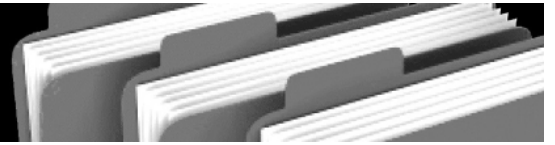




## SECTION 7. OTHER INFORMATION



# Transportation and Traffic Engineering Services City of DeBary, FL

**Traffic Engineering Data Solutions, Inc. (TEDS)** has been fortunate to provide transportation engineering services for the City within which our offices reside, the City of DeBary. Our services have ranged from traffic impact analysis review to improvement concept development to citywide transportation analyses and also include the development of engineering plans for roadway improvements.

Our working relationship with the City began when we were tasked to prepare a Citywide transportation analysis to forecast the projected operating conditions of critical roadway segments and intersections with the addition of trips from recently approved developments. The identified deficiencies within the study enabled the city to anticipate concurrency challenges for upcoming development. As a result, the City was able to develop and collect proportionate-share contributions for improvements to the US 17/92 at Highbanks Road intersection.



### Left-Turn Movement Exiting Site

- Current configuration (STOP control)
  - Signage to prohibit movement
  - Would likely be ignored
  - Safety concerns with driver expectation
- If prohibited, would create U-turns at US 17/92 intersection
  - Advisory affects intersection capacity
- Roundabout
  - Will not accommodate semi-trucks "to/from" the east and "from" the west (only allows "to" the west)
  - Will accommodate fire trucks in all movements

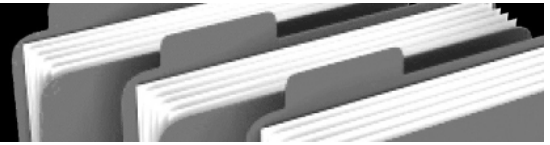
Another critical area identified was the US 17/92 at Fort Florida Road intersection, where turn-lane needs were anticipated in the Citywide study. **TEDS** prepared engineering plans for turn-lane improvements at this intersection. Given that FDOT was simultaneously preparing the engineering plans for a new signal at this intersection, our design team had extensive coordination with the FDOT to ensure plan consistency, recognizing the construction timing would play a critical role in the design efforts. Further, through expediting the design of these improvements, the City was able to work with the Rivington Development and require the development to take on the nearly \$1,000,000 construction of the improvements to mitigate the development's traffic impacts to this intersection.

In 2019, a sales tax initiative was being presented to Volusia County residents. **TEDS** assisted the City in the visioning of various transportation-related improvements and subsequently developed improvement concept diagrams and cost estimates to help the City staff convey, to their elected officials and residents, potential projects and costs should the sales tax become reality. While the sales tax was voted down, the improvement efforts have carried forward as TEDS is currently working with the City and the Volusia County School Board on the development and refinement of access-related improvements for DeBary Elementary School to mitigate operational challenges on Highbanks Road created by the school's lack of onsite vehicular storage during parent drop-off/pick-up times.

**TEDS** has provided a few other services including a presentation to City Council members on speed zoning, an access assessment (including roundabout evaluation) at the driveway for the recently constructed Wal-Mart to address resident concerns, review of the TPO's roundabout feasibility study at the US 17/92 at Dirksen Drive intersection, and the preparation of three-lane and four-lane improvement concepts for Dirksen Drive.



## SECTION 7. OTHER INFORMATION



### Design and Permitting Services for LAP Projects

#### *City of Port Orange, FL*

The City of Port Orange selected **Traffic Engineering Data Solutions, Inc. (TEDS)** for this contract which included the design, permitting, and bidding-assistance on multiple Local Agency Program (LAP) sidewalk and shared use path projects.

