Northeast Florida Regional Council
Military Installation Readiness Review

Naval Station Mayport

Adaptation Package #2: Adaptation for Mobility Corridor Wonderwood Drive

This package includes strategic recommendations that in combination improve roadway resilience on this mission-critical corridor. It encompasses grey and green infrastructure improvement recommendations that can be led by state, regional, and local authorities and agencies.

This study was prepared under contract with the Northeast Florida Regional Council with financial support from the Office of Local Defense Community Cooperation, Department of Defense.

The content herein reflects the views of the Northeast Florida Regional Council and does not necessarily reflect the views of the Office of Local Defense Community Cooperation or the Department of Defense.

How to Read this Document

Project Summary Packages provide details on recommendations, background, and context to facilitate and accelerate implementation. The summaries are presented by mission-critical priority assets in the study area. The recommendations may include physical projects, new partnerships, and modernized policies identified over the course of the project. Presented in three sections, **Background and Context, Recommendations, and Implementation Tools**, each summary package can be used to brief decision makers and to complete funding requests and/or grant applications.

The first section, **Background and Context**, situates the reader to the Military Installation Readiness Review (MIRR) project, the study area location, and the military installations. It includes the following subsections:

- **Mission of the Installation of the Package**, which reminds the reader of the installations' purpose and importance of readiness
- **Mission-Critical Priority Assets** for the installation as identified through stakeholder engagement and vulnerability assessment
- **Current Conditions** of the mission-critical asset of the package, which illustrate the issues in local context
- **MIRR Adaptation Strategy Framework**, which is aligned to the region's vision for a Resilient First Coast and is the foundation of this body of work

The second section, **Recommendations**, dives into the issues challenging the region and study area and presents recommendations in the form of investments through projects, policy modernization, and/or by forging new partnerships among diverse stakeholder groups. This section is informed by the vulnerability assessment findings, stakeholder insight on ongoing projects and priorities, and best practices research. Information on the following topics is included in this section:

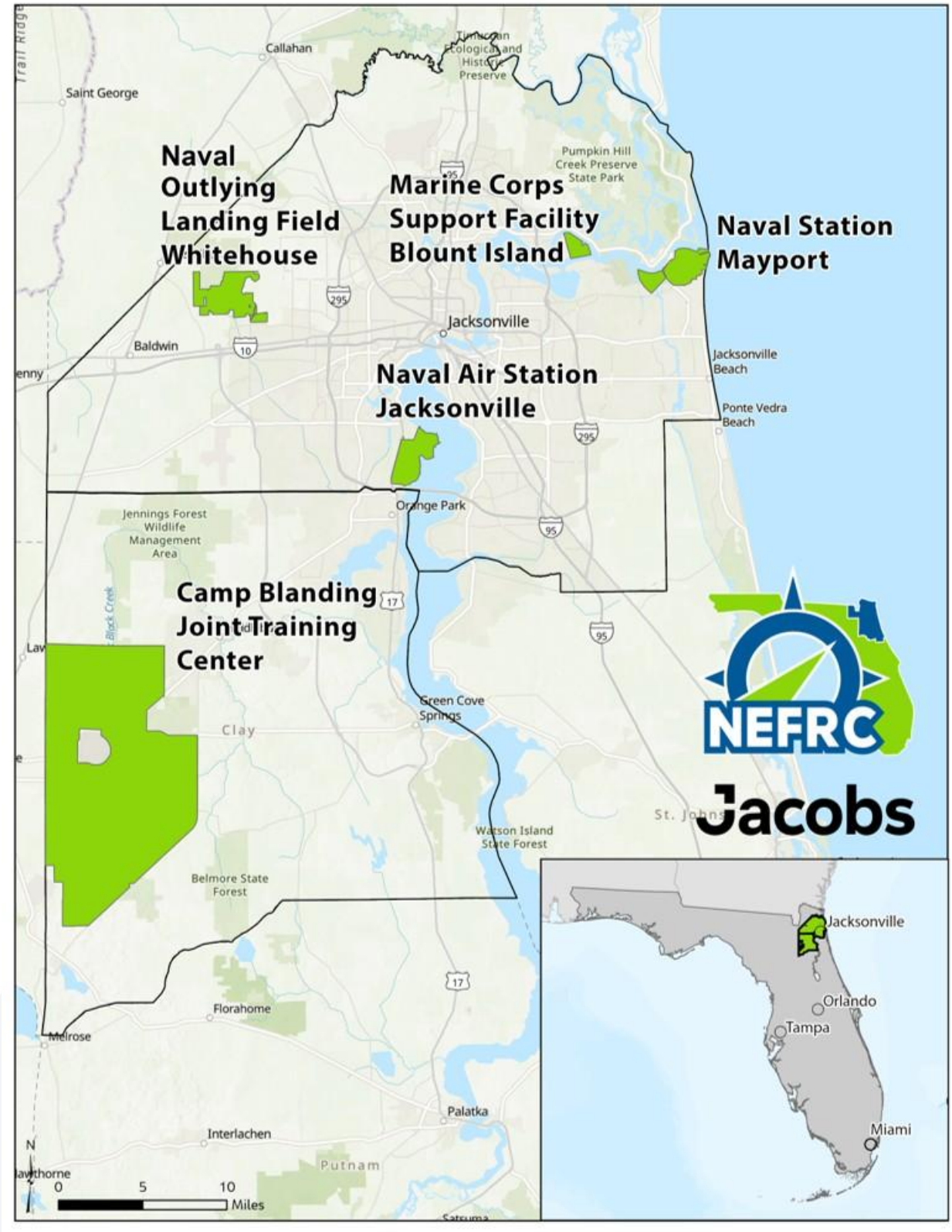
- **Shocks and Stresses** affecting the mission-critical asset
- **Project Objective**, which captures the adaptation goal for the following recommendations to support mission readiness through community resilience
- **Stakeholders and Current Efforts** highlighting successful foundational work upon which to build
- Recommended **Strategic Projects, Policies, and Partnerships**, including the owners and partners, vulnerability being addressed, co-benefits, foundational existing projects (as applicable), and timeline to comment implementation
- The **Metrics and Cost-Benefit Analysis** section, which illustrates how the recommendations were evaluated to determine appropriateness, viability, and achievement of project goals; this tool is available as new projects are identified by implementation partners

The final section, **Implementation Tools**, is provided as a resource to move from planning to action:

- **Financial Strategy Toolkit with Funding Opportunities**, which presents a matrix of opportunities and tools to finance and fund recommendations. Some recent grant opportunities are highlighted; however, given the changing conditions of federal sources and requirements, these should be viewed as initial suggestions for further review and applicability at the appropriate time.
- **References** are presented for user convenience.

Background and Content

Figure 1. Northeast Florida MIRR Study Area Map



In 2024, the Northeast Florida Regional Council (NEFRC) obtained a MIRR grant from the Department of Defense's Office of Local Defense Community Cooperation to identify and analyze the assets, hazards, and corresponding vulnerabilities and risks that affect the military installations in Duval and Clay counties. This study includes Camp Blanding Joint Training Center, Marine Corps Support Facility Blount Island, Naval Station (NS) Mayport, and Naval Air Station Jacksonville (Figure 1). The goal is to increase the resilience and readiness of these installations from the impacts of extreme weather events, infrastructure challenges, and other vulnerabilities, thereby promoting mission assurance. The adaptation projects are structured into comprehensive Summary Packages, with each focused on a specific mission-critical asset or system.

NS Mayport

NS Mayport is located on the eastern edge of Duval County at the mouth of the St. Johns River. The installation is north of Atlantic Beach, south of the St. Johns River, and east of the Village of Mayport. Because of its location, NS Mayport is unique in its operational composition, combining a busy seaport with an air facility. It can accommodate 34 ships while also operating an 8,000-foot-long runway suitable for any aircraft in the DoD inventory. The base also houses helicopter training sites and uses the surrounding marshlands as essential training environments. Another benefit to NS Mayport's location is the small tidal fluctuations that enable loading and unloading of ships throughout the year. Because of its location at the confluence of the St. Johns River and Atlantic Ocean, the installation is able to serve as a central hub of naval activity, with easy access to Central America, South America, and the Caribbean.

