



TAMPA-HILLSBOROUGH
EXPRESSWAY
AUTHORITY

**Connected Vehicle Pilot
Tampa, Florida –
Managing Safety and Mobility
Impacts in Integrated
Expressway/Surface Street
Networks**

August 1, 2017
ITE Annual Meeting
Toronto, Canada



Connected Vehicle Pilot Program



PROGRAM GOALS



PILOT SITES



ICF/Wyoming DOT

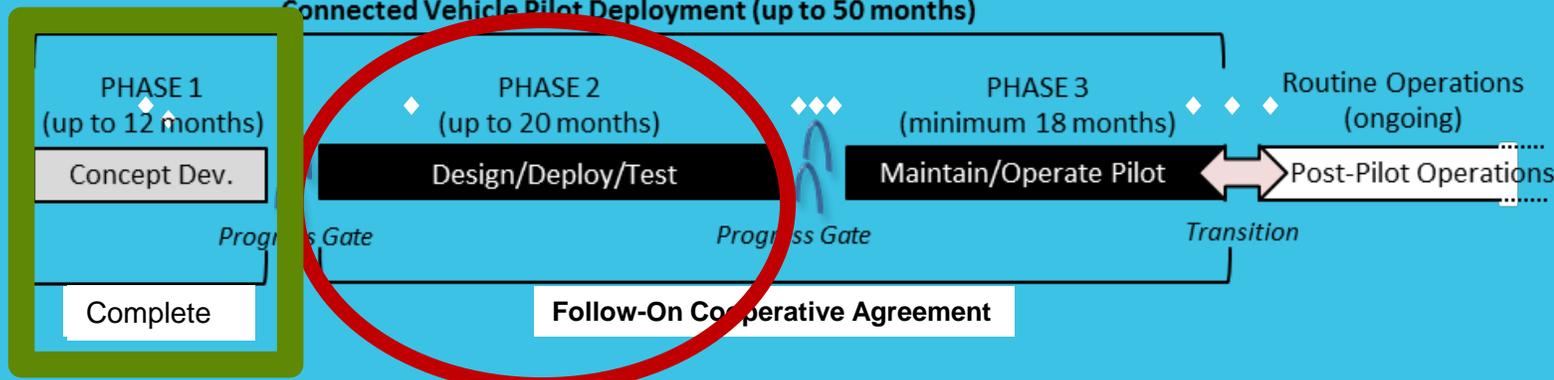


NYCDOT



Tampa (THEA)

Connected Vehicle Pilot Deployment (up to 50 months)



Participants



PHOTO: THEA



PHOTO: NPR



PHOTO: THEA



PHOTO: THEA

1,600

Privately Owned
Vehicles

500+

Pedestrian
Smartphones
(Android devices only)

10

TECO Line
Streetcar Trolleys

10

Hillsborough Area
Regional Transit
(HART) buses

Connected Vehicle Applications 1 of 2



APPLICATION	DESCRIPTION
End of Ramp Deceleration Warning (ERDW)	Alerts driver approaching curve with speed safety warning
Emergency Electronic Brake Light (EEBL)	Enables broadcast to surrounding vehicles of severe braking
Forward Collision Warning (FCW)	Warns driver of impending collision ahead in same lane
Intersection Movement Assist (IMA)	Indicates unsafe (i.e., wrong way) entry into an intersection
Intelligent Traffic Signal System (I-SIG)	Adjusts signal timing for optimal flow along with PED-SIG and TSP
Probe Date Enabled Traffic Monitoring (PDETM)	Uses vehicles as probes to calculate travel times
Transit Signal Priority (TSP)	Allows transit vehicle to request and receive priority at a traffic signal
Vehicle Turning Right in Front of a Transit Vehicle (VTRFTV)	Alerts transit vehicle driver that a car is attempting to turn right in front of the transit vehicle
Wrong Way Entry	Warns driver of potential and actual Wrong Way travel direction

Connected Vehicle Applications 2 of 2



APPLICATION	DESCRIPTION
Pedestrian Collision Warning (PCW)	Alerts vehicle to the presence of pedestrian in a crosswalk
Pedestrian Safety	Single pedestrian application
Pedestrian in a Crosswalk Vehicle Warning (Ped-X)	Calculates the path trajectory of the pedestrian and approaching vehicles and logs an event if a potential conflict is identified.
Pedestrian Mobility (PED-SIG)	Gives pedestrians priority with signal phase and timing
Pedestrian Transit Movement Warning (PTMW)	Provides informational warnings to pedestrians that a bus or streetcar is starting up / stopping at an intersection

