SUNGUIDE℠ CVO

STATE OF FLORIDA • DEPARTMENT OF TRANSPORTATION

Florida Department of Transportation
Incident Management / Commercial Vehicle Operations Programs
Annual Report
Fiscal Year 2006

TIM Traffic Incident Management

Welcome to the 2006 "FDOT Incident Management/Commercial Vehicle Operations Annual Report." This is the inaugural annual report on the progress FDOT has made in the Traffic Incident Management (TIM) and Commercial Vehicle Operations (CVO) Programs.

The FDOT and its State Traffic Engineering and Operations Office is focused on providing a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of our environment and communities. In line with this effort, the FDOT State Traffic Engineering and Operations' TIM/CVO Programs present this 2006 annual report highlighting 12 of the many initiatives completed or currently underway.

The primary goals of the FDOT TIM Program are to increase mobility and reduce secondary incidents. Traffic incidents have a significant impact on the state's transportation system and lead to loss of life, injuries, and destruction of personal property and commercial goods; resulting in costly delays, lost productivity, wasted fuel, and air pollution. Traffic incidents substantially reduce the mobility and security of the traveling public and commercial traffic. The vision for FDOT's TIM Program is to: "Develop an institutionally integrated, fully cooperative association of all public agency and private industry traffic incident management stakeholders to improve the safety and reliability of the Florida transportation system and maintain Florida's status as a national leader in TIM programs."

The FDOT CVO Program has four primary goals. Each CVO project undertaken by FDOT is designed to address at least one of these primary goals. The CVO goals are to 1) Improve the state's CVO regulatory environment; 2) Ensure CVO-related safety without undue costs to the motor carrier industry; 3) Guide the development and installation of adopted Commercial Vehicle Information Systems and Networks (CVISN) projects and programs in an efficient and cost-effective manner; and 4) Optimize safe and efficient movement of people and goods throughout the state of Florida.

This annual report is divided into three emphasis areas:

1. Traffic Incident Management,
2. Hurricane / Contraflow (an important subset of the TIM Program), and
3. Commercial Vehicle Operations.

This inaugural report highlights only 12 of the many successful activities conducted this year for the benefit of Florida's economy and safety of its citizens. We hope you find this report informative and useful. If you have any questions, do not hesitate to contact me.

Sincerely,

Mike Akridge
Deputy State Traffic Engineer
Incident Management & CVO Programs
Florida Department of Transportation
605 Suwannee Street, MS 90
Tallahassee, Florida 32399-0450
Office: (850) 410-5607
Fax: (850) 410-5501
Internet mail: michael.akridge@dot.state.fl.us

Table of Contents

Traffic Incident Management—

A Picture is Worth-Less Delay?

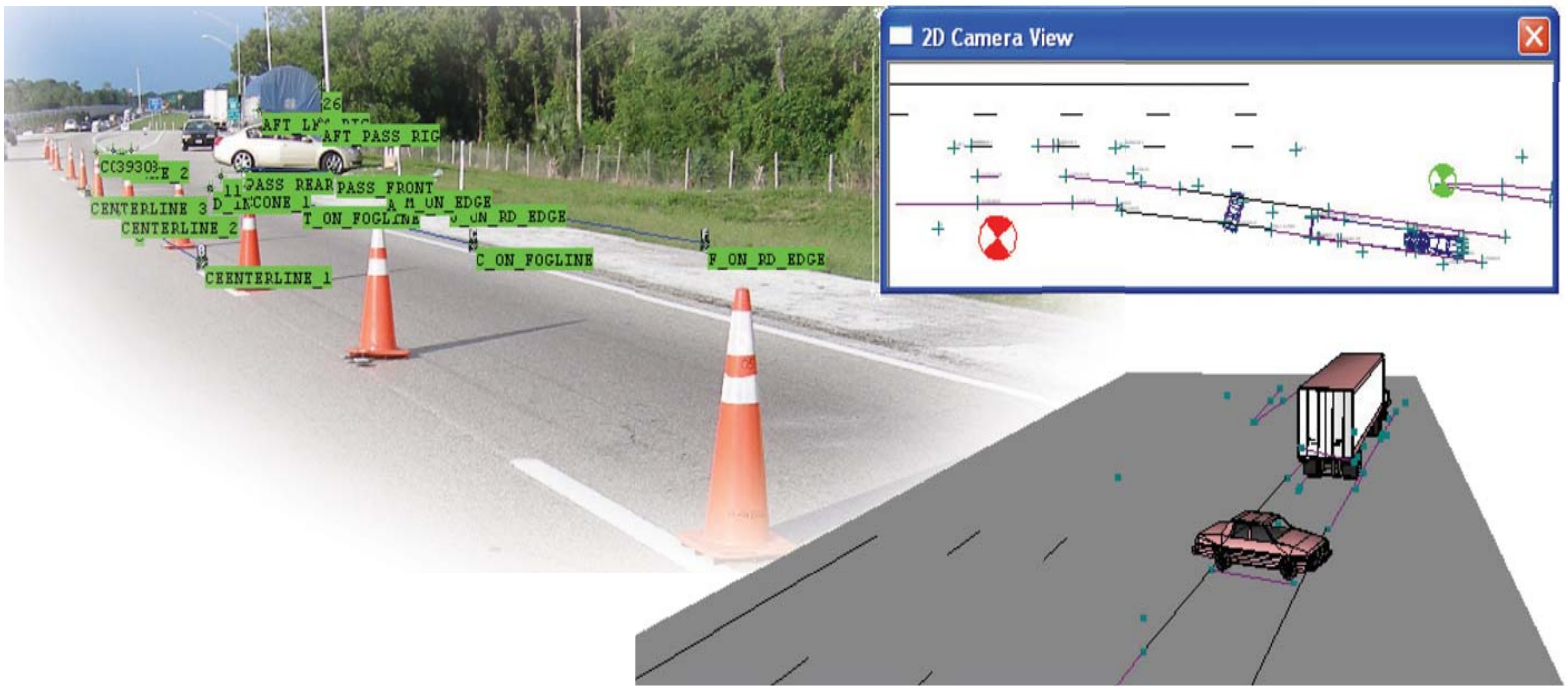
by Paul Clark, FDOT

I recently started working as FDOT's Statewide Traffic Incident Management Program Manager and, boy, has the learning curve been steep. I have been traveling the state and attending different meetings trying to determine ways to help lessen the effects of nonrecurring incidents statewide. The research shows that approximately 25 percent of roadway congestion is caused by what is classified as nonrecurring congestion (crashes and disabled vehicles), and in some areas in the state this percentage is even higher.

One of the ways to help lessen congestion when an incident occurs is to limit the time on-scene. This is a difficult task, especially when dealing with a traffic fatality. Law enforcement officers must ensure that they have all of the critical measurements and data needed to provide a thorough and accurate investigation. It takes time for officers to gather this information, and during this time you have the possibility of secondary crashes due to lane closures for these investigations.

Recently, 13 Florida Highway Patrol (FHP) officers, assigned to Traffic Homicide statewide sections, came to Tallahassee and participated in a 2-week train-the-trainer class to help lessen the time on-scene during incidents. They were trained on how to use iWitness, a photogrammetry-based software.

iWitness is an image-based, 3-dimensional (3-D) measurement software used for accident reconstruction. It uses a digital camera to create accurate 3-D measurements that allow for object modeling. The officer in the field takes overlapping pictures of the accident scene from different angles. Once back in the office, the officer imports the photos into the iWitness software, marks the same overlapping image locations in two or more photos, and iWitness processes the 3-D modeled points and lines. Okay, it's a little more complicated than that, but you get the idea.



