

SAND

Solving Access for NC 12 in Dare County



**PROTECT FFY 2022 and 2023
GRANT APPLICATION
AUGUST 2023**



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Project Type: PROTECT Planning Grant

Unique Entity Identifier Number: XSN8A4TT1DY5

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Application Materials: <https://connect.ncdot.gov/resources/PROTECT2023-NC12/Pages/default.aspx>

PROJECT SNAPSHOT

Solving Access for NC 12 in Dare County (SAND) is seeking PROTECT funding to complete a Planning and Environmental Linkages study that includes comprehensive resiliency planning, alternatives development and evaluation, and robust public engagement. SAND will establish a solid foundation for future project development and construction, with the goal of streamlining subsequent environmental review, accelerating project delivery, and securing long-term resiliency for NC 12. This collaborative project will be spearheaded by the North Carolina Department of Transportation (NCDOT) with support from partners US Fish and Wildlife Service and National Park Service.



Project Location: An 11-mile section of NC 12 between Oregon Inlet and Rodanthe on Pea Island in Dare County, NC.



Estimated Completion Date: Quarter 4, calendar year 2026



Project Budget: \$1,865,000

Application Materials: <https://connect.ncdot.gov/resources/PROTECT2023-NC12/Pages/default.aspx>

Merit Criteria Benefits



Program Alignment: Incorporates best available climate data and decision support tools, develops alternatives that incorporate nature-based solutions to support the optimal functioning of the Barrier Island ecosystem, and aligns with existing resilience and transportation plans for the region.



Schedule + Budget: Completes the activities described in the application in a feasible and reasonable manner, commensurate with the anticipated level of effort.



Public Engagement, Partnerships, + Collaboration: Proactively and meaningfully engages a broad range of partners, stakeholders, and members of the public, including federal, state, and local agencies, academia, community-based organizations, and advocacy groups to build a common framework for decision-making to ensure that diverse perspectives are considered, particularly those from disadvantaged communities.



Innovation: Leverages innovative partnerships, technologies, and techniques to ensure that the decision-making process is grounded in reliable climate data, expert knowledge, and industry best practices. Incorporates nature-based solutions where appropriate and feasible.

Jenni Koontz of Epic Shutter Photography

"SAND demonstrates NCDOT's commitment to deliver resilient, long-term solutions for NC 12 on the Outer Banks through collaborative partnerships and active public engagement."

--J. Eric Boyette,
NCDOT Secretary



Climate & Economic Justice Screening Tool Data for Study Area

98th
Percentile

Expected Building Loss Rate

98th
Percentile

Expected Population Loss Rate

98th
Percentile

Projected Flood Risk

76th
Percentile

Low-Income Households

Transportation Disadvantaged Populations Served

Zero-Vehicle Households

12% Study Area / 6% State Average

Persons with Disabilities

28% Study Area / 13% State Average

Persons > 65 Years Old

30% Study Area / 16% State Average

FHWA Priority Considerations

The Project demonstrates exceptional benefits in public engagement, partnerships, and collaboration by taking a comprehensive and inclusive approach to create a shared vision for NC 12 that considers the needs and aspirations of all. With the award of PROTECT funding, NCDOT will be able to take the next step for the long-term resilience of this important corridor.

I. BASIC PROJECT INFORMATION

PROJECT DESCRIPTION

Solving Access for NC 12 in Dare County (**SAND**, or “the Project”) seeks PROTECT funding to complete a Planning and Environmental Linkages (PEL) study that includes comprehensive resiliency planning, alternatives development and evaluation, and robust public engagement for an approximately 11-mile stretch of North Carolina Highway 12 (NC 12) on Pea Island, between the Marc Basnight Bridge, which spans Oregon Inlet, and the Rodanthe “Jug Handle” Bridge in Dare County, North Carolina.

This collaborative project, spearheaded by the North Carolina Department of Transportation (NCDOT), with support from project partners the National Park Service (NPS) and the US Fish and Wildlife Service (USFWS), will establish a solid foundation for future project development and construction, with the goal of streamlining subsequent environmental review, accelerating project delivery, and securing the long-term resiliency of NC 12.

NC 12 is the primary link connecting coastal communities scattered along the barrier islands known as the Outer Banks. These barrier islands are narrow, low-lying, landforms that run parallel to the North Carolina mainland and are constantly and dynamically being reshaped by wave and wind action. Rising sea levels, coupled with the increasing severity and frequency of coastal storms, are accelerating the impacts of these forces. This leads to dune breaches, flooding from precipitation and soundside inundation, shoreline erosion, and sand and ocean overwash that damages the roadway and causes extensive repair and cleanup costs. The large dunes that run parallel to NC 12, while protecting the roadway, trap flood waters and ocean overwash in the road corridor when they are breached. When the water recedes, a substantial amount of sand and debris often remains. NCDOT must quickly deploy maintenance and repair crews to push this material back onto the dunes and perform emergency repairs to reopen the roadway.

Since 2010, NCDOT has spent more than \$72 million to keep NC 12 south of Oregon Inlet passable following storm events. These persistent challenges disrupt the lives of residents and visitors, adversely impact the Cape Hatteras National Seashore (CAHA) and the Pea Island National Wildlife Refuge (PINWR), and negatively affect the regional economy. According to the [*National Aeronautics and Space Administration's \(NASA's\) Interagency Sea Level Rise Scenario Tool*](#), experts predict that sea levels could rise by up to 7.1 feet by the year 2100, the Project's horizon planning year. This has significant implications for the future of NC 12 and the development of sustainable solutions that protect taxpayer investment in this vital transportation link.

The Project corridor is a critical lifeline connecting residents, tourists, and property owners on Hatteras Island to the rest of Dare County and mainland North Carolina. Its proper functioning is vital to the safety, quality of life, and economy of the Outer Banks and is the sole means for the public to access PINWR and CAHA. Hatteras Island's southern villages rely on the Project corridor as a sole evacuation route during coastal storms and to access essential services, employment, and educational opportunities.

To address these climate-related challenges, SAND will bring together federal and state agencies, academia, advocacy groups, and the public to build a common framework for decision-making and develop long-term solutions that address vulnerabilities

PINWR provides habitat for migratory waterfowl and threatened and endangered species and opportunities for the enjoyment of wildlife.

CAHA, the nation's first national seashore, was established in 1953 to preserve significant segments of remote and unspoiled barrier islands along the North Carolina coast.

Residents and visitors from around the world visit CAHA and PINWR for birdwatching, hiking, biking, swimming, fishing, and boating.



at projected future breach locations and areas of frequent ocean overwash, or 'hot spots' (see **Project Location** map). The following goals will guide the Project; the public engagement process will identify additional goals and the overarching vision for the Project (see **Public Engagement, Partnership, and Collaboration** for more information):

- Use best available sea level rise data and vulnerability assessments to guide the decision-making processes.
- Identify alternatives that are cost-effective, constructable, and avoid and minimize environmental impacts.
- Ensure public access to nationally significant conservation and recreational lands in CAHA and PINWR.
- Improve connectivity and access for non-motorized transportation modes, including bicycling and walking, as part of the long-term vision for the Mountains-to-Sea Trail (MST).
- Incorporate innovative approaches to ecosystem restoration and nature-based solutions (NBS) to alternatives development and evaluation.

