

Tampa, Florida

CONNECTED VEHICLE PILOT DEPLOYMENT PROGRAM

Photo Source: USDOT

Pedestrians, transit riders, and automobile drivers in downtown Tampa, Florida, experience transportation challenges on a daily basis. During morning peak periods, inbound commuters on the Lee Roy Selmon Expressway's Reversible Express Lanes (REL) encounter significant delays and, too often, rear-end crashes. Vehicle and pedestrian conflicts are commonplace, especially at a busy mid-block crosswalk near the Hillsborough County Courthouse. Drivers and pedestrians also experience conflicts with buses and streetcars that traverse the central business district. This combination of pedestrians, automobiles, streetcars, and buses makes downtown Tampa a promising environment for new transportation solutions.



Connected Vehicle Pilot Deployment Program

The Connected Vehicle Pilot Deployment Program was launched in September 2015 to deploy, test, and operationalize cutting-edge mobile and roadside technologies and to enable multiple connected vehicle applications. Sponsored by the Intelligent Transportation Systems (ITS) Joint Program Office (JPO), the USDOT awarded cooperative agreements to three agencies:

- New York City Department of Transportation
- Tampa Hillsborough Expressway Authority (THEA)
- Wyoming Department of Transportation.

THEA Connected Vehicle Pilot

The THEA Connected Vehicle Pilot aims to transform the experience of automobile drivers, transit riders, and pedestrians in downtown Tampa by preventing crashes, enhancing traffic flow, improving transit trip times, and reducing greenhouse gas emissions.

Approach

The THEA Connected Vehicle Pilot has equipped buses, streetcars, and hundreds of privately owned vehicles with connected vehicle technology that enables them to communicate vital information with each other and transportation infrastructure elements. Bus and streetcar operators receive information via a dedicated display, while individual commuters get safety alerts in their vehicle's rearview mirror.

Partners

- USDOT
- Florida Department of Transportation
- City of Tampa
- Hillsborough Area Regional Transit (HART)
- HNTB
- University of South Florida Center for Urban Transportation Research
- Siemens
- Brandmotion
- Global-5 Communications.

Stay updated on the THEA
Connected Vehicle Pilot



@Tampa_CV



www.facebook.com/TampaCVpilot



www.TampaCVpilot.com



Use Cases and Applications

The THEA Connected Vehicle Pilot is deploying a variety of safety and mobility applications to address six major issues (use cases).

Morning Backups

As westbound commuters approach the downtown terminus of the REL, they enter a sharp curve ending at a traffic light at the intersection of Twiggs Street and Meridian Avenue. Morning traffic backs up at this intersection, increasing the risk of rear-end crashes. The following applications will address this issue:

End of Ramp Deceleration Warning: Warns the driver to slow down to a recommended speed as the driver approaches the end of a queue.

Forward Collision Warning: Warns the driver when a forward collision is imminent.

Emergency Electronic Brake Light Warning: Alerts the driver that a vehicle ahead is hard braking.

Wrong-Way Drivers

The downtown terminus of the REL is a potential entry point for wrong-way drivers. The THEA Pilot aims to reduce the risk of collisions by detecting and warning wrong-way



drivers before they enter the expressway with the following applications:

Wrong-Way Entry: Warns the driver of a vehicle that is entering the REL from the wrong direction. This application also broadcasts a warning to other equipped vehicles on the REL that a wrong-way driver is approaching.

Intersection Movement Assist: Warns the driver when it is not safe to enter an intersection because of other traffic approaching the intersection. (Note: This is a vehicle-to-vehicle application, so it is not limited to any particular intersection.)

Pedestrian Safety

Conflicts between vehicles and pedestrians crossing Twiggs Street to and from the Hillsborough County Courthouse are common. The THEA Pilot has installed connected vehicle technology at the mid-block crosswalk to enable a pedestrian safety application:

Pedestrian Collision Warning: Alerts the driver of a connected vehicle when a pedestrian is present in the crosswalk ahead.

Transit Delays

Downtown traffic congestion can prevent HART buses from reaching their stops on time, causing them to fall behind schedule. The THEA Pilot has outfitted 10 HART buses with

equipment that will enable them to communicate with traffic signals on several downtown routes:

Transit Signal Priority: Sends signal priority requests from buses, and may lengthen a signal green phase to give priority to a bus if it is behind schedule.

