

Integrated Intelligent Transportation Systems Laboratory at Florida International University

The Integrated Intelligent Transportation Systems (IITS) Laboratory was officially dedicated on May 11, 2009, at the Florida International University (FIU) in Miami, Florida. The opening ceremony was attended by leading officials and transportation engineering professionals from around south Florida. The IITS Laboratory is equipped with a video wall, the statewide SunGuide® Software, data and traffic analysis software, servers, and operator workstations that resemble, on a smaller scale, those used at the Florida Department of Transportation (FDOT) transportation management centers (TMC). The IITS Laboratory is one of a few similar laboratories in the United States. It is an on-campus laboratory that will give students the opportunity to conduct research related to traffic management, other ITS applications, and traffic flow theory and operations using actual field data.

By accessing real-time video, and historical and real-time data from the FDOT TMC and other sources, students and researchers will be able to analyze traffic



Helping to dedicated the new FIU IITS Laboratory: (L-R) Harpal S. Kapoor, Miami-Dade Transit Director; Rep. Mario Diaz-Balart; Amir Mirmiran, Professor and Dean of the FIU College of Engineering and Computing; Gus Pego, FDOT District Six Secretary; Javier Rodriguez, Miami-Dade Expressway Authority Executive Director; and Manuel M. Maroño, Sweetwater Mayor.

conditions along south Florida roadways. This analysis will allow identification of operational and safety problems and the causes of these problems. The availability of video and data will also facilitate the development of tools to support the design, implementation, operation, and management of transportation systems.

FIU has worked very closely with FDOT District Six in the

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The SunGuide Disseminator is a publication of: Florida Department of Transportation Traffic Engineering and Operations Office 605 Suwannee Street, MS 36 Tallahassee, Florida 32399-0450 (850) 410-5600 http://www.dot.state.fl.us past three years to establish a connection between the FIU Engineering Campus and FDOT District Six TMC. FDOT has been sharing their live video feeds with the FIU IITS Laboratory since June 2008. The main challenge in starting this sharing was the need to establish a communication link between the FDOT District Six TMC and the FIU Engineering Campus at a relatively low cost, considering the FIU IITS Laboratory budget limitations. A number of alternatives were considered and, with the help of FDOT District Six TMC and FIU IT personnel, short- and long-term solutions were identified to allow the establishment of this link.

FIU Lehman Center is currently working on a number of research projects with the FDOT Central Office, and FDOT Districts Four and Six. Establishment of the IITS Laboratory



The Freeway and Tollway Conference Tour of the IITS, June 2008

will provide significant support to these research activities. Some examples of recent and on-going projects include:

- Assessing the benefit and cost analysis of TMCs,
- Estimating incident durations based on their attributes,
- Assessing travel time estimation methods,
- Developing tools to support TMC operations,
- Developing "software-in-the-loop" simulation tools to test the SunGuide Software modules, and
- Assessing ITS hardware and software.

FIU students and researchers have also used the data to verify and calibrate traffic flow theory relationships and in other transportation engineering studies.

Undergraduate engineering students and high school students have visited the laboratory on scheduled tours. Presentations and demonstrations made during these visits have generated a significant interest in the transportation engineering field among these students.

It is expected that additional hardware and software and information from other sources will be available at the laboratory in the near future, allowing additional research opportunities. In addition, FDOT District Six and FIU are in the process of signing a memorandum of understanding to allow the use of the FIU laboratory as a backup to the FDOT operation in case of emergencies.

This article was provided by Mohammed Hadi, Ph.D., PE, Florida International University. For information, please contact Mr. Hadi at (305) 348-0092 or email to HadiM@fiu.edu.

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FDOT WiFi[®] Goes Mobile...

In 2008, the Florida Department of Transportation (FDOT) initiated the WiFi® Pilot Project and installed WiFi hot spots at all four of Florida's welcome centers and the Florida's Turnpike Enterprise Turkey Lake Service Plaza. Now, the FDOT is ready to launch the newest WiFi hot spot—a mobile system integrated into an FDOT trailer. This trailer will be moved to various rest areas to analyze whether WiFi service should be provided at that site. This analysis will save money by identifying the most appropriate candidate sites for future expansion of the WiFi system.

