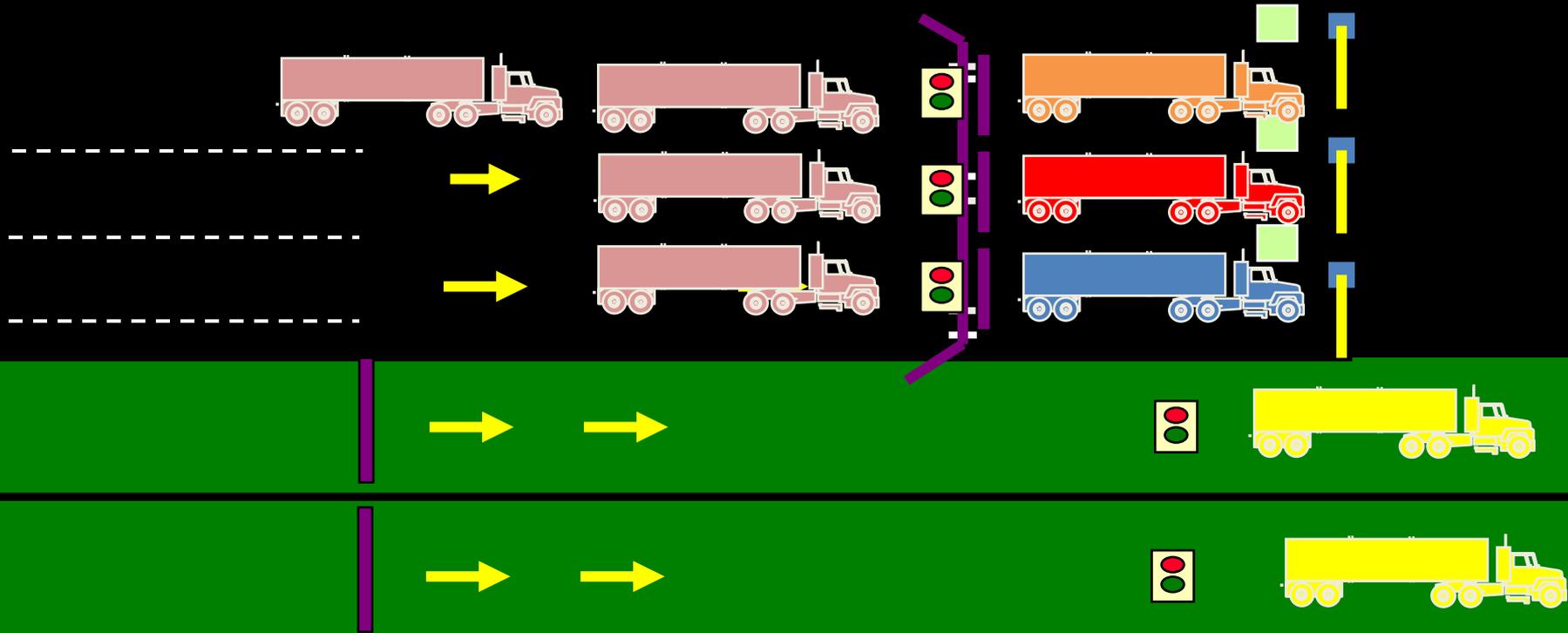




SEAPORTS
CHARTING OUR FUTURE

Cargo Gate Green Lanes



Presentation Developed by
Southwest Research Institute and Automated Port Solutions
Cargo Gate Green Lane





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Cargo Gate Green Lanes

- Overview of Current Operation
- Cargo Gate Green Lanes Concept
- Project Phases
- Summary / Discussion

