TEAMFL RECOMMENDED INITIATIVES

January 2015

TEAMFL has identified five key initiatives to advance in 2015 that are important to Toll Agencies across the state of Florida. These initiatives seek to promote safety, efficiency, and cost effectiveness. It is our hope that this document will be of value to toll agencies, transportation advocacy organizations and interested trade associations.

- **Improving OCR Performance on Florida's License Plates –** continued expansion of electronic tolling has increased reliance on Optical Character Recognition (OCR) performance. Department of Highway Safety and Motor Vehicles (DHSMV) working collaboratively with FDOT has identified opportunities for improvements to both OCR and human readability.

- **Promoting Bus Toll Lane Financing** – a public transportation concept that combines the strengths of transit and tolling through new lanes on urban highways dedicated specifically to bus service and toll-paying private drivers

- **Creating a Transportation Technology Center of Excellence** – a state-of-the-art research and teaching center at Florida Polytechnic that would train the next generation of the state's transportation professionals and provide laboratory testing for FDOT on current and emerging practices and technologies in the field

- **Improving Measures to Prevent Wrong-Way Driving (WWD)-** techniques that will help prevent and address the problem of wrong-way drivers on ramps from on limited access highways

- **Implementing Recommendations from FTC Management Compensation Study –** adjusting personnel salaries to make them competitive as outlined in Florida Transportation Commission's recent market salary analysis in order to reduce "talent drain" from FDOT

The following document summarizes the importance of each of these goals and outlines next steps toward achieving them. Supplementary materials can be found in the appendices.

Improving OCR Performance on Florida's License Plates

What does it mean to improve OCR performance?

Expansion of tolling in Florida has resulted in an increased reliance on OCR and agency dependency on OCR performance in our OCR engines. OCR engine performance has a direct impact on the efficiency and cost effectiveness of image review processes through reduction of human review requirements. Florida's Turnpike Enterprise (FTE) approached the Department of Highway Safety and Motor Vehicles (DHSMV) with concepts representing opportunities for improvements in both OCR and human readability. DHSMV requested FTE work with PRIDE to explore and vet the concepts. Opportunities that have been identified to date are characters that are confused or misread by OCR, and characters that are obscured by license plate frames. The ability for an agency to correctly read a license plate directly impacts Florida agencies abilities to identify the correct registered owner of a vehicle.

Why do we want to improve OCR performance of Florida's license plates?

- **Preventing lost revenue for Florida Toll Agencies that results from inaccurate image-based reads of license plates**

  In the absence of cash tolling and associated gates, customers whose vehicles do not have a valid transponder that is properly mounted are billed based on an image taken of the vehicle's license plate. Automation of the read of the license plate improves the agency's ability to correctly apply toll charges in a timely manner. License plate images where OCR cannot reliably read information results in a human review of the plate image, a process that adds time and cost to the process.

- **Improvements to OCR Performance have a direct benefit to law enforcement**

  Beyond the commercial interests of toll agencies, license plate misreads by law enforcement diminish their ability to identify and apprehend suspected criminals or terrorists, recover stolen vehicles, or aid people in need of assistance. *Improvements in OCR Performance will not just help recover toll agencies' revenues, but will offer improved public safety.*

What are the Existing OCR Infrastructure Change Management Considerations?

- **Impact of change on production OCR environments.**

Production OCR environments may need to be retrained to accurately read and report any license plates that contain modifications to the font, or any other changes that may be made to a plate type over time.

- **Florida's general issue license plate replacement cycle.**

  Florida currently has a ten-year replacement cycle for general issue license plates. Quantities estimated for replacement are not an even or fixed percentage distributed over the ten-year cycle. Production forecasts provided by PRIDE for 2015 represent approximately 15.5% of the general issue plate population. The production forecasts for years 2016 – 2019 are similarly disproportionate. The potential for a large number of plates in circulation with a change in format highlights the potential cumulative impact on OCR performance and the need for proactive change management and retraining efforts.

What are the next steps to improve license plate OCR Performance?

- **Identification of characters that confuse an OCR engine or can be obscured by a license plate frame**

  An inter-agency member committee was formed in 2012 to identify areas that could yield improved OCR performance. A number of recommendations were made and specific characters were identified that would yield improvements in efficiency.

- **Modifying the License Plate Font**

  FTE working collaboratively with PRIDE, and the state's predominant OCR Vendor have proposed a modification of the font in Florida's standard plate. In the proposed font 16 characters have been modified to prevent character confusion or obstruction by most license plate frames.

- **Testing and analysis of the proposed font for OCR performance evaluations and recommendations**

  FTE has run sample plates in test environments to capture and assess images. The FTE OCR vendor will provide performance results, and FTE is also performing blind human review to validate human readability.

Promoting Bus Toll Lane Financing

What is Bus Toll Lane Financing?