This contract included the addition of a shared use recreational path along 5,239 feet of Spruce Creek Road, a rural section 2-lane roadway. A 10-foot wide concrete pathway was proposed. The pathway was designed to meander in and out of trees and other existing obstacles to maintain the appropriate vertical and horizontal clearances from lateral obstructions, with extensive pruning of tree limbs and roots required. Plans preparation included preparation of two (2) typical sections and plan views that incorporated the required drainage improvements, as well as the required signing and pavement marking improvements and erosion control measures. With the City's standard bid package



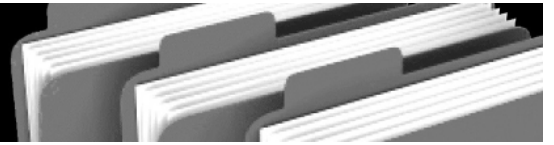
template in flux, **TEDS** collaborated with the City's Attorney's office and Purchasing Division to compile a bid document package that incorporated both the City's current bidding preferences, and at the same time, met all of the requirements for federal aid contracts. **TEDS** provided assistance to the City through bidding of the project, including responding to bidder questions, providing certified bid tabulation, and attending the pre-construction meeting.

This contract also included improvements to the Clyde Morris Boulevard/Herbert Street intersection. This project was inadvertently excluded from the bundle of other LAP projects that were authorized in the contract. Unfortunately, the City found themselves falling behind in the schedule previously committed to FDOT. Given the extensive relationships that Mr. Ferrell had with the LAP personnel at District 5, **TEDS** was able to shave off several months on the schedule, and enabling the project to stay in the Work Program. Reconstruction of the existing curb ramps at the intersection was required to comply with the American with Disabilities Act (ADA), and modification of the existing traffic signal was required for the addition of current pedestrian signalization equipment. Plans preparation included a typical section and plan views that delineated areas of proposed milling/resurfacing and new full depth asphalt construction, which incorporated the required erosion control measures, though a designated SWPPP Notes sheet was also developed to incorporate the other requirements of NPDES. Permitting services included obtaining a Verification of Exemption from ERP from the SJRWMD, as well as a Right of Way Use Permit from Volusia County for connection to Clyde Morris Blvd. (CR 483) at the intersection. **TEDS** prepared the LAP Checklist and provided a complete project manual containing bidding requirements and contract documents, incorporating both the City's current bidding preferences, as well as the requirements for federal aid contracts.

**TEDS** provided assistance to the City through bidding of the project. **TEDS** designed two other sidewalk projects, one extending along McDonald Road adjacent to Sugar Mill Elementary School. The other sidewalk project extends along Victoria Gardens Boulevard adjacent to Sweetwater Elementary School.



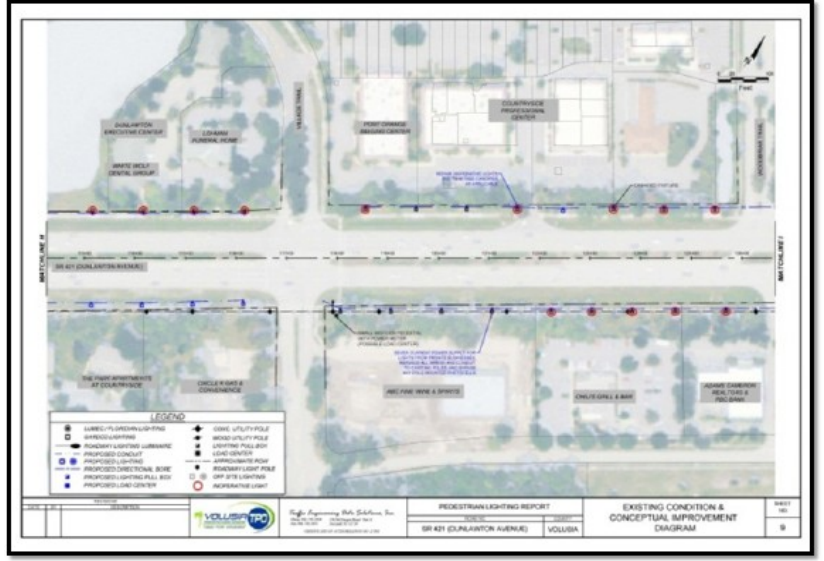
## SECTION 7. OTHER INFORMATION



### Traffic Operations Studies and Transportation Engineering (*River to Sea TPO*)

Under this contract, **TEDS** served the River to Sea TPO by working on traffic engineering studies/projects such as project justification, feasibility analysis, operational analysis, traffic distribution, diversion analysis, emergency pre-emption evaluation, ITS design and implementation studies, and new roadway design.