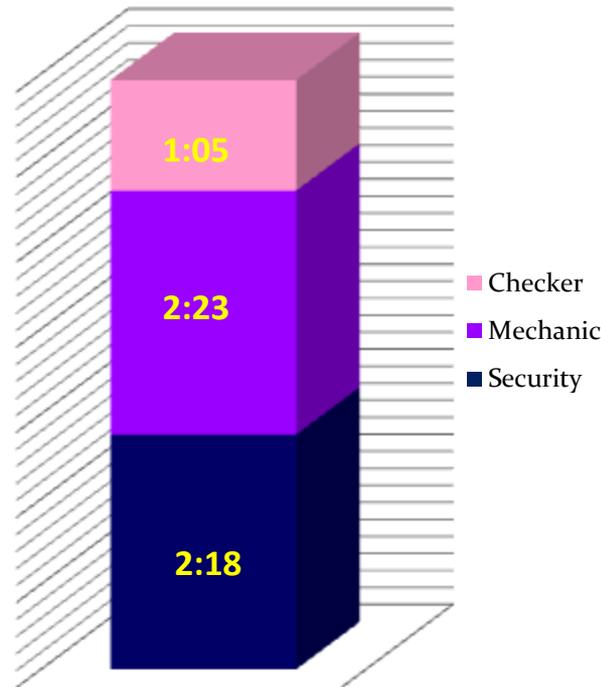




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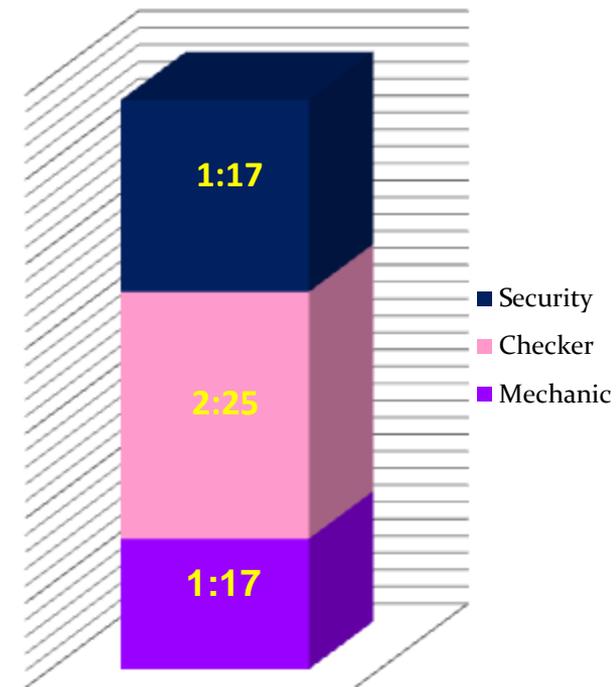
Understanding that Container Terminals perform the same basic mission, they may introduce business rules and processes which meet their individual goals and processing requirements. The graphic illustrates average data capture times for each function.

Inbound



Average Total Processing Time: 5:46
(includes drive and wait time between functions)

Outbound



Average Total Processing Time: 5:36
(includes drive and wait time between functions)





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Inbound Data Collection

Arrival Date and Time
Port Identification Number
TWIC Card (Display Only)
Equipment Type (Container, Chassis, Genset) * may occur several times
Equipment Number * may occur several times
Fuel Level (If Equipment Type = Genset)
Temperate (If Equipment Type = Genset)
Empty = Y/N (If Equipment Type = Container)
Size (If Equipment Type = Container)
Trucking Company Name
Truck License Plate Number
Booking Number
Scale Weight
Road-ability
Damages
Seal Number
HAZMAT Placards Ver.
TIR



Security Gate

The driver approaches security gate and provides TWIC and ID. Once security validates credentials the trucker is allowed to proceed to Mechanic Inspection area.



Port Identification Card



TWIC Card



Gate Mechanic Inspection Area

The inbound mechanic and checker are located in the same location. The mechanic visually inspects the truck and records information via the Gate Inspection Form (next slide). After the form is completed it is issued to the trucker who proceeds to the checker window.



At the inspection area, the mechanic records:

- License Plate Number
- Container Number
- Chassis Number
- Seal Number (if full)
- Container Size and Type
- Genset Number (if a reefer)
- Genset Fuel Level (if a reefer)
- Genset Temperature
- Damages
- Cleanliness(Empty Containers)
- Weight



Gate Checker Station



At the checker window, data entry is completed and a TIR is generated. After a TIR is generated the trucker is allowed to enter the yard.

