

SMART ST. AUGUSTINE

Funding Opportunity for the Department of
Transportation's National Infrastructure Investments
Program (RAISE Grant) for Fiscal Year 2022
NOFO: G4910-9X

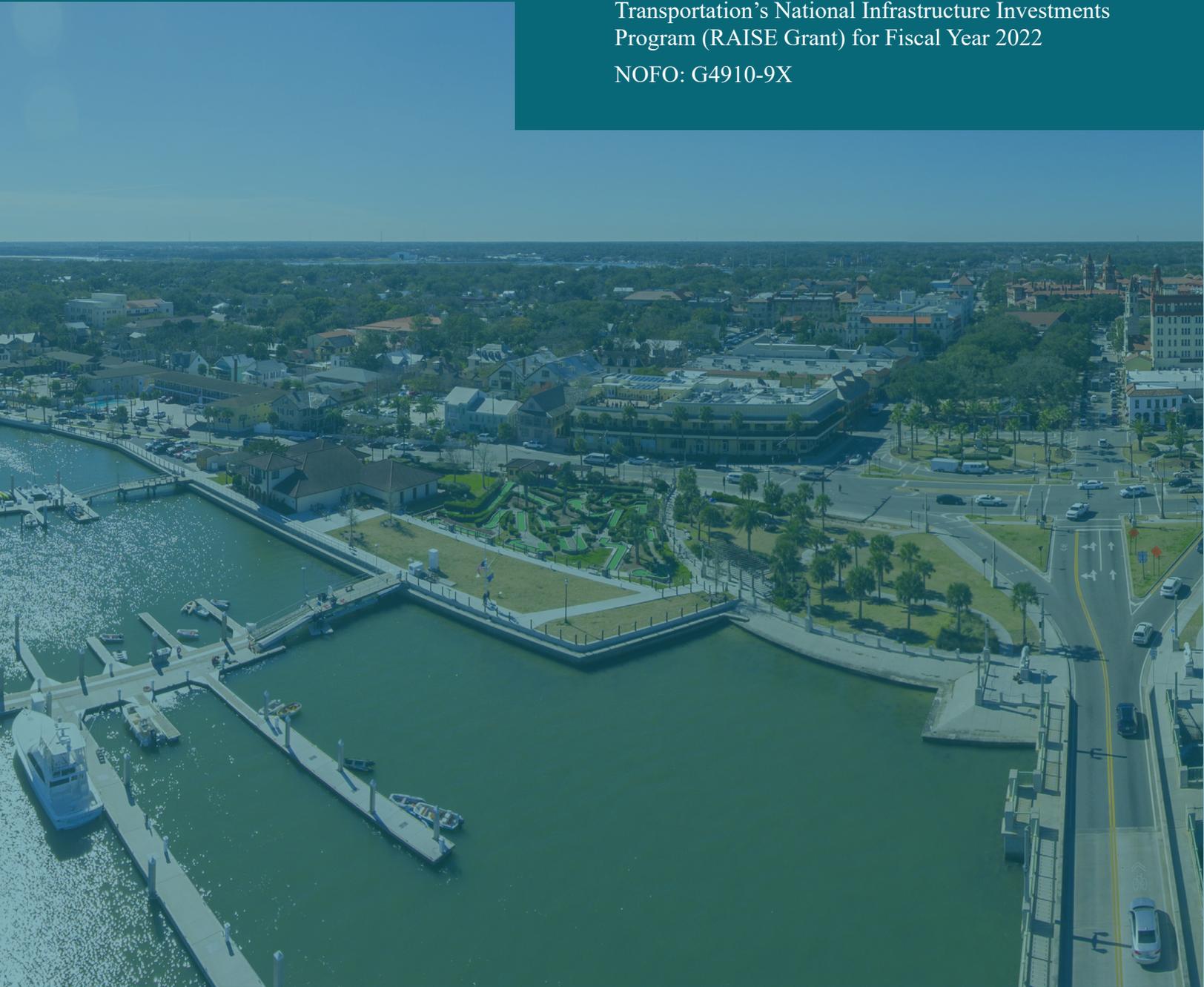


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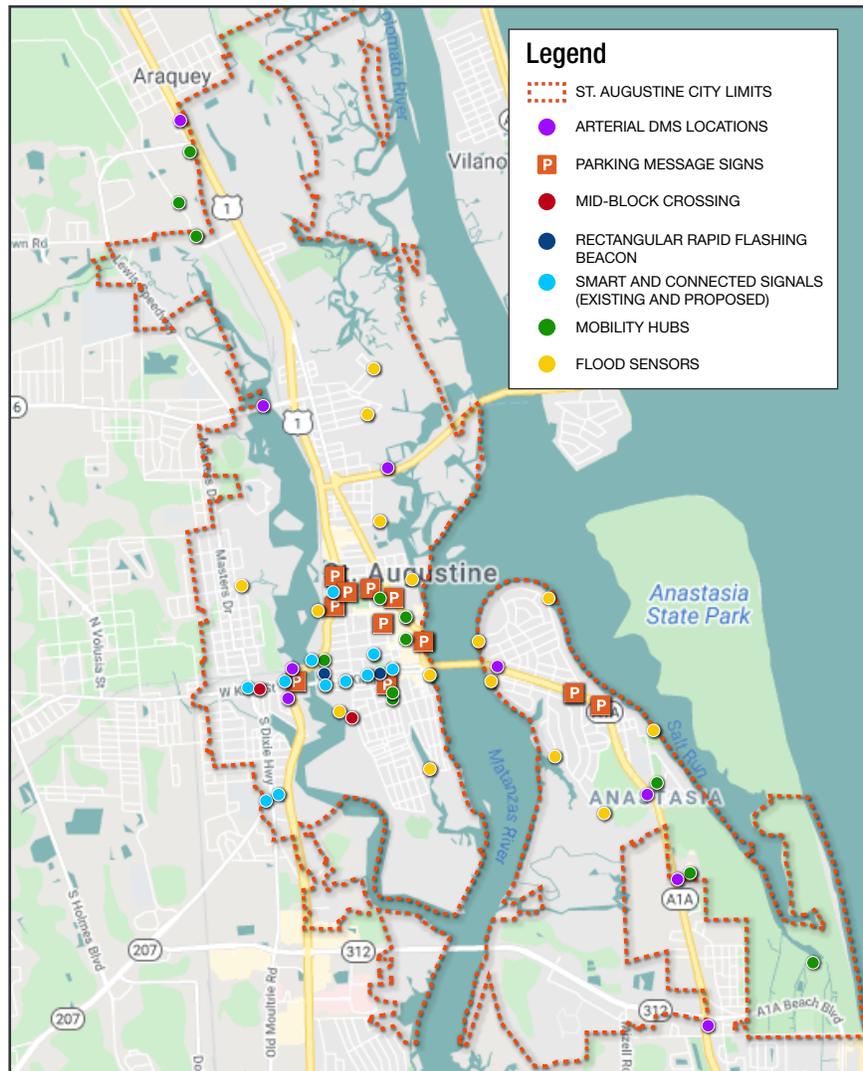
Executive Summary

The Florida Department of Transportation (FDOT), with the City of St. Augustine and the North Florida Transportation Planning Organization (TPO), are pleased to submit this grant application requesting \$12.26 million in RAISE funding for the *SMART St. Augustine* project.

The project includes a citywide deployment of innovative transportation technologies to fulfill the vision of making one of the nation's oldest continuously inhabited cities the nation's smartest city. This vision will be accomplished by deploying innovative transportation technologies to enhance mobility, improve safety, reduce environmental impacts, reduce the costs to operate and maintain infrastructure and provide critical connections for underrepresented groups to social services and jobs.

With a benefit-cost ratio of 2.34, this project is an extremely efficient use of federal resources to improve local and regional safety, sustainability and transportation reliability.

Overall Improvements Map



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Growing volumes of vehicles, pedestrians, trucks, and for-hire vehicles are overwhelming the limited parking and street infrastructure downtown. This congestion is a risk to the city's residents, workers, visitors, and historic resources. Pedestrian safety is a major priority for the city, as crashes have increased with higher traffic and pedestrian volumes. Strategies that can improve the lives of residents, workers and visitors are needed. This will provide new economic opportunities for disadvantaged areas such as West St. Augustine.