**TEDS** completed a County-Wide Traffic Signal Emergency Pre-Emption System Study which required extensive coordination and collaboration amongst the various emergency service groups within Volusia County. Ultimately, a GPS system was recommended and was subsequently implemented by South Daytona and is currently under implementation in New Smyrna Beach.



In the City of Port Orange, **TEDS** completed a Pedestrian Lighting Concept Report on State Road 421. Lighting along the corridor was installed and is maintained by numerous different property owners, resulting in inadequate/inconsistent lighting. Thus, the study was conducted to help the City better understand the current conditions and the potential costs associated with taking over ownership and operational/maintenance responsibility.

Within Volusia County are several small communities that lack expertise relative to the pursuit of federal funds through the Local Agency Program (LAP) as well as the management of projects where federal funds are involved. On behalf of the VTPO, **TEDS** assisted the community of Pierson to become LAP certified for a sidewalk project. Then, **TEDS** acted as the Project Manager through the preparation of the engineering plans.

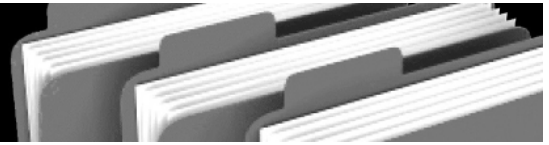
The River to Sea TPO also utilized this contract to have **TEDS** conduct intersection improvement feasibility studies at the US 1/Turgot Avenue (Edgewater) and SR 421/City Center Parkway (Port Orange) intersections. These studies include data collection, evaluation of crash history, and field reviews/qualitative assessments. From there, improvement recommendations and concepts are developed taking into account such items as drainage considerations, utility impacts, and right-of-way constraints. Subsequently, cost estimates are prepared for each of the improvements.

**TEDS** also prepared a pedestrian safety evaluation for more than four (4) miles of South Atlantic Avenue in the City of Daytona Beach Shores. The study included conducting pedestrian counts corridor-wide, field observations, and a review.





## SECTION 7. OTHER INFORMATION



### Continuing Contract for General Planning Services

#### *City of Orange City, FL*



On the basis of our long-standing continuing services contract with the City of Orange City, **Traffic Engineering Data Solutions, Inc. (TEDS)** routinely provides development review assistance on behalf of their Development Services Division and Public Works Department, in both traffic engineering and civil engineering disciplines. In addition to review of private development projects, we also commonly serve in capacity as their City Engineer at the regular meetings of their Technical Review Committee (TRC). On a daily basis, the City truly relies on both **Chris Walsh, PE** and **Mike Hale, PE** to be an extension of their staff. Realizing that TRC comments prepared by **TEDS** will be a direct reflection on the City's development review process from the developer's point of view, we ensure that comments are thorough, yet easily comprehended by applicants, providing the most opportunity for successful revision to address the issues raised.

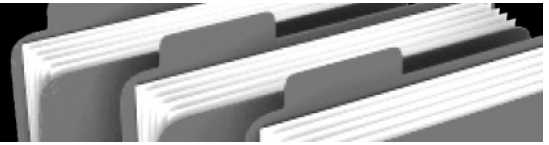
**TEDS** provides assistance with a wide variety of development applications received from private applicants, including Comprehensive Plan Amendment, Rezoning, Conditional Use, Site Plan, Subdivision Plat, Stormwater Management Permit, etc. Civil engineering services commonly provided to the City include comprehensive review of master plans and development agreements for projects in the early stages of entitlement, but we also provide extensive review of construction plans and calculations for site plans or subdivisions, addressing all aspects of design, such as horizontal layout, roadway design, signing and pavement markings, stormwater design, erosion control measures, utility design, hydraulics for distribution systems or lift stations, etc. In addition to ensuring private project designs comply with minimum code requirements, we also keep watch for opportunities to have Citywide infrastructure components enhanced by projects that may also benefit from joint participation, such as upsizing of distribution mains for potable water or reclaimed water, or intersection improvements that provide operational enhancement.