APM TERMINALS
GATE INSPECTION FORM

Date: 8/27/09

Container #: MWCU-6589207 20 45 HCube
 Chassis #: APMZ-405944 Open Top Open Side Tank
 Genset #: MALG-301417 CR Clip-on Under-slung
 Fuel Level: Empty 1/4 1/2 3/4 Full Temperature: -4.52
 Seals ML-115603/023 080338
 MGW 74,960/14 TARE _____ Ins by: RB

CIRCLE Container Component: Hinges Roof bows Plywoods J-Bar
 L-Bars Handle Roof Floor Doors C-members Vents Sills T-Rail
 B-Rail C-Post Tarp Cable Headers Posts S-Plates Gaskets

CIRCLE Container Location:
 Front Rear Left Right Top Bottom

CIRCLE Container Damage Type:
 Dirty Dent Bent Hole Rust Push in
 Cut Missing Scratched Damaged Push out

CIRCLE Chassis Damage Component:
 Air-Chambers R. Bumpers C-handle Tires Brakes G-hand Frame
 T-locks Lights Ice-bumper Airlines Oil seal L-legs H-caps M-flaps
 Boulsters S. Shoes D. Wheels

CIRCLE Chassis Damage Type:
 Damaged Blown Missing Airleak Cap off Worn
 Foreign Flat Cut Flat-spots Destroyed
 LEFT RIGHT REAR FRONT





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Technological Vision

The cornerstone of the Green Lane Concept to achieve a balance between advanced technology and streamlined processes:

A unified gate complex, fully integrated to the Terminal Operating system, and capable of processing and providing all the necessary information to all parties in a secured and safe environment. The overall goals are:

1. Dramatically minimize turn-around time and;
2. Maximize usable acreage for the benefit of the Terminals and;
3. Reduce Terminal Operator Labor Costs



Recommendation

- **Down-size Terminal Gate footprint**
- **Introduce pre-arrival information entered via the Web**
 - Declaration of Equipment
 - Shipping Information submittal
 - Driver Information submittal
- **Introduce new technology**
 - HD cameras
 - Gamma technology
 - Handheld devices
- **Transfer collected information** to terminal yards
 - Shipping company information
 - Verification of Hazmat placards
 - Equipment information(Container, Container size, Chassis, Gen-set, Seal numbers, Scale weight, Tag number, Fuel levels for reefers, and Temperature of reefers,)
 - Video feeds for road ability inspection
 - Video feeds for damage assessment
 - Driver Information(Port ID number, TWIC card validation)
 - Booking Information



Pre-trip Website

- Trucking Firm fills out Trip information on a secure website
- Web service interface will be made available to allow programmatic submittal if firm desires and has capability

Miami-Dade County - Port of Miami - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://www.miamidade.gov/portofmiami/greenlane.asp

Miami-Dade County - Port of Miami

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Equipment Number:

Equipment Type: GENSET Number:

Tag Number: Seal Number:

TWIC # Booking Number:

Shipping Company:

Shipping Address:

State

Terminal Yard

Damages:

Find: Match case

Read www.miamidade.gov

Screenshot provided is intended as an example of potential implementation

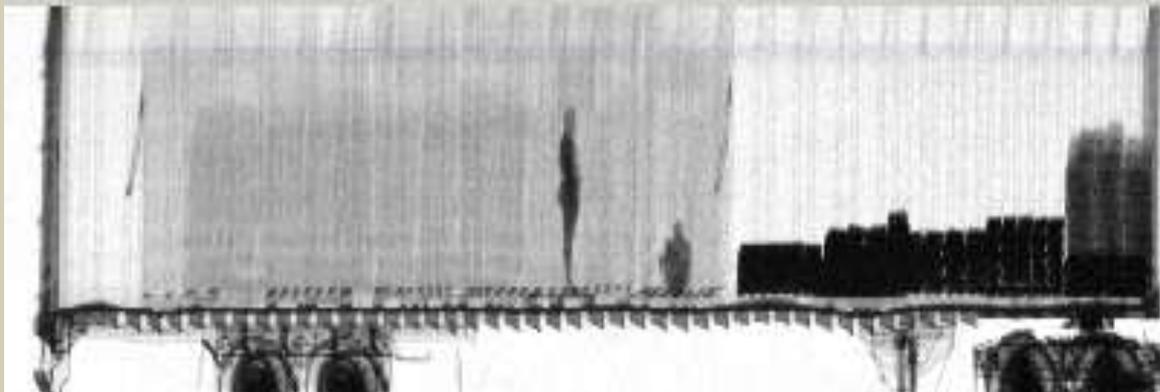
New Technology

High Definition Cameras pass road-ability images to terminal operators for review.



Radio Frequency ID TAG to positively identify the truck

Gamma ray technology can be introduced to check if container is empty or full



In-Cab Card Reader to verify drivers identify and Screen to communicate with the driver



Transfer of Information

Data captured at Pedestal:

```
<portid>75365</portid><lastname>CALZADA</lastname><firstname>ARMANDO</firstname><driverlicenseno>C42301571  
0920</driverlicenseno><driverlicenset>FL</driverlicenset><datetime>03-AUG-  
10_1157</datetime><licenseplate>581JIQ</licenseplate><containerno>HDMU2156020</containerno><chassisno>BAYT  
7099</chassisno><scale></scale></pom>
```

