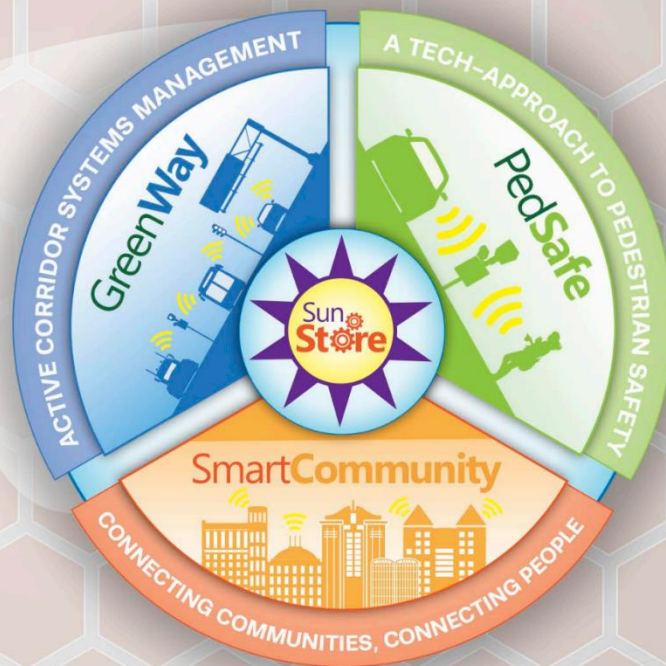


Connecting the East Orlando Communities

Volume 1 - Technical Application



Advanced Transportation and Congestion
Management Technologies Deployment
Initiative Notice of Funding Opportunity
Number 693JJ317NF0001

In Partnership With



UNIVERSITY OF
CENTRAL FLORIDA

Project Name	Connecting the East Orlando Communities
Eligible Entity Applying to Receive Federal Funding	Florida Department of Transportation
Total Project Cost (from all sources)	\$65,031,289
ATCMTD Request	\$11,946,279
Are matching funds restricted to a specific project component? If so, which one?	Yes. Matching funds from local agencies are being used for deployments or upgrades on systems in their respective jurisdictions. Details are provided in Volume II.
State(s) in which the project is located	Florida
Is the project currently programmed in the: <ul style="list-style-type: none"> • Transportation Improvement Program (TIP) • Statewide Transportation Improvement Program (STIP) • MPO Long Range Transportation Plan • State Long Range Transportation Plan 	Yes – elements/phases of the project are already programmed in the TIP, STIP, and long range transportation plans. Minor updates to the TIP/STIP would be needed to advance the deployment phase if awarded.
Technologies Proposed to Be Deployed (briefly list)	<ul style="list-style-type: none"> • Advanced traveler information systems • Advanced transportation management technologies • Infrastructure maintenance, monitoring, and condition assessment • Advanced public transportation systems • Transportation system performance data collection, analysis, and dissemination systems • Advanced safety systems, including vehicle-to-vehicle and vehicle-to-infrastructure communications, technologies associated with autonomous vehicles, and other collision avoidance technologies, including systems using cellular technology • Advanced mobility and access technologies, such as dynamic ridesharing and information systems to support human services for elderly and disabled individuals



Mrs. Elaine Chao - Secretary
United States Department of Transportation
1200 New Jersey Ave, SE, Washington, DC 20590

RE: *Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Initiative Grant Application*

Dear Secretary Chao:

The Florida Department of Transportation (FDOT) continues to move from a “shovel ready” approach to a “connection ready” philosophy. Connection Ready goes beyond the threshold of whether a project can be quickly implemented. Connection Ready is a focus and plan for how projects connect communities, transportation modes, technologies and data, economic drivers, investments, short and long-range plans, and, ultimately, a focus on how to best connect people. New connections will improve the safety, livability, economic opportunities, and mobility of a region, city, neighborhood, and individual.

Commitment: USDOT's ATCMTD Initiative is an extraordinary opportunity to advance key connection opportunities in East Orlando and the Central Florida region by leveraging local, regional and state resources with federal funds to improve mobility and safety. The \$12 million of Federal funding requested will be matched by \$53 million in non-federal funds or in-kind assets. In addition, FDOT has programmed \$47 million over the next five years (the limit of the work program) for the operations and maintenance of the program so the user and community benefits will exist long after the grant has been implemented.

Technology: The FDOT, MetroPlan Orlando (the MPO for Orange, Seminole and Osceola Counties) and the University of Central Florida (UCF) will utilize the grant to advance the following opportunities:

1. **PedSafe** is an innovative pedestrian and bicycle collision avoidance system currently being designed by the FDOT. PedSafe will connect advanced signal controller capability, use of Connected Vehicle (CV) technologies, and existing communication capabilities to reduce the occurrence of pedestrian and bicycle crashes. As a region and a state that annually tops the Dangerous by Design list of most dangerous areas for walking, development and implementation of PedSafe is an immediate priority with multiple benefits. The application will be easily transferable throughout the country.
2. **GreenWay** is a FDOT project to connect Advance Sensor Technology, Conditional Transit Signal Priority (TSP), Adaptive Deployment Traffic Signal Interface with Track Positive Train Control (SunRail), and Smart Parking technology with Signal Performance Metrics (SPM), Expand Integrated Corridor Management (ICM), and Signal Control Analytics and Visualization. GreenWay is designed to better utilize the multimodal transportation system by actively managing over 1,000 traffic signals within the region. Data managed in the proposed SunStore will be connected with GreenWay to support Real Time Operation through a regional Decision Support System (DSS). This connection will allow strategic planning for special events to include consideration of all modes and users and will provide a unified approach to system operations and management.
3. **SmartCommunity** is an integrated program that connects people to the places they need to go and the services they need to receive. Through a Mobility on Demand (MoD) framework, SmartCommunity leverages existing ridesharing and car sharing products to offer residents access to cars when required. SmartCommunity's trip planning application, Transit AVL, and Transit Kiosks will provide real-time multimodal travel information to integrate trip planning with modal choice options. SmartCommunity will allow travelers in the same area to share information and coordinate trips to destinations such as employment centers, education facilities, the grocery store, and medical treatment centers. SmartCommunity will have a benefit for low income and underserved populations in the area and help to connect the community to the region.

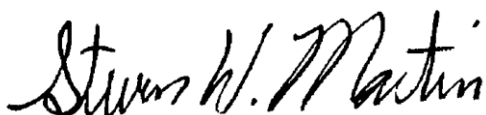
4. **SunStore** is an ongoing FDOT initiative to connect and integrate the many data sources created and utilized by the FDOT. SunStore includes Master Data Management, Data Fusion, and Sensor Fusion for increased data quality. SunStore interfaces with Florida's Data Integration and Video Aggregation System to make transportation data available to universities, research institutions, and businesses to encourage and support innovation. Data in SunStore will be used to support the PedSafe, GreenWay, and SmartCommunity deployments.

Implementability: The East Orlando area to implement PedSafe, GreenWay, and SmartCommunity was strategically chosen to be part of a Smart City vision for the Central Florida Region. The area is anchored by the University of Central Florida and is part of a CV environment that includes an existing FDOT CV test bed to the north and a Central Florida Expressway CV demonstration project to the south. The area experiences bike and pedestrian safety issues, congestion, and limited connectivity to the broader transportation system. The area is ideal for congestion management technology due to the existing robust communication and multimodal network, a population of people comfortable and equipped with technology (such as university students), and a transit, bicycle, and walking dependent population. It is expected that the community will see immediate benefits related to pedestrian and bicycle safety, and increased accessibility to traveler information and mode choices. This expectation of change and improvement will be measured and documented using a range of defined performance measures. This area is truly Connection Ready!

Scalability/Portability: But a successful implementation and use of the grant funding in East Orlando is just the beginning. The lessons learned and technology and processes developed will quickly be applied to the currently developing Creative Village in Downtown Orlando. The Creative Village will be a 68-acre transit oriented, urban infill neighborhood in the heart of Orlando that supports a dynamic mix of uses including office/creative studios, higher education, PS-8 education, mixed-income residential, retail/commercial and hotel. It is expected that the Creative Village will add over 10,000 students and residents to downtown Orlando. With vertical construction underway, the Creative Village is Connection Ready! This pattern of using and improving upon the technology developed by the grant can be repeated throughout the Orlando and Central Florida area. Over \$100 million in non-federal funds or in-kind assets has been committed to make these connections happen. The presence of over 65 million visitors to the region will serve as demonstration of the benefits of the project implementation.

We are proud of the work that is underway in the region and the connections we have made. Our success has been based on collaboration with counties, municipalities, transportation agencies, and UCF. In this spirit, 28 local governments and regional agencies have approved Resolutions in support of the grant application. This letter confirms our full commitment and endorsement for the grant application in response to the Notice of Funding Opportunity (NOFO) dated April 12, 2017. We look forward to working with your team on this exciting opportunity. We are Connection Ready!

Sincerely,



Steve Martin, PE
District Secretary | FDOT District Five




Harold W. Barley
Executive Director | MetroPlan Orlando

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1 SUMMARY TABLE

Selection Criteria		Description	Reference
Technical Merit			
1	Degree that the proposed technology deployment aligns with vision, goals and focus areas in Section A of this announcement.	HIGH - The project aligns with the program’s vision by integrating Smart City systems and communications into routine functions to address the region’s issues and challenges in safety, mobility, sustainability, economic vitality and air quality. The project’s ability to achieve specific Goals and Focus Areas identified in Section A are identified with a  icon throughout the document.	§2.1, 2.4, 2.9, 2.10
2	Readiness of the proposed technology(ies) to be deployed, and the likelihood of success of the applicant to deploy and sustain the proposed technology(ies), including the proposed approaches to addressing any regulatory environment and other obstacles to deployment.	HIGH - The Department has committed funding for the implementation of SunStore and the design for GreenWay and PedSafe projects - the project is Connection-Ready, and the grant funding will be utilized for deployment. Funding for operations and maintenance is committed in FDOT’S work program.	§2.12
3	Scalability or portability of the proposed technology deployment to other jurisdictions.	HIGH - The project is designed with scalability and portability in mind, with this initial deployment in a subregion of East Orlando. The broader vision is for a future scaled deployment in the City Beautiful’s Central Business District and on routes of significance throughout the Central Florida region and statewide.	§2.3
4	Commitment to evaluate the effectiveness (i.e., cost-benefit) of activities proposed.	HIGH - The project has developed a methodology and dedicated funding to evaluate of activities. Based upon lessons learned from recent CV pilot deployments, the appropriate data collection equipment will be identified and included for the evaluation. UCF has also partnered on the project to re-search the project's effectiveness and provide real-time enhancements to maximize effectiveness.	§2.8
Staffing			
1	Degree that the Application includes a program/project management structure or organization that will successfully oversee the proposed technology deployment.	HIGH - The project includes a fully staffed team of experts with strong working relationships, and the project manager is currently overseeing over \$150 million in ITS program funds. The team is already working together within their defined roles to successfully prepare the project for deployment.	§3
2	Expertise and qualifications of key personnel for managing or conducting appropriate aspects of the proposed technology deployment through the period of performance.	HIGH - The key personnel identified for this project have the expertise and qualifications to successfully deploy and operate the project through the performance period. They are local experts that work in the area and know the area. The project's scalability and portability will continue to strengthen the Department's workforce capability as similar projects are developed and deployed.	§3
Cost			
1	Cost will be considered in the award decision. The cost information will be analyzed to assess cost reasonableness and conformance to applicable cost principles. Applicants must provide the required matching funds, and supporting detail for these funds.	HIGH - The project requests \$12M in federal funding, which will be matched with \$53M committed in non-federal matching funds or in-kind assets. The requested funds do not exceed the maximum and will be matched at a rate of 4.4:1 in non-federal funds or in-kind assets or services from its partners (FDOT, MetroPlan Orlando, UCF, local agencies). The cost estimate was vetted through Siemens, a technology provider, to verify accuracy.	Volume 2
2	Funding availability will also be considered in the award decision. This evaluation factor will not be rated, but will be considered in the award selection.	Available - The project requests \$12M in federal funding, less than the maximum for the grant, and will match the awarded funds with \$53M committed in non-federal funds or in-kind assets and services.	Cover
Project Prioritization			
1	The Department will prioritize projects that also enhance personal mobility and accessibility.	HIGH - The project utilizes transportation technology, data, and services to better connect people to essential services including employment centers, health care, education facilities, healthy food, and recreation. The project removes physical barriers to access with deployments focused on enhancing transit services and pedestrian/bicycle accessibility.	§2.1
2	The Department may consider whether a project’s design is likely to generate benefits for all users of the proposed project, including non-driving members of a community adjacent to or affected by the project.	HIGH - The project has a primary focus on improving safety and mobility for all users, including improved pedestrian/bicycle safety and improving public access to real time integrated traffic, transit and multimodal transportation information to make informed travel decisions.	§2.1

2 PROJECT NARRATIVE

Florida is facing a new and rapidly developing environment with an aging and increasingly diverse population, both culturally and economically. Demand on the transportation system has never been higher. In addition to growth and diversity, Central Florida has one of the highest frequencies of pedestrian crashes. The Florida Department of Transportation (FDOT) and MetroPlan Orlando are committed to solving the challenges of this growing demand on the system, supporting underserved communities with safe transportation options, and improving safety and mobility for all modes of transportation.

One area with unique mobility challenges in the East Orlando area, home to the University of Central Florida (UCF) and the Central Florida Research Park (CFRP). UCF currently has the **second highest number of enrolled students in the U.S.**, with more than 64,000 students. Recent growth at UCF has increased enrollment from about 34,000 students in 2000 to its present level. About 2,000 faculty members and 9,000 staff members work at UCF. Immediately abutting UCF, the CFRP is the **largest research park in Florida**, home to more than 10,000 employees in over 100 companies. About \$1.4 billion in federal contracts is awarded by the U.S. military each year for activities in and around the vicinity of the CFRP.

Despite the high level of activity and momentum in the East Orlando area, workers, residents, and students continue to struggle with mobility issues, including pedestrian safety, transit reliability, and non-recurring congestion due to special events. Furthermore, due to its location on the fringes of the Orlando urbanized area, the East Orlando area's single primary connection to major employment, cultural, and entertainment destinations is a tolled freeway.

FDOT District Five and its partners see a golden opportunity to leverage technology to connect the workers, residents, and students in the East Orlando area. Throughout the years, FDOT has

worked with local partners to lay the groundwork for technology deployment, including a robust communication and data storage system. Most recently, FDOT began the design, development, and population of a regional data store—named **SunStore**—that will serve as the backbone of the region's Transportation Systems Management & Operations (TSM&O) efforts. In summary, this area and this region are *Connection Ready*.



In addition, the demographics of the area suggest that the residents are younger and better educated. They are likely to embrace, use, and help develop the innovative technology that is needed to enhance mobility opportunities.

But a successful implementation of smart technology is just the beginning. The lessons learned and technology and processes developed will immediately be applied to the currently developing Creative Village in Downtown Orlando, connecting the residents and employees in the City's Central Business District to employment opportunities, healthcare choices and educational institutions.

2.1 Proposed Programs

The technology solutions being proposed will connect with and leverage the existing technology infrastructure to create a unified transportation management system. The East Orlando area will provide the demonstration of the technologies for future deployment across Florida's many urban and rural areas. We are proposing the following three interrelated programs: **PedSafe**, **GreenWay**, and **SmartCommunity**. Brief introductions to the programs are presented in this section, with additional details provided in §2.5 Services and Systems.

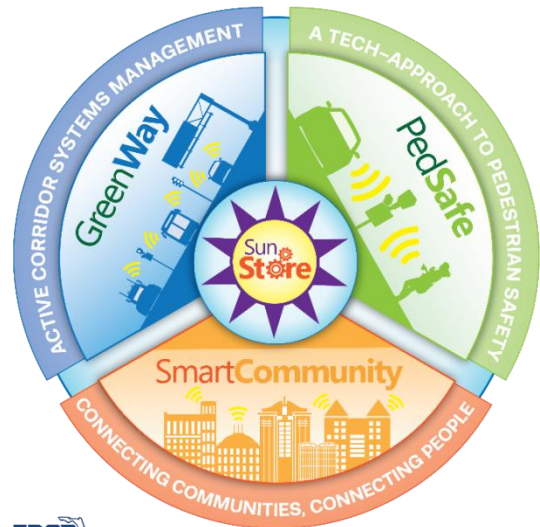
2.1.1 PedSafe

The growth in enrollment and jobs in the East Orlando area has led to the opening of retail, restaurants, and housing choices. As the mixture of the vehicular, pedestrian and bicycle traffic has grown, many crashes involving pedestrians or bicycles with vehicles have occurred throughout the community. Between 2006 and 2014, 259 crashes involving pedestrians or bicycles have occurred along Alafaya Trail, University Boulevard, and McCulloch Road, of which, 11 were fatalities and 207 were injuries.