The City has also utilized this contract to have **TEDS** provide assistance with review of Traffic Impact Analyses (TIAs) for new developments ensuring they conform with the River to Sea TPO's TIA guidelines, as adopted by Orange City. Upon the identification of deficient roadways/intersections, **TEDS** has assisted the City with negotiating proportionate-share calculations and mitigation plans to address development impacts, resulting in the extension of critical turn lanes, the four-laning of a major collector through the City (Veterans Memorial Parkway), and the implementation of pedestrian enhancements.





## SECTION 7. OTHER INFORMATION



### Consulting Services for Professional Traffic Engineering and Transportation Planning *Volusia County, FL*

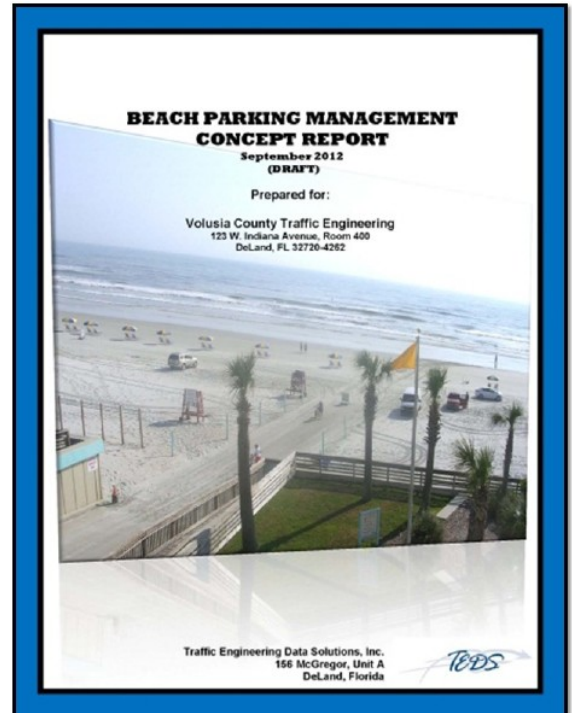
Over the course of this contract, **Traffic Engineering Data Solutions, Inc. (TEDS)** has conducted various transportation engineering and planning tasks per the County's request. In response to pedestrian concerns along South Atlantic Avenue in the New Smyrna Beach, **TEDS** prepared engineering plans for three pedestrian signals. More than, **TEDS** also developed parking restriction guidance for the County relative to midblock crosswalks. Ten (10) signal designs have been prepared for the County including Saxon Boulevard/Enterprise Road which required extensive coordination with the power company due to extensive impacts with overhead lines.

In response to growing concerns regarding Volusia County's unique challenges to beach access and parking, **TEDS** conducted a feasibility study relative to beach parking management signage, including the use of dynamic message signs along seven key corridors. This study required field evaluation of potential sign locations, conceptual improvement diagrams, and cost estimates.

**TEDS** assisted the County with addressing a sight distance concern pertaining to a new major improvement on Pioneer Trail. This evaluation required a tailored approach to understand how vehicles traveling in opposing directions influence visibility.

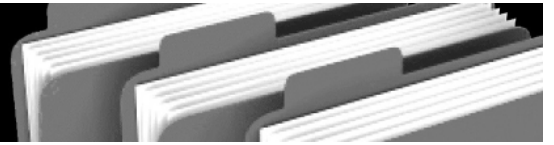
From a transportation planning perspective, **TEDS** assisted the County with the 2040 Long Range Transportation Plan process by reviewing, for the County, socioeconomic data for the regional travel demand model and comparing the information to existing uses. Separately, **TEDS** has reviewed several TIAs to tailored a proportionate-share calculation spreadsheet that can be used for future TIAs.

