



Photo Source: USDOT and THEA

Connected Vehicle Pilot Deployment Program: **TAMPA, FLORIDA**



Connected Vehicle Pilot Deployment Program

Sponsored by the U.S. Department of Transportation (USDOT) Intelligent Transportation Systems Joint Program Office, the Connected Vehicle Pilot Deployment Program is a national effort to deploy, test, and operationalize cutting-edge mobile and roadside technologies and enable multiple connected vehicle applications.

In early September 2015, the USDOT awarded three cooperative agreements collectively worth more than \$45 million to three sites for the regional connected vehicle pilots:

- New York City, New York
- Wyoming
- Tampa, Florida.

The locations were selected in a competitive process to go beyond traditional vehicle technologies to help drivers better use the roadways to get to work and appointments, relieve the stress caused by bottlenecks, and communicate with pedestrians on cell phones of approaching vehicles.

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 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, buses, and even a cruise ship terminal make downtown Tampa a promising environment for new transportation solutions.

Tampa Connected Vehicle Pilot

The Tampa 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 Tampa Connected Vehicle Pilot will equip buses, streetcars, and privately owned vehicles with connected vehicle technology, which will enable them to communicate vital information with each other and transportation infrastructure elements. Pedestrians will also participate by downloading and using a smartphone app. Drivers, transit riders, and pedestrians in the connected vehicle environment will enjoy a range of safety and mobility benefits, including crash prevention, enhanced traffic flow, and greenhouse gas reductions.



U.S. Department of Transportation

Partners

The Tampa Hillsborough Expressway Authority (THEA) leads this pilot. THEA's partners include:

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

Use Cases and Applications

The Tampa Connected Vehicle Pilot will deploy 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 Lee Roy Selmon Expressway's REL, they enter a sharp curve ending at a traffic light at the intersection of East 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 problem:

- **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 Tampa Pilot aims to reduce the risk of collisions by detecting and warning wrong-way drivers before they get on the expressway with the following applications:



- **Wrong-Way Entry:** Warns the driver of a vehicle that is entering the reversible express lanes from the wrong direction. This application also broadcasts a warning to other equipped vehicles on the reversible lanes that a wrong-way driver is approaching.
- **Intersection Movement Assist (IMA):** Warns the driver when it is not safe to enter an intersection because of other traffic approaching the intersection.

Pedestrian Safety

There are often conflicts between vehicles and pedestrians crossing East Twiggs Street to and from the Hillsborough County Courthouse. The Tampa Pilot will install connected vehicle technology on East Twiggs Street to enable the following pedestrian safety applications:

- **Mobile Accessible Pedestrian Signal System:** Requests a pedestrian crossing signal when an equipped pedestrian approaches the crosswalk at a signalized intersection.
- **Pedestrian in a Signalized Crosswalk Vehicle Warning:** Warns the driver when a pedestrian is using a crosswalk in the vehicle's projected path. The pedestrian also receives a warning that a vehicle is approaching the crosswalk. An additional sensor will detect and warn pedestrians jaywalking outside the crosswalk.

Transit Delays

Downtown traffic congestion can prevent HART buses from reaching their stops on time, causing them to fall behind schedule. The Tampa Pilot will outfit 10 HART buses with equipment that will enable them to communicate with traffic signals along the Marion Avenue bus corridor.

- **Transit Signal Priority:** Receives signal priority requests from buses, and may lengthen a signal green phase to give priority to a bus if it is behind schedule.
- **IMA (described previously):** Will also be used at the instrumented intersections along Marion Avenue.

Streetcar Conflicts

The TECO Line Streetcar System is an electric trolley line that roughly follows Channelside Drive between downtown Tampa and Ybor City. The Tampa Pilot will equip 10 TECO Line streetcars with devices that enable them to communicate wirelessly with other connected vehicles and pedestrians, enabling the following applications:

- **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.
- **Pedestrian in a Signalized Crosswalk Vehicle Warning (described previously):** Will also be used at the instrumented intersections along Channelside Drive to warn pedestrians and streetcar drivers.