This is a dire and complex problem which requires a combination of solutions, including infrastructure, enforcement, education, and technology. **PedSafe** is an innovative pedestrian and bicycle collision avoidance system that uses connected vehicle (CV) technologies to reduce the occurrence of pedestrian and bicycle crashes at high crash rate locations. Connections to existing traffic signal systems will provide information on phasing changes along with pedestrian detection at each intersection to manage potential conflicts and congestion within the PedSafe area.

- **Problem #1:** Pedestrian phases are ending with pedestrians still in crosswalks.
Solution: PedSafe will dynamically adjust signal timings to allow for completion of pedestrian movements.
- **Problem #2:** Buses, trucks, and large vehicles have a hard time noticing pedestrians and bicyclists.
Solution: PedSafe will use connected vehicle technology to warn drivers, and pedestrians, of a potential conflict.
- **Problem #3:** Long cycle lengths discourage pedestrians from using signalized crosswalks.
Solution: PedSafe will monitor pedestrian activity and break cycles during off-peak periods to provide enhanced pedestrian service.



The following ATCMTD goals are directly addressed by the PedSafe program:

- ✓ Reduction in the number and severity of traffic crashes and an increase in driver, passenger, and pedestrian safety: PedSafe integrates CV technology, existing signal systems, and mobile applications to reduce the occurrence of pedestrian-bicycle conflicts at intersections
- ✓ Accelerated deployment of vehicle-to-vehicle, vehicle-to-infrastructure, and automated vehicle applications, and autonomous vehicles and other advanced technologies: PedSafe is built upon CV and V2I technology and will accelerate deployment of such technology
- ✓ Integration of advanced technologies into transportation system management and operations: PedSafe not only senses pedestrian presence and potential conflicts but interacts with signal timing infrastructure to provide enhanced pedestrian service at intersections

Additional details on PedSafe are provided under Section 2.5.

2.1.2 GreenWay

The GreenWay Program is designed to reduce congestion and increase reliability by actively managing traffic signals within the East Orlando area.

The proposed GreenWay program incorporates Central Florida's Active Detection Technology (ADT) and elements of Orlando's Smart City initiative to improve the multimodal movement of people and goods. Available information from traffic signals will be fused, normalized and then processed by deterministic or stochastic models. Real-time results will then be presented in a consumable format to Signal Timing Engineers to use in actively managing traffic signal systems. Alerts will also be provided connecting the response of emergency services, bus, and commuter rail.



- **Problem #1:** Data on intersection performance is expensive, time-consuming, and only available for short snapshots of time.
Solution: GreenWay will equip traffic signals with technology that will enable FDOT to monitor intersection usage and performance in near-real time from the comfort of its new traffic management center.
- **Problem #2:** When special events such as UCF football games happen in East Orlando, traffic grinds to a halt.
Solution: GreenWay will deploy adaptive signal technology that automatically adjusts signal timing based on actual conditions, improving traffic flow and reducing demand on law enforcement resources for traffic management.
- **Problem #3:** Due to lack of coordination, train crossings result in more delay to vehicles than necessary.
Solution: GreenWay will connect railroad crossing signals to trains using Positive Train Control (PTC) to reduce delay without impacting safety.

- **Problem #4:** Transit riders regularly complain about long waits when transferring, and especially about those “near misses”.
Solution: GreenWay will implement transit signal priority to enhance on-time arrival for all transit vehicles, but especially when transfers are involved. A connected vehicle pilot in Tampa, FL is already leveraging that technology to implement transit signal priority. This same technology could also be used to reduce delays for emergency response vehicles.

The following ATCMTD goals are directly addressed by the GreenWay program:

- ✓ **Reduced costs and improved return on investments, including through the enhanced use of existing transportation capacity:** GreenWay will improve the efficient use of existing capacity through adaptive signal control and transit signal priority.
- ✓ **Delivery of environmental benefits that alleviate congestion and streamline traffic flow:** Through the use of improved signal coordination, GreenWay will reduce stopping and starting vehicle platoons resulting in less fuel consumption and fewer emissions.
- ✓ **Measurement and improvement of the operational performance of the applicable transportation networks:** GreenWay incorporates Central Florida's Active Detection Technology to improve the multimodal mobility through real-time measurement and active management of traffic signal systems.
- ✓ **Reduction in the number and severity of traffic crashes and an increase in driver, passenger, and pedestrian safety:** GreenWay includes CV technology deployments at select locations including queue warning, curve speed warning, and vehicle

turning in front of bus warning. Applications such as these are already being demonstrated in Tampa, FL and New York City.



Collection, dissemination, and use of real time transportation related information to improve mobility, reduce congestion, and provide for more efficient and accessible transportation, including access to safe, reliable, and affordable connections to employment, education, healthcare, freight facilities, and other services: GreenWay incorporates Central Florida's Active Detection Technology to improve multimodal mobility through real-time measurement and active management of traffic signal systems connecting to East Orlando residents, employment centers, the UCF campus, and healthcare facilities. All data produced by GreenWay will be fed into FDOT's SunStore, making it easily accessible to its partners.



Monitoring transportation assets to improve infrastructure management, reduce maintenance costs, prioritize investment decisions, and ensure a state of good repair: GreenWay includes connections to SunStore and the Regional Traffic Management Center to diagnose equipment failures and create maintenance tickets in real-time.



Delivery of economic benefits by reducing delays, improving system performance and throughput, and providing for the efficient and reliable movement of people, goods, and services: GreenWay incorporates Central Florida's Active Detection Technology to actively manage East Orlando's arterial corridors, reducing system delays for commuters, students, and freight vehicles on the road.



Accelerated deployment of vehicle-to-vehicle, vehicle-to-infrastructure, and automated vehicle applications, and autonomous vehicles and other advanced technologies: GreenWay includes deployment of CV technology for safety applications and autonomous shuttle deployment for shuttling between UCF and off-campus housing.



Integration of advanced technologies into transportation system management and operations: GreenWay's deployment of CV technology, AV technology, and automated traffic signal performance measure technology will integrate with SunStore and FDOT's and Regional Traffic Management Center to advance the regional effectiveness of its TSM&O program.

Additional details on GreenWay are provided under Section 2.5.



2.1.3 SmartCommunity

SmartCommunity is an integrated program that aims to connect communities by connecting people to the places they need to go and the services they need to get. The SmartCommunity proposal is rooted in a regionwide emphasis around USDOT's Smart Cities initiative, which has engaged leaders in the community to think about ways to use technology to improve quality of life.

Deploying SmartCommunity in the East Orlando area is expected to alleviate or eliminate current and future challenges, including access to regional destinations, sustainable energy production, and the steep burden of transportation costs on residents. The deployment will integrate well with UCF's plans for a 50-acre, 12 MW Solar Farm. The Solar Farm targets the key University Climate Action Plan goals of achieving 15% renewable energy by 2020, with a firm commitment to sustainability by offsetting 28 tons of CO₂ annually and providing clean energy.

- **Problem #1:** The East Orlando area's only primary connection to the rest of the region is a tolled freeway. The need for multimodal access is expected to grow with the completion of the Creative Village in downtown Orlando.

Solution: The SmartCommunity program has a strong transit component that will efficiently connect this community to the rest of the region. SmartCommunity's transit services will be data-centric, providing operators and users with real-time information on bus arrivals and performance.

- **Problem #2:** The energy needs of the East Orlando area have continued to grow as the area attracts more workers, residents, and students. **Solution:** SmartCommunity proposes both central and distributed renewable energy production in more locations. UCF already produces



solar energy, and is contemplating a 12-megawatt solar plant which will save \$2M in utility bills each year.

- **Problem #3:** Workers, residents, and students in the East Orlando area must spend significant parts of their income on automobiles.

Solution: Through a Mobility on Demand (MoD) framework, SmartCommunity leverages existing ridesharing and carsharing products to offer East Orlando residents access to cars when they need them, reducing the need for car ownership.

The following ATCMTD goals are directly addressed by the SmartCommunity program:

- ✓ Collection, dissemination, and use of real time transportation related information to improve mobility, reduce congestion, and provide for more efficient and accessible transportation, including access to safe, reliable, and affordable connections to employment, education, healthcare, freight facilities, and other services:

SmartCommunity's trip planning application, Transit AVL, and Transit Kiosks will provide real-time multimodal travel information to integrate trip planning with modal choice options and improve mobility. The program's dynamic ridesharing application will allow travelers to coordinate similar trips together and encourage carpooling within the area.

- ✓ Integration of advanced technologies into transportation system management and operations: SmartCommunity will include smart parking applications to improve the distribution of traffic and parking throughout the community and to effectively manage demand during events. The program's dynamic ridesharing application will allow travelers to carpool.

Additional details on SmartCommunity are provided under Section 2.5.

2.2 Entities Entering Agreement

The **FDOT** will be the entity that will enter into the agreement with the FHWA and deliver the project.



The FDOT is an executive agency, which means it reports directly to the Governor. The FDOT is decentralized in accordance with legislative mandates. Each District is managed by a District Secretary has major divisions for Administration, Planning, Production and Operations.

The FDOT Central Office will play a key role in ensuring transportability and scalability of projects. They will be responsible for updating Department policy, procedure, design standards, and specification to support advancements made within the projects. Additionally, FDOT software is managed from the Central Office and the same staff will be used to manage the software development effort as part of this work. Design, construction, integration, operations, and maintenance will occur at the District level using District staff. This includes data management functions.

2.2.1 Key Partners

The following organizations will play active roles throughout the life of the project:

MetroPlan Orlando:

MetroPlan Orlando will play a key leadership role to ensure projects meet their intended purpose and that local agency support is maintained throughout the project's life.



MetroPlan Orlando covers 22 cities and towns in Orange, Seminole and Osceola Counties. About 2 million people live within its planning boundary. As a regional organization, MetroPlan Orlando can use its broad coverage to facilitate collaboration among agencies. As such, MetroPlan Orlando will lead a group of counties and cities that have

all passed resolutions of support for the project's objectives (see Volume 2). MetroPlan Orlando's TSM&O Advisory Committee and the existing FDOT D5 TSM&O Consortium group will serve as forums for information dissemination and feedback.

Central to MetroPlan Orlando's role in the region is promoting scalability, prioritization, and performance monitoring. These will be valuable in making sure that the proposed programs ultimately benefit the entire region.

University of Central Florida:

UCF will play a central role by bringing its research capabilities and existing Smart Cities initiative to advance the objectives of the proposed programs.



UCF is already taking steps to address the challenges that the proposed programs are intended to alleviate, but the support of USDOT and FDOT District Five would mean a significant boost to their efforts to become a model for smart transportation. UCF will lead the Transportation system performance big data collection and analysis.

Local Municipalities:

FDOT's success with major projects has been based on strong collaboration and cooperation with counties, municipalities and other transportation agencies. In this spirit, 28 local governments and regional agencies have approved resolutions in support of the grant application that accompanies this letter (see Volume 2). This reflects our region's commitment to work together with implementing grant-related activities and deployments.

2.3 Geographic Description and Map

2.3.1 East Orlando

The East Orlando area is home to more than 200,000 residents and 30,000 employees. The University of Central Florida (UCF) has the highest number of enrolled students in the U.S., with about 63,000 students. The majority of UCF's student population lives on campus or in the student housing developments surrounding the campus. High tech businesses have a substantial presence in East Orlando, including Siemens Westinghouse, Lockheed Martin, and the Central Florida Research Park (CFRP) – the largest research park in Florida and headquarters of the nation's simulation and training industry.

Florida Hospital East Orlando is a major employer and healthcare provider. The hospital employs more than 500 doctors, provides healthcare services to more than 80,000 patients annually, and has the busiest emergency department in Central Florida.

The limits of the project area are illustrated on the following page.

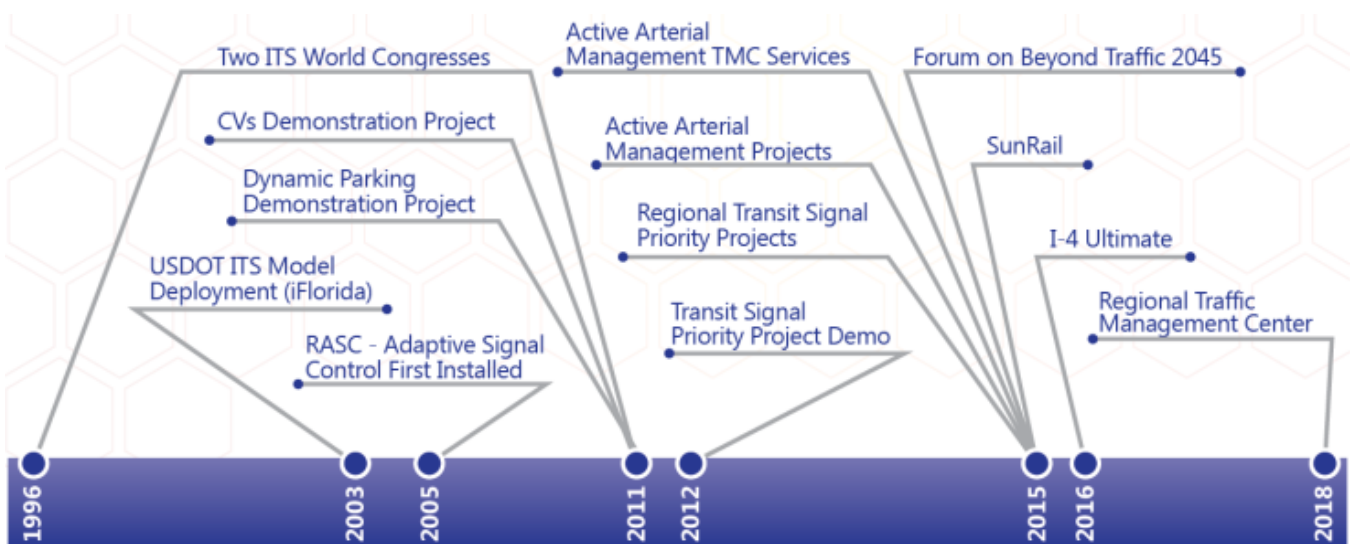
2.3.2 Central Florida's Innovative History

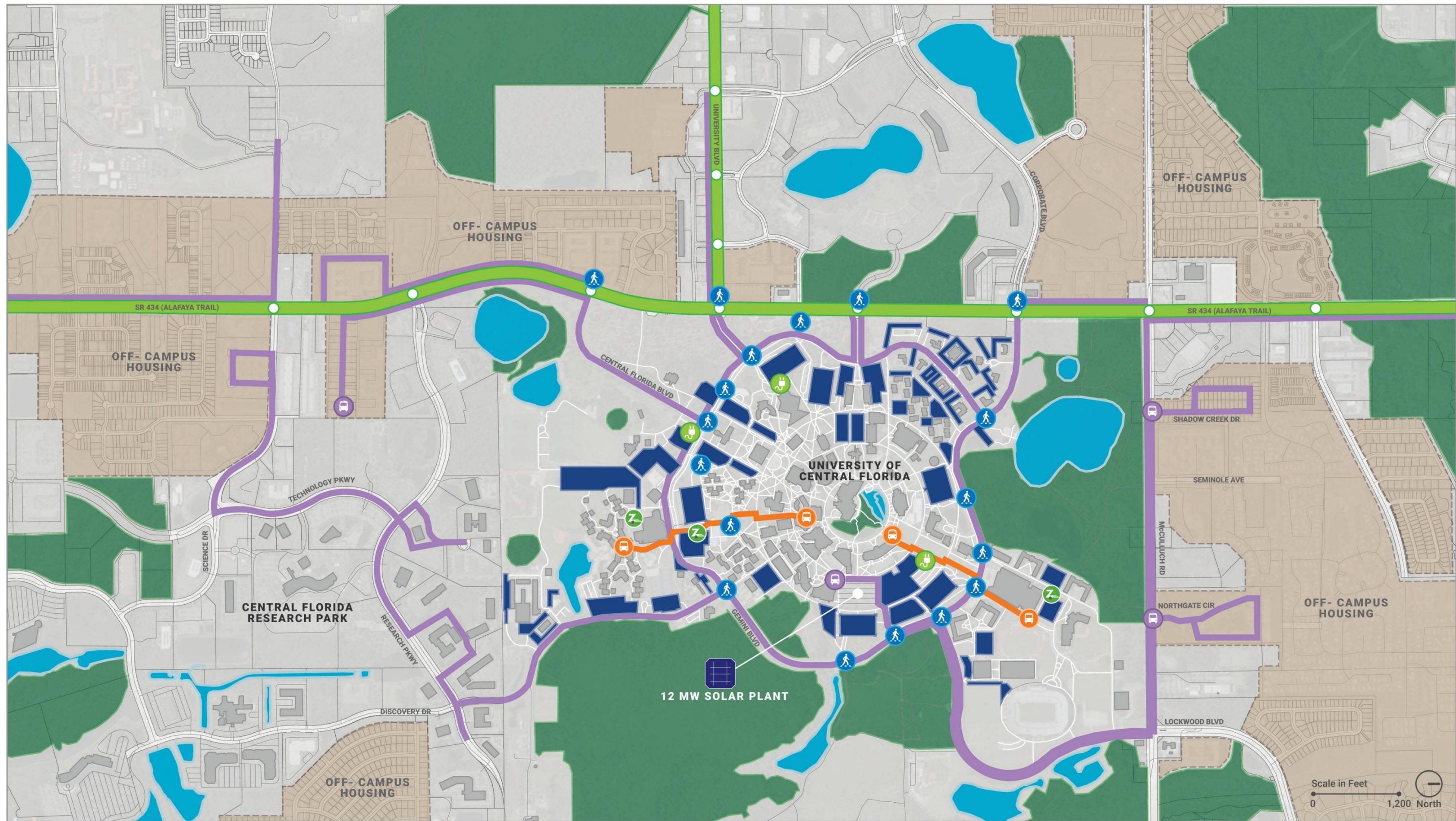
Central Florida has a proud history of delivering innovation to FHWA and the rest of the country. In 1992, Central Florida became the testing ground for a groundbreaking FHWA pilot of in-car navigation called *TravTek*. Twenty-five years later, it is rare to find new cars without the technology first tested here in Central Florida.

