

Connected Vehicle Pilot Deployment Program Phase 3

Operational Capability Showcase Summary – Tampa (THEA)

www.its.dot.gov/index.htm
Final Report — May 7, 2019
FHWA-JPO-18-718



U.S. Department of Transportation

Produced by Tampa Hillsborough Expressway Authority (THEA) CV Pilot Team
U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office (ITS JPO)

Notice

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof. The U.S. Government is not endorsing any manufacturers, products, or services cited herein and any trade name that may appear in the work has been included only because it is essential to the contents of the work.

This document is based upon work supported by the Federal Highway Administration under contract number DTFH6116H00025. Any opinions, findings and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the Federal Highway Administration.

Technical Report Documentation Page

1. Report No. FHWA-JPO-18-718		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Connected Vehicle Pilot Deployment Program Phase 3, Operational Capability Showcase Summary – Tampa (THEA)				5. Report Date May 7, 2019	
				6. Performing Organization Code	
7. Author(s) Jeff Brown (Global-5), Sue Chrzan (THEA)				8. Performing Organization Report No.	
9. Performing Organization Name And Address Tampa Hillsborough Expressway Authority 1104 East Twiggs Street, Suite 300 Tampa, Florida 33602				10. Work Unit No. (TRAI5)	
				11. Contract or Grant No. DTFH6116H00025	
12. Sponsoring Agency Name and Address U.S. Department of Transportation ITS Joint Program Office 1200 New Jersey Avenue, SE Washington, DC 20590				13. Type of Report and Period Covered	
				14. Sponsoring Agency Code	
15. Supplementary Notes Govind Vadakpat, AOR Sarah Tarpgaard, AO					
16. Abstract The Tampa Hillsborough Expressway Authority (THEA) Connected Vehicle (CV) Pilot, as part of the U.S. Department of Transportation (USDOT) CV Pilot Deployment Program, staged an Operational Capability Showcase on November 29, 2018. The showcase was a media event to communicate the capabilities, intent and value of the deployment. This document summarizes the showcase activities and the media coverage that followed the event.					
17. Key Words Intelligent Transportation Systems, Connected Vehicles, Intelligent Vehicles, Connected Vehicle Pilot Deployment, Vehicle Communication, Outreach, Communications, Media Relations			18. Distribution Statement		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 23	22. Price

Version History

#	Date	Author(s)	Summary of Changes
1.0 Initial Draft	3/12/19	THEA/Global-5	
1.1 Revised Draft	4/16/19	THEA/Global-5	
2.0 Final Report	5/7/19	THEA/Global-5	

Table of Contents

1 Introduction and Overview	2
2 Demonstrations	4
2.1 DEMO #1 – STREETCAR SAFETY	4
2.2 DEMO #2 – BUS SAFETY	5
2.3 DEMO #3 – PEDESTRIAN SAFETY.....	7
3 Media Relations	8
4 Media Coverage	9
4.1 TELEVISION.....	9
4.2 PRINT/DIGITAL.....	9
5 References	11
APPENDIX A. Display Boards.....	12
SHOWCASE OVERVIEW	12
STREETCAR SAFETY	13
BUS SAFETY	14
PEDESTRIAN SAFETY	15
APPENDIX B. News Releases.....	16
APPENDIX C. Media Handout.....	18
APPENDIX D. Fact Sheet.....	22

List of Figures

Figure 1. THEA Executive Director and Chief Executive Officer Joe Waggoner welcomes attendees to the showcase. (Source: THEA).....	2
Figure 2. Streetcar safety demonstration (Source: THEA)	4
Figure 3. Attendees board a TECO Line streetcar. (Source: THEA).....	5
Figure 4. Bus safety demonstration (Source: THEA)	6
Figure 5. A TV news crew reports from a HART bus during the bus safety demonstration. (Source: THEA).....	6
Figure 6. Pedestrian safety demonstration (Source: THEA).....	7
Figure 7. THEA Director of Planning and Innovation Bob Frey speaks with a TV reporter. (Source: THEA)	8

1 Introduction and Overview

The Tampa Hillsborough Expressway Authority (THEA) Connected Vehicle (CV) Pilot is testing and deploying a variety of CV applications to improve safety, mobility and the environment in downtown Tampa as part of the U.S. Department of Transportation (USDOT) CV Pilot Deployment Program. The USDOT program, which also includes sites in New York City and Wyoming, is intended to support the advancement of CV technology by overcoming barriers to deployment, documenting lessons learned, and pointing the way for other potential deployers. (For more information on the program, visit <https://www.its.dot.gov/pilots/>.)

In Tampa, THEA has installed onboard units in the cars of more than 1,000 individual volunteers to enable these vehicles to communicate with each other and with roadside infrastructure. These motorists receive safety alerts on a rearview mirror display. Technicians have also equipped 8 streetcars and 10 buses owned and operated by the Hillsborough Area Regional Transit Authority (HART).



Figure 1. THEA Executive Director and Chief Executive Officer Joe Waggoner welcomes attendees to the showcase. (Source: THEA)

The THEA CV Pilot staged an Operational Capability Showcase in Tampa on November 29, 2018. The showcase was a media event to communicate the capabilities, intent and value of the deployment. Approximately 40 people attended the event, including stakeholders and media.

Plans for the event are summarized in Reference (2). For information about THEA CV Pilot outreach and media relations more broadly, see Reference (1).

The event began with a press conference in THEA's first-floor board room from 8:30 a.m. to 9:00 a.m. Joe Waggoner, Executive Director and Chief Executive Officer of THEA, welcomed the group and Bob Frey, Director of Planning and Innovation for THEA, gave a brief overview of the CV Pilot. Ruthie Reyes Burckard, Chief Operating Officer of HART, gave the transit perspective of the CV Pilot and James Christian, Florida Division Administrator for the Federal Highway Administration (FHWA) offered his comments.