HMI Photos



Mirror display uses sticker to depict location and concept of warning.
Actual image is still in development

Source: Brand Motion and Global 5

Component Locations



REARVIEW MIRROR

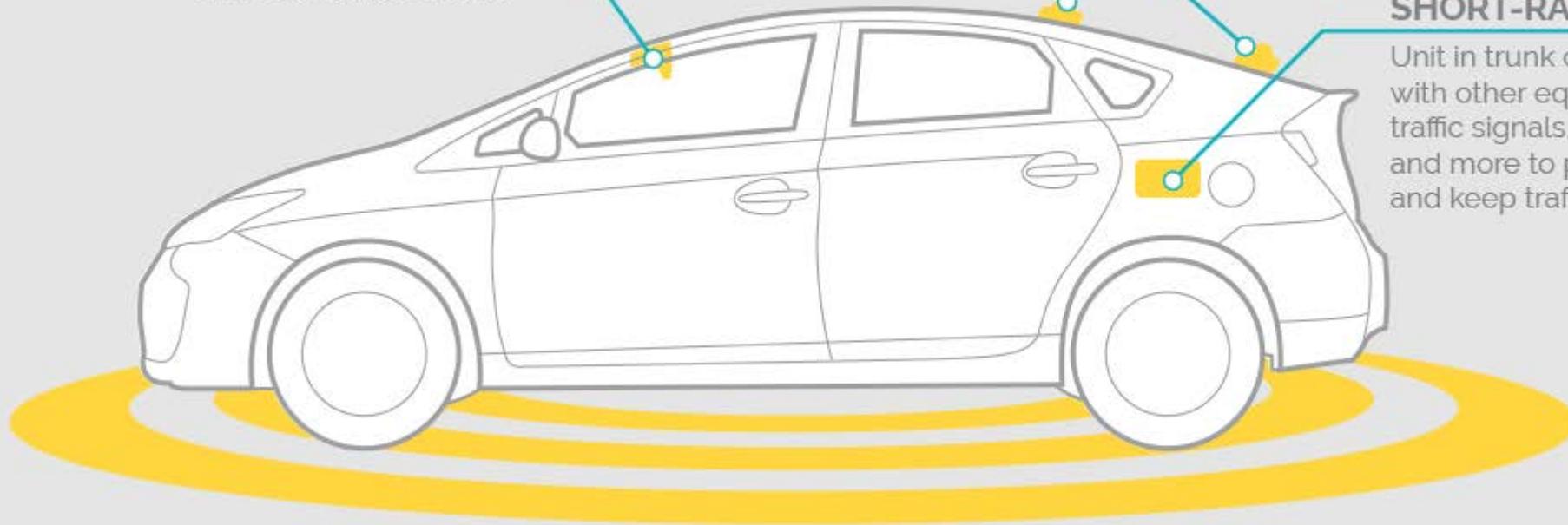
Displays safety messages and issues audio alerts

ANTENNAS

Send and receive data

SHORT-RANGE RADIO

Unit in trunk communicates with other equipped cars, traffic signals, crosswalks and more to prevent crashes and keep traffic moving



(Actual location of equipment may vary.)

Workforce Development Needs – PCB Targets



- Vehicle Maintenance Issues
 - Aftermarket equipment connected to ODE-2 port
 - OEM Equipment connected to CAN Bus
 - FIPS 140-2 Level 2/3 HSMs
 - Antenna Replacements
 - Non-CV Aftermarket Device Interference
- Security / Privacy Issues
 - OEM Line Staff Training
 - Interoperability Among Makes/Models - SCMS
 - HSM Compromise
 - Stolen Vehicle
 - Wrecked Vehicle
 - Malicious Actor/Owner
 - Misbehavior Detection
 - Resale – mechanism to sanitize PII



- Dealership sales / Service Staff Training Programs
- Parts Suppliers / Retailer Staff Training
- Collision Repair Facilities Staff Training

- ITS Designers
 - DSRC Training (CVP)
 - Wireless Security
 - IoT Security
 - Smartphone Applications / Security
- ITS Integrators
 - DSRC Training (CVP)
 - Wireless Security
 - IoT Security
 - Smartphone Applications / Security
- Road Operators / TMC Staff training