CONNECTED VEHICLE PILOT
Deployment Program

Tampa (THEA) Concept of Operations

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ITS Joint Program Office
TODAY’S AGENDA

- Purpose of this Webinar
  - To share the Concept Development Activities from the Tampa (THEA) Pilot site with the stakeholders of connected vehicle technologies.

- Webinar Content
  - Connected Vehicle Pilot Deployment Program Overview (*Govind Vadakpat*)
  - THEA Concept of Operations (*THEA Team*)
  - Stakeholder Q&A (*Govind Vadakpat & THEA Team*)
  - How to Stay Connected (*Govind Vadakpat*)

- Webinar Protocol
  - Please mute your phone during the entire webinar.
  - You are welcome to ask questions via chatbox at the Q&A Section.
  - The webinar recording and the presentation material will be posted on the CV Pilots website.
To provide all interested parties a sense of the key issues targeted at each site, the conceptual approach, and what they have learned from working in-depth with key stakeholders in the Concept Development Phase.
Expected Impact Area

[Map showing the expected impact area around Tampa International Airport, Hillsborough Bay, and other key locations with the Selmon Expressway highlighted.]

Legend:
- Selmon Expressway: 14 miles
- Reversible Express Lanes (REL): 11 miles
- Selmon Connector
- Mainline Toll Gantry
- Ramp Toll Gantry
- Extended Stakeholder Impact Area

Focused CV-Pilot Area

[Source: U.S. Department of Transportation]
Where will CV be deployed?
Why This Geographic Region

- THEA Owns and Operates the Leroy Selmon Expressway
- THEA Owns and Operates Meridian Avenue
- Substantial Commuting Into Downtown
- Commuters Through Downtown (MacDill Air Force Base)
- City of Tampa Staff Co-Located at THEA Traffic Management Center
- High Pedestrian Traffic
- Significant Interaction Between Light Vehicles, Transit, and Pedestrians
- Specific Known Problem Areas
Six Use Cases

- Morning Backups And Congestion
- Wrong-Way Entries
- Pedestrian Safety
- Transit Signal Priority Optimization And Safety
- TECO Line Streetcar Conflicts
- Enhanced Signal Coordination And Traffic Progression
Intersection of Twiggs Street and Meridian Avenue at Reversible Express Lanes Entrance/Exit

ISSUES AND NEEDS
- Queue backup on curve
- Poor traffic flow on signalized arterials
- Back-to-back right turns
WRONG-WAY ENTRIES

Entry/Exit Points Along Selmon Expressway and Reversible Express Lanes (REL)

ISSUES AND NEEDS
- Wrong-way REL entry leads to serious incidents
ISSUES AND NEEDS
- Pedestrian struck-by incidents
- Midblock crossing with no protected left turn at signal
- Pedestrians crossing at unmarked locations
Express Route through Downtown City Streets to Marion Street Transit Station

ISSUES AND NEEDS

- Poor traffic flow on signalized arterials
- Passenger vehicles blocking access to transit stops
TECO LINE STREETCAR CONFLICTS

ISSUES AND NEEDS
- Safety concerns and incidents due to streetcar, pedestrian, vehicle, cyclist conflicts
- Afternoon peak alternate routes
- Planned special events
ENHANCED SIGNAL COORDINATION AND TRAFFIC PROGRESSION

ISSUES AND NEEDS
- Morning backups and congestion
- Planned special events backups and congestion
- MacDill Air Force Base controlled access points congestion
Deployment Concept Overview

Tampa (THEA)
Tampa Hillsborough Expressway Authority

Steve Novosad – System Development Lead
Dave Miller – Integration Lead
Approach

- 6 Use Cases Created
- Each Use Case Integrates Two or More USDOT Connected Vehicle Applications
- Use Cases Cover More Than a Single Location
- Use Case Coverage can Overlap
Target Area
Intersection of Twiggs Street and Meridian Avenue at Reversible Express Lanes Entrance/Exit

Avoid Crashes due to Back-to-back Right Turns
V2V Safety: FCW and EEBL

Reduce Queue Backup on Curve
Curve Speed Warning (CSW)

Improve Signal Timing Progression
Intelligent Traffic Signal System (I-SIG)

Performance Measures
- Number of Alerts
- Number of Incidents
- Queuing/Position on Curve
- Traffic Speed
- Queue length
- Wait time
- Percent on Green
Wrong-Way Incidents

Target Area
Entry/Exit Points Along Selmon and Reversible Express Lanes (REL)

Improve Safety at the Entry/Exit Point

Effectively Control Reversible Express Lane

Signal Control at Express Lane Entries

Performance Measures
- Number of Alerts
- Number of Incidents
- Percent on Green
- Red Light Running
Pedestrian Safety

Target Area
Midblock of Twiggs Street at Hillsborough County Courthouse

Improve Pedestrian Safety at Unmarked Crossing Locations

Provide Pedestrian Crossing Signal Timing

Pedestrian in Signalized Crosswalk Warning

Mobile Accessible Pedestrian Signal (PED I-SIG) and I-SIG

Performance Measures
- Number of Alerts Drivers
- Number of Alerts Pedestrians
- Number of Incidents
- Pedestrian Wait Time
- Vehicle Wait Time
Transit Signal Priority, Optimization And Safety

Target Area
Express Route through Downtown City Streets to Marion Street Transit Station

- Improve Signal Timing Progression
- Improve Bus On-schedule Performance
- Intelligent Traffic Signal System (I-SIG)
- Transit Signal Priority (TSP)