In addition to its use as a mobile WiFi hot spot, the FDOT included some pilot project features in the trailer to enhance its functionality.

Included in the trailer are a mobile weather station and a camera system that will allow the FDOT to remotely monitor events from the trailer. Additional potential uses for the trailer are continuing to be identified. Since it will be launched just in time for the 2009 hurricane season, the FDOT mobile WiFi hot spot trailer could be used to monitor evacuation traffic or to provide internet services to first responders. During the recent spring flooding at the Suwannee River, although integration of the trailer was not yet complete, the FDOT considered using it to view the status of the I-10 bridge over the river.

The trailer uses a special system of equipment to achieve such a versatile operations profile. First, it has a unique motorized satellite antenna that can seek out and find the right satellite in the sky more than 20,000 miles away, creating an internet link for the trailer. The satellite antenna can retract itself automatically when the trailer needs to be moved. For WiFi internet access, several WiFi hotspot antennas are installed on the trailer's crank-up tower that can be deployed to a height of 100 feet! The tower also has a weather station and camera platform installed on it. The camera platform can be rotated remotely and includes two fixed cameras along with one camera that has a "pan-tilt-zoom" feature, enabling the remote operator to "zoom-



in" on a particular view. All of the weather station and camera information can be viewed in real-time through the satellite connection.

The power system in the trailer is also specialized, allowing the trailer to be plugged in to "shore power" standard AC service. The trailer can also be powered up by a generator or by solar panels installed on the trailer. A bank of onboard batteries permits the trailer to run when none of the power services are available. All of these systems are monitored using a sophisticated device that can send an alarm via email when it detects an anomaly.

This mobile WiFi hot spot trailer will be a successful addition to the FDOT WiFi Pilot Project—helping to provide the FDOT with the information it needs for a potential statewide WiFi deployment and also supporting emergency events or other FDOT tasks. The trailer represents the final construction component for this project. The operational phase of the project will continue through the end of the year when the FDOT will decide whether to continue to operate the system or to terminate the pilot project.

This article was provided by Randy Pierce, FDOT Traffic Engineering and Operations Office. For information, please contact Mr. Pierce at (850) 410-5608 or email to Randy. Pierce@dot.state.fl.us.

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District Six Implements a System of Emergency Preparedness—Deploys Operational Redundancy

The Florida Department of Transportation (FDOT) District Six Transportation Management Center (TMC) recently outfitted a redundant area in the Adam Leigh Cann Building (District Six Headquarters) to serve as a back-up center to the SunGuide® TMC. The back-up center will be activated in the event of an emergency situation affecting regular operations at the TMC.

The site is equipped with a communications and traffic management control system that is capable of operating at a reduced capacity with various components of the TMC. With the region considered as one of the most congested areas in the nation, and the recent additions of the 95 Express and ramp signaling to its transportation infrastructure, implementing this level of redundancy was especially important to District Six.

Support staff can perform regular operational and incident management procedures through the redundant software and communications system collocated within the remote site. The back-up facility has two workstations, radio communication devices, and a landline telephone system that enables operators to communicate



with field staff and partner agencies at all times. The combination of these resources, allows operators to remotely manage the most critical aspects of the Districts' intelligent transportation systems (ITS) operations, including the 95 Express and ramp signaling, from this site.

The remote capabilities of this facility are supported by the recent addition of the ITS network equipment in the Network Access Point (NAP) of the Americas. The NAP is one of the largest and most connected data centers in the world, and guarantees 100 percent availability for all power systems. It provides reliable and high-bandwidth access to the world's major carriers, which allows District Six to secure its operations even through major interruptions to system connectivity.