USDOT Research Transportation Specialist Govind Vadakpat, who was the Agreement Officer Representative for the THEA CV Pilot and the final speaker of the morning, commented briefly on the importance of interoperability and what the pilot sites are doing to achieve that goal. He then introduced a short video depicting the interoperability testing that occurred at the USDOT Turner-Fairbank Highway Research Center in McLean, Virginia, on June 26-28, 2018. This video was later made available to the public at <https://www.its.dot.gov/interoperabilityvideo/index.htm>.

After the morning press conference, THEA and its partners conducted a series of three live demonstrations of CV applications. Display boards were set up in the board room to provide attendees with more information about the demonstrations. These boards illustrated the three CV applications to be demonstrated: Vehicle Turning Right in Front of Streetcar, Intersection Movement Assist and Pedestrian Collision Warning (see Appendix A).

After viewing the interoperability video, attendees were invited to board the bus that would take them to the site of the first demonstration.

THEA and Global-5 documented the showcase with photos and video. These assets will be incorporated into slides to be shown at future workshops, conferences and trade shows, as well as the CV Pilot monthly e-newsletter, social media communication channels, and future outreach materials.

2 Demonstrations

2.1 Demo #1 – Streetcar Safety

The streetcar safety demo showed how the CV Pilot is deploying the Vehicle Turning Right in Front of Transit Vehicle (VTRFTV) application to prevent crashes between equipped automobiles and streetcars.

Attendees wishing to participate in the demo rode a bus from THEA to the HART building at 1201 East 7th Avenue, then boarded a streetcar that carried them to Centennial Park Station of the TECO Line Streetcar System. The demo took place at Centennial Park Station.

The streetcar safety demo involved two equipped vehicles: an automobile and a streetcar. A project representative drove the automobile, and a trained TECO Line streetcar motorman operated the streetcar. Attendees were permitted to ride in the back seat of the automobile and on the streetcar. Camera crews were also allowed to shoot from inside and outside of the vehicles.

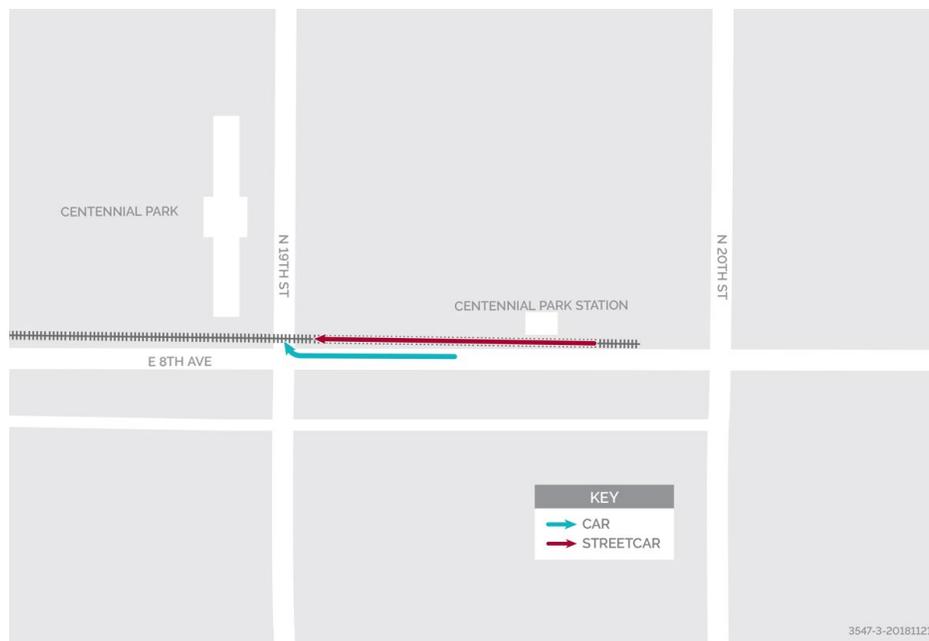


Figure 2. Streetcar safety demonstration (Source: THEA)

The automobile began behind and to the left of the streetcar. As the streetcar moved forward, the automobile driver accelerated alongside the streetcar, activated the right turn signal, and turned to the right as if to cross the track in front of the streetcar. The automobile driver immediately received an

audio and visual alert on the rearview mirror. The streetcar motorman received an audio and visual alert on the screen and responded by bringing the streetcar to a stop.



Figure 3. Attendees board a TECO Line streetcar. (Source: THEA)

Attendees had the opportunity to ask questions during the demo. Afterward, attendees rode the streetcar back to the HART building, where they boarded a bus that took them to the site of the second demo.

2.2 Demo #2 – Bus Safety

The bus safety demo showed how the CV Pilot is deploying the Intersection Movement Assist (IMA) application to help prevent crashes between vehicles at intersections.

Attendees rode the bus from the HART building to the site of the demo on the east side of Meridian Avenue near the intersection with Whiting Street.

This demo involved two equipped vehicles: an automobile and a HART bus. A project representative drove the automobile and a trained HART bus operator drove the bus. Attendees were permitted to ride in the back seat of the automobile and on the bus. Camera crews could also shoot from inside or outside of the vehicles.

The bus traveled northbound on Meridian Avenue toward the intersection with Whiting Street while the automobile traveled west on Whiting Street toward Meridian Avenue. The automobile driver and bus operator both received an audio and visual alert warning them of a potential collision. Both vehicles came to a stop. To repeat the demo, the bus backed up to its starting position. Attendees had the

opportunity to ask questions during the demo. The demo was repeated several times. Attendees returned to THEA on the HART bus.