But what iWitness really does is cut down the on-scene time for officers, allowing the roadway to be cleared at a much faster rate; thereby, lessening congestion. Here are some additional benefits:

- Improves officer safety
- Reduces roadway closure times
- Reduces secondary collisions
- Improves the quality of investigations
- Enhances the database for future mapping
- Reduces cost (equipment and manpower)
- Reduces incident-related congestion
- Improves response and clearance times
- Improves traffic flow and air quality
- Decreases the economic impacts of incidents
- Improves overall safety

FHP has plans to train 193 officers statewide in the use of iWitness and photogrammetry. The training began in July 2005. What this means to motorists in the state is faster processing of traffic homicides and less congestion on the roadways.

Additional information on iWitness software can be found at www.iwitnessphoto.com. Also, thanks to Jennifer Heller with FDOT District Five and Sergeant Steve Ashburn with FHP for their contributions to this article.

District 4 Severe Incident Response Vehicle Program

by Gaetano Francese, FDOT

The Severe Incident Response Vehicle (SIRV) program in District 4 began in Broward County as a 1-year pilot project. The pilot project began in January 2005 and concluded in January 2006. An independent evaluation of the pilot project is currently underway and a final report will be distributed shortly which will include an analysis of the project's effectiveness, cost benefits, and recommendations for a permanent program. Because of the success of the pilot project, and the demand for a continuation of services, the project has been extended for another year until permanent funding can be obtained.

The concept of the SIRV program was born out of a desire to provide an FDOT presence at all major incidents occurring on the freeways in District 4. Until the arrival of SIRV, the only time FDOT had a presence at these incidents was when FDOT Maintenance was called out—if there was damage to the infrastructure. This usually occurred late in the event after the initial clearance of the incident had already taken place. FDOT was not usually considered part of the Incident Command or even represented in the Unified Command System.

The SIRV Operators are now called out to all Level 2 and Level 3 incidents. These are incidents involving lane closures with durations of 30 minutes to 2 hours for Level 2, and 2 hours or more or full road closures for Level 3. The SIRV itself serves as an incident command post when fire rescue has left the scene. The SIRV carries six portable radios that are given to each responding agency's commander, providing a common channel for communications among responders. The SIRV Operator facilitates the quick clearance of blocked lanes by acting as liaison between other responding agencies and FDOT resources, such as Maintenance, Asset Management, and Road Rangers. The SIRV is dispatched from the Broward SMART SunGuide Transportation Management Center 24 hours a day, seven days a week.

Other SIRV responsibilities include documenting response and clearance times, actively participating in Traffic Incident Management Team meetings, conducting post-incident analysis meetings, conducting Road Rangers vehicle inspections and quality of service audits, and attending public outreach events. All of these SIRV Operator activities require that this position be staffed by emergency response-qualified personnel.

Standard Operating Guidelines (SOGs) were developed for the SIRV Operator position. Persons interviewed for this position were retired law enforcement or fire rescue personnel with emergency response experience. SIRV Operators are trained and qualified in Incident Management and Command, Unified Command System, NIMS (National Incident Management System), Advanced Maintenance of Traffic, Emergency Vehicle Operation, and First Responder.

The vehicle is a Ford F350 dual-wheel, covered utility body truck, equipped with two telescoping high-intensity floodlights on the front of the truck and two fixed-mounted high-intensity floodlights on the rear of the vehicle. The vehicle is equipped with a computer docking station for the operator to use a laptop computer for data input during incidents.

In addition to this equipment and the previously mentioned radio equipment, the truck also carries 100 traffic cones, two Fold & Go advance warning signs, turbo flares and standard flares, oil dry, portland cement, cold asphalt patch, hazmat spill mitigation pads, vehicle fluid spill mitigation chemicals, bottled water, radio repeater system, digital camera, and much more.

The ultimate goal of the SIRV program is to assist all responding agencies in safely reopening the roadways as quickly as possible to meet the state of Florida's Open Roads Policy 90 minute goal.

A Plan for Success—

Florida's Traffic Incident Management Strategic Plan

by Paul Clark, FDOT

Florida has one of the most proactive Traffic Incident Management (TIM) Programs in the country. Other states have looked to Florida as a model when beginning to build their TIM programs. Despite being a leader in this area, there are still improvements that can be made to be even more successful; these improvements are contained in the *TIM Strategic Plan* completed in May 2006.

The overall goal of the plan is to provide the FDOT with more detailed strategies to ensure the success of TIM. It outlines and reaffirms areas that FDOT needs to look at as far as benchmarking and performance monitoring for the program. The *TIM Strategic Plan* is designed to aid the FDOT in continuing to move in the right direction.

The *TIM Strategic Plan* also highlights some of the state and local successes. Some of these highlights are as follows:

Current Status of Statewide TIM

- Statewide "Open Roads Policy" between Florida Highway Patrol (FHP) and FDOT
- Guidelines of Accidental Discharge of Motor Vehicles (Non-Cargo)
- iWitness Photogrammetry software used on major incidents to expedite opening roads after an incident
- FDOT Road Rangers approval to join the State Law Enforcement Radio System (800MHz)

Current Status of Local TIM

- 15 Active TIM teams involving 24 counties
- 8 Counties in the planning stages
- Florida's Turnpike Enterprise
  - Rapid Incident Scene Clearance (RISC) Program
- Districts 1 and 4
  - Sponsoring 14 FHPs on Alligator Alley
- District 2
  - Establishing the "Open Roads Policy" at the local level
- District 4
  - Severe Incident Response Vehicle (SIRV)
  - Tablet-based tracking of Road Rangers data
- District 5

- All counties within the District are a member of a TIM team
- Sponsoring 21 FHPs on I-4
- Established and/or establishing local "Open Roads Policies" District wide
- Established agreement with the Medical Examiner
- Tested a common TIM communications system

- District 6
  - PDA-based tracking of Road Rangers data

It is expected that this list will continue to grow. What the *TIM Strategic Plan* tries to do is embrace these proactive programs and apply them statewide. The philosophy of the plan is to think globally (statewide), plan regionally, and practice locally.

There are four major areas the plan addresses:

- TIM operations (deals with resource and incident management),
- Communications and technologies (looks at the integration of communications, ITS, etc),
- Programs and institutions (increases stakeholders, Memorandums of Understanding, staffing, etc), and
- Recommended changes in law, policies, and procedures.

Many of the goals in the *TIM Strategic Plan* could be considered quite aggressive, but without setting these aggressive goals, the TIM Program would continue to move forward, but not at the needed pace. Florida continues to grow and TIM must keep pace with it in order to be successful. The *TIM Strategic Plan* is one tool the FDOT will utilize to assure the TIM Program's success.

Road Rangers—

Where Do We Go From Here?

by Paul Clark, FDOT

On July 24 and 25, 2006, FDOT had our Road Rangers Program Manager meeting in Orlando in conjunction with the ITS Working Group Meeting. This was a great opportunity to increase the participation in the Road Rangers meetings and ensure that FDOT is moving forward as a group in developing the Road Ranger Program policies and procedures.

