CAMBRIDGE SYSTEMATICS

Potential ITS Solutions

Broward County ITS Intermodal Plan

final technical

memorandum

prepared for

Broward County Metropolitan Planning Organization

prepared by

Cambridge Systematics, Inc.

May 2003

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Cambridge Systematics, Inc.
150 CambridgePark Drive, Suite 4000
Cambridge, Massachusetts 02140

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1.0 Introduction

This Technical Memorandum is a working document that summarizes all activities performed under Task 3 of the Broward County ITS Intermodal Plan project. The objectives of Task 3 are to develop a comprehensive set of ITS improvements that address the needs and deficiencies identified under Task 2; to prioritize the needs and possible solutions; and to group the improvements into logical, functional clusters tied to specific transportation facilities to form alternatives, which will be analyzed in more detail under Task 4. This section provides an overview of the approach and results from the major work steps completed under Task 3.

The technical approach for Task 3 primarily involved matching the needs and deficiencies identified under Task 2 with operational mitigation measures. This mapping exercise incorporated the results of a national review of ITS intermodal/freight programs. Serious consideration was also given to mitigation strategies involving potential integration and coordination opportunities with existing or planned future ITS programs in Broward County and in the Southeast Florida region. Both general and freight-specific ITS mitigation measures were considered.

The mapping of potential ITS strategies to regional needs and deficiencies was presented to the Freight Technical Advisory Committee (FTAC) meeting on February 20, 2003 at Port Everglades. The purpose of this meeting was to present and validate the findings from previous tasks, provide an opportunity for feedback from, and start the process of prioritizing the possible solutions/mitigation measures developed under Task 3. This included active participation by attendees to assess the feasibility and priority of each potential ITS mitigation strategy listed in the mapping.

Based on the input received at this meeting, "alternatives" were created by grouping the mitigation strategies into logical, functional clusters. A set of objectives were defined for each "alternative" to help determine which strategies belonged under which category. Six alternatives, or sets of mitigation strategies, were developed consisting of the following:

- Port Everglades Access Improvements;
- Rail-Related Improvements;
- Incident Management Improvements;
- Outreach and Communication Improvements;
- Better Use of Data; and
- Traffic Management Improvements.

A detailed description of each alternative was presented to the FTAC on April 14, 2003 at the offices of the Broward County Metropolitan Planning Organization.

This technical memorandum provides detailed descriptions of the Task 3 activities and is organized as follows:

- Section 1.0, *Introduction*. This section provides a summary of Task 3 activities and describes the organization of this report.

- Section 2.0, *Review of Available Technologies*. This section presents the results of the review of state-of-the-art ITS applications that are being tested and/or deployed around the country.

- Section 3.0, *Working Meeting Results*. This section summarizes the results of the working meeting held in February 2003 to evaluate the defined ITS mitigation strategies.

- Section 4.0, *ITS Mitigation Alternatives*. This section presents the six alternatives developed to address the needs and deficiencies statement.

- Section 5.0, *Next Steps*. This section summaries the remaining activities associated with this project.

2.0 Review of Available Technologies

Under the broad umbrella of Intelligent Transportation Systems (ITS), some of the newest applications and technologies are being designed to address and facilitate freight movements. Specifically, these systems focus on activities being performed by truck drivers, truck fleet operators, and state regulators; and for managing points of entry such as international border crossings, airports, and seaports. This literature review presents an overview of the state-of-the-art in ITS intermodal/freight applications being tested and deployed around the country to facilitate the safe, secure, and efficient transport of freight. The summary is divided into technologies that exist locally and throughout Florida, followed by a summary of ITS applications that exist throughout the United States.

2.1 ITS Technology in Broward County and Florida

Florida's economy relies heavily on its transportation infrastructure; and ITS/CVO provides the opportunity to optimize existing infrastructure, improve safety, and make the motor carrier and motor coach industries – as well as the government agencies that regulate them – more efficient. Using ITS to improve the efficiency of these operations will improve the economic productivity of Florida's businesses.

Florida's commitment to improving its transportation system through the use of technology is well documented. Some key examples include:

- **E-Screening/Pre-Pass.** Electronic screening at Florida's weigh stations is being operated by Pre-Pass. Vehicles of qualified carriers are pre-cleared by weigh stations in participating states using advanced technologies to verify the carrier's safety and credential status. As of December 2000, Florida had 19 operational and committed Pre-Pass sites.

- **Electronic Toll Collection Systems.** Florida's electronic toll collection systems include SunPass, E-Pass, C Pass, Leeway, and O Pass. SunPass is a statewide system that is being implemented on all state-operated toll roads. The state of Florida is actively pursing interoperability between SunPass and the state's other toll systems.

- **Advanced Traffic Management Systems (ATMS).** Florida has deployed ITS to combat congestion throughout the state. These initiatives use advanced technologies (e.g., closed circuit television cameras, in-pavement detectors, dynamic message signs, and fiber optic communications) to enhance incident detection and response. The system can identify roadway congestion and inform the public which areas should be avoided.

- **Automated Commercial Vehicle and Driver Inspections.** Florida Motor Carrier Compliance Officers utilize ASPEN-equipped laptop computers to automate roadside inspections. Florida currently is in the process of upgrading its ASPEN software to ASPEN 2.0.

- **511 Service.** In July 2002, FDOT launched a 511 service to provide travelers in the Orlando, Miami-Dade, Broward and Palm Beach areas with continuously updated information on traffic incidents, roadway conditions, travel times, and congestion. Transit information will be available shortly. Tampa and Jacksonville will most likely be added to the 511 network in the near future.

- **Commercial Vehicle Information Systems and Networks (CVISN).** As a national program administered by the Federal Motor Carrier Safety Administration (FMCSA), CVISN is designed to improve motor carrier safety and to enhance the efficiency of administrative processes for industry and government. CVISN is designed to facilitate electronic linkages for the exchange of motor carrier information among the state, commercial vehicle operators, regional clearinghouses, and national databases. The state of Florida is aggressively working on its CVISN Program, which will be implemented over the next few years.

In addition to the initiatives listed above, Florida is actively involved a variety of ITS/CVO forums, including the ITS America Commercial Vehicle and Freight Mobility Forum and the Commercial Vehicle Safety Alliance's ITS Committee. Such forums are setting the stage for the future of ITS/CVO and CVISN practices.

The cornerstone of the Broward County ITS program is the new traffic management center (TMC). The TMC will serve as the nerve center for ITS projects deployed in Broward County including the I-95/I-595 Dynamic Message Sign System, Freeway Video Monitoring, Advanced Traveler Information System (ATIS), Advanced Traffic Management System (ATMS), Advanced Incident Information System (AIIS), 511 service, and the Broward County Signal System. All of these technologies impact overall traffic flows, thereby improving freight movements as well. In addition, the ITS Intermodal Plan development, as well as the new Port Everglades security program, will specifically address ITS applications for freight operations.

2.2 State-of-the-Art in ITS Freight Applications

Traditional ITS projects such as ATMS provide benefits to all motorists, including commercial vehicles. As the use of ITS to solve transportation problems has become more widespread, new and innovative systems have emerged specifically to target freight and goods movement. These ITS strategies should be coordinated with existing and planned ITS projects. Florida has a strong ITS program which should be leveraged as appropriate in the development of freight-specific projects.

Examples of such ITS technology designed to facilitate freight flows and improve Commercial Vehicle Operations (CVO) have been grouped into the following categories:

- Commercial Vehicle Information Systems and Networks (CVISN);
- Electronic Toll Collection (ETC), Electronic Screening (E-Screening), Electronic Commerce (E-Commerce);
- Point of Entry Control and Security;
- Advanced Traveler Information Systems (ATIS);
- Traffic Management;
- Incident Management; and
- Intelligent Vehicle Initiative (IVI).

A brief description is provided for each ITS category in Table 2.1. Examples within each category have been ranked (high, medium, low) according to applicability in the southeast Florida region. A high ranking corresponds to a high level of applicability. In addition, in the last column, a summary of potential or existing initiatives underway in Florida is provided. Detailed descriptions for each of the ITS solutions in this table are provided in Appendix A.