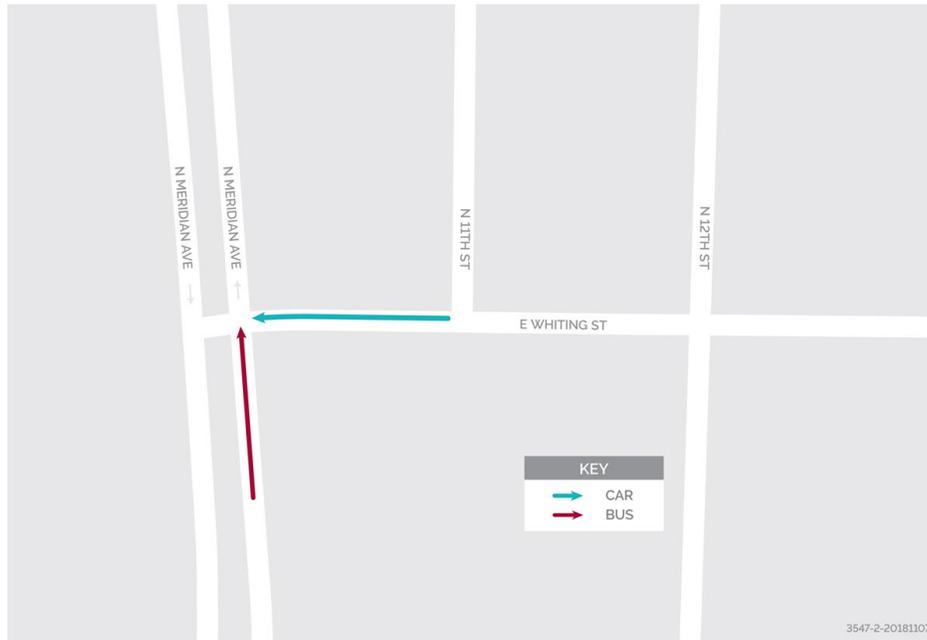


Figure 4. Bus safety demonstration (Source: THEA)



Figure 5. A TV news crew reports from a HART bus during the bus safety demonstration. (Source: THEA)

2.3 Demo #3 – Pedestrian Safety

The pedestrian safety demo showed how the CV Pilot is deploying the Pedestrian Collision Warning (PCW) application to reduce vehicle/pedestrian conflicts on Twiggs Street.

Attendees wishing to participate in the demo boarded CV-equipped automobiles at THEA.

This demo involved two equipped automobiles driven by project team members. Attendees were permitted to ride in the back seat. Camera crews were also able to shoot from inside the car and the north and south sides of Twiggs Street.

The automobiles took turns driving west on Twiggs Street toward the midblock crosswalk at the Hillsborough County Courthouse. A project representative crossed the street within the crosswalk as the automobile approached. The automobile driver received an audio and visual alert warning of a pedestrian in the crosswalk ahead. The driver safely came to a stop. Attendees had the opportunity to ask questions during and after the demo.

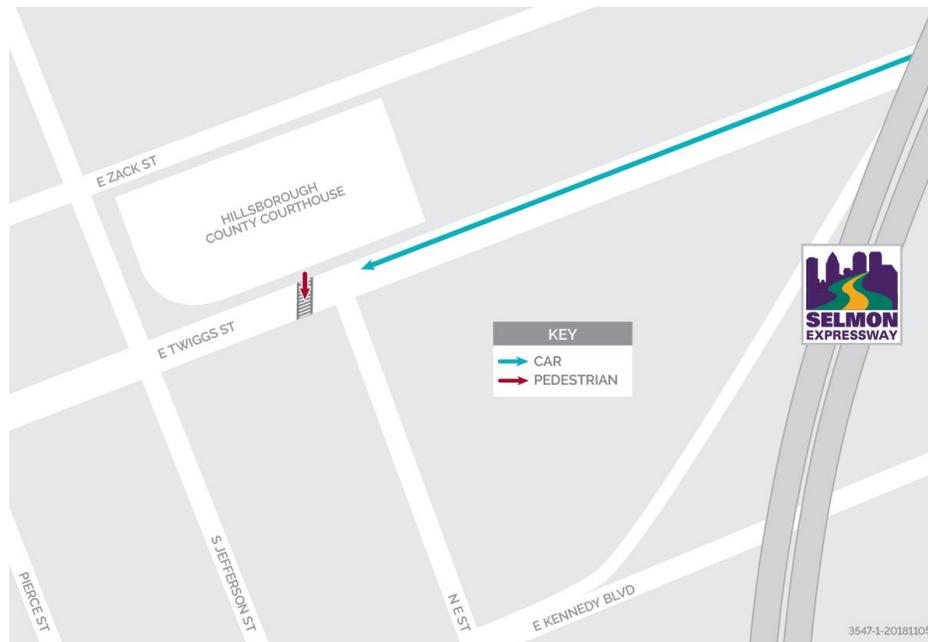


Figure 6. Pedestrian safety demonstration (Source: THEA)

3 Media Relations

THEA issued a media advisory regarding the showcase on November 21, 2018, and a news release on November 27. The distribution list included local TV, radio, print and online media; industry media; and national media. THEA also issued a follow-up news release on November 30, the day after the event (see Appendix B).

THEA gathered resources for news outlets into an electronic media kit that was made available to reporters at the event as well as online. The electronic media kit included the November 27 news release (Appendix B); a handout including an agenda, maps and descriptions of the demonstrations (Appendix C); a project fact sheet (Appendix D); and a USB flash drive with supporting photos and video.

Reporters conducted impromptu on-camera interviews at THEA at various times throughout the day.

The media kit is available at <https://www.tampacvpilot.com/media-kit-nov2018/>.



Figure 7. THEA Director of Planning and Innovation Bob Frey speaks with a TV reporter. (Source: THEA)

4 Media Coverage

The showcase attracted significant interest from local, state and industry media. THEA has linked to these media mentions on its social media accounts and on the dedicated THEA CV Pilot social media accounts (Facebook and Twitter). Other stakeholders including HART and ITS JPO also promoted coverage of the event on their social media accounts.