Streetcar Conflicts

The TECO Line Streetcar System is an electric trolley line that roughly follows Channelside Drive between downtown Tampa and Ybor City. The THEA Pilot has equipped eight TECO Line streetcars with devices that enable them to communicate wirelessly with other connected vehicles, enabling the following application:



Vehicle Turning Right in Front of Transit Vehicle:

Warns the streetcar operator when a vehicle is turning right at an intersection the streetcar is approaching, and warns the driver of a connected vehicle that is turning right in front of a streetcar.

Deployment by the Numbers

The THEA Connected Vehicle Pilot is deploying:

- 1000+** privately owned vehicles equipped with onboard units
- 10** buses equipped with onboard units
- 8** streetcars equipped with onboard units
- 48** roadside units throughout downtown

Traffic Progression

Connected vehicles can communicate with traffic signals at equipped intersections on Meridian, Nebraska, and Florida Avenues; Channelside Drive; and other downtown streets to optimize signal timing and improve traffic flow. The instrumented intersections will enable the following applications:

Intelligent Signal System: Optimizes traffic signal timing based on connected vehicle data.

Probe Data-Enabled Traffic Monitoring: Gathers real-time traffic data and sends it to the City of Tampa's Transportation Management Center to improve system-wide performance.

For more information, visit http://www.its.dot.gov/pilots/pilots_thea.htm or contact:

Govind Vadakpat, Research Transportation Specialist, Federal Highway Administration
(202) 493-3283 | g.vadakpat@dot.gov | www.fhwa.dot.gov/

Susan R. Chrzan, Director of Public Affairs and Communications, Tampa Hillsborough Expressway Authority
(813) 272-6740 | info@tampa-xway.com | www.tampa-xway.com

Connected Vehicle Pilot Deployment Program

Connected Vehicle Pilot Interoperability Testing

In the summer of 2018, the pilots successfully achieved a major milestone in paving the way for a nationwide deployment by demonstrating the connected vehicle devices and equipment are interoperable, meaning they can operate as designed anywhere in the country, regardless of where they were built.

Over the course of four days at the Turner-Fairbank Highway Research Center (TFHRC), a federally owned and operated national research facility in McLean, Virginia, the three Connected Vehicle Pilot sites conducted an interoperability test to demonstrate whether a vehicle with an onboard device from one site was able to receive messages from the OBU and RSUs of another site in accordance with the key connected vehicle interfaces and standards. A test of this nature and scope, involving three deployment sites and six device vendors, had never been done before.

Results of the testing indicated successful, interoperable transfer of V2V messages between the OBUs from different vendors, four of which used DSRC and one used a combination of DSRC and satellite communications. Additionally, equipment from each vendor demonstrated the successful transfer of messages between RSUs and each site's OBUs.

6 Things to Know About the Connected Vehicle Pilots



New Wireless Technology Is Being Tested

- Vehicle and pedestrian applications
- Wireless devices
- Standards
- Interoperable technology

All Types of Travelers Are Involved in the Tests

Testing is taking place in commuter traffic, in congested city centers, in crosswalks, and on rural roads



The Pilots' Results Will Transform Transportation

A connected infrastructure can improve the safety, mobility, and efficiency of trucks, cars, buses, pedestrians, traffic signals, work zones, and trolleys

Other Communities Can Replicate the Pilots' Success

Through sharing and collaboration, communities nationwide can follow the successes of the Connected Vehicle Pilot sites



The Data Is Free for Public Use

Detailed reports from each Connected Vehicle Pilot will be published and available for anyone to access for free

Connected Vehicles Could Be in Your Community in the Next Decade

The goal is to create a national system of interoperable connected vehicles and infrastructure



For more information, visit the Connected Vehicle Pilot Deployment Website: <https://www.its.dot.gov/pilots/index.htm> or contact:

USDOT Connected Vehicle Pilot Deployment Program: Kate Hartman, Connected Vehicle Pilot Deployment Program Manager,
ITS Joint Program Office | (202) 366-2742 | kate.hartman@dot.gov | www.its.dot.gov

Wyoming Site: Kate Hartman
Connected Vehicle Pilot Program Manager
ITS Joint Program Office
(202) 366-2742 | kate.hartman@dot.gov

New York City Site: Jonathan Walker
Research and Demonstration Program Manager
ITS Joint Program Office
(202) 366-2199 | jonathan.b.walker@dot.gov

Tampa Site: Govind Vadakpat
Research Transportation Specialist
Federal Highway Administration
(202) 493-3283 | g.vadakpat@dot.gov