Table 2.1 Overview and Ranking of ITS Freight Applications

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
CVISN	**CVISN is a national program administered by the Federal Motor Carrier Safety Administration (FMCSA) designed to improve motor carrier safety and to enhance the efficiency of administrative processes for industry and government.**		
CVISN	• CVISN facilitates the exchange of motor carrier information among state, commercial vehicle operators, regional clearinghouses, and national databases. • The system allows carriers to apply for and receive their essential operating credentials remotely, and provides regulatory agencies with safety and inspection data.	High	• Deployment of CVISN technology in Broward County has been proposed by FDOT District 4 as an operational test to improve security at Port Everglades. This would include technology deployments on I-595 on the approach to Port Everglades for the purpose of identifying high-risk trucks. • FDOT's CVISN program will provide motor carriers with the ability to access electronic credentialing throughout the state, including Broward County. This system is not in place yet, but is a component of the state's overall CVISN program.
ETC, E-Screening, and E-Commerce	**ETC systems employ transponders that enable the electronic payment of highway, bridge, and tunnel tolls. E-Screening systems are deployed at weigh stations and international border crossings to ensure trucks are in compliance with safety and regulatory requirements. E-Commerce allows preapproved carriers to monitor shipment status at ports, airports, etc.**		
SunPass	• SunPass is one of several ETC systems currently operating in Florida.	High	• ETC is available in much of Florida through SunPass, E-Pass, C Pass, Leeway, and O Pass. Florida is actively pursing interoperability between SunPass and the state's other toll systems. Broward County should ensure that ETC is available and compatible with other systems when possible.
Pre-Pass	• Pre-Pass is an E-Screening system that allows participating vehicles with transponders to bypass designated weigh stations and other facilities in 24 states. Pre-cleared vehicles proceed at highway speed, thereby increasing safety and efficiency while allowing law enforcement to focus resources on noncompliant motor carriers. (Florida has 19 sites).	High	• E-screening at weigh stations and agriculture inspection facilities is available in Florida through Pre-Pass. Pre-Pass is part of Florida's CVISN architecture. Weigh stations and agriculture inspections facilities equipped with Pre-Pass are located in northern, central, and southwestern parts of the state. Broward County does not have any Pre-Pass/CVISN sites. If possible, Broward County should explore the possibility of developing a weigh station and/or agriculture inspection site that is Pre-Pass compatible. This will be a Florida DOT (weight/safety) or Florida Department of Agriculture and Consumer Services.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
ETC, E-Screening, and E-Commerce	**(continued)**		
North American Pre-clearance and Safety System (NORPASS)	• NORPASS is a similar system to Pre-Pass and is used in five states. NORPASS transponders can be read by the Pre-Pass system, but not vice versa.	Low	• As a member of the Pre-Pass program, Florida will not participate in NORPASS.
I-95 Corridor Coalition ETC and E-Screening Interoperability Project	• This is a pilot program to develop a single windshield-mounted transponder to pay tolls in the E-ZPass system and to bypass CVISN-compatible weigh stations.	Medium	• Broward County should monitor efforts by the I-95 Corridor Coalition and others to develop a single use transponder for both ETC and E-Screening. When the technology is fully tested and ready, Broward County should consider making the new transponders available to shippers and carriers.
Freight Information Real-time System for Transport (FIRST)	• FIRST is a relatively new network that integrates real-time port, cargo transfer and carrier information and displays it on a user-friendly web site for the Port of New York and New Jersey (NY and NJ).	Medium	• Port Everglades is currently undertaking a major initiative to upgrade security. The use of ITS models such as FIRST, PortNet.com, and Port Pass should be considered viable strategies to improve port access and freight cargo movements into and out of the port facility in Broward County.
PortNet.com	• Similar to the FIRST system, PortNet.com integrates real-time relevant information for ports and their customers. This system has been deployed in Singapore since 1999, where use of the system is enforced by the government.	Medium	• Port Everglades is currently undertaking a major initiative to upgrade security. The use of ITS models such as FIRST, PortNet.com, and Port Pass should be considered viable strategies to improve port access and freight cargo movements into and out of the port facility in Broward County.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
ETC, E-Screening, and E-Commerce	**(continued)**		
Port Pass	• Readers are being installed at entry lanes, truck slots, and exit lanes at the Port of NY and NJ to read E-ZPass transponders on trucks. Port Pass will interface with FIRST to enable the creation of an appointment system for cargo pickup and delivery.	Medium	• Port Everglades is currently undertaking a major initiative to upgrade security. The use of ITS models such as FIRST, PortNet.com, and Port Pass should be considered viable strategies to improve port access and freight cargo movements into and out of the port facility in Broward County.
Air Cargo Electronic Supply Chain Manifest (ESCM)	• A field test led by the American Transportation Research Institute, ESCM is designed to demonstrate the efficiency and security of an Internet-based electronic manifest system compared with traditional processes and paper-based manifest systems.	Low	• Although Fort Lauderdale – Hollywood International Airport experiences limited air cargo movements, they can also benefit from using ITS. The ESCM field operational test should be monitored, and used as the basis for improving security, and air cargo movement at Fort Lauderdale airport.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
Point of Entry Control and Security	**Systems in this category facilitate the exchange of vital information at international border crossings and ports.**		
Integration of Electronic Commercial Vehicle, Cargo, and Driver Information at the United States/Canada Border	• Three integrated ITS systems are being deployed to identify, monitor, and pre-process cargo in intermodal containers that are trucked over the Washington/British Columbia border. Two of the systems use a standard transponder that provides commercial vehicle information; the third (eSeal) uses an electronic container door seal to confirm border clearance and verify there was no tampering with the load.	Low	• Port Everglades and the Fort Lauderdale – Hollywood International Airport could adopt portions of the WSDOT eSeal Project. The eSeals were tested as means to track shipping containers both in ports and along roadways. They also were tested as a tool to increase the security of cargo as the seals have a tamper indicator message. Cargo shipments arriving at ports or airports with the eSeal can help inspectors quickly identify containers that have been tampered with, and concentrate on non-participating shippers.
Virginia Port Authority Security Program	• The Virginia Port Authority and Hampton Roads shipping terminal installed a security system that checks for bombs on containers as they depart the terminal, an effort to prevent terrorists from using cargo containers as a means for sneaking bombs into the country.	High	• In today's security conscientious world, improving security at points of entry is a primary focus. Port Everglades has an extensive security program underway that includes the deployment of "star system" gamma x-ray equipment at port access gates designed to enhance law enforcement efforts to stop the exportation of stolen automobiles and heavy construction equipment from this country. Similar detection equipment that detects explosives should be investigated. Port Everglades can use the Virginia Port Authority and Hampton Roads shipping terminal as an example of a system that, although limited, addresses security while minimizing disruptions to freight movements. Ideally, non-intrusive security systems could be installed that scan containers while they are being loaded/unloaded.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
Advanced Traveler Information System (ATIS)	**ATIS are designed to provide real-time traffic information, enabling travelers to make optimum route and mode selection decisions. Recently, the ATIS concept has been adapted for freight-specific uses.**		
FleetForward	• FleetForward is a field test being performed by the I-95 Corridor Coalition that pairs real-time traffic information (i.e., congestion, incidents, highway construction and maintenance activities) with motor carrier's routing and dispatch decisions. The system focuses on truck relevant data, such as information that helps truckers navigate through an entire metropolitan region.	Medium	• Develop a platform similar to FleetFoward to provide route-specific information to motor carriers and dispatchers in Broward County. Motor carriers have unique traffic information needs that are not typically met by a traditional ATIS. A modified system could pivot off the ATIS technology and format data to provide information specifically tailored to meet the needs of the motor carrier industry.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	**Description**	**Ranking**	**Application Opportunities for Broward County, Florida**
Advanced Traveler Information System (ATIS)	**(continued)**		
Advanced Transportation Management, Information, and Security System (ATMIS)	• The Ports of Long Beach and Los Angeles are planning to implement three types of ITS technologies: 1) deliver real-time en-route information and safe evacuation routes during major incidents; 2) a transportation management system that will control ITS field devices, monitor traffic signals and roadway travel conditions; and 3) an ATIS promoting the exchange of data between the public and private sectors.	High	• The ATMIS technology utilized by the Ports of Long Beach and Los Angeles could be adapted to meet the needs of Port Everglades. Port Everglades is facing many of the same problems as the Ports of Long Beach and Los Angeles including maintaining efficient access to the port facility in light of rapidly growing truck traffic as well as increased security concerns. A program similar to ATMIS would help Port Everglades manage such issues more effectively. • The new Broward County Traffic Operations Center (TOC) will serve as a central platform for expanding future ITS operations. The TOC will support the SunGuide ATIS that will provide real time information to motorists in Miami-Dade, Broward, and Palm Beach County via phone, fax, radio, TV, and the Internet. • In July 2002, FDOT launched the 511 dialing code for traveler information in Orlando, Miami-Dade, Palm Beach, and Broward Counties. The 511 service provides continuously updated information on traffic incidents, roadway conditions, travel times, and congestion. Transit data will also be available shortly. In the future, this system could develop information specifically designed for motor carriers and dispatchers, such as traffic conditions in and around Port Everglades.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
Traffic Management	**By and large, traffic management employs policy or technological strategies to increase the safety, quality of operations and level of service of a transportation network.**		
Truck-only Lanes	• Truck-only Lanes are lanes designated for the exclusive use by trucks. They can employ ITS devices such as DMS or other lane use signals to regulate and inform motorists when lanes are designated as truck-only, similar to the operation of high-occupancy vehicle (HOV) lanes.	Low	• Both I-95 and I-595 have a high volume of truck traffic. Truck only lanes could improve travel times for motor carriers using these corridors, and improve safety. This option does require further study to determine if this could be an appropriate solution for Broward County given public concerns over truck only lanes.
Overheight Vehicle Detection System (OHVDS)	• AN OHVDS alerts drivers if their vehicles exceed the clearance limit for an upcoming bridge, overpass, overhead walkway, etc. The system detects the overheight vehicle and warns drivers in enough time for them to take action and avoid damaging their vehicle and the overhead structure.	Low	• In areas of Broward County where trucks have repeatedly damaged overhead structures such as highway overpasses, an OHVDS could be installed to warn overheight motor carriers that they are too tall to clear the upcoming overpass or tunnel. Such a system could help reduce further incidents, minimize damage to infrastructure and trucks, and improve travel time for motor carriers and the traveling public.
Truck Speed Warning Systems	• Several projects have coupled Weigh-in-Motion (WIM) devices with DMS to provide customized warning messages for trucks approaching dangerous downgrades and/or steep curves. The system can use the weight measurement to calculate the appropriate speed for the vehicle within seconds. Simpler, systems are also available that employ flashing signs and warning messages when a truck is exceeding recommended speeds.	High	• As a result of the geography of Broward County, steep downgrades with sharp curves are uncommon. However, at the terminus of Eller Drive into Port Everglades, for example, the geometry of the roadway is problematic for large trucks. A flashing warning system would be an effective way to alert drivers they need reduce speeds. • As in most other metropolitan areas, motor carriers traveling at excessive speeds is a problem regardless of the roadway geometry. In areas where this a concern, DMS could be installed in conjunction with a truck speed warning systems to alert motor carriers that they are traveling at excessive speeds. This system can allow other messages (i.e., general traffic conditions) to be displayed, and only display the warning message when a truck is determined to be traveling above the recommended speed limit for that area.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
Incident Management	**Incident management is a planned and coordinated program to detect, respond to and remove unplanned traffic incidents, restoring capacity as safety and quickly as possible. Successful programs include well-defined plans and regular collaboration among all involved agencies.**		
Incident Management	• Incidents involving trucks are particularly complex, as they often require specialized equipment and a timely, well-coordinated response by law enforcement, fire and rescue, emergency medical services, towing services, and HAZMAT cleanup services.	High	• As part of the incident management program in Broward County, Chemtrec – a national hazardous material information service – was contracted to provide detailed information on hazardous materials and appropriate response to HAZMAT clean up responders. Each FDOT District, including the Turnpike, has an Emergency Operations Center that is activated for major incidents/emergencies, which in turn usually impact freight flows. Broward County should continue to improve coordination between the public and private sector through the use of ITS technology to ensure an efficient, and timely response to all traffic incidents. Efforts underway include: – In 2004, a planned Advanced Incident Information System (AIIS) will be able to deploy flashing beacon signs along Broward County arterials with I-95 interchanges to indicate incidents. – In conjunction with this effort, a Freeway Incident Management team of approximately 60 members representing State, County, and local engineering and emergency management, law enforcement, fire department agencies, towing, HAZMAT, and traffic information services is programmed for 2002-2006.

Table 2.1 Overview and Ranking of ITS Freight Applications (continued)

Category *ITS Freight Application*	Description	Ranking	Application Opportunities for Broward County, Florida
IVI	**Led by the U.S. DOT, the IVI program is designed to reduce crashes by helping drivers avoid hazardous mistakes. IVI aims to accelerate the development and commercialization of vehicle-based driver assistance products that will warn drivers of dangerous situations, recommend actions, and even assume partial control of vehicles to avoid collisions.**		
IVI	• Many of the IVI technologies represent advanced systems that are not yet available. Specific commercial vehicle-related IVI operational tests include: a roll-over advisor/education and control system; a hazardous material collision notification system; and a "trucker advisory" system that notifies truck drivers as they approach locations with the potential for danger (past crash history, geometry, downgrade, etc.). Florida is a participant in the "trucker advisory" test being conducted by McKenzie Tank Lines.	Low	• Much of the IVI technology is still in testing stages, but Broward County should monitor its progress and try to participate in future pilot programs.

3.0 Working Meeting Results

On February 20, 2003, the Broward County ITS Intermodal Plan Meeting and Workshop was held at Port Everglades. The objectives of this meeting were to review the project status, present and validate the findings from previous tasks, provide an opportunity for feedback from key freight ITS stakeholders, and start the process of prioritizing the possible solutions/mitigation measures developed under Task 3. Materials from the meeting including the agenda, list of attendees, and PowerPoint presentation are provided in Appendix B. The Mapping Table handout is provided in Appendix C.

In the first portion of the meeting, a presentation was given on the status of the project, including the project schedule and key accomplishments to date. The presentation included an overview of the Needs and Deficiencies Statement, along with some examples of national ITS intermodal/freight programs from the national literature review. An updated version of the Project Vision was also presented and validated. The accepted Project Vision is threefold:

- Develop potential ITS projects to address the freight needs and deficiencies in Broward County and the Southeast Florida region;
- Lay the foundation for a coordinated ITS intermodal program for Broward County; and
- Coordinate with the security program at Port Everglades.

The latter portion of the meeting took the form of a workshop in order to encourage active participation by the attendees. A Mapping Table (see Appendix C) was distributed that summarized the mapping of ITS mitigation strategies to the needs and deficiencies. This Mapping Table was divided into the same six categories as the Needs and Deficiencies Statement. The following are the potential mitigation strategies that were identified for each of the six categories.

- **Significant Congestion in Key Freight Corridors**
  - Advanced Traveler Information System (ATIS)
  - Truck-only lanes
  - Signal timing optimization
  - Use freight trucks as probes
  - Improve communications with train operators

- **Limited Access for Freight Movements**
  - Speed warning system
  - Dynamic Message Signs (DMS)
  - Ramp Metering
- **Balancing Freight Operations and Security**
  - Port Everglades Security Program
  - Lane Use DMS
  - Expand CVISN to Ports
  - DMS
  - Appointment System
- **Freight-Specific Incident Management Issues**
  - Enhance incident management program
  - Database of shared resources
  - Institute a "Quick-Clearance" agreement
  - Improve interagency communications
  - Provide real-time train locations to emergency response agencies
  - Provide critical information to HAZMAT responders
  - Support federal Intelligent Vehicle Initiative (IVI) program
- **Need for Improved Regional Communications and Coordination**
  - Improve communications
  - Integrate ITS freight programs
  - Outreach and education
  - Information sharing
  - Database integration
- **Infrastructure Limitations**
  - Guidance system for truck service facilities
  - Dynamic curve warning system
  - Improve and reduce at-grade rail crossings
  - Double-tracking of SFRC
  - Overheight vehicle detection system

The Mapping Table handout in Appendix C lists the needs and deficiencies from the first Technical Memorandum, corresponding potential ITS strategies for consideration, a detailed description of the strategy, any partial or full existing deployments of such strategies in the region, the geographic scale of each strategy (local, regional, statewide, national), and the expected benefits that could potentially be realized by each strategy. The goal was to get input from the workshop participants in order to fill in the three blank columns on the right-hand side of the Mapping Table: 1) Pass/Fail, 2) Rank, and 3) Lead Organization. To accomplish this, Cambridge Systematics facilitated a short discussion on each ITS mitigation strategy and documented the group's decisions.

- **Pass/Fail –** Cambridge Systematics worked together with the attendees to perform a fatal flaw analysis for each line item. An ITS strategy "passed" the fatal flaw test if the group agreed the option was viable[1], if the technology was currently available or would be soon, if the strategy was applicable to the region, and if the strategy fit within the scope of this project.

- **Rank –** For those ITS strategies that passed the fatal flaw analysis in the first step, the group then determined the strategy's priority level based on strategic importance. The attendees contemplated whether or not the strategy should be implemented in the near-term, whether or not the strategy could make a big impact relatively quickly, and whether or not there are resources already in place that make it easy to implement. The group indicated priority as high, medium, or low.

- **Lead Organization –** Workshop participants also provided input on which organization(s) should take the lead on each strategy. If more than one agency was deemed to be responsible for a particular strategy, the group identified the most likely primary and secondary agencies.

- **Comments –** A "Comments" column was also included in order to document important clarifying remarks provided by the participants.

Following the workshop, participants were invited to ask questions, provide comments, and suggest additions to the Mapping Table. In general, the group provided positive feedback on the proposed mitigation strategies. The detailed results of the meeting are provided in the last four columns on the right-hand side of the Mapping Table in Appendix C. An overview of the results is provided below.

- **Fatal Flaw Analysis –** Of the 33 strategies presented, the fatal flaw analysis was results were as follows:

  - Twenty-eight potential mitigation strategies "Passed" the fatal flaw analysis;
  - Two "Failed"; and
  - Three tabled for further investigation.

[1] Viable was defined by the stakeholders as politically and technically feasible.