Bus Toll Lanes (BTL) are a transit alternative that involves the development of new, dedicated highway lanes in urban centers that 1) provide rapid bus service to transit customers, and 2) fill remaining capacity with toll-paying private vehicles.

BTLs would take advantage of electronic toll collection and "priced managed lanes" (the restricted use of dedicated lanes to rapid transit and paying customers in combination with "value pricing" of tolls based on time of day and highway congestion) in order to speed travel for all traffic, both buses and toll-paying private vehicles.

With BTLs, transit funding contributions to the capital cost of building dedicated lanes are an equity investment, as such, they allow transit authorities to gain access to the toll revenues produced by the priced managed lanes. Those revenues are toll revenues available in excess of any toll bond payments and the ongoing O&M costs for the lanes and toll systems for the project. In other words, transit agencies obtain an ownership interest in the facility; toll revenues paid by non-transit vehicles to use the transit guideway that are in excess of debt service or O&M would be available payments to the transit system.

The Tampa-Hillsborough County Expressway Authority (THEA) in partnership with the Hillsborough Area Regional Transit Authority (HART) are leading the way on the BTL concept, as detailed in a study funded by a grant from the Federal Highway Administration (FHWA) Value Pricing Pilot Program (VPPP), and a local match provided by the Florida Department of Transportation (FDOT). The study explored and tested three different hypothetical BTL networks in Hillsborough County to gauge the potential effectiveness of such a system in the region. It found that each network would produce significant revenues from fares + tolls well above operating costs (see appendices for details).

Why do we want Bus Toll Lane Financing?

- **Financially sustainable transit service**

  Traditional transit fare revenues only cover a relatively small portion of operating costs. *BTLs enable ongoing transit costs to be covered by user-based tolls as a long-term, inflation-adjustable revenue stream.* Ongoing toll revenues—owned by the transit authority—would cover transit operating costs, future bus replacement and renewal costs, and generate additional funds to grow future transit service in the corridor.

- **Increased use of transit service**

  Concerns over the reliability and swiftness of traditional bus service can make it difficult to attract ridership. *BTL improves bus transit times, makes transit options more appealing to commuters, and grows transit passenger volumes.* Subsequently, as public transit passenger volumes grow, fares can be reduced, making bus service more affordable.

- **Significant traffic congestion relief**

  More passengers on transit buses means fewer drivers crowding the roads in metro areas. By creating express lanes and increasing transit ridership, *BTLs can increase potential people moving capacity 187% or more compared with a standard congested highway lane* (see the "Bus Toll Lane Concept Feasibility Study" in appendices or found at http://www.tampa-xway.com/Projects/BusTollLanes.aspx). Reductions to traffic congestion improve community quality of life, as well as support local business and economic development.

- **Advancing transportation solutions more quickly through partnership between transit and toll agencies**

  Capital financing for building new facilities is typically funded through toll bonds, which can be insufficient for large-scale transit projects. *Introducing local, state, and federal transit capital sources as partners with toll agencies to build such facilities would reduce the financing costs.* This would free use of those toll revenues to support public transit operating, maintenance, and replacement costs associated with bus service.

<u>What are the steps needed to bring about Bus Toll Lane Financing?</u>

- **At the federal level, two proposed Amendments to MAP21 (the Moving Ahead for Progress in the 21st Century Act) during Federal Reauthorization:**

  1) Redefine "Fixed Guideway" - revert to pre-MAP21 definition of "fixed guideway" to allow the use of transit right of way by other forms of transportation.

  2) Redefine "Dedicated to Transit Use" - define this term to be "a right of way that gives first priority to transit use during peak periods; and, that is owned by a designated grant recipient, under the operational control of a designated grant recipient, or, where a designated grant recipient enters into a long term lease agreement (25-years or longer) with a State to provide public transportation for a project that receives funding under section 5309."

Creating a Transportation Technology Center of Excellence

What is a Transportation Technology Center of Excellence?

Centers of Excellence can be found in many fields, and refer to shared facilities, programs, or teams that provide leadership, best practices, research, support and/or training for a particular discipline. The State of Florida currently funds eleven Centers of Excellence at universities across the state, encompassing fields as diverse as Optics, Alternative Energy, Aero-Propulsion, Regenerative Health Biotechnology, and Hurricane Response.

Establishing a Transportation Technology Center of Excellence located at Florida Polytechnic University would enable students to gain real world experience and institutional knowledge in the Transportation sector, developing the much-needed skilled labor to design, improve, and manage Florida's future transportation system.

A Center of Excellence devoted to transportation would expose students to both public and private sector agencies and integrators. It would provide a facility and program that encourages transportation technology integrators to demonstrate and test their applications and equipment. Furthermore, it would support concurrent test implementations for Vendor Demonstrations, Proof of Concept, and detailed testing. Finally, the Center would provide a test-bed for ongoing research regarding the Florida Department of Transportation's toll systems – both those currently deployed and new technologies and configurations.