In 1997, Central Florida became the first region in the US to implement Bus Rapid Transit (BRT). The Central Florida Regional Transportation Authority's *LYMMO* serves downtown Orlando's residents and workers with free BRT running on exclusive lanes. Many cities, from Cleveland to Washington, now look to BRT to make their transit systems more reliable and efficient.

In 2003, FDOT District Five yet again pushed the boundaries on transportation technology deployment through the *iFlorida* pilot conducted with support from FHWA. Through the *iFlorida* project, FDOT District Five instrumented major freeways to deliver real-time information to travelers. Nowadays, most people expect to have this information at their fingertips every time they travel.

FDOT District Five and its Central Florida partners want to continue pushing the boundaries on smart technology deployments that improve the quality of life of our residents and the millions of visitors we receive each year.





East Orlando Deployment Area



PedSafe



 PedSafe Intersections

GreenWay

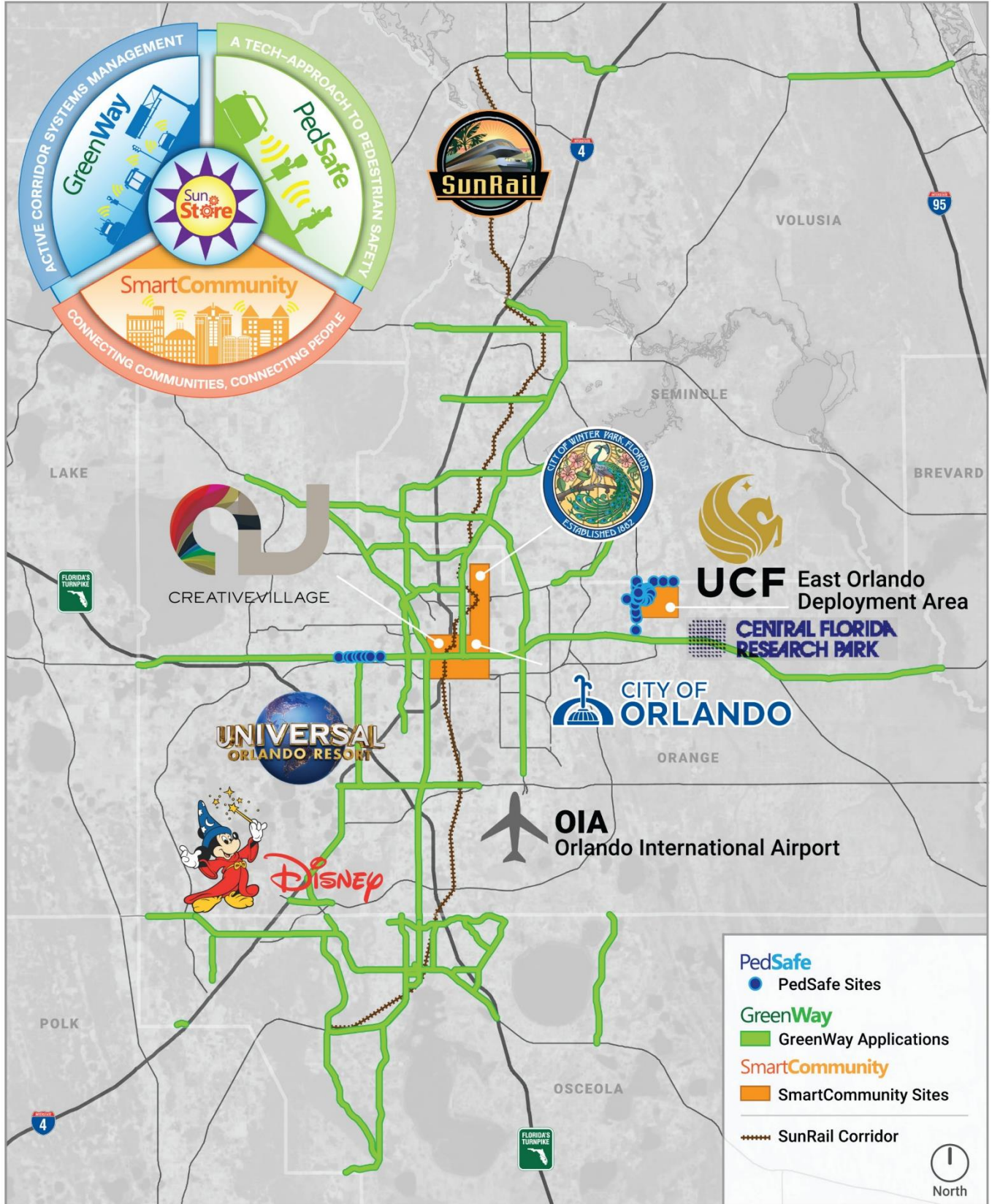
 GreenWay Corridor & Intersections

SmartCommunity

 Advanced Parking Management
 Autonomous Shuttles

 EV Charging Stations
 Zipcar Carsharing

 Existing Shuttle Routes



Central Florida Region | Scalability and Portability Potential

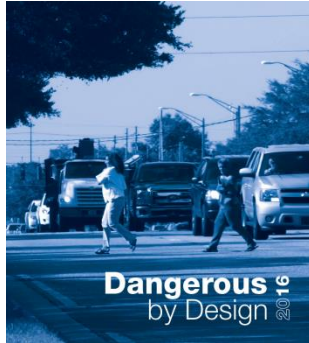
Not to Scale

2.4 Real World Issues and Challenges

The project was created to address Central Florida's real-world issues and challenges.

Traffic-Related Crashes and Fatalities

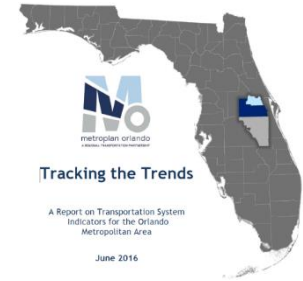
Central Florida experiences a high level of traffic-related crashes. Orlando consistently ranks in the top four cities in Florida for crashes in all focus areas of Florida's Strategic Highway Safety Program, including serious injuries and fatalities and pedestrian or bicycle related crashes. The Orlando metropolitan area has ranked in the top three dangerous locations for pedestrians and bicyclists over the past several years, with more than 600 related deaths since 2005 ([Dangerous by Design](#)). State and local visions and action plans encourage action to improve safety and reduce traffic-related crashes and fatalities across the region. A recent study completed by Orange County focused on pedestrian safety along SR 434 within the project's deployment area, and coordination has occurred to implement safety improvement recommendations in this area. UCF has also prioritized innovative safety research and has become a leading university in this field. PedSafe has a particular focus on technology deployments to improve pedestrian safety, and the CV deployments within GreenWay include vehicle safety applications such as advanced queue warning and curve warning systems.



Traffic Congestion and Travel Time Reliability

Orlando is one of the top 40 congested areas in the nation, causing delays approximately three hours each day and accounting for nearly 30 percent of the area's total VMT ([MetroPlan Orlando's Tracking the Trends Report](#)). Travel time index has been above 1.2 the past several years, ranking Orlando in the top 35 cities for travel time reliability

issues. As a result, **excess fuel emissions continue to increase**, having an adverse impact on air quality and the environment. GreenWay technology deployment is designed to alleviate congestion, improve travel time reliability, and reduce excess fuel emissions through integrated corridor management and adaptive signal control. GreenWay will help alleviate recurring congestion in the normal peak hours, but it will also provide the adaptability needed to manage fluctuating demand and diversion traffic during nonrecurring congestion resulting from incidents and/or weather events. UCF is currently working with FDOT in developing Integrated ATM strategies for Central Florida.



Access to Transportation Alternatives

Orlando struggles to provide access to multi-modal transportation options, particularly for the underserved populations. Land use patterns and transit service headways tend to deemphasize transit as a preferred option in Central Florida. However, GreenWay deployments will upgrade corridors with transit signal priority, improving bus travel times and on-schedule performance. The integration of SmartCommunity with SunStore will also provide travelers with real-time information on transit options in order to make informed trip-making decisions. SmartCommunity will also include a ridesharing program allowing travelers in the same area to share information and coordinate trips to locations such as employment centers, education facilities, the grocery store, and medical treatment centers. The program will also introduce autonomous shuttles into the shuttle fleets between UCF's main campus and the surrounding residential areas. Table 1 describes the technologies included within each program and how it aligns with the stated ATCMTD focus areas.

Table 1: Alignment to ATCMTD Focus Areas

ATCMTD Focus Areas	Existing Program	Proposed Programs		
	SunStore	PedSafe	GreenWay	SmartCommunity
Multimodal Integrated Corridor Management (ICM)				
CV Tech at Intersections and Ped Crossings				
Freight Community System				
Tech to Support Connected Communities				
Infrastructure Assessment				
Rural Technology Deployments				



- Denotes where the proposed programs align with the stated ATCMTD Focus Areas

2.5 Services and Systems

FDOT has invested heavily in services and systems within Central Florida that form the backbone of the grant application, allowing us to leverage previous and future investments for an anticipated 440 percent match on the investment by the United States Department of Transportation (USDOT). The following proposed programs will build upon the existing and planned infrastructure as outlined below.

1. **PedSafe** is an innovative pedestrian and bicycle collision avoidance system currently being designed by the FDOT. PedSafe will connect advanced signal controller capability, use of Connected Vehicle (CV) technologies, and existing communication capabilities to reduce the occurrence of pedestrian and bicycle crashes. The application will be easily transferable throughout the country.
2. **GreenWay** is an FDOT project to connect Advance Sensor Technology, Conditional Transit Signal Priority (TSP), Adaptive Deployment Traffic Signal Interface with Track Positive Train Control (SunRail), and Smart Parking technology with Signal Performance Metrics (SPM), Expand Integrated Corridor Management (ICM), and Signal Control Analytics and Visualization. GreenWay is designed to better utilize the multimodal transportation system by actively managing over 1,000 traffic signals within the region. Data managed in the proposed SunStore will be connected with GreenWay to support Real Time Operation through a regional Decision Support System (DSS). This connection will allow strategic planning for special events to include consideration of all modes and users and will provide a unified approach to system operations and management.
3. **SmartCommunity** is an integrated program that connects people to the places they need to go and the services they need to receive.

Through a Mobility on Demand (MoD) framework, SmartCommunity leverages existing ridesharing and car sharing products to offer residents access to cars when required.

SmartCommunity's trip planning application, Transit AVL, and Transit Kiosks will provide real-time multimodal travel information to integrate trip planning with modal choice options. The program will also introduce autonomous shuttles into the shuttle fleets between UCF's main campus and the surrounding residential areas.

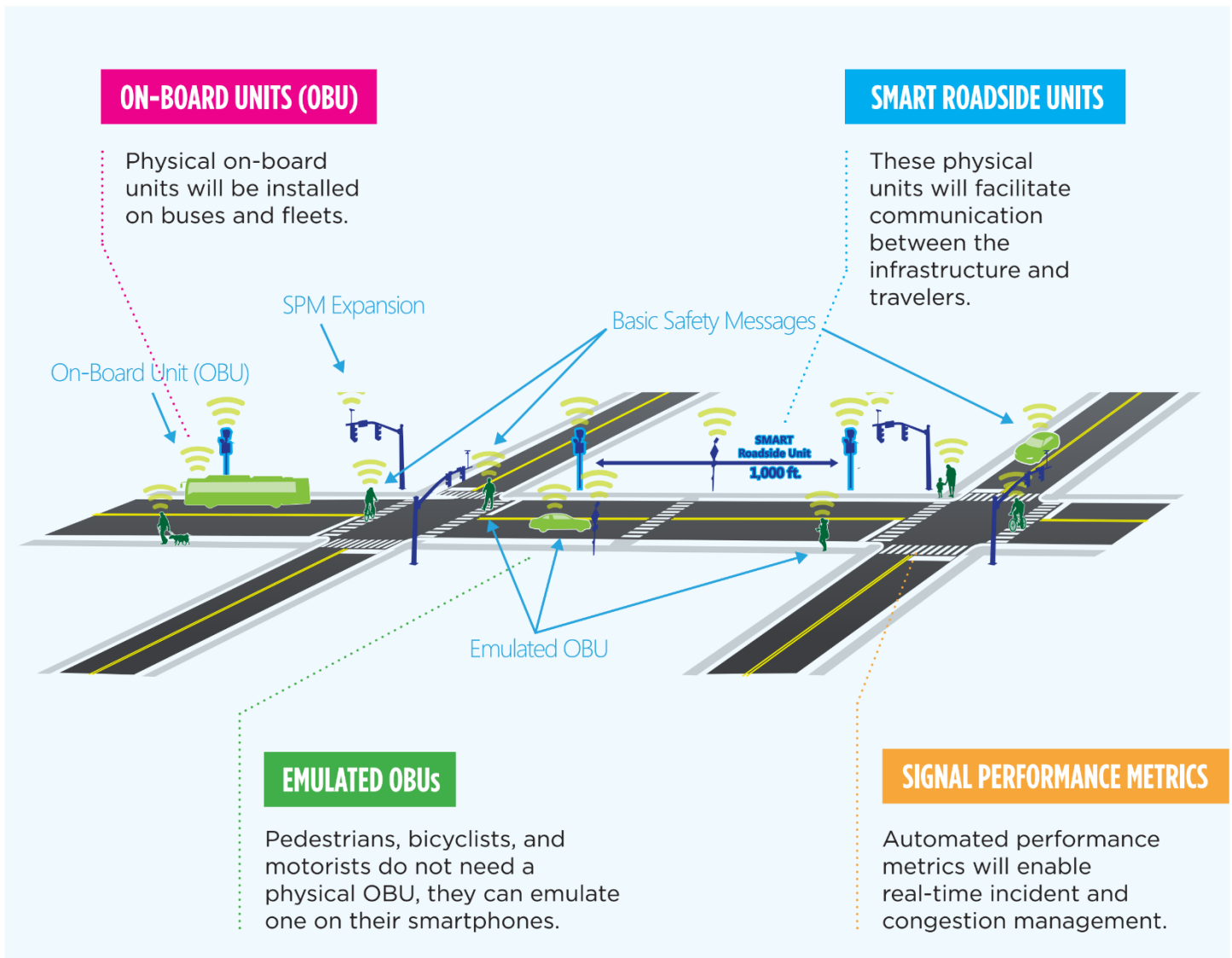
4. **SunStore** is an ongoing FDOT initiative to connect and integrate the many data sources created and utilized by the FDOT. SunStore includes Master Data Management, Data Fusion, and Sensor Fusion for increased data quality. SunStore interfaces with Florida's Data Integration and Video Aggregation System to make transportation data available to universities, research institutions, and businesses to encourage and support innovation. Data in SunStore will be used to support the PedSafe, GreenWay, and SmartCommunity deployments.

