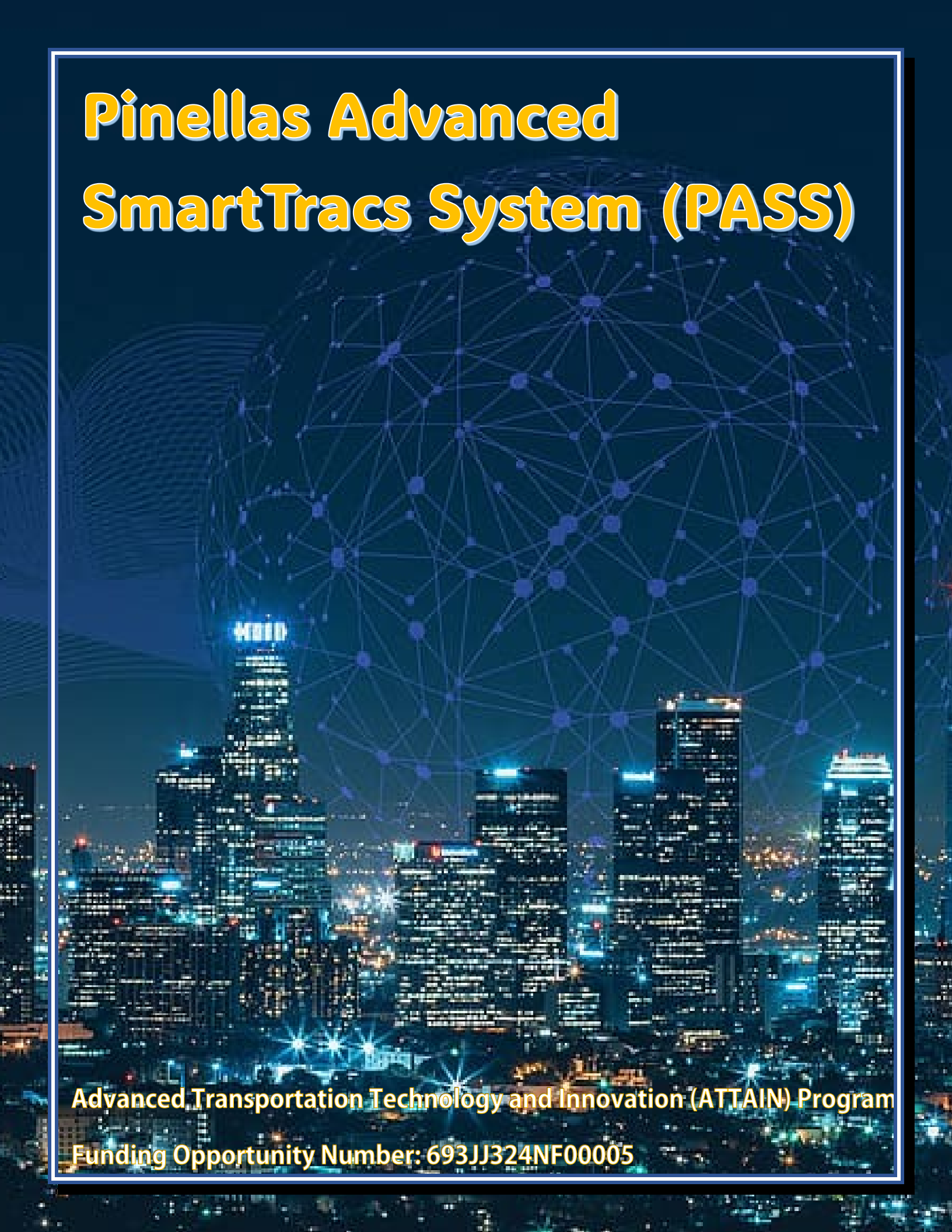
Pinellas Advanced SmartTracs System (PASS)



Advanced Transportation Technology and Innovation (ATTAIN) Program

Funding Opportunity Number: 693JJ324NF00005

Cover Page

• Project name	Pinellas Advanced SmartTracs System (PASS)
• Eligible entity applying to receive Federal funding	Pinellas County, FL
• Total project cost (from all sources)	$8,333,620.00
• ATTAIN requested funding	$2,000,000.00
• Are matching funds restricted to a specific project component? If so, which one?	Yes – Equipment and materials
• State(s) in which the project is located	Florida
• Is the project currently programmed in the: Transportation Improvement Program (TIP), Statewide TIP (STIP), MPO, Long Range Transportation Plan, and/or State Long Range Transportation Plan?	TIP = Yes STIP = Yes MPO LRTP = Yes State LRTP = Yes
• Technologies proposed to be deployed.	• Axilion X Way AI timing plan optimization software • DERQ AI Platform with connected infrastructure and traffic sensors • Lyt - Transit Signal Priority – Cellular Communications • Kapsch – Connected Vehicle Roadside Units
• Will the project have connected vehicle technologies?	Yes
• Will the project have automated vehicle system technologies?	Yes
• Is the project located in a rural area?	No

Table of Contents

List of Figures

List of Tables

List of Tables – Volume I

List of Tables - Volume II

Volume I

Technical Application

Project Narrative

Proposed Project Summary

The Pinellas Advanced SmartTracs System (PASS) project is proposing the use of Artificial Intelligence technology to solve some of the county's most congested, dangerous, and heavily disadvantaged corridors using AI technology to optimize signal timing plans, improve safety through smart sensors and detection systems for predictive analytics, increase transportation reliability through transit signal priority (TSP), and enhance transportation communication through Connected Vehicle (CV) Roadside Units (RSU).

Introduction

Pinellas County and its partners recognize the need to leverage technology and innovation to support the region's growing transportation needs. Improving safety, mobility, and reliability requires cooperation between the agencies who operate and manage the regional transportation network and the residents, commuters, commercial vehicle operators, and tourists who want to benefit from all the area has to offer.

Over the past decade, Pinellas County has adopted a proactive approach to traffic management and has worked with its partners to develop a strong core framework of institutional coordination, standardized operational procedures, and technical integration. The county proposes the Pinellas Advanced SmartTracs System (PASS) project application to leverage AI to expand on the efforts previously performed through the Advanced Transportation and Congestion Management Technologies Deployment Initiative (ATCMTD) funded Pinellas County Smart Community: Connected Community for Safety and Mobility project. PASS solutions include:

- Signal Timing Optimization using AI timing plan optimization software
- Vehicle, Pedestrian and Bicycle Detection
- Transit Signal Priority (TSP)
- Emergency Vehicle Preemption (EVP)
- Traffic and Safety-Responsive Signal Operation
- Blank-out Sign Activation
- Adaptive Streetlight Brightness
- C-V2X Messages and Alerts
- IoT Data Exchange
- Safety and Traffic Insights

To continue to maintain and grow the economic vitality and to improve the movement of people and goods and ensure the safety of the increased volume of the traveling public, it is critically important to deploy these next-generation transportation management and operations platform. Meeting these goals and objectives not only corresponds with the administrative priorities and goals of the Advanced Transportation Technology and Innovation (ATTAIN) Program, but it also addresses the escalating pressures in a continuously sought after hub for people, places, and their goods.

Pinellas County is included in the Tampa-St. Petersburg-Clearwater Metropolitan Statistical Area (urban area) along with Hillsborough and Pasco Counties. The total population of the urban area is 3,091,399 (2016), 18th largest in the United States. The county earned accolades for the home to #1 Beach in the South by USA Today for Clearwater Beach, and #1 Beach in the U.S. and #5 in the world by TripAdvisor for St. Pete Beach. The county sees nearly one million residents and an additional 15.5 million seasonal residents and tourists (2017) each year. This is reflected as the population density of Pinellas County is the highest of all counties in Florida.

The increasing density and attraction of Pinellas County has created stressors along the transportation network resulting in degradation in mobility and safety being adversely affected. There are considerable increases in travel times and delays, vehicular crashes, and pedestrian and bicycle incidents. A countywide assessment of the county's transportation network yielded the following results:

- Pinellas County is recording **nearly six times the national average fatalities seeing 62.14 fatalities per 100,000 people**, consequently ranking the Pinellas County region as the 4th highest metro area for pedestrian and bicycle fatalities according to Smart Growth America's Dangerous by Design 2022 edition.
- There are approximately 22,320,234 daily vehicle miles traveled[1];
- Over capacity road segments have increased since 2020 from 14% to 21%[2];
- Sixteen percent of the monitored network performs poorly at Level of Service E or F[2];
- Transit ridership totals 10.4 million annually; 33,158 average weekday[2];
- Thirty-nine percent, or 368.3k persons, reside within the Disadvantaged Census Tracts in Pinellas County[3].

Project Location

Pinellas County, a county located along the Gulf coast of Florida, is home to a culturally and economically diverse population, offering a vibrant employment base, and many local attractions and points of interest. Growth in the local population combined with a steady increase in seasonal tourism identifies Pinellas County as the densest county in the state of Florida with 1,521.1 population per square mile[4]. Pinellas County experiences severe traffic pattern fluctuations from Tampa towards Clearwater Beach and St. Petersburg, especially during the spring break months, and during regular commuter traffic. Visitors to Clearwater Beach have

[1] https://forwardpinellas.org/document-portal/level-of-service-report/?wpdmdl=47559&refresh=659413f5224801704203253&ind=16939273307671&filename=2023_LOS_Report_final.pdf
[2] https://www.psta.net/about-psta/history-and-facts/
[3] USDOT Equitable Transportation Community - https://experience.arcgis.com/experience/0920984aa80a4362b8778d779b090723/page/ETC-Explorer---State-Results/
[4] http://www.usa.com/rank/florida-state--population-density--county-rank.htm

reached record numbers and continue to grow each year, resulting in an increase in traffic congestion and crashes.

With the county's increasing population, the prioritization of PASS project locations included an assessment of the county's transportation network, considering factors such as level of service, safety, transit priority, disadvantaged populations (**Figure 1**), and evacuation routes (**Figure 2**).

The prioritized assessment makes up the PASS demonstration corridors (**Figure 1**):

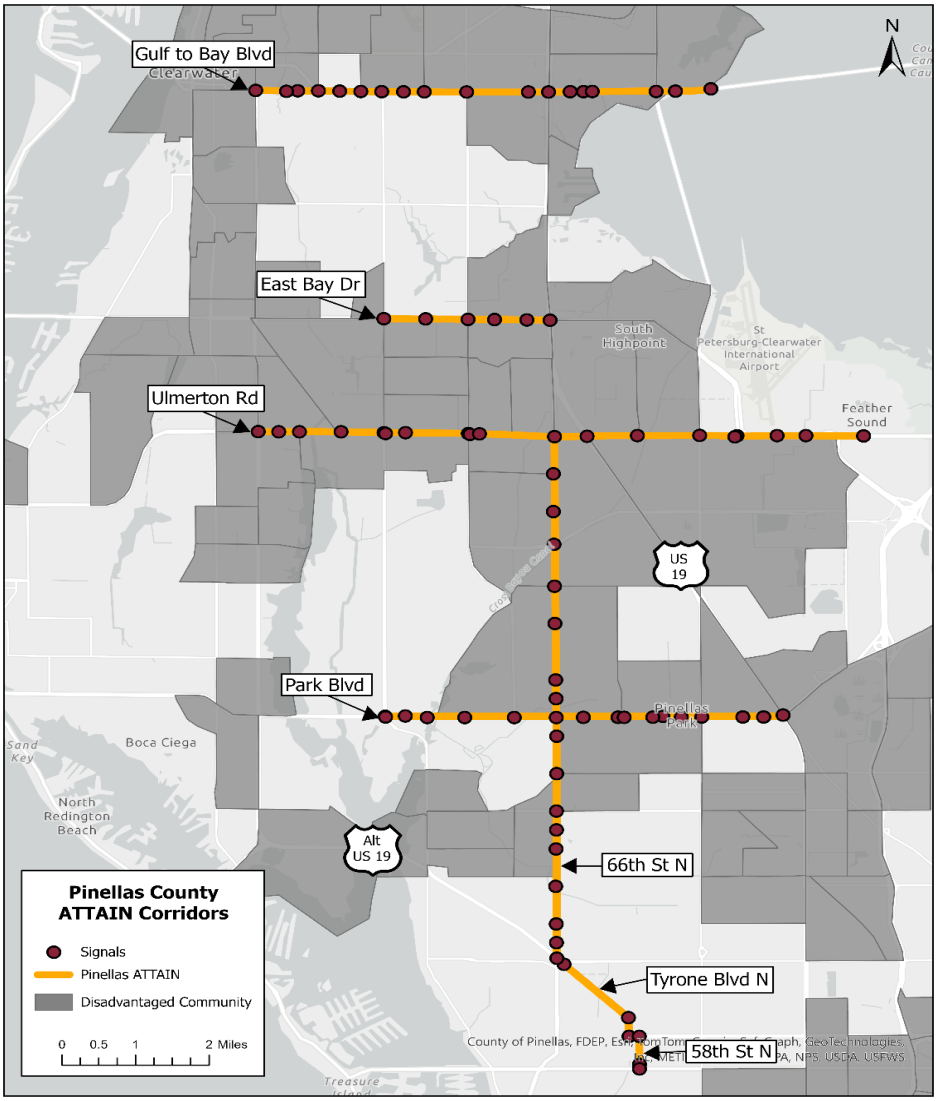


Figure 1: Project Location

1. SR 60 (Gulf to Bay Boulevard) from US 19/Missouri Avenue to Patel Boulevard
2. Ulmerton Road from US 19/Missouri Avenue to Feather Sound/Carillon Parkway
3. Park Boulevard from Starkey Road to US 19;
4. E Bay Drive from Starkey Road to US 19;
5. 66th Street N from Tyrone Boulevard to Ulmerton Road;

6. Tyrone Boulevard from 58th Street to 66th Street N; and,
7. 58th Street from Central Avenue to Tyrone Boulevard.

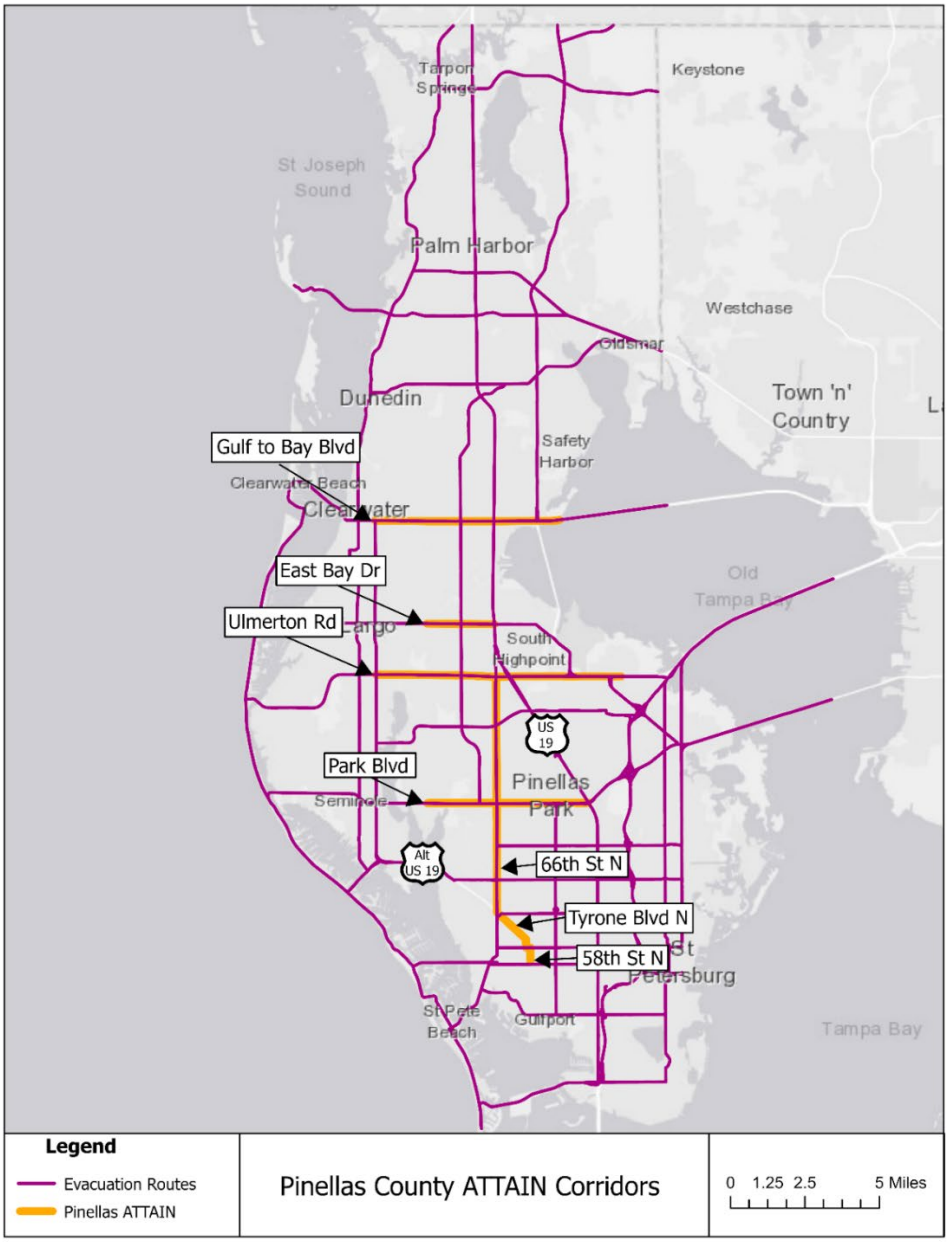


Figure 2: Pinellas County ATTAIN Corridors and Evacuation Routes

Description of Transportation Systems and Services

Pinellas County's proposal for the ATTAIN federal grant encompasses a comprehensive cloud-based artificial intelligence multi-modal transportation systems management and operations system. The PASS project addresses the county's growing challenges through the integration of advanced technologies. The key components include Axilion X Way, DERQ AI Platform, Lyt,

and Kapsch RIS-9x60 V2X Roadside Units (RSU). **Figure 3** highlights the existing Pinellas County Smart City System Architecture including the proposed PASS technologies.