SAND will achieve these goals by leveraging prior decision-making and environmental analyses from the previous phases of State Transportation Improvement Program (STIP) project B-2500, as well as incorporating the efforts of the NC 12 Task Force (see **Project History**). This approach aims to identify a range of reasonable alternatives for the subsequent National Environmental Policy Act (NEPA) evaluation and facilitate a preliminary consensus on the preferred alternative with support from Project partners, stakeholders, and the public. Resiliency and mitigation planning will be a key focus, and the Project will identify opportunities to return the ecosystem to its natural state and incorporate innovative NBS approaches such as oyster reef restoration, living shorelines, and green stormwater infrastructure where appropriate and feasible. The Project will include the activities and components outlined in the list of tasks, below. For more detailed information, refer to the Scope of Work (SOW) in the **Supplemental Materials**.

TASK 1

Project Management: NCDOT will oversee SAND and manage the Project's scope, schedule, and budget.

TASK 2

Stakeholder Engagement (see **Public Engagement, Partnerships, and Collaboration for more information**): NCDOT will perform robust public and stakeholder engagement, including public meetings, small group stakeholder meetings, and outreach using a variety of tools and platforms to solicit input. A Steering Committee composed of representatives from federal, state, and local agencies, academia, and environmental advocacy groups will provide guidance and technical assistance throughout the course of the Project.

TASK 3

Planning Level + Environmental Considerations: NCDOT will compile information on past planning efforts and environmental conditions, including geotechnical investigations and hydrodynamic modeling to support the development and evaluation of alternatives.

TASK 4

Alternatives Development + Conceptual Design: NCDOT will perform conceptual roadway and structure design for alignment alternatives and evaluate the alternatives for cost, constructability, operations and maintenance, resilience, environmental impacts including Section 106 and 4(f), NBS, and bicycle and pedestrian access. The goal of this task is to identify the range of reasonable alternatives and a preliminary consensus on the preferred alternative.

TASK 5

Implementation Strategy + Tools: NCDOT will build on Tasks 2 through 4 to identify implementation steps, including a NEPA and permitting timetable, phasing scenarios, the organizational framework for implementation, and identification of potential funding sources.

TASK 6

Study Development: NCDOT will prepare a report that compiles and documents the information developed in Tasks 2 through 5 to provide a solid foundation for subsequent environmental review and design.



PROTECT-required Resilience and Floodplain Information

There is no applicable Resilience Improvement Plan under 23 USC § 176(e)(2).

Most of the NC 12 roadway within the study corridor is located in the 0.1% annual chance flood zone (zone AE). NCDOT will not be implementing the Project pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

These elements will address vulnerabilities at projected future breach locations as well as the Canal Zone and PINWR Visitor Center Hot Spots, where rising tides are breaching dunes and sand and ocean overwash are a major challenge during and after coastal storms.

Securing the PROTECT funding will enable NCDOT to accomplish several important goals and milestones that lay a solid foundation for subsequent project development and construction for a resilient, long-term solution to climate-related challenges facing the Project corridor:

- Complete all necessary Project Delivery Network (PDN) steps in Stage 1, Project Initiation and make substantial progress on Stage 2, Alignment defined (see **Innovation** section).
- Frontload essential elements of the NEPA process, including the Purpose and Need statement, alternatives development, affected environment, and environmental consequences.
- Develop consensus around Project vision, goals, and the range of reasonable alternatives (including a preferred alternative).
- Develop more accurate and precise cost estimates.

By supporting SAND with PROTECT funding, USDOT will support a more sustainable and resilient future, ensuring the continued growth and prosperity of the region while addressing critical climate-related challenges faced by NC 12.

PROJECT HISTORY

STIP Project B-2500

In 2002, long-range planning efforts to address the vulnerabilities of the Project corridor commenced when NCDOT began work on the Supplemental Draft Environmental Impact Statement (EIS) for the Bonner Bridge replacement (STIP project B-2500). As a response to the escalating threats of shoreline erosion and overwash from coastal storms, NCDOT expanded the study area southward from Oregon Inlet to encompass NC 12 to Rodanthe, with the goal of identifying a long-term approach to minimizing climate-related risks through 2060. Since then, NCDOT has worked diligently to complete the design, environmental review, and construction of the selected alternative, Parallel Bridge Corridor with Transportation Management Plan. The Marc Basnight Bridge replaced the Bonner Bridge in 2019 (B-2500, Phase I) and the Rodanthe “Jug Handle” Bridge opened in 2022 (B-2500, Phase IIb).

Phase IIa of STIP project B-2500 consists of long-term improvements in the vicinity of the Pea Island Inlet, which formed as a result of Hurricane Irene in August 2011. In October 2013, NCDOT completed an Environmental Assessment (EA) for this phase to identify and assess changes in the setting, project, and potential impacts that may have occurred since the 2010 Record of Decision (ROD). Subsequently, NCDOT prepared an alternatives study report in 2017 that expanded the study area south to the northern terminus of Phase IIb and developed conceptual alignments for a Bridge On New Location Alternative and connectors to Oregon Inlet. Following the completion of this report, NCDOT refined the conceptual alignments connecting Oregon Inlet and the Phase IIb alternative alignments as part of its Strategic Transportation Prioritization process (SPOT project H170917).

NC 12 Task Force

The NC 12 Task Force was established in 2020 with the primary objective of developing feasible short- and long-term solutions for NC 12. The goal of this collaborative effort was to develop a prioritized and resilient transportation plan for NC 12 in Dare and Hyde counties, North Carolina, to reduce vulnerability to damage and closures, with a strong emphasis on safety, reliability, cost-effectiveness, and ease of maintenance. The Task Force analyzed hot spots at the "Canal Zone" (near the Basnight Bridge) and the PINWR Visitor Center. Over the short-term, the consensus of the subcommittee was to continue the current approach of reinforcing dunes, building temporary bridges when necessary, and to consider beach nourishment as an emergency, stop-gap measure. The Task Force evaluated a long-term solution of adding bridges that bypass the Canal Zone and Visitor Center Hot Spots and found that an approximately seven-mile-long bridge may be the most feasible solution considering highway vulnerability and costs. The Project will build on the Task Force's findings and recommendations to continue the development of effective solutions for the Project and to better understand their environmental impacts, costs, and constructability.