Examples of activities that would be pursued at a Transportation Technology Center of Excellence include:

- Research on transportation technology, tolling, congestion management, materials science, etc.
- Development and testing of Autonomous Vehicle Program initiatives
- ITS equipment testing within a tolling test track with detectors, signage, weather, enforcement, monitoring, etc.
- Materials-testing labs for individual toll and ITS components such as cameras, detectors, etc.
- Development of software for transportation, from testing dynamic pricing algorithms to developing mobile applications for toll customers or AV/CV work
- Conceptual R&D into a BYOD (Bring Your Own Device) Multi-Modal Transportation Network
- Simulators for testing drivers and focus groups for transportation concepts such as signing
- "Research Garage" for building and testing larger scale concepts for automobiles
- Sponsorships / Partnerships with government and private industry

Why do we want a Transportation Technology Center of Excellence?

- **Facilitating testing of new technologies, new software, firmware, and hardware releases**

  Live testing often means interruptions to traffic and employees at operational toll facilities. *The Center would provide both controlled, lab-type environments and simulators for testing that would produce road-ready technologies and practices*. Improved transportation techniques would be made available for use across the state faster and more effectively.

- **Increasing recruitment of the best of the best to work on FDOT projects**

  A program of this caliber puts the spotlight on a given field for top students, ones who might not have previously considered transportation as a career. *A Transportation Technology Center of Excellence would develop and groom the next generation of transportation professionals.* It would encourage professional interest in transportation-technologies disciplines, expose students to the vendor marketplace, foster knowledge transfer and provide real-world experience in the field.

- **Fostering diversity of viewpoints and innovation concepts by including academia in the tolling industry.**

  Through its university setting, a Transportation Technology Center of Excellence would *take advantage of a wide variety of academic research and multi-disciplinary approaches*. Furthermore, existing Centers of Excellence have demonstrated that the impact on a field draws on sources beyond the boundaries of the home state through input from other state DOTs and industry.

What are the steps needed to bring about a Transportation Technology Center of Excellence?

- **The Florida Department of Transportation is working closely with Florida Polytechnic University to establish the program for the Transportation Center of Excellence. The program is anticipated to take shape in 2015.**

Improving Measures to Prevent Wrong-Way Driving (WWD)

What is involved in preventing wrong-way driving?

According to the National Transportation Safety Board (NTSB), one of the most serious types of highway accidents involve collisions caused by vehicles traveling the wrong way on high-speed divided highways (see NTSB 2012 "Wrong-Way Driving" report in appendices or found at http://www.ntsb.gov/safety/safety-studies/Documents/SIR1201.pdf).

This topic has become one of growing concern in Florida. For example, in February of last year, the Florida Department of Transportation (FDOT) requested that Districts conduct WWD treatment inventory (see "Wrong Way Driving FDOT District 7 Actions" presentation in appendices or found at http://members.teamfl.org/files/FDOT%20D7%20Wrong%20Way%20Findings%20%20Actions%20Oct%202014.pdf) and also began a series of pilot projects to test new approaches to preventing wrong-way driving on state roads (see article from FDOT's March 2014 newsletter in appendices or found at http://www.dot.state.fl.us/trafficoperations/Newsletters/2014/2014-Mar.pdf)

In addition, the Central Florida Expressway (CFX), partnering with the University of Central Florida (UCF), has been testing deployment of wrong-way driving detection technology in its system to explore the effectiveness of certain preventative countermeasures (see article from FDOT's August 2014 newsletter in appendices or found at http://www.dot.state.fl.us/trafficoperations/Newsletters/2014/2014-Aug.pdf).

There are a number of techniques—short-term and long-term—available to address the problem of WWD on Florida ramps from access-controlled highways, including:

- **Repair and maintenance of current WWD signage and pavement markings**

  Local Traffic Operations and Maintenance offices replace and repair their current wrong-way signs and markings on an ongoing basis to address problems such as fading, incorrect orientation, visual obstruction, missing or incorrect signs, etc.

- **Improvements to WWD signage and pavement markings**

  Updates to current signage can include introducing oversized signs, wrong-way pavement arrows with raised reflective pavement markers, large overhead wrong-way sign panels added to back side of existing guide sign trusses, additional turn movement pavement marking channelization in median openings along cross roads at exit ramps to make it more difficult to make wrong-way movements, etc.

- **Introduction of new transportation technologies to detect and alert authorities to WWD events**

  Additional approaches to prevent wrong-way driving might include the installation of newer technologies such as vehicle-activated Rectangular Rapid Flashing Beacons (RRFB) or other LED blinker signs that alert wrong-way drivers with flashing signals and ITS (Intelligent Transportation System) treatments that, for example, detect wrong-way driving using microwave Doppler radar and cellular technology to notify the regional transportation management center of a wrong-way driving event. Many of these technologies are currently being tested in the field.