Mission

NS Mayport spans 3,409 acres and serves as a major surface and air warfare-focused installation. Its mission is to provide "The Finest Service to the Finest Fleet." NS Mayport supports the homeporting, readiness, and sustainment of Atlantic Fleet surface forces while also hosting the headquarters and operational activities of U.S. Naval Forces Southern Command/U.S. Fourth Fleet, which employs maritime forces in cooperative security operations to maintain access, enhance interoperability, build enduring partnerships, strengthen regional security, and promote peace, stability, and prosperity throughout the Caribbean and Central and South America. The Fourth Fleet's Area of Responsibility includes 31 countries, 16 dependencies, and areas of special sovereignty, a combined area equaling approximately one-sixth of the world's landmass.

In addition to providing a home for the Fourth Fleet, NS Mayport also supports aviation basing for rotary-wing and unmanned aircraft. The installation is home to the Helicopter Maritime Strike Wing, U.S. Atlantic Fleet (CHSMWL), multiple Helicopter Maritime Strike Squadrons, and the launch, recovery and maintenance location for Unmanned Patrol Squadron (VUP) 19, which uses MQ-4C Triton aircraft for intelligence, surveillance, and reconnaissance purposes. Overall, NS Mayport plays a critical role for fleet readiness and sustainment in the southern hemisphere.

NS Mayport also has multiple secondary missions. It enables carrier and amphibious operations, enables joint/coalition operations and exercises, supports humanitarian and disaster response, and supports major tenant commands. The installation provides operational, logistical, and quality of life support to 82 tenant commands. NS Mayport serves as a critical hub for regional and international defense operations. As of March 2024, NS Mayport is home to 8,076 active-duty

and reserve full-time support personnel, along with 21,500 family members. The workforce also includes 826 civilian employees, 523 non-appropriated fund employees, 1,504 contract employees, and 19 Selected Reserve members.

Installation Interconnections

The Naval Station Mayport linkage overlays, as shown in the NEFL MIRR webpage, illustrate the installation's role as one of Florida's most important surface-fleet, rotary-wing, sustainment, and maritime operations hubs. The maps show how Mayport connects locally to NAS Jacksonville, Blount Island, the St. Johns River defense logistics network, while also linking nationally to Norfolk-based Navy fleet, surface-force, aviation, training, maintenance, and logistics commands. Together, the layers demonstrate that Mayport is not simply a ship homeport, but a combined operating platform that supports surface combatants, helicopter maritime strike forces, long-range maritime reconnaissance, Fourth Fleet operations, ship and aircraft sustainment, port operations, munitions, fuels, training, and operational support.

The broader strategic value of Naval Station Mayport is most strategically significant in its international and theater linkages. Its surface-force and HSM networks connect Mayport to Norfolk, Rota, Guantánamo Bay, and deployed U.S. Navy ships; its Fourth Fleet role links directly to SOUTHCOM, JIATF-South, CSL Comalapa, and maritime security cooperation across the Caribbean, Central America, and South America. Its sustainment and training layers connect broadly across the Navy systems commands and shore enterprise to include: NAVSEA, NAVAIR, FRCSE, AUTEC, Bahrain, Dahlgren, Pensacola, Orlando, NAVSUP, DLA, and Navy expeditionary support commands. When viewed as a combined overlay, NS Mayport is revealed as a critical Atlantic and SOUTHCOM-facing naval node that links Northeast Florida to fleet readiness, regional maritime security, deployed surface operations, and international partnership missions.

Identification of Priority Assets for NS Mayport

Figure 2. Primary and Secondary Mission Critical Assets for NS Mayport

Priorities for the installation were based on the direct assets and local services required to support the missions. This includes the shorelines that protect the installation and its systems, the roadways required to access the base, the electrical systems that support all activities, the fueling facilities that support the fleet, and the natural systems that protect the installation from erosion and flooding. These assets were evaluated for exposure to shocks and stresses (Figure 2).

Primary Mission Critical asset types for ship homeporting and support, 4th Fleet Headquarters support, aviation basing and support, managing fuel depots, homeland defense, major ship repairs

- **Location-Specific Positioning**
  - St. John's River
  - Wetlands and Marshes
  - Shorelines
  - Fuel Depot
- **Assets Providing Direct Support**
  - Electric Production and Supply Facilities
  - Roads and Bridges
  - Communications Facilities (e.g., cell towers, fiberoptic lines)
  - Water utility supply facilities
  - Wastewater conveyance and treatment facilities
  - Safe Harbor Facilities (JAXPORT)
  - Offsite dry dock facilities (BAE)

Secondary Mission Critical asset types that offer the regional fueling depot

- **Assets Providing Direct Support**
  - Emergency Response Facilities
  - Shorelines (Atlantic Coast shorelines)
  - Fire Stations
  - Mission Supportive for the livelihood and health of installation personnel, indirect support to primary and secondary missions.
- **Personnel Support**
  - Affordable Housing
  - Childcare Facilities
  - Emergency Response Facilities (Hospitals)
- **Assets Providing Indirect Support**
  - Solid and Hazardous Waste Facilities

This package addresses the specific shocks and stresses of the mission critical Wonderwood Drive for NS Mayport.

Current Conditions that Affect Wonderwood Drive Corridor

Wonderwood Drive (State Road 116) is a critical east–west arterial corridor in Jacksonville that connects inland Arlington communities to Mayport Road and NS Mayport. The roadway functions as a primary connector between residential areas, coastal communities, and one of the Navy's most important Atlantic Fleet installations. At its eastern terminus, it provides direct connectivity to Mayport Road, which serves as the main access route into NS Mayport and the surrounding coastal environment.

The corridor plays a vital role in supporting vehicular movement associated with military operations, freight activity, and daily commuting. NS Mayport supports more than 11,000 daily personnel and extensive ship and aviation operations, generating consistent traffic demand on Wonderwood Drive from military personnel, civilian employees, contractors, and service providers. In addition to installation-related traffic, the corridor carries regional commuter flows and recreational travel to coastal destinations, contributing to fluctuating congestion patterns tied to both work shifts and seasonal demand (SERPPAS n.d.).

Land use along Wonderwood Drive reflects its function as a transition zone between suburban, military, and coastal environments. Inland segments are characterized by residential neighborhoods that depend on the corridor for access to employment, services, and regional connectivity. Moving eastward, the corridor connects to Mayport Village (a historic waterfront community) and NS Mayport, where dense concentrations of military, industrial, and maritime uses dominate. This combination of land uses creates strong social and economic interdependencies because Wonderwood Drive enables access to jobs, supports port-adjacent activity, and connects residents to both urban services and coastal resources.

Despite its importance, the corridor operates under increasing pressure due to growing demand and environmental vulnerability, particularly from coastal flooding driven by sea level rise (SLR), storm surge, and high-tide events. The Mayport area has been identified in regional resilience studies as one of the most vulnerable locations in Northeast Florida for roadway flooding, including segments of Wonderwood Drive near Sherman Creek and its connection to Mayport Road (NFTPO n.d.).