4.1 Television

The following Florida TV stations covered the Operational Capability Showcase:

- (1) WFLA-TV (News Channel 8) – Tampa
- (2) WFTS-TV (ABC Action News) – Tampa
- (3) WFTX-TV (Fox 4) – Fort Myers/Naples
- (4) WTVT-TV (Fox 13) – Tampa

4.2 Print/Digital

The Operational Capability Showcase generated the following articles in print and online news outlets:

- (1) “Connected vehicle tech tested in Tampa, Florida,” Metro, December 3, 2018, <http://www.metro-magazine.com/technology/news/732257/connected-vehicle-tech-tested-in-tampa-florida/>
- (2) Descant, Skip. “Tampa launches major test of connected vehicle technology,” Future Structure, December 11, 2018, <http://www.govtech.com/fs/automation/Tampa-Launches-Major-Test-of-Connected-Vehicle-Technology.html>
- (3) Descant, Skip. “Tampa launches major test of connected vehicle technology,” Mass Transit, December 12, 2018, <https://www.masstransitmag.com/alt-mobility/autonomous-vehicles/news/21036579/tampa-launches-major-test-of-connected-vehicle-technology/>
- (4) “Florida transportation agencies demonstrate connected vehicle tech,” Roads & Bridges, December 5, 2018, <https://www.roadbridges.com/florida-transportation-agencies-demonstrate-connected-vehicle-tech/>
- (5) Fox, Andrea. “Buses and streetcars added to Tampa connected vehicle pilot,” EfficientGov, November 28, 2018, <https://efficientgov.com/blog/2018/11/28/buses-and-streetcars-added-to-tampa-connected-vehicle-pilot/>
- (6) Frost, Adam. “USDOT’s Tampa pilot successfully demonstrates connected technology with transit vehicles,” Traffic Technology Today, December 10, 2018,

- <https://www.traffictechtoday.com/news/connected-vehicles-infrastructure/usdots-tampa-pilot-successfully-demonstrates-connected-technology-with-transit-vehicles-2.html>
- (7) Grigg, Nicolle. "Cars talking to cars happening in Tampa as connected vehicle program rolls out," ABC Action News, November 29, 2018, <https://www.abcactionnews.com/news/driving-tampa-bay-forward/cars-talking-to-cars-happening-in-tampa-as-connected-vehicle-program-rolls-out/>
- (8) Jones, Jana. "New technology in 'connected' vehicles aims to make Tampa roads safer," News Channel 8, November 29, 2018, <https://www.wfla.com/news/hillsborough-county/new-technology-in-connected-vehicles-aims-to-make-tampa-roads-safer/1626436582/>
- (9) Mesmer, Aaron. "Tampa tests next step in driverless cars," Fox 13 News, November 29, 2018, <http://www.fox13news.com/news/local-news/tampa-tests-next-step-in-driverless-cars/>
- (10) Peeples, Doug. "Connected transit: a big step toward safer streets," Smart Cities Council, December 6, 2018, <https://na.smartcitiescouncil.com/article/connected-transit-big-step-toward-safer-streets/>

5 References

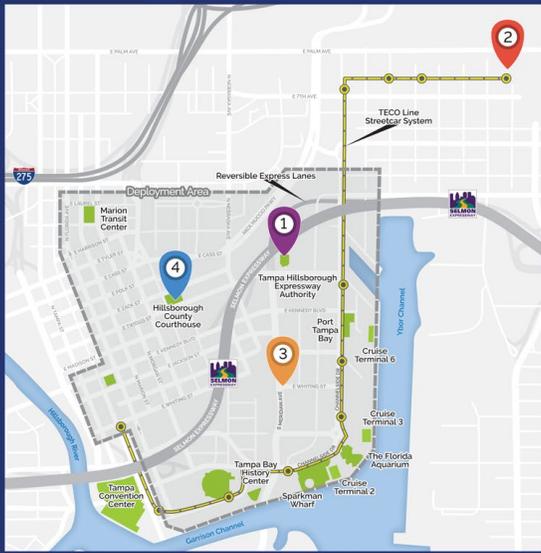
- (1) Tampa Hillsborough Expressway Authority. *Connected Vehicle Pilot Deployment Program Phase 2, Outreach Plan—Tampa (THEA)*. FHWA-JPO-17-479. Washington, D.C.: U.S. Department of Transportation, Updated Report, December 2018.
- (2) Tampa Hillsborough Expressway Authority. *Connected Vehicle Pilot Deployment Program Phase 3, Operational Capability Showcase Plan—Tampa (THEA)*. FHWA-JPO-18-717. Washington, D.C.: U.S. Department of Transportation, November 2018.

APPENDIX A. Display Boards

Showcase Overview



TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY CONNECTED VEHICLE PILOT SHOWCASE



SCHEDULE

8:30 AM	1. Introduction THEA Boardroom
9:15 AM	2. Streetcar Safety Demo Centennial Park Station, E 8 th Ave
10:15 AM	3. Bus Safety Demo Intersection of Meridian Ave & Whiting St
11:15 AM	4. Pedestrian Safety Demo Twiggs St at Hillsborough County Courthouse