- **Priority Ranking –** Of the 28 strategies that passed the fatal flaw analysis, the priority ranking results were as follows:
  - Thirteen "High" priority;
  - Ten "Medium" priority;
  - Four "Low" priority; and
  - One tabled for further investigation.
- **Lead Organizations –** Of the 23 strategies that ranked medium to high priority, the following organizations were identified as lead agencies:
  - Broward County Metropolitan Planning Organization;
  - Broward County Traffic Engineering Department/Traffic Management Center;
  - Florida Department of Transportation, Central Office;
  - Florida Department of Transportation, District 4;
  - Florida Department of Transportation, Turnpike District;
  - Fort Lauderdale/Hollywood International Airport;
  - Port Everglades; and
  - Tri-Rail.

To ensure consensus, the results of this meeting were documented and presented for validation purposes to the Freight Technical Advisory Committee (FTAC) on April 14, 2003.

4.0 ITS Mitigation Alternatives

Alternatives, or sets of ITS strategies, were developed by grouping the identified ITS mitigation strategies into logical, functional clusters. All the ITS strategies that passed the fatal flaw test and ranked medium to high priority during the February Broward County ITS Intermodal Plan Meeting and Workshop have been included in the alternatives.

The analysis generated six alternatives, grouped by transportation mode and/or functionality. The rationalization behind the groupings is best illustrated by reviewing the objectives and strategies listed under each. Table 4.1 presents the six defined alternatives and provides the objectives and strategies for each of them.

Table 4.1 ITS Mitigation Alternatives

Alternatives	Objectives	Strategies
Port Everglades Access Improvements	• Improve safety at I-595 terminus • Balance port operations with security requirements • Reduce queuing and delays • Optimize port operations • Provide valuable, reliable traveler information to port users	• Install speed warning system at I-595 terminus • Sort vehicles prior to security gates via Lane Use DMS • Install static guide signs within the port • Install static guide signs to/from port and FLL airport • Enhance port security through CVISN technologies • Implement scheduling system for cruise deliveries • Provide traveler information via DMS at port exits • Establish communications link between port and Broward County TMC
Rail-Related Improvements	• Improve safety and grade crossings • Improve incident management at railroads • Reduce delays for trains, trucks and cars	• Provide real-time train locations to fire and rescue agencies • Improve communications with train operators • Better define incident management plans and responsibilities • Double-tracking and related SFRC improvements

Table 4.1 ITS Mitigation Alternatives (continued)

Alternatives	Objectives	Strategies
Incident Management Improvements	• Reduce incident response times • Improve incident clearance times • Reduce delays and secondary incidents	• Continue improving the regional incident management program • Share resources; create inventory of clearance equipment • Upgrade communications with towing contractors • Provide weather and drainage data to HAZMAT responders • Work to institute a statewide "Quick-Clearance" agreement
Outreach and Communication Improvements	• Improve communications across all ITS programs • Enhance coordination among all freight and ITS stakeholders • Increase awareness of ITS benefits • Reduce commercial vehicle and passenger conflicts	• Improve communications among regional ITS programs • Establish a freight stakeholders committee • Create a web site for freight/ITS information sharing • Provide outreach and education about: – ITS benefits – Importance of freight – Driving safely near trucks
Better Use of Data	• Improve ability to effectively use ITS-related data for freight planning activities • Improve ability to effectively use ITS data to better manage the freight transportation system in real time	• Identify and collect additional data • Integrate available databases into centralized system • Use system performance data to improve long-range transportation planning activities • Use current/real time data to improve regional traffic management system activities
Traffic Management Improvements	• Improve east-west freight movements	• Optimize signal timing for key freight movements on east-west arterials

The proposed alternatives along with their objectives and strategies were presented to the FTAC for review on April 14, 2003 at the Broward County ITS Intermodal Plan Meeting held at the offices of the Broward County Metropolitan Planning Organization. In addition to obtaining feedback from the FTAC regarding the alternatives, the objectives of the April FTAC Meeting were to review project status, present and validate the findings from previous tasks, and discuss the approach for remaining work, including a discussion

about potential evaluation criteria. The agenda, list of attendees, and PowerPoint presentation from this meeting are provided in Appendix D.

At the April Meeting, members of the FTAC provided positive feedback on the proposed alternatives, thereby accepting and validating the groupings. Following the incorporation of some minor comments received at and after the April meeting, the ITS mitigation alternatives, as defined in Table 4.1 above, are now considered final.

The results of the mapping exercise from the February Workshop were also presented at the April Meeting. The filled-in Mapping Table (shown in Appendix C) was distributed for review. Since some FTAC members were not present at the February Workshop, Cambridge Systematics described the procedure used for the mapping exercise and asked all the April Meeting attendees to review and comment on the Mapping Table. Following the one-week review period, no comments were received from the FTAC on the mapping results, and therefore the Mapping Table in Appendix C is considered final.

5.0 Next Steps

With the FTAC's acceptance of the ITS mitigation alternatives, Task 3, *Develop ITS Solutions* is complete. Task 4, *Develop Project Concepts* begins with the development of evaluation criteria and performance measures for the alternatives defined under Task 3. The results of the evaluation will be used to prioritize and rank the alternatives. The preferred alternative will be will be identified and further developed into actual projects for inclusion in the Implementation Plan.

The following evaluation criteria were proposed at the April Meeting for review by the FTAC. The FTAC provided positive feedback on these performance measures, which included:

- Delay Savings;
- Travel Time Reliability;
- Crash Reduction Savings;
- Fuel Consumption and Emissions Savings;
- Security and Strategic Importance;
- Freight Operational Efficiency;
- Compatibility with National, Statewide, and Regional ITS Architectures;
- Costs of Alternatives; and
- Coordination Opportunities with Other Regional Existing or Planned Future ITS Projects.

The evaluation of ITS alternatives will essentially entail a benefit/cost analysis. The procedure will involve the development of a preliminary cost estimate for each of the six alternatives. As data are available, the impacts and benefits will be estimated using appropriate evaluation tools, such as spreadsheets. The results of the evaluation will be presented to the FTAC, including a preferred alternative recommendation. The approved alternative will then be expanded to develop specific ITS projects for inclusion in the implementation plan.

Appendix A

Literature Review

Literature Review

This literature review presents an overview of the state-of-the-art in ITS intermodal/ freight applications being used to address freight movements. Detailed descriptions of the ITS strategies listed in Section 2.0, Table 2.1 of this technical memorandum are contained in this Appendix.

Commercial Vehicle Information Systems and Networks (CVISN)

Summary. As a national program administered by the FMCSA, CVISN is designed to improve motor carrier safety and to enhance the efficiency of administrative processes for industry and government. CVISN is designed to facilitate electronic linkages for the exchange of motor carrier information among the state, commercial vehicle operators, regional clearinghouses, and national databases. Guided by a national architecture, participating states plan and design customized programs in three key areas:

- **Electronic Screening –** Programs and projects that facilitate the verification of size, weight, safety, and credentials information of vehicles in motion. Systems are designed to allow properly credentialed vehicles of carriers that have histories of good safety performance to bypass inspection facilities. Florida is one of 24 states using the Pre-Pass system for electronic screening at weigh stations and agricultural inspection stations.

- **Electronic Credentials Administration –** Systems that allow motor carriers to apply for and receive their necessary operating credentials remotely. At a minimum, the International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials are included in a state's CVISN program.

- **Safety Data Management –** Systems that facilitate the sharing of interstate motor carrier safety and credentials information among states, as well as between agencies within a state. These include automated inspections and safety information systems.

Applications. The Florida CVISN Program will primarily be implemented over the next few years. Florida's CVISN Program adheres to the national CVISN architecture, a framework for states to exchange information between existing and newly designed systems, using standards and available communications protocols. Florida's CVISN Program is guided by its Program Plan and Top-Level Design, both of which have been reviewed and accepted by the Federal Motor Carrier Safety Administration.

Application Opportunities for Broward County

- Deployment of CVISN technology in Broward County has been proposed by FDOT District 4 as an operational test to improve security at Port Everglades. This would include technology deployments on I-595 on the approach to Port Everglades for the purpose of identifying high-risk trucks.

- FDOT's CVISN program will provide motor carriers with the ability to access electronic credentialing throughout the state, including Broward County. This system is not in place yet, but is a component of the state's overall CVISN program.

Electronic Toll Collection (ETC), Electronic Screening (E-Screening), and Electronic Commerce (E-Commerce)

ETC systems enable the electronic payment of highway, bridge, and tunnel tolls. These systems use dedicated short-range communication (DSRC) transponders to expedite throughput, minimize queuing and delay, improve travel time and fuel consumption, reduce congestion, and lower the risk of accidents at toll barriers. Some examples of ETC systems include Metropolitan New York, New Jersey, and Pennsylvania E-ZPass; Massachusetts Turnpike FAST LANE; and Florida SunPass.

E-Screening systems are deployed at weigh stations, agriculture interdiction facilities, and international border crossings. Such systems automate the screening process to ensure that trucks are in compliance with safety and regulatory requirements. E-Screening technology often couples transponders with weigh-in-motion (WIM) devices, thereby improving controls and better serving the needs of regulators and enforcement staff. WIM devices are capable of weighing vehicles while in motion at speeds up to and including typical mainline highway speeds. These devices improve productivity by reducing time lost at traditional static weigh stations without sacrificing safety concerns.

Electronic commerce (e-commerce) uses web-based technology to facilitate the movement of freight by allowing pre-approved carriers to monitor shipment status at ports and airports, expedite international border crossings, and allow law enforcement agencies to focus regulatory efforts on non-approved carriers. E-commerce is well established throughout the world in both public and private sector processes. For instance, the shipment tracking system developed by Federal Express allows customers to monitor their shipment status/location throughout the delivery process. Other examples include proprietary systems developed by shippers and carriers that allow for the automated transfer of shipment information among two or more parties to facilitate operational efficiency. An example of this would be a point of sale system that automatically triggers inventory replenishment from the appropriate suppliers.

The following provides examples of systems that have been developed and deployed by public/private partnerships to test the application of specific technologies for improved highway operations. Note that these summaries do not specifically address in-house systems developed solely for the enhancement of business functions.

Pre-Pass

Summary. Pre-Pass is an automatic vehicle identification (AVI) and E-Screening system that allows participating transponder-equipped commercial vehicles to bypass designated weigh stations, port-of-entry facilities, and agricultural interdiction facilities. Participating motor carriers are pre-certified, and their safety records and credentials are verified with state and federal agencies periodically. In addition to increasing throughput and minimizing queuing and delays, Pre-Pass allows law enforcement to focus resources on noncompliant motor carriers, and reduces the safety hazard of trucks entering and exiting weigh stations. Participating motor carriers pay $.99 per bypass for the convenience of the Pre-Pass system.

Applications. As of December 2000, Florida had 19 operational and committed Pre-Pass sites. Nationwide, over 216,000 trucks are equipped with Pre-Pass transponders using 267 operational and committed sites. Pre-Pass is deployed in 24 states in including Alabama, Arizona, Arkansas, California, Colorado, Florida, Illinois, Indiana, Iowa, Kansas, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, Ohio, Oklahoma, Tennessee, Virginia, West Virginia, Wisconsin, and Wyoming. For more information, refer to the www.prepass.com web site.

Pre-Pass is working with the New York State Thruway Authority (NYSTA) on a cooperative pilot program that enables truckers to use one transponder for both weigh station pre-clearance and electronic payment of tolls. New technology introduced by MARK IV has made the effort possible. Current ETC and E-Screening transponders utilize different protocols, but MARK IV Fusion CVO transponders combine technology used by E-ZPass and Pre-Pass into one device.

NORPASS

Summary. The North American Preclearance and Safety System or NORPASS is an E-Screening system similar to Pre-Pass. NORPASS, Inc. is a not-for-profit partnership of state agencies and the motor carrier industry. The NORPASS transponder allows participating motor carriers to be electronically screened for weight and safety credentials as they approach a weigh station. The NORPASS transponder is read electronically – and provided the motor carrier meets all requirements and is not selected for random inspection – the vehicle is given the green light to proceed. Similar to Pre-Pass, its participants are pre-certified, and their safety records and credentials are routinely verified with state and federal agencies. For more information, go to the www.norpass.net web site.

Applications. The NORPASS system is currently available for use in Georgia, Idaho, Kentucky, Utah, and Washington, as these states are members of the NORPASS partnership. NORPASS transponders can also be used in Connecticut, Minnesota, Oregon, and Virginia at no additional cost. NORPASS-equipped carriers can register their transponders in the PrePass system but the Pre-Pass transponder system cannot be registered/read by the NORPASS system. NORPASS charges motor carriers for the cost of the transponder, but not per use – as does Pre-Pass. There are over 25,000 trucks

registered in the NORPASS system. The NORPASS system evolved from the Advantage I-75 program.

I-95 Corridor Coalition Pilot Program – Electronic Toll Collection and Electronic Screening Interoperability Project

Summary. The I-95 Corridor Coalition is sponsoring a program for coalition member toll agencies, transportation authorities, and trucking associations to develop a single windshield-mounted transponder to pay tolls electronically in the E-ZPass system and to bypass CVISN-compatible weigh stations. Currently, toll agencies are concerned that commercial vehicles equipped with multiple toll and electronic screening transponders may interfere with reliable toll transponder operation. Motor carriers would also prefer one transponder that is interoperable among all the different transponder-based systems, as they often have to purchase each individual transponder. This would streamline their operations and ultimately save them money.