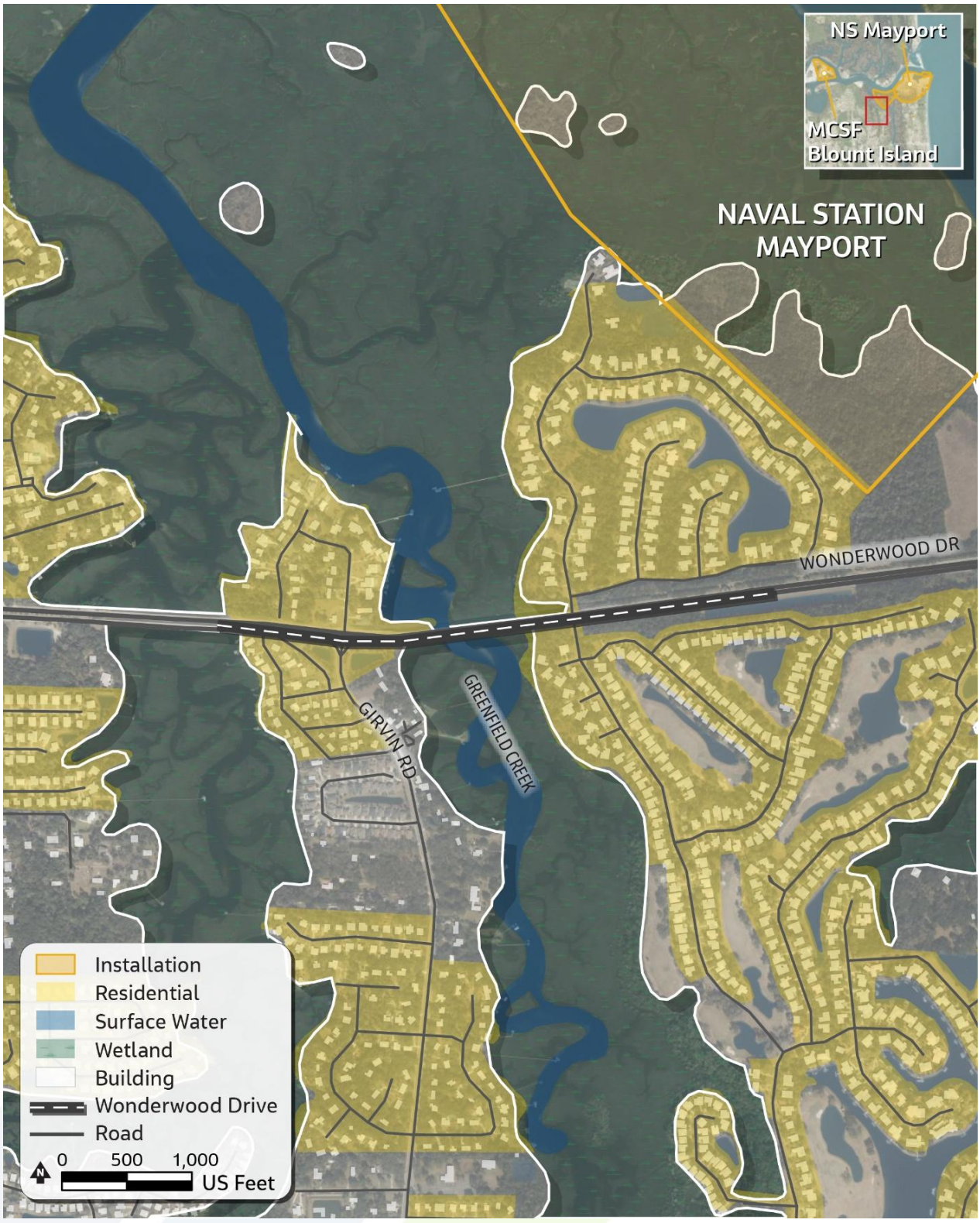
Coastal flooding risks are compounded by the corridor's low elevation and proximity to tidal waterways, including the St. Johns River and adjacent marsh systems. National Oceanic and Atmospheric Administration (NOAA) data indicate increasing frequency of high-tide flooding in the Mayport area, with projections showing dozens of flood days annually by mid-century under intermediate SLR scenarios. More broadly, research on NS Mayport indicates that tidal flooding events could increase dramatically—from fewer than 10 events per year today to potentially 150 to 370 events annually by 2050—due to rising sea levels and compounding coastal processes (NOAA 2026; UCS 2016).

These conditions directly affect Wonderwood Drive by increasing the likelihood of roadway inundation, reduced travel reliability, and safety risks. Flooding can limit lane availability, reduce traction, obscure hazards, and disrupt access to the installation and surrounding communities. Because the corridor serves as a key approach to NS Mayport and connects to limited alternative routes, flooding events can have outsized impacts on mobility, emergency response, and mission readiness.

In addition to direct inundation, coastal processes contribute to erosion, drainage challenges, and long-term infrastructure stress, particularly in segments adjacent to marshes and creeks. Rising groundwater levels and more frequent tidal overtopping can reduce pavement longevity and compromise roadside stability. These impacts are expected to intensify over time as sea levels continue to rise and storm events become more frequent and severe.

Overall, Wonderwood Drive operates as a highly used and strategically important corridor that supports military operations, community connectivity, and coastal access while facing increasing challenges from environmental exposure. Its role as a primary access route to NS Mayport, combined with limited network redundancy and growing coastal flood risk, makes it a critical focus for resilience planning and infrastructure investment. Figure 3 shows a map of current conditions as it relates to Wonderwood Drive.

Figure 3. Wonderwood Drive Location Map



MIRR Adaptation Strategy Framework

The NEFRC envisions a resilient, prosperous, and inclusive region where communities work collaboratively across jurisdictional boundaries to strengthen economic vitality, safeguard natural and built systems, and enhance quality of life for current and future generations. In 2022, the Council launched **Resilient First Coast** to collaboratively address climate-related challenges across its seven member counties—Baker, Clay, Duval, Flagler, Nassau, Putnam, and St. Johns. This regional effort received strong support to develop a plan focused on addressing climate impacts and related threats to the region. Guided by this vision, the Regional Resilience Action Plan (RRAP) was published in 2025, providing a unifying framework that translates shared regional goals into coordinated action (NEFRC 2025).

Figure 4. Regional Resilience Action Plan Vision (NEFRC 2025)

The RRAP establishes a durable foundation for implementing this vision—enabling member governments and partners to prioritize investments, leverage funding opportunities, and advance solutions that build long-term resilience to environmental, economic, and social challenges across Northeast Florida. As such, the MIRR adaptation projects are built upon this framework to ensure alignment and promote successful implementation of the recommended strategies (Figure 5).

RRAP Goals and Objectives

Figure 5. Regional Structure for Resilience as Framework for the MIRR

Create a Durable and Adaptive Built Environment

- Minimize magnitude and cost of damage to infrastructure
- Improve development practices and policies
- Decrease utility service disruptions and recovery time
- Improve transportation and mobility

Develop a Thriving Regional Economy

- Improve education and employment opportunities
- Increase housing stability
- Enhance tourism and historic preservation
- Increase smart growth and development

Ensure a Vibrant Quality of Life

- Improve public health and wellness
- Enhance supply of food, energy, and other critical resources
- Increase public participation and engagement
- Minimize disparity

Promote a Healthy Natural Environment

- Reduce heat stress
- Increase biodiversity and ecological services
- Maximize quality of soil, air, and water
- Minimize erosion, flooding, and storm impacts

Connecting this Built Environment Asset to the Regional Economy, Natural Environment, and a Vibrant Quality of Life

This framework provides the structure for how assets were organized and evaluated. This resilience project is centered on assets in the Built Environment pillar, so the following acknowledgments indicate how it is connected to the Regional Economy, Natural Environment, and Quality of Life.

Figure 6. Connection of This Asset to the Community

Recommendations

Documenting Shocks and Stresses with a Vulnerability Assessment

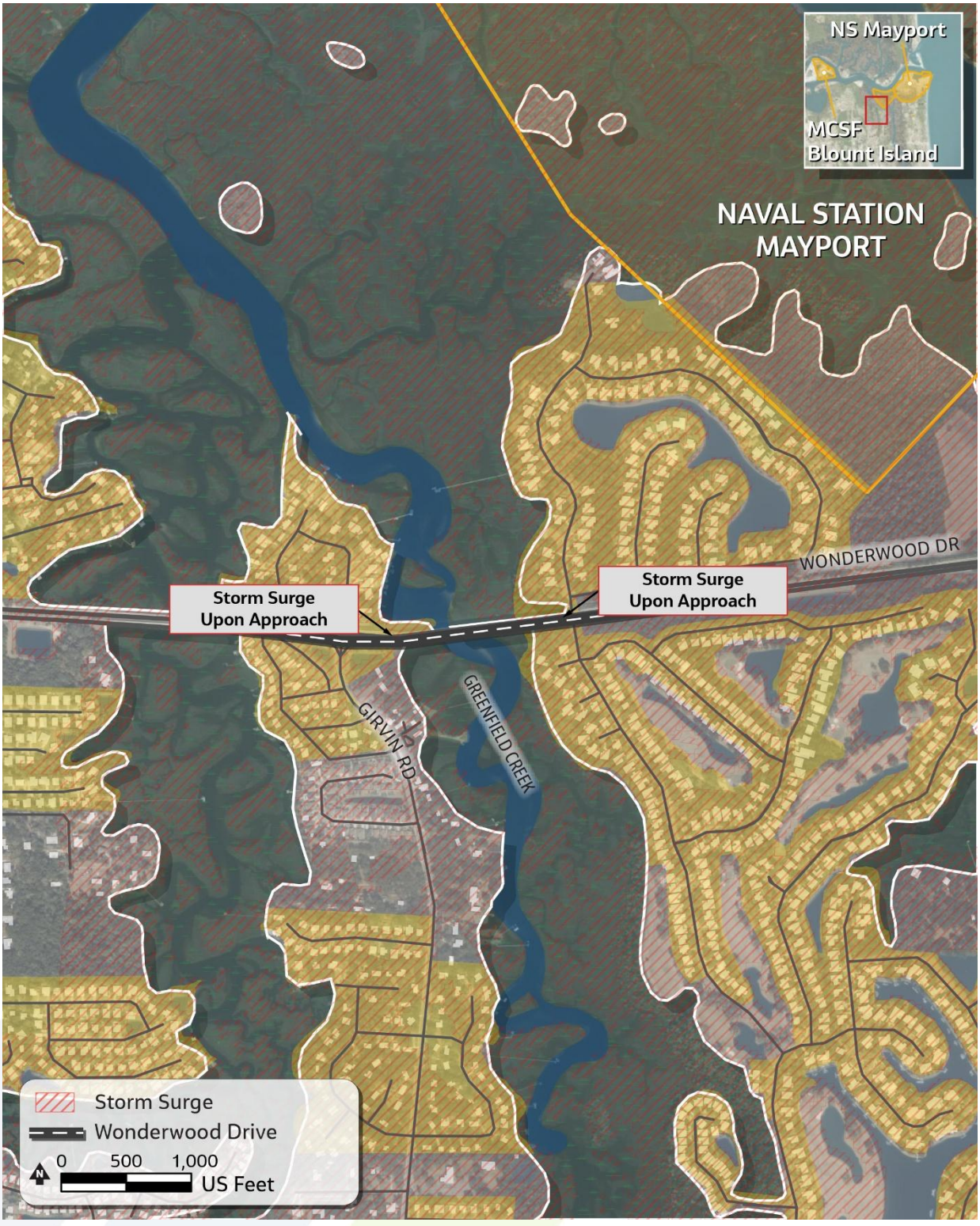
Shocks and stresses to the mission-critical assets supporting NS Mayport include rainfall-induced flooding, coastal flooding due to SLR and storm surge, shoreline loss due to erosion, and school closures.