PROJECT BENEFITS

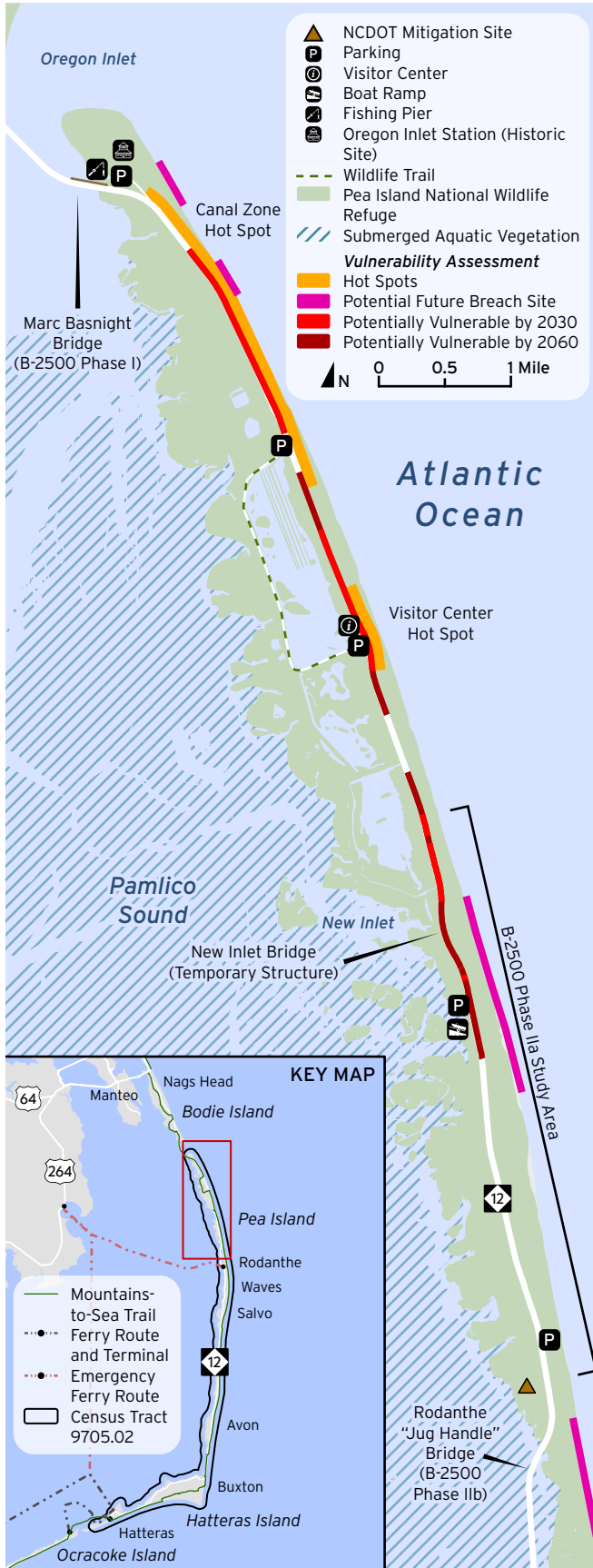
In addition to progressing the development of long-term, resilient solutions for NC 12, SAND provides additional benefits:

- **Supporting the Regional Economy:**

Between 2020 and 2022, over 8.7 million people visited CAHA, resulting in numerous economic benefits to the Outer Banks. According to [NPS data](#), a record-breaking 3.2 million CAHA visitors spent an estimated \$645 million in 2021; these expenditures supported a total of 3,200 jobs, \$92.1 million in labor income, \$158 million in value added, and \$294 million in economic output. The Project corridor is the only means of accessing the CAHA and PINWR; SAND is an important first step to securing long-term access to these nationally significant recreation and conservation lands, which are integral to the regional economy.

- **Access and Connectivity:** SAND will play a crucial role in ensuring uninterrupted multimodal access along NC 12, safeguarding the well-being and quality of life for communities that rely on this roadway to reach essential services and opportunities. According to the Equitable Transportation Community (ETC) Access Burden Summary for Hatteras Island, residents face considerable travel distances to access adult education (103 minutes), medical facilities (38 minutes), and parks (62 minutes). The Project is a crucial step in securing future access to essential services, medical care, and education and employment opportunities in the northern portion of Dare County, Currituck County, and the mainland.
- **Freight Traffic:** While NC 12 is not a NC Priority Highway Freight Corridor, there are no alternative routes to support this area of the state. By identifying long-term, resilient solutions, SAND fulfills a critical need to ensure that the transport of goods to the Hatteras Island's southern villages is not interrupted.
- **Emergency Access:** As the frequency and intensity of coastal storms continues to increase, it is increasingly important that the Project corridor remain operational during and after these events to allow the ingress and egress of emergency responders and medical aid, utility crews, residents, and property and business owners. In its current condition, the Project corridor is vulnerable to damage that compromises the ability of first responders to reach Hatteras Island's southern villages in emergency situations. By identifying resilient, long-term solutions and laying the groundwork for their implementation, SAND will protect the life safety of the over 4,000 people who call Hatteras Island home.

PROJECT LOCATION



Project Location Map

SAND will perform a PEL study, which includes robust public and stakeholder engagement and the development and evaluation of long-term, resilient solutions for an 11-mile stretch of NC 12 in the PINWR. The Project corridor is intricately linked to vital transportation infrastructure in coastal North Carolina that meets the access and connectivity needs of residents, visitors, and businesses in the Outer Banks:



- Roads: Connects to US 64 and US 158 in Nags Head.
- Trails: Pathway for the MST, which traverses the Outer Banks.
- Ferry Access: Connects to an emergency ferry route between Rodanthe and Stumpy Point.

While the study area does not contain any residential areas, 4,272 individuals residing in the Hatteras Island’s southern villages rely on this section of NC 12 to access essential services and economic opportunities, including medical care, education, employment, and amenities like grocery stores, retail centers, and recreational facilities.

The Project is located in rural (according to 23 USC § 176(d)(5)(H)(ii)) Census Tract (CT) 9705.02, which includes all of Hatteras Island. The Climate and Economic Justice Screening Tool classifies this CT as disadvantaged as it meets its burden threshold for Climate Change and the associated socioeconomic threshold for low-income populations:

- 98th Percentile Expected Building Loss Rate
- 98th Percentile Expected Population Loss Rate
- 98th Percentile Projected Flood Risk
- 76th Percentile Low-Income Households

This CT is also a USDOT Transportation Disadvantaged Census Tract and meets the criteria for Transportation Access Disadvantage according to the ETC Explorer. Data from NCDOT's Transportation Disadvantage Index (TDI) tool shows that individuals aged 65 and over, households without access to vehicles (see **Public Engagement, Partnerships, and Collaboration**), and individuals with disabilities in this CT far exceed the statewide averages. Elderly and disabled populations depend on NC 12 for accessing medical care, including the only hospital on

the Outer Banks, while all three identified populations rely on NC 12 for multimodal access to essential services and employment opportunities.

By considering the diverse needs and challenges of these underserved and disadvantaged populations when developing long-term resilient transportation solutions, the Project will promote equitable access, minimize disparate impacts, and contribute to overall community well-being, in line with the Justice40 Initiative.



Pea Island, February 2023

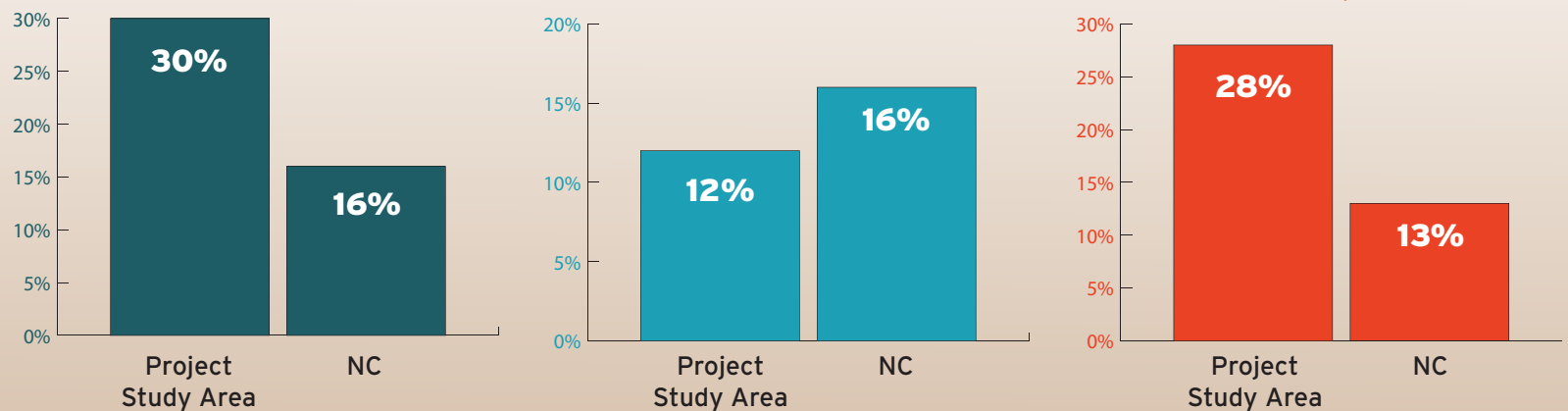
Jenni Koontz of Epic Shutter Photography

NCDOT's TDI Populations for the Project

Age 65 and Older

Zero-Car Households

Disability Prevalence (Adult Population)



Source: [NCDOT's TDI Tool](#)

PROJECT PARTIES



NCDOT

NCDOT will serve as the PROTECT 2023 Discretionary Grant Applicant and Recipient. NCDOT will assume responsibility for administering the grant if selected for award, provide leadership and oversight of project delivery, and ensure robust stakeholder and public participation throughout the Project. Each year, NCDOT manages the receipt and expenditure of over \$1.5 billion per year in Federal-Aid Highway Program funds under Title 23, United States Code (USC). NCDOT understands USDOT's reporting requirements and maintains the records and accounting systems that will allow it to comply with the PROTECT programs reporting and administration requirements.