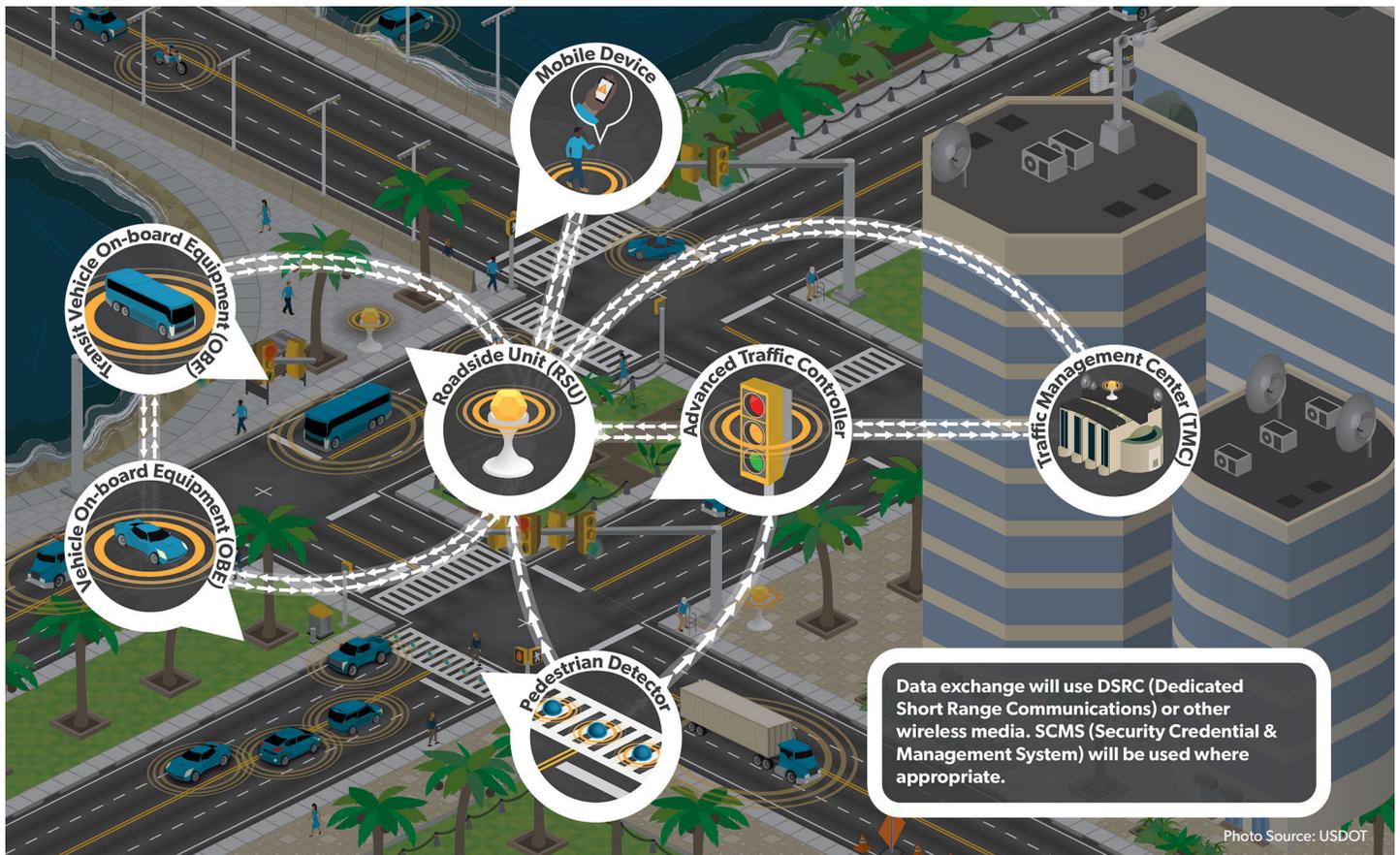


Photo Source: USDOT

Traffic Progression

Connected vehicles will communicate with some traffic signals on Meridian, North Nebraska, and Florida Avenues to optimize signal timing and improve traffic flow based on real-time traffic conditions. The instrumented intersections will enable the following applications:

- **Intelligent Signal System:** Optimizes traffic signal timing based on real-time 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.
- **IMA (described previously):** Will also be used at the instrumented intersections along these avenues.

Deployment by the Numbers

The Tampa Connected Vehicle Pilot is deploying:

- 1,600 privately owned vehicles equipped with onboard units
- 10 buses equipped with onboard units
- 10 streetcars equipped with onboard units
- 500 or more pedestrian participants
- 40 roadside units at the busiest intersections.

Stay updated on the Tampa Connected Vehicle Pilot:

Website: www.TampaCVpilot.com

Facebook: www.facebook.com/TampaCVpilot

Twitter: [@Tampa_CV](https://twitter.com/Tampa_CV)

For more information, please visit http://www.its.dot.gov/pilots/pilots_thea.htm or contact:
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Ready to bring the transportation revolution to your community?

Discover best practices from connected vehicle leaders and early deployers.



Connected vehicle technologies are already being deployed around the country from major cities in Florida and New York to the highways of rural Wyoming. If you are interested in using these revolutionary technologies, visit the Connected Vehicle Pilot Deployment Program's website. This comprehensive website contains FREE up-to-date resources for connected vehicle deployment.

- Updates from the Connected Vehicle Pilot locations
- Pre-recorded webinars showing how other communities are deploying the technology
- Sample deployment concepts
- In-depth planning documents from the sites that can assist you in planning for your community
- Fact sheets you can share with your colleagues
- Other vehicle-to-infrastructure deployment resources

www.its.dot.gov/pilots



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