1. Flooding has been documented as occurring throughout the installation because of storm surge and SLR. It also threatens to permanently inundate other regional mission-critical systems, such as regional fuel depots, in the foreseeable future.
2. **Rainfall-induced flood events are also projected to affect supporting access roads, such as Wonderwood Drive.**
3. Storm surge can inundate multiple regional facilities, such as electric substations. It can also cause significant shoreline erosion.
4. Shoreline erosion has occurred on the installation's own shores (such as north of the fuel farm) and affects supporting infrastructure, such as the State Road (SR) A1A. This erosion is exacerbated by major storm events.
5. The pending closure of the Anchor Academy would be a major shock, requiring students to find a new school and posing physical, emotional, and financial challenges to military families, potentially impacting readiness.

This project package addresses projected flood events at Wonderwood Drive (item 2).

Project Need: Improve Flood Risk and Infrastructure Capacity for Future Demand

Figure 7. Risk to Mission Map



Vulnerabilities Creating Risk to Mission for this Asset

Wonderwood Drive runs east–west just south of NS Mayport and is owned by the Florida Department of Transportation (FDOT). It is a mission-critical corridor, serving as the primary access and emergency evacuation route for the installation while also functioning as a major east–west arterial connecting Mayport to the rest of Jacksonville. The roadway is part of the Florida Strategic Intermodal System, underscoring its importance for military access and regional mobility. West of the Greenfield Creek bridge, Wonderwood Drive transitions into McCormick Road.

The bridge over Greenfield Creek is low-lying and vulnerable to storm surge, coastal flooding, and storm-related impacts (Figure 7). It is partially located within saltwater marsh wetlands and shoreline areas owned by the Florida Department of Environmental Protection (FDEP), making it particularly susceptible to coastal hazards. The bridge embankment also acts as a barrier between marsh systems, highlighting its significance not only for transportation connectivity but also within the surrounding coastal environment. As one of the primary connections between NS Mayport and Jacksonville, this asset is mission-critical, with resilience improvements needed in the near term (Table 1).

Table 1. NS Mayport Wonderwood Drive Asset Summary

Asset Name	Owner	Location	Mission Criticality	Relevant Shocks & Stresses	Level of Urgency
McCormick Road/ Wonderwood Drive	City of Jacksonville / FDOT	Bridge approach at Greenfield Creek	Primary	Storm Surge	Near-term

Stakeholders and Current Efforts

Stakeholders are actively engaged in advancing improvements along the McCormick Road/Wonderwood Drive corridor. These partners collaborate to enhance roadway resilience, improve safety, support military operations at NS Mayport, and maintain public access to surrounding natural resources. Their coordinated efforts reflect the corridor's importance as both a mission-critical access route and a vital regional transportation link. Key stakeholders include:

- NS Mayport
- FDOT
- City of Jacksonville
- North Florida Transportation Planning Organization (NFTPO)
- FDEP
- St. Johns River Water Management District (SJRWMD)

While there are currently no major capital improvement projects underway along this corridor, several long-term resilience initiatives are in progress or planned. The City of Jacksonville's Resilient Jacksonville plan includes citywide compound flood modeling, real-time flood level monitoring, critical assets hardening, shoreline stabilization, and nature-based solutions that can help better define flood risks and identify opportunities to strengthen wetlands and shorelines against storm surge. Similarly, SJRWMD is advancing shoreline preservation and restoration efforts.

FDOT continues to invest in improving intermodal connectivity and has prioritized funding for transportation projects within the Strategic Intermodal System, recognizing the corridor's role in maintaining reliable and efficient movement of people and goods. In addition, the corridor is part of the Core-2-Coast regional trail network, a shared-use path connecting Jacksonville to coastal communities. As part of this effort, protected bicycle and pedestrian facilities have been implemented along the bridge to enhance safety and accessibility

The City of Jacksonville also has adopted the *Vision Zero Action Plan* as its guiding transportation safety policy, incorporating Safe System principles. The SSA recognizes that human error is inevitable and focuses on designing transportation systems that reduce the likelihood of fatal and serious injury crashes through safer roadway design, improved operations, safer speeds, safer vehicles, and effective post-crash care. Transportation recommendations within the MIRR should be implemented consistent with the City's Vision Zero principles and the Safe System Approach, recognizing that roadway users are vulnerable to human error and that resilient transportation systems should support reducing fatal and serious injury crashes through safer infrastructure, safer operations, safer speeds, multimodal connectivity, and effective post-crash care. This approach aligns with the City of Jacksonville's adopted *Vision Zero Action Plan* while supporting military readiness, workforce mobility, and long-term transportation resilience.

Figure 8 gives the locations of existing efforts. Table 2 gives details on projects and efforts that are currently ongoing or have been identified as a need within the region as it relates to mitigating vulnerabilities along Wonderwood Drive for NS Mayport.

Figure 8. Current and Existing Efforts Map

Table 2. Ongoing and current efforts that have been identified as a need within the region related to mitigating vulnerabilities along Wonderwood Drive for NS Mayport.

Existing Project	Entity	Location	Purpose	Timeline
Strategic Intermodal System (SIS)	FDOT	SIS within Florida	Statewide connectivity	Ongoing
Strategic Shoreline Hardening	City of Jacksonville; SJRWMD; USACE	Shoreline along the Atlantic Ocean and the St. Johns River within Duval County	Protect against flooding and SLR	Remain at the planning level
Targeted Shorelines for Nature-based Solutions	City of Jacksonville; SJRWMD; USACE	Shoreline along the Atlantic Ocean and the St. Johns River within Duval County	Protect against flooding and SLR	Remain at the planning level
Core-2-Coast Trail	NFTPO; City of Jacksonville	From the Atlantic coastal area to downtown along FL-116 and FL-105.	Bicycle-pedestrian connectivity and safety.	Plan completed; partially constructed
Strengthening Emergency Response and Evacuation Plans	City of Jacksonville-Office of Resilience; JFRD-Emergency Preparedness	Citywide	Strengthening emergency response	Remain at the planning level
City of Jacksonville's Vision Zero Action Plan	City of Jacksonville Transportation Planning Division	City-wide/Countywide	Guide transportation safety policy, specifically following the Safe System Approach (SSA)	Plan adopted, safety policies ongoing integration into transportation projects (current and future)