Video feeds for Road-ability and

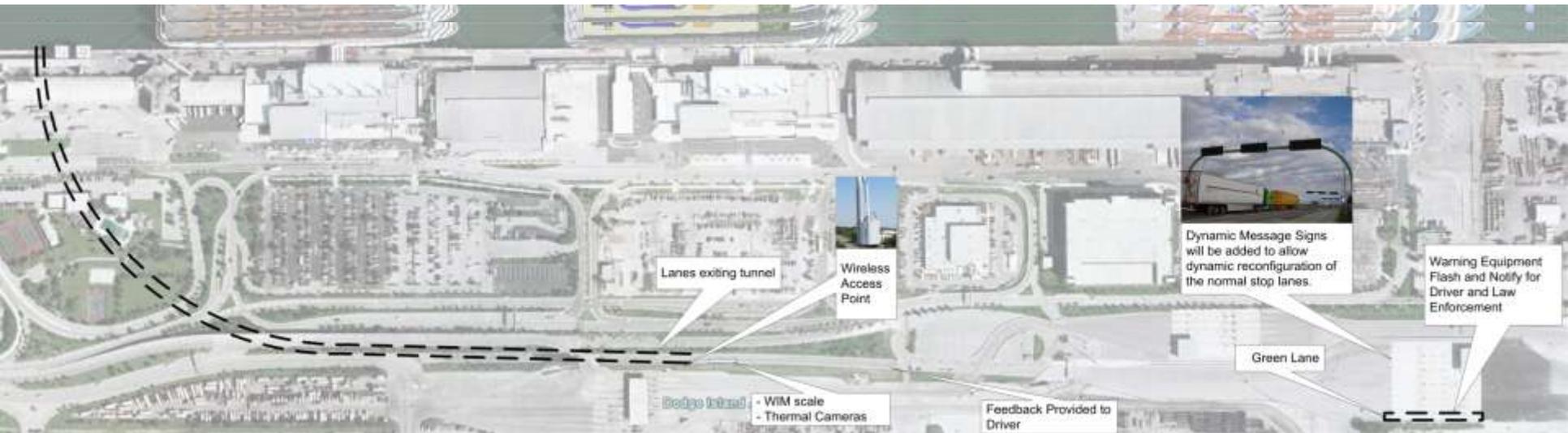


Green Lane Concept

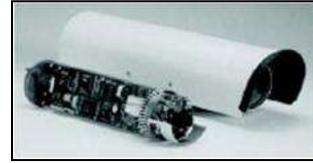
- Truck is identified via truck mounted RFID tags that are issued to the trucking companies to be permanently affixed to their trucks (Trusted Truck)
- Pre-trip information is entered into a secure website (Trusted Trip)
- At entry (point of no return)
 - Driver scan their TWIC card and provide their biometric (Trusted Trucker)
 - Thermal cameras will sense number of occupants in the truck
 - Weigh-in-Motion scales will capture scale weight
 - OCR cameras will capture Truck Tag, Container Number and Chassis Number
 - RFID (Trusted Truck), ID (Trusted Trucker), Scale Weight, Occupant Count, OCR Data will be transmitted to the Port of Miami via wireless transmission. Captured Data will be validated and compared to pre-trip information
 - Monitor in truck will advise truck driver whether the “Trip” qualifies for Green Lane
- At Green Lane entry...
 - Law Enforcement will be notified if unauthorized truck transverses the green lane (visually and via computer monitor)

Representative Site Plan

- Equipment at Entrance Chokepoint(s) located prior to arrival at Entrance Gates
- The “Green Lane(s)” will be located adjacent to the existing stop lanes



Equipment at Entrance Chokepoint(s)



- OCR camera:
- - Truck Tag
 - - Container #
 - - Chassis #

- Transceiver reads data from truck at tunnel exit
- Uses 5.9 GHz DSRC and 1609.11 security similar to tolling and WRI systems (128 bit AES encryption)
 - Data along with OCR, Thermal, and WIM readings are used to qualify truck for Green Lane.

Green Lane Entrance:

- Truck presence detected
- RFID is reconfirmed
- Financial Transaction Performed
- Feedback provided to driver via red/green signal and/or message sign



- Thermal Camera senses number of occupants in truck

- Weigh-In-Motion Scales capture scale weight

- Feedback provided to driver
- Green Lane Access (Granted or Denied)

- Unauthorized Vehicle Detected
- Enforcement notified (visual and computer monitor) for violation processing

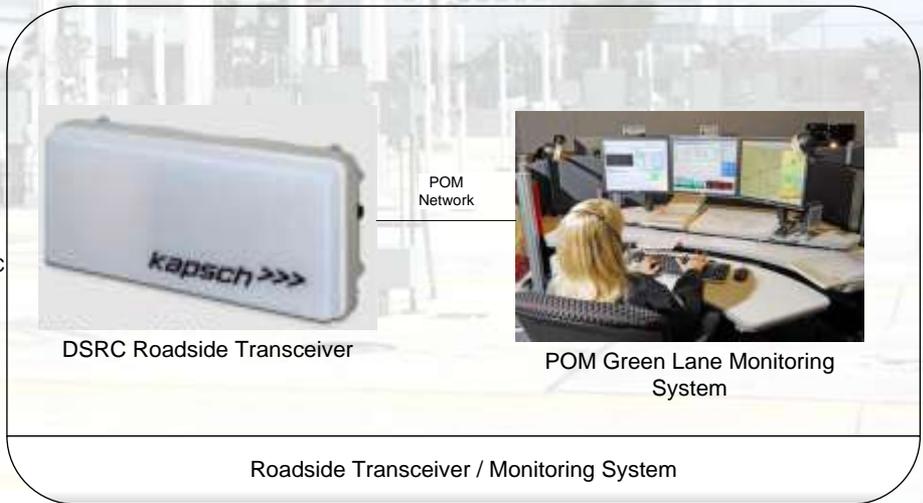


Vehicle Equipment / Communications

- Aftermarket on-board device would be developed
- Communications between vehicle equipment and roadside is encrypted using IEEE 1609.11 (128 bit AES)
- Equipment shown is only an example – final equipment would be specified in design phase