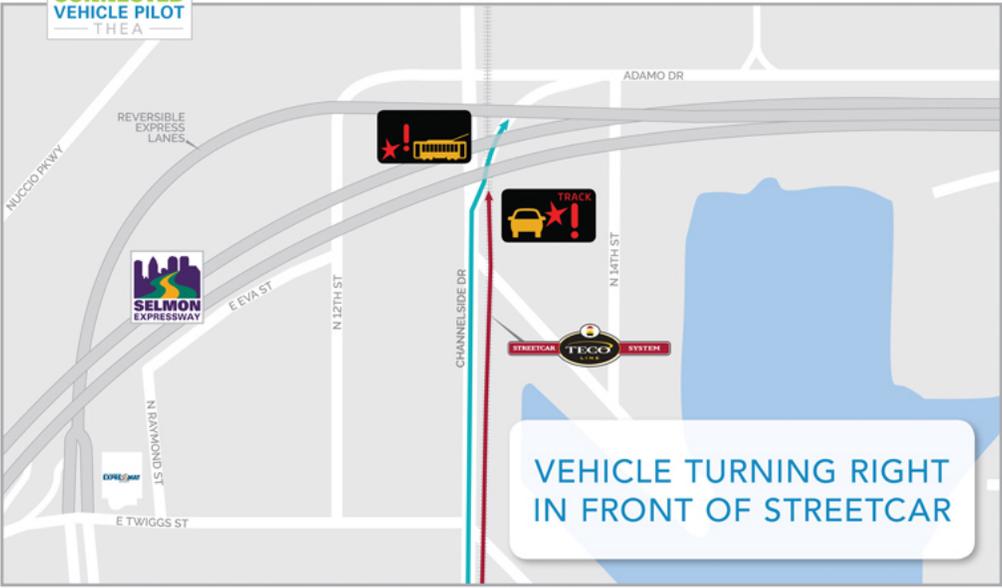
U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

Streetcar Safety

Vehicle-to-Vehicle Communication



CONNECTED VEHICLE PILOT
THEA



VEHICLE TURNING RIGHT IN FRONT OF STREETCAR




 If the driver of a connected vehicle attempts to turn right in front of a moving streetcar, the driver receives a warning.




 The streetcar motorman receives a warning that a connected vehicle is crossing the track ahead.

TAMPA BAY REGIONAL
EXPRESSWAY
AUTHORITY

TampaCVPilot.com

TampaCVPilot

@Tampa_CV

TampaCV

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

Bus Safety



Vehicle-to-Vehicle Communication

INTERSECTION MOVEMENT ASSIST



KEY

- CAR
- BUS



Drivers of connected cars and buses receive an alert if they are on a potential collision course with another connected vehicle that is approaching the same intersection, even if they cannot see the other vehicle.

TAMPA BAY AREA EXPRESWAY AUTHORITY

TampaCVPilot.com [TampaCVPilot](https://www.facebook.com/TampaCVPilot) [@Tampa_CV](https://twitter.com/Tampa_CV) [TampaCV](https://www.instagram.com/TampaCV)

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

Pedestrian Safety


Vehicle-to-Infrastructure Communication



PEDESTRIAN COLLISION
WARNING



Drivers of connected vehicles receive an alert if they are on a potential collision course with a pedestrian in the crosswalk ahead.





 TampaCVpilot.com
 TampaCVPilot
 @Tampa_CV
 TampaCV

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

APPENDIX B. News Releases



For Immediate Release
November 27, 2018
Contact: Sue Chrzan
Tampa Hillsborough Expressway Authority
sue@tampa-xway.com
813-272-6740 ext.130

NEWS RELEASE

Tampa Hillsborough Expressway Authority to Demonstrate Connected Vehicle Technology with HART Transit Vehicles

Tampa, FL – The Tampa Hillsborough Expressway Authority (THEA) and the Hillsborough Area Regional Transit Authority (HART) invite you to attend a press event showcasing connected vehicle technology used in transit vehicles. The Connected Vehicle Pilot Showcase will take place on Thursday, November 29, 2018, from 8:30 am to 1:00 pm. After brief opening remarks, media will travel to three demonstration sites to witness the first-ever demonstration of how the connected vehicle safety applications on transit vehicles can help prevent crashes between cars, transit vehicles, and even pedestrians. Transportation to each destination is courtesy of HART.

The safety applications in the vehicles have been successfully demonstrated and reported on previously; this event will highlight applications involving HART buses, TECO Line System streetcars, and pedestrians for the first time. Media will have the opportunity to ride in a car, bus and streetcar that are equipped to “talk” to the roadway and other connected vehicles.

A media kit is available online at <https://www.tampacvpilot.com/media-kit-nov2018/>.

Date: Thursday, November, 29, 2018
8:30 am – 9:00 am – Introductory Remarks
9:00 am – 1:00 pm – Demonstrations

Location: Tampa Hillsborough Expressway Authority
Board Room
1104 E. Twiggs St.
Tampa, FL 33602

Resources: Reporters will have access to:

- Rides in a connected car, bus, and streetcar accompanied by experts
- Interview opportunities with THEA, HART and visiting US Department of Transportation officials
- Electronic media kit including photos and video

Directions: From downtown Tampa, go east on Twiggs Street, cross Meridian Avenue and turn left on N. Raymond Street. Take the second entrance on the left into the THEA parking lot.

1104 East Twiggs | Tampa | FL | 33602 | Tampa-xway.com

1

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office



For Immediate Release

November 30, 2018

Contact: Sue Chrzan

Tampa Hillsborough Expressway Authority

sue@tampa-xway.com

813-272-6740 ext.130

NEWS RELEASE

Tampa Hillsborough Expressway Authority Demonstrates Connected Vehicle Technology with HART Transit Vehicles

Tampa, FL – On Thursday, November 29, the Tampa Hillsborough Expressway Authority (THEA) and the Hillsborough Area Regional Transit Authority (HART) demonstrated connected vehicle technology in HART transit vehicles for the first time. The live demonstrations were a milestone for the THEA Connected Vehicle Pilot, which has now deployed the potentially lifesaving technology in 1,000 cars, 10 buses and 8 streetcars to improve safety and mobility in downtown Tampa.