JFRD = Jacksonville Fire and Rescue Department

USACE = U.S. Army Corps of Engineers

Review of Strategic Partnerships and Policies

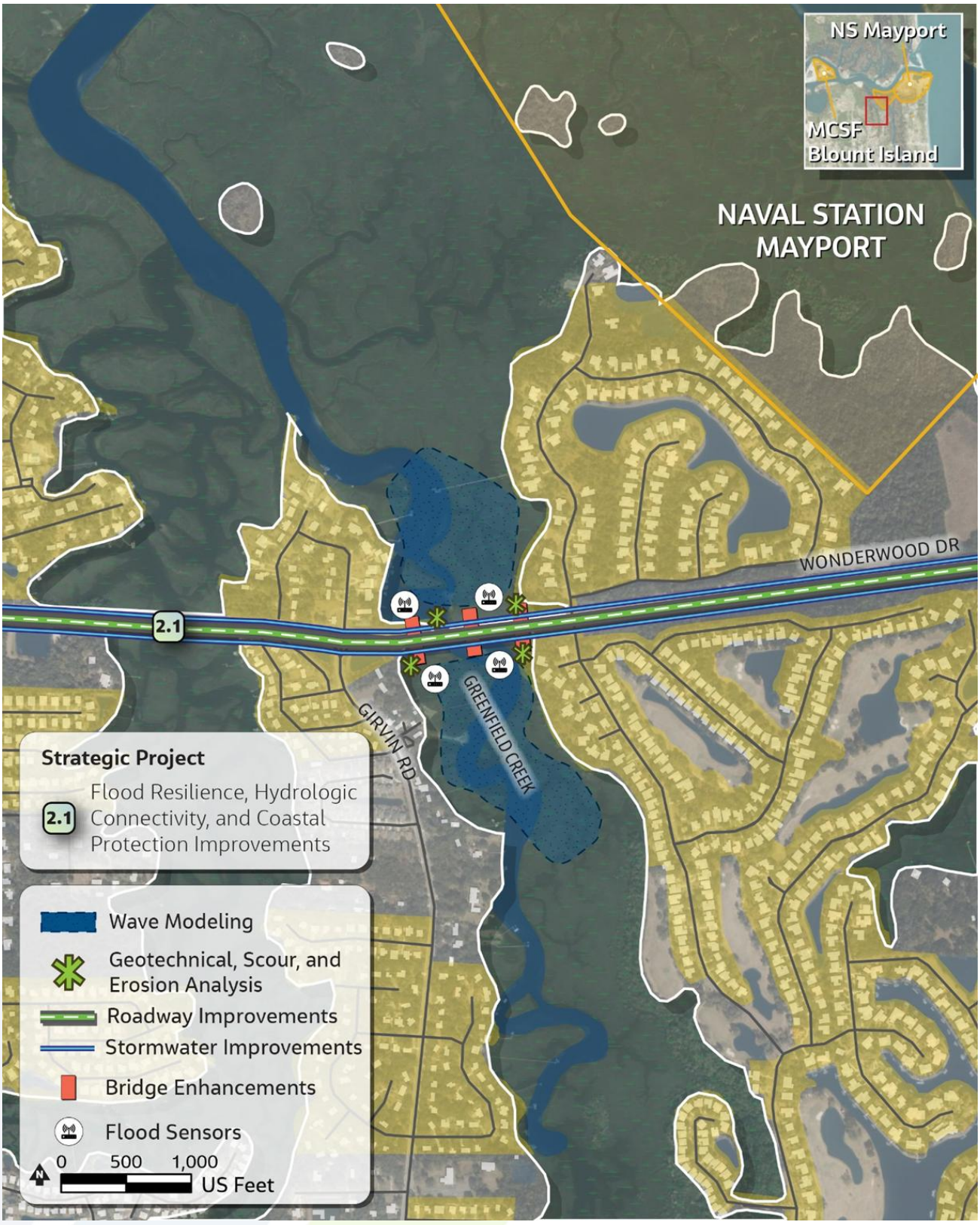
Naval Station Mayport's approach to addressing flooding risks along Wonderwood Drive is closely tied to regional transportation planning partnerships, particularly through the North Florida Transportation Planning Organization (TPO). The TPO provides a formal and institutionalized forum that brings together federal, state, and local stakeholders including Navy representation in an ex officio role, the Florida Department of Transportation (FDOT), and local governments—to coordinate transportation priorities affecting the installation. This structure is especially important given that key access routes to NS Mayport, including Wonderwood Drive and surrounding corridors, fall largely outside the installation's direct control and are owned or maintained by FDOT and local entities.

Within this framework, the TPO has demonstrated effectiveness by incorporating sea level rise, storm surge, and associated flooding risks into its transportation resilience planning. Regional analyses have identified vulnerable corridors serving NS Mayport, including segments near Wonderwood Drive, and have outlined potential adaptation strategies such as roadway elevation, drainage improvements, and long-term resilience investments. As a result, the TPO serves as a critical mechanism for ensuring that the installation's mission-critical access concerns are considered in broader infrastructure planning and funding decisions, even in the absence of direct Navy authority over these assets.

Looking ahead, the durability of this partnership is a key strength. The TPO's federally mandated structure ensures continued coordination among military and civilian stakeholders, and its forward-looking planning processes explicitly account for evolving environmental conditions. This positions the region to address increasing flooding risks over time in a systematic and coordinated manner. Given this existing capacity, additional installation-specific coordination mechanisms would likely provide limited added value. Instead, continued active engagement within the TPO framework represents the most efficient and effective path for advancing resilience improvements along Wonderwood Drive and ensuring reliable access to NS Mayport.

Adaptable Built Infrastructure Projects

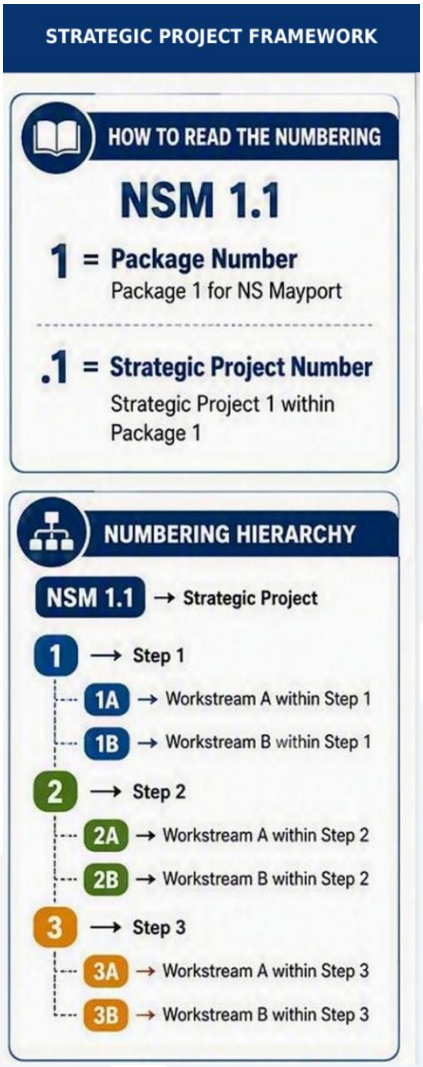
Figure 9. Adaptation Strategies Map



Strategies included in the adaptation plan have been organized by short, mid, and long-term timeframes for implementation. The strategy numbers in the maps correspond to the details provided in their respective sections, which outline a comprehensive approach to strengthening energy resilience and support long-term mission continuity. These strategies focus on enhancing existing system performance, reducing vulnerabilities, and advancing modern, flexible infrastructure solutions that can adapt to future demands and environmental conditions. Order-of-magnitude cost estimates will be provided in 2026 dollars to the extent possible, with up to 50% contingency unless otherwise noted.

Potential Project Leads and Partners are mentioned by organization in the following narratives. The intent is to identify the correct stakeholders that have agency, authority, and interest in the work that is being proposed. Being listed as a lead or partner provides the opportunity to collaborate, advise, and be involved in the adaptation efforts, but does not mandate participation. Funding and financing of projects are not indicated as the responsibility of the project lead or partners, and the monetary tools for obtaining such are in the Implementation section of this package.

Figure 10. Strategic Project Framework



The strategic projects are organized by installation, package, project, step, and actions. The 2-3 letter code indicates the installation. The first number indicates which package this project is in. The second number indicates the project number in the package.

Within each project, the timeline of activities is indicated through the steps (Step 1, Short-term, etc.), and the order of activities is narrated in the sub-steps (1A, 1B, etc.). Through this organization, each strategic project illustrates its project number, timeline, and actions in the narrative.