Performance Measures
- Queue length
- Wait time
- Percent on Green
**TECO Line Streetcar Conflicts**

**Target Area**
- Adamo Drive (SR 60)/Channelside Drive
- Amalie Arena/Channelside Drive Area

**Avoid Potential Vehicle Conflicts**

**Improve Signal Timing for Special Events**

**Performance Measures**
- Number of Alerts – Trolley Operators
- Number of Alerts – Pedestrians
- Number of Incidents

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*Vehicle Turning Right in Front of Bus Warning*

*Intelligent Traffic Signal System (I-SIG)*
Target Area
- Along Twiggs Street from Selmon to Marion Street
- Along Meridian Avenue from REL to Channelside Drive

Performance Measures
- Queue length
- Wait time
- Percent on Green
- Red Light Running

Enhanced Signal Coordination And Traffic Progression
- Effectively Monitor Peak Queuing and Congestion
- Improve Traffic Progression
- Probe Enabled Traffic Monitoring
- Intelligent Traffic Signal System (I-SIG)
What makes all this work?

- Basic Connected Vehicle elements
  - Vehicle On-Board Units (OBUs)
  - Roadside Units (RSUs)
  - Wireless Communication Technologies
  - Integration of Applications
  - Connected Vehicle Systems Engineering Architecture (CVRIA)
  - Data Management
  - Security
- THEA Traffic Management Center
- Existing Traffic Control System
- Stakeholder Cooperation
  - THEA
  - CoT
  - HART
  - MAFB
Stakeholder Engagement Summary

Tampa (THEA)
Tampa Hillsborough Expressway Authority

Steve Johnson – Program Management Lead
Stakeholder Engagement - Who we talked to

- Team Member/Partner Stakeholders
  - THEA and consultants
  - City of Tampa
  - Hillsborough Area Regional Transit (HART)

- Non Team Member Partner Stakeholders
  - FDOT District Seven
  - Hillsborough County
  - Hillsborough County Sheriff
  - City of Tampa Police
  - Florida Highway Patrol
  - MacDill AFB

- General Stakeholders
  - Tampa Bay Port Authority & Cruise Terminal, Amalie Arena (Tampa Bay Lightning), Tampa Downtown Partnership, Tampa Chamber of Commerce, Tampa Convention Center, Hillsborough County Circuit Court, and others.
Stakeholder Engagement – What We Heard

➤ From Partner Stakeholders
   ❖ Excitement and Pride in the award and Tampa being a technology leader
   ❖ Validated that our use cases selected were on target
   ❖ Concerns as to interim effect on operations
     ▪ Training, Interruptions, Installation and Maintenance, Liability

➤ From Non Partner Stakeholders
   ❖ Validated that our use cases selected were on target
   ❖ Mixed perceptions of what CV Pilot was all about
     ▪ Autonomous Vehicle (AV) vs. Connected Vehicle (CV)
   ❖ Concerns about cost – misconception that we may be offering a referendum for taxes to fund Pilot
   ❖ Concerns for Privacy and Anonymity
Stakeholder Engagement – What We Learned

- **From Partner Stakeholders**
  - Gleaned information that allowed us to refine our use cases and CV Applications for better synergy among use cases and multiple sites.
  - Better understanding of the operations and the Pilot’s impact to our partners.
  - Reinforced the need to build a sustainability model for post-pilot continuity and expansion of operations.
  - That Florida is out in front in creating a legislative/regulatory environment for advancing AV/CV Applications.

- **From Non Partner Stakeholders**
  - Need for early outreach and education to provide dissemination of accurate information about Connected Vehicles and the Pilot:
    - Alleviate concerns about cost
    - Alleviate Privacy Information Concerns
  - Previous Pilots experienced participant difficulties
So the ConOps is done, Now What Do We Do With It?

- What the ConOps does in terms of setting the tone for the remainder of the Phase 1 activities.
  - Builds common consensus on which partners/stakeholders can base their understanding of what to expect from the pilot, build MOU’s and other operational interoperability documents.
  - Provides the structure from which we create the standards and specifications to ensure vendors understand and comply with system requirements

- The ConOps is the foundational document for Phase 1.
  - Teams will build System Requirements from validated user needs in the ConOps.
  - And we will create a full scale plan to deploy the system in phase 2

But the ConOps is a “Living” document.

- It will be continually reviewed and updated throughout phase 1 and phase 2
- It will incorporate lessons learned and adjust for new developments in available technology.
Please keep your phone muted

Please use chatbox to ask questions

Questions will be answered in the order in which they were received
Join us for the *Getting Ready for Deployment* Series

- Discover more about the 2015 CV Pilot Sites
- Learn the Essential Steps to CV Deployment
- Engage in Technical Discussion

Website: [http://www.its.dot.gov/pilots](http://www.its.dot.gov/pilots)
Twitter: [@ITSJPODirector](https://twitter.com/ITSJPODirector)
Facebook: [https://www.facebook.com/DOTRITA](https://www.facebook.com/DOTRITA)

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Public ConOps Webinars:

- **ICF/Wyoming Pilot Site**
  2/5/2016, 1:00 – 2:00 pm EST

- **Tampa (THEA) Pilot Site**
  2/8/2016, 2:00 – 3:00 pm EST

- **NYC Pilot Site**
  TBD

Please visit the CV pilots website for the recording and the briefing material of the previous webinars.