Applications. Approved for funding in March 2001, the interoperability project is using the Mark IV Fusion transponder as a platform to support multiple transponder applications including ETC and E-Screening at weigh stations in Maryland and Connecticut. Demonstrating and eventually establishing regional interoperability of ETC systems and E-Screening systems within a single Fusion transponder is the ultimate goal of this project. For more information go to the I-95 Corridor Coalition web site at www.i95coalition.org under the projects section – Project Code: 9-4B and 9a4B/Electronic Toll Collections and Electronic Screening Interoperability.

Freight Information Real-Time System for Transport (FIRST)

Summary. FIRST is an Internet-based, real-time network that integrates cargo and port information from many resources into a single, easy-to-use web site. FIRST uses the Internet as a platform to store data in a variety of formats that when fully developed will provide the Port of New York and New Jersey with a new, centralized, online application that will consolidate the various existing sources of critical cargo transfer and carrier information.

The FIRST system provides up-to-date container cargo status; real-time video feeds to monitor congestion at seaport entry gates and road conditions on the major arterial roadways leading to the port; and enhanced intermodal connectivity by improving the in-transit visibility of cargo. Eventually, FIRST will allow private terminals to schedule pickup and delivery times with trucking companies, thereby significantly increasing the productivity and efficiency of freight movements and reducing congestion in and out of port terminals.

Applications. The FIRST web site – www.firstnynj.com – has 327 registered users from a total of 231 registered companies. Three of the six container terminals at the Port of New York and New Jersey, and eight steamship lines currently are providing data to the system. However, the full potential of the FIRST system is not being realized because carriers are not providing enough data to populate the system. Carriers fear that

providing data to the system will erode their competitive advantage. Creating an incentive for carriers to provide data is the single biggest hurdle facing the FIRST system. Application of the FIRST system and similar platforms (PortNet.com) at other United States ports will likely face similar data problems.

PortNet.com

Summary. PortNet.com – developed by the Port of Singapore (PSA) – was one of the first ever attempts to create an integrated port community system. Originally developed in 1984, PortNet.com came online in 1999 as an Internet-based system. It extends PSA's computer systems to the maritime community, and facilitates end-to-end information flow that will eventually lead to paperless documentation. Customers can electronically submit their declarations plans and manifests; check on sailing and berthing schedules; check on particulars of containers and cargo at terminals; make inquiries; and submit requests. Portnet.com has been successful in Asia, where ports are run by the government and the use of the system is enforced.

Application. In early 2001, the Port of Seattle implemented a version of the PortNet.com system. This is the first collaboration that PortNet.com has made with a United States port. Initial reports from the Seattle system indicate that they are facing the same problem as users of the FIRST system – namely the lack of data and participation. However, the level of participation for this implementation should be closely monitored because the Port of Seattle contracts the terminal operations out to third parties and the ability of the Port of Seattle to convince these terminal operators to utilize PortNet.com software and provide data to populate the system will be interesting. See www.portseattle.org for more information.

Port Pass

Summary. The Port Pass test project is being led by the I-95 Corridor Coalition in partnership with the Port Authority of New York and New Jersey, and is seen as an opportunity to expand single transponder use. The project is intended to complement the current I-95 ETC and E-Screening Interoperability project. Port Pass involves installing passive readers throughout marine terminals (entry lanes, truck "slots," exit lanes) to read E-ZPass transponders on trucks. Port Pass will interface with the FIRST system to enable the creation of an appointment system for cargo pickup and delivery.

Applications. The Port Pass test project is still in the development stage. Some key objectives include establishing "express lanes" for pre-notified trucks to shorten lines at gates, reducing terminal congestion by spreading out truck arrivals, and enhancing the ability to integrate CVO credentials and e-screening.

Air Cargo Electronic Supply Chain Manifest (ESCM)

Summary. The air cargo electronic supply chain manifest (ESCM) is in the field operational testing phase of development, and is the first operational electronic air cargo

manifest and security system in the United States. Led by the American Transportation Research Institute, the goal of this test is to demonstrate the efficiency and security of an Internet-based electronic manifest system compared with traditional processes and paper-based manifest systems. The ESCM system is designed to allow authorized users to monitor critical aspects of air cargo movements and access valuable shipment information. The ECSM system has two basic goals: 1) improve security of the air cargo system and automate the Federal Aviation Administration's (FAA's) "Known Shipper" protocol, and 2) use technology to make the manual, paper-based manifest process more efficient.

The ESCM project builds on an earlier FAA test at Chicago's O'Hare Airport. Phase I of this test used biometric "smart cards" to confirm the identity of a truck driver using a stored thumbprint, and provided information about the seal and contents of the cargo the driver was transporting. The purpose was to improve the security of freight movements into and out of airports. Phase II builds upon these same technologies, introduces the electronic manifest, and provides substantially more freight management functions.

Applications. Phase II testing involved the deployment of ESCM technology at two airports (O'Hare and John F. Kennedy). Phase III testing was originally envisioned to provide an automated cargo profiling system, but has since been modified to expand the Phase II system to two additional airports **(**Los Angeles and Toronto). This decision was made to further test the system domestically as well as to test an international location. This expansion took place in the fall of 2002 and is still underway. Preliminary figures indicate that trucking companies experienced two to four times faster processing times time using ESCM technology, thereby increasing productivity while meeting security requirements. Findings also indicate that the system's weaknesses are related to building a critical mass of participants as there is a lack of incentive for key players throughout the supply chain to provide data. Phase II started in mid-2000 and was estimated to be complete by the end of 2002. For further information, refer to the http://ops.fhwa.dot.gov/freight/operations_technology.htm web site.

Application Opportunities for Broward County

ITS technology can help maintain efficient, reliable and secure access to large generators of truck traffic in Broward County, such as Port Everglades. The State of Florida and Broward County have actively deployed ITS technology to allow for ETC, e-screening, and e-commerce. ITS applications in these three areas can be introduced, further implemented, and improved in Broward County.

- ETC is available in much of Florida through SunPass, E-Pass, C Pass, Leeway, and O Pass. The state of Florida is actively pursing interoperability between SunPass (the most popular system) and the state's other toll systems. Broward County should ensure that ETC is available and compatible with other systems when possible.

- E-screening at weigh stations and agriculture inspection facilities is available in Florida through Pre-Pass. Pre-Pass is part of Florida's CVISN architecture. Weigh stations and agriculture inspections facilities equipped with Pre-Pass are located in northern, central, and southwestern parts of the state. Broward County does not have

any Pre-Pass/CVISN sites. Broward County should coordinate with FDOT to explore the possibility of developing a weigh station and/or agriculture inspection site that is Pre-Pass compatible.

- Broward County should monitor efforts by the I-95 Corridor Coalition and others to develop a single use transponder for both ETC and E-Screening. When the technology is fully tested and ready, Broward County should support the deployment of this technology to local shippers and carriers.

- Port Everglades is currently undertaking a major initiative to upgrade security. The use of ITS models such as FIRST, PortNet.com, and Port Pass should be considered viable strategies to improve port access and freight cargo movements into and out of the port facility in Broward County.

- Although Fort Lauderdale – Hollywood International Airport experiences limited air cargo movements, they can also benefit from using ITS. The ESCM field operational test should be monitored, and used as the basis for improving security, and air cargo movement at Fort Lauderdale airport.

Point of Entry Control and Security

The volume of intermodal containers moved by air, rail, truck, and through ports worldwide has doubled over the past decade. Over the next two decades, volumes are expected to nearly double again. ITS technology can help balance the needs of the private sector – global supply chains require efficient and reliable movement of goods – with the mandate of the public sector – maintaining security at points of entry without compromising productivity of the private sector.

Integration of Electronic Commercial Vehicle, Cargo, and Driver Information at the United States/Canada International Border

Summary. The Washington State Department of Transportation (WSDOT) is leading an effort to install three integrated ITS deployments at the Washington/British Columbia border. These systems are designed to identify, monitor, and pre-process cargo in intermodal containers that are trucked over the Washington/British Columbia border. Two of the systems use a standard transponder that provides commercial vehicle-related information while the other (the eSeal Project) uses a disposable electronic container door seal to monitor the status of the cargo (confirmation of border clearance, and verification that there was no tampering with the load). The eSeal Project tested disposable electronic seals that replaced mechanical container door seals. These eSeals were tested as means to track shipping containers both in ports and along roadways. They also were tested as a tool to increase the security of cargo as the seals have a tamper indicator message. These systems are integrated within a secure Internet communications network that distributes the information to authorized users. These projects are designed to facilitate the movement of participating commercial vehicles across the border by providing border enforcement agencies, carriers, brokers, and commercial vehicle operators with electronic

information about the vehicles and their cargo. The Internet-based system links automatic vehicle identification (AVI) readers, the Trade Corridor Operation System (TCOS), the shipping line's information system, and U.S. Customs Automated Manifest System (AMS).

Applications. The International Mobility and Trade Corridor (IMTC) partnership is an effort led by over 60 public and private stakeholders in Washington State and British Columbia to improve border mobility at the "Cascade Gateway," which includes four land border crossings between British Columbia and Washington State. This partnership supports the efforts of WSDOT and others to deploy ITS technology at the Ports of Tacoma and Seattle, both sides of the international border, and particularly in Blaine, WA. Two-way trade at the Blaine border crossing was valued at more than $35 million per day in 2000.[1] It has also been estimated that $40 million in operating costs are lost *annually* due to border crossing delays at the Blaine border facility alone. ITS technology has enormous potential to mitigate losses due to border crossing delays by providing all concerned parties with the information necessary to clear customs well in advance of carrier arrival at the border.

As of March 2002, WSDOT applied for additional funds under the FY 2003 ITS deployment program. These funds would be used to evolve and expand the functional capabilities of each project by increasing the volume of pre-processed, cross-border shipments. This would also facilitate the clearance of freight hauled by trusted and pre-approved motor carriers, thus allowing enforcement and inspection resources to be focused on higher risk carriers.[2]

Virginia Port Authority Security Program

Summary. As part of an effort to prevent terrorists from using cargo containers as a means for sneaking bombs into the country, the Virginia Port Authority and the Hampton Roads shipping terminal installed a new security system that checks for bombs on containers as they leave the terminal. Hampton Roads shipping terminal is the first cargo port in the country to install a new security system of this type. The system is now scanning 5,000 container trucks per week for radiation just before they carry their goods out of the port. The system is somewhat limited because it's designed to detect radioactive material only; it cannot detect explosive material and does not scan containers before they enter the port itself. Refer to www.vaports.com for additional information.

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[1] U.S. Department of Transportation, Bureau of Transportation Statistics, *North American Trade and Travel Trends,* BTS02-07, (Washington, D.C.: 2001).

[2] Washington State Department of Transportation, *Preliminary Application to the Federal Highway Administration for Participation in the Fiscal Year 2003 ITS Deployment Program for the Integration of Electronic Commercial Vehicle, Cargo, and Driver Information at the U.S./Canada International Border,* March 2002.

Applications. In the heightened security environment since September 11, 2001, applications such as those found in Virginia will become much more common.

Application Opportunities for Broward County

Airport and seaport facilities in Broward County have the difficult task of maintaining their competitive advantage relative to other facilities, while providing secure, efficient, and reliable service and access in the face of rising demand. To help airport and seaports in Broward County meet this challenge:

- Port Everglades and the Fort Lauderdale – Hollywood International Airport could adopt portions of the WSDOT eSeal Project. The eSeals were tested as means to track shipping containers both in ports and along roadways. They also were tested as a tool to increase the security of cargo as the seals have a tamper indicator message. Cargo shipments arriving at ports or airports with the eSeal can help inspectors quickly identify containers that have been tampered with, and concentrate on non-participating shippers.

- In today's security conscientious world, improving security at points of entry is a primary focus. Port Everglades has an extensive security program underway that includes the deployment of "star system" gamma x-ray equipment at port access gates designed to enhance law enforcement efforts to stop the exportation of stolen automobiles and heavy construction equipment from this country. Similar detection equipment that detects explosives should be investigated. Port Everglades can use the Virginia Port Authority and Hampton Roads shipping terminal as an example of a system that, although limited, addresses security while minimizing disruptions to freight movements. Ideally, non-intrusive security systems could be installed that scan containers while they are being loaded/unloaded.

Advanced Traveler Information Systems (ATIS)

Advanced traveler information systems (ATIS) are designed to provide travelers with real-time traffic information, enabling them to make optimum route and mode selection decisions. Recently, the ATIS concept has been adapted for freight-specific uses.

FleetForward

Summary. The I-95 Corridor Coalition led FleetForward, an operational test of an ATIS for commercial vehicle operators. The FleetForward operational test coupled real-time traffic information with motor carrier's routing and dispatch decisions. FleetForward used data provided by both the Information Exchange Network (IEN), maintained by the state departments of transportation within the I-95 Corridor Coalition, and SmartRoute Systems to provide motor carriers with information on congestion, incidents, and highway construction and maintenance activities. The system processed and formatted the available traffic information in order to provide truck relevant data. This concept is

different from the traditional ATIS data because truck drivers require distinct information. Commercial vehicle operators need timely information that assists them in navigating through an entire metropolitan region, whereas the typical commuter only needs timely one way traffic information to assist them in their movement from a residential area to the central business district. Further, commercial vehicle operators often are required to notify their customers when shipments are delayed – FleetForward assisted the carriers identify delays resulting from congestion, incidents, or construction-related activity.