**TEDS** conducts the annual traffic counts for the County, which encompasses more than 430 locations. Other projects have included an intersection / roundabout analysis at Tomoka Farms Road and Pioneer Trail, providing construction engineering inspection for the installation of fiber-optic cable on Dunlawton Avenue and a traffic signal on State Road 400, an access evaluation for Spruce Creek High School, a residential community traffic control plan for the Westchester-area neighborhood in western Volusia County, and evaluations of four schools zones including DeBary Elementary School, Easter Seals Charter School and Enterprise Elementary.



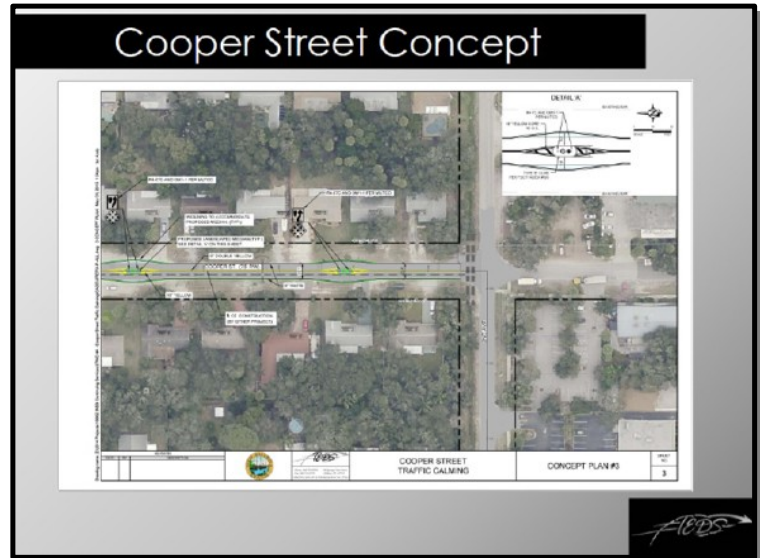


## SECTION 7. OTHER INFORMATION



### Continuing Services for Traffic Engineering City of New Smyrna Beach, FL

Under this particular contract, the City of New Smyrna Beach has called upon **Traffic Engineering Data Solutions, Inc. (TEDS)** to provide various traffic engineering services. **TEDS** has provided traffic impact analysis review assistance for numerous developments. Our familiarity with the River to Sea TPO's TIA guidelines as well as additional requirements in the City's Land Development Regulations enables us to provide cost-effective reviews in a timely manner focusing on the critical issues quickly such that mitigation negotiations, where required, can be expedited. Additionally, our knowledge of the local roadway network enables us to look beyond just analyses provided in a document and determine if results are logical and reasonable. This local knowledge is also critical in providing the City guidance with regard to any access-related improvements are



considerations. As with other communities that we serve, we have been successful in helping City staff understand the potential implications of various aspects of a development's impact and the options available to address such issues, as often the objective is to find a reasonable solution to which the developers are agreeable and that provide a benefit to the public. It should also be noted that **TEDS** has a strong working relationship with Volusia County and, for many of the TIAs, interacted closely to understand their concerns and develop a mutually agreed-upon strategy during the review process.

The City also utilized **TEDS** under this contract to develop a cost-effective traffic calming concept for Cooper Street (on beachside). After an assessment of various options, we presented an aesthetically appealing median-island concept and cost estimate for implementation. Following, **TEDS** prepared the engineering plans for implementation of the concept, which has since been constructed and determined to be effective. The City is now considering the implementation of the concept elsewhere in the City.

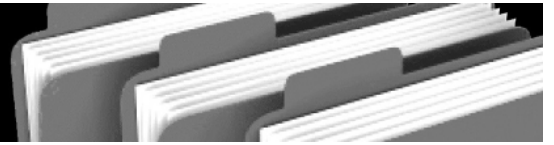
**TEDS** assisted the City with the installation of GPS opticom at 19 signalized intersections through the preparation of a Systems Engineering Management Plan (SEMP) and Risk Assessment Concept of Operations report, as required for ITS-related projects that utilize federal funding. Following, **TEDS** prepared the engineering plans for installation through FDOT's Local Agency Program (LAP), plans which were noted by reviewers at the Department to be of very high quality.