One of the areas covered in the meeting was the integration of Road Rangers into the SunGuide℠ Software for transportation management centers (TMCs). Trey Tillander, ITS Software, Architecture and Standards, led a discussion on how this integration would occur. Initially, the District Four software development, Smart℠ SunGuide, would be used to get the state up and running. Then, moving forward with version 3.x of the SunGuide software, we would see integration of automatic vehicle location for dispatching and monitoring of the vehicles as well as the statewide Road Rangers data tracking portion of the project. In the near future this would allow for simplified performance measure monitoring and easier reporting capabilities through the integration of pre-developed reports and Road Rangers vehicle dispatch.

Another topic discussed in the meeting was what should, or should not, be standardized statewide with the Road Ranger Program. With the current draft release of the Road Rangers procedure, this was a very interesting topic. The Road Ranger Program has been in place for several years and all the Districts have excellent programs; however, there has never been a procedure for the program. There are things we all agree that need to be standardized, such as uniforms, vehicle color, and equipment; but there are some things that could be at the District's discretion, such as vehicle type, message boards, and other areas. Trying to develop a procedure has been a tough job, but through working with the team we are almost there.

Training seems to always be a topic on our agenda. Trying to determine where we need to go with training is a tough issue. District Six is assisting with this project by surveying service patrols nationally; initial findings show training varies widely throughout the nation. District Six is now looking to see what is being done statewide and the results will be ready in the near future. From these results we hope to determine what we need to do as a state in the future.

Steve Corbin, FDOT District Four, and John Easterling, Florida's Turnpike Enterprise (FTE), discussed statewide incident coordination. Since the TMCs in south Florida are located so close together, the need for coordination from center to center is very apparent. As a result, the South East Florida Regional TMC Operations Committee (SEFRTOC) was formed. District Four and FTE have seen great benefits from this alliance and believe there is merit to move forward with this concept statewide. This issue is being looked at and we envision a new group, the Florida Uniform Statewide Integrated Operations Network (FUSION), to be formed in the near future.

The Road Ranger Program is an exciting area to work in, but trying to standardize things can be a tough nut to crack. The Districts do a great job and the positive response that is received from the public is a true benefit.

Better Contraflow Plan—

A Tool for FDOT Incident Management

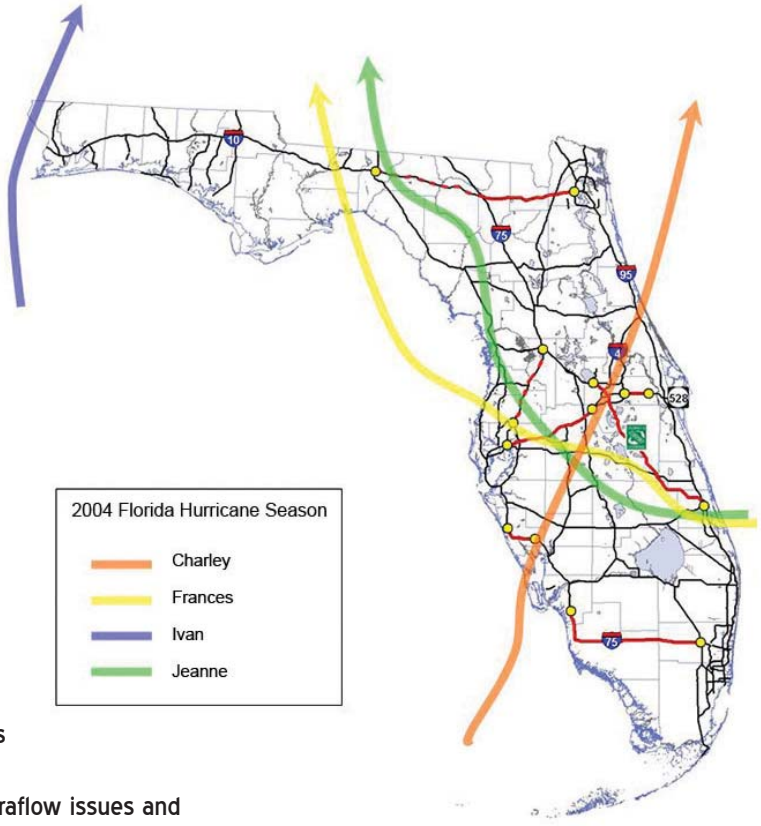
by Michael Akridge, FDOT

With the start of the 2005 hurricane season, FDOT traffic managers have a revised guidance document available to them that sets the parameters for one-way operations on certain limited-access highways in the state.

The technique used in the hurricane evacuation guidance document—referred to as a "contraflow"—is a means of gaining additional roadway capacity for traffic leaving an area in advance of a hurricane by reversing the traffic flow on roadways that lead into the evacuation zone. The FDOT Traffic Engineering and Operations Office's Traffic Incident Management Section conducted the statewide contraflow plan review and updated the various provisions it contains to make sure this technique used in emergency operation is conducted safely and effectively.

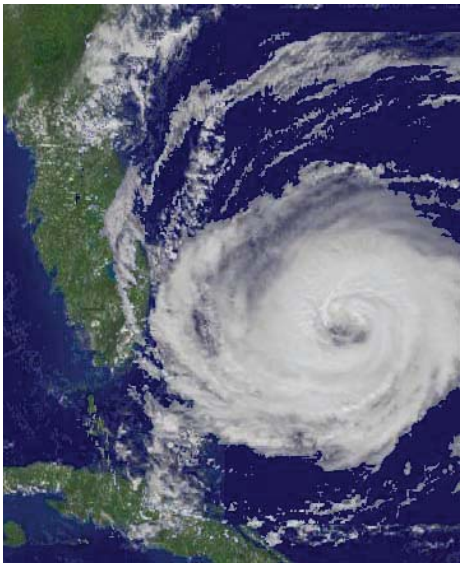
The Florida Intrastate Highway System Contraflow Plan Review project was initiated in February 2005 as a response to the unusually high level of hurricane activity during the summer of 2004, when a tropical storm and four major hurricanes struck Florida during a 7-week period. Though a contraflow operation was never implemented in 2004, FDOT Districts still have their own individual plans for reversing interstate or expressway lanes and routing the traffic to a predetermined end-point. Each operation is carried out in cooperation with the Florida Highway Patrol (FHP), the Florida Department of Law Enforcement (FDLE), local fire and emergency medical personnel, and state emergency operations teams.

The original contraflow document, entitled *Analysis of Florida's One-Way Operations for Hurricane Evacuation*, was written in 2000 after the massive evacuation prior to Hurricane Floyd in 1999. At that time, several FDOT Districts had produced contraflow plans—part of the wave of evacuation planning efforts throughout the Southeast in response to Floyd. More recently, FDOT Districts and Florida's Turnpike Enterprise have been revising their individual contraflow plans, so the FDOT Incident Management Section intended that its update effort be a statewide strategic plan easily distinguished from the Districts' tactical plans. The purpose of the statewide plan is to provide general guidelines for contraflow planning and criteria for the utilization of reverse-lane operations on limited-access highways.



Meetings held around Florida from February 22 to April 1, 2005, gave Districts, the FHP, FDLE, local agencies, and others an opportunity to offer their perspective on contraflow issues and evacuation planning. The six District meetings were followed by a seventh meeting in Tallahassee with FDOT Central Office staff and individuals from other state departments involved in emergency response. Later, separate FDOT meetings were held with Alabama and Georgia transportation officials to acquaint them with Florida's evacuation planning and explain potential impacts on their highway systems from Florida residents fleeing hurricanes.