NATIONAL PARK SERVICE (NPS)

The mission of NPS is to preserve unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. NPS manages the CAHA, through which NC 12 has an easement in the study corridor. NPS will leverage their expertise in managing and preserving natural and cultural resources to support the integration of climate change adaptation, NBS, and ecosystem restoration in the alternatives development process. They will also advise NCDOT on Section 4(f) considerations for the Project as well as considerations for NPS staff and public access to CAHA.



US FISH AND WILDLIFE SERVICE (USFWS)

The mission of the USFWS is to work with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. USFWS manages the PINWR, through which NC 12 has an easement in the study corridor. USFWS will leverage their expertise on wildlife conservation and habitat preservation to assist NCDOT to assess impacts of Project alternatives on endangered species and sensitive ecosystems in the Project area, such as loggerhead sea turtles and submerged aquatic vegetation (SAV). USFWS will also advise NCDOT on preferred NBS and other measures to avoid, minimize, and mitigate adverse impacts on wildlife and their habitats in the PINWR.

NPS and USFWS contributed to the development of this grant application.



PINWR Visitor Center Road Washout, May 5, 2022

II. GRANT FUNDS, SOURCES, + USES OF ALL PROJECT FUNDING

NCDOT is requesting \$1,865,000 (2023\$) in PROTECT Discretionary Grant Program Planning funding to complete a PEL study for an 11-mile section of NC 12. The receipt of PROTECT funds will enable NCDOT to perform robust public and stakeholder engagement, alternatives development and evaluation, and implementation planning to ultimately implement a long-term, resilient transportation solution for NC 12 on the PINWR.

Upon PROTECT grant obligation notice, NCDOT will immediately proceed with the tasks outlined in the SOW. There are no

previously incurred costs for these tasks and activities. NCDOT is requesting 100 percent federal funding through the PROTECT program, pursuant to (23 USC § 176(d)(5)(E) (i)).

Table 1 summarizes the cost for each task as well as funding sources and percentages for how each funding source will share in major Project activities, while Table 2 provides more detailed costs for each task. The Project's cost estimate includes a 15 percent contingency to account for volatility in the labor market.

Table 1. SAND Sources and Uses of Funds (2023\$)

Task	Cost	PROTECT Funds	Other Federal Funds	Non-Federal Funds
Task 1. Project Management	\$100,000	100%	0%	0%
Task 2. Public + Stakeholder Engagement	\$525,000	100%	0%	0%
Task 3. Planning Level + Environmental Considerations	\$600,000	100%	0%	0%
Task 4. Alternatives Development + Conceptual Design	\$440,000	100%	0%	0%
Task 5. Implementation Strategies + Tools	\$100,000	100%	0%	0%
Task 6. Study Development	\$100,000	100%	0%	0%
Total	\$1,865,000	100%	0%	0%

Table 2. SAND Detailed Costs and Budget (2023\$)

Task 1. Project Management	
Task Total	\$100,000
Task 2. Public + Stakeholder Engagement	
Public Involvement Plan (PIP)	\$25,000
Public Meetings	\$400,000
Ongoing + Virtual Engagement	\$100,000
Task Total	\$525,000
Task 3. Planning Level + Environmental Considerations	
Planning Considerations + Environmental Screening	\$100,000
Geotechnical Screening	\$100,000
Hydraulics Review + Preliminary Hydrodynamic Modeling	\$450,000
Task Total	\$650,000
Task 4. Alternatives Development + Conceptual Design	
Alternatives Development	\$250,000
Alternatives Evaluation	\$190,000
Task Total	\$440,000
Task 5. Implementation Strategy + Tools	
Action Plan	\$100,000
Task Total	\$100,000
Task 6. Study Development	
Task Total	\$100,000
PROJECT TOTAL	\$1,865,000



Dune Breach at PINWR Visitor Center After Coastal Storm, November 11, 2021

III. MERIT CRITERIA



PROGRAM ALIGNMENT

SAND is a critically important step to securing the safe and cost-effective long-term operation of NC 12. In completing the proposed PEL study, the Project will bring together a diverse range of stakeholders to build a common framework for decision-making, advance the development of long-term, resilient solutions for this critically important corridor, and address vulnerabilities at projected future breach locations and hot spots. The Project will support the development of a multimodal transportation corridor that will enable residents, tourists, and property owners to access essential services, recreational amenities, and employment opportunities. To accomplish this, SAND will incorporate best available climate data and decision support tools, develop alternatives that incorporate NBS and support the optimal functioning of the Barrier Island ecosystem, and align its efforts with existing plans for the region.

CLIMATE DATA SETS, INFORMATIONAL RESOURCES, + DECISION-SUPPORTING TOOLS

NCDOT will leverage several State and federal climate data sets, information resources, and decision support tools to inform the development and evaluation of long-term, resilient solutions for NC 12. Data will be collected and synthesized during Task 3 (Planning-Level and Environmental Considerations) and will provide a foundation for the development and evaluation of long-term, resilient alternatives in Task 4.

Project ATLAS (Advancing Transportation through Linkages, Automation, and Screening): This web-based platform consolidates statewide spatial data for nearly 600 data layers into a single interface with several Geographic Information System (GIS) tools for screening and mapping environmental features and constraints. NCDOT will use Project ATLAS to help manage the Project and track progress, store key project documents, perform

environmental screening, and document the human and natural affected environment to support the evaluation of alternatives.

Coastal Monitoring Program: As a condition of the 2010 ROD for replacement of the Herbert C. Bonner Bridge (Phase I of STIP project B-2500), NCDOT, in partnership with USFWS, is leading this detailed coastal monitoring program. Its purpose is to monitor habitat and erosion within PINWR, and will inform the planning efforts for future phases of the Project B-2500, which includes SAND. This annual report monitors highway vulnerability between Oregon Inlet and Rodanthe across several parameters, including erosion rate and road vulnerability, distance from ocean to estuarine shoreline, and beach volume above mean high water. The data for this program will inform the Project's assessment of past and existing conditions and roadway vulnerability.

Coastal Roadway Inundation Simulator (CRIS): CRIS simulates predicted roadway inundation from coastal flooding and quantifies the potential effects of inundation up to 17 feet in the web application (data is available up to 35 feet), using NC QL2 LiDAR data. The Project will leverage this tool to visualize the effects of various flooding scenarios to document existing roadway vulnerabilities and inform the development of alternatives.