To address these challenges, the project will implement the following improvements:

- Improvements will result in a **safer and more reliable pedestrian and bicycle environment**, anticipated to reduce vulnerable road user crashes by 25%. **Vehicle crashes will reduce by 5% for all severity classes.**
- Much of the city's traffic congestion is caused by six million visitors searching for parking to reach the 0.5 square mile historic district. Smart parking and traveler information systems are anticipated to **reduce delays by 8%**. "Smart" signals will reduce delay an additional 2%, while investments in alternative travel options will reduce the number of vehicles in the historic district and help manage risks to people walking or on bicycles.
- Investments in EV charging technology at mobility hubs will **reduce transportation-related carbon emissions** and advance the use of sustainable low-carbon travel options.
- The proposed transportation investments are anticipated to **improve travel reliability** throughout the city, **including commute reliability between the city's areas of persistent poverty and job opportunities in Downtown St. Augustine.** Safety improvements are also anticipated to greatly improve bicycle and pedestrian safety for those who rely on public transit and active transportation to access education, health care and jobs.
- Data collection **will improve the risk assessments and strategies identified for infrastructure** improvements to protect \$505 million in city infrastructure and \$2.9 billion of historic resources.

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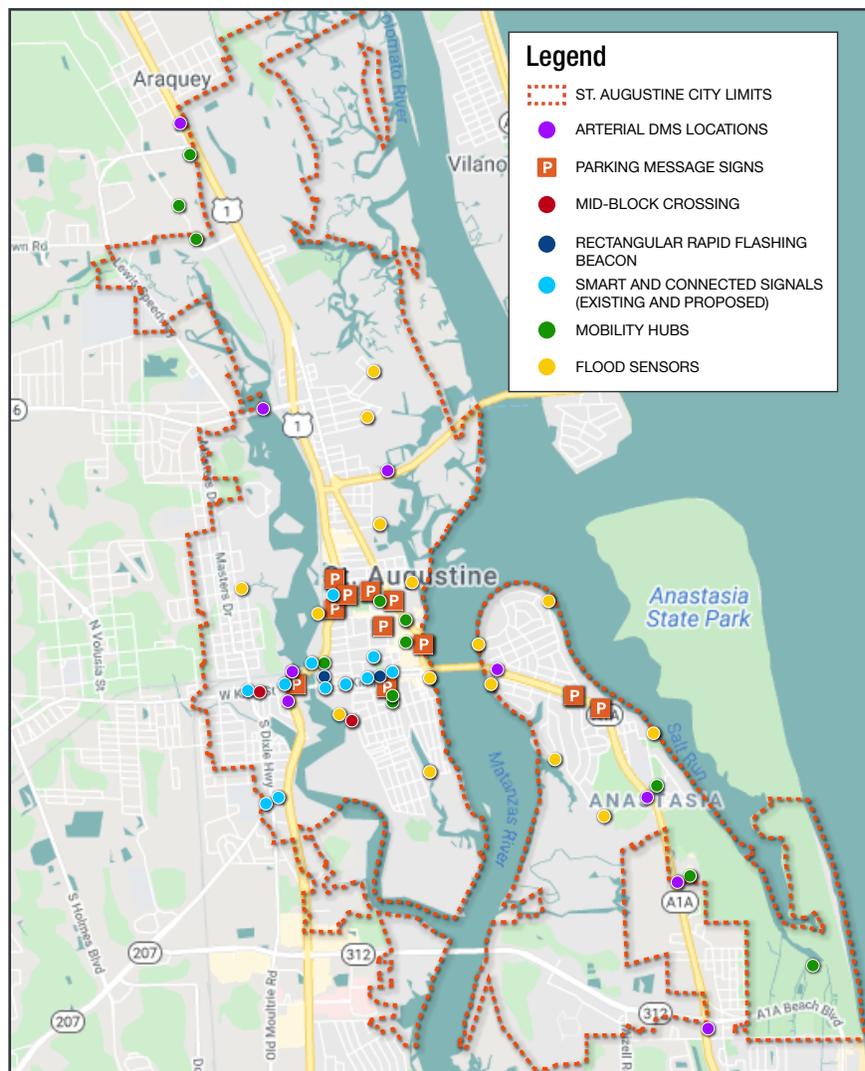
I. Project Description

The Florida Department of Transportation (FDOT), with the City of St. Augustine and the North Florida Transportation Planning Organization (TPO), are pleased to submit this grant application requesting \$12.26 million in RAISE funding for the *SMART St. Augustine* project.

The project includes a citywide deployment of innovative transportation technologies contributing to the vision of making one of the nation's oldest continuously inhabited cities the nation's smartest city. This vision will be fulfilled by deploying innovative transportation technologies to enhance mobility, improve safety, reduce environmental impacts, reduce the costs to operate and maintain infrastructure and provide critical connections for underrepresented groups to social services and jobs.

St. Augustine, dated to 1565, is the nation's oldest continuously occupied settlement of European origin in the continental United States. Six million people visit this 12.9 square mile city by car each year and converge to a historic downtown that is only 0.5 square miles. This creates unique transportation challenges that can only be addressed through this project.

Figure 1: Overall Improvements Map



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Project Benefits

Growing volumes of vehicles, pedestrians, trucks, and for-hire vehicles are overwhelming the limited parking and street infrastructure downtown. This congestion is a risk to the city’s residents, workers, visitors, and historic resources. Pedestrian safety is a major priority for the city, as crashes have increased with higher traffic and pedestrian volumes. Strategies that can improve the lives of residents, workers and visitors are needed. The project will also tie different parts of the city together. This will provide new economic opportunities for disadvantaged areas such as West St. Augustine.

To address these challenges, the project will implement the improvements summarized in Table 1:

Table 1: Project Improvements and Benefits

Project Improvements	Benefits
Foundational Activities	
<ul style="list-style-type: none"> • Software integration • Communications infrastructure for field devices • Align data exchange and analytics • Marketing and communications • Strategies to preserve multicultural historic and architectural resources in St. Augustine 	Software integration and a comprehensive smart city strategy will improve reliability, reduce maintenance costs, and provide quality-of-life benefits for both residents and visitors.
Improve Safety of Vulnerable Road Users	
<ul style="list-style-type: none"> • Crosswalk improvements • Automated bicycle and pedestrian sensors • Audible pedestrian count down signals • Bicycle and pedestrian safety app • Smart lighting • Street flood and water level sensors 	Improvements are anticipated to reduce vulnerable road user crashes by 25% overall. Vehicle crashes will reduce by 5% for all severity classes.
Enhance Mobility	
<ul style="list-style-type: none"> • Parking Management System (PMS) • Arterial Dynamic Messaging Signs (DMS) • Parking information signs • Virtual DMS • “Smart” signals and the Connected Vehicle Environment (CVE) • Automated Traffic Signal Performance Measures (ATSPM) and real-time congestion monitoring • Bridge closure notification system • Mobility hubs with information kiosks, parking pay stations, bike racks, and Electric Vehicle (EV) charging stations • Integrated traveler information application 	Much of the city’s traffic congestion is caused by visitors searching for parking in the historic district or during major events. Smart parking and traveler information systems are anticipated to reduce delays by 8%. “Smart” signals will reduce delay an additional 2%, while investments in alternative travel options will reduce the number of vehicles in the historic district and help manage risks for vulnerable road users.

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Project Improvements

Benefits

Provide Sustainable Solutions and Create Resilient Communities

- Street lighting replacement with Light Emitting Diode (LED) luminaries
- EV charging stations at mobility hubs
- Stormwater sensors for resiliency risk assessments and data analytics

Investments in sustainable energy will reduce transportation-related carbon emissions, maintenance costs, and encourage the use of sustainable travel options. Stormwater sensor data collection will improve the city's ability to assess risk and identify strategies for infrastructure improvements to protect \$505 million in city infrastructure and \$2.9 billion of historic resources.

Remove Barriers to Accessing Opportunities

- Transportation Network Companies (TNCs) and Flagler Hospital partnerships

The proposed transportation investments are anticipated to improve travel reliability throughout the city, including commuter reliability between the city's Areas of Persistent Poverty and job opportunities in downtown St. Augustine. Safety improvements will greatly improve bicycle and pedestrian safety for those who rely on public transit, paratransit, and active transportation to access education, health care, and jobs.

Project History and Context

The *Smart Region Master Plan*, prepared by the North Florida TPO for the metropolitan area was adopted by the greater St. Augustine region in 2018. The plan was endorsed by more than 100 stakeholders from government, business and non-government organizations in the region including the City Commission. The plan identified *SMART St. Augustine* as a signature, priority project. The *SMART St. Augustine* project consists of investments to address transportation issues related to safety, mobility, resiliency, energy, ladders of opportunity, and healthcare.