Strategic Project NSM 2.1. Wonderwood Drive Flood Resilience, Hydrologic Connectivity, and Coastal Protection Improvements

This project enhances the resilience, reliability, and safety of Wonderwood Drive (SR 116) along the segment from Fort Caroline Shores to Jimmy Buffett Memorial Highway (SR A1A) by addressing increasing coastal flooding, drainage limitations, and infrastructure vulnerability associated with SLR, storm surge, and heavy rainfall events. The corridor serves as a critical access route to NS Mayport, coastal communities, and regional employment centers, making it essential to both military readiness and community connectivity. The effort focuses on improving corridor performance under stress conditions while maintaining continuous vehicular access.

The project advances a coordinated approach that includes hydrologic and hydraulic modeling, targeted roadway elevation, drainage improvements, structural stabilization, and real-time monitoring. These actions collectively address both the root causes of flooding and the physical vulnerabilities of the roadway. By integrating engineering and environmental strategies, the project reduces inundation risk, limits erosion, and improves long-term operational reliability.

The segment's proximity to Greenfield Creek, adjacent marsh systems, and the St. Johns River, combined with its low elevation, exposes the corridor to compound flooding conditions. These include tidal influence, storm surge, and rainfall-driven flooding. The project responds to these risks through a combination of data-driven analysis, targeted capital improvements, and adaptive management strategies designed to sustain corridor functionality under future climate conditions.

Potential Project Leads and Partners

- Florida Department of Transportation (FDOT)
- North Florida Transportation Planning Organization (NFTPO)
- City of Jacksonville
- Naval Facilities Engineering Systems Command (NAVFAC)
- NS Mayport
- St. Johns River Water Management Disctrict (SJRWMD)
- Environmental resource agencies, including FDEP, NOAA, and USACE

Current Stakeholder Projects

- Strategic Intermodal System (SIS) (Ongoing)
- Strategic Shoreline Hardening (Planning Stage)
- Targeted Shorelines for Nature-based Solutions (Planning Stage)

Estimated Cost

211,250,000

Step 1: Hydrologic Analysis, Modeling, and Erosion Assessment (Short-term)

1A. Conduct Hydrologic and Hydraulic Modeling and Coastal Flow Analysis

- FDOT can collaborate with City of Jacksonville on their compound flood model. Review for detailed hydrologic and hydraulic modeling to evaluate how storm surge moves through Greenfield Creek and nearby marsh systems and interacts with the Wonderwood Drive bridge and roadway embankments. This analysis identifies areas where water accumulates, where flow is restricted, and where tidal backwater effects contribute to flooding near low roadway segments. Improved understanding of these dynamics supports targeted design strategies that increase flow efficiency, reduce water buildup, and improve roadway safety during storm events. Identify if there is need for any additional modeling to support the following analyses.

1B. Perform Geotechnical, Scour, and Erosion Analysis (FDOT and NAVFAC)

- Agencies can perform geotechnical, scour, and erosion analyses of bridge foundations and embankments to identify structural vulnerabilities under surge and high-flow conditions. Evaluating how sediment stability and structural integrity are affected in a marsh environment helps reduce the risk of long-term degradation and infrastructure failure.

1C. Deploy Predictive Modeling and Scenario-based Simulation

- Advanced modeling tools can simulate storm surge, overtopping, erosion patterns, and future SLR scenarios across the corridor. These simulations inform design decisions such as roadway elevation targets, culvert sizing, and hydrologic restoration strategies that are tailored to site-specific coastal dynamics.

1D. Conduct Remote Sensing and High-resolution Site Assessment

- Agencies can deploy drones, light detection and ranging (LiDAR), and other remote sensing tools to map shoreline change, embankment condition, and erosion patterns. These data improve model accuracy and provide a foundation for long-term monitoring and adaptive management. Remote sensing and UAS collection near the installation must be coordinated with NS Mayport and appropriate aviation/security authorities, with collection, retention, and dissemination controls appropriate to the location.

Step 2: Roadway Elevation, Drainage Improvements, and Hydrologic Restoration (Mid-term)

2A. Prioritize Elevation of Low-lying Bridge Approaches and Roadway Segments Using Risk-based Criteria

- FDOT can prioritize elevation of low-lying roadway segments using a risk-based framework that evaluates exposure, infrastructure criticality, and consequences of failure. Bridge approaches and crossings, particularly at Greenfield Creek, are prioritized because they are most vulnerable to storm surge, tidal interactions, and rainfall-induced flooding and because they serve as essential access points to NS Mayport. Future transportation improvements should consider nationally recognized guidance, including the *Don't Give Up at the Intersection* principles developed by the National Association of City Transportation Officials

(NACTO), the 2024 *Guide for the Development of Bicycle Facilities* published by the American Association of State Highway and Transportation Officials (AASHTO), the Manual on Uniform Traffic Control Devices (MUTCD), and other applicable federal and state design guidance, as appropriate.

- This prioritization aligns with federal resilience funding strategies by focusing investment on high-risk, high-consequence assets that deliver the greatest system-wide benefit. Elevating these segments reduces roadway closures, improves safety under flood conditions, and maintains reliable access during emergencies and peak operational periods.

2B. Improve Stormwater and Tidal Drainage Connectivity

FDOT and partners can improve drainage systems through expanded culverts, upgraded outfalls, and enhanced conveyance pathways that increase water movement beneath and adjacent to the roadway. These improvements reduce ponding, lower hydraulic pressure on embankments, and enhance safety by preventing standing water conditions that can lead to vehicle instability and reduced visibility.

2C. Restore Hydrologic Connectivity to Adjacent Marsh Systems

- Agencies can implement measures such as culvert expansion or partial structure elevation to restore tidal exchange between marsh systems that are currently separated by roadway embankments. This allows floodwater to disperse more evenly across the marsh landscape, reducing overtopping and erosion while supporting sediment transport and ecological resilience.

2D. Deploy Flood Sensors and Monitoring Systems at Critical Low Points

- FDOT can collaborate with City of Jacksonville to utilize their compound flood model for water-level monitoring at high-risk locations identified through the prioritization process, including bridge approaches and low-lying segments. The goal is for early detection of hazardous conditions and supports proactive traffic-management decisions such as warnings, lane closures, and detours. Integration with weather and tidal data improves predictive capabilities and supports performance-based evaluation of resilience outcomes.

Step 3: Structural Stabilization and Coastal Protection (Mid-term)

3.A Stabilize Bridge Foundations and Embankments

- FDOT can stabilize bridge foundations and roadway embankments through reinforcement, scour protection, and erosion control measures. These improvements reduce vulnerability to surge-driven forces and extend infrastructure lifespan while maintaining reliable access during extreme events.

3.B Implement Nature-based Shoreline and Erosion Control Solutions (FDOT and Environmental Agencies)

- Agencies can implement living shorelines and vegetative stabilization to reduce erosion, dissipate wave energy, and improve sediment stability along the corridor. These nature-based solutions enhance durability while also supporting ecological function in adjacent marsh systems.

Step 4: Smart Monitoring and Adaptive Flood Management (Long-term)

4.A Deploy Monitoring Systems and Ongoing Data Collection

- Agencies can establish continuous monitoring systems that track water levels, infrastructure performance, and shoreline change over time. These systems support proactive maintenance and improve the ability to respond quickly to emerging risks.

4.B Implement Adaptive Management and Climate-informed Design Updates

- Data collected through monitoring and modeling can inform adaptive management strategies and future design updates, ensuring that corridor improvements remain effective under changing sea level and storm conditions. This approach supports long-term resilience and efficient infrastructure investment.

Alignment and Support of the Regional Resilience Action Plan

Figure 11. Alignment with the RRAP

This project advances RRAP Actions 5, 8, 13, 14, 16, 17, 19, and 23 by addressing a Strategic Intermodal System corridor that serves as both the primary access route and the emergency evacuation route for NS Mayport, with a low-lying bridge over Greenfield Creek partially sited within saltwater marsh wetlands. Targeted elevation of low-lying bridge approaches and roadway segments using a risk-based prioritization framework, together with geotechnical, scour, and erosion analyses of bridge foundations and embankments, implements Action 8 (Support Regional Transportation Networks), specifically, Subaction 8.1 on ensuring safe and sufficient evacuation routes, under which the Collaborative works with local governments to ensure roads along evacuation routes are properly maintained and improved, and Subaction 8.2

on improvements to regionally significant transportation assets designed for future conditions rather than today's needs, which directs that sea level rise and flood zone data inform transportation improvement projects. Structural stabilization, scour protection, and erosion control implement Subaction 16.1 on protecting critical assets where relocation is impractical.

