Port Everglades Petroleum Commodity Flow Pilot Study

presented by
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Min-Tang Li, FDOT-D4

December 9, 2015
Project Objectives

- Establish partnerships between agencies and with private sector
- Quantify petroleum product flows from PEV:
  - Collect, or
  - Approximate objectively
- Research and pilot test innovative technologies to:
  - Identify and track
  - Truck and Rail tanker vehicles
- Information sharing with freight community

Applies to transportation infrastructure:
- Planning
- Management
- Network recovery
Project Partnerships

FHWA
- Headquarters
- Resource Center
- FL Division

FDOT
- Central Office
- District 4
- District 6

Regional Partners
- Port Everglades
- Petroleum Assn. PEV
- Trucking companies
- FEC Railway

Stakeholders
- MPOs: Broward, Miami-Dade, Palm Beach
- Airports
Petroleum Commodity Flow

Gulf Coast Supply Origins

Foreign Supply Origins

Container ships

(Petroleum Products)

Barge Delivery

Port Everglades

Shipping Companies

Storage Tanks

Pipeline

Gas Station

User

FLL to MIA

Rail Shipment (Ethanol)
Commodity Flow Analysis

- Fuel Tax Data – Florida Department of Revenue
  - Origin and destination locations
  - Transaction date
  - Fuel product type
  - Shipping mode, carrier
  - Volume (gal)

  - 7.2M records

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ATRI Data Analysis – USF

- **Task 1:** Gather ATRI’s truck-GPS data and other data sources and sign non-disclosure agreement with ATRI
- **Task 2:** Derive the trip chains of trucks originating at Port Everglades (PEV)
- **Task 3:** Identify & separate petroleum tanker trucks originating at PEV
- **Task 4:** Derive travel paths for trucks traveling between PEV and gas stations
Truck Route Choice
Truck Route Choice

36% of 400+ facilities
[= ~160] not covered
Consumption Analysis

DOR Database

Validation
- InfoUSA
- Here
- Google Map

Fuel Consumption Regression
- Traffic
- Station Char.
- SE data
- Competition
- Location

Impute Missing Locations

Broward County Fuel Consumptions
Technology Application

- Traditional Technologies
  - Road Tubes
  - Piezometers
  - Inductance loops

- Transponders
  - Bluetooth
  - FTPK

- Laser Scanner / LIDAR
  - SICK / Perrone Robotics
  - MANDLI / Certainty3D

- License Plate Recognition
  - Transcore
  - Raytheon

- Image Processing
  - Citilog
  - Miovision
Image Processing

• Miovision

  Image recognition technology

  Road tankers

Rail tankers
• Video data collection
  - Truck video – 3 locations
  - Rail car video – 2 locations
    • Compare 2 video formats
    • 60+ hours of data uploaded

• 90%-95% accuracy
License Plate Data Collection

- Data collection at Port Everglades
  - Three gates:
    - Classification counts
    - License plate survey of fuel tankers

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License Plate Data Matches

- Locations of license plate matched tanker trucks operating at Port Everglades
Findings

• Establish partnerships between agencies and with private sector

• Quantify petroleum product flows from PEV:
  – Collect, or
  – Approximate objectively

• Research and pilot test innovative technologies to:
  – Identify and track
  – Truck and Rail tanker vehicles

• Information sharing with freight community
Data collection technology and approach pilot tested here – tax revenue data and image recognition – have potential for:

- Expanded national application for fuel and other tanker vehicles – truck and rail
- Expansion to other vehicle and commodity types – Rail corridor traffic makeup
• FDOT
• Cambridge Systematics
• Gannett Fleming
• CTS Engineering
• Marlin Engineering
• Miovision
Website: http://fdotd4-shrp2c20.com/

Contacts

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