Lastly, **TEDS** prepared signing and pavement marking plans for the Marianne Clancy Park located beachfront on South Atlantic Avenue.





## SECTION 7. OTHER INFORMATION

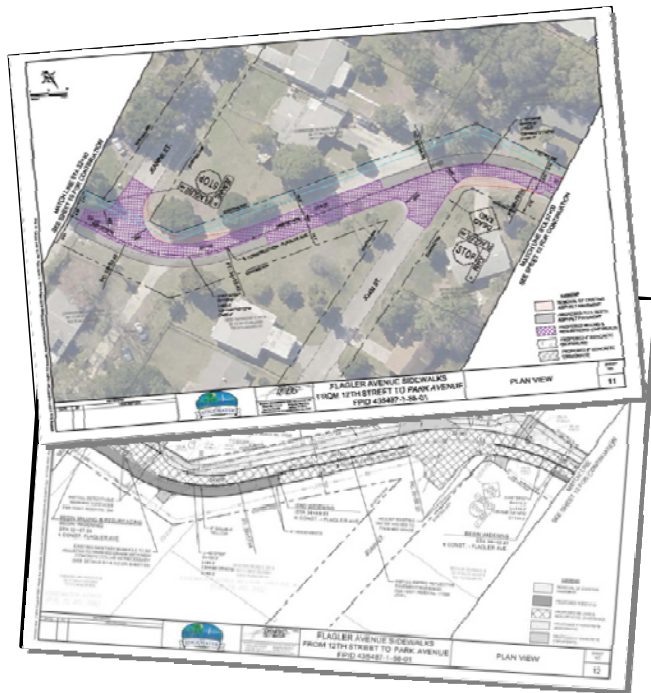


# Flagler Avenue Sidewalks from 12th Street to Park Avenue (FPID 435487-1) City of Edgewater, FL

As part of the Safe Routes to School program, the R2CTPO completed a study which identified the need for sidewalk along the Flagler Avenue corridor in the City of Edgewater, since no sidewalk had existed previously, and it is used heavily by an abundance of school children going to and from nearby Edgewater Elementary School. In 2013, a feasibility study was completed to estimate the costs associated with designing and constructing 4,900 feet of concrete sidewalk within the 50-foot wide right of way, which has 95 adjacent residential properties. As typical in the feasibility

stage for these bicycle/pedestrian projects, survey information was not available, and the study had mentioned that additional right of way may be required in a few critical areas, which can easily add years to a federally funded project. The study was finalized with a sidewalk alignment recommended along the east side of the right of way, though it seemed to us somewhat arbitrary and inferior given that the east side of the right of way hosts the City's water main utility and the predominant amount of overhead utilities within the corridor, and that it would require the installation of a closed drainage collection system for approximately 1,000 feet of the corridor.

During the Request for Qualifications process, **Traffic Engineering Data Solutions, Inc. (TEDS)** presented an alternative alignment along the west side of the right of way, which would avoid the need for approximately \$70K of proposed drainage improvements. In addition, **TEDS'** proposal included relocation of the existing roadway through the tight curves where right of way was questionable in order to make room for the proposed sidewalk, such that right of way acquisition was not required. As a result, reconstruction of the pavement section was required to shift the crown of the roadway, but it could easily be afforded without increased funding necessary, given the savings on drainage components.

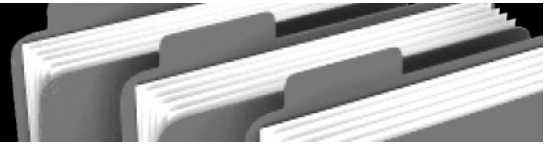


The City selected **TEDS** with Mr. Hale serving as PM/EOR to complete the design and permitting for this LAP sidewalk project. As part of our team's initial efforts, Mr. White of (PEC) had crews promptly field locate the right of way in advance of topography, so that we could prepare an accurate conceptual plan for the alternative alignment overlaid on orthographically correct aerial images obtained through our subscription to Pictometry, Inc. ®. This composite mapping enabled ESI to complete a biological site assessment early on in the process to confirm there were no issues with wetlands or protected species that might delay the project schedule unexpectedly.