PASS will leverage Pinellas County's existing Smart City technology infrastructure. The new systems, in turquoise and green, will either provide information to the traffic signal controller at the intersection or to the Centracs central system at the PCC. The end result will be improved traffic signal operations in real time and improved signal timing and coordination resulting in less delay and fewer crashes. The PASS architecture diagram, below, depicts existing Smart City infrastructure and how the hardware and applications included in PASS will connect to it. This PASS architecture will inform definition of information flows between system elements. The ConOps and the System Requirement documents will define and incorporate the information flows during systems engineering analysis.

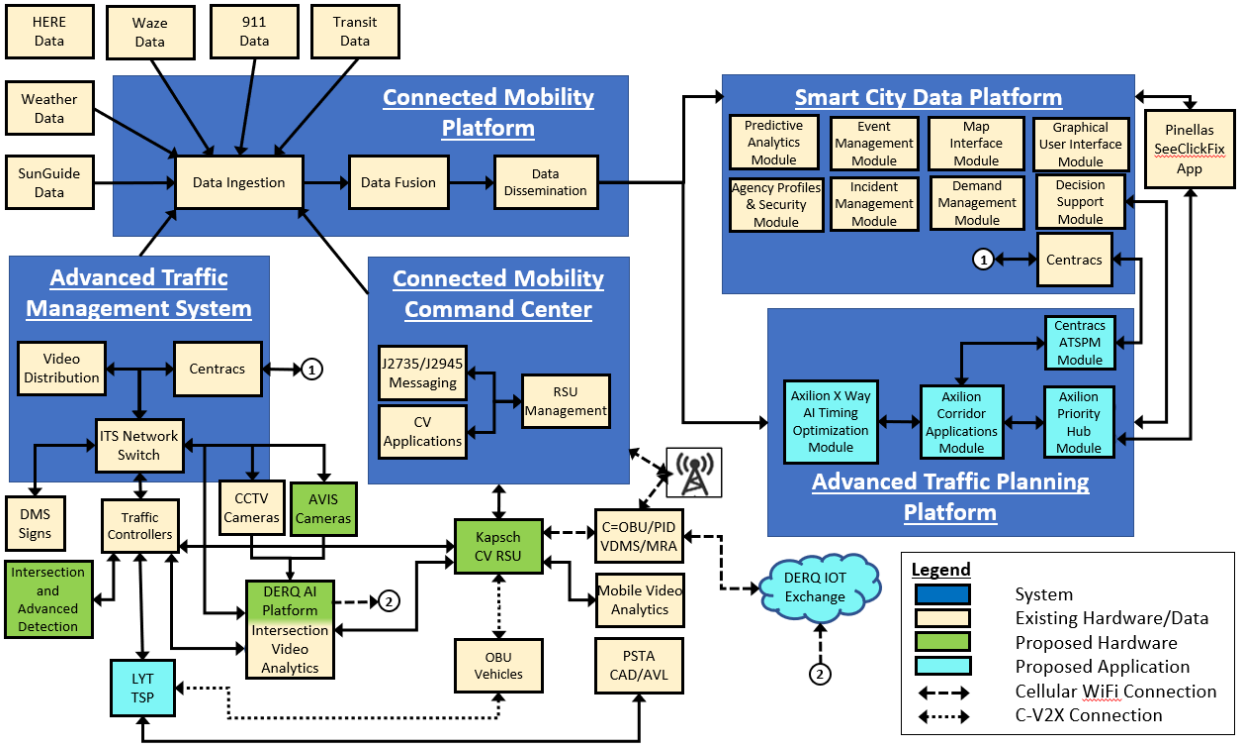


Figure 3: System Architecture

Axilion X Way: Axilion X Way is an AI Cloud Services (SaaS) system (see Figure 4) designed to generate real-time traffic insights and optimized traffic plans without requiring additional hardware. The system focuses on urban multimodal travel, safety, and carbon emission reduction. Its features include automated traffic health indications, deep reinforcement learning for continuous mobility optimization, and resource savings without costly infrastructure changes.

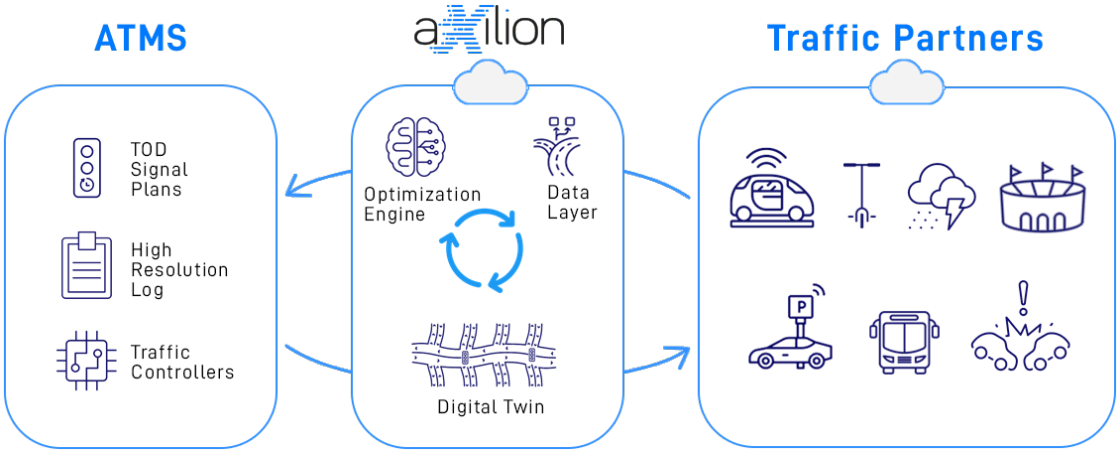


Figure 4: Axilion Structure

DERQ AI Platform: DERQ's AI Platform (see Figure 5) integrates with infrastructure and traffic sensors, offering applications such as pedestrian phase activation, flashing pedestrian signs, and vehicle alerts based on predictive AI technology. The solution deploys edge processing units along with roadside infrastructure, utilizing panoramic video cameras for accurate object detection. DERQ's Edge unit also controls alerting systems for pedestrian crossings, enhancing safety through real-time data infusion. Sample applications include:

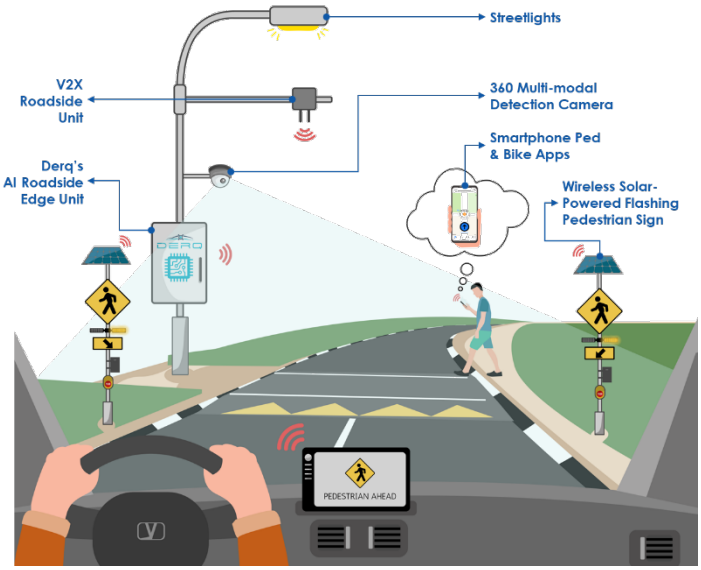


Figure 5: DERQ Technologies

- Deployment dashboard
- Incident reports with video recording
- Illegal crossing trajectories
- Near-Miss Heatmap and Analysis
- Vehicle Counts and Classification Reports
- Turning Movement Counts

Applications enabled by the solution include:

- Placing a call within a traffic signal controller to activate the desired pedestrian phase by utilizing the data generated from the fusion of passive pedestrian detection, behavior prediction and a smartphone application.
- Activating flashing pedestrian signs (such as RRFBs) at mid-clock crossings for an approaching pedestrian by utilizing the data generated from the fusion of passive pedestrian detection, behavior prediction and a smartphone application.

- Alerting approaching vehicles both audibly and visually of pedestrian or cyclist presence based upon a potential conflict prediction made possible by the broadcasting of C-V2X messages such as Basic Safety Messages (BSMs) and Personal Safety Messages (PSMs) generated by the fusion of passive pedestrian detection, behavior prediction and a smartphone application. Vehicles can also be alerted through the integration of the solutions data with popular navigation apps or CV platforms, such as Waze, Google Maps or OnStar.
- Alerting pedestrians and cyclists using a smartphone application at crossings of approaching vehicles based upon a potential conflict prediction made possible by the fusion of advanced vehicle detection, behavior prediction and C-V2X messages (BSMs) broadcasted by the vehicle.
- Increasing the brightness of streetlights around crossings for an approaching pedestrian by utilizing the data generated from the fusion of passive pedestrian detection, behavior prediction and a smartphone application.

The DERQ solution on edge processing units placed along with the roadside infrastructure to run its Platform and integrate with new or existing off-the-shelf network cameras at the target intersections or crossings.

Derq Roadside Edge Unit

The Derq AI Perception and Connectivity Roadside Edge unit is a ruggedized module embedding powerful compute with machine learning processing capabilities to run real-time aggregation and fusion of data from different sources such as traffic sensors, signal controllers and connected infrastructure. The Edge unit is designed to be hardware-agnostic for flexible industry-standard integration with a wide range of traffic sensors, signal or RRFB controllers (through NTCIP over SNMP, SDLC, Digital I/O, Contact Closures, etc.) and RSUs. The Edge unit can connect with surrounding devices through ethernet, serial or wireless communication.

Cameras

The sensors proposed for this solution are panoramic video cameras (360 degrees field of view) with high-definition image quality and dynamic range allowing the AI algorithms to detect objects with higher accuracy and to extract more details from a specific scene (thus detecting more classes) than industry-standard systems while extending the detection range significantly (to over 300ft). The video camera also has infrared sensors giving the system great low-light and night-time detection capabilities. The camera is rated for outdoor installations, withstands wide temperature ranges and is protected against dust and corrosion.

Alerting Systems

Derq's Edge unit also uses its AI-powered road user detection and behavior prediction outputs to control the different alerting systems around pedestrian crossings, including V2X Roadside Units, Rapid Flashing Beacons and in-road warning lights controllers or streetlight brightness controllers.

The control algorithms can activate or deactivate an alert and can control the time an alert can remain active. An alert can be configured to remain active for a predetermined time, or if a

pedestrian is detected. The edge unit can connect to an activation device through a network or serial connection, or a contact closure.

Lyt: Lyt is a cloud-based transit signal priority and emergency vehicle preemption system that optimizes traffic flow. It ingests data from existing CAD/AVL systems and enhances safety by examining pedestrian walk intervals and utilizing machine learning. Lyt improves on-time transit performance, reduces fuel consumption and emissions, and contributes to building resilient communities. It is interoperable, providing real-time insights and coordination among multiple signals.

69% **INCREASE IN AVERAGE EMERGENCY VEHICLE SPEED**	**0:42 sec** **AVERAGE REDUCTION IN INCIDENT TRAVEL TIME**	**0** **ADDED FIELD HARDWARE**

Kapsch RIS-9x60 V2X Roadside Units: As a continuation of the ATCMTD funded Pinellas Smart Communities project, Kapsch RSUs will be installed at signalized intersections not covered under the Pinellas Smart Communities. These roadside units provide a short-range, low-latency wireless communication between infrastructure and vehicles. The platform supports ITS-5G, C-V2X, and Dual-Mode RSU, enabling cooperative connected vehicle systems. Its modular architecture ensures scalability and future-proof capabilities for traffic management, signal controllers, and edge applications.

Deployment Plan

The project deployment plan includes seven key phases: develop systems engineering documents; procurement; software development and implementation; soft launch; official launch; Systems Acceptance Testing; Operations and Maintenance. See Project Schedule to reference the timing of each phasing sequence.

- ***Develop Systems Engineering Documentation*** - Systems engineering and design will engage all project stakeholders to document user needs and requirements, develop the Systems Engineering Review Form, Project Management Plan (PMP), Systems Engineering Management Plan (SEMP), Concept of Operations (ConOps), Project Evaluation Plan (PEP), and Data Management Plans (DMP), Systems Requirements Specifications (SyRS), System Verification Plan, and the System Validation or Impact Assessment Plan; This phase also includes developing technical requirements, drawings, and schedule for system procurements. The county will lead this effort with the assistance of a systems engineering consultant.

- ***Procurement*** – In accordance with CFR 200 Procurement Standards, the county will competitively procure hardware, software, and Systems Integrator and Supplier Contractor to complete the PASS project. The Procurement Phase will include developing the procurement documents and requests for proposals, advertisements, evaluation of proposals, selection of vendors and installers, and award of contracts. The county will lead this effort with the assistance of a systems engineering consultant.
- ***Software Development and Implementation*** – Deployment will include purchasing technology hardware and software, software licenses, installation of hardware, configuration of hardware and software for specific applications and features, integration of field technologies, communication networks, and central systems, and implementation of the DMP. Vendors and software firms will lead this effort under guidance of the county and the systems engineering consultant. Project elements such as the Axilion Optimization, Corridor Applications, and Priority Hub modules, the DERQ Intersection Video Analytics module, and the LYT TSP and EVP will be activated in two phases: soft launch and official launch.
- ***Soft Launch*** – The soft launch will allow the PASS team to ensure all elements are communicating, functioning, and producing outputs as intended. The schedule estimates a 6-month period to test, correct, and implement to proceed to an official launch date. Initial launch procedures include:
    - Installation of DERQ and LYT infrastructure solutions along all signalized intersections on proposed project corridors.
    - Integration of supplemental data sources into the X Way platform, as well as the formulation of Axilion's Digital Twin layer, which will enable the advanced data analysis involved in the next phase.
- ***Official Launch*** – The official launch will allow the county to proactively manage traffic to improve both safety and mobility along the PASS corridors. A construction engineering and inspection (CEI) consultant will oversee field installation of hardware at traffic signals and in traffic signal cabinet. Before data for the impact assessment will be evaluated during procurement and deployment.

    - **Supporting Deployment with DERQ and LYT:**

Axilion provides essential technical insights to support and guide the installation of DERQ and LYT devices, ensuring seamless alignment with the overall traffic optimization strategy.

This supportive role is key to preparing for the effective integration of data collected by DERQ and LYT into Axilion's X Way platform.