NOAA's Coastal Flood Exposure Mapper: This tool provides detailed scenarios related to coastal hazards. SAND will use these scenarios to inform the development of design criteria and alignment alternatives.

NASA DEVELOP Study: This partnership with NPS will explore the capabilities of synthetic-aperture radar (SAR) and optical data for delineating shorelines and mapping coastline changes between 2014 and 2024. This study will support future decision-making for SAND, including but not limited to prioritization of investments in mitigation, strategic planning for adaptations including potential relocation of NC 12, dredging projects, and placement of beach nourishment efforts.

Quantifying future precipitation extremes within NC for resilient design (NCDOT Research Project Number 2020-57):

The study is led by NC State University and is planned for completion in 2025. Its objective is to improve confidence in climate change projections by quantifying future precipitation extremes within NC for resilient design (e.g., precipitation intensity, duration, frequency curves), incorporating guidance developed for the National Cooperative Highway Transportation Research Board, NCHRP 15-61. SAND will coordinate with the research team to leverage their preliminary and final findings to inform design criteria and alternatives development regarding predictions for future precipitation extremes and other future precipitation scenarios.

Enhancing Coastal Resilience through Participatory Transformation of Barrier Island:

This study, recommended for funding in summer 2023, is a National Science Foundation Research project in CAHA, with collaboration from NCDOT, North Carolina State University, NPS, Dare County, and Hyde County. The goals of this research are to advance understanding of how local erosion events contribute to floods at neighboring communities, how these floods can be managed by allowing barrier sections to return to nature, and how such a transformation, when informed and deliberated by community stakeholders may affect community attachment and sense of place.

Highways in the Coastal Environment, Third Edition (Hydraulic Engineering Circular No. 25): This FHWA manual presents tools for the planning, design, and operation of highways in the coastal environment. It focuses on roads near the coast that are influenced by coastal tides and waves. Its goal is the integration of coastal engineering principles and practices in the planning and design of these roads and bridges to make them more resilient. SAND will use this resource to ensure its planning and design principles, evaluation criteria, and design standards are aligned with national best practices.

Sea Level Rise Data: SAND's alternatives development and evaluation process will

consider sea level rise scenarios through a planning horizon year of 2100 to ensure the range of reasonable alternatives represent solutions that will secure long-term resilience. To accomplish this, SAND will primarily rely on the [Probabilistic Sea Level Rise Study](#) finalized in 2022 for the US 64 Bridge Replacement between Tyrrell and Dare counties. This study analyzed sea level rise and storm flooding adjacent to the Project study area based on a probabilistic model that illustrates the degree of uncertainty present in sea level change projections. This study will be supplemented with data from [NOAA's 2022 Sea Level Rise Technical Report](#), which found that moderate flooding similar to the events that are shutting down the project corridor today will continue to increase in coastal areas. The Project will also be informed by the [NC Climate Science Report](#) (NCCSR), which examined the impacts of climate change in the Coastal Plain and across the state, as well as sea level rise scenarios and climate data from [NPS' Sea Level Rise Tool](#), [NOAA's Sea Level Rise Viewer](#), [NOAA's Tides & Currents Tool](#), [NASA's Interagency Sea Level Rise Scenario Tool](#), [NC Department of Environmental Quality's \(DEQ's\) Coastal Resources Commission Sea Level Rise Assessment Report](#), and [NC Emergency Management's Sea Level Rise Impact Study \(SLRIS\)](#).

NCDOT will work closely with the Steering Committee to synthesize data from these tools and develop assumptions that will inform the development of design criteria (e.g., bridge heights that meet or exceed sea level rise predictions for 2100) and ensure the advancement of reasonable alternatives for subsequent evaluation through the NEPA process.

By leveraging the best available federal and state climate data and decision support tools, NCDOT will develop design criteria and eliminate alternatives that do not secure the long-term resilience of NC 12 from further consideration. By leveraging these resources, NCDOT will develop solutions for NC 12 that adapt to climate change to protect life safety, natural resources, and the economy.

EXISTING PLANS

In addition to leveraging the data tools and resources described in the previous section, NCDOT will coordinate and align SAND with existing plans and previous environmental analyses, including:

- Documentation and Analysis for Phases I, IIa, and IIb of STIP Project B-2500;
- NC 12 Task Force Final Report;
- Outer Banks Hazard Mitigation Plan;
- Dare County CTP (2015);
- Albemarle RISE Vulnerability Assessment;
- NCDOT Climate Strategy Report;
- PINWR Comprehensive Conservation Plan; and
- CAHA Sediment Management Framework Final Environmental Impact Statement.

During Tasks 3 and 4, NCDOT will work collaboratively with its Project partners and stakeholders to identify relevant guidance and information that will drive the subsequent development and evaluation of alternatives. Where conflicts between these existing plans and the needs of SAND exist, NCDOT will collaborate with the relevant agencies to identify the needed resolution.

METHODS FOR DEVELOPING RESILIENT + NATURE-BASED SOLUTIONS (NBS)

The foundation of NCDOT's approach to SAND is to develop alternatives that demonstrate long-term resilience and adaptation to climate change. The persistent challenges of rising sea levels and increasingly severe and frequent coastal storms highlight the importance of developing resilient solutions that include appropriate and feasible NBS that protect future NC 12 from the damaging effects of flooding, runoff, wave action, and wind and maximize the natural functioning of the barrier island ecosystem. The Project will use the following method for developing resilience solutions and incorporating NBS:

By setting the planning horizon for 2100, NCDOT will ensure the planning and conceptual design process intentionally considers future climate and environmental conditions to address both current and future risks and vulnerabilities.

- 1 Develop design criteria in consideration of current best practices and future climate conditions through planning horizon year 2100, including sea level rise, precipitation, and the increasing intensity of coastal storms.
- 2 Develop reasonable alternatives based on these design criteria and incorporate NBS following the matrix provided in the **Innovation** section to guide the selection of appropriate strategies.
- 3 Evaluate Alternatives (see Table 3) and identify avoidance, minimization, and mitigation measures.
- 4 Develop Implementation recommendations that synthesize information on short-, medium-, and long-term climate and environmental conditions to inform next steps, phasing scenarios, organization framework for implementation, and potential funding opportunities.

For a more detailed discussion of how the Project considers NBS, please refer to the **Innovation** Section.



Living Shoreline with Oyster Sill on Jones Island, NC

Table 3. SAND Alternative Evaluation Factors

Factors	Components
Cost	Environmental impact mitigation
	Construction
	Operations and maintenance
Constructability	Geotechnical assessment of bridge feasibility
	Shallow vs deep water construction considerations
	Laydown areas
	Necessary construction techniques (e.g., jetting, drill piers etc.)
Operations + Maintenance	Ease of roadway maintenance
	NCDOT ability to operate roadway during coastal storms
Resilience	Sand and ocean overwash
	Potential breach locations
	Erosion
	Sea level rise
Natural Environmental Impacts	ATLAS screening results
	SAV impacts and mitigation
	Essential fish habitat
	Threatened and endangered species and habitat assessments
	Facilitates natural dune processes
Nature-Based Solutions (NBS)	Potential for ecosystem restoration
	Integration of oyster reefs and/or living shorelines
	Integration of stormwater management
Utilities	Fiberoptic lines
	Electrical transmission lines
Section 106 + 4(f), access to recreational amenities	Public and staff access to PINWR facilities and amenities - potential changes to Visitor Center location, protection of impoundments if road relocated.
	Determination of refuge compatibility (required under the 1997 National Wildlife Refuge System Improvement Act)
	Public and staff access to CAHA
	Public access to Bonner Bridge Fishing Pier
	Coast Guard Lifesaving Station
Bike + Pedestrian Access	Visual impacts to 4(f) and Section 106 properties
	Thru bicycle and pedestrian connections between Nags Head and Rodanthe
	Multimodal Improvements at tie-in locations

Note: The weighting of these factors will be determined based on public and stakeholder input.