Operational procedures are being developed and key staff members are being trained to ensure system readiness. Testing activities have been initiated, and will be conducted on a monthly basis to ensure system availability and reliability. Final system deployment is scheduled to be in time for the 2009 hurricane season.

This article was provided by Javier Rodriguez, FDOT District Six. For information, please contact Mr. Rodriguez at (305) 470-5341 or email to Javier.Rodriguez2@dot.state.fl.us.

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Travel Time Information Debuts in Tallahassee

The Florida Department of Transportation (FDOT), in cooperation with the City of Tallahassee, successfully completed a project which allows posting of travel time information on dynamic message signs (DMS) located in the Tallahassee area. At 1:00 p.m. on May 20, the City of Tallahassee, operating the signs from their traffic management center, posted the first travel time messages on DMSs located on I-10 in the Tallahassee area.

The information posted on the DMSs is enabled through the use of license plate readers which provide data adequate for calculating travel times. The license plate read sites are located at exits 209, 203, 199, and 196 on west bound I-10, and exits 192, 196, 199, and 203 on east bound I-10. Two cameras focused on the right two lanes are installed at each of these locations, totaling three travel time segments for each direction.

The license plate readers capture an image of a vehicle's license plate. This information is then converted to an alphanumeric string with the first and the last license characters deleted (to

protect privacy). This data, along with the time and the reader location, is then sent to the City of Tallahassee traffic management center where the data is matched with information from different license plate reader stations. Once this information is matched, the license plate image is deleted, assuring the individual's privacy—no license plate information is retained in the system. Each vehicle's travel time between readers is then calculated and, using all of the individual travel times between adjacent readers, average travel times are calculated for each segment. This travel time information is then displayed on the dynamic message signs located on the west and east sides of I-10 in the Tallahassee area.

This technology will benefit drivers in and around Tallahassee by allowing them to make better informed travel decisions. It is a huge satisfaction when an idea and then a plan becomes a reality.

There were many people involved in this project and much hard work in order to reach a successful ending. Many "thanks" go out to these people, including project management; those involved with the software revisions; the City of Tallahassee; and all those involved in one way or another...Much thanks!

This article was provided by Elizabeth Birriel, FDOT Traffic Engineering and Operations Office. For information, please contact Ms. Birriel at (850) 410-5606 or email to Elizabeth.Birriel@dot.state.fl.us.



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Inside the TERL

The Florida Department of Transportation (FDOT) has a goal to assure that only a safe and uniform traffic control system and intelligent transportation systems (ITS) are implemented in the state of Florida. The Traffic Engineering Research Lab (TERL) plays a part in obtaining this goal by satisfying Florida Statute 316.0745 - Uniform Signals & Devices. Below is a look Inside the TERL at activities that help accomplish our goal.

The primary mission of the TERL is to maintain an Approved Product List (APL) of devices that have been tested and verified to meet FDOT requirements. Establishing and maintaining the APL encompasses a broad variety of activities. These activities



include the review of manufacturer QA/QC programs, comprehensive product evaluation and testing, development and continuous improvement of specifications, maintenance, and technical operations of the systems used for testing (including the design, installation, and operation of a small-scale transportation management center), as well as the installation and integration of field devices around the TERL facility and various remote testing locations. The primary goal of these efforts is to ensure that products sold and deployed on transportation projects in Florida are safe, reliable, perform as required, are of good quality, and manufactured by companies who have demonstrated good QA/QC practices and customer service.

Providing a centralized APL is an efficient method for ensuring that products submitted for use on FDOT projects meets the specifications and requirements set forth by FDOT. The TERL is able to perform consistent, comprehensive product testing that benefits FDOT and manufacturers alike. FDOT benefits by removing the additional burden, and in some cases, duplication of effort associated with design approval tests that would otherwise be required on a project-by-project basis. The manufacturers benefit by having a consistent and centralized review and approval process that reduces the need to provide excessive submittal data or perform additional design approval testing job-by-job. Both benefit from the product improvements and corrective actions that are often identified and applied during product evaluation. FDOT ultimately receives better products, and the manufacturers have a better opportunity to resolve any product-related issues prior to deployment (and, therefore, limit the likelihood that they will need to fix multiple defects uncovered at multiple locations during installation or integration at a later date).