The FleetForward operational test developed color-coded route segments representing incident areas and severity of traffic congestion. The information was accessible via a specially designed map-based web site. FleetForward information also was directly integrated into motor carriers routing and dispatching software (ALK's PC Miler) to facilitate the carrier's fleet management and rerouting of affected vehicles.

Applications. A recent evaluation of FleetForward deemed it an overall success. Although FleetForward was found to be a technically sound product, some limitations were uncovered: There is a need for additional data (such as weather, historical traffic reports, parking information, etc.); motor carrier management failed to fully integrate the system into normal daily operations; and the turnover of motor carrier staff impacted the level of participation. The FleetForward model has the potential to improve motor carrier operations and the overall efficiency of the highway system.[3]

Ports of Long Beach and Los Angeles – Advanced Transportation Management, Information, and Security System (ATMIS)

Summary. Combined, the Ports of Long Beach and Los Angeles currently generate about 34,000 truck trips per day. If predictions hold, they will generate 50,000 by 2010 and 92,000 by 2020. To address this massive growth, the Ports of Long Beach and Los Angeles are planning to utilize three types of ITS technologies:

- The Port Transportation Facility Security System/Emergency Response and Evacuation System is being designed for the dual purpose of providing real time en-route information on a daily basis, and safe evacuation routes during major incidents;

- The Advanced Transportation Management System (ATMS) will control ITS field elements, monitor traffic signals, and roadway traffic conditions; and

- An ATIS system is being designed to exchange and share data between the public and private sector. With such a high volume of truck traffic entering and exiting the port

[3] Cambridge Systematics, Inc. in association with Science Application International Corporation, *FleetForward Evaluation,* prepared for the I-95 Corridor Coalition, and U.S. DOT ITS Program Assessment Support Contract (December 2000).

on a daily basis, ITS technology is being used to help support efficient access and mitigate lost productivity resulting from travel time delays.[4]

Applications. The Port of Long Beach is lead agency for this project and is partnered with the Port of Los Angeles. These agencies are in the process of obtaining funding for this planned ITS deployment package. Refer to www.polb.com or www.portla.com for information on the Ports of Long Beach/Los Angeles Advance Transportation Management, Information, and Security System – "Project Summary."

Application Opportunities for Broward County

The new Broward County Traffic Operations Center (TOC) – construction is underway – will serve as a central platform for expanding future ITS operations. The traffic operations center will support the SunGuide Advanced Traveler Information System (ATIS) that will provide real time information to motorists in Miami-Dade, Broward, and Palm Beach County via phone, fax, radio, television, and the Internet. The TOC and the ATIS can be used to:

- Develop a platform similar to FleetForward to provide route-specific information to motor carriers and dispatchers in Broward County. Motor carriers have unique traffic information needs that are not typically met by a traditional ATIS. A modified system could pivot off the ATIS technology and format data to provide information specifically tailored to meet the needs of the motor carrier industry.

- The ATMIS technology utilized by the Ports of Long Beach and Los Angeles could be adapted to meet the needs of Port Everglades. Port Everglades is facing many of the same problems as the Ports of Long Beach and Los Angeles including maintaining efficient access to the port facility in light of rapidly growing truck traffic as well as increased security concerns. A program similar to ATMIS would help Port Everglades manage such issues more effectively.

- In July 2002, FDOT launched the 511 dialing code for traveler information in Orlando, Miami-Dade, Palm Beach, and Broward Counties. The 511 service provides continuously updated information on traffic incidents, roadway conditions, travel times, and congestion. Transit data will also be available shortly. In the future, this system could develop information specifically designed for motor carriers and dispatchers, such as traffic conditions in and around Port Everglades.

[4] www.polb.com

Traffic Management

Broadly defined, traffic management employs policy or technological strategies to increase the quality of operations and level of service of the transportation network. Traffic management centers (TMCs), such as the forthcoming Broward County TOC, serve as control hubs from which surrounding roadways are monitored and operated. ITS field devices terminate at the TMC, where operators monitor closed-circuit television cameras, traffic and weather sensors, dynamic message signs (DMS), traffic signals, ramp meters, and other devices to manage traffic flow on streets and freeways. As the TMC processes information, operators can determine appropriate signal timing changes and other mitigation strategies in response to real-time traffic conditions. A TMC does not typically target freight movements specifically. Rather, a good traffic management program provides benefits to the entire roadway network, thereby improving the movement of both freight and people. The following recent traffic management strategies explicitly target freight and goods movement.

Truck-Only Lanes

Summary. Truck-only or "truck lanes" are lanes designated for the exclusive use by trucks. Traditionally, trucks have been forced to share travel lanes with passenger vehicles. In many states this includes additional restrictions, such as no trucks in the left-most lane(s). Creating exclusive truck lanes could improve travel time, reduce operating costs, and reduce crashes; thereby improving economic productivity as virtually all goods in the United States are delivered or moved by truck at some point. ITS technology – such as DMS or other lane use signals – can be used to identify when lanes are designated as truck-only, similar to the operation of high-occupancy vehicle lanes.

There are a number of challenges for Truck-Only Lanes: With the existing congestion on the highway networks around the country, the public generally is not supportive of providing new (or redesignating existing) capacity for truck operations. In addition, to justify the substantial cost of these lanes, a large volume of truck traffic is required, and in many instances tolls are suggested. These tolls create an obstacle that deters commercial vehicles and sometimes results in the trucking industry continuing to use the general purpose lanes.

Applications. Very few exclusive truck lanes exist in the United States. In February 2001, the Southern California Association of Governments (SCAG) completed a feasibility study report on exclusive lanes for commercial trucks (see www.scag.ca.gov). The study identified strategies and criteria for selecting truck lanes. Currently, California has one existing truck lane and another under construction.[5] It will be interesting to monitor SCAG's goods movement program to assess its applicability and potential benefits for other corridors around the country.

[5] www.dot.ca.gov/hq/traffops/trucks/trucksize/fs-trucklanes.htm

Overheight Vehicle Detection System (OHVDS)

Summary. An OHVDS is designed to alert drivers if their vehicles exceed the clearance limit for an upcoming bridge, overpass, overhead walkway, etc., and provide them with ample warning time to take action to avoid damaging their vehicle and the overhead structure. Audible alarms and flashing signs are most commonly used to provide attention-getting warnings that alert drivers of where they need to exit the roadway to avoid a potential crash. As an alternative to static signs with flashing beacons, DMS are increasingly being used to display warning messages (e.g., "WARNING – HEIGHT RESTRICTION") when an approaching vehicle exceeds the height restrictions of the structure. During times when the message is not activated, the sign may blank out or display any operator-defined message. These systems not only reduce costly infrastructure damage to structures caused by overheight vehicles, but they also help prevent congestion resulting from overheight vehicles getting stuck underneath an overpass, a serious incident that can cause lengthy delays, and bridge and road closures.

Applications. The latest technology has improved detection, and combined audible alarms with traditional warning message signs. An OHVDS is scheduled to be installed at tunnel entrances for Boston's Central Artery project. The Port Authority of New Authority of New York and New Jersey completed a study and recently installed an OHVDS at the Port Authority bus terminal. Some leading vendors for OHVDS include Trigg Industries (www.triggindustries.com), Intelligent Road Dynamics Inc. (www.irdinc.com), and Traffic Technologies (www.traffic-technologies.com).

Truck Speed Warning Systems

Summary. Truck drivers face an unique set of operating conditions including long-haul trips across the country, fatigue, and hazardous and unfamiliar driving environments. These factors, combined with such difficult driving conditions as steep downgrades with sharp curves, increase the risk of traffic fatalities. Moreover, a single crash can cause millions of dollars of damage. Therefore, ITS technology is being employed to notify drivers of dangerous operating conditions, and suggest appropriate actions. Several projects have used ITS technology to link weigh-in-motion (WIM) devices with DMS to provide customized warning messages for trucks approaching dangerous downgrades and/or steep curves. In general, these systems measure the weight of approaching trucks using a WIM, and within seconds calculate and display the appropriate speed for that particular vehicle. Not all systems provide customized information, but rather employ flashing signs and warning messages when a truck is exceeding recommended speeds.

Applications. Several studies and operational tests of truck speed warning systems have been conducted in recent years. Examples include the Green Light Field Operational Test Truck Speed Warning System led by Oregon DOT (initial deployment currently being evaluated before setting a full operational date); Truck Activated Flashers led by Missouri DOT (installed in 1999 and currently active); and The Sandstone Mountain Downhill Truck Warning System led by the West Virginia Division of Highways (installed in 1998 and currently active). More information can be found through the U.S. DOT, Federal Highway Administration, Safety Applications of ITS in Rural Areas, September 2002.

Application Opportunities for Broward County

These truck-specific traffic management tactics hold promise for addressing freight flows in Broward County. The new traffic operations center will be able to manage the deployment of these systems, and monitor daily operation. Potential applications include:

- Both I-95 and I-595 have a high volume of truck traffic. Truck only lanes could improve travel times for motor carriers using these corridors, and improve safety. This option does require further study to determine if this could be an appropriate solution for Broward County given public concerns over truck only lanes.

- In areas of Broward County where trucks have repeatedly damaged overhead structures such as highway overpasses, an OHVDS could be installed to warn overheight motor carriers that they are too tall to clear the upcoming overpass or tunnel. Such a system could help reduce further incidents, minimize damage to infrastructure and trucks, and improve travel time for motor carriers and the traveling public.

- As a result of the geography of Broward County, steep downgrades with sharp curves do not exist. However, at the terminus of Eller Drive into Port Everglades, for example, the geometry of the roadway is problematic for large trucks. A flashing warning system would be an effective way to alert drivers they need to reduce speeds.

- As in most other metropolitan areas, motor carriers traveling at excessive speeds is a problem regardless of the roadway geometry. In areas where this a concern, DMS could be installed in conjunction with a truck speed warning system to alert motor carriers that they are traveling at excessive speeds. This system could allow other messages (i.e., general traffic conditions) to be displayed, and only display the warning message when a truck is determined to be traveling above the recommended speed limit for that area.

Incident Management

Summary. A specific subset of traffic management, incident management is a planned and coordinated program to detect, respond to and remove unplanned traffic incidents, and restore traffic capacity as safely and quickly as possible. Effective incident management programs must include well-defined plans and regular collaboration among multiple agencies, as various types of incidents require different types of response. Additionally, incidents can occur on the border of separate, defined rights-of-way. Therefore, it's also important for incident management plans to include and define responsibilities of agencies in neighboring communities.

While traffic incident management focuses on all modes of vehicular traffic, special attention is paid to incidents involving trucks. In order to properly respond to incidents involving trucks, coordination is necessary among law enforcement, fire and rescue, emergency medical services, towing services, and environmental agencies or contractors

for hazardous material (hazmat) cleanup. Crashes or incidents involving trucks often require a coordinated response between public and private entities to ensure that a timely and safe cleanup is administered, while minimizing traffic congestion and travel time delays. When trucks are involved in an incident, the response and clearance activities become more complicated as special heavy duty towing equipment is often required, and if there is any type of cargo spill, hazardous or otherwise, a specialized clean up crew is required. The recovery period is therefore much longer when commercial vehicles are involved. Examples of traffic incident management programs can be found on the Federal Highway Administration's Office of Operations web site at http://ops.fhwa.dot.gov/Travel/IncidentMgmt/IncidentMgmt.htm.

Applications. As traffic continues to grow around the country, the formalization of incident management plans will continue to occur. This will include improvements to existing programs and creation of programs where none exist. ITS applications for these programs will focus on real-time notification of incidents as well as integrated communication systems to ensure coordination and cooperation among the responding agencies.

Application Opportunities for Broward County

As part of the incident management program in Broward County, Chemtrec – a national hazardous material information service – was contracted to provide detailed information on hazardous materials and appropriate response to hazmat clean up responders. Each FDOT District, including the Turnpike, has an Emergency Operations Center that is activated for major incidents/emergencies, which in turn usually impact freight flows. Broward County should continue to improve coordination between the public and private sector through the use of ITS technology to ensure an efficient, and timely response to all traffic incidents. Efforts underway include:

- In 2004, a planned Advanced Incident Information System (AIIS) will be able to deploy flashing beacon signs along Broward County arterials with I-95 interchanges to indicate incidents.

- In conjunction with this effort, a Freeway Incident Management team of approximately 60 members representing State, County, and local engineering and emergency management, law enforcement, fire department agencies, towing, hazmat, and traffic information services is programmed for 2002-2006.

Intelligent Vehicle Initiative (IVI)

Summary. The IVI is a technology-driven program being led by the U.S. DOT designed to reduce crashes by helping drivers avoid hazardous mistakes. IVI aims to accelerate the development and commercialization of vehicle-based driver assistance products that will warn drivers of dangerous situations, recommend actions, and even assume partial control of vehicles to avoid collisions. Some of the more promising IVI solutions include rear-end collision avoidance; lane change and merge collision avoidance; road departure

collision avoidance; intersection collision avoidance; vision enhancement; vehicle stability; and driver condition warning systems. The ultimate goal of IVI is to integrate driver assistance and motorist information functions so that vehicles operate more safely and effectively.[6]

Applications. Many of the IVI technologies represent advanced early generation systems that are not yet available to the public. The development of these systems is ongoing as safety issues continue to receive significant focus and as auto manufacturers pursue the development of advanced vehicles. The specific application of these technologies to trucks will continue to be led by the Federal Motor Carrier Safety Administration (FMCSA). Specific commercial-vehicle-related IVI operational tests include: a roll-over advisor/education and control system; a hazardous material collision notification system; and a "trucker advisory" system that notifies truck drivers as they approach locations with the potential for danger (past crash history, geometry, downgrade, etc.). The State of Florida is a participant in the "trucker advisory" operational test being conducted by McKenzie Tank Lines – a Florida-based carrier.