The region moved forward to invest in developing the *SMART St. Augustine Master Plan* (completed in 2019) to refine the vision. Systems engineering for the investments in this grant was completed in 2021. The activities include a systems engineering management plan, concept of operations, digital architecture, preliminary plans for an initial phase of the project that is programmed and system requirements **making this a “shovel-ready” project ready for design-bid-build procurement.**

The project also leverages the following recent investments made by the City, TPO and FDOT:

- Construction of new Rectangular Rapid Flashing Beacon (RRFB) mid-block crossings on SR A1A in the Uptown District on San Marco Avenue
- Adding automated pedestrian detection as a pilot into a new RRFB mid-block crossing near Flagler College
- Implementing a smart parking system consisting of pay stations and on-line payment systems
- Construction of an innovative intersection improvement at May Street and San Marco Avenue (two segments of SR A1A)
- Raising the heights of traffic signal cabinets and other infrastructure to enhance resiliency
- Implementing smart waste receptacles on St. George Street
- Developing a regional Integrated Data Exchange (IDE) where information is shared between agencies and real-time congestion management tools, corridor planning tools and tools to support the needs of organizations preparing grants for underserved communities

An initial phase of this project to install traffic signal controller upgrades and Roadside Units (RSUs) in the CVE along US 1B King Street and Cathedral Street in downtown St. Augustine is funded for \$960,000 as part of the FDOT’s Technology Application Partnerships with Local Agencies for Deploying Connected and Automated Vehicle Technologies (TAPS-LA).

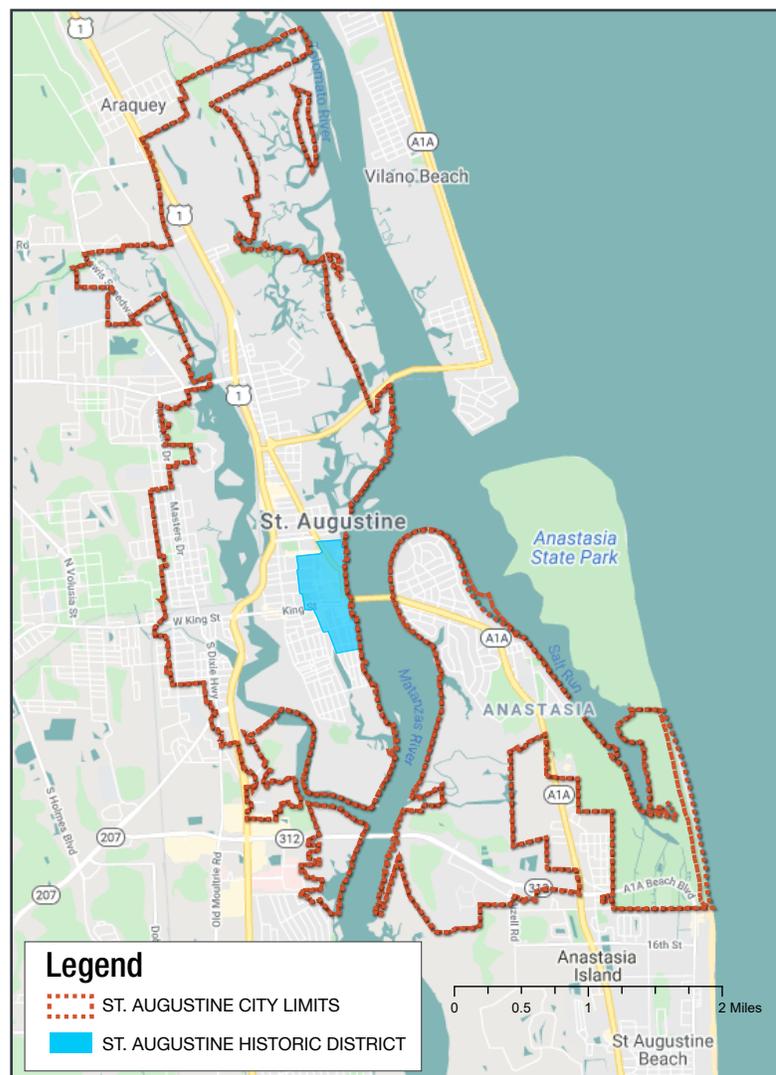
II. Project Location

SMART St. Augustine is a transformative project within the City of St. Augustine, Florida. The city is located in St. John’s County and is part of the Jacksonville metropolitan statistical area (MSA). According to the 2020 Census, the City of St. Augustine has a population of about 14,300 while the MSA population is approximately 1.6 million. A map of St. Augustine and its larger geographic context is shown in Figure 2.

US 1 is the city’s major north-south arterial, which connects the city’s historic downtown with rapidly growing municipalities to the north and south. SR A1A is a coastal scenic highway and connects to other coastal cities. The City is located approximately five miles east of I-95 and is connected to the Interstate System by four-lane SR 16 and SR 207. I-95 and US 1 connect the City to the greater Jacksonville area and to other major metropolitan areas on Florida’s east coast to the south. **Six million visitors arrive to this 12.9 square mile city by car each year and converge to a historic downtown that is only 0.5 square miles.**

The Northeast Florida Regional Airport, located on US 1 north of the City, is a general aviation airport with limited commercial flights. The Florida East Coast Railway, a Class III railroad, is the primary railroad for freight service on the east coast of Florida running between the Port of Miami and Jacksonville. St. Augustine’s Historic District is a major regional tourism destination that draws millions of visitors. It is the city’s major job center with a high percentage of local jobs supporting the tourism and service industries.

Figure 2: Project Context Map



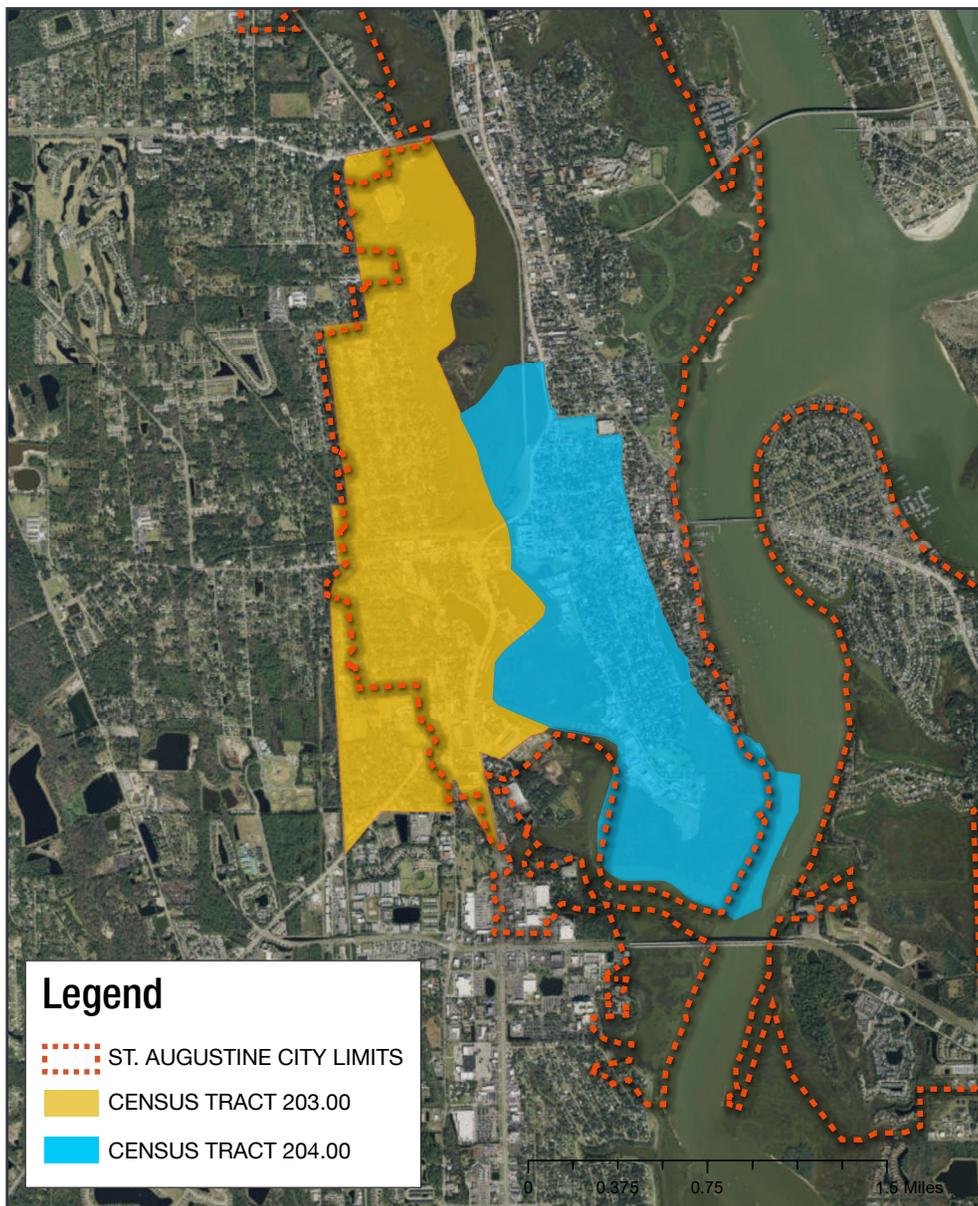
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The City includes two census tracts (203 and 204) designated as areas of persistent poverty, with one tract (203) also being designated as a historically disadvantaged community. In addition, the project falls within Federally Designated Opportunity Zone 12109020400, as shown in Figure 3. **Fifty-three percent of the city's population lives in areas designated as having persistent poverty.**

Table 2: Project Location

Location	Urban/Rural	Areas of Persistent Poverty	Historically Disadvantaged Community
City of St. Augustine, FL	Urban	Census Tracts 203, 204	Census Tract 203

Figure 3: Areas of Persistent Poverty



III. Grant Funds, Sources and Uses of all Project Funding

The project budget shown below is based on the *SMART St. Augustine Systems Engineering Report*, most recently updated in February 2022.