The East Orlando geographic area was strategically chosen to be part of a Smart City vision for the Central Florida Region. The area is anchored by the University of Central Florida and is part of a CV environment that includes an existing FDOT CV test bed to the north and a Central Florida Expressway CV demonstration project to the south. The area is ideal for congestion management technology due to the existing robust communication and multimodal network, a population of people comfortable and equipped with technology (such as university students), and a transit, bicycle, and walking dependent population. This area is truly Connection Ready!



PedSafe

Introduction: PedSafe is an innovative pedestrian and bicycle collision avoidance system that uses connected vehicle (CV) and existing technologies to minimize or eliminate pedestrian and bicycle crashes.



According to FDOT D5's 2016 Bike and Ped Count Program, four out of every five bicyclists ride on the sidewalks and use the crosswalks.

PedSafe Program Description: PedSafe will utilize SunGuide, the proven statewide Advanced Traffic Management System as the software backbone and will deliver audible Basic Safety Messages to vehicles, bicycles and pedestrians. Pedestrian detection technology has been coordinated with three providers providing a choice of hardware and software that perform presence detection of pedestrian and/or other objects as well as interface with the controller for signal phasing and timing data. PedSafe uses both DSRC and standard high-speed communications (3G and 4G) to communicate with vehicles, bicycles and pedestrians using the CV’s on-board unit (OBU) or an OBU emulator such as a smartphone. Roadside units are placed to facilitate instantaneous infrastructure to vehicle, bicycle and pedestrian communications. Existing fiber optic communications will be leveraged to communicate with the central SunGuide ATMS system and the signal system.

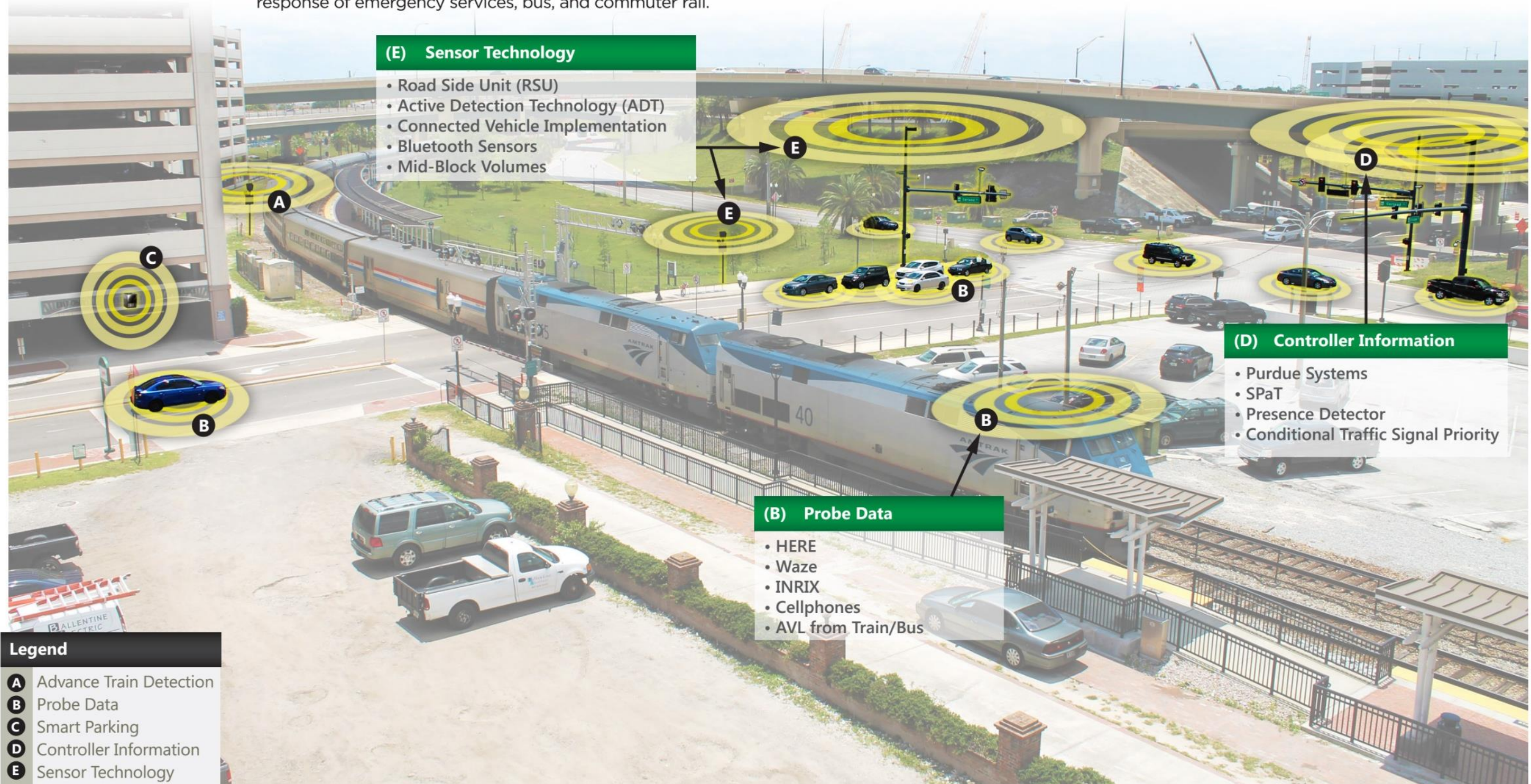
Innovation	Implementability
SmartPhone software as OBU emulator for direct communication and location information with pedestrians and bicycles.	The CV component will mirror Tampa Hillsborough Expressway Authority’s CV Testbed Initiative and Central Florida CV Testbed.
Data exchange for private incentive to join in OBU software application development.	All identified locations have existing communications infrastructure in place, currently maintained and operated by the region.
Communicates with CV’s OBU on instrumented vehicles.	SunGuide, the proven statewide ATMS system, is the software backbone.
Communicates infrastructure information to vehicles, bicycles and pedestrians.	Addresses vehicles, bicycles and pedestrians that do not have OBUs, by emulating the OBU using a smartphone app.
Supplementary pedestrian and bicycle collision avoidance system at critical intersections.	Delivers audible Basic Safety Messages to vehicles, bicycles and pedestrians.
Incident and congestion management features within the PedSafe area.	US 192 and International Drive are USDOT established CV test beds.
	Key partners, such as MetroPlan Orlando and UCF, share the same vision of a fatality-free transportation system.

Scalability/Portability	Measures of Success
Smartphone application software will be public property and the State would seek participation to support costs and data sharing by 3rd parties, engaging private industry. Minimizing the need for hardware instrumentation, transferability is increased.	Overall reduction in pedestrian and bicycle crashes.
Probe information is obtained without extensive instrumentation using the emulated OBU, increasing transportability.	Overall reduction in pedestrian and bicycle fatalities.
All data will be in a standard format to facilitate data sharing.	Overall OBU software applications saturation among users.
Pedestrian and bicyclist safety is not a challenge unique to Central Florida. FDOT Central Office is looking to implement new crash-reduction techniques statewide.	Overall number of confirmed alerts issued.
	Number of partnerships with private industry.
	Number of PedSafe projects programmed by MPOs.
	Feedback from user surveys.



GreenWay

Introduction: The proposed GreenWay program incorporates Active Detection Technology (ADT) and elements of Orlando's Smart City initiative to improve the multimodal movement of people and goods. Available information from traffic signals will be fused, normalized and then processed by deterministic or stochastic models. Real-time results will then be presented in a consumable format to Signal Timing Engineers to use in actively managing traffic signal systems. Alerts will also be provided connecting the response of emergency services, bus, and commuter rail.



(E) Sensor Technology

- Road Side Unit (RSU)
- Active Detection Technology (ADT)
- Connected Vehicle Implementation
- Bluetooth Sensors
- Mid-Block Volumes

(D) Controller Information

- Purdue Systems
- SPaT
- Presence Detector
- Conditional Traffic Signal Priority

(B) Probe Data

- HERE
- Waze
- INRIX
- Cellphones
- AVL from Train/Bus

Legend

- A** Advance Train Detection
- B** Probe Data
- C** Smart Parking
- D** Controller Information
- E** Sensor Technology

GreenWay Program Description: The GreenWay Program is designed **to improve safety, increase reliability, and reduce congestion** by expanding existing systems and implementing new signal technologies.

Innovation	Implementability
<p>Signal performance metrics (SPM) Expansion: Purdue software will be expanded from 130 existing locations to more than 1,000 locations throughout Central Florida.</p> <ul style="list-style-type: none"> • Use of adapters will help avoid change of existing controllers, eliminate incompatibility, and produce cost and time savings. 	<p>Stakeholders buy-in secured.</p> <p>Statewide approach to implementation in effect:</p> <ul style="list-style-type: none"> • Data Fusion and normalization software under design. • Advanced Intersection Detectors being installed. • SPM already running. • Interfaces being documented. • Lessons learned from Dallas and San Diego incorporated.
<p>Activate traffic signal flush plans prior to train arrival at railroad crossings using the Positive Train Control (PTC) to provide train type (duration of closure) and prediction of closure.</p>	<p>Positive Train Control (PTC) and traffic signal system interaction via proven technology.</p>
<p>Real-time data collection for traffic management from advanced detection technology expansion at 33 existing signals.</p>	<p>V2I/V2V technology On Board Units (OBUs) will be placed on transit vehicles to obtain probe vehicle information.</p>
<p>Expansion of existing Adaptive Signal Systems to actively control signals on major state roadways.</p>	
<p>Notification of parking availability in public parking garages to reduce circulation.</p>	

Scalability/Portability	Measures of Success
<p>TSM&O Strategic Plan will deploy integrated corridor management (ICM) statewide.</p>	<p>Travel time reliability.</p>
<p>Publicly held intellectual property rights will permit streamlined distribution.</p>	<p>Increased intersection throughput.</p>
<p>Varied data sources allows partial implementation in many locations.</p>	<p>Reduction in crashes and system delay.</p>
<p>Positive Train Control (PTC) nationwide requirement and interaction with signal systems present all over US.</p>	<p>Reduction in vehicle/train crashes.</p>
	<p>On Time Arrival Percentage of buses on SunRail connecting routes.</p>
	<p>Reduction in cost of congestion.</p>
	<p>Reduction in environmental system emissions.</p>

GreenWay

Active Corridor Systems Management

GreenWay Program Support

The GreenWay program will be supported by the expansion of active detection technology in Central Florida. GreenWay includes the framework for data collection in support of regionally coordinated responses to multi-modal network operations.



Program Partners

- FDOT Districts
- MPOs & TPOs
- Cities & Counties
- Research Institutions
- Private Industry
- Law Enforcement



Data Collection

Signal Performance Metrics (SPM), and deployment of phases of Active Arterial Management infrastructure (CCTV/s, Bluetooth, etc.).



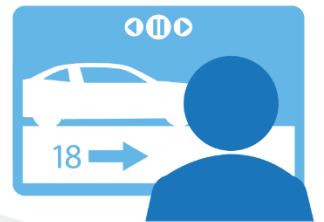
Data Management

FDOT's investments in SunStore will be leveraged by GreenWay to support real-time operations:

- Via a regional decision support system.
- Strategic planning for events to provide unified system management.

Regional Operations

Arterial operations personnel to work in collaboration with our freeway personnel at the Regional Traffic Management Center (RTMC), providing an integrated approach to operations throughout the region.



Regionally Coordinated Responses

Our region is currently defining a Decision Support System (DSS) to automatically implement or provide suggestions to our regional partners for traffic management plans in response to congestion or incidents based on regional data received.



SmartCommunity

Introduction: The proposed SmartCommunity program is an integrated solution to connect people to the places and services that they need.

CONNECTED INFRASTRUCTURE



QUEUE AND CURVE WARNINGS:
Roadside units will alert drivers of upcoming queues and curves.



PARKING AVAILABILITY:
Parking sensors will communicate real-time parking availability to travelers.



AUTOMATED SHUTTLES:
The frequency and span of service of transit can be greatly enhanced with automated shuttles.



TRANSIT SIGNAL PRIORITY:
Connections between transit vehicles and signals will lead to better reliability.

EFFICIENT AND RELIABLE TRANSIT

SUSTAINABLE ENERGY



SOLAR AND RENEWABLE SOURCES:
UCF is already advancing a 12 MW solar power plant.



SELF-POWERED GARAGES:
East Orlando's garages of the future will power themselves through solar arrays on their top deck.



CARSHARE AND RIDEHAIL:
Under a MoD framework, travelers will have access to cars without having to own them.

MOBILITY ON DEMAND (MOD)



MOBILITY KIOSKS:
Connected and tablet-enabled kiosks will provide access to MoD even without a smartphone.

SmartCommunity Program Description: The SmartCommunity proposed program integrates CAV technology, connected infrastructure, renewable energy, and a Mobility on Demand framework to alleviate the day-to-day challenges facing the East Orlando community. In addition to the program’s major components, the SmartCommunity program will leverage elements from the PedSafe and GreenWay projects. The result will be a unified, seamless interface for users and developers. The program will tie in closely to FDOT’s existing SunStore to archive, manage, and serve data to our partners.

Innovation	Implementability
CV technology, including queue and curve warnings, will lead to enhanced safety.	All identified locations have existing communications infrastructure in place, currently maintained and operated by the region.
Automated shuttles will efficiently connect students and workers with their school and work locations.	
Increasing the reliability of transit through transit signal priority, connection protection, and MoD access.	Stakeholder buy-in has been secured.
Investing in solar and renewable energy to reduce environmental impact and utility costs.	Demonstration efforts with Navya, an automated transit manufacturer, have already been done.
Increased mode choice through a MoD framework that combines: <ul style="list-style-type: none"> • Carshare (CV and private), • Ridehail (CV and private), • Transit systems, • Parking, and • Travel time estimates with route and mode choice 	
Parking management through: <ul style="list-style-type: none"> • In-pavement sensors • CCTV • Automated vehicle -based solution 	A proof of concept for real-time parking management is underway in downtown Orlando.

Scalability	Measures of Success
CV Adapters will be based on industry standards (NTCIP).	Reduction in rear-end and lane departure crashes.
New adapters do not require changing architecture of the system.	Percentage Zero or Car-Light Households.
MoD framework to be built to accept a variety of mobility options.	Non-SOV mode share.
The under-development Creative Village in downtown Orlando is a natural next step for scaling the programs.	Percentage of energy consumed that is generated by renewable sources.
The under-development Creative Village in downtown Orlando is a natural next step for scaling the programs.	Percentage Zero or Car-Light Households.
	Number of third party mobility partners.

2.6 Operations & Maintenance

The Central Florida Region has been operating and maintaining ITS, signal and technology related equipment since the 1990s. This has provided the region with over two decades of operations and maintenance experience and demonstrated the commitment to not only building capital improvements, but also operating and maintaining them over time. Central Florida has spent over \$3 million on management and operations over the past two years and over \$6 million in maintenance.

A quality cost estimate - including the capital costs and the ongoing operations and maintenance – is essential to ensure a successful deployment through the full project life. FDOT has engaged Siemens Corporation as a resource to in vetting the quality of the cost estimate for this deployment. To make way for the additional operational cost of GreenWay, the Department first funded operations before funding any capital projects. An additional \$2.6 million is already allocated per year for future GreenWay operations. Maintenance allocations are based on deployment size and activity within the state, meaning budgets will grow with the deployment of sensors. Licensing and TMC costs have been projected and will be covered by existing funding levels. The region is committed to continued operations and maintenance funding of these improvements long after the grant funding is applied.

The region is in the final stages of updating the regional ITS Master Plan to define the future planning of the region as related to TSM&O improvements and regional interaction. The ITS Master Plan builds on the long standing regional TSM&O Consortium, traditional ITS improvements, and advanced features identified within this application.

2.7 Barriers to Deployment

No major regulatory or legislative challenges are expected for his deployment. The legislative environment in Florida is very supportive of connected and autonomous vehicle technology. The state of Florida is ready for CV and AV testing on public roadways thanks to Florida House Bill 7027. In Florida, any person who possesses a valid driver's license may operate an autonomous vehicle in autonomous mode on the roads in the state. The House Bill also allows the use of truck platooning and requires FDOT to conduct a study or pilot projects for autonomous goods movement.

The [Central Florida Automated Vehicle Partners](#), consisting of FDOT D5, City of Orlando, UCF and other regional partners, was recently designated by the USDOT as one of ten nationwide autonomous vehicle proving grounds. UCF is also part of the USDOT's University Transportation Centers program—and it is using its extensive resources in simulation and modeling to become a simulation hub for technology testing, improvements, and human factors. The City of Orlando has joined the Smart Cities Council, a nationwide forum for cities to experiment and share technology lessons with the goal of improving urban livability, workability and sustainability.