Application Opportunities for Broward County.

Much of the IVI technology is still in testing stages, but Broward County should monitor its progress and try to participate in future pilot programs.

[6] www.itsdocs.fhwa.dot.gov

Appendix B

Broward County ITS Intermodal Plan Working Meeting – February 20, 2003

Broward County ITS Intermodal Plan Working Meeting

February 20, 2003 at Port Everglades

AGENDA

9:00 a.m. Introductions and Overview

9:15 a.m. Project Review: "Broward County ITS Intermodal Plan"

- Project Scope, Schedule, and Status

9:30 a.m. Presentation of Phase 1 Results: "Needs & Deficiencies Statement"

- Significant Congestion in Key Freight Corridors
- Limited Access for Freight Movements
- Balancing Freight Operations and Security
- Freight-Specific Incident Management Issues
- Needs for Improved Regional Communications and Coordination
- Infrastructure Limitations

10:00 a.m. Break

10:15 a.m. Part II Workshop

- Workshop Purpose
- Sample ITS freight projects
- Preliminary Mapping of ITS Strategies to Address Needs
- Open Discussion and Feedback

11:45 a.m. Wrap-up and Next Steps

12:00 noon Adjourn

Transportation Planning Division, 115 S. Andrews Avenue, #329H, Ft. Lauderdale, FL 33301
Phone: 954-357-6608 Fax: 954-357-6228 www.broward.org/mpo

Broward ITS Intermodal Plan Working Meeting

February 20, 2003 at Port Everglades

List of Attendees

Name	Agency/Organization	E-mail Address
Nancy Bonomo	FDOT OMD	nancy.bonomo@dot.state.fl.us
Bill Austin	FDOT Turnpike	bill.austin@dot.state.fl.us
Enrique Zelaya	Broward County MPO	ezelaya@broward.org
David Anderton	Port Everglades	danterdon@broward.org
Mark Gelband	Broward County Aviation	mgelband@broward.org
Mario Aispuro	Broward County MPO	maispuro@broward.org
Murali Pasumarthi	Broward County TED	mpasumarthi@broward.org
Jan Thakkar	FDOT District 4	janak.thakkar@dot.state.fl.us
Tahira Faquir	FDOT District 4	tahira.faquir@dot.state.fl.us
Peter Haliburton	Kittelson & Associates	phaliburton@kittelson.com
Jennifer Strasser	Cambridge Systematics	jstrasser@camsys.com
Mike Williamson	Cambridge Systematics	mwilliamson@camsys.com

Broward County ITS Intermodal Plan

Working Meeting

presented by
Michael T. Williamson
Jennifer B. Strasser
Cambridge Systematics, Inc.

February 20, 2003

Welcome

- Broward County MPO is leading the development of the ITS Intermodal Plan in cooperation with FDOT District 4 and Port Everglades
- A successful plan needs to involve all freight and ITS stakeholders, which is why you've been invited here

Agenda

- Welcome and Introductions
- Meeting Purpose
- Project Summary, Status, and Schedule
- Part I – Presentation of Findings
  - Summary of "Needs and Deficiencies Statement"
- Break

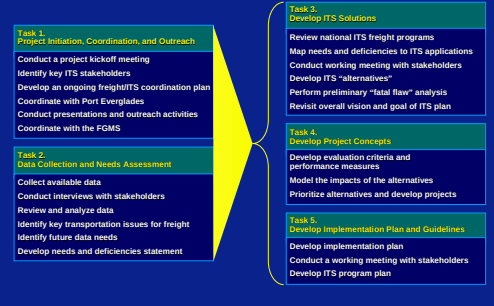
Agenda (continued)

- Part II – Workshop
  - Evaluate potential ITS mitigation strategies
  - Open discussion and feedback
- Wrap-up and Next Steps

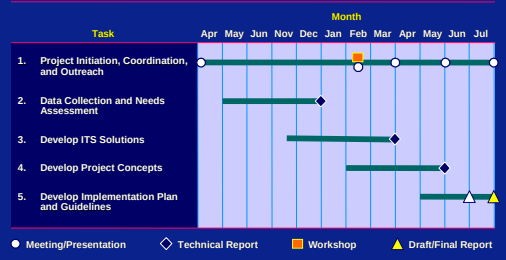
Meeting Purpose

- Provide a summary of project work to date
- Verify findings and provide opportunity for feedback
- Present potential ITS strategies that address freight needs

Review of Project Scope



Project Schedule



Key Accomplishments to Date

- Identified public and private stakeholders
- Coordinated with FGMS and Port Everglades Security Program
- Conducted outreach via stakeholder interviews
- Collected and analyzed documents, plans, and data related to ITS and freight in Broward County and Florida
- Developed a comprehensive Needs and Deficiencies Statement
- Reviewed national ITS intermodal/freight programs and plans
- Began mapping ITS strategies to address freight needs

Why Develop a Needs and Deficiencies Statement?

- To identify and collect all available data
  - Comprehensive literature review
  - Regional ITS and freight stakeholder interviews
- To generate a list of all regional freight transportation issues, needs, challenges, and deficiencies
- To determine future data needs

Summary of Broward's Needs and Deficiencies Statement

1. Significant congestion in key freight corridors
2. Limited access for freight movements
3. Balancing freight operations and security
4. Freight-specific incident management issues
5. Need for improved regional communications and coordination
6. Infrastructure limitations

1. Significant Congestion in Key Freight Corridors

- Major highways are congested
- Lack of east-west highways causes overreliance on east-west arterials
- Peak hours spread beyond traditional a.m. and p.m. periods
- Expected population growth and increased freight volumes will further strain the transportation system
- Considerable under use of mass transit

Examples of Congested Roadways

- I-95
- U.S. 441
- I-595
- I-75
- U.S. 27
- Florida's Turnpike
- Hallandale Beach Boulevard
- Hollywood Boulevard
- Davie Boulevard
- Broward Boulevard
- Oakland Park Boulevard
- Commercial Boulevard
- Cypress Creek Road
- Atlantic Boulevard
- Sample Road

2. Limited Access for Freight Movements

- Safety concern at terminus of I-595 at Eller Drive
- Poor access from Port Everglades to FLL airport
- Poor access from air cargo terminals to I-595, I-95, and U.S. 1
- Deficient signage at Port Everglades and FLL airport
- Inadequate loading/unloading zones, i.e., low-hanging trees for trucks making local deliveries in downtown areas

3. Balancing Freight Operations and Security

- Long queues at Port Everglades security gate check points
  - Bottlenecks along main entrance at Eller Drive
  - Spillback onto I-595
- New security regulations require that only one truck is permitted dockside to a cruise ship at any given time
  - Large queues of delivery trucks waiting to unload while passengers arrive by car or bus

4. Freight-Specific Incident Management Issues

- Truck crashes are difficult and time consuming to clear
  - Require specialized equipment
  - Long delays likely result in secondary incidents
- On-scene commanders in Florida can be held liable for cargo damage or loss during clearance
- Need for better defined areas of responsibility
- Fatalities on the SFRC right-of-way can take 2-3 hours to clear

5. Need for Improved Regional Communications and Coordination

- Multiple planning agencies without regional program
  - Several Large MPOs and County agencies
  - FDOT Districts 4, 6, Turnpike
- ITS and freight priorities vary considerably among agencies
- Vastly different planning horizons for public and private sector stakeholders
- Lack of awareness about benefits of ITS
- Negative perception of freight

6. Infrastructure Limitations

- Lack of east-west freight shipment infrastructure
  - High truck volumes on arterials strain capacity and pose a conflict with cars
- Limited number of truck service facilities in Broward County for trucks to consolidate or transfer loads
- SFRC shared by Tri-Rail, CSX, and Amtrak
  - Double-tracking initiative will reduce constraints
- Numerous at-grade railroad crossings

Break

Part II
Workshop

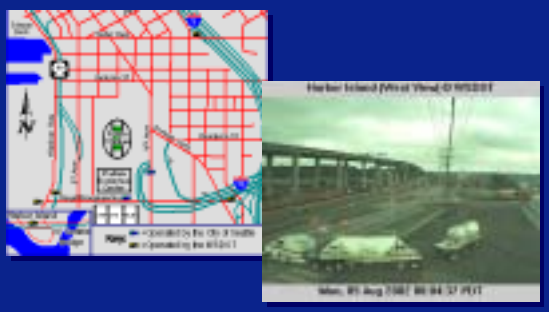
- Evaluate potential ITS mitigation strategies
- Open discussion and feedback
- Wrap-up and next steps

Future Traffic Controls at Port Everglades

Electronic Cargo Seal Operational Test

Port of Tacoma Congestion Notification System

Port of Seattle Port Traffic Information System



Project Vision

- Develop potential ITS projects to address the freight needs and deficiencies in Broward County and the southeast Florida region
- Lay the foundation for a coordinated ITS intermodal program for Broward County
- Coordinate with the security program at Port Everglades

Map ITS Strategies to Needs and Deficiencies

- Needs/deficiencies (categorized by 6 themes)
- ITS strategies for consideration
- Existing deployments
- Geographic scale
- Potential benefits
- Pass/fail
- Priority ranking
- Lead organization

Pass or Fail?

- Do you think the ITS strategy could work?
- Is the technology currently available or will it be soon?
- Is the ITS strategy applicable to the region?
- Does the ITS strategy fit into the scope of this project?
  - Which parts make sense to keep?

If It Passes, Should It Be a Priority?

- Is this ITS strategy very important?
- Should it be implemented in the near-term?
- Can it make a big impact relatively quickly?
- Are there resources in place that make it easy to get started?

H = High

M = Medium

L = Low

Who Should Take the Lead?

- What organization(s) need to participate?
- Which organization(s) will likely benefit from the ITS strategy?
- Does the ITS strategy build off another existing project?
- Who should own or operate the system?
- Who has the resources?
- If this is a group initiative, who should take the lead?

Wrap-Up

- Thank you!
- If you have any additional thoughts feel free to contact us!
  - jstrasser@camsys.com
  - mwilliamson@camsys.com
  - maispuro@broward.org
- Next steps will include incorporation of today's input and development of specific alternatives

Appendix C

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies
Results from Broward County ITS Intermodal Plan Working Meeting held February 20, 2003

Need/Deficiency	ITS Strategy for Consideration	Description	Existing Deployments	Geographic Scale	Potential Benefits	Pass/ Fail	Rank	Lead Org.	Comments
1.0 Significant Congestion in Key Freight Corridors									
1.1 Major highways are congested	ATIS	• Provide more reliable truck-oriented travel time information so commercial vehicle operators can make informed route choices. • Review results of FleetForward, a field test performed by the I-95 Corridor Coalition that pairs real-time traffic information with motor carrier's routing and dispatch decisions. The system focuses on truck relevant data.	511, SunGuide	Local	• Travel time • Reliability	P	H	Port Everglades BC TED	Current 511 system needs enhancements to improve reliability; Begin with deployments at Port Everglades (i.e., DMS at port exits); Then link to 511; Then expand to other facilities and market to truckers
1.2 Increasing freight volumes; trucks share roadways with passenger cars	Truck-only lanes	• Implement truck-only lanes and times on key freight highway segments. • Install ITS devices such as DMS or other lane use signals to regulate and inform motorists when lanes are designated as truck-only, similar to the operation of high-occupancy vehicle (HOV) lanes. • Decrease conflicts with passenger cars.		Regional	• Travel time • Safety	F			Technically sound idea but politically infeasible due to public opposition to trucks in general
1.3 Region lacks east-west highways	Signal timing optimization	• Optimize signal timings on key freight arterials regionwide, particularly during peak hours (Sample Road, Hollywood Boulevard, Broward Boulevard, University, U.S. 1 etc.).	Technology in place, optimization planned	Local, Regional	• Travel time	P	H	BC TED	Optimization already in place that includes signal preemption and priority (EMS in place, transit under consideration); Work with truckers to investigate providing truck priority at key locations
1.4 Additional source of real-time traffic data	Use freight trucks as probes	• Investigate use of freight trucks to provide first-hand, real-time travel condition information using their existing internal communications. • Use data to help manage traffic operations, incident response, and for the provision of travel information to other motorists. • Form a public-private partnership.		Local, Regional	• Travel time • Data	F			Time consuming process to get public-private partnership established; Traffic cameras will provide enough data
1.5 Real-time information for train operators	Improve communications with train operators	• Investigate the provision of real-time operational information (e.g., timely speed restriction information) via in-train devices or DMS along the corridor at-grade crossings.	Currently radio-based	Regional	• Data	P	?	?	Need to investigate further – contact railroads and Larry Merritt of FDOT

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies
Results from Broward County ITS Intermodal Plan Working Meeting held February 20, 2003