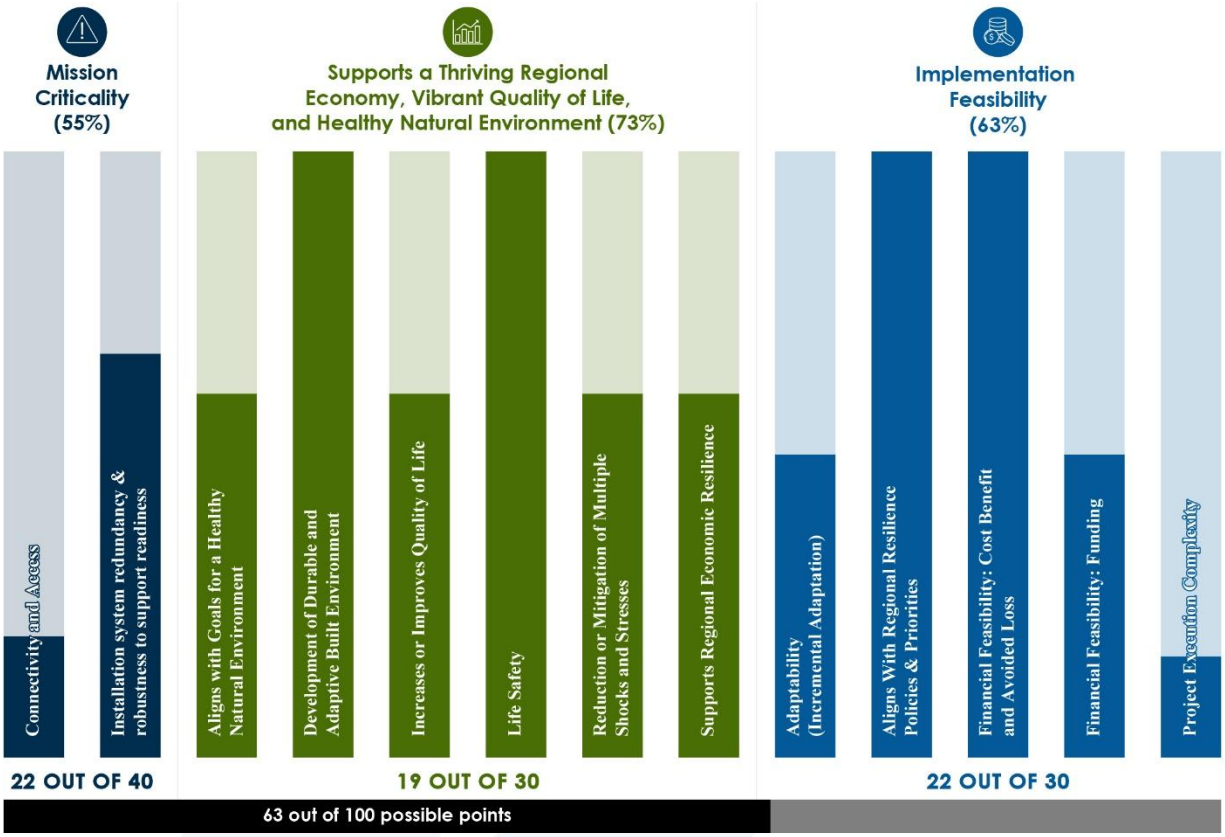
The project's hydrologic and nature-based components deliver the RRAP's Healthy Natural Environment goal alongside corridor reliability. Restoring tidal exchange between marsh systems currently separated by the roadway embankment, through culvert expansion or partial structure elevation, implements Subaction 5.1 on conserving and restoring estuarine wetlands, recognizing that the embankment presently functions as a barrier that concentrates flow and limits the marsh system's ability to disperse floodwater. Living shorelines and vegetative stabilization to reduce erosion and dissipate wave energy implement Subaction 17.2 on encouraging nature-based solutions where conditions are appropriate and the RRAP's direction that projects evaluate site suitability before installation. Expanded culverts, upgraded outfalls, and enhanced conveyance pathways implement Subaction 14.6 on encouraging advances in stormwater management to reduce flooding and improve water quality, the subaction in which the RRAP observes that traditional gray infrastructure may prove inadequate as extreme precipitation events become more frequent and promotes green stormwater infrastructure as the preferred approach for retrofit projects. Together these elements should be documented in the inventory of nature-based projects maintained under Action 27, including surge attenuation and water storage performance.

The project's monitoring and coordination components extend alignment into preparedness and regional planning. Flood sensors and water level monitoring at bridge approaches and low-lying segments, integrated with weather and tidal data to support warnings, lane closures, and detours, implement Subaction 23.1 on compiling and distributing locally relevant information about weather hazards and changing weather patterns in accessible formats. Remote sensing, LiDAR mapping, and continuous performance monitoring under Step 4 generate the corridor-level data the Collaborative synthesizes under Subaction 32.1, through which it hosts Northeast Florida's Vulnerability Assessment Portal and builds toward regional-scale analysis. The corridor's role in the Core-2-Coast regional trail network, with protected bicycle and pedestrian facilities already implemented along the bridge, supports Subaction 19.3 on fostering safe and walkable streetscapes and connecting neighborhoods with regional destinations. Coordination through the North Florida TPO, on which the Navy holds representation, together with sustained engagement with FDOT, SJRWMD, FDEP, and the City of Jacksonville, expresses Subaction 13.3 on intergovernmental partnerships with state and federal agencies, including the military, to increase regional readiness.

Metrics Score

The NS Mayport Mobility Corridor Wonderwood Drive project was evaluated against a robust series of metrics to determine the appropriateness, viability, and achievement of goals. The metric categories are given a percentage weight to indicate the comparative importance for the MIRR, with Mission Criticality being the highest. High and mid-range scores across all metric categories indicate that implementing the strategies and policy recommendations within this project will promote mission assurance for the installation (Figure 12).

Figure 12. Metrics Scorecard Results



Cost-Benefit Analysis

Benefit-cost analysis (BCA) determines the cost-effectiveness of adaptation projects. This effectiveness is calculated using the equation

$\frac{B}{C}$ = Value

Where B is the benefit, or avoided costs, of the project and C is the cost to implement the project. A benefit-cost value greater than 1 indicates that a project is cost-effective (i.e., the benefits of the project outweigh the costs incurred in implementing it), whereas a BC value less than 1 indicates the project may not be cost effective (i.e., the costs exceed the benefits).

Adaptation project costs were costed to include project construction and design costs, where feasible. Project benefits were costed to include direct (construction or repair costs) and indirect (social, economic, and environmental) costs whenever feasible.

Data sources for benefit values include the Federal Emergency Management Agency, the National Institute of Standards and Technology, the National Interagency Fire Center, and others.

In many cases, associated financial savings data (such as improved installation operations, improved quality of life for installation personnel, or asset-specific O&M costs) was unknown; in these cases, the benefit is described. Hence, BCA values may not reflect the total possible benefit of the proposed adaptation project.

Total Project Package Snapshot

Figure 12. Total Project Package Snapshot

Implementation Tools

Financial Strategy Toolkit

Many of the tools required to fund, finance, and coordinate resilience implementation are already available under current Florida law or institutional precedent. The challenge, then, is aligning, adapting, and scaling existing tools to support coordinated regional resilience investment strategies. Thus, this section provides an initial inventory of funding, financing, and institutional tools that can be used to support the implementation of the MIRR project portfolio and the broader resilience system envisioned above.

Shorelines & Natural Infrastructure

Position Flood-Reduction Structures for Resilient Florida and FEMA Mitigation Funding

Flood mitigation projects involving hard and grey infrastructure including tidal gates and hybrid armoring qualify for a different set of programs than green and habitat-oriented work. To keep these projects eligible for grant funding, the region should incorporate them into relevant planning documents including regional and municipal hazard mitigation and climate adaptation plans before funding rounds open. Strategies may include:

- Positioning coastal flood-reduction projects for FL DEP's Resilient Florida Grants, which fund vulnerability analysis, planning, and implementation for flooding and sea level rise and are open to counties, municipalities, and regional resilience entities.
- Ensuring qualifying projects are written into the applicable local hazard mitigation strategies/plans now, since FEMA/FDEM's Hazard Mitigation Grant Program requires a presidential disaster declaration and inclusion in an adopted mitigation plan, and eligibility cannot be assembled after the fact.
- Screening structures and NFIP-insured assets for FEMA/FDEM Flood Mitigation Assistance, which supports elevation, acquisition, relocation, and localized flood-reduction projects.