- **Integration into Axilion's X Way Platform:**

Alongside the deployment of DERQ and LYT technologies, Axilion will focus on configuring its X Way platform to integrate and process the large volume of new data.

These preparatory steps are crucial for enabling the platform to begin training its AI and digital twin on the enriched dataset, laying the foundation for traffic signal optimization analysis in the Operations phase.

- ***Systems Acceptance Testing*** – The official launch will be followed by a series of Systems Acceptance Testing. The Deployment Plan will develop procedures, tests hardware and software cohesion, and document changes for scalability and deployment.
    - Develop System Acceptance Testing plan and scripts.
    - Test software and system development methodology as well as final deployment and start of operations.
    - Review Systems Acceptance Testing results.

  An impact assessment will begin no sooner than three months after beginning of on-going operations to ensure any system "bugs" are identified and resolved prior to beginning the impact assessment. The impact assessment will continue for one year to account for impacts during the various transportation seasons in Pinellas County. The impact assessment will determine or estimate the short-term and long term return on investment for the PASS Project. The impact assessment will be conducted by a Florida research university under the direction of the county.

- ***Operations and Maintenance*** – Once systems are installed and validated that they are working as intended, on-going operations will commence. In the Operations and Maintenance Phase, the suite of deployed technologies will process the comprehensive data sources, equipping Pinellas County with sophisticated tools for traffic optimization.
    - Priority Hub: Provides a dynamic, corridor-level overview by integrating various data sources:
    - DERQ safety insights for identifying potential safety issues.
    - X Way TWIN insights for pinpointing congestion challenges.
    - These insights inform a county-wide priority system, aligning with county importance guidelines for strategic traffic management.
    - Traffic Insight Station: This feature allows traffic engineers to delve into specific corridor challenges:
    - Safety Analysis: Cross-correlating safety events with the digital twin to suggest AI-based safety guidelines for future optimization runs.
    - Congestion Analysis: Identifying congestion issues through a similar process, using traffic data and digital twin insights to inform AI-based traffic retiming.
        - Resolution of Safety Concerns: Implementing the AI-derived safety guidelines into timing optimization, ensuring a proactive response to identified risks.
    - Resolution of Congestion Issues: Utilizing AI-based retiming strategies that incorporate congestion insights for effective traffic flow management.
    - Internet of Things Pilot: This feature will pilot the IoT data exchange to share the collected data for consumer use.

  The county will lead operations from the PCC with support of technology and software vendors. Performance assessments will commence during this phase and continue for at

least one year. The county will lead performance assessments with the support of the systems engineering consultant.

On-Going Maintenance – On-going system trouble-shooting, preventative maintenance, and responsive maintenance will commence with on-going operations. The county will lead maintenance activities with the support of the county's ITS maintenance contractor and the PASS Project vendors. Vendors will support maintenance for at least two years after completion of deployment.

Real-World Issues and Challenges

With the proposed technology solutions, the PASS project will address several real-world challenges as summarized in **Table 1**.

Table 1: Real-World Issues and Challenges

Challenges	Strategic Solutions
Safety Pinellas County's pedestrians and bicyclists account for 256, or 45% of the fatalities over the last 5 years (2018 – 2022) with future projections on the rise. Pinellas County is recording nearly 6x the national average seeing 62.14 fatalities per 100,000 people in 2020, consequently ranking the Pinellas County region as the 4th highest metro area for pedestrian and bicycle fatalities according to *Smart Growth America's Dangerous by Design 2022 edition*.	▪ Proposed project corridors focus on corridors located on the county's High Injury Network. ▪ DERQ AI Technology Solutions will implement detection systems and sensors to track near misses, perform Intersection Video Analytics, Traffic Counts for AADT, Turning Movement, pedestrian, and bicycle for improved analysis and recommendations. ▪ Predictive analytics will focus county resources to mitigate crash severity and emergency response times. ▪ Connected – Vehicle to Everything (C-V2X) technology will use existing RSUs to communicate safety warnings to pedestrians and bicyclists.
Mobility The county owns and maintains 2,279 lane miles of roadway in addition to 678 miles of sidewalks, 134 miles of bike lanes and 87 miles of trails that have been constructed throughout Pinellas County. Addressing the mobility challenge involves safeguarding pedestrians and bicyclists while enhancing operational flow. Currently, around 27% of the county's total roadway network is operating at a deficient level.	▪ Axilion's X Way AI computing technology will improve timing plans, locate gaps, and detect maintenance issues. ▪ Kapsch Roadside Units are proposed to expand the ATCMTD funded Pinellas Smart Communities project to implement C-V2X, V2X, V2I infrastructure for load balancing and systems equilibrium. ▪ Deployment of Lyt technology improves the mobility of transit user and emergency vehicle response times.

Challenges	Strategic Solutions
Climate Change The county has been experiencing the effects of sea level rise for decades and performed a vulnerability assessment on sea level rise and storm surges[5]. The Tampa Bay Climate Science Advisory Panel (CSAP) reports that since 1946, the water levels in Tampa Bay have increased 7.8 inches at the St. Petersburg tide gauge, which equates to roughly an inch of sea level rise per decade. Future projections show: ➢ One foot of sea level rise is anticipated sometime between 2020-2050, ➢ Two feet of rise is projected between 2040-2090 ➢ Three feet between 2060 to beyond 2100	▪ Axilion's X Way AI computing technology will improve timing plans, locate gaps, and detect maintenance issues. This results in less congestion, less idling, and reduces vehicle emissions. ▪ DERQ smart sensors will equip drivers with sensor based notifications to prevent crashes and reduce crash severities, leading to a reduction in gas emissions. ▪ *Approximately 80%* of the project corridors fall within the Climate and Economic Justice Screening Tool.
Equity In August 2023, transit ridership facilitated 840,647 passenger trips. Consequently, transit reliability is alarming with on time services ranging between 66 – 74%[6].	▪ Transit signal priority is being proposed along the county's primary transit corridors. ▪ Wealth Creation ▪ Education and training will be provided to develop the project's available workforce crews. ▪ *All project locations* fall within a DOT designated Disadvantage Census Tract.
Workforce Development 39%, or 368.3k persons, reside within the Disadvantaged Census Tracts in Pinellas County. The following describes the characteristics and need for workforce development in Pinellas County[7]. ➢ Median household income averages $66,406 with an average of 2.24 persons per household;	▪ Provide education and training sessions prior to procurement to increase workforce, create higher paying jobs, and increase wealth. ▪ Create a business educational and technical assistance campaign that offers local business owners the opportunity to learn about the county's sustainability and resiliency work.

[5] https://pinellas.gov/wp-content/uploads/2023/03/Pinellas-County_Vulnerability-Assessment_Exec-Summary_2022-reduced.pdf
[6] https://www.psta.net/media/6680/11_aug23.pdf
[7] US Census Quick Facts - https://www.census.gov/quickfacts/fact/table/pinellascountyflorida/PST045222

Challenges	Strategic Solutions
➢ 12.4% of persons in Pinellas County are considered to be living in poverty. ➢ Mean travel time to work is 24.7 minutes. ➢ Median value of housing units is $284,300	▪ Provide reliable transportation alternatives to driving to provide options for the disadvantaged.

Approach to Real World Issues and Challenges

Safety: Pinellas County is committed to the National Roadway Safety Strategy (NRSS) to respond to the current crisis in roadway fatalities by "taking substantial, comprehensive action to significantly reduce serious and fatal injuries on the Nation's roadways," in pursuit of the goal of achieving zero roadway deaths through a Safe System Approach. The image to the right illustrates a heat map of the crashes in Pinellas County over the last 5-year period covering 2018 to 2022. Approximately 25% of all crashes in the county have resulted in possible injury or worst.

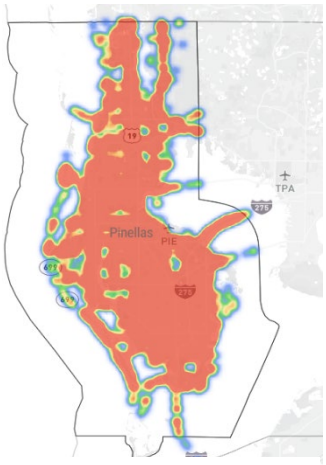


Figure 6: Crash Heat Map

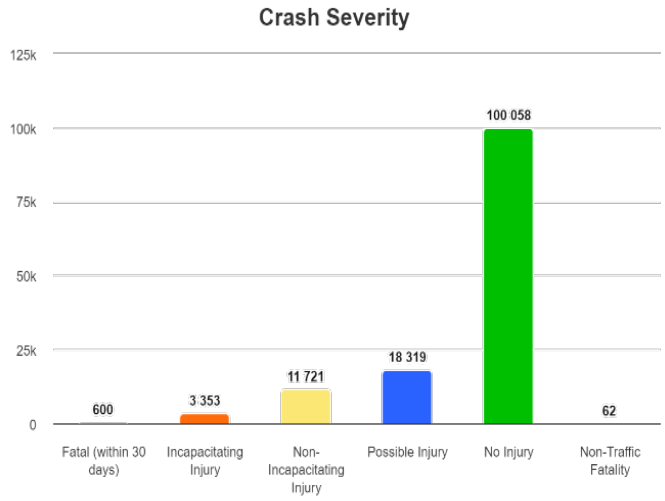


Figure 7: 5-Year Crash Severity

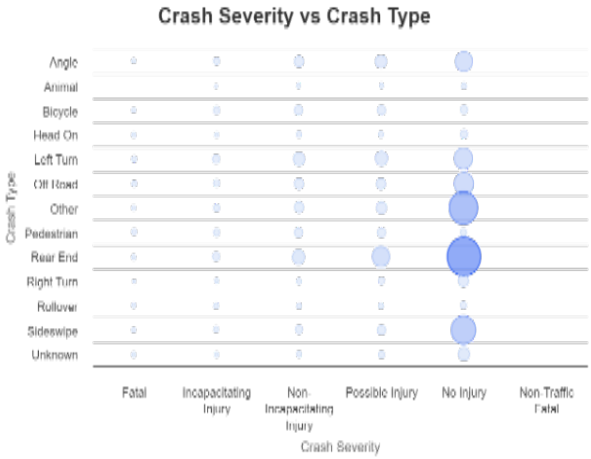


Figure 8: 5-Year Crash History vs. Crash Type

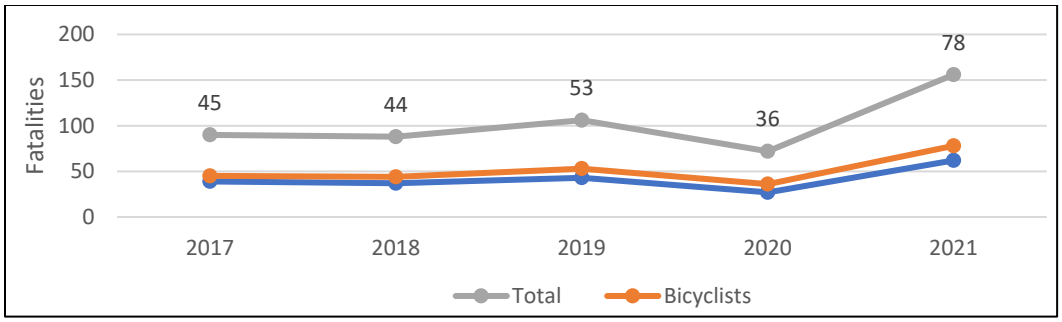


Figure 9: 5-Year Fatality Count

Pinellas County has adopted the Safe Systems Approach (Figure 10), which understands that humans make mistakes. In studying the impacts of 1) driver behavior, 2) bike, ped, and transit infrastructure, and 3) design concerns, the county's Safe Systems Approach solution identifies ITS technologies through PASS and prior technology investments to address intersection control, pedestrian and bicyclists crossing time, turn warning, amongst other safety applications described in the Transportation Systems and Services section.

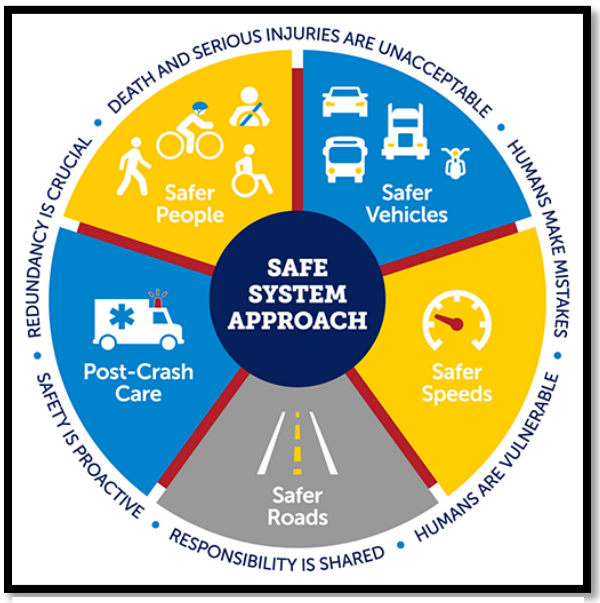


Figure 10: Safe Systems Approach

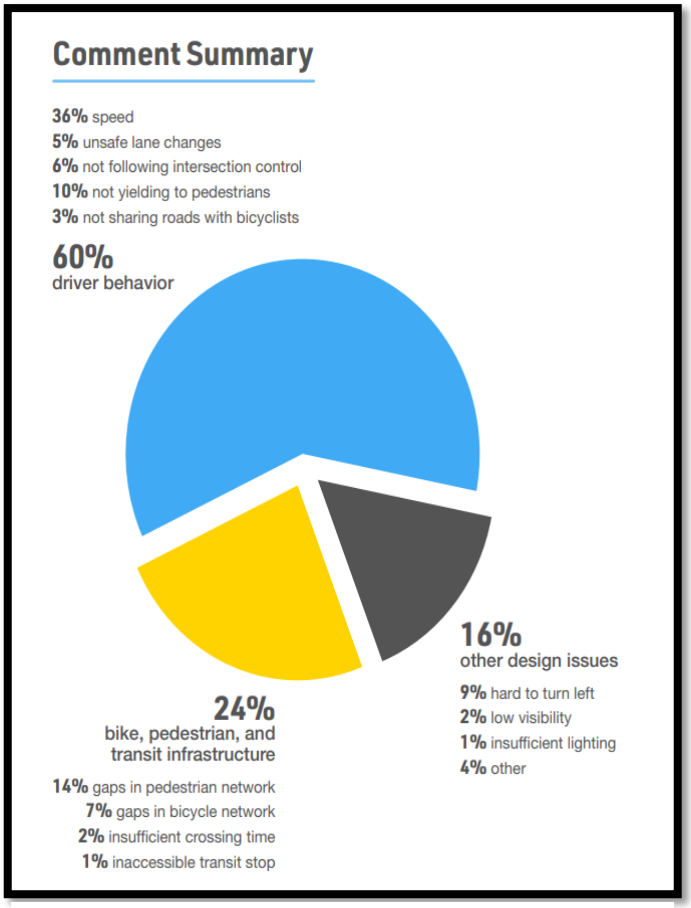


Figure 11: Safety Comment Summary

Mobility: Transit ridership totals 10.4 million annually, with 33,158 average weekday trips. On time performance and transit reliability averages ~71%. A critical component to addressing the growing congestion needs within the county is providing reliable transit opportunities. The PASS project's approach **Mobility**: Transit ridership totals 10.4 million annually, with 33,158 average weekday trips. On time performance and transit reliability averages ~71%. A critical component

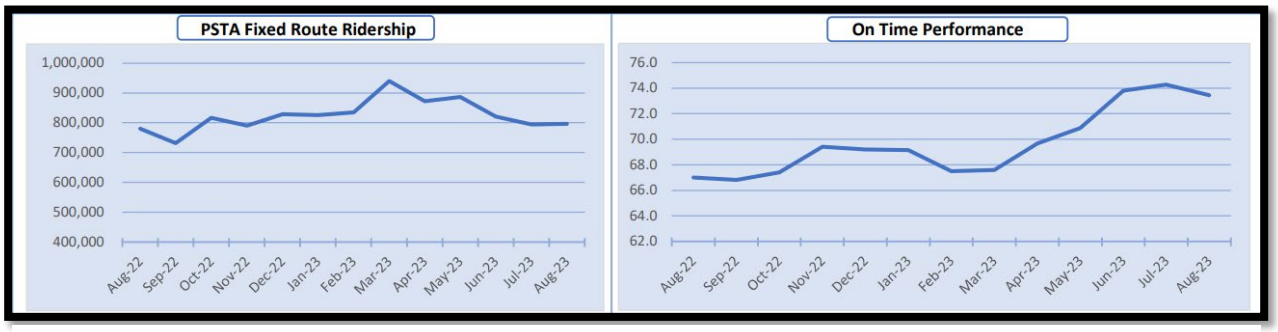


Figure 12: Transit On-Time Performance

to addressing the growing congestion needs within the county is providing reliable transit opportunities. The PASS project's approach to mobility will incorporate transit signal priority through Lyt solutions along some of the county's most frequently used transit corridors.

