- Equip up to 10,000 vehicles (taxis, buses, commercial fleet delivery trucks, and City-owned vehicles) that frequently travel in Midtown Manhattan and Central Brooklyn to transmit and receive connected vehicle data
- Install V2I technology at high-accident rate arterials:
  - Upgrade 239 traffic signals along 1st, 2nd, 5th, and 6th Avenues in Manhattan and Flatbush Avenue in Central Brooklyn (emergency evacuation route)
  - Deploy Roadside equipment (RSE) along FDR Drive

Deployment Team:
- Prime Consultant: NYC DOT
- Sub Consultants: JHK Engineering, Battelle, Cambridge Systematics, KLD Engineering, Security Innovation and Region 2 University Transportation Research Center
NYCDOT Pilot Deployment Vision
Objective:
- The primary objective of this deployment is to alleviate congestion and improve safety during morning commuting hours.
  - Deploy a variety of vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) safety, mobility, and agency data applications to create reinforcing benefits for motorists, pedestrians, and transit operation.

Approach:
- Deploy a variety of connected vehicle technologies on and in the vicinity of reversible express lanes and three major arterials in downtown Tampa to solve the following transportation challenges:
  - Morning peak hour queues, wrong-way entries, pedestrian safety, bus rapid transit (BRT) signal priority optimization, trip time and safety, streetcar trolley conflicts, and enhanced signal coordination and traffic progression.

Deployment Team:
- Prime Consultant: Tampa Hillsborough Expressway Authority (THEA)
- Sub Consultants: HNTB Corporation, Siemens Industry, Inc., Booz Allen Hamilton, Center for Urban Transportation Research at University of South Florida and Global-5 Communications
Data exchange will use DSRC (Dedicated Short Range Communications) or other wireless media. SCMS (Security Credential & Management System) will be used where appropriate.
Smart City

“A city that uses information and communications technology (ICT) to enhance its livability, workability, and sustainability.”

The Smart Cities Council
Smart Cities and Connected Vehicles

Smart Cities incorporate and expand connected transportation to ensure that connected transportation data, technologies and applications – as well as connected travelers – are fully integrated with other systems across a city, and fulfill their potential to improve safety, mobility and environmental outcomes in a complexly interdependent and multimodal world that supports a more sustainable relationship between transport and the city.
The Time Is Now…

- First new cars with connected vehicle technology available for sale/lease in 2017
- National deployment of connected vehicles is likely by 2020
- Aftermarket devices will bring older vehicles into the connected environment
For More Information

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