Need/Deficiency	ITS Strategy for Consideration	Description	Existing Deployments	Geographic Scale	Potential Benefits	Pass/ Fail	Rank	Lead Org.	Comments
2.0 Limited Access for Freight Movements									
2.1 Safety concerns at terminus of I-595 at Eller Drive	Radar speed detector, DMS warning system	• Detect queues at Eller Drive security gate and warn approaching vehicles "SLOW TRAFFIC AHEAD" and "BE PREPARED TO STOP." • Or, deploy a truck speed warning system (WIM and DMS provide customized warning messages for trucks approaching dangerous downgrades and/or steep curves). Simpler systems employ flashing signs and warning messages when a truck exceeds recommended speed.	Geometric redesign planned	Local	• Safety	P	H	FDOT D4 Port Everglades	Well-known high-accident area; FDOT for the DMS; Port for the detector; Maybe static signs; New security gate will be set in to allow much more queuing space; investigate pavement reflectors that flash in wet weather
2.2 Deficient signage to/ from Port Everglades	DMS	• Install DMS and static guide signs for vehicles entering/exiting Port Everglades, particularly toward FLL Airport (in English and Spanish). • Especially helpful during security incidents. • Coordinate with FLL for consistency. • Temporary signage needed while permanent program is planned.		Local	• Access	P	H	FDOT D4	Coordinate with Rick Mitinger, who is working with FLL on static signs
2.3 Deficient signage to/ from/within FLL Airport	DMS	• Install DMS and static guide signs for vehicles entering/exiting FLL Airport. • Especially helpful during security incidents. • Coordinate with Port for consistency. • Specific signage to air cargo area needs improvement. • Temporary signage needed while permanent program is planned.		Local	• Access	P	H	Airport FDOT D4	Primarily static signs; Being addressed under current construction project
2.4 Highway design sections are marginal	Ramp metering	• Install ramp metering on congested highways in the region.	Ramp metering is planned in Miami-Dade on I-95	Local, Regional	• Travel time • Safety	P	M	FDOT D4	Waiting to learn from FDOT D6's experience along I-95 in Miami-Dade county

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies
Results from Broward County ITS Intermodal Plan Working Meeting held February 20, 2003

Need/Deficiency	ITS Strategy for Consideration	Description	Existing Deployments	Geographic Scale	Potential Benefits	Pass/ Fail	Rank	Lead Org.	Comments
3.0 Balancing Freight Operations and Security									
3.1 Traffic management within a secure port	Port Everglades Security Program	• This extensive program includes the deployment of a Security Operations Center (SOC), fiber optic communications, camera monitoring, security gates, and more.	Planned linkage between Broward County TMC and the Port's SOC	Local	• Access • Security • Travel time	P	H	Port Everglades BC TMC	Coordination is already underway
3.2 Queuing at security gates at Port Everglades	Port Everglades Security Program	• Sort passenger cars and trucks in advance of security gates to eliminate conflicts. • Use DMS in advance of the security gates to display lane use and other information.		Local	• Access • Safety	P	M	Port Everglades	Coordinate with Rick Mitinger, FDOT D4, and Eller Drive project
3.3 Improve security at Port Everglades	Expand CVISN to Ports	• Log security, credentialing, safety and other information about drivers, trucks, and cargo. • Facilitate the exchange of information (e.g., vehicle owner, safety records, driver information, registration, etc.) among port, state, regulatory agencies, commercial vehicle operators, regional clearinghouses, and national databases. • Allow carriers to apply for and receive their essential operating credentials remotely. • Track HAZMAT and agricultural cargo; share information with regulatory agencies.	Port Everglades Security Program, CVISN	Local, Regional, Statewide, National	• Security • Access	P	M	FDOT D4 Broward MPO	FDOT D4 and MPO submitted a project proposal to expand CVISN components into southeast FL; Project is currently on hold; Tahira Faquir of FDOT D4 to send web site with five-year plan; Follow-up with Mike Akridge of FDOT Central Office; Mario Aispuro suggests coordinating with an incident management organization
3.4 Deficient signage within Port Everglades	DMS	• Install DMS and/or static signs that guide vehicles to their destinations within the Port. • Help prevent passenger cars from entering secure areas, reduce passenger car and commercial vehicle conflicts. • Provide real-time travel information via DMS for travelers exiting the port.		Local, Regional	• Access • Travel time • Security • Safety	P	H	1. BC TED 2. Port Everglades	TEC and the Port have already begun to coordinate with regard to DMS
3.5 Poor pier-side freight access to cruise ships	Appointment system	• New security policies only allow pier-side parking for one truck at a time, causing lengthy queues and interfering with passenger arrivals. • Implement scheduling system to improve operations and reduce wait times.		Local	• Access • Security • Travel time	P	M	Port Everglades Operations	Could be a joint effort in combination with the provision of traffic information; Scheduling system would require public-private partnership

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies
Results from Broward County ITS Intermodal Plan Working Meeting held February 20, 2003

Need/Deficiency	ITS Strategy for Consideration	Description	Existing Deployments	Geographic Scale	Potential Benefits	Pass/ Fail	Rank	Lead Org.	Comments
4.0 Freight-Specific Incident Management Issues									
4.1 High number of truck crashes	Incident management program	• Continue to improve the regionwide incident management program that incorporates clearly defined plans and responsibilities, and eliminates gaps in unincorporated rights-of-way. • Hold regular coordination meetings with all incident responders. • High-tech incident management systems could also be incorporated that allow first responders to send images to secondary responders (HAZMAT, etc.).	South Florida Incident Management Working Group	Local, Regional	• Safety • Reliability	P	H	FDOT D4	Improved mechanisms of communication are the key opportunity for ITS; Follow-up with Murali Pasumarthi
4.2 Insufficient salvage equipment for heavy trucks and trailers	Database of shared resources	• Create an inventory of shared equipment that can be accessed by various agencies when needed. • Upgrade communications with towing contractors for speedier response times.		Local, Regional	• Response times • Safety	P	M	FDOT D4 Turnpike	Statewide Traffic Incident Management (TIM) teams (towing industry, DOT, FHP); Should be easily accessible
4.3 On-scene commander liability	Institute a statewide "quick-clearance" agreement	• On-scene commanders are hesitant to rapidly clear spilled cargo on the roadway from truck accidents since they are liable for damage or loss. • Institute a statewide "quick-clearance" agreement like Minnesota or Washington, where commanders are absolved of liability, allowing for faster clearance times.		Statewide	• Response times • Safety • Travel time	P	M	FDOT Central Office	Follow-up with statewide TIM team; Follow-up with Lap Honag, State Traffic Engineer in FDOT Central Office
4.4 Lengthy delays during rail incidents	Improve interagency communications	• Train incidents, particularly fatalities, can take as long as two to three hours to clear. • Implement a more efficient incident management program with clearly defined plans and responsibilities. • Hold regular coordination meetings with all incident responders. • Investigate use of wireless and/or handheld devices for real-time information sharing.	Incident management plan	Regional	• Response times • Reliability	P	M		Tri-Rail with the assistance of the Palm Beach County Law Enforcement Committee, Amtrak, CSXT, and FEC developed a "Standard Operating Procedure for Investigating Rail Incidents." This SOP was developed for assisting law enforcement investigations into rail accidents, and expediting rail traffic.

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies
Results from Broward County ITS Intermodal Plan Working Meeting held February 20, 2003

Need/Deficiency	ITS Strategy for Consideration	Description	Existing Deployments	Geographic Scale	Potential Benefits	Pass/ Fail	Rank	Lead Org.	Comments
4.0 Freight-Specific Incident Management Issues (continued)									
4.5 Need for improved coordination between railroads and emergency responders	Provide real-time train locations to emergency response agencies	• FEC Railway provides real-time train locations to local fire houses. • Expand this program to provide data to all regional fire and rescue agencies. • Implement a similar program for the SFRC.	FEC Railway	Local, Regional	• Response times	P	M		Tri-Rail is a member of the Local Emergency Planning Committee (LEPC) District XI, and has participated in several Emergency Preparedness Drill Exercises with the LEPC. In addition, as required by 49 CFR, Part 239 Tri-Rail conducts drills and training exercises with first responder and law enforcement agencies along the SFRC. Full blown exercises are required every two years. Additional training i.e., equipment familiarization, swat training, etc., are conducted throughout the fiscal year.
4.6 HAZMAT responders need timely information for response	Provide critical information to HAZMAT responders	• Provide critical weather information (particularly data on prevailing winds) to HAZMAT responders at time of incident. • Provide drainage area and sewer information at incident site for containment considerations.		Local, Regional	• Safety • Environmental protection	P	M/L	FDOT D4	Follow-up with Amy Sermons; Requires public-private partnership; Currently use DMS for major leaks/spills, road closures; Could use for security concerns
4.7 Improve commercial vehicle safety	IVI	• IVI technologies represent advanced systems that are not yet available, including: a roll-over advisor/education and control system; a hazardous material collision notification system; and a "trucker advisory" system that notifies truck drivers as they approach locations with the potential for danger (past crash history, geometry, downgrade, etc.).	Florida is a participant in the "trucker advisory" test being conducted by McKenzie Tank Lines	National	• Safety	P	L	MC MPO National	Ongoing
5.0 Need for Improved Regional Communications and Coordination									
5.1 Need for improved coordination among freight and ITS stakeholders; Lack of private sector involvement	Improve communications	• Establish a freight stakeholders committee. • Hold periodic meetings to develop goals, strategies, and share information (perhaps piggyback off another relevant, well-attended working group in the region). • Set up a message board and e-mail group to share information and ask questions.	South Florida ATIS Steering Committee	Regional	• Planning	P	H	Three MPOs	Informational web site, not a project; New committee in Miami-Dade called FTAC
5.2 Enhance coordination among ITS programs	Integrate ITS freight programs	• Enhance coordination among local, regional and state ITS programs. • Increase awareness of various ITS programs. • Integrate and expand where appropriate.	Statewide ITS Strategy, CVISN	Local, Regional, Statewide	• Planning	P	H	Equal effort: MPO, FDOT, and BC TED	Many players and many ideas; ITS course via FDOT D4 ITS group; FHWA ITS Awareness online course

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies
Results from Broward County ITS Intermodal Plan Working Meeting held February 20, 2003

Need/Deficiency	ITS Strategy for Consideration	Description	Existing Deployments	Geographic Scale	Potential Benefits	Pass/ Fail	Rank	Lead Org.	Comments
5.0 Need for Improved Regional Communications and Coordination (continued)									
5.3 Lack of awareness about ITS benefits	Outreach and education	• Although there are many local, regional and statewide ITS deployments, the general public and some decision-makers lack awareness about the benefits of ITS. • Increase in the visibility of ITS deployments and benefits through outreach/education.	511 service	Local, Regional, Statewide	• Gain support for Freight and ITS				
5.4 General public lacks knowledge about freight operations	Outreach and education	• The general public and some decision-makers lack understanding of the importance of freight in their daily lives. • Use outreach/educational tools to teach the importance of freight, and how to drive safely in the vicinity of commercial vehicles and at-grade crossings.		Local, Regional, Statewide	• Safety				
5.5 Need for increased information sharing	Information-sharing and improved communications	• Share real-time travel information among all County TMCs (everyone with valuable travel information should participate). • Initiate an information-sharing agreement between the BC TMC and Port Everglades.	511 service	Regional, Statewide	• Travel time • More effective use of resources				
5.6 Lack of freight planning data	Database integration	• Integrate existing databases to increase understanding of freight-related issues in the region (accident data, freight volume data, freight trip data, etc.). • FDOT Traffic Info CD, FDOT Roadway Characteristics Inventory, Crash Analysis Reporting System (CARS), TMC data, CVO data, and MPO long-range planning data.		Local, Regional, Statewide	• Planning • Data	P	M	FDOT Central Office – Planning	
5.7 Need for improved communications	Improve communications for all ITS programs	• Various technologies need to talk to each other	Individual systems at Airport, Port, TMC, Turnpike, etc.	Local, Regional	• More effective use of resources	P	H	All	Overall ITS, not just for Freight; Institutional issues need to be overcome

Needs and Deficiencies Mapped to Potential ITS Mitigation Strategies
Results from Broward County ITS Intermodal Plan Working Meeting held February 20, 2003

Need/Deficiency	ITS Strategy for Consideration	Description	Existing Deployments	Geographic Scale	Potential Benefits	Pass/ Fail	Rank	Lead Org.	Comments
6.0 Infrastructure Limitations									
6.1 Lack of truck service facilities	Guidance system for truck service facilities	• With the lack of truck service facilities, trucks are forced to use rest areas, trucks stops, or other facilities as de facto staging areas. Many trucks leave the Interstate or Turnpike entirely and park in local neighborhoods. • Investigate the provision of timely information to truckers on location of available facilities. • Investigate the designation of special space and times for trucks at existing facilities, perhaps using DMS to demarcate.		Local, Regional	• Safety	P	L		One is under development at the S.R. 7 and Turnpike interchange, but that is not enough
6.2 Noise pollution on highways	Dynamic curve warning system	• Trucks often screech their brakes where the highway moves from north-south to east-west (Palmetto Expressway). • Deploy DMS and radar detector to encourage reduced speeds in advance of the curve.		Local	• Safety • Reduce noise pollution	P	L		Follow up with Miami/Dade
6.3 Numerous at-grade rail crossings	Improve and reduce at-grade rail crossings	• Frequent trains cause significant queuing on east-west arterials. • Improve at-grade railroad crossing safety via four-quad gates and other devices. • Upgrade rail signal system. • Improve coordination among agencies to minimize impacts.	SFRC crossing upgrade project; FEC shorter train lengths	Local, Regional	• Safety • Travel time	P	H	Tri-Rail; FDOT D4 OMD	Segment 5 Project includes upgrade of 70 grade crossings and signal system on SFRC. Follow up with Dan Mazza, Tri-Rail Director of Engineering.
6.4 Multiple railroad operations on a single rail corridor	Double Tracking of SFRC	• The SFRC was purchased by FDOT; Tri-Rail, Amtrak, and CSX all operate on the corridor.	Tri-Rail Double-Tracking Program	Regional	• Reliability • Safety • Increase capacity	P	H	Tri-Rail	Segment 5 Project will complete the double tracking of the entire SFRC.
6.5 Structural damage from overheight vehicles?	Overheight Vehicle Detection System (OHVDS)	• AN OHVDS alerts drivers if their vehicles exceed the clearance limit for an upcoming bridge, overpass, overhead walkway, etc. The system detects the overheight vehicle and warns drivers in enough time for them to take action and avoid damaging their vehicle and the overhead structure.		Local, Regional	• Safety	P	L		Martin and Indian River Counties; Follow-up with Tahira Faquir at FDOT D4; Not a frequent problem, but it does happen; Something to look at in the future

Appendix D

Broward County ITS Intermodal Plan FTAC Meeting – April 14, 2003

Broward County ITS Intermodal Plan

FTAC Meeting

Broward County MPO, Transportation Division, Rm 301

April 14, 2003, 9:30 a.m. – 11:30 a.m.