Connected vehicle technology enables vehicles to communicate wirelessly with each other and with traffic signals, crosswalks and other infrastructure. In a series of controlled demonstrations, onboard equipment successfully alerted drivers to potential collisions between a car and a TECO Line streetcar; between a car and a HART bus; and between a car and a pedestrian.

Officials from the Florida Division of the Federal Highway Administration and the U.S. Department of Transportation (USDOT) participated in the demonstrations. The THEA Connected Vehicle Pilot is sponsored by the USDOT.

"The connected vehicle pilot is great for Tampa because this is new, innovative technology. If you see what is going on around the world with autonomy, connectivity and smart cities, it's all coming, and Tampa is going to be among the first. We have a base infrastructure in place that we can build on, and that gives us an advantage," said Bob Frey, Director of Planning and Innovations for THEA.

"Connected vehicles hold the promise of saving lives while making travel more convenient and efficient. This project is truly one of a kind, and we are excited to see the results. We are taking safety to a new level by showcasing this technology," said James Christian, Florida Division Administrator for the Federal Highway Administration.

An online media kit is available at <https://www.tampacvpilot.com/media-kit-nov2018/>.

For more information on the Connected Vehicle Pilot, visit <https://www.tampacvpilot.com/>.

APPENDIX C. Media Handout



Walk. Ride. Drive. *Smarter.*

TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY (THEA) CONNECTED VEHICLE PILOT SHOWCASE

1104 East Twiggs Street, Tampa, Florida
November 29, 2018

AGENDA

8:30 a.m. Welcome
Joe Waggoner, Executive Director and CEO, THEA

8:35 a.m. Introduction to the Connected Vehicle Pilot
Bob Frey, Director of Planning and Innovations, THEA

8:40 a.m. Hillsborough Area Regional Transit Authority (HART) Perspective
Ruthie Reyes Burckard, Chief Operating Officer, HART

8:45 a.m. Federal Highway Administration Perspective
James Christian, Division Administrator, Federal Highway Administration

8:50 a.m. Interoperability—Introduction and Video
Govind Vadakpat, Research Transportation Specialist, U.S. Department of Transportation

9:00 a.m. Transportation to Demo #1

9:15 a.m. Demo #1—Streetcar Safety
Location: Centennial Park Station, 20th Street & 8th Avenue

10:00 a.m. Transportation to Demo #2

10:15 a.m. Demo #2—Bus Safety
Location: Intersection of Meridian Avenue & Whiting Street

11:00 a.m. Transportation to Demo #3

11:15 a.m. Demo #3—Pedestrian Safety
Location: Twiggs Street at Hillsborough County Courthouse

12:15 p.m. Conclusion
Bob Frey

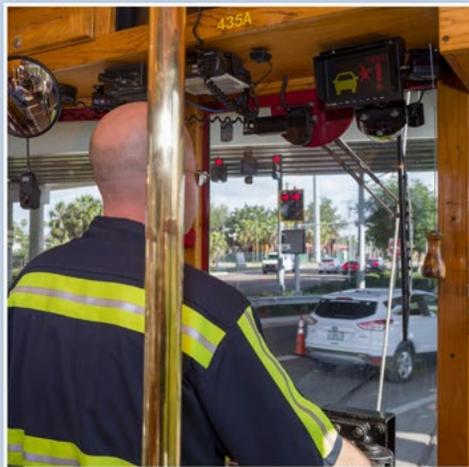
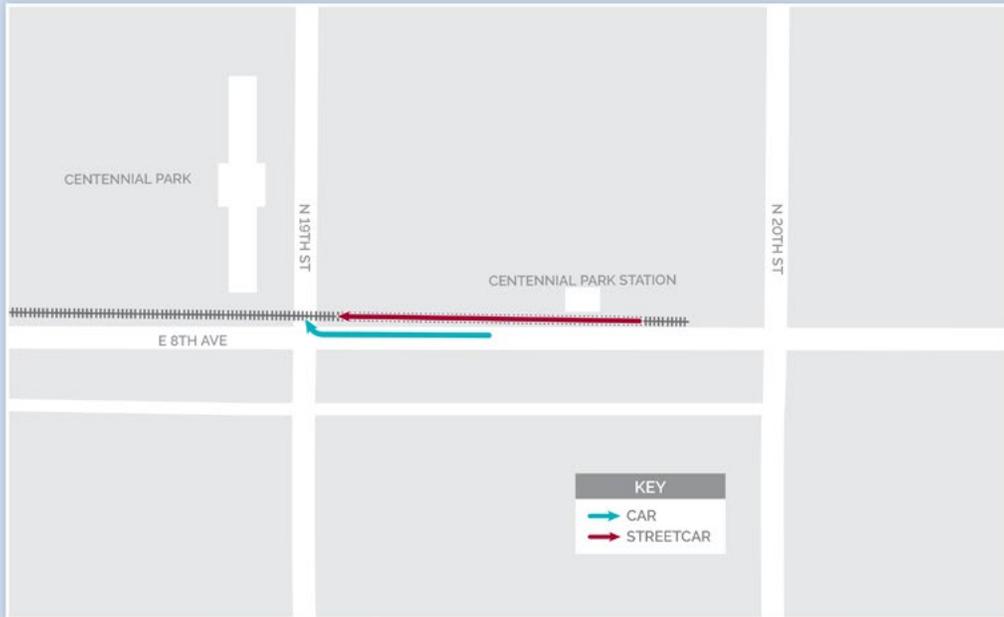
    

3592-20181127

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

DEMO #1 — STREETCAR SAFETY

Location: Centennial Park Station, 20th Street & 8th Avenue



The THEA Connected Vehicle Pilot is the first deployment of connected vehicle technology on a U.S. streetcar line. This demonstration shows how the technology can help prevent crashes between equipped automobiles and streetcars.