Total Project Budget

The total budget for *SMART St. Augustine* is \$15.4 million, which includes the match for the federal funding sources. The total project budget is broken down by project component in Table 3.

Table 3: Project Budget

Project Component	Budget	Percentage
Project Development & Environment (PD&E)	\$305,482	2%
Design	\$1,682,188	11%
Construction	\$11,050,393	72%
Construction Engineering & Inspection (CEI)	\$2,353,819	15%
Total	\$15,391,882	100%

Source of Funds

FDOT requests a RAISE discretionary grant of \$12.26 million for project deployment. This is equal to 80 percent of the total \$15.39 million future eligible project cost, as shown in Table 4. The requested RAISE grant will be the only federal funding in this grant agreement.

Table 4: Source of Funds

Fund Source	Amount	Percentage
Non-Federal Contribution	\$3,128,723	20%
RAISE Grant	\$12,263,159	80%
Total	\$15,391,882	100%

Non-Federal Funding

The non-federal funding commitment of \$3.13 million is comprised of contributions from FDOT and the City as shown in Table 5. FDOT's contribution is programmed in the state's work plan, and a letter committing the City's contribution is provided with the letters of support.

Table 5: Non-Federal Funding Commitments

Organization	Contribution
Florida Department of Transportation	\$2,839,753
City of St. Augustine	\$288,970
Total	\$3,128,723

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Other Program Funding

The overall *SMART St. Augustine* program includes approximately \$1.8 million in previously programmed federal and non-federal expenditures to support coordinating projects. An initial phase of this project is funded for construction in fiscal year 21/22 of the FDOT Work Program for \$968,000 as part of the TAPS-LA. This funding is included in the local match.

Other federal funding expenditures include the use of North Florida TPO funds for public involvement and integrated data exchange, and FDOT federal funding for connected vehicle integration upgrades. TPO federal funding was used to complete the *SMART St. Augustine Master Plan* and *Systems Engineering Report*. Previously expended local match was provided through City of St. Augustine local sources.

The total program is anticipated to have a budget of \$17.15 million including previous expenditures. These funding amounts and sources are shown below in Table 6.

Table 6: Other Programmed or Previously Expended Funding Sources

Source of Funds	Contribution
RAISE Grant	\$12,263,159
Other Federal (Programmed)	\$1,058,552
Other Federal (Previously Expended)	\$160,000
Local match (Previously Expended)	\$535,551
Total	\$17,145,985

Use of Funds

SMART St. Augustine is construction ready. Project funding will be used to fund the final design, deployment, construction engineering and inspection and post-project elevation. No right-of-way acquisition or roadway construction is anticipated in association with this grant. The project qualifies as a Programmatic Type 2 Categorical Exclusion and **no environmental phase is needed**. A cultural resource assessment is proposed in the Project Development and Environmental (PD&E) phase below to avoid impacts to the historic resources in the city.

The anticipated use of each funding source is shown in Table 7, broken down by project component and funding sources. Note that project unknowns are included in the construction budget for this project.

Table 7: Use of Funds by Project Component and Source

Project Component	Non-Federal	RAISE	Total
PD&E		\$305,482	\$305,482
Design		\$1,682,188	\$1,682,188
Construction	\$3,128,723	\$7,921,670	\$11,050,393
Construction Inspection & Engineering		\$2,353,819	\$2,353,819
Total	\$ 3,128,723	\$12,263,159	\$15,391,882

IV. Selection Criteria

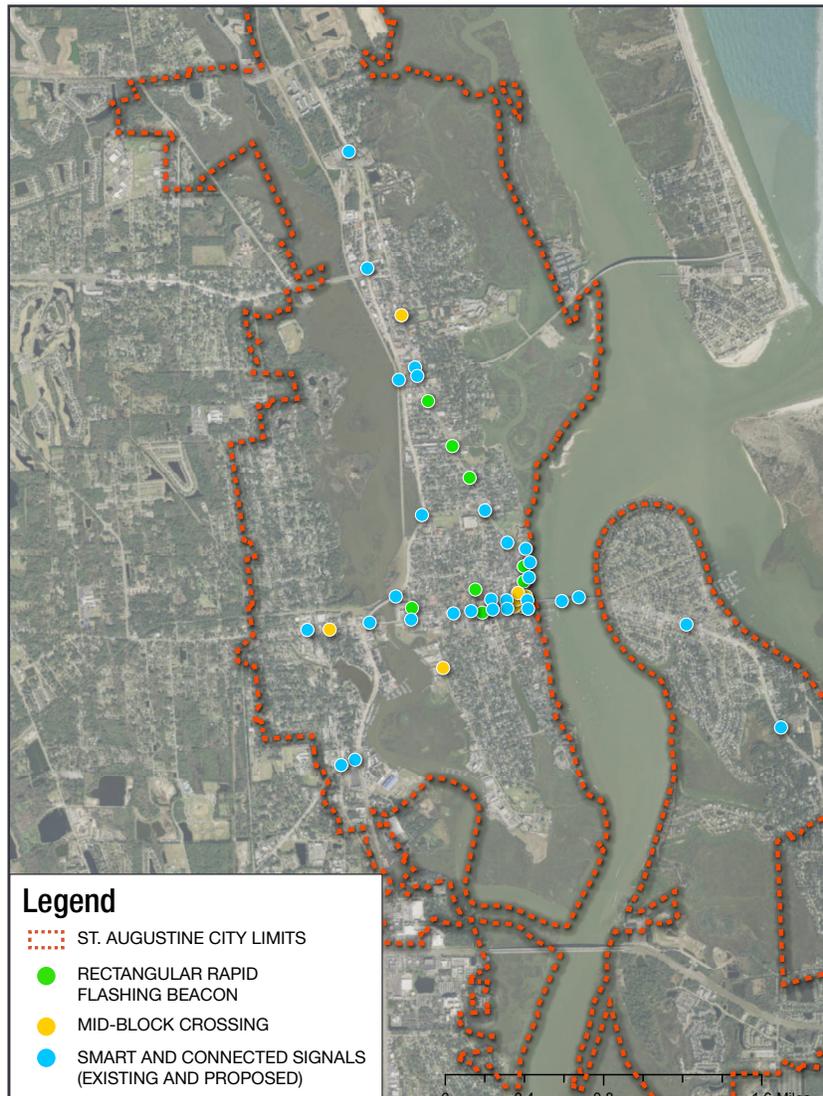
Primary Selection Criteria

Safety

Improving resident, worker, and visitor transportation safety, especially for disadvantaged populations, is one of the key purposes of the *SMART St. Augustine* project. This project will improve safety outcomes within the project area by reducing the number, rate, and severity of transportation-related crashes, particularly for vulnerable road users.

St. Augustine has a high crash rate involving bicyclists and pedestrians. The City experienced four fatalities, 81 serious-injury crashes, and 44 property-damage-only crashes involving bicycles or pedestrians over three years (2017 to 2019). The economic cost of these crashes averages \$28 million per year in lost incomes, medical costs, and other expenses.

Figure 4: Safety Improvement Map



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Characteristics of vulnerable road users in St. Augustine include:

- Tourists who are unfamiliar with the area. Some tourists use wheelchairs and other electronic personal assistive devices
- Over 1,000 students and their families who attend the world-renowned Florida School for the Deaf and Blind, which is located just north of downtown St. Augustine
- Local pedestrians, cyclists, transit riders, micromobility device users, automobile drivers, and horse-drawn carriages
- Special event participants such as marathons, parades, or others

The *SMART St. Augustine* project will reduce crash risk and increase safety outcomes for all people, including vulnerable road users, through the following improvements:

- Installation of six mid-block Rectangular Rapid-flashing Beacon (RRFB) in high-pedestrian traffic areas
- Automatic pedestrian and bicycle detection deployed at four signal locations
- Pedestrian walk time extension for low-mobility pedestrians
- Smart lighting sensors and luminaries at three mid-block crossings
- Audible pedestrian countdown signals at 23 locations

Peer reviewed studies show that smart lighting at mid-block crossings reduced vehicle speeds by 19% and reduced crash severity at similar locations.¹

A bicycle and pedestrian safety mobile-device application is also planned to provide accurate bicycle and pedestrian detection. The application recognizes when the cyclist is within a pre-defined detection zone and notifies the traffic controller to extend the green time for the approaching bicycle. The project will also improve pedestrian safety through a smart parking management system (described under Environmental Sustainability) by reducing the number of vehicles circulating while searching for parking in high-bicycle and pedestrian volume areas.