Conditions that prompt consideration of a contraflow mirror the criteria for declaring a large-scale evacuation, including:



- The strength of a hurricane,
- Its direction of travel,
- The point of anticipated landfall, and
- The measures warranted to protect the population threatened.

Enacting a contraflow plan is considered in that context. It is generally agreed that another busy hurricane season could bring the kind of situation that can trigger a large-scale evacuation of a major urban population prior to the arrival of a rapidly advancing major hurricane. Such a scenario could easily warrant the execution of a contraflow plan for an area's designated route.

If a contraflow is declared, for safety reasons, it would take place during daylight hours. To maximize use of the available daylight hours, the placement of barrels, barricades, signs, and vehicles for the contraflow would occur before dawn to ensure that the roadway is adequately prepared for the reverse-lane operation as soon after sunrise as possible. Later in the day, the reversed lanes would be closed in time to allow the last cars in line to clear the contraflow termination point, and the Districts to retrieve their equipment before sundown.

The most critical element of a contraflow operation is its termination point. Any misdesign or mishandling of the contraflow termination point has great potential to cause a multi-mile traffic backup, and increases the risk that motorists are stuck in their vehicles as the storm approaches. All contraflow plans reviewed involved the reversing of two lanes. Several plans terminate contraflow operations at an interchange with another limited-access facility, where a two-lane exit is employed to move two lanes of contraflow capacity to another roadway.

Other vital elements of contraflow plans are effective coordination among state and local agencies, and the ability to accurately assess whether traffic conditions warrant a reverse of highway lanes. A procedure must be adopted for handling disabled vehicles that may block the roadway, and the staging of emergency response vehicles and personnel along the route. Public awareness is also essential, not only to inform the community about its contraflow plan and its function beforehand, but to also inform them in the use of highway advisory radio, portable message signs, and 511 advanced traveler information system capabilities during the evacuation itself.

Contraflow operations are one of several hurricane response actions available to FDOT, though the Districts agree that the practice is one they hope they never use. To their credit, Florida's transportation professionals and emergency responders have worked together to map their contraflow plans with considerable thought and critical analysis. When the time comes to implement a contraflow operation, this supporting framework of agencies and expertise will increase the likelihood of success.

Contraflow Workshop—

Bringing States Together

by Michael Akridge, FDOT

On February 14-15, 2006, FDOT, along with FHWA, AASHTO, and the I-95 Corridor Coalition, sponsored a workshop concentrating on contraflow operations used during evacuations. As the term implies, a "contraflow" is traffic movement against the normal direction. More specifically, it involves reversing portions of interstates and expressways so that all lanes head in one direction. This specialized evacuation procedure provides additional highway capacity to accommodate the high volume of traffic as coastal residents attempt to move inland prior to a hurricane's landfall.

Florida has several existing contraflow plans that were produced in 2000, after over 2 million Florida residents evacuated Florida's east coast due to Hurricane Floyd in 1999. Transportation and law enforcement officials began planning ways to better use limited-access highways around Florida for reverse-lane operations. The only problem is, when these routes were initially produced, little research and data existed on how they should be prepared and implemented.

With the recent increased hurricane activity, several states have developed and used contraflow routes during their hurricane evacuations. Lessons have been learned and plans have been revised due to exercises and real-life implementation. Our motivation for this workshop was a selfish one since we needed to learn what these states had learned through their implementation and how we might improve our plans and operations from their experiences.

The intent of this workshop was simple—bring the states together to discuss lessons learned and best practices used during contraflow evacuations. The presenting states were Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, and Virginia. All of these states have contraflow plans and the majority of them have implemented those plans in recent years. We also had presentations from FHWA, FEMA, Florida Highway Patrol, Florida's Division of Emergency Management, and the University of Florida

While initial estimates were that we would have 100 attendees at the workshop, we ended up with approximately 195 attendees; with attendees from 15 other states—as far west as Washington and as far north as Vermont and New York. The workshop also drew attendees from all FDOT Districts, most of the FHP Troop Commanders, nine city and county Emergency Managers, and ten consulting firms.

At the conclusion of the first day, a small group gathered to critique what had been presented by the states and to bring together the lessons learned from all of the information that had been presented. A presentation was prepared of the "Do's and Don'ts" that came from the first day's presentations, and was presented by Lap Hoang, State Traffic Operations Engineer, at the end of the workshop.

Some of the Do's and Don'ts

- Have a traffic control plan
- Have an outreach program (communicate, coordinate and educate) both with government (state to state, cross jurisdictions) and the public
- Consider entry and exit locations
- Use ITS to monitor the route
- Provide assistance to stranded motorist
- Provide detour routes for emergency vehicles
- Address infrastructure improvements

DON'T

- Under estimate resource requirements (equipment and people)
- Forget to pre-stage water, gas, restrooms
- Be slow to react
- Underestimate human behavior
- Give the public unlimited choices
- Use contraflow if you have a good evacuation route

All attendees were provided with a workshop CD containing all of the proceedings, papers, and PowerPoint presentations. The CD has integrated text, audio and video elements to deliver the PowerPoint presentations with speaker support using Macromedia Flash to deliver the content.

A DVD was also created. It is a 20+/- minute overview of the entire proceedings.

By the time this workshop was completed it was the consensus of the group that this needed to be a yearly event and should be moved around from state to state. The next workshop will be hosted by the state of Louisiana in 2007 with the venue being New Orleans and in 2008 it will be hosted by the state of North Carolina.

You may view the presentations or hear the audio from the workshop at www.teachamerica.com.

Proposed Contraflow and Hurricane Evacuation/Recovery Capital Improvements

by Paul Clark, FDOT

The hurricane seasons of 2004 and 2005 have served to underscore the importance of transportation systems in managing the weather emergencies that coastal states have endured. Florida has taken this opportunity to examine its own emergency plans, particularly the state's contraflow routes and how best to prepare for this kind of evacuation procedure. To learn more about the contraflow experiences of other states during the past two years, FDOT hosted the first Contraflow Workshop in Orlando on February 14 - 15, 2006. Nine states made presentations on their efforts, which provided valuable insight into how Florida can best plan for this type of evacuation and avoid some of its pitfalls.

From the best practices of these nine coastal states, recommendations were drafted and a final report was presented to FDOT management, which approved the expenditure of $6,392,992 for procuring and installing various highway information systems and safety improvements. These installations will support the state's emergency management and hurricane evacuation efforts, including the execution of the various contraflow plans should reverse-lane procedures need to be implemented for our coastal communities. Other improvements will aid in the transportation network's recovery following a hurricane or similar natural disaster.

Following is an outline of the various improvements.

Exit Numbers

The placement of preformed thermoplastic exit numbers on the pavement is being done at a total of 596 interchanges. This placement, done on the paved shoulder, will allow pilots flying aerial contraflow route checks to verify their aircraft's location, thereby providing more precise reports of conditions along the highway. The exit numbers also help hurricane response teams, maintenance crews, and other relief personnel avoid the problem of damaged or missing exit signs after a hurricane. These numbers will enable emergency responders to reach their destinations without delay.

Flip-down Signs

A total of 198 locations on the state's contraflow routes are to have flip-down signs installed. These signs are intended for use by motorists traveling on the contraflow side of a highway, where the installed signs are facing the wrong direction. To be placed on existing poles, flip-down signs provide a temporary means of marking exit numbers and locations, directional guidance, and detours. In addition, this signage lessens the need for locating variable message signs along a contraflow route to provide the same highway information.