The demonstration begins at the TECO Line Streetcar System's Centennial Park Station near the intersection of 20th Street and 8th Avenue. As the streetcar pulls away from the station, a car passes the streetcar on the left and initiates a right turn in front of the moving streetcar.

Connected vehicle technology enables both vehicles to communicate with each other. As a result, the driver making the turn receives an audible warning and a visual alert on the rearview mirror display. The streetcar motorman also receives an audible warning and visual alert, and brings the streetcar safely to a stop.

TAMPA HILLSBOROUGH
EXPRESSWAY
AUTHORITY



TampaCVPilot.com



TampaCVPilot



@Tampa_CV



TampaCV

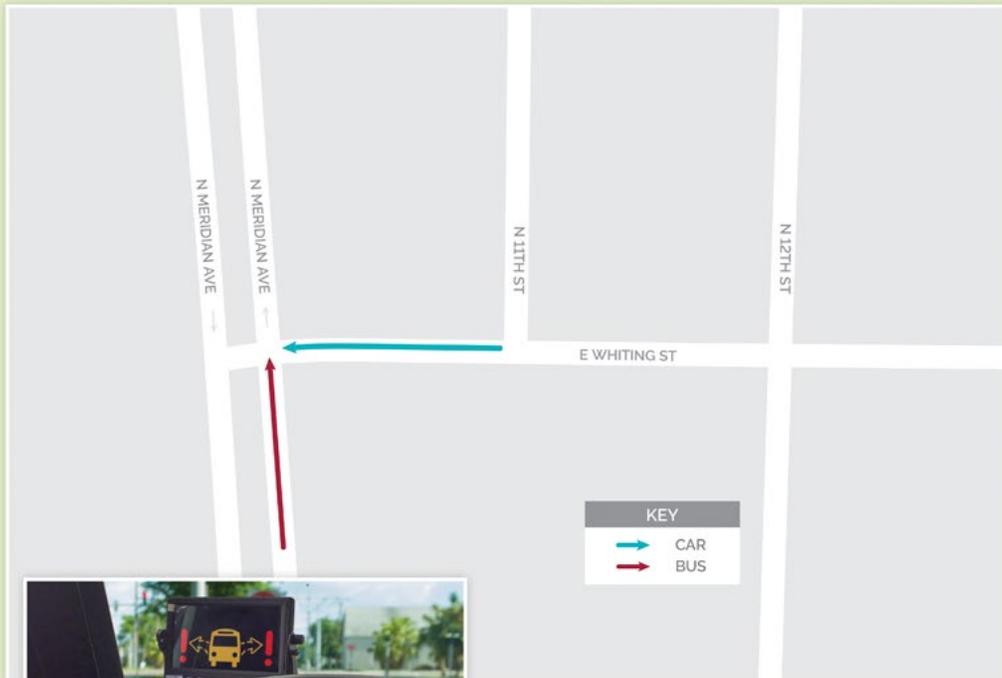
2

3592-20181127

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

DEMO #2 — BUS SAFETY

Location: Intersection of Meridian Avenue & Whiting Street



The THEA Connected Vehicle Pilot enables buses and cars to alert their drivers to potentially dangerous situations. This demonstration shows how connected vehicle technology can help prevent side impact collisions at intersections.



In this demonstration, a Hillsborough Area Regional Transit Authority (HART) bus and a car approach the intersection of Meridian Avenue and Whiting Street from two different directions. Wireless communication enables both equipped vehicles to share vital information, including location, speed and heading. Based on this information, the vehicles' onboard systems calculate that a collision is imminent. Both drivers receive an audio and visual alert so they can brake in time to avoid a crash.

TAMPA HILLSBOROUGH
EXPRESSWAY
AUTHORITY



TampaCVPilot.com



TampaCVPilot



@Tampa_CV



TampaCV

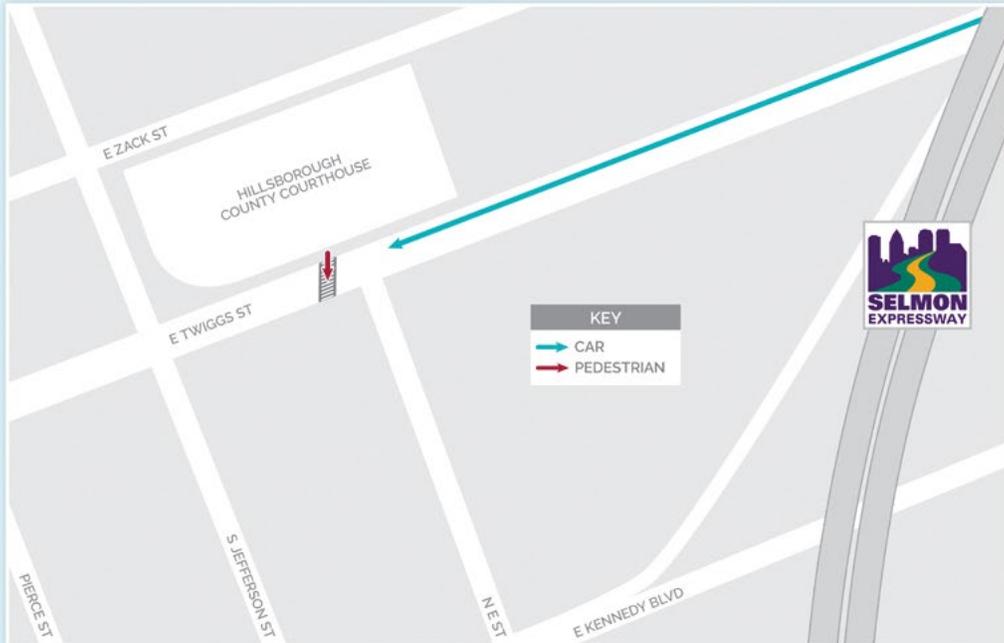
3

3592-20181127

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

DEMO #3 — PEDESTRIAN SAFETY

Location: Twiggs Street at Hillsborough County Courthouse



Improving pedestrian safety is an important goal of the THEA Connected Vehicle Pilot. This demonstration shows how the pilot uses a combination of Light Detection and Ranging (LiDAR) and connected vehicle technology to help achieve that goal.