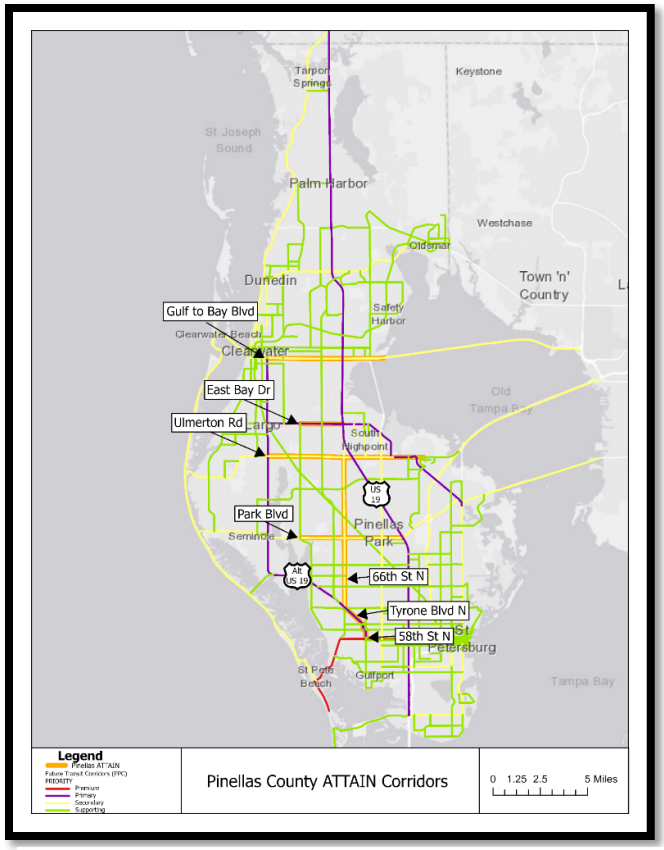


Figure 13: PASS Transit Corridors

Climate Change: Pinellas County is tackling the climate crisis by ensuring that transportation plays a central role in the solution by substantially reducing greenhouse gas emissions and transportation-related pollution and build more resilient and sustainable transportation systems to benefit and protect communities. The county launched the 2023 Resilient Pinellas Action Plan[8] based on a strategic framework, extensive data and public feedback, the plan sets

> "An efficient public transportation plan could reduce the cost and congestion of commuting and improve the air quality as well."

[8] https://pinellas.gov/projects/resilient-pinellas/

ambitious goals intended to make the county and its residents more prepared to handle a range of challenges, from sea level rise to hurricanes. **Nearly 49 percent of community-wide emissions are attributed to the transportation sector**. Included in Resilient Pinellas, the county aims to "Integrate natural resources in infrastructure that supports safe, active modes of transportation such as trails and sidewalks." The PASS project will support this action through the installment of vehicle, pedestrian and bicycle detection systems to enhance safety.

Equity: In March 2022, the Forward Pinellas Board unanimously approved the adoption of an Equity Action Plan to meet the agency's goals of inclusion and equity for all. The plan outlines strategic best practices for Forward Pinellas staff, the governance and committee structure and Forward Pinellas work products to advance equitable outcomes for the entire community.

As a part of the county's Concurrency Management System, several public services require ongoing Level of Service (LOS) analysis including recreation and open space, multimodal and mass transit services, etc. Continued LOS analyses will provide a method for identifying deficiencies and future needs for public facilities and services that support, enhance and foster thriving communities, including equitable distribution of these public goods in identified environmental justice communities.

"More emphasis is needed on environmental justice work. Including support for low-income people, and support for elders and people with disabilities."

The PASS project, through the services provided in improving transit reliability and safety through the project corridors located in the U.S. Department of Transportation's Disadvantage Communities, ensures fair access to services such as parks, bicycle infrastructure and educational and cultural centers.

Workforce Development:

Boosting the county's workforce relies on offering training for skilled laborers and professions, establishing a sustainable and affordable housing market, and creating well-paying jobs. The PASS project facilitates education, training, and on the job training and opportunities. The opportunities created through PASS include supplying necessary equipment and materials, planning and engineering services, and construction activities. Pinellas County further supports workforce development through various programs, including the Advantage Pinellas Housing Compact, Penny for Pinellas Housing Program, HOME Investment Partnerships Program, and Independent Living Program. These programs contribute to affordable housing by offering

Figure 14: Housing Needs

grant funding, rent subsidies, or reduced housing cost to increase the county's workforce.

Description of regulatory, legislative, or institutional challenges

The only known regulatory, legislative, or institutional challenge for the PASS project relates to the Federal Communications Commission (FCC) rulings that limit usage of the 5.9 GHz spectrum for V2X communications to the top third of the 5.9 GHz spectrum and that require use of C-V2X technology.

The PASS project will comply with the FCC August 16, 2023, ruling on C-V2X that approved waivers for C-V2X technologies in Florida. Previous installations of RSU in Pinellas County use dual-technology RSU with both DSRC and C-V2X technologies. Additionally, the PASS project will comply with the following:

- Proposed project will comply with the requirements under the Buy America Act. 23 U.S.C. 313 and 23 CFR 635.410
- The PASS project will NOT require exemption from the FMVSS, FMCSR, or any other regulation.

Quantifiable System Performance Improvements

The PASS Project will provide real-time traffic data analytics and decision support metrics that the county will use to actively monitor and manage traffic signals to increase effectiveness for improving mobility, reducing delay, and reducing crashes along individual and integrated signalized corridors throughout the county. Quantifiable metrics for data analytics and decision support will be whether the systems work as described in the Concept of Operations and SyRS Documents. Specific quantifiable metrics include:

Table 2: Projected Benefits

Performance Area	Projected Benefit
Number of TSP requests and activations.	↑
Number of EVP requests and activations.	↑
Number of Pedestrian activations and activations based on passive detection.	↑
Time for restoration of background intersection signal timing and coordination after TSP/EVP/Pedestrian activations. Number or frequency of traffic signal timing/coordination adjustments based on real-time data analytics. (It is expected this metric would decline over time.)	↓
Number of configuration adjustments needed to support special transportation needs in the county such as emergency evacuation, pedestrian phase activations,	↓

transit signal priority, and/or emergency vehicle preemption.	
Number of traffic detection problems identified and resolved.	
Track the reduction in traffic incidents, with a focus on pedestrian safety.	
Environmental Impact: Assess changes in CO2 emissions and other environmental indicators.	
Travel Time and Delay: Measure changes in average travel time, travel time reliability and delays at key intersections.	
Pedestrian Consideration: Evaluate pedestrian accessibility improvements and pedestrian flow efficiency.	
Total workforce positions created.	

In addition to the quantitative evaluation, the project will provide lessons learned, future improvement areas to guide future project scalability and deployment.

1. **Lessons Learned and Conclusions:**
    a. Review the integrative approach's effectiveness, examining the interoperability and challenges of combined technologies.
    b. Analyze how the intersection of AI analytics, intelligent traffic control, and safety devices have reshaped traffic management.
2. **Future Improvements:**
    a. Identify potential enhancements, such as technology integration, upgrades, or corridor expansions.
    b. Establish continuous improvement feedback loops based on real-time data and traffic pattern evolution.

Quantifiable Safety, Mobility, and Environmental Benefit Projections

Table 3: Quantifiable Benefit Projections

Challenges	Projected Benefit
Safety Pinellas County's pedestrians and bicyclists account for 256, or 45% of the fatalities over the last 5 years (2018 – 2022) with future projections on the rise. Pinellas County is recording nearly 6x the national average seeing 62.14 fatalities per 100,000 people in 2020, consequently ranking the Pinellas County region as the 4th highest	Reduction of Pedestrian-Related Crashes across the Region (3%) Reduction in Pedestrian fatalities in the Region (5%)

metro area for pedestrian and bicycle fatalities according to *Smart Growth America's Dangerous by Design 2022 edition*.	
Improve Corridor Performance Optimizing networks at the corridor level will result in an improvement to multi-modal corridor performance, particularly in high travel demand and/or reduced. capacity periods.	Increased Person throughput on connected corridors (2%)
Reduce Congestion 27% of the county's total roadway network is operating at a deficient level. Providing improved mobility information, especially route congestion information and incentivization will reduce the corridor's congestion.	Reduction in congestion along managed corridors (3%)
Environmental Benefit The county has been experiencing the effects of sea level rise for decades and performed a vulnerability assessment on sea level rise and storm surges[9]. The Tampa Bay Climate Science Advisory Panel (CSAP) reports that since 1946, the water levels in Tampa Bay have increased 7.8 inches at the St. Petersburg tide gauge, which equates to roughly an inch of sea level rise per decade. Future projections show: ➢ One foot of sea level rise is anticipated sometime between 2020-2050, ➢ Two feet of rise is projected between 2040-2090 ➢ Three feet between 2060 to beyond 2100	LYT technology has shown reduction in fuel consumption by 14% and emissions by 12%.

Vision, Goals, and Objectives for the Technology Deployment

Table 4: Technology Objectives

Priority Title	Priority Description	Technology Objective
Safety and Reliability	Improve the safety of systems for pedestrians, bicyclists, and the broader traveling public. Improve emergency response.	The proposed solution aims to improve the safety of pedestrians, bicyclists, and other road users and help eliminate fatalities and severe injuries.

[9] https://pinellas.gov/wp-content/uploads/2023/03/Pinellas-County_Vulnerability-Assessment_Exec-Summary_2022-reduced.pdf

Resiliency	Increase the reliability and resiliency of the transportation system, including emergency management, congestion mitigation, and resiliency to climate change effects.	The proposed solution offers multiple mechanisms redundant to each other to achieve a reduction in pedestrian and bicycle fatalities and severe injuries. The solution is also built using industry best-practices in terms of cybersecurity.
Equity and Access	Connect or expand access for underserved or disadvantaged populations. Improve access to jobs, education, and essential services.	Pedestrian and bicycle fatalities and severe injuries occur more often in disadvantaged areas. Deploying the solution will help make those areas safer for road user travel. Safer roads for pedestrians and bicycles mean more people are willing to walk/cross to get to near public transit or cycle to move around, thus increasing equity as well.
Climate	Reduce congestion and/or air pollution, including greenhouse gases. Improve energy efficiency.	Crashes, near-crashes, and other safety issues are known to have a negative impact on congestion and emissions, so the deployment of solution will have a positive contribution to emission reduction
Partnerships	Contribute to economic competitiveness and incentivize private sector investments or partnerships, including technical and financial commitments on the proposed solution. Demonstrate committed leadership and capacity from the applicant, partners, and community.	The deployment of this solution would constitute a collaboration between public agencies (MDOT, Transit, DPD, MSP, etc.), Derq and other stakeholders to the project to deploy industry-leading set of technologies. MDOT's and the city's leadership are committed to improving safety on Detroit's roads. Economic competitiveness of the area will also benefit from improved road safety becoming more attractive for people to transit, live and work there.
Integration	Improve integration of systems and promote connectivity of infrastructure, connected vehicles, pedestrians, bicyclists, and the broader traveling public.	The proposed solution is designed to integrate all available infrastructure systems and subsystems, such as sensors, controllers and connected devices, into an end-to-end coordinated solution to help eliminate fatalities and severe injuries. The solution also aims to integrate all modes of transportation in the overall system using novel concepts such as infrastructure sensing or the multiplication of

		communication technologies (V2X, LTE, 5G).

Plan to Leverage Existing Technology Investments

The PASS Project will leverage existing technology investments in Pinellas County. Over the past two decades, Pinellas County has installed fiber-optic communication networks along the State Highway System and county arterials throughout the county including along the routes included in the PASS project. Pinellas County also implemented and operates a state-of-the art traffic management center (TMC) called the Pinellas County Primary Control Center (PCC). The county implemented a county-wide advanced traffic management system (ATMS) central software allowing PCC operators to adjust traffic signal timing and coordination to optimize traffic flow and manage traffic anomalies using center to roadside communication over the fiber-optic network.

Recent County Investments

- Pinellas County manages the Centracs system for the 60 connected intersections within the City of Clearwater
- Installed 300 miles of in-ground fiber.

  Designated FOC trunk lines on US-19, SR-693 (66th Street), and Alt US-19 through the mid-county and south-county area have 144-count single mode FOC, and serve as primary data transmission corridors.
- 425 connected traffic signals, and over 250 additional electronically controlled safety devices
- 190 Adaptive Signal Control Technology (ASCT) intersections including both InSync and Edaptive through Econolite as their adaptive signal control system.
- 88 NEW Roadside Units installed.
- 6 piloted Intersection Video Analytics.

The county has tested various adaptive traffic signal control technologies and is currently operating Centracs (edaptive) on SR 60, Adaptive on East Lake Road (CR 611), and Shredder on Ulmerton Rd. (CR 688). The county has installed arterial dynamic message signs (DMS) and highway advisory radios (HAR) allowing PCC operators to provide real-time travel and road condition information along major arterials. Finally, the county has also implemented CAV RSU along several major corridors. The RSU are currently broadcasting MAP and signal phase and timing (SPaT) messages as well as other basic safety messages (BSM).

The PASS Project will leverage the systems engineering documentation developed for previous ITS and CAV projects in Pinellas County. The text box above highlights recent technology investments in the county.

Leveraging of the ITS program or innovative technology initiatives

The PASS project will leverage the systems engineering analysis guidance in the USDOT ITS4US initiative as follows:

- The Concept of Operations will follow the ITS4US outline. FDOT's ConOps template follows the ITS4US outline as well.
- The Systems Requirements Specifications Document (SyRS) will follow the ITS4US outline.
- The Data Management Plan (DMP) will follow the outline introduced in USDOT's ITS4US program.
- The Systems Engineering Management Plan (SEMP) will follow the ITS4US outline. FDOT's Project Systems Engineering Management Plan (P-SEMP) template follows a similar outline.

Table 5: Technologies Implemented with PASS

Technologies	Implemented/ Addressed by Application (Check all that apply)
1. Advanced traveler information systems	✓
2. Advanced transportation management technologies	✓
3. Advanced transportation technologies to improve emergency evacuation and response by Federal, State, and local authorities	✓
4. Infrastructure maintenance, monitoring, and condition assessment	✓
5. Advanced public transportation systems	✓
6. Transportation system performance data collection, analysis, and dissemination systems	✓
7. Advanced safety systems, including V2V and V2I communications, technologies associated with automated vehicles, and other collision avoidance technologies, including systems using cellular technology	✓
8. Integration of intelligent transportation systems with the Smart Grid and other energy distribution and charging systems	
9. Integrated corridor management systems	✓
10. Advanced parking reservation or variable pricing system or system to assist trucks in locating available truck parking	
11. Electronic pricing, toll collection, and payment systems	
12. Technology that enhances high occupancy vehicle toll lanes, cordon pricing, or congestion pricing	
13. Integration of transportation service payment systems	
14. Advanced mobility and access technologies, such as dynamic ridesharing and information systems to support human services for elderly and disabled individuals	✓
15. Retrofitting DSRC technology deployed as part of an existing pilot program to C–V2X technology, subject to the condition that the retrofitted technology operates only within the existing spectrum allocations for connected vehicle systems	✓

16. Advanced transportation technologies, in accordance with the research areas described in section 6503 of Title 49	✓

USDOT Goals and Focus

Table 6: USDOT Goals Addressed by PASS

Program Goals	Implemented/ Addressed by Application (Check all that apply)
1. Reduction in the number and severity of traffic crashes and an increase in driver, passenger, and pedestrian safety;	✓
2. 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;	✓
3. Demonstration, quantification, and evaluation of the impact of these advanced technologies, strategies, and applications towards improved safety, efficiency, equity, and sustainable movement of people and goods;	✓
4. Improvement in the mobility of people and goods;	✓
5. Improvement in the durability and extension of the life of transportation infrastructure;	✓
6. Reduced costs and improved return on investments, including through the enhanced use of existing transportation capacity;	✓
7. Protection of the environment and delivery of environmental benefits that alleviate congestion and streamline traffic flow;	✓
8. Measurement and improvement of the operational performance of the applicable transportation networks;	✓
9. Collection, dissemination, and use of real-time transportation-related information including, but not limited to, work zone, weather, transit, and paratransit, to improve mobility, reduce congestion, and provide for more efficient and accessible, and integrated transportation, including access to safe, reliable, and affordable connections to employment, education, healthcare, freight facilities, and other services;	✓
10. Facilitating account-based payments for transportation access and services and integrating payment systems across modes;	
11. Monitoring transportation assets to improve infrastructure management, reduce maintenance costs, prioritize investment decisions, and ensure a state of good repair;	✓
12. Accelerated deployment of V2V, V2I, vehicle-to- pedestrian, and technologies associated with automated vehicle applications and other advanced technologies;	✓
13. Integration of advanced technologies into transportation system management and operations;	✓

14. Reproducibility of successful systems and services for technology and knowledge transfer to other locations facing similar challenges;	✓
15. Incentivizing travelers— (I) to share trips during periods in which travel demand exceeds system capacity; or (II) to shift trips to periods in which travel demand does not exceed system capacity.	