- **Authorize image-based WWD citation by law enforcement**

  Technology similar to that used in video tolling on all-electronic toll facilities/toll enforcement could be installed to collect images of wrong-way vehicle license plates. This would allow law enforcement—when not able to apprehend a wrong-way driver at the scene—to issue a Uniform Traffic Citation to the registered owner of a vehicle based on those license plate images. Fines and fees from the citation could be dedicated to a driver training or victim recovery program.

Why do we want to improve measures to prevent wrong-way driving?

The consequences of WWD events are terrible. Police studies indicate that 90% of WWD violators are not caught, and, when crashes occur, 63% of them are severe (fatal or incapacitating). *There have been more than 11 deaths associated with wrong-way driving in the Tampa Bay region alone over the last year*, with incidences of WWD crashes in that region occurring at a higher rate than found nationwide.

The State of Florida can increase on-road prevention of WWD through better signage and warnings to drivers as well as improved communication with authorities. The State can also increase accountability by authorizing image-based citations after the event has occurred.

What are the steps needed to improve measures to prevent wrong-way driving?

- **Work with FDOT as they evaluate and roll-out new technologies currently undergoing pilot testing for preventing Wrong-Way Driving events.**

- **Encourage the Florida Legislature and Department of Highway Safety and Motor Vehicles to evaluate the merits of permitting image-based Wrong-Way Driver Citations.**

Implement Recommendations from FTC Compensation Study

What are the recommendations from FTC Management Compensation Study?

The Florida Transportation Commission contracted with Thomas Howell Ferguson (THF), a certified public accounting firm, and MGT of America, Inc., to conduct an external market analysis regarding salary, benefits, and training of all management position classifications at the Florida Department of Transportation (FDOT). In this study, they provide independent recommendations and assessments of appropriate personnel compensation, including pay ranges and benefits for all positions (see 2014 "Management Compensation Study of the Florida Department of Transportation" in appendices).

Some of the FTC study's key findings include:

- FDOT minimum and midpoint salary ranges fall below market standards, whereas maximum salary ranges fall high, indicating that the pay ranges are too wide and not reflective of the market in which FDOT operates.
- Turnover of Florida P.E. Training participants has been relatively low in the past decade.
- Florida provides a very comprehensive Engineer-in-Training (EIT) program compared to other southeastern states.
- Overall, FDOT's P.E. Training Program's pay raise system is relatively competitive in comparison to other southeastern states.
- Demand for engineers will continue to increase with projected population growth. Florida's population is projected to grow at a higher rate than any other southeastern state.
- National average salaries of Engineer-In-Training and Engineer Interns are very competitive compared to FDOT salary averages.

According to the Bureau of Labor Statistics (BLS) salary data gathered in the FTC Compensation Study, when it comes specifically to FDOT salaries:

- On the southeastern regional level, 43% of FDOT positions fell below BLS regional market average salaries, ranging from 3.3- 34.2% below the market average.
- On a statewide basis, 56% of FDOT positions fell below BLS market average salaries, ranging from 2.3 - 44.3% below the market average.
- On a national level, 66% of FDOT positions fell below BLS market average salaries, ranging from 0.1- 60.3% below the market average.

The FTC study made <u>three</u> primary recommendations:

1. Utilize a more customized salary range template as a guide in hiring and promoting staff to more closely align to general transportation industry sector salaries.
2. Consider providing a significant salary increase to the Secretary of Transportation position. The FDOT Secretary's salary is significantly below BLS and private industry reported salaries.
3. Consider increasing the starting salary of the P.E. Trainees to at least the value equal to the average paid by other southeastern states. This increase would increase P.E. Trainee salary by approximately $652 to $45,406.

<u>Why do we want to implement the recommendations from FTC Management Compensation Study?</u>

- **To attract, retain, and motivate the best possible workforce**

  You get what you pay for. Employers compete for talented employees, and use compensation as one of the tools to attract the best workers. As Florida's economy continues to improve, *many of FDOT's most talented and effective personnel will be lured to the private sector or take positions with other transportation agencies that offer superior compensation*.

- **To maintain the stability and productivity of the Department**

  "Talent drain" has a serious negative impact on the Department. *Turnover among FDOT employees results in the need for additional training, more employees to produce the same output, disruptions and delays to projects, and overall diminished speed and quality of performance.* Furthermore, studies indicate that there is a connection between workers who report that they are "highly satisfied" with their compensation and their productivity. In short, it is less expensive to keep the best employees than to attract and train new personnel.

<u>What are the steps needed to implement the recommendations from FTC Management Compensation Study?</u>

- **Encourage the Florida Department of Transportation and Office of the Governor to give the FTC Management Compensation Study favorable consideration.**