The people who support the TERL possess a broad variety of skills and bring all of them to bear on the day-to-day activities at the lab. These activities reflect the multi-disciplinary reality of traffic operations and ITS. The team has expertise in software development, systems integration, network administration, quality engineering, electrical engineering, and traffic engineering; and apply all of these skills to help ensure that the citizens of Florida are well served by their transportation system.

Notable activities during the past month included approval of the following:

- Daktronics VF-2000 Series Walk-in DMS.
- ITS Products CLDMG2 and CLDMG2-EXT Camera Lowering Device.
- Teleste EASI-MP-E Series Encoder and EASI-MP-D Series Decoder.
- Horizon Signal Technologies SQ2MPR Portable Traffic Signal.
- Iteris VersiCam Vehicle Detector for Intersection Applications.

As always, the TERL welcomes and encourages comments and feedback. Having trouble with something on the APL? Would you like to have a product placed on the APL? Are you a city, county, or District office that would like to sponsor a project to evaluate a new product or share your experiences? We want to hear from you!

Our offices in Tallahassee, and our District counterparts, are regularly approached by vendors interested in doing business with FDOT. Many offer products that may not be defined by existing FDOT specifications, but require approval by the State Traffic Engineer to legally be sold, installed, or operated within a transportation system. We want to work with you to ensure that the products you need are properly approved and that the transportation systems throughout the state, regardless of size or scope, comply with applicable FDOT requirements and Florida Statutes.

This article was provided by Ron Meyer, FDOT Traffic Engineering and Operations Office. For more information, please contact Mr. Jeff Morgan at (850) 921-7354 or email Jeffrey.Morgan@dot.state.fl.us.

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ITS Florida: Lap Hoang—An Ode to Mobility

On a perfect spring day in Tallahassee, celebrating his remarkable recovery, Lap and I reminisced about how the Sunshine State came to be a leader in applying engineering principles to optimize travel. Although this vanguard position has been made possible through the contribution of many, the dedication and vision of one individual deserves a special mention.

Growing up in war-ravaged Vietnam in the sixties, this bright, impressionable boy from Hue had already decided that his life would be devoted to improving the civil infrastructure of all societies. Destiny had not yet foreshadowed that the beneficiary of his talents would be another tropical region halfway around the world in Florida.

Born around the time Ho Chi Minh was a rising political force in Vietnam, this young man was so focused on academics that he won a competitive national scholarship to pursue his college education in the United States. Lap did not have the slightest doubt that his higher education would be directed toward civil engineering. He recalled a few of his early mentors, Ken Courage, Joe Wattleworth, and Charlie Wallace, among others, as having shaped his vision



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of applying engineering principles for the common good. Florida's growing economy and population hungered for an efficient statewide transportation network. For his master's thesis topic in the mid-seventies, he chose the still-emerging field of traffic operations—a specialty that would become a hallmark of his career in later years. One of his earliest projects was a traffic study for NW 7th Avenue in Miami, from the Golden Glades Interchange to Miami International Airport.

Eager to apply his college education to the real world, Lap joined the Florida Department of Transportation (FDOT) immediately upon completion of his master's degree in 1976. During his initial assignment as FDOT's area engineer for Brevard County, he found that most FDOT functions were centralized in Tallahassee. In order to better respond to diverse regional and sub-regional traffic needs and priorities, Lap immediately pushed for a proactive decentralization effort to empower FDOT Districts to take ownership of the transportation solutions needed for their respective communities. He continued to press on the same theme in his role as the Orlando area engineer, and then as FDOT engineer for the North Region Area.