Table 7: Administration's Priorities Addressed by PASS

Administration's Priorities	Implemented/ Addressed by Application (Check all that apply)
1. Safety	✓
2. Climate Change and Sustainability	✓
3. Equity	✓
4. Workforce Development, Job Quality, and Wealth Creation	✓

Table 8: DOT Focus Areas Addressed by PASS

DOT Focus Areas	Implemented/ Addressed by Application (Check all that apply)
1. State of Good Repair	✓
2. Integration of intelligent transportation systems with the Smart Grid and other energy distribution and charging systems	
3. Advanced public transportation systems	✓
4. Freight (or Port) Community Systems	✓
5. ROUTES Initiative	
6. Complete Trip Program	✓
7. Data Availability	✓

Project Schedule

Deployment of the technologies planned for the PASS project are scheduled to be completed within three years of full execution of the cooperative agreement and obligation of funding. The first year will include systems engineering analysis, data management planning, and documentation; procurement (procurement documents, advertisements, and award); and before performance data collection for use in systems validation testing. The systems engineering analysis will identify elements of the Regional ITS Architecture (RITSA) that are being implemented and any needed updates to the RITSA resulting from the PASS project. Deployment and system verification testing that includes device testing and system testing will

occur simultaneously with deployment. The fourth year will include on-going operations and the systems performance validation testing, or after studies.

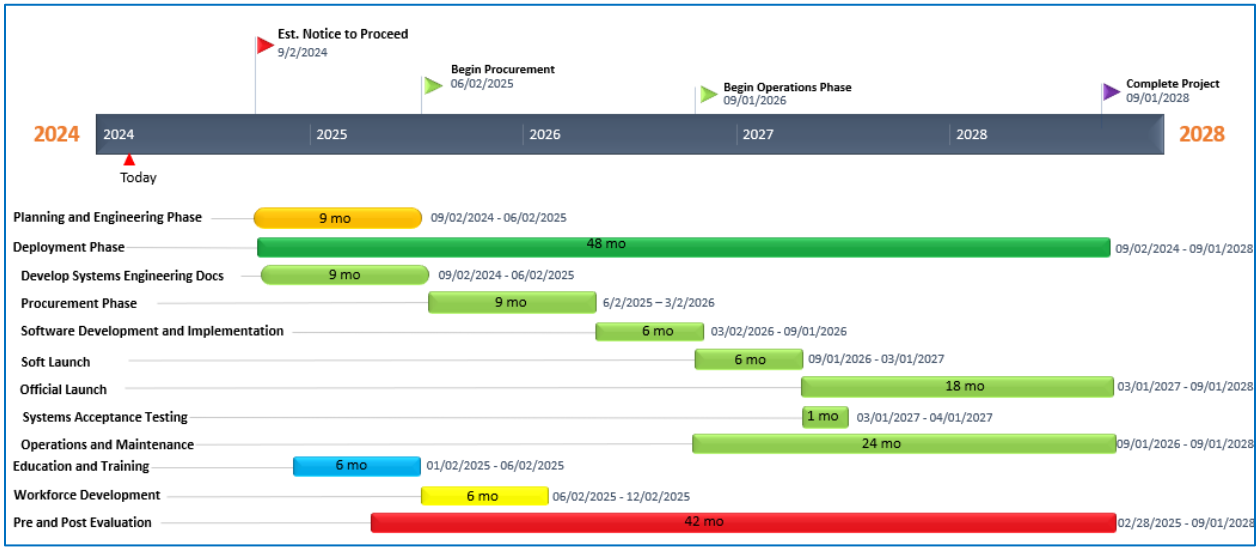


Figure 16: PASS Project Schedule

The project is methodically structured into five key phases. Each phase contributes to the overarching goal of optimizing traffic efficiency and safety. Focused on data-driven analysis, integration of cutting-edge traffic management technologies, and detailed operational strategies, the project aims to enhance the traffic conditions effectively in these corridors, setting a practical and scalable example for traffic management systems in Pinellas County.

The proposed schedule for the PASS project spans a duration of 4 years, commencing with an estimated Notice to Proceed (NTP) on Monday, September 2, 2024, and concluding with the completion of testing and operations on September 1, 2028.

Table 9: PASS Schedule Phases and Descriptions

Phase	Phase Description
1) Planning and Engineering	This phase sets the stage for the strategic implementation of DERQ's AI-powered road safety analytics, LYT's intelligent traffic control systems, and Axilion's X Way system. The gathered data will guide where and how these technologies can be most effectively deployed to enhance traffic safety and efficiency. Tasks include: ➢ Complete the process for a Type I Categorical Exclusion NEPA approval. ➢ Draft Concept Plans outlining the optimal integration points for DERQ and LYT technologies, ensuring that their deployment is data-driven and targeted to address specific challenges identified in the analysis.. ➢ Apply and attain pertinent permits. ➢ Coordinate with project partners and stakeholders.

		Submit quarterly reports highlight work performed, upcoming work, status of all planned procurement activities, problems, costs, budget revisions, and additional items of concern.
	2) Development Phase	Reference Deployment Plan. ➢ Develop Systems Engineering Docs ➢ Procurement ➢ Software Development and Implementation ➢ Soft Launch ➢ Official Launch ➢ Systems Acceptance Testing ➢ Operations and Maintenance
	3) Education and Training	The Education and Training Phase focuses on hosting education and training seminars to inform the public of the project elements and benefits, while offering technical seminars to train and increase the number of skilled laborers and professionals. ➢ Provide education and training seminars. ➢ Host public meetings describing the PASS project.
	4) Workforce Development	In line with the Education and Training Phase, the Workforce Development will offer the opportunities to support the creation of good paying jobs with the free and fair choice to join a union and the incorporation of strong labor standards and training and placement programs. Opportunities will ensure the inclusion of local entrepreneurship such as the utilization of Disadvantaged Business Enterprises, Minority-owned Businesses, Women-owned Businesses, or 8(a) firms. Workforce Development efforts will include: ➢ Coordinate with Pinellas Technical College ➢ Incorporate apprenticeship requirements under procurement. ➢ Coordinate with local community organizations.
	5) Pre and Post Evaluation	This phase will evaluate the impact of the advanced technologies, strategies, and applications towards improved safety, efficiency, equity, and sustainable movement of people and good. The evaluation will study the effects of pre and post project deployment. **Pre Evaluation** ➢ This initial stage involves the collection of traffic data from a variety of sources. Existing infrastructure, such as loop detectors and Roadside Units (RSUs) provide valuable insights into current traffic patterns and congestion points. ➢ External data sources, including probe data from vehicles, contribute to a richer, more dynamic understanding of traffic behaviors and trends in Pinellas County. This probe data offers real-time insights into traffic conditions, enhancing the accuracy of the analysis. **Post Evaluation** ➢ With data from both existing infrastructure and external sources, Axilion's X Way platform will conduct an in-depth analysis to pinpoint areas for improvement in traffic flow and safety.

		➢ Key focus areas include: 1. Assessing Traffic Flow: Analyzing congestion and identifying high-density traffic areas. 2. Safety Evaluation: Identifying accident-prone zones and potential hazards. 3. Environmental Impact: Estimating CO2 emissions and identifying potential for greener traffic management. Public Transit and Pedestrian Dynamics: Understanding the relationship and tradeoffs between vehicular traffic, public transportation efficiency, and pedestrian safety.

Management Structure

Pinellas County will serve as the lead agency entering a direct recipient agreement with USDOT to deliver the project. The county will oversee the full grant overseeing the systems engineering, evaluation, integrator, and procurement process. All project partners and stakeholder activities will be coordinated through Pinellas County, with Technical and Fiscal Advisory services through former Deputy Secretary of the USDOT and current President of Axilion, John D. Porcari.

Diagram depicting the organizational structure of the project team

The following figure depicts the PASS organizational Structure.

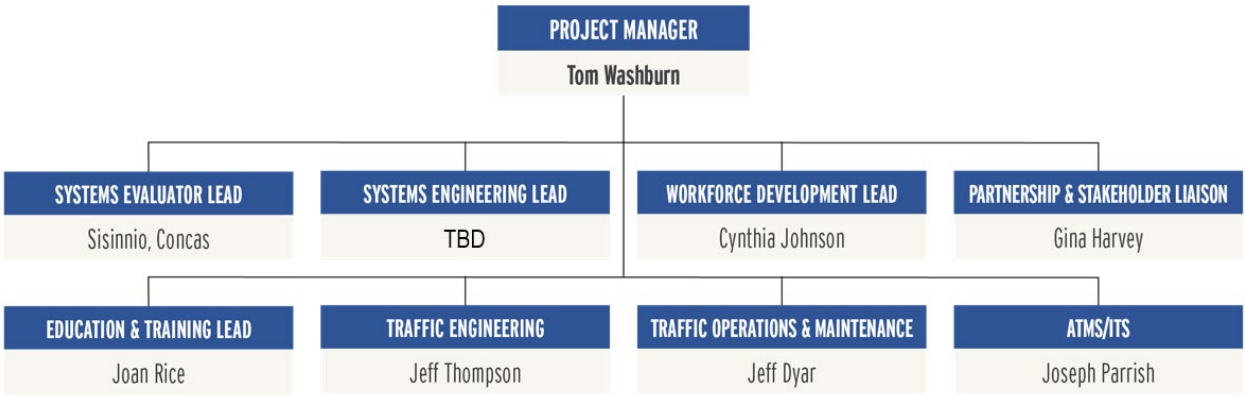


Figure 17: PASS Organization Structure

The project team is organized to keep the county's Project Manager informed about news and updates related to the PASS project. Tom, serving as the single point of contact for USDOT, will oversee and manage the day-to-day project. The diagram above highlights the people and role of the PASS project team.

Plan for collaborating with the private sector or public agencies

Pinellas County currently partners with several private sector companies through an on-call general engineering contract, which will be leveraged for this project. Additionally, Pinellas County has long term relationships with several transportation technology companies which

currently provide traffic signal systems, ITS operations software, and traveler information systems that will be leveraged for specific technologies.

Pinellas County also has a strong relationship with the public agencies within the county, and include the stakeholder agencies that are a part of this application, along with neighboring jurisdictions to include Hillsborough County, and the City of Tampa among others.

Designation of all proposed subrecipients or project collaborators

All funding will be provided to Pinellas County. Contract agreements with private companies will be created for systems engineering, evaluation, integration, and procurement process.

Risk Assessment

The following table identifies five (5) potential risk factors along with mitigation factors for each risk factor.

Table 10: PASS Risk Factors and Mitigation Measures

Risk Factor	Mitigation Measures
Financial Stability	Pinellas County provides a 76% local match funds, exceeding the minimum 20% match requirement. This 76% commitment is indicative of the county's financial stability to provide the local match and see this project to completion. The local match source is an existing program within Pinellas County.
Project Success and Past Performance	As a direct recipient of the ATCMTD grant award, Pinellas County has demonstrated that it has the management systems to meet the standards prescribed in 2 CFR Part 200 and past performance record to lead the PASS project to success and completion.
Meeting schedule and proceeding to construction.	The PASS project builds from past experiences in developing the schedule for the ATCMTD funded Pinellas Smart Communities project. The schedule incorporates adequate schedule buffers for individual tasks to ensure compliance with NEPA, procurement, and evaluating the post deployment benefits. The schedule understands that NEPA will be completed prior to final design and procurement selection.
Effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities;	Pinellas County will ensure that project hardware and software comply with the Buy America Act. 23 U.S.C. 313 and 23 CFR 635.410

Risk Factor	Mitigation Measures
Costs Overruns	The cost estimate for the PASS project was constructed through a Request For Information to determine unit costs for various elements of the project. Unit prices account for slight increases due to inflationary costs. If additional measures are required to mitigate costs overruns, the county's operations team is equipped through past education and training sessions to install devices at-cost to mitigate cost overruns.

Why Pinellas County?

Pinellas County grapples with significant issues concerning safety and congestion. With a fatality rate nearly six times the national average and a surge in popularity as a tourist destination, the county is experiencing a mounting congestion challenge. Securing a successful ATTAIN grant is crucial for addressing these pressing concerns. Pinellas County is confident that the PASS project aligns seamlessly with the Program and Administrative goals and focus areas of the U.S. Department of Transportation, as outlined below:

- Pinellas County commits a substantial 76% non-federal match to fund the project.
- The county's past performance in the direct recipient ATCMTD grant indicates the county's ability to successfully manage and construct the proposed ATTAIN project.
- Project Readiness – The county has identified the key regulations and legislations that would be a challenge for this project on top of mitigating risks strategies to ensure project completion.
- Scalability – The project is hardware agnostic, allowing for flexibility and adaptability.
- Comprehensive Addressal – The project addresses concerns related to safety, climate change, sustainability, equity, workforce development, job quality, and wealth creation.
- Congestion Reduction – Utilizing AI learning technology, real-time congestion detection, and recovery, this project targets to alleviate the growing congestion.
- Better Insights - Automated traffic health provides insights leveraging historic, current, and future traffic situations.
- Mobility Optimization – Deep Reinforcement Learning technology continuously optimizes mobility, enhancing the quality of life for all road-users via Deep Reinforcement Learning technology that continuously optimizes mobility.

Staffing/Team Description

The PASS project team has assembled a robust group of leaders and subject matter experts to navigate and oversee the project from inception to completion. Heading this endeavor is Tom Washburn, P.E., the Director of Pinellas County's Transportation Division Director, bringing over 31 years of Transportation, Systems Engineering and Operations experience. Notably, Tom recently served as the Project Manager over USDOT's inaugural direct recipient ATCMTD grant, managing the Pinellas Smart Communities project.

Key Personnel

Tom is bolstered by a team of highly skilled and seasoned professionals who will play pivotal roles in various aspects of the project. The table below highlights the Key Personnel and the roles each member will lead. Furthermore, Tom will be supported by professionals, engineers, skilled laborers, and technicians at Pinellas County that have prior experience managing and implementing various scopes from past federally funded projects. Pinellas will be supported by the City of Clearwater, Forward Pinellas (Pinellas MPO), Pinellas Suncoast Transit Authority, Center for Urban Transportation Research, and more.

Table 11: PASS Key Personnel and Roles

Key Personnel	Role	Title
Thomas Washburn, P.E.	PASS Project Manager	Transportation Division Director, Pinellas County
Kenneth Jacobs, TSOS, RSP1	Systems Engineering Lead	Traffic Engineering and Operations Group Director, HNTB
Sisinio Concas	Systems Evaluator	Program Director | Research Associate Professor University of South Florida, Center for Urban Transportation Research
Cynthia Johnson	Workforce Development Lead	Business Development Director, Pinellas County
John D. Porcari	Technical and Fiscal Advisor	President, Axilion Inc. and former Deputy Secretary of the USDOT.