A Verification of Exemption from ERP was obtained from SJRWMD, and a Volusia County Right of Way Use Permit was obtained for the connection at W. Park Avenue. Construction was completed October 2018.



## SECTION 7. OTHER INFORMATION



### French Avenue Sidewalk & Shared Use Path Segments (FPID's 435499-1 & 435538-1)

*City of Orange City, FL*

Though maintained by Volusia County, the City of Orange City identified the need for pedestrian facilities along W. French Avenue to provide sidewalk/trail connectivity between the City's primary corridor of US 17/92 and Volusia County's Spring-to-Spring Trail, to be completed in two (2) separate projects through the LAP program.

#### **W. French Ave. Sidewalk from Valentine Park to N. Carpenter Ave. (FPID 435499-1)**

Known as Little French, the first project included the design of 1.1 miles of sidewalk on French Avenue extending from Valentine Park to N. Carpenter Ave. on the north side of the right of way. Without underlying right of way maps available, Mr. White (PEC) researched underlying deeds for each of the adjacent properties to delineate the existing right of way, and prepared right of way maps meeting the acceptance of Volusia County's Right of Way Department. Mr. Brinson and Mr. Handley of ESI completed all ecological and cultural resource assessments in accordance with the requirements of federally funded projects.

Upon initially evaluating the corridor, **TEDS** noted that the widths of existing travel lanes and bike lanes varied greatly, which in many areas were greater than the values prescribed by current regulations. Typical sections were developed to standardize the widths of these lanes, offering sufficient room for the new sidewalk to be constructed as close to the existing right of way as possible. Gravity walls were required in a few locations where maximum allowable tie-slopes would've extended beyond the right of way. Drainage basin analysis was completed to identify existing drainage patterns. Though the feasibility study had grossly underfunded design fees, **TEDS** completed detailed grading models for each of the 10 intersecting side streets and 33 driveways within the corridor to ensure that the new roadside swales conveyed runoff to appropriate locations without puddling. A Verification of Exemption from ERP was obtained from SJRWMD, and a Volusia County Right of Way Use Permit was obtained for work in W. French Ave. right of way. Construction was completed in May 2018.

#### **W. French Ave. Shared Use Path from Spring to Spring Trail to Valentine Park (FPID 435538-1)**

The second project, known as Big French, includes 0.61 miles of shared-use path extending from Volusia County's Spring-to-Spring Trail to Valentine Park, with a new pedestrian bridge spanning entirely over the SunRail / CSX Railroad right of way near the entrance to Blue Springs State Park. The R2CTPO's feasibility study had conceptualized the trail on the north side of the roadway based on GIS parcel information. However, during **TEDS** team's pursuit of the project, Mr. White of (PEC) completed initial deed research and field survey verifications confirming the GIS information was not accurate, and that the south side of the right of way offered significantly more room to host a trail, which could be constructed of standard asphalt materials, as well as result in far less conflict with existing utilities. A midblock crosswalk with RRFB was introduced at the location where the new 12-foot shared use path will connect to the existing 8-foot sidewalk at Valentine Park.

**TEDS** was awarded the design contract at the end of 2017. Right of way maps prepared by PEC will serve as the basis for the City to certify right of way, as required in the LAP process. As a first priority in design, **TEDS** immediately commenced coordination with Duke Energy for relocation of their existing 230kV overhead electric transmission lines that parallel the railroad right of way, which is a substantial cost that was also not identified in the study. Specially relocation of a transmission pole is required to provide clearances to energized lines as required by OSHA, with the wires to be raised in order to provide the minimum required vertical clearance over the bridge. FDOT has accepted the final Bridge Concept Memo (BCM) and bridge design is nearing 30% completion, while roadway is nearing 90% completion.

