FTA Office of Research, Demonstration and Innovation

Safety Pilot Model Deployment - Transit

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Topics

- Transit Safety Retrofit Package (TRP)
  - Applications
  - Independent Evaluation
  - Next Steps

- 2014 Transit Connected Vehicle for Safety Research
  - V2I
  - Light Rail
TRP Applications & Phasing

- *Pedestrian in Signalized Crosswalk Warning (PCW) - V2I*
- *Vehicle Turning Right in Front of Bus Warning (VTRW) - V2V*
- *Forward Collision Warning (FCW) - V2V*
- *Emergency Electronic Brake Lights (EEBL) - V2V*
- *Curve Speed Warning (CSW) - V2I*

**Phased Deployment:**
- Phase 1: FCW, EEBL, and CSW in cloaked mode - August 2012
- Phase 2: Data Acquisition System (DAS) - October 2012
- Phase 3:
  - Bus driver training - December 2012
  - All applications operational – February 1, 2013
Onboard Equipment

Transit Vehicle

Transit Vehicle

Transit Vehicle

Bus Stops

Intersections

TRP Safety

Applications

In-Vehicle Display

Wireless Safety Unit

(WSU)

DVI Interface

TRP Safety

Applications

GPS Antenna

DSRC Antennas

GPS

DSRC Radio

Basic Safety

Applications

Vehicle Data

Data Acquisition

System

Vehicle Information

DAS

Video Cameras

Radar

Roadside Infrastructure

Information

Remote Vehicle

Information

Transit Vehicle

Information

GPS Signal

Hardware Boundary

Image Sources: USDOT, Battelle, and UMTRI, 2012
Pedestrian in Signalized Crosswalk Warning

Provides bus driver a warning when a pedestrian is crossing the street as the bus is making a turn.

NOTE:
Option 1 — This option includes sending an alert when the crosswalk signal has been activated.
Option 2 — This option includes the use of a pedestrian detection system to detect the presence of a pedestrian in the crosswalk.

Image Sources: Google Maps and Noblis
PCW Infrastructure

Clockwise from top right:
- Savari roadside equipment (RSE)
- SPaT interface device
- SmartWalk XM pedestrian detection sensor (24.125 GHz microwave transmitter/receiver that uses a microprocessor-analyzed Doppler detection method)
PCW Video

Video Source: Battelle, 2013
Vehicle Turning Right in Front of Bus Warning

Provides bus driver a warning when a vehicle turns right in front of a bus as the bus pulls away from a bus stop

Image Sources: [http://www.youtube.com/watch?v=9gXEgFw99_0](http://www.youtube.com/watch?v=9gXEgFw99_0) and Noblis
VTRW Video
Independent Evaluation

- System Performance
  - Application accuracy
  - Availability
  - Driver interface

- Driver Acceptance
  - Usability
  - Perceived benefits
  - Understandability
  - Desirability

- Safety Impact
  - Response to alerts
  - Driver attention
Next Steps

- **TRP**
  - Bus driver survey – September (completed)
  - Bus driver focus group – September 30
  - Complete data collection – September 30
  - Preliminary evaluation – October
  - Applications modification and testing – November through January
  - In-service operations and final feedback – February
  - Evaluation results – Summer 2014

- **2014 Transit Connected Vehicle for Safety Research**
  - Transit V2I applications selection, development, and testing
  - Light rail exploratory research
For More Information

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