SCHEDULE + BUDGET

The estimated cost to conduct a PEL study for the 11-mile Project corridor is \$1,865,000. NCDOT is requesting that 100 percent of the

Project be funded with PROTECT program funds. **Section II. Grant Funds, Sources and Uses of all Project Funding** provides a detailed description of the Project budget and funding source breakdown.

Upon receipt of the fully executed agreement for PROTECT grant funds, NCDOT will

immediately initiate the tasks detailed in the SOW (see **Supplemental Materials**). Community engagement will occur throughout project development and delivery, as NCDOT and the Project’s partners are committed to identifying long-term, resilient, and equitable transportation solutions that are responsive to the community’s needs and input.

NCDOT anticipates PROTECT funding will be obligated prior to September 1, 2024, and the Project will be completed by the end of calendar year 2026.

	2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	★		★									
Task 1. Project Management												
Project Kick-off Meeting												
Bi-Weekly Coordination Meetings												
Task 2. Public + Stakeholder Engagement												
Public Involvement Plan												
Agency Coordination												
Steering Committee Meetings												
Meeting Sets 1, 2, + 3												
Small Group Meetings												
Virtual Public Engagement (Survey)												
Project Communications via Media Outlets												
Webinars												
Task 3. Planning-Level + Environmental Considerations												
Planning Level + Environmental Considerations												
Geotechnical Review												
Hydraulics Review + Modeling												
Task 4. Alternatives Development + Conceptual Design												
Alternatives Development												
Alternatives Evaluation												
Task 5. Implementation Strategies + Tools												
Action Plan												
Task 6. Study Development												
Planning + Environmental Linkages Report												

Note(s): 1. Awards Announced / 2. Grant Agreement Executed

★ PROTECT Grant Milestones



PUBLIC ENGAGEMENT, PARTNERSHIPS, + COLLABORATION

Throughout the Project, NCDOT will proactively and meaningfully engage a diverse range of partners, stakeholders, and the public, fostering their participation in the development of solutions for the long-term resilience of NC 12. The Project's engagement process incorporates specific strategies and actions that have been designed to engage residents of Hatteras and Bodie Islands, property owners, and tourists to build grassroots support and involvement. NCDOT will also engage the academic community by coordinating efforts with the research projects described in the **Program Alignment** section, as well as through its Steering Committee and small group stakeholder engagement activities, to leverage expertise in coastal resilience and sustainability, including representatives of North Carolina State University, University of North Carolina's Coastal Resilience Center, East Carolina University's Coastal Studies Institute, and Duke University's Institute for Energy, Environment, and Sustainability. Lastly, the involvement of local environmental advocacy and community groups, and state and federal agencies will be instrumental in the decision-making process during subsequent environmental review and permitting. SAND's inclusive approach to public engagement, partnership, and collaboration provides opportunities for public input to ensure the perspectives of all participants, particularly those from disadvantaged communities, are considered throughout the Project. Refer to the SOW included in the **Supplemental Materials** for additional details on the Project's public engagement approach.

PUBLIC INVOLVEMENT PLAN

Upon execution of the grant agreement, one of the first activities NCDOT will undertake is to document and formalize the Project's engagement approach and activities described below in a detailed Public Involvement Plan (PIP). The PIP will outline specific activities, timelines, materials, and responsible parties essential for executing the Project's engagement strategies and

include detailed demographic data on the Project's Demographic Study Area (DSA), which includes Hatteras and Bodie Islands, to allow NCDOT to tailor the activities to the needs of its underserved and disadvantaged communities. By developing and following the PIP, NCDOT will help create a well-informed, involved public that is empowered to provide input throughout the course of the Project. The PIP will align with North Carolina's [Statewide Public Involvement Plan](#) and nationwide best practices to meaningfully include local residents, property owners, business owners, and visitors and actively engage a broad range of stakeholders including community-based organizations, federal, state, and local agencies, and environmental advocacy groups.

AGENCY COORDINATION

NCDOT will collaborate with a range of state, federal, and local agencies to deliver SAND through NCDOT's Section 404/NEPA Merger process and the activities of the Steering Committee.

- **Steering Committee:** NCDOT will convene a Steering Committee consisting of Project partners and primary stakeholders and agencies with expertise and decision-making roles in the planning, environmental, and permitting process to provide guidance and technical assistance. SAND's Steering Committee will consist of representatives from NCDOT, NPS, USFWS, NC DEQ, Albemarle Rural Planning Organization (RPO), Dare County, North Carolina Coastal Federation, the Southern Environmental Law Center, and the academic community, among others. This committee will regularly convene in both in-person and virtual meetings throughout the Project to ensure SAND benefits from the expertise and resources of these groups to guide the Project from start to finish. This collaborative approach will build consensus around the reasonable range of alternatives, including the preferred alternative, and ensure permitting requirements are considered early in the planning process. Several of these agencies were consulted to develop the scope and approach for the Project.

- **Merger Process:** Prior to concluding Task 3, NCDOT will complete all required activities and coordination to complete CP1 of the Merger Process. NCDOT will subsequently compile information to developed during Tasks 3 and 4 to support the future completion of CP2A (see **Innovation** section for more information).

PUBLIC MEETINGS

NCDOT will hold three in-person public meeting sets and a series of small group meetings to inform the public and stakeholders about the Project and solicit feedback. Each meeting set will include activities in multiple locations (Nags Head/Manteo, Rodanthe, and Frisco/Buxton) to ensure effective dissemination of information and collection of input and feedback.

PUBLIC ENGAGEMENT TOOLS

PLANNING + ENVIRONMENTAL REVIEW

- » PIP
- » Steering Committee
- » Meeting Set 1 + Webinar
- » Survey

ALTERNATIVE DESIGN + EVALUATION

- » Steering Committee
- » Meeting Set 2
- » Webinar
- » Small Group Meetings

PEL STUDY REPORT

- » Steering Committee
- » Meeting Set 3
- » Webinar



- **Meeting Set 1. Project Kick-off Interactive Workshop:** This meeting set will introduce the Project, provide a summary of work performed in the study area to date, including alternatives identified during previous studies, and review environmental conditions. NCDOT will solicit input on general concerns, elements not captured in previous studies, including potential alternatives, the Purpose and Need statement, vision and goals, and access considerations for NC 12.
- **Meeting Set 2. Alternatives Interactive Workshop:** This meeting set will present the Project's Purpose and Need statement, preliminary alternatives, including a summary of opportunities and constraints, and a summary of findings from the previous public meeting set. NCDOT will solicit input on evaluation criteria for the Project alternatives, including priority and weighting for the evaluation criteria.
- **Meeting Set 3. Open House:** This meeting set will be held toward the end of the Project and will provide an overview of the alternative evaluation results, present the preliminary range of reasonable alternatives, highlight potential mitigation measures and NBS, and provide next steps for the Project. NCDOT will solicit input on whether the reasonable range of alternatives meets the Project's Purpose and Need for the Project and whether they reflect the articulated goals and vision for the corridor.
- **Small Group Meetings:** NCDOT will hold three to five small group engagement activities to facilitate information sharing and input from special interest and community groups and allow stakeholders to informally discuss the Project and have their perspectives shared and documented. The small group meetings will encourage an even greater range of stakeholder inclusion to bolster the ongoing efforts of the diverse Steering Committee. NCDOT anticipates that local business owners, local nonprofit organizations, homeowner's associations, and advocacy groups will play a key role in these meetings.