Highway Advisory Radio

A critical need during hurricane evacuations and contraflow operations is the ability to communicate information directly to motorists on the highway. Through a combination of fixed and mobile installations, highway advisory radio (HAR) enables FDOT to broadcast vital route information and other details to evacuees. HAR is planned for a total of 13 locations and will give emergency managers the ability to broadcast messages at the beginning, middle and end of an evacuation route. The same systems can be used for other large-scale operations, such as special events or major traffic incidents. The fixed HAR sites will be furnished first, followed by mobile facilities as needed for the best signal coverage.

CB Wizard

A companion to HAR is the CB Wizard Alert System, which FDOT will use to broadcast emergency messages to truck drivers and other commercial highway users who rely on citizens band (CB) communications. Installations of CB Wizard on given routes will improve coverage and ensure that emergency broadcasts and information reach commercial vehicle operators prior to their arrival at the contraflow route or emergency situation.

Median Crossovers

Two-lane median crossovers will permit the shifting of traffic between the regular-flow and contraflow lanes on an interstate. The exact location of these crossovers is to be determined by FDOT and the Florida Highway Patrol (FHP). Permanent, paved crossovers permit the safe funneling of traffic from one side of a divided highway to the other and will aid the planned contraflow operations by providing a means to load the contraflow side of a highway or to move traffic back to the regular-flow side at the end of a contraflow route.

Drop Gates

A total of 236 drop gates are to be installed at interchanges to prevent the wrong-way entry of vehicles on ramps that serve contraflow lanes during an evacuation. These gates extend across the ramp lane and the paved shoulder. They lock in the down position and are better devices to use than typical barricades, cones or barrels. Use of the gates also reduces the number of FDOT or FHP personnel to staff each ramp during a contraflow operation. The gates also reduce the number of maintenance of traffic (MOT) devices and amount of setup time required to activate a contraflow route.

CCTV Cameras

Two closed-circuit television (CCTV) camera installations are needed for remotely monitoring traffic flow at critical interstate locations where hurricane evacuations will be occurring in Districts 1 and 2. Cameras are a proven means of viewing traffic conditions in real time when there are no on-scene personnel to monitor the highway and provide reports. The cameras also can alert TMC operators of a traffic problem or an accident, the nature of the problem, and what response personnel would be appropriate to dispatch to the scene.

Traffic Signal Stockpile

The four major hurricanes that struck Florida in 2004 damaged more than 3,500 signalized intersections statewide. In 2005, over 2,000 signalized intersections sustained damage. To avoid the potential for signal equipment shortages after hurricanes, FDOT plans to warehouse replacement traffic signal heads, cable and span wire equal to 7.5 percent of the total installed traffic signals on the state's roads. This inventory will be available for prompt traffic signal replacement in hurricane-damaged areas so that intersections can be returned to normal service without delays. Our plans call for storing these items at 16 locations around the state as a remedy for the huge losses of traffic signals due to hurricane winds.

Stop Sign Deployment Plan

Being developed jointly by FDOT and law enforcement, the stop sign deployment plan will follow the current regulatory requirements for intersections. It will apply to signalized intersections that are not functioning after a hurricane and which need to meet these requirements to provide for motorist safety. The plan will be distributed to local governments and maintaining agencies for implementation. While FDOT will endeavor to use potable generators for restoring some intersections to service, the stop sign deployments will be the remedy in situations where signals are damaged beyond immediate repair.

Public Information

The public awareness aspects of contraflow operations are critical to the plans' success. It is FDOT's intent to provide a public information campaign for the benefit of government policy-makers and the general public so that they understand the reasons for this evacuation procedure and how it affects them. This initiative will be carried out through the development of printed brochures and a Web site, and will require the involvement of the FDOT and FHP Public Information Offices.

License Plate Readers Add Safety

by Richard Easley and Sharon Easley, E-Squared Engineering

The FDOT Motor Carrier Compliance Office (MCCO) has deployed technology that will improve the safety and security of freight on Florida's highways, which will ultimately benefit the citizens of Florida. Unless otherwise pre-cleared, each truck on Florida's interstate system, and some U.S. routes, must come through weigh stations strategically located throughout the state. In calendar year 2006, over 15 million vehicles passed through Florida's weigh stations. With license plate reader (LPR) technology, enforcement officers have the potential to electronically read the license plates on all of those trucks and check them for safety and security purposes.

The MCCO recognized the opportunity to extend their capabilities by utilizing LPR technology. Their LPR system automatically records the vehicle's license plate number as it travels through the weigh station and compares it against state and federal crime information databases. MCCO personnel are given an alert when the comparison indicates a license plate as a potential violator.

The MCCO was able to secure funding for the project through a grant with the U.S. Department of Homeland Security. Thirteen LPR cameras have been deployed across Florida's highway system to test the weigh station LPR concept. The cameras work 24-hours a day, 7-days a week in any environmental or ambient light condition. FDOT is one of the first organizations in the country to implement wide-scale LPR technology at high-speed locations throughout the state.

The camera captures a license plate image for each truck bypassing the sensors. Using optical character recognition (OCR) software, the LPR system attaches data to the image. The data consists of whether or not the plate was successfully read, time, date, and location of the read; and it also indicates if the license plate number is or is not in either crime database. In addition to being available to MCCO personnel, this information is also available through the Internet to virtually any location in the world with Internet access. An authorized user can enter the LPR system and check any of the LPR sites with the use of a secure password.

The LPR system proved effective immediately after installation. At one of the locations the system alerted the weigh station personnel of a license plate match with the crime databases within seconds of initial operation.

While funding continues to be an issue in today's governmental 'do more with less' environment, FDOT would like to expand the LPR system to all of Florida's weigh stations. Doing so will certainly increase the safety and security of Florida's citizens.

Commercial Vehicle Operations Workshop Held in Tampa

by Richard Easley and Sharon Easley, E-Squared Engineering

Hurricanes...Super Bowls...The Daytona 500...Roadway design...Federal certification of MPOs...What do all of these have in common? All of these topics, in addition to many others, were discussed during the recent FDOT sponsored commercial vehicle operations (CVO) workshop in Tampa.

On June 19-20, 2006, the FDOT Incident Management and CVO Programs sponsored an interactive workshop centered around commercial vehicle operations and the important relationship CVO has with traffic engineering, transportation operations, and planning. The workshop, held in Tampa, was designed to educate transportation professionals who traditionally are not involved with CVO issues in their daily work. The "classroom" portion of the workshop brought in speakers from Florida and across the U.S. to share their expertise with the workshop attendees. Throughout the workshop, attendees also learned from each other as they were encouraged to share their own lessons learned with the group. In addition to the interactive presentations, a half-day of the workshop was devoted solely to hands-on demonstrations of ITS technologies applied to commercial vehicle regulation activities and to a site visit in the Tampa area where participants witnessed roadway design challenges that come with having truck weigh stations in urbanized areas.

Representatives from various disciplines (and perspectives) attended the workshop. Attendees were from state government (Florida, Georgia, and Texas), federal government, private industry, municipal planning organizations (MPOs), academia, law enforcement, the trucking industry, and toll road authorities. This breadth and depth of knowledge allowed attendees to ask questions and establish meaningful dialogs about issues that they are not normally directly exposed to in their daily activities. These issues will, however, impact their agency or their work at some point as truck volumes increase significantly in the coming years.