The total annual monetized benefit associated with the reduction in bicycle, pedestrian and vehicle crashes was monetized at \$39.7 million, or \$20.4 million at a 7% discount, over the analysis period of seven years.

Environmental Sustainability

SMART St. Augustine will advance environmental sustainability by implementing EV charging technology to reduce greenhouse gas emissions, addressing sea level rise, coastal flooding, and by improving coastal flooding modeling and early warning systems.

The Florida School for the Deaf and Blind is located in central St. Augustine. It is the largest of its type in the United States, with 47 buildings on 82 acres. It serves 600 students and 400 infants/toddlers (and their parents). The SMART St. Augustine project directly supports this population by adding pedestrian countdown signals, extending pedestrian walk times, implementing automatic pedestrian detection at four signals, and constructing other improvements that were identified through extensive conversations with the School.



Figure 5: Street Flooding in St. Augustine Following a September 2020 Rainstorm



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The project supports the sustainability goals of the City’s 2030 Comprehensive Plan, the 2018 Historic Preservation Plan, Stormwater Master Plan update, the Resiliency Master Plan, and the region’s long-range transportation plan.

The project also supports FDOT’s Resiliency of State Transportation Infrastructure Policy to consider resiliency of the State’s transportation system to support the safety, mobility, quality of life and economic prosperity of Florida’s residents and preserve the quality of our environment and communities. Resiliency includes the ability of the transportation system to adapt to changing conditions and prepare for, withstand, and recover from disruption.

Reducing Greenhouse Gas Emissions

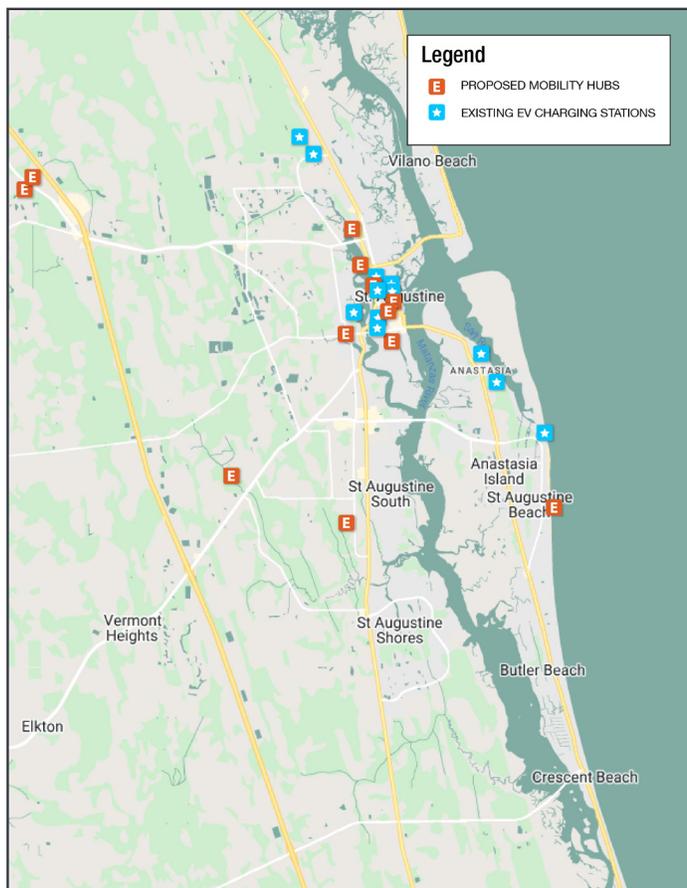
The *SMART St. Augustine* project will reduce citywide greenhouse gas emissions by installing EV charging infrastructure at the project’s mobility hubs to encourage the use of EVs and improve traffic operations in the city. Proposed EV charging hubs are shown in Figure 6.

There are currently one public EV charging station and eight private EV charging stations within the city limits. The City’s six million annual visitors arrive primary by personal vehicle and *SMART St. Augustine* will install infrastructure to support EV charging stations at mobility hubs located in public parking lots, garages and remote parking lots used during special events when shuttle services are active. These hubs will also include visitor information kiosks and bicycle racks to further incentivize mobility hub use.

Vehicles circulating to find available parking spots currently increase traffic congestion by 30%.² The project will install a smart parking management system consisting of occupancy sensors, license plate readers and a parking and travel information app. DMS and a virtual DMS app will direct visitors to available parking. These information signs will be located along entry corridors to the city to eliminate the need for vehicles to travel downtown. Studies have shown that broadcasting information on the availability of on-street parking spaces reduces delays by up to 43%,³ while reducing traffic volumes by up to 9% and lowering emissions.

The project will install a system of smart and connected signals to proactively manage the street and highway system. Traffic volumes and patterns change regularly in St. Augustine depending on day of the week, hour of the day, current

Figure 6: Proposed and Current EV Charging Hubs



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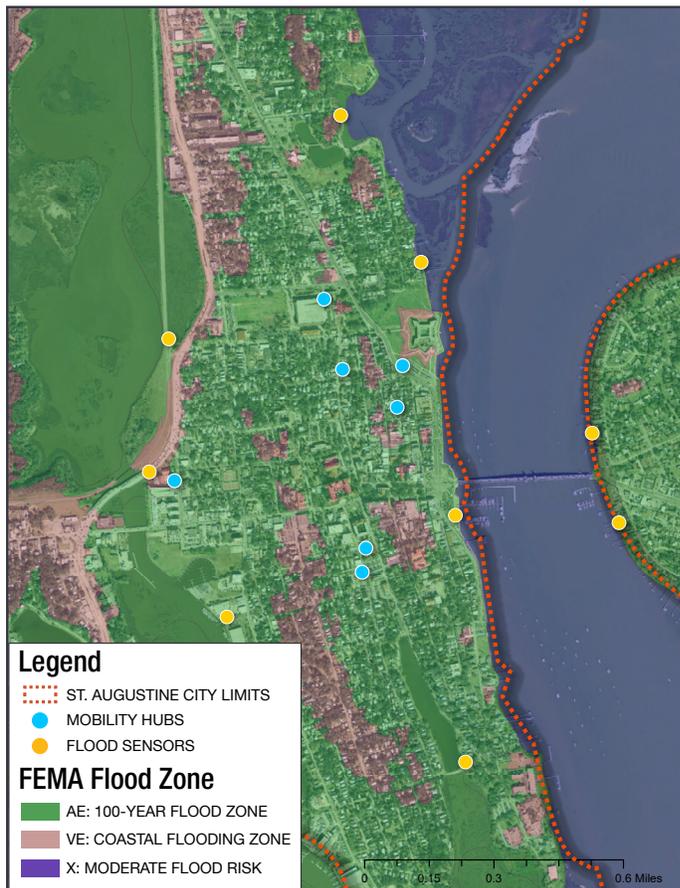
events, weather, and flooding. Connected signals will communicate with connected vehicle systems to share information about signal timing, allowing vehicles to better time their arrival at signals, reducing idle time. Pilot projects have shown a 40% travel time reduction and 25% lower vehicle maintenance and operations expense by reducing vehicle braking and idling.

The total benefit associated with the emissions reduction was \$0.17 million (approximately \$93,425 at a 7% discount rate). A net travel time savings for all vehicles of \$17.0 million in 2020 dollars, or \$9.3 million at a 7% discount rate is anticipated. This benefit does not include additional user cost savings.

Sea Level Rise and Coastal Flooding

Proximity to scenic waterways and pristine coastlines is economically valuable to St. Augustine. The presence of these waterways also corresponds with enhanced risks associated with climate change. These risks include frequent street flooding due to sunny day (or tidal) flooding tied to sea level rise, and risk for other severe storm events such as hurricanes. Risks such as these and others place the city's \$505 million of public infrastructure and \$2.9 billion worth of historic resources at risk. This regular flooding presents safety and mobility risks to residents, workers and visitors and is a significant threat to the regional economy.

Figure 7: Sustainability/Flood Sensor Map



To manage this risk, the project will install new flood sensors at locations identified in a Coastal Vulnerability Assessment prepared for the City by the Florida Department of Environmental Protection.⁵ To improve stormwater management, sensor data from the proposed street flood warning system will be used to improve the city's predictive modeling and better understand the risks caused by increased coastal flooding. It will also improve the city's resiliency risk analysis, assessments, and prioritization of funds. The grant-funded project will leverage the data produced by these new flood sensors to alert residents when street flooding is imminent or occurring and route travelers around this hazard to enhance safety.