As with any cutting-edge project, some institutional and technological challenges are to be expected, including:

- Compatibility with a variety of legacy systems;
- Rapid advances in technology mean that specifications are likely to evolve during the life of the project;
- Maintaining a schedule that is both ambitious and attainable; and
- Development of a long-term operations and maintenance plan that is acceptable to all partners;

The FDOT D5 TSM&O Consortium, an interagency group dedicated to all things ITS and TSM&O, will

be a critical part of overcoming coordination challenges. The group has flourished for over a decade and continues to meet regularly to discuss important topics. Given the longevity and success of the forum, it will be used to keep all the partner agencies informed about the projects from planning to system integration.

2.8 Quantifiable System Performance Improvement

FDOT purchases HERE high-resolution travel time data on a continuous basis. These data are then augmented with data from FDOT's sensors and other data sources, such as WAZE, to obtain high-quality travel time and volume data. FDOT archives this data and uses it to monitor regional roadway speeds before, during, and after implementation of the proposed programs to determine quantifiable system benefits for mobility in virtually real-time.

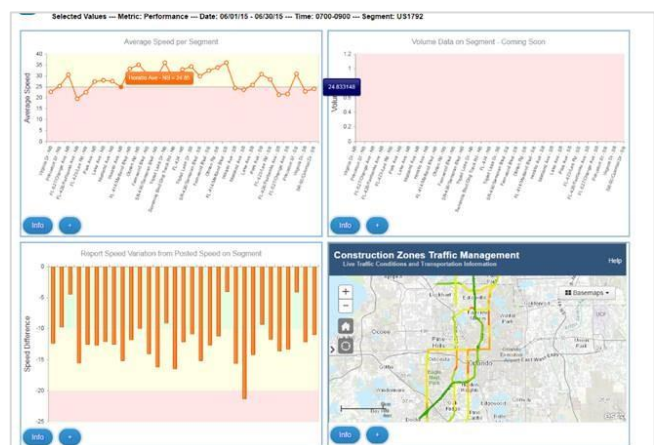
In addition to segment performance data, the GreenWay program will result in high-resolution signal performance data that will help monitor how the program improves traffic flow. For example, using these data it will be possible to determine whether the percentage of vehicles arriving on green increased as a result of optimized progression through a corridor. Similarly, advanced detector data coupled with signal and phasing information will enable actual delay calculations--rather than relying on time-consuming and potentially less accurate models. This will make it easy to calculate the vehicle- or person-hours of recurring and non-recurring delay saved by adaptive signal optimization.

To assess and communicate transit performance, the SmartCommunity program will embrace open data standards (such as [GTFS-RT](#)). These standards are well documented, portable, and widely supported by third-party developers.

Central Florida's arterial operations contract is in the process of designing additional dashboards to show operational performance. The dashboards include the following parameters:

- Customer complaint logs
- Signal IV crash statistics
- Construction activity logging
- Number of new plans generated
- Number of new plans used
- Volume data

Screenshots of the dashboards are presented below.



In short, FDOT has the tools and knowledge in place to commit to a before-after evaluation program that quantifies the system performance improvement of this deployment.

2.9 Quantifiable Safety, Mobility, and Environmental Benefit Projections

The proposed deployment will have quantifiable benefits to safety (reduced crashes), mobility (reduced congestion and improved travel time reliability), and environmental benefits (fuel emissions savings). PedSafe is expected to directly reduce pedestrian crashes through safer crossings, better pedestrian-scale lighting, and CV technology. A seven percent reduction in pedestrian crashes is expected as CV saturation rates increase (VRUITS). GreenWay is expected to reduce recurring congestion on arterial roadways by up to 20 percent, improving travel time reliability by up to 10 percent. Transit on-schedule performance is expected to increase by up to 20 percent as a result of transit signal priority implementation. The safety and mobility benefits will improve fuel efficiency, reducing excess fuel consumption by up to 10 percent.

FDOT commits to an evaluation program that quantifies the safety, mobility, and environmental benefits of this deployment through before-and-after studies. Part of that commitment is the emphasis on automated data collection through the proposed programs, including the deployment of signal performance metrics in GreenWay and collection of safety data from PedSafe.

ATCMTD goal met:



Demonstration, quantification, and evaluation of the impact of these advanced technologies, strategies, and applications towards improved safety, efficiency, and sustainable movement of people and goods: The FDOT is committed to evaluation of the project to quantify the impact of technology deployment. In addition, the project is committed to funding research that will explore additional strategies to optimize the deployment's effectiveness and provide recommendations for future deployments in other areas of Orlando and Florida.

2.10 Vision, Goals, and Objectives

VISION

For East Orlando’s workers, residents, and students to be connected to their community and to the broader region. For UCF and the Central Florida Research Park to be more than just users of new technology, and instead actively create and maintain it. To have the engine for transportation and Smart Cities innovation for the rest of the country right here in Central Florida.

GOALS	OBJECTIVES
Increase connectivity to the region for all modes of travel	Use technology to reduce the effects of recurring and nonrecurring congestion
	Provide Mobility on Demand options to disadvantaged communities by expanding access to local transit and transportation options
	Increase mobility options by alternate mode choice such as ridesharing, car sharing, bicycle sharing, and transit availability
	Provide real time travel information to the public for route choice and trip planning
Improve safety for all modes of travel	Leverage technology to increase awareness between drivers and pedestrians to reduce crashes
	Decrease number of vehicle crashes
Promote environmental stewardship	Use technology and strategic planning to decrease delay and vehicle hours traveled (VHT)
	Use Green technology when available to provide energy saving resources such as CV / AV technologies, EV parking, and green building techniques for parking garages
Promote social justice	Remove mobility barriers for individuals in disadvantaged communities
	Leverage technology to provide access to modal options
	Provide seamless route transfers for transit riders

ATCMTD goal met:



Reproducibility of successful systems and services for technology and knowledge transfer to other locations facing similar challenges:

Lessons learned in the East Orlando area **need** to be quickly transferred to the upcoming Creative Village in downtown Orlando. The rest of downtown, the Orlando metropolitan region, and the entire country will follow.

2.11 Public and Private Partnership Opportunities

In an effort to make data available to its citizens to accomplish a connected city vision, the Central Florida area is launching an open source data platform via a web mapping portal that allows access to data for analysis and reporting within Central Florida. This platform is the first of its kind for the region and will also leverage other data made available from state sources. This platform will include further development utilizing citizen feedback. This open data source will support the existing Smart City infrastructure and the proposed GreenWay and PedSafe program elements.

FDOT is also working closely with private industry to make important progress on CV technology. FDOT is an active participant in the Tampa, FL CV Pilot Deployment that will install CV on-board units on the entire Hillsborough Area Regional Transit (HART) streetcar fleet and on approximately 1,600 privately-owned vehicles. The CV applications are designed to improve mobility and

safety. Lessons learned during this pilot will be valuable for collaboration with industry during the deployment of PedSafe, GreenWay, and SmartCommunity.

The private sector will be leveraged for the development of third-party applications such as real-time traveler information mobile apps. Through decades of experience working with private partners, FDOT has learned that the interest of the state and its residents is better served by using interoperable (and ideally open-source) data, standards, and protocols. That way, FDOT is not locked to any one vendor or developer to advance its goal for public and private partnerships.

Opportunities for data sharing and exchange will be explored with these third-party partnerships in an effort to derive a holistic picture of the transportation network, safety, and operations status at any given time. FDOT has already started to collaborate with the tech community to develop a vision for delivering data and services to Central Florida's residents and visitors.

FDOT Tech Industry Partners



(and others)

2.12 Leverage Existing Technology Investments

The Central Florida region is *Connection Ready*. Over the last twenty years, FDOT has built an extensive Intelligent Transport System (ITS) infrastructure that enables fast deployment of advanced technologies. This infrastructure includes more than 1,000 miles of fiber, more than 800 CCTV cameras, and a new regional transportation management center.

FDOT’s partners have also made important strides through strategic investments. For example, MetroPlan Orlando has just completed its ITS Master Plan, which will guide the deployment of devices, services, and technologies to improve the region’s transportation system.

UCF has taken initial steps to reduce its environmental footprint—including the installation of solar arrays to power its garages and charge electric vehicles.

All of these efforts are complete and ready to be leveraged as part of the PedSafe, GreenWay, and SmartCommunity programs.

FDOT

- Integrated Corridor Management Systems Engineering Analysis Documentation (view through [this](#) link)
- Regional ITS Architecture
- SunStore

MetroPlan Orlando

- ITS Master Plan
- Performance-based signal retiming

UCF

- Solar-powered hot water system
- Solar-powered vehicle charging station
- Wall-mounted solar awning on Engineering I building
- Garage B 108 kW Array

Orange County

- Adaptive signal system on four state roadways
- Greater Orlando Transit Signal Priority Equipment

City of Orlando

- Smart Parking program



2.13 Schedule

A schedule for conducting the technology deployments and for completion of all proposed activities is provided below. The planning and design is already completed or underway for many of the project components, and initial deployments for SunStore are already completed. This project is *Connection Ready*. In addition to the technology deployment, the project is committed to project evaluation and funding research to optimize the effectiveness of this deployment and future deployments planned in Orlando’s Central Business District and throughout Florida.

Project Component/Task	2016		2017				2018				2019				2020				2021			
	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
GreenWay																						
Planning																						
Design																						
Build/Deploy																						
Operations & Maintenance																						
PedSafe																						
Planning																						
Design																						
Build/Deploy																						
Operations & Maintenance																						
SmartCommunity																						
Planning																						
Design																						
Build/Deploy																						
Operations & Maintenance																						
SunStore (Existing Program)																						
Planning																						
Design																						
Build/Deploy																						
Maintenance & Enhancement																						
Project Reporting																						
Project Evaluation																						
Research & Optimization																						

* Annual Review for 2 years

2.14 USDOT ITS Program Leverage

The USDOT's Strategic Plan for ITS research and priorities for the second half of the decade focuses on six categories:

1. CVs,
2. Automation,
3. Emerging capabilities,
4. Enterprise data,
5. Interoperability, and
6. Accelerating deployment

The proposed programs cover all USDOT areas of interest.

PedSafe will build off existing V2X technology, leveraging CV research and applying in a real-world setting to improve pedestrian and bicyclist safety.

GreenWay's approach to overhauling the way traffic signals work relies on **CV** technology, but is best characterized by a focus on **automation** and **interoperability**. The use of adapters will avoid large upfront costs in changing signal controllers, eliminate incompatibility issues across different signal controller manufacturers, and result in cost and time savings for FDOT. Florida's Approved Products List process will be used for hardware acquisition to ensure effective connectivity among devices.



SmartCommunity will deploy **emerging capabilities**, including technologies included in the Mobility on Demand, Smart Cities, and autonomous vehicle efforts.

All the proposed programs will rely on FDOT's existing SunStore for housing, sharing, analyzing, transporting, and applying **enterprise data** for improved safety and mobility across all modes of travel. This will help **accelerate deployment** of the proposed programs.

The proposal also builds on past USDOT investments such as the USDOT Signal Performance Metrics and the Integrated Corridor Management deployments in Dallas and San Diego.



3 STAFFING DESCRIPTION

The program organizational chart is included below. We have organized a management team of highly qualified individuals that have a history working together to successfully deliver innovative transportation solutions. Jeremy Dilmore, PE will lead the effort as **Program Manager**. Mr. Dilmore is extremely well qualified for this role, having extensive experience with technology deployments through his twelve-year career at FDOT. Mr. Dilmore’s experience ranges from early-stage architecture building to making the connections in the field.

Mr. Dilmore will be supervised by **Principals-In-Charge** capable of overseeing the production and ongoing support of each aspect of the program, and assisted by **Project Managers** that have the technological expertise and support personnel to successfully accomplish the deployment and support it through the period of performance. The Program Manager, Principals-in-Charge, and Project Managers make up the program’s Key Staff, shown in Table 2. Design and Build support for the PedSafe and SmartCommunity programs will be obtained through a competitive acquisition process, allowing FDOT to select the most qualified personnel to support the program. The same process was used and will continue to be used for the selection of support for the GreenWay program. The team is committed to obtaining the best staff for each component of the programs. Resumes for Key Staff are provided in Appendix A.

Table 2: Key Staff

Name	Title
Jeremy Dilmore, PE	FDOT District 5 TSM&O Engineer
Jim Stroz, PE	FDOT District 5 Traffic Operations Engineer
Rick Morrow, PE	FDOT District 5 Director of Transportation Development
Eric Hill	MetroPlan Orlando TSM&O Director
Mohamed Abdel-Aty, PhD, PE	Chair, UCF Department of Civil, Environmental and Construction Engineering
Fred Heery, Sr., PE	FDOT State TSM&O Program
Raj Ponnaluri, PhD, PE, PTOE	FDOT State Arterial Management System Engineer
Joe Santos, PE	FDOT State Safety Engineer
Charles Ramdatt, PE, PTOE, AICP	City of Orlando Director of Special Projects
Derek Vollmer, PE	FDOT SunGuide Software Project Manager
Russell Allen, PE	FDOT State ITS Program Development Engineer
Jay William, PE	FDOT District 5 Arterial Engineer
Anthony Nosse, PE	FDOT District 5 Safety Engineer
Tushar Patel	FDOT District 5 TSM&O Production Manager

Program Manager

Jeremy Dilmore

Steering Committee

FDOT
Jim Stroz
Rick Morrow

MetroPlan Orlando TSM&O Committee
Eric Hill

University of Central Florida
Mohamed Abdel-Aty

PIC - Principal-in-Charge
PM - Project Manager

PedSafe

PIC	Joe Santos
PM	Tony Nosse
Support	Under Selection

GreenWay

PIC	Fred Heery, Raj Ponnaluri
PM	Jay William
Support	Kevin Miller, Dale Cody

SmartCommunity

PIC	Eric Hill, Charles Ramdatt
PM	Jeremy Dilmore
Support	Under Selection

SunStore

PIC	Derek Vollmer, Russel Allen
PM	Tushar Patel
Support	Clay Packard, Keith Smith

Appendix A: Resumes of Key Staff

Jeremy Dilmore, PE

District 5 TSM&O Engineer-Freeways

Education

BSME, University of Central
Florida
MSCE, University of Central
Florida

Registrations/ Certifications

Professional Engineer, FL
#67510

Publications

Abdel-Aty M., Dilmore J.
and Hsia L. (2006) Applying
Variable Speed Limits and
the Potential for Crash
Migration, *Journal of the
Transportation Research
Board*, No. 1953, pp. 21-30.

Abdel-Aty M., Dilmore J.
and Dhindsa A. (2006)
Evaluation of Variable
Speed Limits for Real-Time
Freeway Safety
Improvement, *Accident
Analysis and Prevention*,
Elsevier, Volume 38, issue 2,
pp. 335-345.

Abdel-Aty M., Dos Santos
C., Gayah V., Dhindsa A.
and Dilmore J. (2006) The
Potential of ITS Applications
to Reduce Crash Potential
on Urban Freeways using
Micro-Simulation,
Proceedings of the
International Symposium of
Transport Simulation 2006
(ISTS06), Lausanne, Sep
2006

Mr. Dilmore has more than 11 years' experience working at FDOT District 5. He is currently the District's TSM&O Engineer-Freeways. In this position he oversees the development, operations, and maintenance of District 5 Intelligent Transportation System. He also serves as the Operations Lead for the Ultimate I-4 and Beyond Ultimate I-4 project. He has previously overseen the District Minor Design Program. He has a background in simulation modeling based on graduate work at the University of Central Florida.

11 years of professional experience

Mr. Dilmore has more than 11 years' experience working at FDOT District 5. He is currently the District's TSM&O Engineer-Freeways. In this position he oversees the development, operations, and maintenance of District 5 Intelligent Transportation System. He also serves as the Operations Lead for the Ultimate I-4 and Beyond Ultimate I-4 project. He has previously overseen the District Minor Design Program. He has a background in simulation modeling based on graduate work at the University of Central Florida.

Ultimate I-4

The project is a 21 mile reconstruction of I-4 through the Downtown Orlando. It includes the application of managed lanes and ramp meters in addition to maintaining the existing ITS, including service patrol, DMS, MVDS, and CCTV. The project is a PPP and is currently in acquisition.

Served as the Department's Operations Lead during development overseeing the development of the simulation modeling including validation, calibration, and use, development of the traffic and revenue report

Currently serves as the ITS Lead overseeing systems engineering, service patrol, ITS operations, ITS design, and ITS inspection.