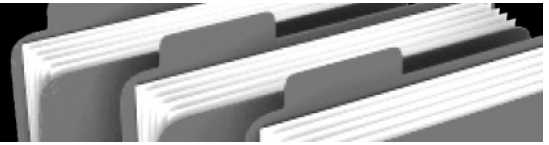
**TEDS** is currently coordinating with FDOT on the ability for this electric transmission relocation to be deemed federally participating, and the project is on-going.







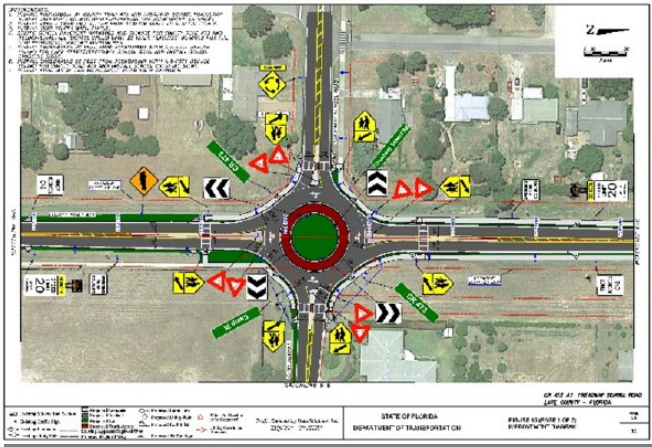
## SECTION 7. OTHER INFORMATION



### Districtwide Continuing Services for Safety Studies FDOT- District 5

As FDOT's continuing consultant, **Traffic Engineering Data Solutions, Inc. (TEDS)** has provided various consulting expertise on a broad range of safety projects. The projects include safety studies which evaluate the crash reduction potential of various improvements utilizing data obtained from the Federal Highway Administration's Crash Modification Factors (CMF) Clearinghouse. Within these studies, **TEDS** conducts an engineering assessment for the purposes of developing cost estimates which are then utilized in a benefit-cost analysis to determine if a project qualifies for federal safety funding.

Under this contract, **TEDS** evaluated the safety benefits of converting a seven-lane section of State Road 436 to a six-lane section with a raised median. This high crash section had three fatal bicycle-related crashes in the past three years. **TEDS** developed a typical section and access management concept and subsequently coordinated with District staff to obtain approval. The study concluded that the \$800,000+ improvement could eliminate seven (7) crashes per year, resulting in a significant benefit along the corridor, thus qualifying for federal safety funds. A similar access management study was conducted for a five-lane section of State Road 551 from State Road 408 to State Road 50 in Orange County, Florida.



For another corridor, State Road 482 (Sand Lake Road) in Orlando, a significant number of crashes occurred under wet pavement conditions. Upon conducting a study, it was justified that resurfacing this six-lane section and incorporating bike lanes into the resurfacing as well as pedestrian features at the signalized intersections could potentially reduce crash frequency by more than seven (7) crashes per year. Therefore, this \$2,000,000+ improvement qualified for federal safety funds.

**TEDS** has been called upon for numerous pedestrian-related projects throughout central Florida. Along State Road A1A from US 192 to State Road 518 in Brevard County, **TEDS** evaluated pedestrian crossing patterns, volumes, and crash history, ultimately developing concepts and providing recommendations for the proposed locations of midblock crosswalks. Another project included the evaluation of existing midblock crossings on a six-lane section of Orange Blossom Trail, immediately south of Interstate 4. These three existing midblock crosswalks experience a high pedestrian demand, but have also experienced several pedestrian crashes. Through multiple field visits and evaluation volume and safety data, **TEDS** recommended and developed improvement concepts and cost estimates for the installation of a pedestrian hybrid beacon (HAWK) at each crosswalk. FDOT is currently evaluating the next steps for implementation.

Other projects include the evaluation of the CR 473/Treadway School Road intersection with a history of angle crashes. **TEDS** ultimately prepared a roundabout concept which is being considered for implementation by Lake County.

**TEDS** also prepared studies and engineering plans involving audible pavement markings which have been shown to significantly reduce road-departure crashes on rural roadways. Additionally, **TEDS** conducted a preliminary safety evaluation regarding a road-diet conversion of a section of Amelia Avenue in DeLand.