ONGOING + VIRTUAL ENGAGEMENT

In addition to these discrete activities, NCDOT will use a range of traditional, innovative, and virtual engagement techniques to share Project information and collect feedback. This comprehensive approach will help NCDOT reach a wider audience and ensure inclusivity in the Project's decision-making process. These ongoing and virtual methods include:

- **Project Webpage + Materials:** NCDOT will host a website and develop content to share on this platform, including Project contact information, updates, schedule, maps, and links to documents and information resources as they are developed. NCDOT will also develop videos and/or podcasts, which will be posted to the website. It will be updated on an as-needed basis throughout the process and will allow individuals to sign-up to receive Project updates.
- **Online Engagement Platform:** NCDOT will use PublicInput.com to proactively engage and share information with the public by providing easy access to Project information, enabling citizens to actively participate and share their comments through the user-friendly interface. This platform will complement the in-person and virtual Project activities and will be used to deploy an interactive map to gather geographic-based input and a community survey to gather other input. This platform will provide opportunities for residents with mobility limitations, property owners, and visitors who may be unable to attend in-person events to participate in the Project.
- **Media Outlets:** NCDOT will use media outlets such as advertisements and notices in newspapers, radio announcements, and television news to communicate Project information. NCDOT will partner with Dare County's Public Information Office to send out local press releases and upload messaging to social media outlets regarding Project milestones and other updates.

- **Webinars:** NCDOT will conduct three webinars approximately two weeks after each public meeting set. These interactive, virtual meetings sessions will provide additional opportunities for active engagement, Q&A, and the sharing of diverse perspectives. To ensure accessibility, meeting recordings will be available on the Project webpage, allowing those who could not attend live to view them at their convenience.

Through this comprehensive engagement approach, as well as accompanying strategies and actions, the Project will build trust, promote transparency, and create a shared vision for NC 12 that considers the needs and aspirations of all stakeholders, partners, and agencies involved.

SAND ensures the meaningful participation of disadvantaged populations on Hatteras and Bodie Islands who face disproportionate impacts from the natural disasters and climate-related risks by disseminating information through multiple **media outlets** and platforms, soliciting **feedback** through both **virtual** and **in-person** events, and ensuring meeting locations and materials are **accessible** to persons with limited mobility, disabilities, and Limited English Proficiency (LEP).



NC 12 Task Force Meeting, July 2021



INNOVATION

SAND leverages innovative methods to establish a comprehensive decision-making framework for the development of resilient, long-term solutions for NC 12. By integrating evidence-based science and leveraging expert knowledge, the Project ensures that decision-making is grounded in reliable climate data and industry best practices. SAND will make significant progress towards establishing an accessible, connected, and resilient NC 12 corridor that effectively balances the diverse needs and priorities of Project partners, stakeholders, and the public at-large.

PARTNERSHIPS

SAND will foster strategic partnerships and collaboration with various groups and organizations to harness their technical expertise, particularly for NBS and natural resource management.

- **NBS:** The Project's Steering Committee and small group stakeholder meetings (see **Public Engagement, Partnerships, and Collaboration**) will provide technical assistance and guidance on the incorporation of NBS during the alternatives development and evaluation process. By engaging groups like the North Carolina Coastal Federation, NC DEQ, environmental groups and academics, NCDOT will identify appropriate and feasible solutions, grounded in best practices, that will contribute to the long-term resilience of the corridor.
- **Natural Resource Management Agencies:** NCDOT is partnering with NPS and USFWS to deliver the Project (see **Project Parties** for information).

The Project's approach to partnerships and collaboration will ensure the participation of technical experts in climate change adaptation and NBS. These collaborations will support the development and evaluation of alternatives that demonstrate long-term resilience to climate change and address current and future vulnerabilities. For a more detailed discussion of the Project's

partnerships refer to **Public Engagement, Partnerships, and Collaboration**.

NATURE-BASED SOLUTIONS (NBS)

SAND will integrate NBS into the alternatives development process to increase the future resiliency and sustainability of the Project corridor. By incorporating appropriate and feasible NBS into conceptual alternatives, the Project will avoid, minimize, and mitigate adverse environmental impacts and support the creation of a transportation corridor that is more resilient the effects of rainfall, runoff, wave action, and wind.

The Project corridor traverses PINWR, which has a nationally-significant coastal ecosystem that is adapted to the harsh coastal environment, protects inland areas from the energy of waves, provides habitats for migratory waterfowl and a host of threatened and endangered species, and filters water and air pollutants, among other ecological functions ([Nature-Based Solutions for Coastal Highway Resilience | FHWA \(dot.gov\)](#)). Where appropriate and feasible, the Project will integrate multifunctional NBS to enhance these ecosystem services, provide environmental benefits, and promote the resiliency of the Project corridor. These NBS include active measures, such as the construction of oyster reefs or living shorelines to create new habitat opportunities while providing protection from shoreline erosion. They also include infiltration practices such as filter strips or infiltration basins to reduce runoff volumes and remove pollutants from roadway runoff before it reaches adjacent surface waters.

Alignment alternatives that bridge through the Pamlico Sound will serve as NBS in themselves, as this approach to creating a more resilient Project corridor will generate new opportunities to return the ecosystem to its natural state as it removes the need for NCDOT and its partners to perform beach nourishment, dune repair, and emergency and routine maintenance. By allowing the natural processes shaping this barrier island to take over, this innovative approach to NBS will benefit the overall resiliency and ecological value of the Project corridor.

The Pamlico Sound's tidal salt waters are suitable for commercial and recreational shell fishing, and High-Quality Waters (HQW) with exceptional biological and physical characteristics. The Project will strive to protect the integrity of these sensitive ecosystems and develop alternatives that implement NBS and other best practices to avoid, minimize, and mitigate impacts to both aquatic and terrestrial habitats. The Project's successful protection of these ecosystems may result in economic benefits to the region, particularly regarding oyster reef restoration. According to the [*Albemarle-Pamlico National Estuary Partnership*](#), every dollar invested into oyster habitat restoration returns over \$4 to North Carolina's economy

through seafood sales, job creation, and tourism value.

When determining appropriate and feasible NBS to incorporate into Project alternatives, NCDOT will weigh factors such as long-term resiliency in a changing climate, construction feasibility, quantifiable environmental benefits, and public input. To aid the decision-making process, NCDOT developed a matrix to assess the environmental risks and benefits associated with potential NBS. This matrix will guide the selection of appropriate strategies and interventions to ensure the Project alternatives create a more resilient transportation system in the Outer Banks.