Topics covered during Day One of the workshop included:

- The Importance of CVO to Florida;
- An Overview of Florida's Commercial Vehicle Information Systems and Networks (CVISN) Program; and
- Planned and Unplanned Special Events as they relate to CVO (including the Super Bowl; hurricanes, evacuations and their immediate aftermath).

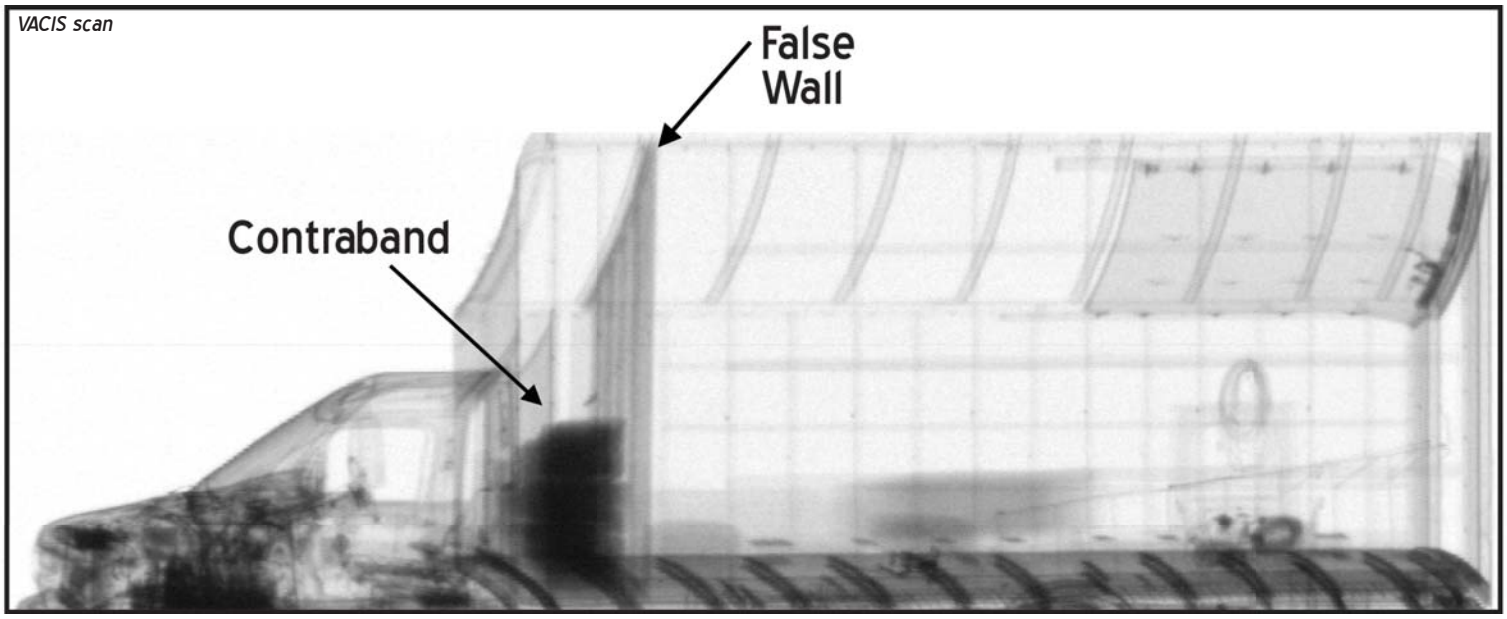
Day Two focused on:

- The Federal Perspective on CVO and Freight Concerns (with regard to transportation planning activities);
- CVO and Traffic Incident Management;
- Input from the trucking industry;
- CVO and Freight From the MPO Perspective; and
- CVO Technologies – Saving Lives, Money Time

Pre-VACIS manual inspection

Day Two also included site visits where attendees participated in technology demonstrations and personally used some of the latest technologies. Participants rode along with Department of Agriculture and Consumer Services officers as they scanned a tractor-trailer with a VACIS™ (Vehicle and Cargo Inspection System) machine and pointed out the contraband in the vehicle and trailer (a shot gun, simulated cannabis, and a simulated pipe bomb, were just a few items that were uncovered in a matter of a few minutes [rather then the manual method of an officer climbing into the back of the truck and investigating each box or carton]).

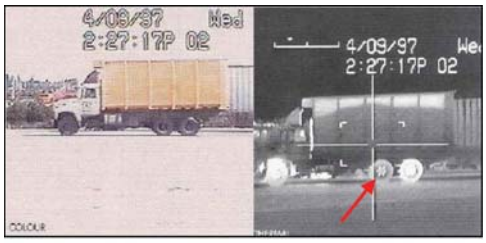
VACIS Scan



VACIS scan

At the I-4 weigh station several participants performed what is referred to as performance based brake testing. They used a hand held unit which uses infrared video imaging and differences in temperature to identify potential safety problems with a vehicle's brakes. This ITS tool allows officers to quickly screen vehicles as they pass through the weigh station; giving them a visual indicator of those vehicles which require a more in-depth brake inspection. The bottom photo demonstrates what is visible to inspectors as a vehicle passes through the inspection station and the figure on the right shows what the camera sees. The red arrow indicates a wheel which could have brake problems. Since this wheel is darker than the rest, it is not generating heat (which normal functioning brakes do). This vehicle would be pulled in for a manual inspection of its brakes.


Infrared handheld units



Infrared brake testing

In their evaluations of the workshop, participants gave high marks to the overall workshop, the quality of the presenters, the workshop content, and the value of the site visits/technology demonstrations. When asked whether the workshop should be offered again, participants overwhelmingly said 'yes,' and that they would recommend it to others. Although the workshop was originally planned as a one-time occurrence, the feedback received from participants has sparked the idea that it should be repeated. As was stated earlier, one of the primary reasons this workshop was held was to mainstream CVO and freight issues into the transportation planning and operations processes in Florida. Given this fact, it seems to make sense to continue a program that reaches those individuals that are responsible for those activities.

GAMMA RAY Technology—

Protecting Florida's Citizenry, Agriculture, and Economy

by Michael Akridge, FDOT

The major tenet of Florida's Commercial Vehicle Information Systems and Networks (CVISN) Program is using advanced technology to improve commercial vehicle safety, streamline the regulation of the commercial vehicle industry, and improve the efficiency of the motor carriers and motor coach companies operating in Florida. One of the partner agencies of this multi-agency team has invested substantial departmental resources in gamma ray technology in order to perform their duties more effectively and efficiently.

According to Agriculture Commissioner Charles Bronson, one of the most important functions of the Department of Agriculture and Consumer Services (DACS) is to inspect the roughly 12 million trucks that enter Florida each year to make sure they are not carrying prohibited cargo. In 2003, the first mobile Vehicle and Cargo Inspection System (VACIS) machine was deployed by DACS. Since that time, DACS has added three additional units bringing the total number of VACIS units in their fleet to four. These four VACIS units are assigned randomly to the DACS interdiction stations that have the highest volume of trucks subject to inspection. Since the VACIS units are mobile types (rather than fixed types), they are relatively easily transported from one location to another. The units are permanently attached to trucks and are driven to whatever locations they are needed.

Why VACIS

One of the many important missions of DACS is to protect the agriculture, aquaculture, horticulture, and livestock industries in Florida. All vehicles and vessels entering and leaving the state are subject to inspection by DACS, and Florida law requires the vehicles to stop at inspection sites and submit to regulatory inspection. DACS is responsible for the enforcement of state and federal regulations pertaining to animal health and disease, plant disease, and pest infestation, for the enforcement of state and federal regulations pertaining to food safety, public health, and public safety, and for the enforcement of state and federal regulations pertaining to fruit and vegetable products.