AGENDA

- Introduction
- Review Scope and Schedule
- Brief Review of Literature Review and Needs & Deficiencies Statement
- Presentation of Solutions and Priorities Developed from Working Meeting
- Presentation and Discussion of Proposed Evaluation Criteria for Alternatives
- Discuss Remaining Work and Next Steps
- Adjourn

Broward ITS Intermodal Plan FTAC Meeting

April 14, 2003 at Broward County MPO Office

List of Attendees

Name	Agency/Organization	E-mail Address
Gary Sypek	Broward County Aviation	gsypek@broward.org
Miranda Blogg	Kittelson & Associates	mblogg@kittelson.com
Nancy Bonomo	FDOT OMD	nancy.bonomo@dot.state.fl.us
Ella Gilbert	Tri-Rail	gilberte@tri-rail.com
David Anderton	Port Everglades	danterdon@broward.org
Roger Del Rio	Broward County MPO	rdelrio@broward.org
Tommie Dawson	Broward County MPO	tdawson@broward.org
John Krane	FDOT District 4	john.krane@dot.state.fl.us
Frank Baron	Miami-Dade MPO	fbaron@miamidade.gov
Ossama Al Aschkar	Broward County MPO	oalaschkar@broward.org
Enrique Zelaya	Broward County MPO	ezelaya@broward.org
Jennifer Schaufele	Broward County MPO	jshaufele@broward.org
Mario Aispuro	Broward County MPO	maispuro@broward.org
Jason Price	Broward County MPO	jprice@broward.org
Jennifer Strasser	Cambridge Systematics	jstrasser@camsys.com
Mike Williamson	Cambridge Systematics	mwilliamson@camsys.com

Broward County ITS Intermodal Plan

FTAC Meeting

presented by
Broward County MPO

April 14, 2003

Agenda

- Introductions
- Review Scope and Schedule
- Brief Overview of Literature Review and Needs and Deficiencies Statement
- Presentation of Solutions and Priorities Developed from Working Meeting
- Presentation and Discussion of Proposed Evaluation Criteria for Alternatives
- Discuss Remaining Work and Next Steps

Review of Project Scope

Task 1. Project Initiation, Coordination, and Outreach
- Conduct a project kickoff meeting
- Identify key ITS stakeholders
- Develop an ongoing freight/ITS coordination plan
- Coordinate with Port Everglades
- Conduct presentations and outreach activities
- Coordinate with the FGMS

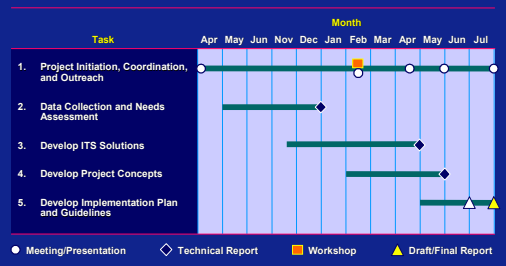
Task 2. Data Collection and Needs Assessment
- Collect available data
- Conduct interviews with stakeholders
- Review and analyze data
- Identify key transportation issues for freight
- Identify future data needs
- Develop needs and deficiencies statement

Task 3. Develop ITS Solutions
- Review national ITS freight programs
- Map needs and deficiencies to ITS applications
- Conduct working meeting with stakeholders
- Develop ITS "alternatives"
- Perform preliminary "fatal flaw" analysis
- Revisit overall vision and goal of ITS plan

Task 4. Develop Project Concepts
- Develop evaluation criteria and performance measures
- Model the impacts of the alternatives
- Prioritize alternatives and develop projects

Task 5. Develop Implementation Plan and Guidelines
- Develop implementation plan
- Conduct a working meeting with stakeholders
- Develop ITS program plan

Project Schedule



Review of ITS Freight Applications in Florida

- Identified existing and planned ITS initiatives in Broward County, the region, and the state
- Focused on constructing a profile of the ITS environment in Florida

Examples of Florida ITS Freight Applications

- E-screening/Pre-pass
- Electronic Toll Collection Systems
- Advanced Traffic Management Systems (ATMS)
- Automated Commercial Vehicle and Driver Inspections
- 511 Service
- Commercial Vehicle Information Systems and Networks (CVISN)

Summary of Broward's Needs and Deficiencies Statement

- Significant congestion in key freight corridors
- Limited access for freight movements
- Balancing freight operations and security
- Freight-specific incident management issues
- Need for improved regional communications and coordination
- Infrastructure limitations

National Review of ITS Freight Applications

- Identified examples of ITS across the country to provide a summary of what is currently deployed and/or being tested
- Identified key technology categories and highlighted potential applications for Broward County
- These ITS examples were considered and incorporated as appropriate into the ITS strategies mapped to the Broward needs and deficiencies statement

Examples of State of the Art ITS Freight Applications

- CVISN
- Electronic Toll Collection (ETC), Electronic Screening (E-Screening), Electronic Commerce (E-Commerce)
- Point of Entry Control and Security
- Advanced Traveler Information Systems (ATIS)
- Traffic Management
- Incident Management
- Intelligent Vehicle Initiative (IVI)

Mapped ITS Strategies to Needs and Deficiencies

- Needs/deficiencies (categorized by 6 themes)
- ITS strategies for consideration
- Existing deployments
- Geographic scale
- Potential benefits
- Pass/fail
- Priority ranking
- Lead organization

Performed Fatal Flaw Analysis
Pass/Fail Criteria

- Do you think the ITS strategy could work?
- Is the technology currently available or will it be soon?
- Is the ITS strategy applicable to the region?
- Does the ITS strategy fit into the scope of this project?
  - Which parts make sense to keep?

Identified Priorities
Ranking Criteria

- Is this ITS strategy very important?
- Should it be implemented in the near-term?
- Can it make a big impact relatively quickly?
- Are there resources in place that make it easy to get started?

H = High

M = Medium

L = Low

Identified Lead Agencies

- What organization(s) need to participate?
- Which organization(s) will likely benefit from the ITS strategy?
- Does the ITS strategy build off another existing project?
- Who should own or operate the system?
- Who has the resources?
- If this is a group initiative, who should take the lead?

Results from Working Meeting

- See handout (legal-sized table)
- Walk through procedure and results for 1.1 and 1.2

Project Development

- Use results from February working meeting
- Consider ITS Strategies that:
  - Passed fatal flaw analysis
  - Ranked medium to high priority
- Organize remaining ITS Strategies into logical, functional groups

Six Alternatives
Sets of Projects

- Port Everglades Access Improvements
- Rail-Related Improvements
- Incident Management Improvements
- Outreach and Communication Improvements
- Better Use of Data
- Traffic Management Improvements

Port Everglades Access Improvements

- Objectives
  - Improve safety at I-595 terminus
  - Balance port operations with security requirements
  - Reduce queuing and delays
  - Optimize port operations
  - Provide valuable, reliable traveler information to port users

Port Everglades Access Improvements
(continued)

- Strategies
  - Install a truck speed warning system at I-595 terminus
  - Sort vehicles prior to security gates via lane use DMS
  - Install static guide signs within the port
  - Install static guide signs to/from port and FLL airport
  - Enhance port security through CVISN technologies
  - Implement scheduling system for cruise deliveries
  - Provide traveler information via DMS at port exits
  - Establish communications link between port and BC TMC

Rail-Related Improvements

- Objectives
  - Improve incident management at railroads
  - Improve safety at grade crossings
  - Reduce delays for trains, cars and trucks
- Strategies
  - Provide real-time train locations to fire and rescue agencies
  - Improve communications with train operators
  - Better define incident management plans and responsibilities
  - Upgrade dispatch capabilities, rail signal system and crossings

Incident Management Improvements

- Objectives
  - Reduce incident response times
  - Improve incident clearance times
  - Reduce delays and secondary incidents
- Strategies
  - Continue improving the reg'l incident management program
  - Share resources – create inventory of clearance equipment
  - Upgrade communications with towing contractors
  - Provide weather and drainage data to HAZMAT responders
  - Work to institute a statewide "quick-clearance" agreement

Outreach and Communications Improvements

- Objectives
  - Improve communications across all ITS programs
  - Enhance coordination among all freight and ITS stakeholders
  - Increase awareness of ITS benefits
  - Reduce commercial vehicle and passenger conflicts

Outreach and Communications Improvements (continued)

- Strategies
  - Improve communications among regional ITS programs
  - Establish a freight stakeholders committee
  - Create a website for freight/ITS information sharing
  - Provide outreach and education about
    - ITS benefits
    - Importance of freight
    - Driving safely near trucks

Better Use of Data

- Objectives
  - Improve ability to effectively use ITS related data for freight planning activities
  - Improve ability to effectively use ITS related data to better manage the freight transportation system in real time
- Strategies
  - Identify and collect additional data
  - Integrate available databases into centralized system
  - Use system performance data to improve long range transportation planning activities
  - Use current/real time data to improve regional TMS activities

Traffic Management Improvements

- Objectives
  - Improve east-west freight movements
- Strategies
  - Optimize signal timing for key freight movements on east-west arterials

Discussion

- Feedback on the groupings

What's Next?

- Determine evaluation criteria
- Obtain data sources
- Conduct evaluation

Proposed Evaluation Criteria

- Delay savings
- Travel time reliability
- Crash reduction savings
- Fuel consumption and emissions savings
- Security and strategic importance
- Freight operational efficiency
- Compatibility with national, statewide and regional ITS architectures
- Costs of alternatives
- Coordination opportunities with other regional existing or planned future ITS projects

Proposed Evaluation Criteria
Incident Management Alternative

Performance Measures

- Delay savings
- Travel time reliability
- Crash reduction savings
- Fuel consumption and emissions savings
- Costs of alternative

Data Needs

- Traffic volumes
- Traffic speeds
- Freeway and arterial accident history
- VMT for trucks
- Estimated cost of alternative

Proposed Evaluation Criteria
Port Everglades Access Alternative

Performance Measures

- Crash reduction savings
- Port operational efficiency
- Delay savings
- Travel time reliability
- Fuel consumption and emissions savings
- Costs of alternative

Data Needs

- Accident history
- Vehicle entry time/queues at security gates
- Traffic flow inside port
- Time required to deliver goods to cruise ships
- Traffic volumes and speeds
- Estimated cost of alternative

Proposed Evaluation Criteria
Rail-Related Alternative

Performance Measures

- Freight operational efficiency
- Delay savings
- Travel time reliability
- Crash reduction savings and safety
- Costs of alternative

Data Needs

- Incident response time
- Accident history at grade crossings
- Delay at grade crossings
- Estimated cost of alternative

Proposed Evaluation Criteria
Better Use of Data Alternative

Performance Measures

- Level and use of data in planning and project development
- Level and use of data in daily transportation management activities
- Costs of alternative

Data Needs

- Level of use of new or enhanced data
- Time required to obtain and process data
- Estimated cost of alternative

Proposed Evaluation Criteria
Traffic Management Alternative

Performance Measures

- Delay savings
- Travel time reliability
- Truck operation efficiency
- Costs of alternative

Data Needs

- Time saved along prioritized corridor/segment
- Traffic volumes and speeds
- Estimated cost of alternative

Proposed Evaluation Criteria
Outreach and Communications Alternative

Performance Measures

- Improved recognition of freight impacts and needs
- Recognition and acceptance of ITS benefits
- Impacts of technology deployment and outreach activities
- Costs of alternative

Data Needs

- Participation of freight in state and regional planning activities
- Awareness of ITS in the freight community
- Case studies of other ITS related outreach activities and the resulting change in perception
- Estimated cost of alternative

Discussion

- Feedback on the performance measures

Next Steps

- Please review and provide comments by April 21
- Evaluate alternatives
- Use results to prioritize and select projects
- Develop implementation plan

Contact Information

- Thank you!
- If you have questions please contact us!
  - jstrasser@camsys.com
  - mwilliamson@camsys.com
  - maispuro@broward.org