In yet another pioneering achievement, Lap served as FDOT's legislative liaison for the successful authorization of \$700 million in funding for the state's first fixed-guideway transit system—Metrorail in Miami. Graciously acknowledging his inspirational gurus, Lap said he learned a great deal during this period from his supervisor Craig Portz, and from Bill Miller, who was in charge of FDOT's contracts office at the time.

With this well-rounded background, it is little surprise that in 1985, Lap was promoted to become the Deputy State Traffic Operations Engineer. He served in this role until 2000, when he became the State Traffic Operations Engineer. In October 2008, Lap elected to retire in order to spend more time with his family after a 32-year career with FDOT. As we continue to benefit from his leadership in making travel in Florida safer and more efficient, we will miss his guiding presence.

Lap, we wish you a retirement full of health and happiness.

For more information on ITS Florida, please check the ITS Florida Web site at www.itsflorida.org or contact Sandy Beck, Chapter Administrator, at itsflorida@itsflorida.org.

If you wish to contribute an article to the SunGuide® Disseminator on behalf of ITS Florida, please email Mary Hamill at MaryKHamill@ global-5.com.

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Editorial Corner—Reporting on the 23rd Annual Florida Governor's Hurricane Conference

Annually, elected officials, emergency managers, first responders, and vendors from around the state and the country travel to Florida for the Annual Governor's Hurricane Conference. This year, like the three previous years, the conference was held at the Fort Lauderdale Convention Center. Participants attend this conference for the training courses provided in coordination with the Florida Division of Emergency Management; for the workshops, which cover a variety of emergency management topics; and to see new products for disaster preparedness, response, and recovery. This annual conference provides an excellent opportunity for responders of all backgrounds to expand their knowledge in disaster preparedness, response, recovery, and mitigation.

The Florida Department of Transportation (FDOT) Traffic Engineering and Operations Office hosted two workshops at this year's conference: "Responder Safety: Don't be a Victim Too" and "Ins and Outs and Ups and Downs of Reverse Lane Operations." The responder safety workshop focused on providing basic traffic safety information to emergency responders and disaster volunteers. Many of these individuals have not had the formal maintenance of traffic and traffic safety courses that keep us safe as we work in or near traffic. In this workshop Robert Frick from District Four and myself discussed topics, such as the importance of wearing safety vests, safe parking techniques, and traffic awareness.

The workshop titled "Ins and Outs and Ups and Downs of Reverse Lane Operations" provided basic information on Florida's reverse lane plans, focusing on the routes, decision making, personnel, and logistics issues that are posed with the implementation of this type of evacuation strategy. In this workshop, Jim Kelly and Douglas Prager from Florida's Turnpike Enterprise discussed the resources needed for reverse lane operations and the operational processes, such as the motorist assistance plan. We were also fortunate to have Captain John Roberts from the Florida Highway Patrol, who provided insight on the law enforcement operations that would be ongoing during reverse lane operations. As always, this topic generated excellent dialog between the presenters and the attendees.

As with past conferences, the number of excellent workshops and classes exceeded one's ability to attend. Of particular interest this year was a Wednesday morning

class entitled "How to Perform Well Under Pressure." For anyone working emergency operations—whether it is an incident at 6:00 a.m. on a major urban interstate or a more slowly evolving event, such as the flooding in North Florida this past April—the information provided in this class was applicable. Stress is everywhere around us and we all have our own methods of coping with these issues, some of which are more healthy than others. Sometimes it's the little things that we do each day that help keep our daily stress in check—like eating a balanced meal, taking a short walk during the day, or having a short conversation with a friend. All of these activities are beneficial to our health and wellbeing.

Evacuations are difficult; we should all remember that! We have to remember that as storms approach or wildfires grow, local officials often face a difficult task—ordering the evacuation of sometimes thousands of residents that are at risk from areas in their communities. Each time an evacuation order is issued, communities loose tourism revenue; students loose valuable classroom time; employees loose wages as businesses close; and these are just a few examples of the costs.



Damage from Hurricane Ivan, Escambia County.

