Presentation Overview

• Truck Parking Availability System (TPAS)
• Research Projects
• Federal Grants
• TPAS Deployment Locations
• Deployment Mechanisms
• Project Schedule
• TPAS Documents
• TPAS Architecture
• Data Dissemination
Truck Parking Availability System (TPAS)

TPAS Supports

• Federal Motor Carrier Safety Administration (FMCSA) Hours-of-Service regulation
• Safe and convenient parking options
• Just-in-time delivery
• Advance planning for freight operation
• Reduced truck parking violations
• Electronic monitoring and dissemination of information
Florida International University (FIU) Research

Part 1: Identify current supply and demand of public parking
- Identified needs to “balance” parking use
- Developed key requirements for TPAS
Florida International University (FIU) Research

Part 2: Assess technology to improve parking management
  • Leon County Pilot Project with in-pavement sensors

FIU Research Report

Leon County Truck Parking

RN: Relay Node
DC: Data Collector
Pucks (typ.)
Project Delivery

STAGE 1: Implementation of technology to accurately assess and disseminate the availability of truck parking.

STAGE 2: Development of predictive analysis for future parking, with Stage 2 following once sufficient data is available.

STAGE 3: Incorporation of private parking locations for systemwide resource utilization.

Three-stage approach to statewide comprehensive truck parking solution.
FDOT Pilot Project

- Location: I-95, St. Johns County, FDOT district 2
- Project used MVDS sensors to count trucks at ingress/egress of truck parking lot
- Provide advanced notification of truck parking availability

Pilot TPAS Sign on I-95 in St. Johns County
University of Florida (UF) Research

Evaluation of in-ground sensors to examine their capabilities

- Tested four different vendors

Ground-truth data through video logs

Three products listed on Innovative Products List (IPL)

Video Camera Mounting Details
SensIT

- Detection using magnetic and infrared (IR) sensors
- Frequency band at 902-928 MHz.
- In-ground sensor power using battery
  - Battery life: 5-10 Years
- Relay Node power using battery
  - Battery life: 5-7 Years
- Data aggregator (data collector)
  - Power: 100-240Vac, 50-60 Hz
Sensys

- MicroRadar detection
- Frequency band at 2400-2483.5 Mhz
- In-ground sensor power using battery
  - Battery life: 8 Years
- Repeater power: Battery
  - Battery life: 8 Years
- Data aggregator input power
  - External power 22-26 VDC (24 VDC nominal)
University of Florida (UF) Research

CivicSmart

- MicroRadar detection
- Frequency band at 2405-2480 MHz
- In-Ground sensor power using battery
  - Battery life: 8 Years
- No Repeater or Relay node
- Data aggregator can work on commercial as well as solar power
- Data aggregator power
  - 8.2 VDC rechargeable battery pack
  - External power 12 VDC
  - 10 Watt solar panel power
University of Florida (UF) Research

Performance Accuracy Requirements

- Turnover Accuracy – 90%
- Occupancy Accuracy – 95%
- Detection system test conducted over two 15 hour (6:00 pm to 9:00 am) sessions

Developmental Specification 660

VEHICLE DETECTION SYSTEM.
(REV 12-20-16)

ARTICLE 660-2 is expanded by the following:

660-2.5 Truck Parking Detection System: Furnish and install a truck parking detection system in accordance with the details shown in the Plans. The detection system must be capable
Federal Grants

FDOT Received two (2) federal grants

• Federal AID: $1 Million
• FASTLANE: ~ $11 Million
TPAS Deployment

Deployment TPAS System

- Rest Areas
- Weigh Stations
- Welcome Centers
TPAS Locations

- 45 rest areas
- 20 weigh stations
- 3 welcome centers

<table>
<thead>
<tr>
<th>Number of Truck Parking Spaces Monitored</th>
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<td>Microwave Vehicle Detection System (MVDS)</td>
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FDOT Public Truck Parking Locations
- Rest Area
- Welcome Center
- Weigh Station

4 Corridors: I-95, I-4, I-75, I-10
3 Welcome Centers
20 Weigh Stations
45 Rest Areas
Truck Parking Sites Located in FDOT Districts 1, 2, 3, 4, 5 and 7
# Deployment Mechanism

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<th>FDOT District 5 (Phase I)</th>
<th>Funding</th>
<th>Corridor</th>
<th>Sites</th>
<th>Vendor</th>
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<td>1 Welcome Center, 12 Rest Areas, 4 Weigh Stations</td>
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Project Schedule

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TPAS Integration

TPAS device communication integration with existing ITS communication network

• Minimal interruption to existing ITS infrastructure and RTMC operations
• No fiber splices allowed to existing ITS fiber network
• Connect to available ports in existing MFES Switch in ITS cabinet
• Existing fiber network is untouched

TPAS Device Power

• Reduce additional utility bills
  • Use of Existing ITS service drops where feasible
  • Connect to existing ITS cabinet to draw power for TPAS sign
• NO UPS and/or solar power provided to the TPAS cabinets
TPAS System Engineering Documents

Deployment TPAS System

• Project Systems Engineering Management Plan (PSEMP)
• Concept of Operations
• Truck Parking ConOps Companion
• Requirement Verification Traceability Matrix (RTVM)
• TPAS Guidelines for RTMC Standard Operating Procedures (SOPs)
TPAS Concept Plans and Guide Sign

- Concept Plans Development
  - For each Design Build Project
  - Identified TPAS Sign location
  - TPAS system integration details

- Guide Sign Worksheets
  - Rest Area, Welcome Center and Weigh Station TPAS Signs
  - TPAS Sign Placed Inside Rest Area to Guide Trucks Towards Available Parking Rows
TPAS Certification Documents

Certification Documents

- Environmental Evaluation Report
- Environmental Certification
- Utility Certification
- Rail Certification
- Right of Way certification
TPAS Sponsorship Sign

TPAS Supplemental Sponsorship Sign

- 6’ X 4’ Size of the Supplemental Sponsorship Sign
- Supplemental Sign located right justified below TPAS Sign
- FDOT received FHWA Approval

WELCOME CENTER
TRUCK PARKING
XXX
SPACES AVAILABLE

Supplemental Sponsorship Sign
TPAS Sign Cabinet
TPAS Architecture

Data collection
• In-ground sensors
• Ingress and egress sensors

Data communications
• Existing ITS network

Data collection, processing, and storage
• RTMC using SunGuide® system

Data dissemination
• Embedded roadside Dynamic Message Sign (DMS)
• Connected Vehicle and Dedicated Short Range Communications (DSRC) - Future
• Florida 511
• Data Integration and Video Aggregation System (DIVAS)
TPAS SunGuide® Interface

- Each in-ground sensor vendor
  - Mock set up at Traffic Engineering Research Lab (TERL)
  - Interface Control Document (ICD) using TPAS ConOps Companion
- In-ground sensor data interface with SunGuide® is adopted during mock set up
- SunGuide® Release 7.0
  - Display truck parking availability at rest areas and weigh stations
  - Truck parking availability posted on DMS signs
Information Dissemination - Signs

Criteria used for roadside signs

- Two to three miles upstream of the parking facility preferably prior to an upstream exit ramp for better decision-making
- Manual of Uniform Traffic Control Devices (MUTCD) compliant
- Near existing ITS communication and power source
- Near an existing CCTV for message verification
Information Dissemination - 511

FL511 Website Truck Parking Facility Map View

FL511 Mobile App Truck Parking Facilities List View
Questions?

Thank you!

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