The proposed sensor locations are shown in Figure 7.

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The proposed improvements preserve transportation capacity and improve safety and reliability while not adding impervious surface to the city’s existing system to avoid creating additional runoff and exacerbating flooding.

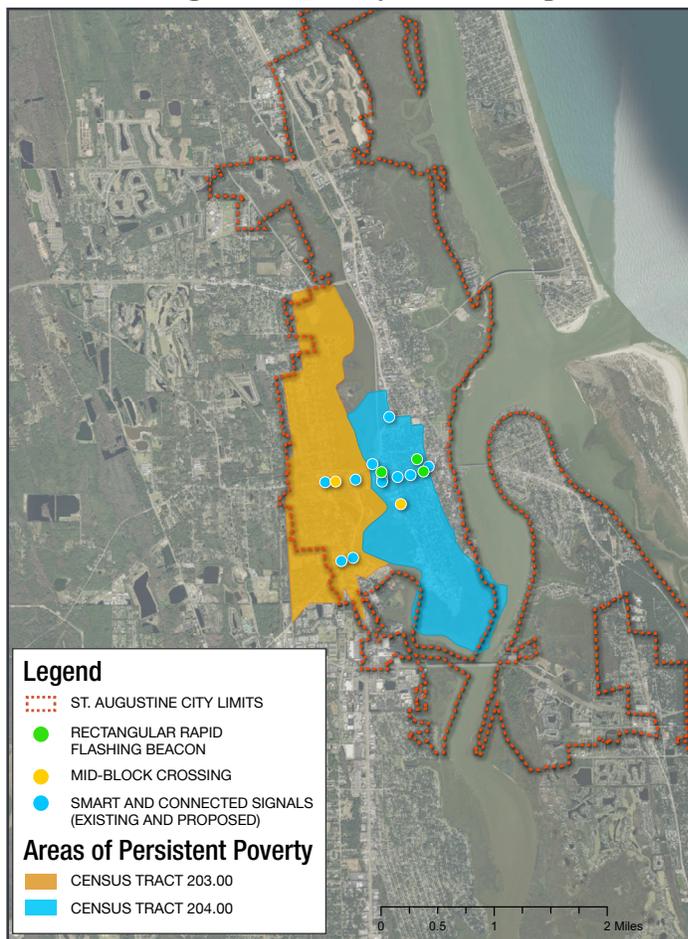
Quality of Life

The grant-funded *SMART St. Augustine* project will improve the quality of life for residents, workers, and visitors. *SMART St. Augustine* will reduce barriers to accessing the city’s major job center, the Historic District, by improving safety and transportation reliability for those commuting into downtown by all modes.

Improve Access to Medical Care

A lack of reliable and affordable transportation is a barrier to residents and workers accessing medical care in St. Augustine as noted in the North Florida TPO’s study “Mobility for the Underserved: Improving Lives Through Mobility.” Developing “ladders of opportunity” is a core objective of the North Florida TPO’s *Smart Region Master Plan*, referring to strategies that help underserved communities elevate their income, health, and quality of life. The North Florida TPO and FDOT are partnering to implement these strategies through *SMART St. Augustine*.

Figure 8: Quality of Life Map



Transportation barriers are the third leading cause of missing a medical appointment for older adults across St. John’s county. To mitigate these affects, the project includes partnership with Flagler Hospital and a transportation network company (TNC) (GetMiles) to develop a pilot program that subsidizes travel by people with low incomes to and from medical appointments. This program will also increase TNC availability in low-income communities. An incentive will be provided in the form of electronic gift cards or discounts on other services when a patient attends a scheduled appointment. The benefits of this program will be to improve attendance for high-risk populations such as prenatal care, to avoid unneeded emergency room visits, and provide more reliable attendance and revenues for the medical-care provider.

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St. John’s County, where St. Augustine is located, has significant racial disparities in poverty rates. Low-income and minority populations are heavily concentrated in West St. Augustine, which is designated as an area of persistent poverty. The West St. Augustine area is designated as medically underserved as defined by the U.S. Department of Health Resources and Services Administration, meaning there are “too few primary care providers, high infant mortality, high poverty or a high elderly population.”

Reducing Barriers for Vulnerable Populations

As noted previously, St. Augustine is also home to the FDSB, the nation’s largest school of its type. To enhance safety, audible countdown pedestrian signals and automatic pedestrian detection are proposed throughout the City to provide greater accessibility for these students. The FDSB’s curriculum emphasizes teaching life skills and through regular community outings and interaction, so visually and hearing-impaired students and staff are regular users of the city’s infrastructure. Improving safety for these vulnerable road users increases their ability to access local opportunities safely and without barriers.

Figure 9: FSDB Students Navigating the City’s Streets



Improves Mobility and Community Connectivity

This program will improve mobility for non-motorized users through the safety improvements noted the “Safety” section. The technology and crossing improvements described in that section are anticipated to reduce crashes for vulnerable road users throughout the City. All pedestrian and crossing improvements will be designed to meet Americans with Disabilities Act requirements and Florida’s Elder Road Users Policies.

In addition, the *SMART St. Augustine* parking management system will reduce the total volume of circulating vehicles throughout the congested downtown historic district. Up to 30% of the city’s traffic congestion is estimated to occur from visitors circulating and looking for a parking spot to visit a downtown destination. Improved parking information signage is expected to decrease the volume of circulating vehicles in an area with a high rate of pedestrian and bicycle crashes, thereby decreasing the probability of collisions in an area with a high volume of pedestrians.

The project includes the installation of mobility hubs throughout the community. These mobility hubs will include EV charging stations, information kiosks, and bicycle parking racks to serve both the St. Augustine Community and the high volume of tourists. Mobility hubs are especially important in areas such as the historic downtown district where a large volume of visitors are unfamiliar with the area. The information provided at these locations will encourage visitors to navigate to their destinations on foot and improve connectivity between various destinations, while simultaneously providing services for workers of the historic districts.

Economic Competitiveness and Opportunity

The proposed improvements will benefit the local and regional economy by accommodating further growth in the region’s tourism economy and improving access to regional jobs for local workers.

Increase Tourism Opportunities

St. Augustine receives an astounding six million visitors per year and the economy relies heavily on tourism jobs, which are concentrated in the historic district. Over 20% of the historically disadvantaged West St. Augustine residents are employed in tourism-related jobs in the downtown historic district.

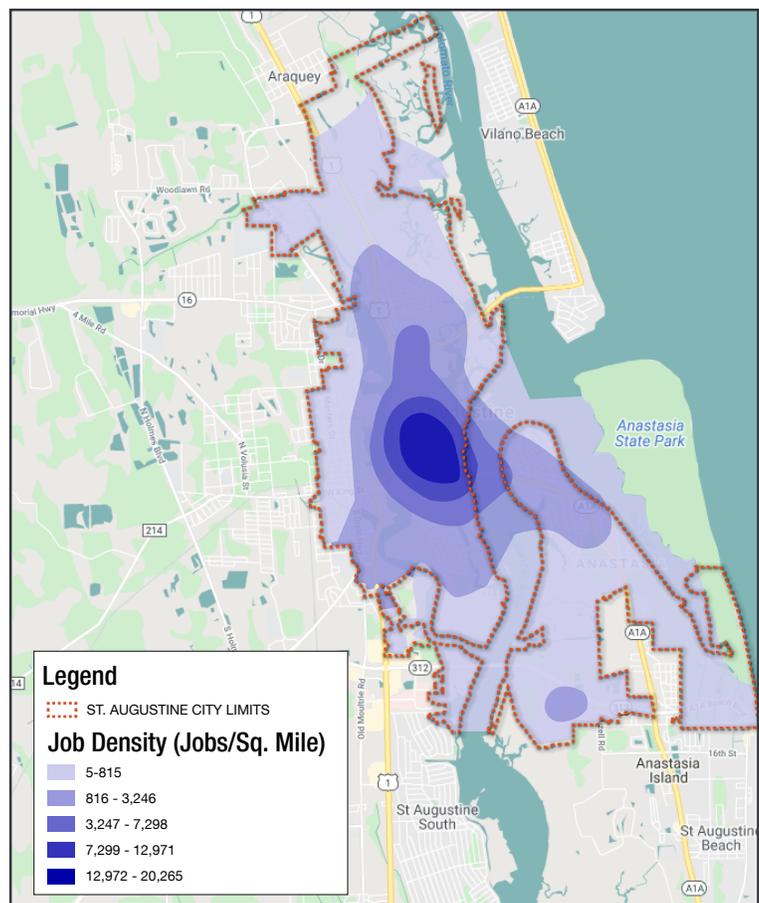
Currently, the largest threat to St. Augustine’s continued growth as a national tourism hub is congestion and mobility challenges that discourage visitors. The current constraints, particularly in the congested historic district, result in lengthy traffic delays, vehicle congestion, and a confusing parking system. As tourism continues to grow, these challenges are likely to mount, to the point that many visitors may choose an alternate vacation destination.