Evacuations are not a vacations where there is something to look forward to at the end of the journey. Families have no peace of mind, knowing that all the things they have worked for will be there when they return. When someone evacuates, they are sometimes making quick decisions about what to take and what to leave behind—because there isn't room for everything, or there just isn't time. As we are working during these incidents, we should remember that these are not just vehicles on the highway, but rather, our friends and neighbors; and even little acts of kindness can make things better as they seek shelter.

Now that hurricane season is upon us, we should all take a few minutes and check our emergency supplies and replace those items that are out of date; check the first aid kits; and review our family emergency plans and update if needed. Surveys have shown that many residents in Florida are unaware of which evacuation or flood zone, if any, applies to their home. If you are unsure about whether your home is in an evacuation zone or flood zone, please contact your local county emergency management office.

For disaster related information and family disaster preparedness information, please visit www.floridadisaster.org. and for updates on tropical weather, please visit www.nhc.noaa. gov.

This editorial was provided by Patrick Odom, FDOT Traffic Engineering and Operations Office. For information, please contact Mr. Odom at (850) 410-5631 or email to Patrick. Odom@dot.state.fl.us.

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News From District Four

Closed-Circuit Television Camera Poles Join the 511 Marketing Effort!

Motorists have one more-make that almost 90 more-reminders to use 511.



In early May, the Florida Department of Transportation (FDOT) District Four Intelligent Transportation Systems (ITS) Unit completed a deployment of nearly 90 511 signs in Broward County. The new signs can be seen on I-95 and I-75. No signs were posted on I-595 due to the upcoming 595 Express construction.

The unique feature of these new signs is *where* they are mounted. Rather than traditional post mounting, they are attached to existing FDOT closed-circuit television camera poles. The graphic design of the sign is the same as those deployed throughout the state.

"Hopefully, motorists will make a connection between the cameras and the information available through the 511 system," said Daniel Smith, recently appointed District Four ITS Operations Manager. "It's not just hit and miss traffic reports, but real-time information that is being verified by hundreds of cameras and teams of people that monitor them 24 hours a day."

This article was provided by Daniel Smith, FDOT District Four. For information, please contact Mr. Smith at (954) 847-2633 or email to Daniel.Smith@dot.state.fl.us.

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Announcements

Traffic Systems Studies Engineer Appointed

FDOT is pleased to announce the appointment of Mr. Alan El-Urfali, P.E. to the position of Traffic Systems Studies Engineer in the Traffic Engineering and Operations Office in Tallahassee.

Alan has over 17 years of experience in Transportation Design, Planning, Traffic Operations, and Civil Land Development with expertise in traffic flow and traffic engineering studies. He graduated from the University of Tennessee, Knoxville, with a B.S. Degree in Engineering Physics and is currently working on completing his Master's degree in Transportation Engineering.

Prior to joining FDOT, Alan served as Engineer VI for Johnson Engineering, Inc. in Naples Florida. He was in charge of a design team providing cost-effective transportation and traffic engineering solutions for their clients.

Please join us in welcoming Alan to the FDOT Team!

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New District Four ITS Operations Manager

Congratulations to Daniel Smith on his appointment as the District Four ITS Operations Manager. Daniel will be primarily based at the Broward Transportation Management Center, but is responsible for overseeing operations throughout the five District Four counties.

Daniel joined the Florida Department of Transportation in April 2007, when he came on board as the District Four ITS Design and Deployment Coordinator. He is an alumnus of Florida Atlantic University where he earned a

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Bachelor of Science degree in Electrical Engineering. He also served in the Air Force for four years, including serving in Operation Desert Shield/Storm

The District Four ITS Unit is looking forward to the leadership and innovation that Daniel brings with him to this new assignment. Please join us in welcoming him to his new role.

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FDOT Traffic Engineering and Operations Mission and Vision Statements

Mission: (

Provide leadership and serve as a catalyst in becoming the national leader in mobility.

Vision:

Provide support and expertise in the application of Traffic Engineering principles and practices to improve safety and mobility.



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