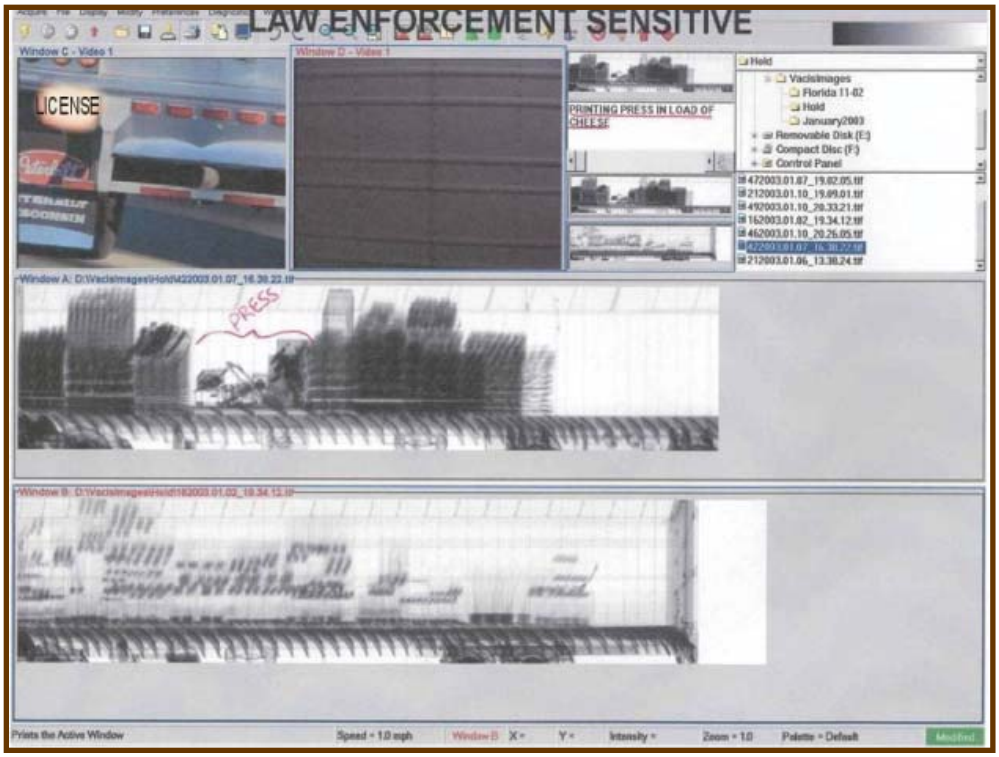
VACIS allows DACS officers to cut the vehicle inspection time dramatically. A manual inspection takes around 15 to 30 minutes. However, this can vary greatly depending on many factors, such as size of load, type of cargo, how it is loaded/packed, etc. The VACIS machine can inspect an entire tractor trailer, including the cab, in just a few minutes. The scan allows officers to see through the walls and view everything contained inside the vehicle. Any contraband, weapons, or hidden compartments are immediately visible to the officers trained in VACIS inspections.

How the Technology Works

The VACIS unit uses gamma ray technology to produce an image (similar to an x-ray) of a vehicle and its contents. Gamma radiation is superior to x-rays because the equipment used to generate the rays is more reliable (98 percent uptime), much lower radiation levels, and faster scan speeds. Even though the scan produces about the same radiation dosage as one minute of natural radiation exposure at 30,000 feet altitude in a passenger airplane, it is not

standard procedure to subject anyone to unnecessary radiation exposure. This low radiation exposure is important because many times the contraband in a vehicle may turn out to be a stowaway.

During an inspection, the driver pulls his truck beside the VACIS unit, exits his vehicle, and clears the scan area. The VACIS unit has an L-shaped boom which extends over the top of the vehicle and down the other side. The gamma ray source is at the bottom of the boom. As the VACIS unit passes along side the truck being inspected, the source emits gamma ray particles, which pass through the truck to the reader on the other side. The system software then converts the information to an image on the operator's computer screen. The whole process takes just a few minutes. The VACIS operator views the screen to "see through" the walls of the truck to view all of its contents. The figure to the right is an example of the image operators see during a VACIS inspection. Once trained on how to read the scan, officers can easily recognize if the vehicle contains contraband such as drugs, firearms, agricultural products not on the truck's manifest, false walls in the trailer, stolen vehicles, or even stowaways.



VACIS – Increasing Safety and Security Throughout Florida

The VACIS technology has been proven over and over during vehicle inspections. DACS has provided VACIS support for federal, state, and other local agencies at the 2005 Super Bowl in Jacksonville, the Free Trade Areas of the Americas (FTAA) in Miami, the G-8 Summit in Brunswick, Georgia, and at various US Customs Ports in Florida. Additionally DACS is gearing up to provide VACIS support at the 2007 Super Bowl to be held in Miami. DACS frequently provides VACIS support to FDOT, Florida Department of Law Enforcement (FDLE), the DEA, and numerous sheriff's offices.

Commercial Vehicle Remotely-Operated Compliance Stations

by Amr A. Oloufa, University of Central Florida

Regardless of the principle mode for the movement of freight, whether it is by rail, ship, or plane, trucks at some point in their journey carry all goods consumed. According to the United States Department of Transportation, freight volume moving within the U.S. has nearly doubled the rate of population growth over the past three decades. It has even exceeded the growth rates in disposable income and GNP. It is estimated that the volume of goods moved by truck will increase approximately 45 percent between now and 2015.

The primary mission of motor carrier operations in the State of Florida is the safe and efficient movement of goods. Large and heavy trucks, traveling at highway speeds, and often for relatively long distances at a time, move goods from one location to others. Efficiency is assured when there is minimum interference in these operations; only to the degree necessary to ensure the safety of the traveling public.

Overweight trucks pose serious safety and roadway maintenance challenges. It is documented that for each 1 pound increase in vehicle weight, there is a quadruple impact on asphalt deterioration. For this reason, all states have created weigh stations to ensure that truck carriers abide by weight limitations and other regulations.

It is practically impossible to stop, inspect, and test every commercial vehicle that travels through Florida to ensure that trucks meet all safety, security, and environmental regulations. Instead, traditional enforcement mechanisms have centered on selecting a random number of commercial vehicles for inspection at weigh stations. These vehicles are taken out of the traffic flow, and asked to park at the weigh station pending the availability of an inspector.

This enforcement mechanism is inefficient for several reasons. First, a substantial amount of time is lost in the inspection process that must be recouped by the carriers. Of course these costs are eventually borne by the taxpayers, not to mention the impact of these delays on interstate commerce. Second, queuing commercial vehicles at weigh stations, with their associated acceleration and deceleration maneuvers, leads to a substantial increase of pollutants in the air. Third, large commercial vehicles stopping at weigh stations require substantial space for parking, space that increases by order-of-magnitude the costs for the right-of-way that needs to be purchased, especially in the vicinity of large urban centers. Here, space may not be available at any cost. And fourth, with the current and forecasted budgetary shortfalls, the state can no longer afford to hire additional enforcement personnel, and must, therefore, rely on an already overworked workforce.

With the expected increase in the number of trucks on our highways, coupled with modern logistic practices and the rapid growth in e-commerce, traffic flow characteristics on highways may also change significantly. This will require the application of new and innovative technologies to expedite the monitoring of commercial vehicle conformance

to regulations governing weight, dimensions, and safety, as mandated by Federal and State regulations.