Shorelines & Natural Infrastructure Longer-term Implementation

Shoreline and natural infrastructure projects are best organized at the coastal-system scale. Active work is already underway across NS Mayport, Blount Island, NAS Jacksonville, and the City of Jacksonville with the leadership and support of other partners. This report describes individual near-term funding opportunities. The longer-term task is to keep those efforts connected as projects move from planning and design toward permitting, restoration, and maintenance.

While it is possible to manage projects individually, opportunity exists to manage them as a shared coastal portfolio. Projects could be sorted by shoreline type and asset owner, design and permitting status, and long-term maintenance responsibilities. Existing shoreline partnerships provide the foundation for this approach. Project sponsors and participating partners can identify which projects are ready for design or implementation funding, which need engineering or permitting support, which require landowner coordination, and which need maintenance or monitoring commitments. Over time, this would shift shoreline work from discrete grant opportunities toward a coordinated investment program serving both installations and the surrounding communities.

Transportation & Mobility

Align Military Access Routes with the FDOT Work Program and TPO Priorities (Near-term)

Since most of the roadway projects sit on FDOT-owned facilities, the highest-leverage near-term action is not a new grant but placement in the pipelines that already fund state roads. Steps include:

- Working with FDOT and the North Florida TPO to align MIRR roadway projects with the FDOT Work Program and the TPO's long-range plan and priority lists, so that resilience upgrades fit into existing corridor and access investments rather than competing as standalone initiatives.
- Using MIRR vulnerability data to inform project scoping, site selection, and the case for prioritization within those programs.
- Embedding resilience and critical-access criteria (flood exposure, installation access, redundancy) into local and regional transportation planning frameworks.

Leverage Defense-Specific Transportation Funding (Near-term)

The installation-access purpose of these routes makes them eligible for funding that general roadway projects cannot reach. The FHWA Defense Access Road (DAR) program provides a mechanism for the Department of Defense to fund public highway improvements necessitated by defense activities, which is a direct fit for access routes such as Mayport Road and the Blount Island corridors. Near-term steps include engaging the installations and DoD early to document the defense necessity that DAR requires, and identifying which access-route projects are strongest candidates. The Defense Community Infrastructure Program (DCIP), discussed under Resilient Utilities, can also fund qualifying off-base transportation projects that support an installation.

Bundle Roadway and Freight-Rail Projects for Federal Discretionary Funding (Near-term)

Federal discretionary programs increasingly favor bundled, regionally coordinated applications, and the region can begin organizing project scopes now even where construction is years out. Near-term steps include:

- Developing a bundled project list focused on installation access routes, freight corridors, and flood-prone transportation nodes.
- Positioning candidate projects for US DOT's BUILD/RAISE and INFRA programs (the latter awarded through the Multimodal Project Discretionary Grant NOFO), which fund road elevation, bridges, freight rail, and multimodal work.
- Coordinating across FDOT, the TPO, CSX, and JAXPORT to align scopes, permitting, and timelines so joint applications and cost-share agreements are ready when rounds open.

Notes: The current federal surface transportation authorization (IIJA) expires September 30, 2026, and future BUILD/RAISE and INFRA rounds depend on reauthorization.

Explore Value Capture and Partnerships in Freight and Growth Corridors (Near-term)

Corridors serving the port and freight network are likely to see rising land values and continued private investment, which creates room for value capture and private participation over a longer horizon. In the near term, the region can conduct a scan of where tax increment financing, mobility fees, or special assessments may be viable, and begin early conversations with private beneficiaries such as JAXPORT tenants, logistics firms, and CSX about co-investment in shared freight-corridor resilience. Full deployment of these tools requires multi-year planning and, in some cases, legislative action, so this is scoping-and-feasibility work now that informs the longer-term strategies.

Transportation & Mobility Longer-term Implementation

As noted earlier, transportation and mobility projects should be carried forward through integration into agency and asset owner investment processes. The key implementation challenge is that mission-related transportation vulnerabilities do not automatically align with established investment priorities. They consequently need to be framed and pursued in ways aligning with those regional priorities.

For roadway and access projects, this may translate into identifying the specific consequences of disruption to mission readiness and positioning projects for the next decision point where they may be advanced. For projects that are already connected to FDOT and the TPO, these should be positioned with the documentation needed for project prioritization and funding consideration.

Freight, port, rail, and aviation needs require similar translation, but through different delivery systems. Port and freight-related priorities may, for example, be framed around topics of regional importance such as shoreline exposure or operational resilience, where those issues intersect with JAXPORT infrastructure planning. Rail-related priorities require early coordination and planning with CSX, with public investment opportunities framed around public benefits while accounting for CSX ownership, operations, and long-term capital planning.

Over time, the strongest adaptation project candidates will be those with a clearly documented readiness consequence, an identified owner or sponsor, established plans, and sufficient scoping to compete for design, capital, or discretionary transportation funding.

Funding Opportunities

Table 3. Transportation Funding Options

Agency/Org	Program	Description	Available Funding	General Eligibility	Example Eligible Projects	Timeline
US DOT	Better Utilizing Investments to Leverage Development (BUILD) Grant Program (formerly RAISE)	Provides discretionary funding for transportation projects that promote safety, environmental sustainability, quality of life, and economic competitiveness.	~$1.5 billion available for FY2026. (transportation.gov/BUILDgrants)	State and local governments, MPOs, transit agencies, port authorities	Complete streets, road elevation, bridges, rail planning, multimodal mobility hubs	FY2026 NOFO published Dec 15, 2025; applications due Feb 24, 2026 (letters of support through Mar 13, 2026). Note: IIJA authorization expires Sept 30, 2026 — future rounds depend on reauthorization. (transportation.gov)
US DOT	INFRA Grant Program	Funds large-scale infrastructure projects that improve the movement of freight and people across the country.	~$1.6 billion/year	States, MPOs, local governments, tribal governments	Highway modernization, road widening, interchanges, freight rail	Awarded through the combined Multimodal Project Discretionary Grant (MPDG) NOFO (INFRA/Mega/Rural); FY2026 round active. IIJA expires Sept 30, 2026. (transportation.gov/grants/mpdg-program)
US DOT	Safe Streets and Roads for All (SS4A) Grant Program	Supports regional, local, and tribal initiatives to prevent roadway deaths and serious injuries through comprehensive safety planning and implementation.	~$993.5 million for FY2026 (~$687.8M Implementation, ~$305.7M Planning & Demonstration). (transportation.gov/grants/SS4A)	Local, regional, tribal governments	Road safety audits, protected bike lanes, speed management systems, crosswalk improvements	FY2026 NOFO closed May 26, 2026. Likely the final SS4A round — IIJA expires Sept 30, 2026. (transportation.gov; visionzeronetwork.org)
FDOT	Transportation Alternatives (TA) Set-Aside Program	Provides funding for smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, and safe routes to school programs.	Approximately $5.1 million annually.	Local governments, regional transportation authorities, transit agencies, natural resource or public land agencies, school districts, and tribal governments.	Construction of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation.	Annual competitive application process; specific deadlines vary by FDOT district.
FDOT	Transportation Regional Incentive Program (TRIP)	Encourages regional planning by providing state funds to improve regionally significant transportation facilities in regional transportation areas.	State funds cover up to 50% of the non-federal share of project costs.	Projects must be identified in the capital improvements element of a local government comprehensive plan and be consistent with the MPO's Long-Range Transportation Plan.	Improvements to regionally significant roadways, public transportation facilities, and intermodal facilities.	Application cycles and deadlines are managed by FDOT districts
FTA	Urbanized Area Formula Grants	Provides formula funding to support public transportation in urbanized areas (pop. > 50,000), including capital, planning, and limited operating expenses.	Over $6.5 billion annually (nationally). Federal funding not to exceed 80% of total project costs.	Public transit agencies, states, and designated recipients in urbanized areas.	Bus and rail capital investments, mobility hubs, transit planning, fare collection systems.	Funding apportioned based on legislative formulas; funds are apportioned annually.
FTA	Pilot Program for Transit-Oriented Development (TOD) Planning	Supports planning efforts near transit corridors to foster compact, mixed-use development and maximize transit access.	~$29 million in FY26	Transit project sponsors with eligible capital projects	Planning for mobility hubs, affordable housing near transit, station area design.	Annual discretionary grant; FY26 NOFO issued on 5/11/26. Applications are due by 7/10/2026.

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