See Appendix A for Key Personnel résumés.

Primary Point of Contact

The county's Project Manager will serve as the project's single point of contact.

Thomas Washburn, P.E. | Transportation Division Director, Public Works
Pinellas County Government
22211 US 19N, Clearwater, FL 33765
Email: twashburn@pinellas.gov
Office: (727) 464-8804

Appendix A
Résumés

Appendix A- Résumés

Key Personnel	Organization	Résumé Attached
Thomas Washburn, P.E.	Pinellas Co.	✓
Cynthia Johnson	Pinellas Co.	✓
Sisinio Concas	USF-CUTR	✓
Kenneth Jacobs, TSOS, RSP1	HNTB	✓
John D. Porcari	Axilion	✓

Thomas Washburn, P.E.

Thomas Washburn, P.E.

122211 US Highway 19
Clearwater, Fl 33765
727-464-8804
twashburn@pinellascounty.org

Skills

- Strong Work Ethic
- Calm Under Pressure
- Team Player – Comfortable in any Role
- Organization and Prioritization
- Attention to Detail
- Effective Communicator

Experience

APRIL 2021 – PRESENT

Division Director - Transportation / Pinellas County Public Works, Clearwater, Florida

- Oversee all transportation related operation and maintenance functions including Roadways, Bridges, Sidewalks, Signals, Signs, Pavement Markings, ATMS/ITS, and Permitting. Manage staff of 121 employees.
- Develop annual operating budgets, administer purchasing contracts, various municipal maintenance contracts and interlocal agreements. Oversee a $26 million operating budget.
- Respond to citizen requests and complaints, speak on behalf of programs and projects at County Commission meetings, and represent the County and Department in professional organizations, public meetings, media, and traffic related litigation.
- Serve as the County's Traffic Engineer; sign Official Traffic Regulations; and prepare traffic control plans for emergency situations.

OCT 2005 – APRIL 2021

Section Manager / Pinellas County Public Works, Clearwater, Florida

- Oversee Traffic Control Center, Traffic Investigations, and Right-of-Way Permitting sections within the Transportation Division. Includes preparation and monitoring of annual operating budgets, interlocal agreements, grants, and consultant/project management.
- Serve as the County's Traffic Engineer; respond to citizen requests; sign Official Traffic Regulations; and prepare traffic control plans for emergency situations.
- Coordinate with other County Departments, local municipalities, the Sheriff's Office, the School Board, and FDOT on items related to traffic safety and transportation.
- Represent the Department at County Commission meetings; City Council meetings; with the media; at public meetings; and with the County Attorney's Office on traffic related litigation.

JUNE 1994 – OCT 2005

Manager – Traffic Engineering / Transportation Engineering Inc. / HNTB, Tampa, Florida

- Managed the Traffic Engineering Department in the Tampa office.
- Program and Project Management; proposal preparation, presentations, and client management; prepared, reviewed and endorsed traffic studies, signal plans, signing and marking plans, and ATMS/ITS plans.

MAY 1991 – JUNE 1994

Traffic Engineer / DSA Group, Inc., Tampa, Florida

- Served as company's traffic engineer.
- Prepared signing and pavement marking plans, signal plans, interconnect plans, traffic studies, traffic impact studies, retiming studies, crash analyses, and data collection.

Education

MAY 1991

Bachelor of Science – Civil Engineering

University of South Florida, Tampa, Florida

Course focus in Transportation and Materials

- Tau Beta Pi – Engineering Honor Society
- Chi Epsilon – Civil Engineering Honor Society
- Teaching Assistant – Materials Department

Certifications

- Professional Engineer – License # 50113
- Road Safety Professional – Transportation Professional Certification Board
- Advanced Maintenance of Traffic

Accomplishments

- Developed the County's Roadside Memorial Policy.
- Developed the County's Transportation Design Manual (set for adoption April 2021).
- Developed the County's Road Safety Audit program.
- Transportation/Traffic Team Lead on the County's APWA Accreditation and Re-Accreditation efforts.
- Enterprise Asset Management Change Liaison Team Member.
- Secured several million dollars' worth of safety grant funds over the last 15 years, including striping materials, signal equipment, designs, signal retiming, studies, and LAP agreements.
- Recently served as Interim County Engineer.

Cynthia Johnson, Ph.D.

Dr. Cynthia Johnson

PHONE: 813-601-1909 **EMAIL:** ccjohnson66@msn.com

PROFESSIONAL SUMMARY

Energetic, **performance-focused collaborative professional**, offering 20 years of **broad-based experience in economic developmen**t, stakeholder engagement and business growth. Acknowledged throughout career as a **creative problem solver, transformative** and inspirational leader with a reputation for advancing the mission of **inclusive economic development.** Key economic development roles include coordinating and leading small business and entrepreneurial business development initiatives, programs, and municipal engagement efforts. Equipped with well-defined financial acumen and well-honed communication, organizational, and technical skills. Current economic development leadership positions include: Director, Office of Small Business & Supplier Diversity, Center Director for Florida Small Business Development Center, and Sr. Manager of Business Assistance. Fully prepared and poised to succeed as Executive of a public or private sector economic development agency.

RELEVANT STRENGTHS

- Leadership & Collaboration
- Inclusive Economic Development
- Community & Partner Engagement
- Grant Administration (Local, State & Federal)
- Creative Problem Solver
- Workforce Training
- Process Improvement
- Cross-functional Leadership and Team Building

LEADERSHIP

Achieved program sustainability by reengineering division structure and expanding partnerships with regional economic development partners to achieve goals. Experienced in multiple domains of economic development, supply chain diversification, business development, and entrepreneurial assistance. I have lead Pinellas County 's Office of Small Business and Supplier Diversity by prioritizing inclusive growth as a pathway to a thriving sustainable economy. I established a relevant organizational structure and departmental focus on industry retention, small business growth, talent identification and development, sustainable workforce strategies, and data sharing.

Key Accomplishments/Responsibilities

- Accountable for administering federal, state, and county budget; oversee compliance of grant funding, and supervised the activities of direct and indirect employees at partner locations.
- Serve as the driving force behind the successful creation and implementation of the Florida Small Business Development Center (FSBDC) for Pinellas County and generating $2.6M in non-general funds since inception to support regional economic development initiatives.
- Strategically deployed Corona Act Recovery Economic Stimulus program for Small Business Grant program, Phase I, – awarding over $35M to economically injured small businesses. Created curriculum, trained, and managed 42 employees from various departments across appointing authorities on administering economic disaster relief to the small business community.
- Improved the FSBDC customer engagement strategy by regionalizing the consultants enabling my team to support 1,100 business owners, resulting in 4,328 jobs supported and increased revenues of $8.03M in capital investment last year.
- Articulate state and local economic development resources and programs to business leaders locally, regionally, and state-wide. Management of a team resulting in increased capital of $8.5M in state disaster bridge loan assistance, and technical assistance for the US Small Business Administration's financial programs.
- Redesigned the Small Business Enterprise Program and increase vendor participation from *42 to 671 vendors* in three years.
- Managed the configuration team and implemented new monitoring software that required collaboration with numerous county departments and appointing authorities to include Clerk of the Courts, Office of Management & Budget, Purchasing, Office of Technology, Risk Management, and an outside vendor.
- Improved diverse vendor utilization and spend from *$225,000 to $17.9M* in just three years of implementation.
- Initiated operational leadership and strategic integration across divisions for the organization's Strategic Focus Areas (SFA). Analyzed and evaluated the effectiveness of program operations and resource partner activity. Process improvement were incorporated in County current SFA.
- Managed $2.5 million textbook and instructional supplement budget as a school administrator.

Dr. Cynthia Johnson

ECONOMIC DEVELOPMENT

Experience in managing successful economic development programs. Including budget and management, operations, cross-departmental project management, program audits, data analysis and review. Strong background in relationship management, team building, and general business acumen coupled with significant track record of leveraging alternative funding to supporting departmental objectives. I coordinate with local agencies to reduce overlap and duplication of efforts and share resources to enhance economic development efforts.

Key Accomplishments/Responsibilities

- Directing all small business services in economic development including retention, increased capital investment and expanding, and diversifying employment opportunities.
- Achieved business performance improvements and 25% alternative funding to finance the department's budget shortfall. Hence, leveraging an additional $260,000 annually in grant funds. This increased partner relations and significantly expanded business assistance services across the 24 municipal governments within the county.
- Appointed by City of St. Petersburg's Mayor as vice-chair of South St. Petersburg's Community Redevelopment Plan AdHoc Committee – researched CRA's, facilitated public forums, and assisted city staff in developing CRA Plan. The plan included business construction incentives, creation of Tax Increment Finance district, and collaboration with other community development organizations like Vision 2020 to reduce poverty.
- Manage a team of business managers that identify, research, and resolve business service issues pertaining to access to capital, zoning and permitting, business model design, minority and small business certification, and state and local economic development resources.
- Recruited by International Economic Development Council to assisted Port Arthur, TX with post disaster assistance. Facilitated a collaborative lab to develop a recovery plan for the community after Hurricane Harvey. Resulting in $4.7M in federal funding for Disaster Supplemental Assistance to support small business.
- Organized and participated in international trade mission to include a skills and knowledge exchange summit. Facilitated industry leaders and workforce trainer's discussion on horizon jobs. Strategized how to work together to fill the workforce pipeline with skilled workers and identify re-training opportunities. Collaboration with local workforce agency and St. Petersburg College.
- Establish and cultivate positive working relationships with economic development organizations, local governments, Chambers of Commerce, existing business and industry, higher educational institutions, public schools, and housing development agencies.

INFLUENCE

I foster a one community approach to diversifying Pinellas's economy. Knowledge exchange partner for business sustainability and implementer who connects the dots between diversity and inclusion efforts across the organization, specific to procurement and small business development.

Key Accomplishments/Responsibilities

- Delivered transformative services for Pinellas's government contractors by assessing service gaps and establishing a Federal Procurement Center (PTAC) providing technical assistance for federal contractors. Recognized as the number one PTAC in the state of Florida in 2018.
- Influenced County project managers to implemented new standard polices for utilization and compliance with the Small Business Enterprise (SBE) policy. Increasing participation and award value from $225,000 to over $17.9 million in contracts in three years.
- Data sharing of small business trends with countywide stakeholder, to influence tactical approaches to developing and implementing organizational strategies and business development plans to guide and grow companies in Pinellas county.
- Developing and maintaining effective relationships throughout the organization, serving as a credible advisor for strategic and tactical approaches for handling diversity, equity and inclusion in service delivery and employee engagement.

Dr. Cynthia Johnson

PARNTERSHIPS & ALLIANCES

I am an economic development leader and relationship builder responsible for building partnerships, and expanding business relationships with local corporations, educational training providers, and government leaders.

Key Accomplishments/Responsibilities

- Strengthening economic development partner network by creating the Small Business Collaborative that includes nineteen regional partner agencies to support and develop strategies for small business retention, growth and development.
- Idea generation and knowledge exchange with city economic developers, elected officials, and community organizations on public policy, encompassing issues, concerns, and generating solutions to business development in distressed communities.
- Organized Superbowl XLIII Host Committee business exchange for small business match maker with the NFL. Fifty selected small businesses promoted their products, goods, and service to NFL prime contractors.
- Influenced the restructure of Minority Enterprise Development Corporation from a 100% public volunteer agency to a public private partnership focusing on Tampa Bay wide minority business development. Won Diversity Business Advocate of the Year in 2018.
- Master Facilitator for Achieve Global (AG) and Pinellas County– AG is leadership development and organizational change curriculum using research principles. Instruct county executives, directors, mid-level managers, and front-line supervisors on leadership principles to build an efficient workforce, reducing the broader cost of doing business and improving morale, engagement, and employee productivity.

WORK EXPERIENCE

Director, Pinellas County Economic Development, Pinellas County, FL 2021 – Present
Director, Office of Small Business & Supplier Diversity and Division Director, Pinellas County Economic Development, Pinellas County, FL 2000 –2021
Center Director, Florida Small Business Development, Pinellas County Government, Clearwater, FL 2010 -2021
Public School Administrator and Educator, Pinellas County School Board, Clearwater, FL 1996 - 2000

EDUCATION

2005 Nova Southeastern University, *Doctor of Education/Ed.D.*, Educational Leadership

1996 Nova Southeastern University, *Master of Education*, Organizational Leadership

1992 Florida Memorial University, *Bachelor of Science*, Elementary Education

1989 St. Petersburg College, *Associate of Science*, Human Resources

PROFESSIONAL CERTIFICATES

2020 Cornell University, Diversity & Inclusion Certification
2019 Dominance, Influence, Steadiness and Conscientiousness (DISC) *Certified*
2014 Certified Business Continuity Professional | International Disaster Recovery Institute
2013 Economic Development Finance Practitioner |National Development Council -*Certified*
2011 Hyperion Planning & Budgeting | Pinellas County Government

COMMUNITY ENGAGEMENT & HONORS

2020 Tampa Bay Business Journal | Top 30 Women to Watch in 2021
2018 Onyx – Women in Government Leadership Award
2016 Executive Leadership Institute, | National Forum of Black Public Administrators, Class President
2013 IEDC Economic Developer – Disaster Recovery Leadership Engagement Award
2008 Leadership Tampa Bay, Tampa FL
2005 Leadership Pinellas, Clearwater, FL
2003 Eckerd College Leadership Institute, St. Petersburg, FL
Enterprise Florida | Urban Work Group, Chair (2001 – 2011)
ONE Community | Equity & Economic Development Committee (2018 – Present)
ICMA | Women in Government Focus Group (2020 – Present)

Sisinnio Concas, Ph.D.

Sisinnio Concas, Ph.D.
Program Director | Research Associate Professor
University of South Florida, Center for Urban Transportation Research

Dr. Concas is the founder and Director of the Autonomous & Connected Mobility Evaluation (ACME) Program at the Center for Urban Transportation Research (CUTR). Leveraging his 24 years of experience as a transportation economist, his research focuses on the evaluation of novel and disrupting mobility technologies.

ACME showcases the very best of USF researchers skilled in advanced econometric methods, traffic engineering, safety, data mining, and artificial intelligence applications to drive innovative solutions and inform policy makers on industry-specific decisions.

Dr. Concas holds a Ph.D. in Economics from the University of South Florida, with a field specialization in Applied Econometrics and Urban Economics. He also holds a Doctoral degree in Political Sciences, with a field specialization in Macroeconomics from the Universitá degli Studi di Sassari, Italy. He currently serves as member of the TRB Standing Committee on Economics and Finance (AMS50) and the Subcommittee on International Developments in Light Rail Transit (AP075-3).

Agency/Firm: CUTR
Years of Experience: 24
Education: PhD in Urban Economics and Applied Econometrics; Doctoral Degree in Political Sciences, Macroeconomics and Political Economy; M.A. in Economic Policy Analysis and Applied Econometrics,
THEA V2X Project Role: Performance Measurement Lead

Professional Experience
July 2017 – Present: **Center for Urban Transportation Research, University of South Florida Program Director, Autonomous & Connected Mobility Evaluation (ACME)**

- Leading the Autonomous & Connected Mobility Evaluation (ACME) program. ACME specializes in performing economic analysis and performance evaluation of autonomous and connected transportation solutions.
- Performance Measurement Evaluation Task Lead, Federal Highway Administration (FHWA) Connected Vehicle Pilot Deployment Program – Tampa Site.
- Managing the independent evaluation of the Federal Transit Administration (FTA) Safety Research and Demonstration (SRD) Program
- Performance Measurement Evaluation Task Lead, Interstate-4 (I-4) Florida's Regional Advanced Mobility Elements (FRAME) Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD)
- Performance Measurement Evaluation Task Lead, Interstate-4 Pinellas County Connected Community (PCC) Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD)

January 2012 – Present: **Department of Civil and Environmental Engineering, University of South Florida Research Associate Professor**

- Exercised project management duties of a $4.5 million research portfolio. Supervising team of post-doctoral researchers and graduate research assistants.
- Managed and coordinated the economic impact evaluation of seven urban circulator and streetcar systems for the Office of the Secretary of Transportation.
- Performed economic impact and feasibility studies of highway, mass transit, and toll-road projects for federal, state, and local transportation authorities.
- Evaluating the return on investments of transportation demand management (TDM) programs.
- Led implementation of dynamic carsharing pricing pilot project funded by the U.S. Department of Transportation Value Pricing Pilot Program (VPPP).
- Contributing to national and international cross-university research collaboration.
- Invited as expert panelist on national and international transport conferences. 2001 – 2011: Center for Urban Transportation Research, University of South Florida Senior Research Associate
- Performed project management duties for a $3.5 million research portfolio. Managed team of graduate research assistants.
- Conducted economic impact analysis of state public transportation systems, tolling agencies work plans, and freight and airport infrastructure investments.
- Conducted research on dedicated truck-way lanes on the highway system.
- Developed a real options approach to estimate benefits of transportation research for the Florida Department of Transportation.
- Designed a framework to assess the feasibility of alternative fuels for mass transit.
- Defined a project prioritization methodology to evaluate Florida's general aviation airport security enhancements.
- Created a standard approach to quantify the costs and benefits of transportation demand management (TDM) initiatives.
- Developed TRIMMS™ (Trip Impacts of Mobility Management Strategies), a benefit-cost analysis model to evaluate TDM strategies.
- Presented study findings at stakeholder's board meetings, public hearings, and forums
- Invited as TDM expert panelist in international conferences on mobility management.