The midblock crosswalk on Twiggs Street at the Hillsborough County Courthouse is one of the busiest crosswalks in downtown Tampa. As part of the THEA Connected Vehicle Pilot, LiDAR equipment (for detecting pedestrians) and a roadside unit (for communicating with connected vehicles) have been installed at this location.



In this demonstration, an equipped vehicle approaches the crosswalk as a pedestrian crosses the street. The LiDAR system detects the pedestrian, and the roadside unit broadcasts the information to any connected vehicles in the area. When the demonstration vehicle's onboard equipment receives the information and calculates that a collision is imminent, the driver receives an audio warning and a visual alert in the rearview mirror. The driver brings the vehicle safely to a stop.

TAMPA HILLSBOROUGH
EXPRESSWAY
AUTHORITY



TampaCVPilot.com



TampaCVPilot



@Tampa_CV



TampaCV

4

3592-20181127

U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

APPENDIX D. Fact Sheet



Walk. Ride. Drive. *Smarter.*



THEA CONNECTED VEHICLE PILOT — FACT SHEET

Tampa, Florida, is one of the first cities in the nation to deploy connected vehicle technology on real city streets. Tampa's deployment is uniquely multimodal, encompassing pedestrians, buses, streetcars and privately owned automobiles.

GOALS

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

BACKGROUND

The THEA Connected Vehicle Pilot began in 2015, when the U.S. Department of Transportation (USDOT) awarded THEA a contract as part of its Connected Vehicle Pilot Deployment Program. In 2016, USDOT authorized THEA and its partners to proceed with design, testing and deployment. The final phase of the \$21-million project, which began in 2018, involves the full-scale operation of connected vehicle technology throughout downtown Tampa.

PARTNERS

THEA has assembled an implementation team that includes HNTB, Siemens, the University of South Florida Center for Urban Transportation Research, Brandmotion and Global-5 Communications. Other key partners include the Florida Department of Transportation, the City of Tampa, the Hillsborough Area Regional Transit Authority (HART) and Hillsborough Community College.

COMMUNITY

Pedestrians, transit riders and automobile drivers in downtown Tampa experience transportation challenges on a daily basis. For example, inbound commuters on the Lee Roy Selmon Expressway's Reversible Express Lanes encounter significant delays and, too often, rear-end crashes during morning peak periods. Vehicle/pedestrian conflicts are commonplace, especially at a busy mid-block crosswalk near the Hillsborough County Courthouse. Drivers and pedestrians also conflict with buses and streetcars that traverse the central business district. The combination of pedestrians, bicyclists, automobiles, streetcars, buses and even a cruise ship terminal makes downtown Tampa an environment ripe for new transportation solutions.

APPROACH

The THEA Connected Vehicle Pilot has equipped buses, streetcars and hundreds of privately owned vehicles with technology that enables them to communicate with each other and with elements of the transportation infrastructure.

Bus and streetcar operators receive information on a dedicated display, while individual drivers get safety alerts in their vehicle's rearview mirror.



TampaCVPilot.com



TampaCVPilot



@Tampa_CV



TampaCV



Walk. Ride. Drive. *Smarter.*



APPLICATIONS

- Emergency Electronic Brake Light Warning** – Alerts the driver to hard braking ahead.
- End of Ramp Deceleration Warning** – Warns the driver to slow down to a recommended speed as the vehicle approaches the end of a queue.
- Forward Collision Warning** – Warns the driver when a forward collision is imminent.
- Intelligent Signal System** – Optimizes traffic signal timing based on connected vehicle data.
- Intersection Movement Assist** – Warns the driver when it is not safe to enter an intersection.
- Pedestrian Collision Warning** – Warns the driver when a pedestrian is using a crosswalk in the vehicle's projected path.
- Pedestrian in a Crosswalk Vehicle Warning** – Identifies potential conflicts between pedestrians in a crosswalk and approaching vehicles.
- Probe Data Enabled Traffic Monitoring** – Gathers traffic data from connected vehicles to optimize transportation management.
- Transit Signal Priority** – Gives buses priority at traffic signals to keep them running on schedule.
- Vehicle Turning Right in Front of Transit Vehicle** – Warns the streetcar operator when a vehicle is turning right at an intersection as the streetcar is approaching.
- Wrong Way Entry** – Warns the driver of a vehicle that is entering the reversible express lanes in the wrong direction and warns other equipped vehicles that a wrong-way driver is approaching.

THE NUMBERS

- More than **1,000** privately owned vehicles equipped with onboard units
- 10** buses equipped with onboard units
- 8** streetcars equipped with onboard units
- 46** roadside units

GET INVOLVED

Website: www.TampaCVPilot.com
 Facebook: www.facebook.com/TampaCVPilot
 Twitter: [@Tampa_CV](https://twitter.com/Tampa_CV)
 Instagram: [@TampaCV](https://www.instagram.com/TampaCV)

For more information, please contact:
 Susan R. Chrzan
 Director of Public Affairs & Communications
 Tampa Hillsborough Expressway Authority
 (813) 272-6740
info@tampa-xway.com / www.tampa-xway.com



TampaCVPilot.com



TampaCVPilot



@Tampa_CV



TampaCV

2672-20181114

U.S. Department of Transportation
ITS Joint Program Office-HOIT
1200 New Jersey Avenue, SE
Washington, DC 20590

Toll-Free "Help Line" 866-367-7487
www.its.dot.gov

FHWA-JPO-18-718



U.S. Department of Transportation