Florida has been a national leader in deploying ITS technologies for commercial vehicle operations. The adoption of modern weigh-in-motion (WIM) systems has allowed trucks to avoid stopping at static scales in weigh stations, leading to large benefits for interstate commerce and the reduction of pollution.

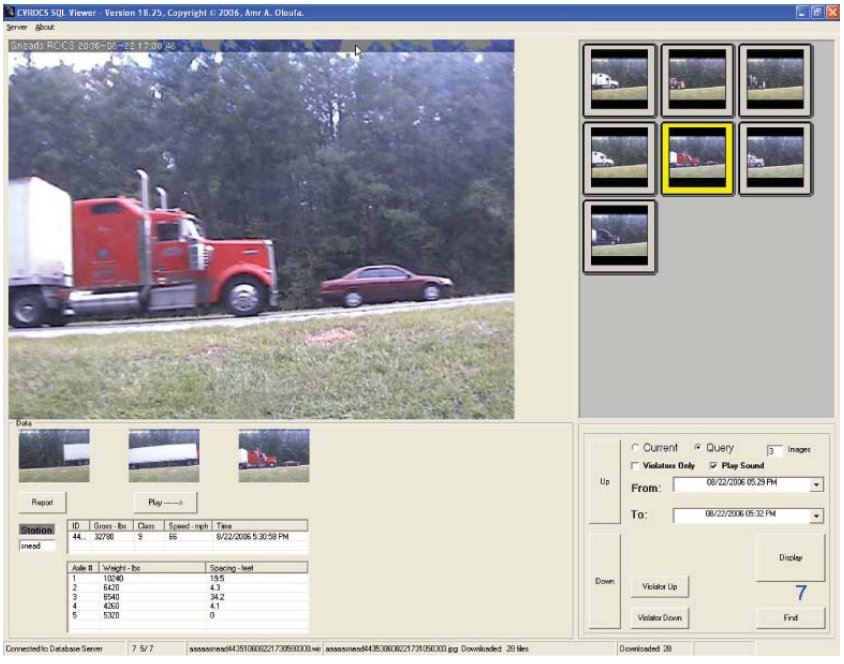
The present environment, however, poses an additional set of challenges. First, it has long been known that some commercial vehicle operators that exceed safe weight limits often bypass fixed weigh stations. Coupled with an increased need and awareness for enhanced security tempered by the current budgetary limitations, there is now a huge demand for proven advanced compliance technologies to assist law enforcement.

This new technology-reliant architecture will lead to improved enforcement, better security, and a more efficient utilization of enforcement personnel who can plan their activities around areas where violations occur. Efficient enforcement will get unsafe vehicles and operators off our roadways where they can be repaired before being allowed to travel our roads or expose the public to unnecessary dangers.

The University of Central Florida (UCF) was awarded a research project to design and deploy a state-of-the-art remotely-operated compliance station (a.k.a virtual weigh stations). This station was envisioned as a test bed to integrate not only weigh-in-motion technologies, but also measure 3-D conformance, brake condition, and a variety of other compliance technologies.

The first station was recently constructed close to the Sneads WIM station, about 60 miles west of Tallahassee. The researchers at UCF designed and implemented a hardware and software system that enables complete control of each technology implemented, including data retrieval and viewing. It also allows real-time viewing of traffic, along with instant access to real-time weight and other measurements.

The system software is based on a database architecture to enable fast searches and efficient data archival, via the Web. Data can be searched by date, time, class, speed, weight, axle weight, user-set violations, and so on. Construction of the station took only 2 days and the station has been operational since July 18th, 2006.



Infrared Brake Testing—
A Useful Screening Technology

by Richard Easley and Sharon Easley, E-Squared Engineering

Infrared brake testing technology is a highly innovative screening tool. FDOT utilizes this technology in its ongoing effort to remove unsafe trucks from Florida's roadways. Many states are using this technology today and it qualifies under Motor Carrier Safety Assistance Program (MCSAP) funding. What makes this technology unique is that it can screen trucks, cars, and even buses when they stop or while they travel at normal speeds. As of August 2006, 12 states (AK, AR, KY, MO, NM, NC, SC, TX, UT, VA, WA, and WV) are also on the list of commercial vehicle safety operations that have deployed infrared brake testing technology.

An overly simplistic description of this technology is that the infrared scanner (mounted atop the back of the van and hand-held in these photos) measures heat. When vehicles drive along a flat grade and the brakes are not in use, the infrared scanner can detect possible brake problems. If any of the wheels measure 'hot' or are bright as in the picture above, then there is a strong possibility that this particular brake is dragging/malfunctioning. Conversely, if a truck is coming to a stop and is using the brakes, all the wheels should measure 'hot' or bright on the infrared monitor. If any of the wheels are 'dark' or are cool, then those particular wheels do not have properly functioning brakes. In either case, the infrared technology serves as a good screening tool to select vehicles for a more in-depth brake inspection. This will always work because when brakes are applied:

1) They produce friction,
2) And where friction exists, heat is produced,
3) And when heat is produced, it can be measured utilizing infrared technology.

The infrared technology also identifies low-pressured tires, worn wheel bearings, worn universal joints, or worn differential joints based on the detection of heat.

This technology can be used in a roving van or as a handheld device, or it can be used in conjunction with a virtual inspection station (VIS). VIS allows enforcement to set up a remote infrared monitoring site where the infrared scanning results can be transmitted downstream to enforcement personnel. Enforcement personnel can use this data to select potentially unsafe trucks to intercept, inspect, and, if warranted, remove the unsafe vehicles from the roadway.

FDOT currently has several of the hand-held infrared technology units deployed at their Motor Carrier Compliance (MCCO) Field Offices. These battery powered units are lightweight and can be utilized by commercial vehicle enforcement personnel at any location in the state. Officers report they have used the equipment successfully to help identify inoperative brakes. They believe the success of this technology lies in the reduced number of fatal crashes resulting from combining quality vehicle inspections with enabling technology. Infrared technology is just another tool in FDOT's arsenal to improve the safety of Florida highways.

Incident Management / Commercial Vehicle Operations Contacts

Mr. Lap T. Hoang, P.E.
State Traffic Engineer
State Traffic Engineering and Operations
Phone: 850-410-5600
Email: lap.hoang@dot.state.fl.us

Mr. Michael T. Akridge, CPM
Deputy State Traffic Engineer, Incident Management & CVO Programs
State Traffic Engineering and Operations
Phone: 850-410- 5607
Email: michael.akridge@dot.state.fl.us

Mr. Paul L. Clark
Road Ranger & Traffic Incident Management Program Manager
State Traffic Engineering and Operations
Phone 850-410-5631
Email: paul.clark@dot.state.fl.us

Mr. Richard B. Easley
E-Squared Engineering
FDOT CVO General Consultant
Phone: 703-858-9545
Email: reasley@e-squared.org

Visit our Web sites:

Traffic Operations & Traffic Incident Management
http://www.dot.state.fl.us/TrafficOperations/Traf_Incident/Traf_Incident.htm
AND
http://www.dot.state.fl.us/trafficoperations/

Commercial Vehicle Operations
http://www.FloridaTruckingInfo.com

Published by:
Florida Department of Transportation
Incident Management / Commercial Vehicle Operations Programs
605 Suwannee Street, MS 90
Tallahassee, Florida 32399