The proposed improvements will increase safety for people walking and bicycling in the historic district and improve overall traffic reliability and parking management. These improvements to the visiting experience are likely to increase the number of visitors who travel to St. Augustine each year, creating additional jobs critical to the local economy.

Increase Access to Jobs

SMART St. Augustine will also improve access to jobs. According to the 2018 Census data, almost 32% of workers who live in St. Augustine’s areas of persistent poverty (Census Tracts 203 and 204) work within the tourism and service industry. U.S. Census data shows a strong relationship between residents in the historically disadvantaged West St. Augustine, in Census Tract 203, and jobs in the historic downtown district. Peer reviewed research shows low-income workers have less flexibility in work hours as compared to higher-wage workers,⁷ and benefit more significantly from more efficient transportation options.

Figure 10: Job Density Map



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The proposed improvements will increase safety for workers that access the downtown historic district by biking or walking, and improve travel efficiency and speed for those that travel via car or transit.

State of Good Repair

The project will invest in state of good repair by implementing improvements that reduce unnecessary wear-and-tear on the city's roadways, improve the city's ability to apply data analytics to infrastructure management and by creating a more connected system that reduces life-cycle maintenance costs.

The proposed "smart" parking management system will significantly reduce circulating traffic seeking parking (as discussed in previous sections). This will lead to fewer vehicle trips on the city's historic roadways extending the service life based on a reduction of basic wear-and-tear. The project will also provide a dynamic truck parking information system to reduce the damage to curbs and drainage structures caused by trucks circulating on the city's narrow roadways seeking parking. The project will save the city expenditures for its pavement resurfacing and repair in the Capital Improvement Program.

Sensor data from the street flood warning system will be used to enhance the city's predictive modeling capability, enhancing the city's long-term sustainability in the face of climate change and sea level rise. Part of the charm and beauty of St. Augustine is its proximity to scenic waterways and pristine coastlines. Simultaneously, these features put the City at risk to flooding from rising tides due to sea level rise and increasingly frequent and intense storm events. These hazards threaten the historic assets that define the City. St. Augustine's historic districts represent 41% of the city's total assessed value.

Seventy-five percent of the land area in historic districts fall within a high-risk flood zone.⁸ Protecting these assets through predictive modeling and proactive planning enhances the region's overall economy by ensuring the historic district remains a tourist destination for the long-term future.

Operations and maintenance of the proposed deployment is included in the life-cycle costs for this project to ensure the project remains in a state of good repair. The operations and maintenance costs are funded through a variety of sources, including FDOT operations funds, city parking revenue, user fees, general revenue, and regional funding sources through the North Florida TPO.

The project also includes the integration of a video-based machine learning pavement management system. This proposal is based on a successful pilot program conducted by the North Florida TPO which demonstrated the effectiveness of this system and is now adopted in other counties in the region.

The total net cost of operations and maintenance over the analysis period was \$2.6 million, or \$1.47 million at a 7% discount. In the benefit-cost analysis, the net increase in operations and maintenance costs is treated as a negative benefit (a disbenefit).

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Partnership and Collaboration

Regional Stakeholders

SMART St. Augustine leverages key regional partnerships developed through the 2018 North Florida Smart Region Master Plan. Regional coordination and adoption of the Smart Region Master Plan occurred in 2018 and the plan was endorsed by more than 100 stakeholder government, chambers of commerce, businesses, and non-government organizations in the region.

The project is included in several regional and local planning documents, as outlined in Section V.

Public-Private Partnerships

The project will also leverage key public-private partnerships to deploy and manage several of the key project components.

TNC Partnerships

The City will partner with existing TNCs to provide enhanced mobility and access to healthcare for local underserved populations. This program is further described in Section IV under “Quality of Life.”

Visit St. Augustine Mobile Application

The *Visit St. Augustine* mobile application is owned and operated by a private sector company and provides information to visitors on things to do, places to stay, where to eat, special events and maps. The City intends to partner with the existing *Visit St. Augustine* mobile application (on a non-exclusive basis) to provide enhanced traveler information. Other parties such as Google may also be interested. Information on parking availability from the existing parking management system and the data collected in the Historic Downtown Parking Garage will be integrated and shown within the existing app to create a single portal for all traveler and visitor information. Advertising is currently used to support the costs of the development and maintenance of this app. If this partnership is successful, the costs of sharing the information will be absorbed by Visit St. Augustine through a service level agreement.

In addition, the project will embed location services into the *Visit St. Augustine* application to provide detection and prediction analytics for bicyclists and pedestrians at intersections. The app will recognize when the cyclist is within a pre-defined detection zone and communicate with the traffic signal to extend green times and allow for safe crossing.

Public Engagement

The *SMART St. Augustine* project grew out of concepts included in several local and regional plans, including the City’s 2040 Mobility Plan, Strategic Plan, Comprehensive Plan, and the North Florida TPO’s Long Range Transportation Plan (further detailed in Section V). Each of those planning efforts featured significant public engagement efforts, which ultimately informed the goals, vision, and specific implementation details of this project.

Figure 11: Project Partners



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Because of the ability to leverage those prior engagement efforts and the significant regional partnerships involved with this project, no specific public engagement efforts have been undertaken regarding this project. Public engagement will be a critical element of this project upon funding.

Although intelligent transportation systems qualify as a programmatic categorical exclusion under 23 CFR 711.117, a cultural resource assessment survey will be performed to identify any potential conflicts during construction. If conflicts are identified, the proposed field element will be relocated to avoid any resources. A public hearing will be conducted as part of this process.

Public hearings will also be conducted as part of the City's Architectural and Historic Review Committee that will participate in reviewing and approving field components on the City-maintained streets.

A separate public information campaign will be conducted to engage residents and business owners in refining the proposed project and promoting adoption of the innovative technologies. This process will begin during the design phase and continue through construction.

Innovation

This project meets the criteria for innovation in all three categories, as described below.

Innovative Technologies

SMART St. Augustine relies on the deployment of innovative technology to manage and improve operations of the existing transportation system, rather than building capacity improvements. Collectively, these technology deployments will improve the safety of vulnerable road users, improve the City's asset management capabilities, prepare the existing system for connected and automated vehicle technology, and improve overall system reliability. Innovative elements are summarized below and further described throughout the document:

- **Arterial DMS** – DMS to direct traffic to available parking and manage traffic flow during events and emergencies on state roads.
- **Smart Lighting** – Provide enhanced lighting at night to improve safety at pedestrian crossings and reduce power consumption.
- **Bicycle and Pedestrian Safety Application** – Location services embedded into Visit St. Augustine application to provide vector and prediction analytics for bicyclists and pedestrians at intersections.
- **Bicycle and Pedestrian Sensors** – Automated pedestrian and bicycle detection at intersections and mid-block crossings to extend green times, crossing times or other safety measures.
- **Smart and Connected Signals** – This deployment will advance the technology by transmitting messages to connected vehicles, roadside units, and vulnerable users such as pedestrians and vehicles per SAE J2735 standards.

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- **Automated Traffic Signal Performance Measures and Real-time Condition Monitoring**
 - Software solutions that provide real-time traffic signal system management will be implemented with the advanced traffic controllers needed to support roadside units.
- **Mobility Hubs** – Mobility hubs will be in public parking lots and include infrastructure to support EV charging stations, visitor information kiosks, bicycle racks, and other amenities.
- **Bridge Closure Notification System** – Messages and notifications will be provided via traffic information systems when bridges are closed to vehicle traffic to allow vessels to pass under the bridge. This will allow vehicles to avoid traveling through downtown when other options such as SR 312 are available and could save travelers time.
- **Pavement Management Systems** – Video-based inventory systems using machine-learning to assess needs and perform pavement maintenance and extend the life-cycle of pavement, sidewalks, and related infrastructure. Pavement in St. Augustine deteriorates faster than normal because of the horse-drawn carriages and other special vehicles.
- **Street Flood Notification System** – Sensors identify locations where street flooding is eminent or occurring to route travelers around this safety hazard.

Innovative Project Delivery

This project will be delivered through FDOT’s Local Agency Program (LAP).

The LAP program provides sub-recipient towns, cities, and counties funds to develop, design, and construct transportation facilities with federal funds. FDOT is the steward of the federal funds and is responsible for oversight of funded projects on behalf of the Federal Highway Administration (FHWA). LAP agencies prioritize and fund local projects (through the North Florida TPO) and are then eligible for reimbursement for the services provided to the traveling public through compliance with applicable federal statutes, rules, and regulations.

The LAP program increases the availability of federal funds for use on the local roadway system and allows local agencies to retain control of day-to-day project management. This allows projects to maintain the priorities and objectives of the managing local agency. Since 2017, FDOT has funded over 750 projects valued at over \$450 million through this program.