Beyond Ultimate I-4

The project is over 40 miles of reconstruction of I-4 through the attractions area and residential areas east and west of Downtown Orlando. It includes the application of managed lanes in addition to maintaining the existing ITS, including service patrol, DMS, MVDS, and CCTV. The project is currently in PD&E. Serves as the Department's Operations Lead overseeing the development of design traffic, development of the simulation modeling including validation, calibration, and use.

Daytona Area Smart Highways III

The project included 90 miles of mainline Interstate ITS including DMS, MVDS, and CCTV, along with ADMS and CCTV along detour routes.

Served as the Department's Project Manager overseeing the final stages of construction, integration, and final acceptance

Daytona Area Smart Highways IV

The project included 25 miles of mainline Interstate ITS including DMS, MVDS, and CCTV. Served as the Department's Project Manager developed the ConOps, SEMP,

Jeremy Dilmore, PE, District 5 TSM&O Engineer-Freeways

RTVM, and RFP; reviewed plans, oversaw all of construction, integration, and final acceptance

Polk County Expansion

The project included 4.5 miles of mainline Interstate ITS including DMS, MVDS, and CCTV. Served as the Department's Project Manager developed the ConOps, SEMP, RTVM, and RFP; reviewed plans

James S. Stroz, Jr., PE

District 5 Traffic Operations Engineer

Education

BSCPE, University of Central
Florida

Registrations/ Certifications

Professional Engineer, FL
#56984

Mr. Stroz has more than 10 years of experience working at FDOT District 5. He is currently the District's TSM&O Engineer-Arterials. In this position he oversees the design, operations, and maintenance of traffic signals and other traffic control devices along the arterial roadway system. He has previously worked 10 years for a consultant firm, where his responsibilities included traffic engineering design, safety studies and operational studies.

20 years of professional experience

District 5 Active Arterial Management - Operations

The project includes 300 traffic signals throughout the Orlando metropolitan area, which are located in both Orange and Seminole Counties. The project includes monitoring of a dozen significant arterial corridors surrounding Interstate 4, and will help coordinate and implement specific timing plans to address recurring and non-recurring congestion. The monitoring is performed in the Regional Traffic Management Center and is staffed 365 days a year. Mr. Stroz serves as the Department's Operations Lead overseeing the management and operation of the project.

Regional Traffic Management Center – Operations

At the RTMC, the staff performs real-time monitoring of congestion and incident management, assists with detour plans, and disseminates information to the motoring public. The RTMC monitors nearly 400 miles of mainline Interstate through the use of 180 DMS, 360 detectors, and over 500 CCTV. The RTMC is staffed 24 hours per day, 365 days per year. Mr. Stroz serves as the Department's Operations Lead overseeing the management and operation of the RTMC.

Ultimate I-4

The project is a 21 mile reconstruction of I-4 through the Downtown Orlando. It includes the application of managed lanes and ramp meters in addition to maintaining the existing ITS, including service patrol, DMS, MVDS, and CCTV. The project is a PPP and is currently in acquisition.

Mr. Stroz currently serves as the Department's Signalization Design Lead Reviewer.

Richard B. Morrow, PE

Director of Transportation Development

Education

BS Civil Engineering
University of Central Florida
1995

23 years of professional experience

FDOT District Traffic Operations Engineer, DeLand, FL

Manage the day-to-day operations of District Five's Traffic Operations group. This group of multiple teams consists of professional engineers, engineer interns, technical writers, and designers. Responsibilities include establishing regulations for traffic control devices, speed limits, turn prohibitions, etc. throughout the nine county district. Duties also include supervision of the district's Intelligent Transportation System and the district Safety, Rail Coordination, and Permit Review teams.

Memberships/ Awards/ Publications

Institute of Transportation
Engineers Member

Implimenting ITS for
Hurricane Evacuations in
Florida
ITE Journal, April 2002

Institute of Transportation
Engineers, Florida Section
Young Transportation
Engineer of the Year
2004

FDOT Bill Gartner Award
1998

Traffic Engineering Manager, Lake Mary, FL

Manage the day-to-day operations of the Lake Mary Traffic Engineering group. This group of multiple teams consists of professional engineers, engineer interns, designers, and data collection technicians organized into four tiers. Responsibilities include developing the annual business plan to meet the goals of the organization including high quality, profitability, and revenue growth. Additional responsibilities include project assignments, quality tracking, staff performance reviews, counseling, and discipline.

Systems Engineering Manager, Lake Mary, FL

Managed the day-to-day operations of the Lake Mary Systems Engineering group. This group of electrical and civil engineers performed a variety of ITS studies and designs. Responsibilities included financial tracking and reporting, staff supervision, developing marketing relationships, and representing the group to upper management.

Senior Project Manager, Traffic Engineering, Lake Mary, FL

Led major marketing efforts serving as the project manager for projects with FDOT and the City of Orlando. Led a group of engineers and designers to develop traffic studies, plans, and signal retiming optimizations. Typical studies ranged from Qualitative Assessments of intersection operations to Arterial Analysis of major arterials. Typical designs ranged from "Pushbutton" intersection improvements to minor resurfacing projects and the traffic portions of urban reconstruction projects. In addition to these duties, provided guidance to Project Managers in the Traffic Engineering group.

Traffic Engineering Project Manager, Lake Mary, FL

Led a group of engineers and designers to develop traffic studies, plans, and signal retiming optimizations. Typical studies ranged from Qualitative Assessments of intersection operations to Arterial Analysis of major arterials. Typical designs ranged from "Pushbutton" intersection improvements to minor resurfacing projects and the traffic portions of urban reconstruction projects.

Project Engineer, Orlando, FL

Developed "Pushbutton" plans for signalization and turn lane intersection improvements. Assisted with marketing efforts including presentations to FDOT.

Richard B. Morrow, PE
Director of Transportation Development

Engineer, FDOT Traffic Operations, DeLand, FL

Designed, developed, and served as project manager for the production of construction plans for "Tallahassee Let" (state or federally funded) and "District Let" projects. Designed, reviewed, and inspected "Pushbutton" intersection improvements including turn lanes, milling & resurfacing, signing & pavement markings, internally illuminated street name signs, and signalization. Reviewed plans and prepared comments for Work Program and Pushbutton projects. Helped manage the Traffic Operations Work Program. Served on consultant selection panels. Served on Value Engineering teams. Completed the Department's Supervisory Academy.

I-4 SMIS Operator, FDOT Traffic Operations, Orlando, FL

Operated the Surveillance and Motorist Information System (SMIS) during peak hours. Created and implemented a message library to reduce time required to update messages. Trained the FHP dispatchers to operate the system during non-peak hour emergencies.

Eric T. Hill

Transportation Systems Management & Operations Director

Education

MS Public Policy
Rutgers University
The State University of
New Jersey, 1989

BS Management Science
Rutgers University
The State University of
New Jersey, 1983

Professional Development

Leadership Tampa Bay,
1996

Executive Leadership
Institute, National Forum for
Black Public Administrators
1997-98

32 years of professional experience

Director, Systems Management and Operations, Orlando, Florida

Responsible for directing activities for METROPLAN ORLANDO, a transportation planning partnership for Orange, Osceola, and Seminole Counties in the Orlando metropolitan region. Areas of purview include integrating Traffic Incident Management, Congestion Management Systems, Intelligent Transportation Systems, Transportation Demand Management, Safety and Security into the regional transportation plan; liaison to Transportation Disadvantaged Local Coordinating Board.

Accomplishments:

Active participation and leadership with industry associations such as the Transportation Research Board, Institute of Traffic Engineers and Conference on Minority Transportation Officials.

Provided guidance to policy-makers on the use of Red-Light Running Cameras to reduce crashes and violations and serve as a source of revenue.

Successfully implemented an organizational change to build, establish the workforce needed and manage the Department of Systems Management and Operations. As a result, several projects have been implemented that improve the efficiency and effectiveness of the transportation system.

Recipient of 2010 Outstanding Individual Leadership Award by the Association of Metropolitan Planning Organizations.

Maintained \$1.2 million annual regional traffic signal retiming program that has an average benefit to cost ratio of 50.88 and substantial improvements in level-of-service conditions on arterial roadways.

Awarded a competitive grant of \$500,000 from the USDOT for a Value Pricing Pilot Study.

Awarded \$500,000 grant from The National Academies of Sciences, Engineering, and Medicine, Strategic Highway Research Program (SHRP2) Implementation Assistance Program to demonstrate the Work Zone Impact and Strategy Estimator (WISE): a software that has the ability to optimize project scheduling and its planned construction stages, focusing on work zone management and traffic management during construction.

Negotiated funding, coordination and implementation of a regional bicycle and pedestrian count program.

Awarded Strategic Highway Research Program 2 (SHRP2) Scholarship to attend 2014 Operations Academy Senior Management Program.

Manager of Systems Planning, Orlando Florida

Duties included implementing elements of the transportation planning process, development and management of tasks in the Unified Planning Work Program and integrating required planning factors into the Long Range Transportation Plan.

Eric T. Hill

Accomplishments:

Established the Municipal Advisory Committee, representing Mayors from cities without voting membership on the MetroPlan Orlando Board.

Successfully led the merger of three subcommittees into the Management and Operations Subcommittee, which improved coordination and collaboration between the operating agencies and the planning community.

Project Manager for Traffic Incident Management Initiative to improve response to traffic incidents and recovery after incidents; traffic incidents account for approximately 60 percent of traffic congestion.

Led First-Worst safety campaign to address leading causes of traffic crashes. The campaign built a coalition between industry, media and law enforcement entities and created a lot of synergy between the desperate agencies.

Senior Research Associate, Tampa, Florida

Conducted research on transportation policy and planning for a university research center. A representation of my research projects are shown below.

Geographic Information Systems as Tool for Examining Environmental Equity Issues in Public Transportation.

African-American, Women, and Other Minorities in Transit.

Florida Advanced Public Transportation System (APTS) Concepts.

Bay Area Attraction Shuttle Study.

Transit Options for Deerfield Beach.

Suburban Mobility Initiative.

Economics and Policy Considerations of Intelligent Vehicle Highway Systems for Transit.

Tri-Rail Service Extension: Market Potential Assessment.

Briefed Congressional Black Caucus (CBC) on mobility issues affecting African American communities.

Transportation Planner, Atlantic City, New Jersey

Atlantic County Transportation Authority, Atlantic City, NJ

October 1989 to July 1990

Responsible for implementing transportation improvements for a transportation authority; this included the administration of a bus parking fee program.

Accomplishment:

Designed and implemented a Project Tracking System, a database designed to track transportation projects in the county.

Administrator of Agency Sales and Contracts, Maplewood, New Jersey

Responsible for administration of Contract Ticket Agency Program that included New Jersey TRANSIT ticket sales at 105 agency locations with revenues of over \$19 million

Eric T. Hill

annually in ticket sales. Additional responsibilities included managing 10 - 12 ticket revenue clerks.

Accomplishments:

Directed the implementation of audit and banking system which reduced administrative expenses for the program.

Developed a standardized application, agency brochure, and agency agreement.

Junior Assistant Schedule Maker, Camden, NJ

Responsible included conducting periodic field audits of fixed-routes, headway effectiveness, and ridership.

Accomplishment:

Recommended adjustments in running time, operating efficiency, and route alignment for fixed routes servicing Glassboro State College (Rowan University).

Mohamed Abdel-Aty, PhD, PE

Pegasus Professor and Chair, Dept of Civil, Environmental and Construction Engineering, University of Central Florida

Education

Ph.D. in Civil Engineering (Transportation), University of California, Davis.

M.Sc. in Civil Engineering (Transportation), Alexandria University.

B.Sc. in Civil Engineering Alexandria University.

Registrations/Certifications

Florida Professional Engineer #55986

Organizations

Editor-in-Chief (July 2013 – present), Accident Analysis and Prevention
Member, TRB Safety Data, Analysis and Evaluation Committee

Member, TRB Highway Safety Performance Committee

Member, TRB Committee on User Information Systems

Member, Editorial Board, ITS Journal and International Journal of Sustainable Transportation

Dr. Mohamed Abdel-Aty, PE is a Pegasus Professor and Chair of the Civil, Environmental and Construction Engineering Department at the University of Central Florida (UCF). He is also the Deputy Director of the Transportation Center (CATSS). His main expertise and interests are in the areas of traffic safety analysis, simulation, big data and data analytics and ITS. He was awarded in 2015 the Pegasus Professorship, the highest honor at UCF. In the last 20 years, Dr. Abdel-Aty has managed more than 50 research projects in excess of \$13 million. Dr. Abdel-Aty has published 450 papers, more than 225 in journals (Citations 9200, H-Index 50). He supervised to graduation 60 PhD and MS students. Dr. Abdel-Aty is the Editor-in-Chief of Accident Analysis and Prevention, the premier journal in safety. He is a member of the Editorial Boards of the ITS Journal and the International Journal of Sustainable Transportation, a former Co-chair of the Transportation Research Board's (TRB) Joint Subcommittee on ATIS, and member of multiple TRB Committees, including Safety Performance, Safety Data, Analysis and Evaluation and User Information Systems. Dr. Abdel-Aty is a leading traffic safety expert at both the national and international levels. In 2003 he was selected as UCF's Distinguished Researcher, and in 2007 as UCF's Outstanding Graduate Teacher. He has received multiple research awards from the College of Engineering & Computer Science in 2003, 2008, 2010 and 2012, including the Dean's Advisory Board award. He and his students received multiple awards for their research from TRB, ITS Florida and FL section ITE. He has been invited to deliver many Keynote speeches in conferences around the world, including in Belgium, Brazil, China, Korea, Turkey, KSA, Qatar and UAE. He is a registered professional engineer in Florida.

EMPLOYMENT

- Chair, Department of Civil, Environmental & Construction Engineering (Fall 2013-present), University of Central Florida
- Professor of Civil Engineering (8/2006 – present): Civil, Environmental & Construction Engineering Dept., University of Central Florida
- Deputy Director (1/2012 – present): Center for Advanced Transportation Systems Simulation, UCF.
- Graduate Program Director (8/2009 – 8/12): Civil, Environmental & Construction Engineering Dept., University of Central Florida
- Program Director (8/2004 – 1/2012), Transportation Safety and Operations, Center for Advanced Transportation Systems Simulation, UCF.
- Associate Professor (8/2000-8/2006): Civil & Environmental Engineering Dept., University of Central Florida
- Assistant Professor (7/95 – 8/2000): Civil & Environmental Engineering Dept., University of Central Florida. (promoted and tenured 5/2000)
- Post Graduate Research Engineer (9/91 - 7/95): Institute of Transportation Studies, University of California at Davis.
- Assistant Lecturer (10/85 - 9/91): Civil Engineering, Alexandria University.

HONORS AND AWARDS

- "Pegasus Professor", UCF, April 2015.
- University 2014 award for "Faculty Excellence in Mentoring Doctoral Students", recipient in the disciplinary grouping of "Engineering, Physical Sciences, and Life Sciences", March 2015.
- College of Engineering and Computer Science, Dean's Advisory Board award, UCF, November 2012.
- College of Engineering and Computer Science Distinguished Researcher Award, UCF, January 2010.
- Research Incentive Award (RIA), College of Engineering & Computer Science, Aug. 2008.
- Teaching Incentive Program (TIP) Award for the College of Engineering & Computer Science, UCF, Aug. 2008.
- College Excellence in Professional Service, College of Engineering and Computer Science, Feb. 2008.
- University Excellence in Graduate Teaching, UCF, 2008.
- Distinguished Professional Service Award, Civil & Environmental Engineering Department, UCF, 2007.
- Excellence in Graduate Teaching Award, College of Engineering & Computer Science, UCF, February 2007.
- University Distinguished Researcher, University of Central Florida, 2003.
- Research Incentive Award (RIA), College of Engineering & Computer Science, Aug. 2003.
- Teaching Incentive Program (TIP) Award for the College of Engineering & Computer Science, UCF, Aug. 2003.
- College of Engineering and Computer Science Distinguished Researcher Award, UCF, January 2003.
- Outstanding Researcher, Civil, Environmental & Construction Engineering Department, UCF, 2002, 2008, 2009.
- CECS Distinguished Research Lecturer, College of Engineering, UCF, April 2003.
- Teaching Incentive Program (TIP) Award, College of Engineering, UCF, Aug. 1998.
- Outstanding Graduate Teacher Award for the Civil & Environmental Engineering Department, UCF, 1997/98, 1999/2000, 2004/05 and 2006/07 academic years.
- Member Chi Epsilon, Civil Engineering Honor Society (initiated Fall 2007)
- Member Tau Beta Pi, National Engineering Honor Society (initiated as eminent engineer, Spring 2000)
- Member Phi Kappa Phi Honor Society (initiated Spring 2000)
- Dissertation Award for outstanding Ph.D. dissertation from the University of California Transportation Center -- UCTC (academic year 1994/95).
- Tuition Fellowship Awards, University of California, Davis (5 quarters for the 1992/93, 1993/94 and the 1994/95 academic years).
- Outstanding Academic Performance Grants throughout five years of undergraduate studies.
- B.Sc. Graduation Grade (1985): Very Good with the Degree of Honor. Ranked 5/703.