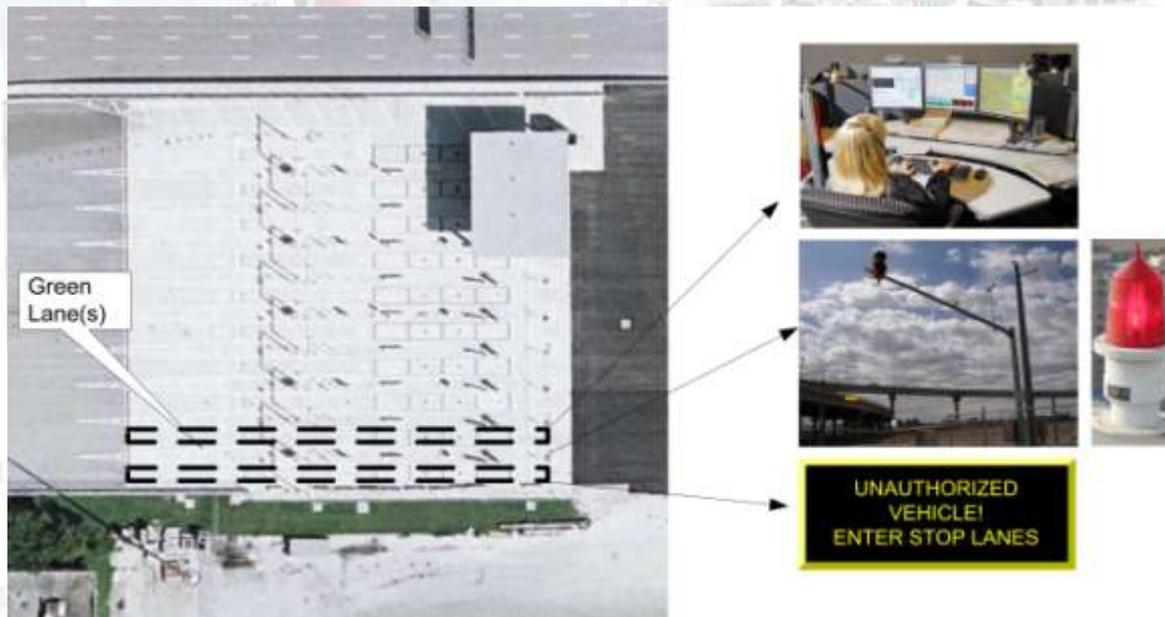


128 bit AES encrypted communications over DSRC



Overhead Depiction of Green Lanes

- Drivers and Law Enforcement will be notified when an unauthorized vehicle has entered a green lane
- Notification to Driver via DMS and Red/Green signal
- Notification to Law Enforcement via red flasher and software
- Equipment shown is for example purposes only





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Project Phases

- Phase 1 – Analysis
- Phase 2 – Design
- Phase 3 – Implementation
- Phase 4 – Support

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Project Phase 1 - Analysis

- Perform Site Survey / Initial Conops Meeting
- Develop Draft Conops / High Level System Requirements
- Review with Port / Gather additional info
- Revise Conops / High Level System Requirements
- Develop Presentation Material / Simulations
- Review Documents & Presentation with Ports Representatives
- Finalize Deliverables
- Provide Presentation / Meeting Support with Trucking Industry





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Project Phase 2 – Design

- Evaluate Equipment based on Conops / Requirements
- High Level System Design
- Roadside equipment specification / selection / testing
- System Proof-of-Concept at SwRI test track and POM
- Detailed System Design / Interfaces
- Design On-board Device
- Develop procurement docs / specs for subs
- Develop cost estimate / schedule for implementation phase





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Project Phase 3 – Implementation

- Construction
- Procure equipment
- System / Software Customization
- On-board device development
- System Integration / Testing
 - Functionality
 - Performance
 - Security
- Acceptance Testing / Training
- Field Operational Test with selected carrier(s)





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Project Phase 4 – Support

- Support technology adoption by operators & carriers
- On-site support / training
- System Enhancements
- System Upgrades





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Funding Sources

- Federal Port Security Grants
- State Department of Transportation



Thank you

Louis A. Noriega

Physical Security & Seaport Operations Technology Consultant
louis.noriega@aportsolutions.com