Awards, Honors, Affiliations

- University of South Florida, Department of Economics, Courtesy Appointment
- University of Tampa, Department of Economics, Teaching Adjunct
- TRB Standing Committee on Economics and Finance (AMS50), Member
- Subcommittee on International Developments in Light Rails Transit (AP075(3)), Member
- International Transportation Economics Association, Member
- SAE Standards Shared and Digital Mobility Committee, Liaison

Select Publications

- **Concas,** S., and Kummetha, V. C. "Impact of COVID-19 on Driving Style and Traffic Safety," in COVID-19: Implications for Policy and Planning Volume 12. Academic Press (2023). https://doi.org/10.1016/bs.atpp.2023.07.001
- Kummetha, V.C., Durrani, U., Mason, J., **Concas,** S. & Kondyli, A. "Driver Classification Using Self-reported, Psychophysiological, and Performance Metrics Within a Simulated Environment." Data Sci. Transp. 5, 6 (2023). https://doi.org/10.1007/s42421-023-00069-8

- Kamrani, M., **Concas, S.**, Kourtellis, A., Rabbani, M., M., Kummetha, V. C., and Dokur, O (2023). "Study of Real-world Drivers' Reactions to Forward Collision Warnings: Leveraging Real-World Data from the THEA CV Pilot." Transportation Research Part F: Traffic Psychology and Behaviour, 92, 108-120, https://doi.org/10.1016/j.trf.2022.10.011.
- Kummetha, V. C., Khoda Bakhshi, A., **Concas, S.**, Kourtellis, A., & Mohammadnazar, A. (2023). "Examining Individualistic Driving Volatility Changes During and One Year into the COVID-19 Pandemic Using Paneled Connected Vehicles Trajectories." Transportation Research Record, 0 (0). https://doi.org/10.1177/03611981231158326
- **Concas, S.**, Kourtellis, A., Kummetha, V., Kamrani, M., Rabbani, M., & Dokur, O. (2022). "Longitudinal Study of the COVID-19 Pandemic Impact on Activity Travel Using Connected Vehicle Data." Transportation Research Record, 0 (0). https://doi.org/10.1177/03611981221107006
- Kummetha, V. C., Kamrani, M., **Concas, S.**, A. Kourtellis, A., and Dokur, O. "Proactive Congestion Management via Data-Driven Methods and Connected Vehicle-based Microsimulation." Journal of Intelligent Transportation Systems, July 2022. https://doi.org/10.1080/15472450.2022.2140047
- Dokur, O., **Concas, S.**, Kamrani, M., Kourtellis, A., & Kummetha, V. (2023). "Securely Sharing and Visualizing Connected Vehicle Analytics: THEA CV Pilot Performance Evaluation Dashboard." Transportation Research Record, 2677(1), 1276–1289. https://doi.org/10.1177/03611981221103870
- **Concas, S.** and, DeSalvo, J. S. The Effect of Density and Trip-Chaining on the Interaction between Urban Form and Transit Demand. Journal of Public Transportation, 17 (3): 16-38, (2014). https://doi.org/10.5038/2375-0901.17.3.2.
- **Concas, S.**, Barbeau, S. J., Winters, P. L., & Georggi, N. L. (2014). Measuring Travel Behavior Changes to Variably Priced Carsharing Using Mobile Applications. In S. Rasouli, & H. Timmermans (Ed.), Mobile Technologies for Activity-Travel Data Collection and Analysis (pp. 276-292). IGI Global. https://doi.org/10.4018/978-1-4666-6170-7.ch017
- Patil, S., **Concas, S.**, Burris, M., & Devarasetty, P. C. (2013). Investigating Changes in Willingness to Pay for Managed-Lane Systems: Quasi-Panel Approach. Transportation Research Record, 2382(1), 37–45. https://doi.org/10.3141/2382-05
- **Concas, S.** (2013). Accessibility and Housing Price Resilience: Evidence from Limited-Access Roadways in Florida. Transportation Research Record, 2357(1), 66–76. https://doi.org/10.3141/2357-08
- Patil, S., Burris, M., Shaw, W.D., **Concas, S.** (2011) Variation in the Value of Travel Time Savings and its Impact on the Benefits of Managed Lanes, Transportation Planning and Technology, 34, (6), 547-567. https://doi.org/10.1080/03081060.2011.600068
- **Concas, S.**, & Winters, P. L. (2007). Impact of Carpooling on Trip-Chaining Behavior and Emission Reductions. Transportation Research Record, 2010(1), 83–91. https://doi.org/10.3141/2010-10
- **Concas, S.**, Winters, P. L., & Wambalaba, F. W. (2005). Fare Pricing Elasticity, Subsidies, and Demand for Vanpool Services. Transportation Research Record, 1924 (1), 215–223. https://doi.org/10.1177/0361198105192400127

Kenneth Jacobs

KEY PERSONNEL EXPERIENCE

KENNETH JACOBS

TSM&O Group Director

Ken Jacobs has more than 35 years of progressive experience in transportation systems management and operations with a focus in traffic engineering, traffic safety, traffic signal design and operation, intelligent transportation systems (ITS) and advanced traffic management systems (ATMS). He is a strategic leader with a successful track record of advancing the transportation field, developing strong intergovernmental partnerships and driving business and technology change initiatives, including adaptive signal control technolgy (ASCT), arterial level ITS, traffic incident management and advanced traveler information systems. Ken has substantial experience in traffic management center (TMC) design and operations, connected vehicle technology and traffic signal control software. Ken offers concentrated experience directing all phases of transportation project activities including project planning, programming, contracts, agreements, design, operations and maintenance.

Prior project experience includes the following:

Pinellas County Smart Community, Pinellas County, FL – As Pinellas Director of Transportation, performed Project Management for the Pinellas County Advanced Transportation and Congestion Management Technology Deployment Initiative (ATCMTD) grant from the Federal Highway Administration. Later, with HNTB, Ken support Project Management efforts and led the Systems Engineering Analysis for the project.

Pinellas County Department of Transportation, Pinellas County, FL – As Pinellas Director of Transportation, oversaw all transportation related functions including engineering, design, ATMS/ITS, transportation planning, safety, operations, roadway maintenance, sidewalk and the Americans with Disability Act (ADA) programs, access management, right of way (ROW) permitting, roadway and multimodal design activities.

Multiple ATMS/ITS Projects, Pinellas County Department of Transportation, Pinellas County, FL – Various project roles and responsibilities for ATMS/ITS projects. Responsibilities included system design, timing plan development, database management, TMC operations, Standard Operating Guideline (SOG) development, contracts, agreements, project management and operations.

- ATMS/ITS Segments 1 – 3 US 19/SR 60: Project Manager responsible for the implementation of new ATMS/ITS system along two major state arterials in Pinellas County. This included 60 signalized intersections, 48 closed-circuit television (CCTV) cameras, 17 arterial dynamic messaging signals, fiber optic communications network, two central signal operations software programs and two adaptive signal control technology (ASCT) software algorithms. Responsible for securing CMAQ grant funds, scope development, ASCT selection, plans review, integration and testing.
- ATMS/ITS Segments 3 – 5: Project Manager responsible for 57 signalized intersections, CCTV cameras, arterial DMS and fiber optic communications. Project included design and construction of traffic management center inside category 5 rated facility.

KENNETH JACOBS

Firm
HNTB Corporation

Education
Certificate, Architectural Drafting, Arizona State University, Tempe, AZ, 1978
Credit-Hours, Pre-Engineering, Arizona State University, Tempe, AZ, 1978

Certifications & Training
Public Works Executive Certified
Traffic Signal Operations Specialist Certified
Roadway Safety Professional Certified

Professional Affiliations
Institute of Transportation Engineers
American Public Works Association
Intelligent Transportation Society of America
International Municipal Signal Association

Hire Date with HNTB
February 2021

Years of Experience with other Firms
35

HNTB

- ATMS/ITS Segments 6 – 16: Program Development Manager responsible for 217 signalized intersections, 190 CCTV cameras, 42 arterial DMS, and fiber optic communications network. Segments 6 – 13 complete with the remainder under construction or design.

Multiple ASCT Projects, Pinellas County, Pinellas County, FL – Implementation of multiple adaptive control software algorithms including OPAC, Rhodes, InSync and Centracs Adaptive. Includes 14 years of experience installing and testing a wide variety of ASCT projects including overseeing the largest ASCT installation in Florida with over 160 intersections along major state and county roadways operating various ASCT programs. Thorough understanding all major ASCT software capabilities and operational characteristics. Provided research and development of the ASCT selection, implementation, evaluation and deployment processes. Served as a site visit location and subject matter expert for United States Department of Transportation ASCT Everyday Counts Program for OPAC and Rhodes.

KENNETH JACOBS

- FDOT InSync Field Test and Evaluation Project: Project included the first installation of InSync ASCT in Florida. Working with FDOT Central Office as Project Manager to install and evaluate performance and reliability of the software to gain state approval on APL. Responsibilities included implementation, integration and evaluation of the system including a before/ after study performed by an independent consultant and submitted to FDOT Central Office as part of the APL Approval process.
- ATMS Segments 1 – 5: Project is using OPAC and Rhodes ASCT algorithms along with installation of ATMS.
- Segments 6 – 12: Program Development Manager responsible for the continued implementation of ASCT at program level.
- Segment 7 Centracs Adaptive Pilot Project: Project Manager who installed, operated and provided feedback to the vendor on operational issues and opportunities for improvement of the adaptive algorithm.

US 19 Signal Phasing and Timing (SPaT) Challenge Project, Central Office/District 7, FL - Project Manager for Pinellas County SPaT Challenge pilot project. Responsibilities included installation of connected vehicle (CV) communication along US 19 at 23 intersections including 11 at grade intersections and 12 grade separated intersections. This included the first installation of C-V2X RSU communications in Florida. Responsible for project oversight, hardware installation and testing.

Multiple Mutimodal Projects, Pinellas County Public Works, Pinellas County, FL

- Belleair Road Feasibility Study: Program Manager to develop needs assessment process to incorporate multimodal review into existing resurfacing, restoration and rehabilitation process. Project included conceptual design of all roadway, drainage and multimodal needs along the two-lane undivided roadway. Multimodal components included safe speed for all users, sidewalk network, multi-use trail and bike lane considerations. Responsible for developing scope, process and overseeing project deliverables.
- FDOT District 7 Tri-County Trail Design Build Project: Project Team responsible for the $4.2 million grant received by Pinellas County for construction of a five-mile trail segment along Keystone Road and through Brooker Creek Preserve.

- North Loop Trail Design Build Project: Project Manager for initial grant submittal process and development of design build criteria package. The project connects two existing trail segments and completes the northern six-mile segment of a countywide trail loop. Contract awarded in 2019 and is still under construction.

- Move Safe Pinellas: Oversaw the development of an award-winning public safety campaign for the County including educational efforts for both school children and other vulnerable road users. Initiatives included bike helmet fittings and giveaways at elementary and middle schools. Distributed safety devices to both children and adult pedestrians, multiple video safety messages and weekly traffic safety messages on social media.

KENNETH JACOBS

FDOT Flashing Yellow Arrow Pilot Project, Pinellas County Public Works, Pinellas County, FL – Project Manager responsible for a joint project with FDOT Central Office to install and evaluate the first Flashing Yellow Arrow in Florida after receiving interium FHWA approval. The project included the development of a public outreach plan, implementation, integration and evaluation, including a before/after study performed by Center of Urban Transportation (CUTR) and submitted to FDOT Central Office, as well as developing operational capabilities to omit FYA during active pedestrian phases by both time-of-day or pedestrian actuation.

Computerized Traffic Signal System, Pinellas County Public Works, Pinellas County, FL – Project Manager for the County's original computerized traffic signal system managing the installation and integration process and supervised the system operations for the system that controlled over 300 signalized intersections.

Computerized Signal System Design, City of Saint Petersburg, Saint Petersburg, FL - Senior Transportation Analyst and System Manager for the City of Saint Petersburg computerized signal system design project. Developed traffic signal field construction plans, TMC design, timing plans, evaluation tasks, technical specifications and testing requirements for specialized field equipment.

John D. Porcari

John D. Porcari
President, Axilion Inc.

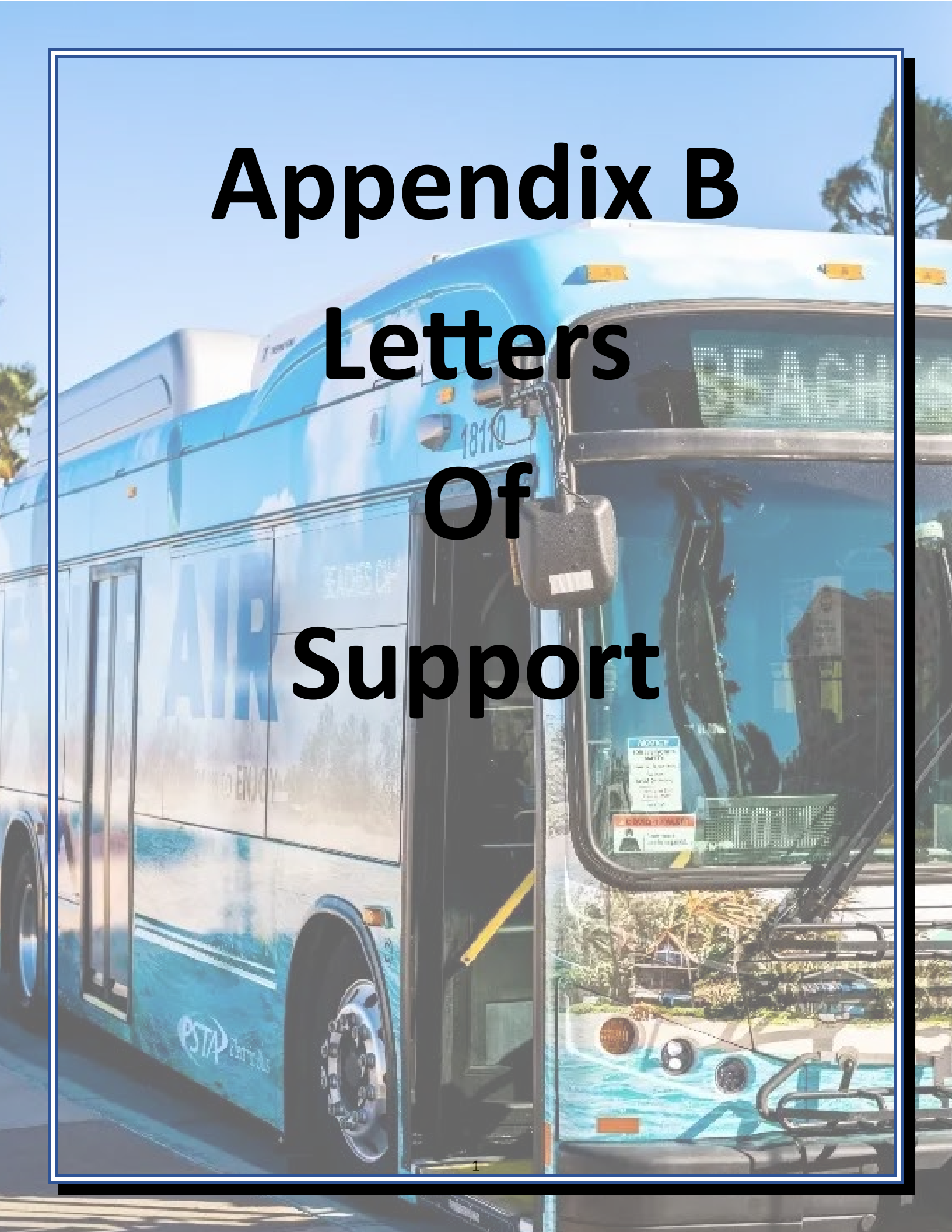
Before joining Axilion, John D. Porcari was President of US Advisory Services for WSP Services provided by WSP Advisory Services include P3 public advisory and investor advisory services, value capture analysis, project development, asset management, policy and research.