LEADERSHIP SUMMARY

- Chair, Department of Civil, Env. & Construction Engineering (Fall 2013- present), UCF
- Deputy Director (1/2012 – present): Center for Advanced Transportation Systems Simulation, UCF.
- Graduate Program Director (8/2009 – 8/2012): Civil, Environmental & Construction Engineering Dept., University of Central Florida.
-

Mohamed Abdel-Aty, Ph.D., PE

- Responsibilities include: managing graduate programs, programs' assessment, programs' review, programs' modifications, catalog changes, advising, mentoring, admission, certification, serve on college GPCC committee.
- Program Director (2004 – 2012), Transportation Safety and Operations, Center for Advanced Transportation Systems Simulation, UCF.
- Editor-in-Chief (July 2013 – present), Accident Analysis and Prevention, Elsevier, Ranked no. 1 journal in safety research, top 3 in Transportation, 2nd out of 83 journals. Five years Impact factor 2.7.
- Associate editor (2006 – 2013), Accident Analysis and Prevention, Elsevier.
- Intelligent Transportation Systems Program Director (2008 – 2009 sabbatical year), Nile University, Cairo.
- Responsibilities included: Establishing the program, preparing academic curriculum, recruit faculty, recruit students, promote program, organized an international conference in March 2009.
- Co-Chair (2004-2011), Transportation Research Board, Joint Subcommittee on Advanced Traveler Information Systems.
- Chair, CECS Honors (2005 -2008)
- Responsibilities included: advising and recruiting honor in the major students, honors scholarship selection, honors in the major thesis awards

PROFESSIONAL SOCIETY MEMBERSHIPS & ACTIVITIES

- Transportation Research Board, National Research Council, National Academy of Sciences
- - Member, Committee on Highway Safety Performance (AND25) – MEMBER (2014-2020)
- - Member, Committee on User Information Systems (AND20) – MEMBER (1998 – 2002, 2004 –2011 and 2014-2010)
- - Co-Chair, Joint Subcommittee on ATIS (AND20 (2)) – (2004- 2011)
- - Member, Committee on Safety Data, Analysis, and Evaluation (ANB20) – MEMBER (2003 – 2014, and 2017-2020)
- Editor-in-Chief (July 2013 – present), Accident Analysis and Prevention, Elsevier, Ranked no. 1 journal in safety research, top 3 in Transportation, 2nd out of 83 journals. Five years Impact factor: 2.7, Cite Score: 2.63.
- Associate editor, Accident Analysis and Prevention, Elsevier, Five year Impact factor 2.7 (2006 – 2013)
- Member, Journal's Editorial Advisory Board, Accident Analysis and Prevention (2001 – 2006)
- Member, Editorial Board, ITS Journal, Taylor & Francis (2003 – ongoing)
- Member, Editorial Board, International Journal of Sustainable Transportation, Taylor & Francis (2013 – present).
- Member Italy National Promotion Commission for Associate and full Professors in Transportation and Infrastructure sectors (2016/17).
- Member International Road Federation Group of Experts on Road Safety (2011-ongoing)
- Visiting scholar and International Research Board Member, MOELAB, Beijing Jiaotong University, China (2011)
- Member, World Conference on Transport Research Society – WCTRS (2004 – ongoing)
- Member, American Society for Engineering Education – ASEE (2002-2004 and 2010 - current)
- American Society of Highway Engineers
- Faculty Advisor for Student Chapter at UCF

Mohamed Abdel-Aty, Ph.D., PE

- Paper reviewer for TRB, Transportation, Transportation Research A, C & D, Accident Analysis and Prevention, ASCE Journal of Transportation Engineering, ASCE Journal of Infrastructure Systems, ITS Journal, Journal of Public Transportation, IEEE transactions on Intelligent Transportation Systems, International Journal of Sustainable Transportation and the Journal of Safety Science (ongoing)
- Committee Chair, SHRP 2 Expert Task Group for the Roadway Measurement Van Project (S03), Transportation Research Board, National Academy of Sciences, 2007
- Chair expert panel, Mobility, Environmental Sustainability and Energy Efficiency, Egyptian Information Technology Industry Development Agency (ITIDA), 2008.
- Board Member, Southeastern Transportation Center (2007-ongoing)
- Expert Panel member for the driving simulator project, Tongji University, China (2007-current)
- Research proposal panel, National Institutes of Health (NIH), September 2009 & Feb. 2011
- Peer reviewer for scientific reports for the Federal Motor Carrier Safety Administration (FMCSA), 2010, 2011.
- External reviewer, Portuguese Foundation for Science and Technology (FCT), 2012.
- Member, Committee of Experts, Road Safety & Environment Engineering Research Center of Ministry of Education (RERC), Tongji University, Shanghai, China.
- Research proposal reviewer for the Connecticut Cooperative Highway Research (Fall 2004)
- Research Proposal Reviewer for the National Sciences and Engineering Research Council of Canada (Fall 2004)
- Committee on Transportation and Housing, Orange County, Florida (past member)

Fred Heery, PE

State TSM&O Program Engineer

Education

MS Civil Engineering
Villanova University

BS Civil Engineering
Drexel University

Registrations/ Certifications

Florida Professional
Engineer #51003

New Jersey Professional
Engineer #35614

Pennsylvania Professional
Engineer #40584-E

Affiliations/ Memberships

Member of Institute of
Transportation Engineers

Member of ITS America

Fred Heery has more than 30 years of experience in traffic and transportation engineering. His experience includes state DOT construction and maintenance experience, being the City Traffic Engineer for local agency, being a Traffic/ITS consultant, and currently in the FDOT Traffic Engineering and Operations Office as Deputy State Traffic Engineer. Mr. Heery manages the TSM&O Program comprising freeway management and arterial management from a statewide policy and leadership perspective.

As the Systems Manager, Fred has overseen the installation, integration, and commissioning of four countywide advanced ITS/traffic signal systems, three of which were traffic adaptive signal control systems. Fred currently manages Department staff and program areas, oversees the statewide ITS Telecommunications contract and the TSM&O General Consultant contract as part of the overall TSM&O Program.

30 years of professional experience

FDOT State Transportation Systems Management and Operations Program Engineer, Tallahassee, FL

Provide leadership and guidance on statewide TSM&O program activities. Provide leadership on freeway and arterial management operations in seven Districts and the Florida Turnpike Enterprise. Oversee the statewide SunGuide Software contract, 511, contracts, Statewide microwave tower contracts, and Arterial Management contracts.

FDOT Deputy State Traffic Operations Engineer, Tallahassee, FL

Manage statewide signing, traffic studies, traffic signal standards and operational procedures and assist district traffic signal engineers and district studies engineers with traffic operation and safety issues and process improvements.

FDPT Traffic Systems Studies Engineer, Tallahassee, FL

Serve as the State Studies Engineer and perform related studies of traffic operational issues as required. Perform investigations into means and methods to improve traffic signal system design, construction, operation, and maintenance. Perform speed studies, truck lane restriction studies and other operational type traffic studies. Analyze operational problems and propose solutions. Perform safety analyses.

Program Manager, Tampa, FL

Served as Systems Manager and managed the \$ 10M Pinellas Countywide ATMS project for FDOT District 7, a System Manager style contract for ITS deployment. Managed multiple tasks including P, S & E design, Procurement, System Manager CEI, and Manage staff, project budgets, workloads and clients. Served as System Manager on \$ 8.5M Pasco County ATMS project, a System Manager contract for FDOT for Stage I. Manage design and integration of the traffic adaptive ATMS project.

Senior ITS Engineer, Orlando, FL

Perform project management and traffic and ITS design duties on Florida DOT projects. Performed project scope definition and cost estimating tasks. Prepared specifications for

Fred Heery, PE
State TSM&O Program Engineer

traffic, ITS, and telecommunications equipment. Performed design management tasks on large-scale Intelligent Transportation System (ITS) projects, including components such as traffic signal control, dynamic message signs, CCTV, vehicle detection stations, and highway advisory radio. Supervised and oversaw team of designers, sub consultants and contractors on transportation projects.

City Traffic Engineer, City of Tallahassee, FL

Division Director. Managed and oversaw the functions of the 52 member Traffic Engineering Division of the Public Works Department. Project Manager for the Advanced Transportation Management System project. Responsible for all development review activities for compliance of land development regulations and traffic impact analyses. Maintain striping and signage programs and oversee the traffic signalization operations for countywide traffic control system. Manage intersection safety improvement program corridor flow bottleneck improvements. Established accident database for crash reporting system. Managed all personnel, operating budgets, and capital budgets for the division.

Assistant City Traffic Engineer, City of Tallahassee, FL

The Assistant Division Director of the 52 member Traffic Engineering Division. Managed all signalization operations and traffic control devices within the capitol county of Florida. Managed the 300+ signalized intersections, school flashers and flashing beacons throughout the county. Managed 26 signalization employees and supervisors. Oversaw signal design, construction and maintenance.

Raj Ponnaluri, PhD., PE, PTOE

FDOT State Arterial Management Systems Engineer

Education

Ph.D. Transportation
Engineering
BIT Pilani, 2013
M.B.A. Engineering
Management
University of Central Florida
2001
MS Transportation
Engineering
Duke University
1995
BS Civil Engineering
Jawaharlal Nehru Technical
University
1992

Registrations/ Certifications

Florida Professional
Engineer #54634
Nevada Professional
Engineer #016963
Professional Traffic
Operations Engineer

Affiliations/ Memberships

Institute of Transportation
Engineers (ITE) Member
American Society of Civil
Engineers (ASCE) Member
Clark County Leadership
Form Graduate Member

Currently serving as the State Arterial Management Systems Engineer at the TSM&O Section of the State Traffic Engineering & Operations Office of the Florida Department of Transportation. Earlier, served as a Principal Civil Engineer at the Regional Transportation Commission of Southern Nevada, County Engineer of Polk County in Florida, Senior Traffic Engineer at the Florida's Turnpike, Project Manager at TEI Engineers & Planners and a Senior ITS Engineer at TransCore. More than twenty one years of experience in areas of roads and highway safety; bus rapid transit systems (BRTS) – from conceptual frameworks through detailed project report preparation through construction, implementation and project management consulting (PMC); proposals preparation, work solicitation, contract management, and project management; research and training, project and tasks execution, formal presentations, and speaking engagements; managing technical projects, preparing reports, work plans, contracts, scopes of services, maintaining project budgets, and training staff on work performance. Served on management, engineering, and technical committees.

21 years of professional experience

FDOT State Arterial Management Systems Engineer, Tallahassee, FL

Responsible for Developing guidance on the many arterial programs in the state. Developing guidance on Arterial Signal Control Technology deployments. Developing dashboards for deploying state of the art performance-oriented systems. Manage the development of a statewide Truck Parking Activity System. Completed a statewide Wrong Way Study that resulted in various design and policy changes. Extending the freeway Wrong Way efforts to arterials for comprehensive evaluation. Developed performance-oriented Traffic Signal Maintenance and Compensation Agreement.

FDOT Traffic Systems Studies Engineer, Tallahassee, FL

Pre-Emption of Traffic Signal at a Railroad Crossing: Reviewed a request for not pre-empting a traffic signal at a railroad crossing near Briarcliff Road and Metro Parkway Boulevard in Fort Myers. Recommendation: Section 8C.09 of the 2009 MUTCD calls for a 'should' condition for pre-emption if the distance between the traffic signal and RR crossing is less than 200'. Therefore, the District was advised to use pre-emption. May 2013. Revision to Section 3.8 of TEM on Mid-Block Crosswalks: Section 3.8 of the TEM titled, "Mid-Block Pedestrian Crosswalks" was revised and updated significantly to include the lessons and national best practices on mid-block crosswalks. The revision was reviewed by FDOT Professional Engineers from several departments. All comments were addressed after detailed discussions and the final version of the Chapter was adopted after a series of reviews by senior management and legal counsel. New Chapter on Removing Traffic Control Signals: Many Districts in Florida are faced with the concern of previously installed traffic signals which may need revalidation due to reduced traffic volumes and other signal warranting factors. A new chapter providing guidance on removing traffic control signals was developed and placed in the Traffic Engineering Manual. MUTCD and national best practices were used in developing the guidance.

Raj Ponnaluri, PhD., PE, PTOE

Study of a Request for Variation from the TEM Section 3.8: Studied a request for variation from Traffic Engineering Manual (TEM)'s Section 3.8 on Mid-Block Crosswalks. TEM's Chapter 1 allows for variation from complying with TEM. The request from District 6 included a variation for conducting pedestrian counts due to "ongoing construction activity". TEM requires at least 20 pedestrians during peak hour and 60 during any four hours of the day. The request sought the installation of RRFBs (Rectangular Rapid Flashing Beacons) at three proposed crosswalks. Recommendation: The variation is not justified since the basis for mid-block crosswalks is pedestrian volume. Also, the locations did not have continuous sidewalks for pedestrian traffic flow. District 6 noted that, due to the area's historic nature, ROW for sidewalks is not available. May-June 2013.

Project Manager, Orlando, FL

Served on Orlando International Airport runway design team. Developed two Advanced Traffic Management System Master Plans. Managed projects and contracts including the preparation of RFPs, preparing project budgets and schedules, and project management.

ITS Engineer and Traffic Engineering Manager, Orlando, FL

Served on the Florida Turnpike and other Toll Systems in the United States. Developed the design specifications for the location and installation of Dynamic Message Signs, Highway Advisory Radios, and Closed Circuit Television cameras. Developed an Advanced Transportation Management System (ATMS) Master Plan for their inclusion on the Florida Turnpike System. Developed the Advanced Traveler Information System for the Florida Turnpike. Have been a part of deploying the SunPass Electronic Toll Collection System which included the evaluation and determination of toll collection technologies. Developed system-level plans for developing brand-new toll systems on both planned and operational corridors. Have been a part of the Open Road Tolling System development in the United States.

Transportation Engineer, Boynton Beach, FL

Served as a Transportation Engineer. Used HCS and other traffic engineering software for operational and planning analyses. Conducted numerous traffic impact analyses. Assisted the President of the company with ITE publication on Saturation Flow Rate Study.

Joseph B Santos, PE, FCCM

FDOT State Safety Engineer

Education

BS Civil Engineering
Florida State
University

Registrations/ Certifications

Florida Professional
Engineer #62961
Florida Certified
Contract
Manager
#3249-16092

Mr. Santos is a licensed professional engineer in the state of Florida with over 27 years of experience in transportation engineering. In addition to his service in the United States Navy and Naval Reserve, Mr. Santos has a successful career with the Florida Department of Transportation and currently manages the State Safety Office and the Highway Safety Improvement Program.

27 years of professional experience

FDOT State Safety Engineer, Tallahassee, FL

Oversight responsibilities for Crash Data Section (30 employees) which involve supervision of 7 personnel that are directly responsible for maintaining and updating the Crash Analysis Reporting system along with developing Geographical Information System data to support statewide crash analysis. Coordinate with Executive Management, Planning, Environmental Management Office, Roadway Design, Traffic Operations, Maintenance, Materials, Pavement Management, and Construction regarding crash data implementation to address project scoping, evaluation, and development. Work with 7 District Safety Engineers to implement the Highway Safety Improvement Program (\$120M/year) and the Safe Routes to School Program (\$7M/year). Manage and coordinate state safety initiatives including the Highway Safety Manual, Local Road Safety, Lane Departure and Intersection Safety Implementation Plan, Strategic Highway Safety Plan, Safety Performance Measures, and Engineering Safety Coalition. Conduct and participate with Federal Highway Association (FHWA) and national safety experts on safety issues addressed thru Safety Peer to Peer Exchanges and Every Day Counts (EDC) initiatives. Assist with national leadership efforts with the Standing Committee on Highway Traffic Safety (SCOHTS).