As noted previously, this project qualifies as a programmatic categorical exclusion under the National Environmental Policy Act as implemented in the FDOT’s PD&E Study process through assignment from the FHWA. Therefore, no environmental review or approval is required.

Innovative Financing

This project involves partnerships including the City, FDOT and the North Florida TPO. An initial phase of this project is funded for construction in fiscal year 21/22 of the FDOT Work Program for \$960,000 as part of the TAPS-LA program.

V. Project Readiness: Environmental Risk

Project Schedule

Deployment of the *SMART St. Augustine* project can begin quickly following receipt of a RAISE Discretionary Grant. Since the environmental documentation and systems engineering processes are complete, the following schedule can be achieved:

Table 8: Project Schedule

Milestone	Estimated Time of Completion
State and Local Planning Approvals	Complete
Environmental Review and Approval	None required
Financial Programming	May 2022
Right-of-way Acquisition	None required
Design-Build Procurement	January 2023
Construction	October 2025

Required Approvals

Environmental Permits and Reviews

This project qualifies as a programmatic categorical exclusion under the National Environmental Policy Act as implemented in the FDOT’s PD&E Study process through assignment from the FHWA. Therefore, no environmental review or approval is required.

The *SMART St. Augustine* project is consistent with local and regional plans, including the City’s 2040 Mobility Plan, Strategic Plan, Comprehensive Plan, and the North Florida TPO’s 2045 Long Range Transportation Plan. Each of those planning efforts featured significant public engagement efforts, which ultimately informed the goals, vision, and specific implementation details of this project.

Because of the ability to leverage those prior engagement efforts and the significant regional partnerships involved with this project, no specific public engagement efforts were undertaken regarding this project but will be included in the implementation phase.

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State and Local Approvals

This project is included in the following plans.

- **Unified Planning Work Program**, as Task 5.36 *SMART St. Augustine* for the systems engineering of the full project, preliminary plans for the TAPS-LA phase of the project and cost estimates.
- **North Florida TPO's Transportation Improvement Program (TIP)** by reference of the use of Federal planning program funds.
- **North Florida TPO's 2045 Long-Range Transportation Plan.**
- **North Florida TPO's Transportation Systems Management and Operations Needs Plan.**
- An initial phase of this project is funded for construction in fiscal year 21/22 of the **FDOT Work Program** for \$960,000 as part of the TAPS-LA.
- A TIP and **Statewide Transportation Improvement Program** amendment included construction funding as of December 31, 2020.
- Included in the City's **2040 Mobility Plan** adopted in 2020.
- Consistent with the goals of the City's **2030 Comprehensive Plan.**

No right-of-way acquisition or property agreements are required for this project.

Federal Transportation Requirements

This project is included in the region's long-range transportation plan, and no other federal requirements apply.

Assessment of Project Risks and Mitigation Strategies

The scale and complexity of this project poses some risk to the project's success. While earlier phases of the project involve proven technologies with well-defined and understood system requirements, many of the proposed improvements are more complex. This type of project is new for the City, who will need to partner with more experienced organizations.

To mitigate these risks, an owner's representative consultant or general engineering consultant will be hired to provide technical staff support during the delivery of the project.

In addition to the risks identified with the support environment, the other most significant risk is security and privacy. Data security refers to the tools, policies, practices and procedures used to protect data from being accessed, manipulated, or destroyed or being leveraged by those with a malicious intent or are unauthorized to do so. Data privacy is the reasonable expectation that data of a sensitive nature will be kept anonymized, encrypted and respectfully and responsibly maintained by all users, managers and collectors of the data, while adhering to applicable laws and regulations, policies and procedures.

An initial risk matrix was prepared and is summarized in Table 9 on the following page.

Table 9: Initial Risk

Project Risk	Risk Mitigation Strategy
Achieve consensus in a dynamic and engaged public environment.	Conduct public information campaign and workshops.
Receiving approval for design of parking DMS signs from the City’s Historic and Architectural Heritage Board.	Conduct workshop with board and use visualization to demonstrate specific design to mitigate any visual impacts.
Receiving approval for design of small cell devices and CCTV from the City’s Historic and Architectural Heritage Board.	Conduct workshop with board and use visualization to demonstrate specific design to mitigate any visual impacts.
Encountering archeological or historical resources during construction.	Prepare cultural resources assessment during preliminary engineering phase and change the location of field deployments to avoid impacts.
Delivery times for contractors to deliver mast arms and cantilever sign posts have been four to six months.	Early design of structures in project schedule.
Ability to negotiate partnership and maintain accurate and timely transfer of data with Visit St. Augustine.	Discussions are ongoing now.
Need for temporary construction easements.	Adjust the location of field elements is required to avoid right-of-way impacts.
Ability to deliver within project schedule.	Monitor and manage risk continuously during the project.
Maintaining products during life-cycle of the deployment.	Budget is included in the life-cycle costs based on history by FDOT or from other deployments.
Maintaining the privacy of the users and ability to manage the system.	Develop detailed cybersecurity protocols and standards that go beyond security credentialing management.

VI. Benefit-Cost Analysis

A Benefit-Cost Analysis (BCA) was completed for the project based on U.S. Department of Transportation Standard BCA Guidance. This analysis shows that the SMART St. Augustine project will provide quantifiable benefits through the reduction of crash rates, travel time, traveler costs and air pollution, along with improvement of emergency preparedness. The expected benefits are summarized in Table 10: Benefit-Cost Analysis Summary. The project is expected to create over \$54 million in quantifiable public benefits. The benefits of this project include:

- A decrease in the cost of regular operations and maintenance of project components
- A reduction in fatal, injury and property-damage-only crashes for both vehicles, bicycles, and pedestrians
- A reduction in costs associated with congestion, including operator time, operating costs, and emissions

These benefits are compared to the costs of the project using quantitative and qualitative measures. The full BCA is included in Appendix A.

The BCA demonstrates the economic merit of the project through comparison of monetized benefits to society.

The project is estimated to have a benefit-to-cost ratio of 2.34 and a discounted net present value of over \$17.84 million. Details of the results including assumptions, methodology and other details of the analysis may be located within the attached memorandum and the benefit-cost workbook. Results of the benefit-cost analysis are included in Table 10.

Table 10: Benefit-Cost Analysis Summary

	Undiscounted	7% Discount
Benefits	\$56,776,305	\$31,137,496
Costs	\$17,317,445	\$13,291,658
Overall B/C Ratio	3.28	2.34
Net Present Value	\$39,458,860	\$17,845,839

Benefits of the project which are not quantified in the Benefit-Cost Analysis include:

- Improved access to public EV charging stations, further incentivizing the use of electric vehicles and a reduction of emissions.
- Economic benefits based on investments in resiliency projects. The National Institute of Building Sciences’ analyzed the result of investment from several federal agencies by the Federal Emergency Management Agency, Economic Development Agency and the U.S. Department of Housing and Urban Development, over a 23-year period. The study found that there is a \$6 return for every \$1 invested in resiliency projects.
- Direct and indirect economic impacts associated with direct federal investment. Studies by the Council of Economic Advisers within the Executive Office of the President have shown that federal investment leads to the creation of additional jobs and an increase in economic activity in the area associate with rising wages and employment.^{ix} FDOT conducted a macroeconomic analysis of the impacts of the FDOT work program and found there is a 4:1 benefit-cost ratio for transportation investments.

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Appendices

Appendix A: Benefit Cost Analysis

BCA Excel Document

BCA Memorandum

Appendix B: Detailed Project Schedule

Appendix C: Letters of Support

Appendix D: Systems Engineering Report

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Sources

1. <https://doi.org/10.3390/safety6020020>
2. http://northfloridatpo.com/images/uploads/docs/St_Augustine_Truck_Study_Final_Report.pdf
3. SFMTA (2014), SFPark Pilot Project Evaluation
4. USDOT (2007), Advanced parking management systems: a cross-cutting study: taking the stress out of parking, Report No. federal -JPO-07-011
5. <https://www.citystaug.com/DocumentCenter/View/323/Coastal-Vulnerability-Assessment-PDF?bidId=>
6. <https://northfloridatpo.com/uploads/Studies/Ladders-of-Opportunity-Final-Draft-Report-20-10-29.pdf>
7. <https://www.urban.org/sites/default/files/publication/32731/412513-How-Employment-Constraints-Affect-Low-Income-Working-Parents-Child-Care-Decisions.PDF>
8. https://npr-brightspot.s3.amazonaws.com/legacy/sites/wjct/files/202010/st._augustine_resilient_heritage_report_wappendices_sep2020web_202009181423240570.pdf
9. http://northfloridatpo.com/images/uploads/docs/St_Augustine_Truck_Study_Final_Report.pdf