Shoreline Restoration Project with Salt Marsh Plugs and Oyster Shell in Bogue Sound

LEGEND

- Direct Benefit
- ◐ Indirect Benefit
- Minimal Benefit

		NATURE-BASED STORMWATER STRATEGIES				INFRASTRUCTURE DESIGN CRITERIA		
		Floating Wetlands + Salt Marshes	Dune Restoration	Oyster Reefs	Living Shorelines	Roadway Design + Alignment	Drainage Design	Pavement Design
CONTROL POLLUTION FROM ROADWAY	Water Quality	●	○	◐	◐	○	○	●
	Water Quantity (Flooding)	●	○	○	○	○	◐	○
	Habitat Protection/Creation	●	●	●	●	●	◐	○
	Hazardous Spill Containment	○	○	○	○	◐	◐	○
	Runoff Temperature Reduction	●	○	○	○	○	◐	◐
	Energy Dissipation at Outfalls	●	◐	●	●	○	●	○
	Reduce Heat Island Effect	○	○	○	○	○	○	●
	Erosion + Sedimentation Control	○	○	○	●	○	●	○
PROTECT ROADWAY FROM CLIMATE	Erosion + Washout	○	●	●	●	●	○	○
	Sand Overwash	○	●	●	●	●	○	○
	Roadway Flooding	○	●	●	●	●	◐	○
	Sea Level Rise	●	●	◐	◐	●	●	○
	Temperature Change	○	○	○	○	○	○	◐
	Wave Action	○	●	●	●	●	○	○
	Risk to Buried Utilities	○	○	○	○	●	◐	○
	Rainfall Pattern Change	○	○	○	○	○	●	◐
VALUE ADDED	Access to Nature	◐	●	◐	●	●	○	○
	Ecosystem Rehabilitation	◐	●	●	●	●	○	○

SAND will use this matrix to guide the selection of appropriate NBS strategies and interventions through the alternatives development process.

TECHNIQUES

NCDOT has developed innovative project delivery techniques and processes that it will leverage to accelerate the delivery of SAND. NCDOT will work with its Project partners and stakeholders to accomplish portions of the Merger Process and PDN to complete critical steps in the PEL process that will streamline future environmental review and permitting efforts.

Merger Process

NCDOT will use its Merger Process to achieve regulatory concurrence on the Project's Purpose and Need. This process, which tailored the Federal Merger Process to North Carolina, provides a shared decision-making and consensus-building approach to streamline project development and permitting by "merging" the NEPA and Clean Water Act (CWA) permitting process. NCDOT will work collaboratively with relevant state and federal regulatory and review agencies to complete CP1, Purpose and Need of the Study Defined, and will compile information developed during Tasks 3 and 4 to support the future completion of CP2A, the focus of which is the identification of bridge locations and approximate lengths and a review of the preliminary alignment for each alternative.

NCDOT maintains a dedicated [webpage](#) that houses comprehensive information and tools to learn more about the Merger Process. NCDOT's Merger Process is a best practice in project delivery that could be replicated by DOTs across the country aiming to promote agency collaboration and streamline project development.

Project Delivery Network (PDN)

NCDOT's [PDN](#) is a scalable and flexible approach to deliver and manage transportation projects with transparent, repeatable, and accountable processes that are more effective and efficient and meet state and federal mandates to streamline the NEPA process. The Project will complete key elements of Stage 1, Project Initiation, and make substantial progress through Stage 2, Alignment Defined (see the SOW in **Supplemental Materials** for a complete list of activities SAND proposes



Rodanthe "Jug Handle" Bridge

to complete). Like the Merger Process, the PDN incorporates best practices that other agencies around the country can replicate:

- Maintain consistency by following a logical progression of activities across the project initiation, environmental, and design phases.
- Streamline processes and procedures throughout the entire project development process.
- Foster multidisciplinary collaboration.
- Implement a systematic quality control and quality assurance process.
- Define essential project deliverables and activities to establish a project schedule that Project Managers and their teams can use to advance project delivery.

The Project's coordinated and collaborative approach, supported by the Merger Process and PDN, sets a valuable example for other agencies to optimize project delivery and build consensus.

V. FHWA PRIORITY CONSIDERATIONS

PUBLIC ENGAGEMENT, PARTNERSHIPS, + COLLABORATION BENEFITS

The Project demonstrates exceptional benefits in Public Engagement, Partnerships, and Collaboration by taking a comprehensive and inclusive approach to engaging residents of Hatteras and Bodie Islands, property owners, tourists, environmental advocacy and community groups, as well as local, state, and federal agencies to create a shared vision for NC 12 that considers the needs and aspirations of all participants to foster support and develop consensus that will improve subsequent design, environmental review, and permitting efforts. Several key elements contribute to these exceptional benefits:

- **Diverse Stakeholder Engagement:**

The Project actively involves a wide range of partners, stakeholders, and the general public, ensuring their meaningful participation in establishing a vision and goals for the corridor, developing alternatives that are responsive to local priorities and long-term climate conditions, and leveraging input to inform the alternatives evaluation process. This inclusive approach seeks to gather diverse perspectives, allowing the Project to benefit from a holistic and community-driven approach to decision-making.

- **Inclusion of Disadvantaged**

Communities: The villages on Hatteras Island that depend on the Project corridor to access essential services and employment opportunities are socially and economically disadvantaged. SAND's public engagement approach will ensure their meaningful participation by holding meetings at accessible locations and times, incorporating a range of activities for public education, information dissemination, and gathering input including virtual engagement activities and small group meetings, and accommodating persons with LEP, mobility limitations, or disabilities to ensure they have an equitable voice in the transportation decision-making process.

- **Partnerships and Collaboration:** SAND leverages the power of partnerships and collaboration to build consensus, obtain technical assistance and expert guidance, and develop innovative and feasible solutions to the vulnerabilities facing the Project corridor. By leveraging the expertise and resources of Project partners and stakeholders through the Merger Process, Steering Committee, and small group meetings, SAND will ensure a comprehensive and integrated approach to resiliency planning.
- **Thoughtful Engagement Activities:** NCDOT thoughtfully crafted each engagement activity to collect public and stakeholder input, which will provide clarity and focus to inform subsequent steps of the Project. This targeted approach enables meaningful participation and builds trust.

SAND will employ specific strategies to actively involve diverse stakeholders, prioritize disadvantaged communities, foster partnerships, and form consensus to support the development of a resilient and equitable transportation system.



Closure and Emergency Repair of NC 12, September 22, 2020

NEED FOR FUNDING

Funding has been a long-standing barrier to improving the resilience of the Project corridor. NCDOT's preliminary estimates to complete planning, design, and construction for this corridor surpass \$1 billion, and no additional funding has been secured to support these activities. While the provision of PROTECT formula funding is an important step in securing the resilience of North Carolina's transportation infrastructure, SAND's funding needs exceed the amount provided under the PROTECT Formula Program, which caps preconstruction and design activities at 10 percent. Moreover, using PROTECT formula funding to address the critical need for this Project would conflict with NCDOT's commitment to distribute PROTECT formula funding equitably across North Carolina to meet the state's varied resiliency needs.

But for the award of a PROTECT Discretionary Grant Program Planning Grant, NCDOT would not be able to continue the work of NC 12 Task Force and advance the next phase of STIP project B-2500. Securing the PROTECT funding will enable NCDOT to accomplish several important

goals and milestones that together lay a solid foundation for subsequent project development and construction for a resilient, long-term solution to the climate-related challenges facing the Project corridor:

- Complete all necessary PDN steps in Stage 1, Project Initiation, and make substantial progress on Stage 2, Alignment Defined (see **Innovation** section).
- Frontload essential elements of the NEPA process, including the Purpose and Need statement, alternatives development, affected environment, and environmental consequences.
- Develop consensus around Project vision, goals, and the range of reasonable alternatives (including a preferred alternative).
- Develop more accurate and precise cost estimates.

By supporting SAND with PROTECT funding, USDOT will support a more sustainable and resilient future, ensuring the continued growth and prosperity of the region while addressing critical climate-related challenges facing with NC 12.



NC 12 Flooding at the Canal Zone Hot Spot after November 11, 2021, Coastal Storm

**PROTECT FFY 2022 and 2023
GRANT APPLICATION
AUGUST 2023**

SAND

Solving Access for NC 12 in Dare County



N.C. Department of Transportation

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