Achievements:

- Programed 100% of Highway Safety Improvement Program funds.
- Developed and conducted over 100 safety related workshops, webinars, or teleconferences.
- Implementing the Highway Safety Manual through policy, training, and involvement from District and Central Office staff.
- Initiated the 2012 and 2016 Florida Strategic Highway Safety Plan.
- Developed and updated the Florida All Roads Base map.
- Published over 90 Florida Crash Shapefiles.
- Received recognition from FHWA for the Crash Reduction and System Hub (CRASH) application.
- Managed 19 safety related FDOT research projects.
- Initiated FDOT traffic count program for bicyclists and pedestrians.
- Coordinate with Florida Association of County Engineers and Roadway Superintendents (FACERS), Florida American Public Works Association (APWA), and the Florida Local Technical Assistance Program (LTAP) at the University of Florida to address safety on local roads.

FDOT Project Manager, Tallahassee, FL

Mange the development of the FDOT Project Management Handbook and supporting workshops and training for FDOT and consultant project managers. Position required active coordination with key FDOT offices (Planning, EMO, Design, Right of Way, Constriction, Maintenance, Professional Services and Work Program) in Central Office and 7 District Offices including the Turnpike Office.

Achievements: Developed the FDOT Project Management Handbook.

Joseph Santos, PE, FCCM
State Safety Engineer

Engineer III, Systems Planning Office, Tallahassee, FL

Assist Florida Intrastate Highway System (FIHS) and Strategic Intermodal System (SIS) coordinators for Districts 1, 3, 5, and 7 on transportation improvement issues related to the development of the Multimodal Needs Plan, Cost Feasible Plan, Tentative Work Program, and Adopted Work Program. Coordinate with Central Office Staff (Work Program, Design, Policy, Statistics, EMO and PTO) for developing and implementing SIS standards. Develop and update policy and procedures for the FIHS and SIS.

Achievements: Published the 2005 Multimodal Needs Plan, and the Cost Feasible Plan.

Engineer II, Systems Planning Office, Tallahassee, FL

Coordinate with district planning, maintenance, and design staff for issues related to Access Management, Interchange Justification Report (IJR), Interchange Modification Report (IMR), Interchange Operational Analysis Report (IOAR), and Site Impact Analysis. Manage the development and training of FDOT Access Management Guidelines for Project Development. Coordination efforts included participation with central office and district staff in Planning, Design, Maintenance, Operations, Right of Way, Project Management, and Environmental Management Office.

Achievements: Conduct the FDOT Access Management Guidelines for Project Development.

Charles A. Ramdatt, PE, AICP, PTOE

Engineer & Urban Planner

Education

BS Civil Engineering
University of
Central Florida

MS Civil
(Transportation)
Engineering
University of
Central Florida

Registrations/ Certifications

Florida Professional
Engineer #42703

ITS America and
ITS Florida

ITE Fellow

Certified PTOE

Registered AICP
Member

APA Member

ASCE Member

FES Member

National Society of
Professional
Engineers,

National Society
of Black

Engineers

American Public
Works

Association

Mr. Ramdatt is a tenured Engineer & Urban Planner with extensive experience as a consensus builder, leader of diverse professional teams, public presenter/speaker, infrastructure planner & implementer. Mr. Ramdatt's experience includes managing and participating in the planning, development, implementation, and operation of billions of dollars' worth of a variety of public improvements, including smart infrastructure in the City of Orlando. 32 years of professional experience

Director of Smart Cities and Special Projects, City of Orlando, FL

Responsibilities include building regional partnerships, developing plans and facilitating citizen, visitor and business engagement to ensure that Orlando facilitates technological research, development and implementation to become and remain a great place to visit, live, work and play; facilitate economic development; promote environmental preservation and sustainability; and attract the creative class; on a continuing and renewing basis; as well as representing Orlando's interests in the ongoing multi-billion dollar Interstate 4 improvements.

Deputy Director of Public Works, City of Orlando, FL

- Director of the development and implementation of the Orlando Intelligent Transportation Systems Master Plan
- Senior Member of project development and operations management team for the Amway Center (Arena) ~ US\$500 million project
- Senior Member of project development and operations management team for the Dr. Phillips Center for the Performing Arts (DPC) ~ US\$500 million project

Current National Profile

- National Steering Committee Member for the MetroLab Network (<http://metrolab.heinz.cmu.edu/>) and current leader of the City of Orlando – University of Central Florida - Florida Polytechnic University MetroLab partnership team

Recent Regional Central Florida Profile

- Co-Leader of the Central Florida Automated Vehicle (CFAV) partnership team that was recently designated as a winner of the US DOT's challenge for automated vehicle proving grounds
- Past Operations Committee Chair for the Central Florida Expressway Authority (CFX)
- Past Transportation Technical Committee Chair and Board Member for Metroplan Orlando, the legally mandated regional transportation planning organization for the tri-county area which constitutes Greater Orlando

Derek Vollmer, PE

FDOT SunGuide Software Project Manager

Education

MS Electrical Engineering
Florida State University

BS Electrical Engineering
University of Louisiana at
Lafayette

Registrations/ Certifications

Florida Professional
Engineer #62938

Designations/ National Committee Appointments

National Transportation
Communication for ITS
Protocol (NTCIP)

Dynamic Message Sign
Committee Voting Member

Derek Vollmer has more than seven years of experience working with ITS devices and managing SunGuide software implementation. Derek has developed ITS device test procedures, performed ITS device testing, and developed ITS device specifications as part of Florida Department of Transportation's (FDOT) TERL. He manages the development of SunGuide software, coordinating with the FDOT's seven Districts, Florida's Turnpike Enterprise, and other participating agencies as part of the CMB. Derek manages the development of FDOT's data warehouse, which is part of the RITIS and its interface to SunGuide software. He has worked on various aspects of the NTCIP, including dynamic message signs and actuated signal controllers.

17 years of professional experience

FDOT SunGuide Software Project Manager, Tallahassee, FL

Manages changes to Florida's SunGuide software; develops ConOps, high-level software system requirements, validation plans, and software test procedures; manages SunGuide software release cycles.

FDOT RITIS Data Warehouse Project Manager, Tallahassee, FL

FDOT has a contract with the UMD to archive data collected by SunGuide software. Works with UMD to resolve issues reported by system users; coordinates with stakeholders on enhancements or changes needed with FDOT's RITIS experience.

FDOT Statewide ITS Architecture Project Manager, Tallahassee, FL

Managing the update for Florida's Statewide ITS Architecture (SITSA), including meetings with Districts and stakeholder to determine changes in user needs and to ensure that Florida's SITSA conforms to the current national ITS architecture.

FDOT Systems Engineering Plan Project Manager, Tallahassee, FL

Managing an update of FDOT's Systems Engineering Plan, including stakeholder meetings. Working with other FDOT departments to include systems engineering references in their procedures and documents. Updates FDOT's systems engineering document templates.

FDOT TERL Testing, Product Evaluation Specialist, Tallahassee, FL

Tested ITS devices for listing on Florida's Approved Products List, including testing dynamic message signs (DMS) and closed-circuit television (CCTV) cameras for NTCIP compliance; tested switches, video wall controllers, and vehicle detectors for compliance with FDOT's Standard Specifications for Road and Bridge Construction; developed detailed test procedures for testing ITS devices, helped edit and rewrite FDOT ITS specifications; created required NTCIP object lists for DMS and CCTV cameras.

W. Russell Allen, PE

ITS Program Development Engineer

Education

BS Electrical Engineering
Florida State University

Registrations/ Certifications

Florida Professional
Engineer #62938

Affiliations/ Memberships

ITS Florida Member Ex-
Officio Officer

Designations/ National Committee Appointments

I-95 Corridor Coalition's
Traveler Information
Program Track

National 511 Coalition

FHWA Road Weather
Management Program

Intelligent Transportation
Society of America

Intelligent Transportation
Society of Florida

Russell Allen joined FDOT in October 2014 as the Intelligent Transportation Systems (ITS) Program Development Engineer. His current duties include managing the statewide ITS Deployment program and budget, including funds allocations for District and Central Office ITS projects, operations, maintenance and equipment replacement; developing and updating ITS specifications and standards; managing Florida's Advanced Traveler Information System (FL511) and all associated marketing/outreach efforts; managing Florida's Data Integration and Video Aggregation System (DIVAS); administrating the General Consultant contract; providing technical expertise related to ITS infrastructure; and technical review of contract scope documentation.

Russell also represents FDOT as a member of the I-95 Corridor Coalition's Traveler Information Program Track, National 511 Coalition, and FHWA's Road Weather Management Stakeholder Meeting.

Prior to this assignment, Russell spent 15 years with RCC Consultants, Inc. (formerly, Omnicom, Inc.) as an in-house consultant to FDOT providing professional wireless and telecommunications and engineering

services in the public safety, transportation, and ITS sectors. Russell's broad technical experience spans areas of facilities planning, design, management, telecommunications product and systems analysis, system design and integration, procurement specification, bid analysis, performance acceptance testing, facilities use agreements, property and insurance documentation and staff management.

17 years of professional experience

FDOT Telecommunications General Consultant, Tallahassee, FL

Provided project management and staff professional engineering services to FDOT. Responsibilities included facilities design and management, developing procurement specifications for new communications sites, grounding and lightning protection upgrades, emergency power generator systems installation, wireless system design and integration, construction engineering and inspection, developing facilities use agreements, providing technical assistance to both Central Office and District engineers and administrators, develop/assist/review of Department specifications and standards, liaison for national stakeholder meetings, and directly interfacing with executive management.

FDOT Lodestar Towers Lease and Operating Agreement, Tallahassee, FL

Providing technical support and assisting with engineering review and analysis of all proposed commercial tower collocation applications, resulting in \$1.3 million annual rental revenue. Assisted in a statewide audit of all collocations thus recovering over \$100K lost rental revenue and recovering approximately \$2,000 rent per month from an undocumented tenant.

FDOT Road Weather Information System (RWIS) Pilot Project, Tallahassee, FL

Assisted with the design, installation, testing, and acceptance of FDOT's first research project pilot RWIS deployment in 2001. This system consisted of fourteen RWIS stations installed on microwave tower sites in strategic locations. The RWIS data was collected by the University of North Florida and disseminated to the National Weather Service. The second phase of this project consisted of installing three wireless antenna systems that communicated with RWIS sensors on key bridges along the east coast of Florida.

FDOT Statewide Microwave System Upgrade Engineer, Tallahassee, FL

Functioned as engineer and technical support for this project - researched available technologies to support the Department's requirements for voice, video, weather, and traffic data. Upgrade of the segmented 300-channel analog and DS-3 digital microwave system into a continuous DS-3 digital microwave system that included a statewide network management system, a statewide data network system, timing and synchronization, and full re-channelization with the necessary flexibility and expandability to accommodate the Department's ITS applications and needs. The project also involved design modifications to accommodate the Florida Highway Patrol (FHP) dispatch consolidations as related to the Department's Motorist Aid Call Box System.

Jeshua I. Williams, PE

Transportation Engineer

Education

BS Civil Engineering
University of
Central Florida

Registrations/ Certifications

Florida Professional
Engineer #81323

Mr. Williams is a licensed professional engineer in the state of Florida with over four years of experience in transportation engineering. He is a successful graduate of the Florida Department of Transportation's Professional Engineer Training Program, which helped him develop a uniquely well-rounded skill set and a passion for improving Florida's transportation system.

4 years of professional experience

Traffic Engineer, Florida Department of Transportation

- Perform engineering review and data analysis in order to develop reports and associated documents that address traffic safety or operational issues.
- Assist in the development and management of professional and contractual services contracts and construction contracts that support the Traffic Operations department.
- Prepare CADD drawings and construction plans for traffic operations and roadway improvement projects.
- Provide review comments on design calculations, drawings, and reports generated by other areas of the Department and other entities.
- Prepare correspondence and other documents for other departments and agencies related to traffic operations.
- Interact with the public related to traffic operations, including addressing public inquiries and attending public meetings.
- Assist the TSM&O group with the review, development, and implementation of traffic signal timing plans.

Professional Engineer Trainee, Florida Department of Transportation

- Rotational internship throughout all departments within the FDOT as part of the PE Training Program in order to gain a better understanding of the Department's overall functions and operations .
- Assist each department with various tasks and projects, including assistance with numerous planning, design, construction, and maintenance projects.

Anthony Nosse, CPM, PE

District 5 Safety Program Engineer

Education

BS Civil Engineering
University of
Central Florida

Registrations/ Certifications

Florida Professional
Engineer #45335

Mr. Nosse is a licensed professional engineer in the state of Florida with over 29 years of experience in transportation engineering. Mr. Nosse has specialized in traffic safety at FDOT for the past 27 years.

19 years of professional experience

FDOT District Safety Engineer, Deland, FL

Performs advanced engineering work in Traffic Operations/Safety including overseeing the management of consultant contracts, the Highway Safety Improvement Program, the District Rail/Highway Grade Crossing Improvements Program and the Grade Crossing Maintenance Program. Directs contract management of consultant contractors that provide safety studies. Signs and seals safety studies and benefit/cost analysis. Reviews draft and final reports to assure fulfillment on content and contractual obligations. Supervises employees in the review of all fatal crashes and analyzes all fatal crash patterns. Supervises employees in the administration of the District Rail/Highway Grade Crossing Improvements Program (DRJGCI) and the Grade Crossing Maintenance program. Supervises the preparation of Maintenance of Traffic plans for railroad detours involving the state highway system. Leads engineering subcommittees for Community Traffic Safety Teams (CTST); organizes and leads special task teams to solve crash problems identified in main meetings; Tracks federal safety projects from concept to concrete to assure projects meet schedules. Tracks federal HSP safety projects from concept to concrete to assure projects meet schedules. Investigates safety related complaints/problems from the public and other governmental agencies and recommends or coordinates necessary corrective action.

FDOT Assistant Safety Engineer, Deland, FL

Study high crash segments and spots to determine crash countermeasures, calculate Benefit to Cost (B/C) ratio and develop safety projects for inclusion into the Safety work program. Analyze crash history for RRR projects. Do fatal crash reviews. Review MOT.

FDOT Permit Engineer, Orlando, FL

Process Vehicular Connection, utility and drainage permits. Review the permits/drawings to make sure they meet MUTCD and current FDOT design standards. Make sure the permit construction is to FDOT specifications and standards.

FDOT Project Engineer, Winter Park, FL

Project Engineer on highway and bridge projects. Supervise inspectors and engineering materials testing. Review construction plans. Ensure projects are constructed according to plans, specifications and standards. Prepare weekly and monthly estimates and reports. Prepare final estimates package for project closeout. Review work zone traffic control through construction projects (MOT).

Tushar Patel

District 5 TSM&O Production Manager

Training

Certified Public Manager
(FSU)

FDOT Management
Academy

FDOT Supervisory Academy

System Engineering for ITS

Mr. Patel has more than 15 years' experience working at FDOT District 5. He is currently the District's TSM&O Project Manager Supervisor. In this position he oversees the planning, design development, and construction of District 5 Intelligent Transportation System. He has previously overseen the District Local Agency Program (LAP), Joint Participation Program (JPA), Minor and Major Design Projects. He has the background in administering Local, State and Federal funded projects.

15 years of professional experience

Regional Transportation Management Center

The project is new 44,700 square foot building that will house the freeway and arterial operations staff and FHP dispatch, which oversee district five roadways. This facility will include the operations of freeway incident management, managed lanes, arterial operations, and ramp metering in addition to outfitting this facility with operator command control, video walls, server room, and offices, for a state of the art operation center. Currently serve as the Department's Project Manager Lead for overseeing the design development for this new facility.

Active Arterial Management & Transit Signal Priority

The project is to deploy ITS field devices i.e. blue tooth and MVDS on various arterials corridors for data collection, and design to deploy GPS devices at specific signals and transmitters on Lynx buses to provide conditional signal priority for buses running to SunRail Stations. Served as a lead supervisor and train project managers and insure the project production delivery.

Local Agency Program and Joint Participation Program (ITS Projects)

The project included signal equipment upgrades, fiber and field equipment deployment on various corridors throughout the Osceola County ATMS, Orange County ATMS and Seminole County ATMS expansion.

Served as the Department's LAP Production Manager overseeing the design and RFP development for Design Build for the local agency, insured the local agency followed the state and Federal rules and regulations, and provide responses on all FHWA Audits.

Stimulus ARRA Project (LAP)

The project included 88 stimulus local agency projects. The Stimulus projects were to be delivered within 1 year time frame. The projects included from milling and resurfacing, and bridge replacements. Final number of stimulus projects was 151 local projects with the use of left over funds. Served as the Department's LAP Production Manager overseeing the beginning to final document delivery from local agency to meet FHWA deadline, reporting activities monthly activities to FHWA, and provide responses from oversight by OIG and FHWA Audits.