John previously served as **Deputy Secretary of the United States Department of Transportation** after being nominated by President Obama and unanimously confirmed by the US Senate. As Deputy Secretary, John served as the department's Chief Operating Officer, with day-to-day responsibility for DOT's 10 operating administrations, 55,000 employees worldwide and a $70 billion operating budget. Porcari served as a member of the President's Management Council, which is responsible for implementing executive branch-wide policies for the US government.

At USDOT, Porcari led the department's American Reinvestment and Recovery Act (ARRA) implementation team, expediting the construction of $48 billion of transportation stimulus projects nationwide and served as a member of the Vice President's Recovery Act Board. John chaired the department's Credit Council, responsible for TIFIA, RRIF and Private Activity Bond allocations, as well as chairing the TIGER grant Senior Review Team. Porcari chaired the DOT Safety Council, working with each of the modal administrations to foster a higher level of safety and a coordinated research program on issues common across the transportation spectrum including fatigue, safety management systems and the deployment of technology in transportation systems. John coordinated the efforts of NHTSA, FHWA, RITA, the auto industry and other stakeholders in launching the connected vehicle pilot program and associated draft rule-making. A special emphasis of Porcari's tenure at USDOT was re-engineering permitting and approval processes at the federal level to achieve measurably better outcomes in a faster, more predictable process.

Prior to his service as DOT Deputy Secretary, John twice served as **Secretary of the Maryland Department of Transportation**. Porcari also served as **CFO and COO of the University of Maryland**. Previous service included appointments as Assistant Secretary for Economic Development Policy for the Maryland Department of Business and Economic Development and several economic development-related positions at the local government level.

Appendix B
Letters
Of
Support



Appendix B – Letters of Support

The following support and interest letters are provided for the PASS Project:

- Pinellas Matching Funds Letter of Commitment
- City of Pinellas Park
- Pinellas Suncoast Transit Authority (PSTA)
- City of Clearwater
- City of St. Petersburg
- Forward Pinellas
- Axilion

Pinellas County Matching Funds Commitment Letter

Public Works
Traffic Engineering

February 1, 2024

U.S. Department of Transportation (DOT)
Federal Highway Administration (FHWA)
Office of Operation
1200 New Jersey Avenue, SE Mail Drop: E86-205
Washington, DC 20590

Attn: Jim Garling

Re: Advanced Transportation Technology and Innovation (ATTAIN) Program (Funding Opportunity Number: 693JJ324NF00005)

Dear Mr. Garling:

Pinellas County is committed to provide $6,333,620.00 for the proposed Pinellas Advanced SmartTracs System (PASS) project. This match is 76 percent of the total project cost of $8,333,620.00. We kindly request for $2,000,000.00 over the next four years with our application to the ATTAIN program.

Sincerely,

Thomas Washburn, PE
Transportation Division Director

22211 U.S. Hwy. 19 N., Building 1
Clearwater, FL 33765
Phone (727) 464-8900
V/TDD (727) 464-4062
www.pinellascounty.org

City of Pinellas Park

PINELLAS PARK
• SIMPLY CENTERED •

CITY HALL - P.O.Box 1100
PINELLAS PARK, FL 33780-1100

January 17, 2024

U.S. Department of Transportation (DOT)
Federal Highway Administration (FHWA)
Office of Operation
1200 New Jersey Avenue, SE Mail Drop: E86-205
Washington, DC 20590

Attn: Jim Garling

Re: Advanced Transportation Technology and Innovation (ATTAIN) Program (Funding Opportunity Number: 693JJ324NF00005)

Dear Mr. Garling

The City of Pinellas Park is pleased to support Pinellas County in responding to the U.S. Department of Transportation and Federal Highway Administration's FY24 Advanced Transportation Technology and Innovation (ATTAIN) Program. The proposed Pinellas Advanced SmartTracs System (PASS) project will implement cutting edge Artificial Intelligence technologies and deploy smart detection systems to improve traffic flow along major arterials. The system will also reduce traffic related crashes and minimize transportation related emissions by improving the efficiency of the system. PASS will deploy, evaluate, and document multiple operational systems that support goals related to safety, mobility, efficiency, environmental impacts, equity, and return-on-investment.

Pinellas County offers a culturally and economically diverse population, vibrant employment base, and attracts seasonal tourism throughout the year. Pinellas County is the densest county in the State of Florida with a population of 1,521 per square mile. Continued growth in the local population combined with a steady increase in annual tourism has emphasized the need for more efficient and robust technology.

The project offers significant benefits that include connectivity that substantially improves safety, mobility, efficiency, and environmental impacts. If you have any questions regarding our support for this project, please do not hesitate to reach out.

Sincerely,

Bart Diebold
City Manager

Pinellas Suncoast Transit Authority (PSTA)

January 19, 2024

U.S. Department of Transportation (DOT)
Federal Highway Administration (FHWA)
Office of Operation
1200 New Jersey Avenue, SE Mail Drop: E86-205
Washington, DC 20590
Attn: Jim Garling

Re: Advanced Transportation Technology and Innovation (ATTAIN) Program (Funding Opportunity Number: 693JJ324NF00005)

Dear Mr. Garling:

The Pinellas Suncoast Transit Authority (PSTA) is pleased to support Pinellas County in responding to the U.S. Department of Transportation and Federal Highway Administration's FY24 Advanced Transportation Technology and Innovation (ATTAIN) Program. The proposed Pinellas Advanced SmartTracs System (PASS) project will implement cutting edge Artificial Intelligence technologies and deploy smart detection systems to improve traffic flow along major arterials. The system will also reduce traffic related crashes and minimize transportation related emissions by improving the efficiency of the system. PASS will deploy, evaluate, and document multiple operational systems that support goals related to safety, mobility, efficiency, environmental impacts, equity, and return-on-investment.

Pinellas County offers a culturally and economically diverse population, vibrant employment base, and attracts seasonal tourism throughout the year. Pinellas County is the densest county in the State of Florida with a population of 1,521 per square mile. Continued growth in the local population combined with a steady increase in annual tourism has emphasized the need for more efficient and robust technology.

The project offers significant benefits that include connectivity that substantially improves safety, mobility, efficiency, and environmental impacts, all of which benefit the larger transportation system, but also PSTA as the public transit provider in Pinellas County. If you have any questions regarding our support for this project, please do not hesitate to reach out.

Sincerely,

Brad Miller
Chief Executive Officer

32 1 / 1

psta.net

City of Clearwater

CITY OF CLEARWATER
POST OFFICE BOX 4748, CLEARWATER, FLORIDA 33758-4748
MUNICIPAL SERVICES BUILDING, 100 SOUTH MYRTLE AVENUE, CLEARWATER, FLORIDA 33756
TELEPHONE (727) 562-4750 FAX (727) 562-4755

PUBLIC WORKS

01/18/2024
U.S. Department of Transportation (DOT)
Federal Highway Administration (FHWA)
Office of Operation
1200 New Jersey Avenue, SE Mail Drop: E86-205
Washington, DC 20590

Attn: Jim Garling
Re: Advanced Transportation Technology and Innovation (ATTAIN) Program (Funding Opportunity Number: 693JJ324NF00005)

Dear Mr. Garling,

The City of Clearwater is pleased to support Pinellas County in responding to the U.S. Department of Transportation and Federal Highway Administration's FY24 Advanced Transportation Technology and Innovation (ATTAIN) Program. The proposed Pinellas Advanced SmartTracs System (PASS) project will implement cutting edge Artificial Intelligence technologies and deploy smart detection systems to improve traffic flow along major arterials. The system will also reduce traffic related crashes and minimize transportation related emissions by improving the efficiency of the system. PASS will deploy, evaluate, and document multiple operational systems that support goals related to safety, mobility, efficiency, environmental impacts, equity, and return-on-investment.

Pinellas County offers a culturally and economically diverse population, vibrant employment base, and attracts seasonal tourism throughout the year. Pinellas County is the densest county in the State of Florida with a population of 1,521 per square mile. Continued growth in the local population combined with a steady increase in annual tourism has emphasized the need for more efficient and robust technology.
The project offers significant benefits that include connectivity that substantially improves safety, mobility, efficiency, and environmental impacts. If you have any questions regarding our support for this project, please do not hesitate to reach out.

Sincerely,

David Lutz, PE
Traffic Engineering Manager

Tara Kivett, PE
City Engineer

Brian J. Aungst Sr., Mayor

Mark Bunker, Councilmember
Kathleen Beckman, Councilmember
David Allbritton, Councilmember
Lina Teixeira, Councilmember

"Equal Employment and Affirmative Action Employer"

City of St. Petersburg

OFFICE OF THE MAYOR

CITY OF ST. PETERSBURG **KENNETH T. WELCH,** MAYOR

January 29, 2024

U.S. Department of Transportation (DOT)
Federal Highway Administration (FHWA)
Office of Operation
1200 New Jersey Avenue, SE Mail Drop: E86-205
Washington, DC 20590

Re: Advanced Transportation Technology and Innovation (ATTAIN) Program (Funding Opportunity Number: 693JJ324NF00005)

Dear Mr. Garling,

The City of St. Petersburg is pleased to support Pinellas County in responding to the U.S. Department of Transportation and Federal Highway Administration's FY24 Advanced Transportation Technology and Innovation (ATTAIN) Program. The proposed Pinellas Advanced SmartTracs System (PASS) project will implement cutting edge Artificial Intelligence technologies and deploy smart detection systems to improve traffic flow along major arterials through the city. We anticipate a project request of approximately $2M to provide advanced technology at an estimated 91 intersections in Pinellas County. Roughly, 15 of those intersections will be in St. Petersburg.

The project builds upon anticipated investments to introduce connected vehicle readiness technology along some of St. Petersburg's most congested and highest crash corridors. The system is expected to improve safety while also minimizing transportation-related emissions. Finally, the PASS project will use a data-driven approach to deploy, evaluate, and document multiple operational systems that support goals related to safety, mobility, efficiency, environmental impacts, equity, and return-on-investment.

Consequently, the PASS project aligns perfectly with the City's Vision to embrace new technologies and partnerships that implement effective solutions to create positive impact and improve quality of life for St. Petersburg residents and visitors. St. Peterburg is Pinellas County's largest municipality and the 5th largest city in the State of Florida. We offer a culturally and economically diverse population, vibrant employment base, and attract seasonal tourism throughout the year. Continued growth in the local population combined with a steady increase in annual tourism has emphasized the need for more efficient and robust technology that provides greater mobility and safety.

We look forward to the opportunities associated with successful implementation of the Pinellas Advanced SmartTracs System project.

Sincerely,

Kenneth T. Welch

Kenneth T. Welch
Mayor

P.O. BOX 2842, ST. PETERSBURG, FLORIDA 33731 | O: 727-893-7201 | F: 727-892-5365 | MAYOR@STPETE.ORG

Forward Pinellas

FORWARD PINELLAS
P: (727) 464.8250
F: (727) 464.8212
forwardpinellas.org
310 Court Street
Clearwater, FL 33756

January 29, 2024

U.S. Department of Transportation (DOT)
Federal Highway Administration (FHWA)
Office of Operation
1200 New Jersey Avenue, SE Mail Drop: E86-205
Washington, DC 20590

Attn: Jim Garling

Re: Advanced Transportation Technology and Innovation (ATTAIN) Program (Funding Opportunity Number: 693JJ324NF00005)

Dear Mr. Garling:

Forward Pinellas, the metropolitan planning organization for Pinellas County, is pleased to support Pinellas County in responding to the U.S. Department of Transportation and Federal Highway Administration's FY24 Advanced Transportation Technology and Innovation (ATTAIN) Program. The proposed Pinellas Advanced SmartTracs System (PASS) project will implement cutting edge Artificial Intelligence technologies and deploy smart detection systems to improve traffic flow along major arterials. The system will also reduce traffic related crashes and minimize transportation related emissions by improving the efficiency of the system. PASS will deploy, evaluate, and document multiple operational systems that support goals related to safety, mobility, efficiency, environmental impacts, equity, and return-on-investment.

Pinellas County offers a culturally and economically diverse population, vibrant employment base, and attracts seasonal tourism throughout the year. Pinellas County is the densest county in the State of Florida with a population of 1,521 per square mile. Continued growth in the local population combined with a steady increase in annual tourism has emphasized the need for more efficient and robust technology.

The project offers significant benefits that include connectivity that substantially improves safety, mobility, efficiency, and environmental impacts. If you have any questions regarding our support for this project, please do not hesitate to reach out.

Sincerely,

Whit Blanton, FAICP
Executive Director

Axilion

Coby Sella
Chief Executive Officer
Axilion
9 Andrei Sakharov St.
Haifa, Israel, 3508409

January 15, 2024

Jim Garling
U.S. Department of Transportation (DOT)
Federal Highway Administration (FHWA)
Office of Operation
1200 New Jersey Avenue, SE Mail Drop: E86-205
Washington, DC 20590

Subject: Letter of Intent for Expanded Deployment with County of Pinellas, Florida - Implementing Axilion's Digital Twin Technology

Dear Mr. Garling,

I am writing on behalf of Axilion to express our intent to expand our collaboration with the County of Pinellas, Florida through the ATTAIN grant. Our aim is to broaden our technology deployment beyond the existing two corridors where it is currently operational, with the goal of achieving enhanced traffic flow efficiency and improved safety throughout the entire county.

Under the previously awarded ATCMTD grant, Pinellas has deployed Axilion's X Way platform across two diverse corridors to optimize traffic corridor timing. One with a fully functional ATSPM infrastructure and the other relying on legacy infrastructure without vehicle detection. By utilizing our technology in both scenarios, we aim to showcase the versatility and scalability of the innovative X Way platform.

X Way is a SaaS solution designed to empower traffic engineers and city/county leaders to improve traffic flow through access to better insights and AI-based traffic signal timing recommendations. The platform incorporates data across a variety of sources, including underground detectors and connected vehicle probe data. With its AI-driven capabilities, traffic engineers can:

1. **Identify and Verify Traffic Patterns:** Recognize recurring time-of-day traffic patterns for precise signal timing adjustments.
2. **Access Tailored Recommendations:** Receive personalized signal timing plan recommendations with insight into how changes will impact traffic flow in each direction.
3. **Digital Twin Testing:** Leverage digital twins to experiment with various signal configurations without affecting real-time traffic conditions.

In addition to expanding these advanced features county-wide, Pinellas County would gain access to Axilion's **Priority Hub**, a user-friendly dashboard that displays a comprehensive view of traffic corridors throughout the entire jurisdiction. The corridors are sorted based on a weighted priority score that considers critical factors like commuter complaints, safety alerts, and traffic conditions. Through the Priority Hub, Pinellas County's traffic management team would benefit from:

1. A holistic view of all corridors within the County's traffic network
2. Insights into which corridors should be prioritized for improvements, contributing to more impactful spending decisions.
3. The ability to launch into other capabilities contained within the greater X Way platform.

This initiative aligns with the U.S. Department of Transportation's goals to enhance urban infrastructure and traffic management. Utilizing Axilion's technology, we aim to significantly improve traffic flow, safety and reduce congestion in Pinellas County. Additionally, the collaborative efforts undertaken through this partnership can serve as a model that can be replicated by other traffic management agencies throughout the US.

We look forward to discussing this proposal further and are available for any additional information or discussion as required.

Thank you for considering our letter of intent.

Sincerely,

Coby Sella
CEO
cobys@axilion.com