NORTH CAROLINA
Department of Transportation

Coastal Resources Commission

Solving Access for NC 12 in Dare County (SAND) Plan

Rodanthe to Oregon Inlet, Dare County

Project No. HO-0020

October 28, 2026

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina



Presentation Plan

- Orientation & Area History
- PEL Grant (SAND) & Progress to date
- Next Steps for SAND
- September Nor-easter Update
- Discussion

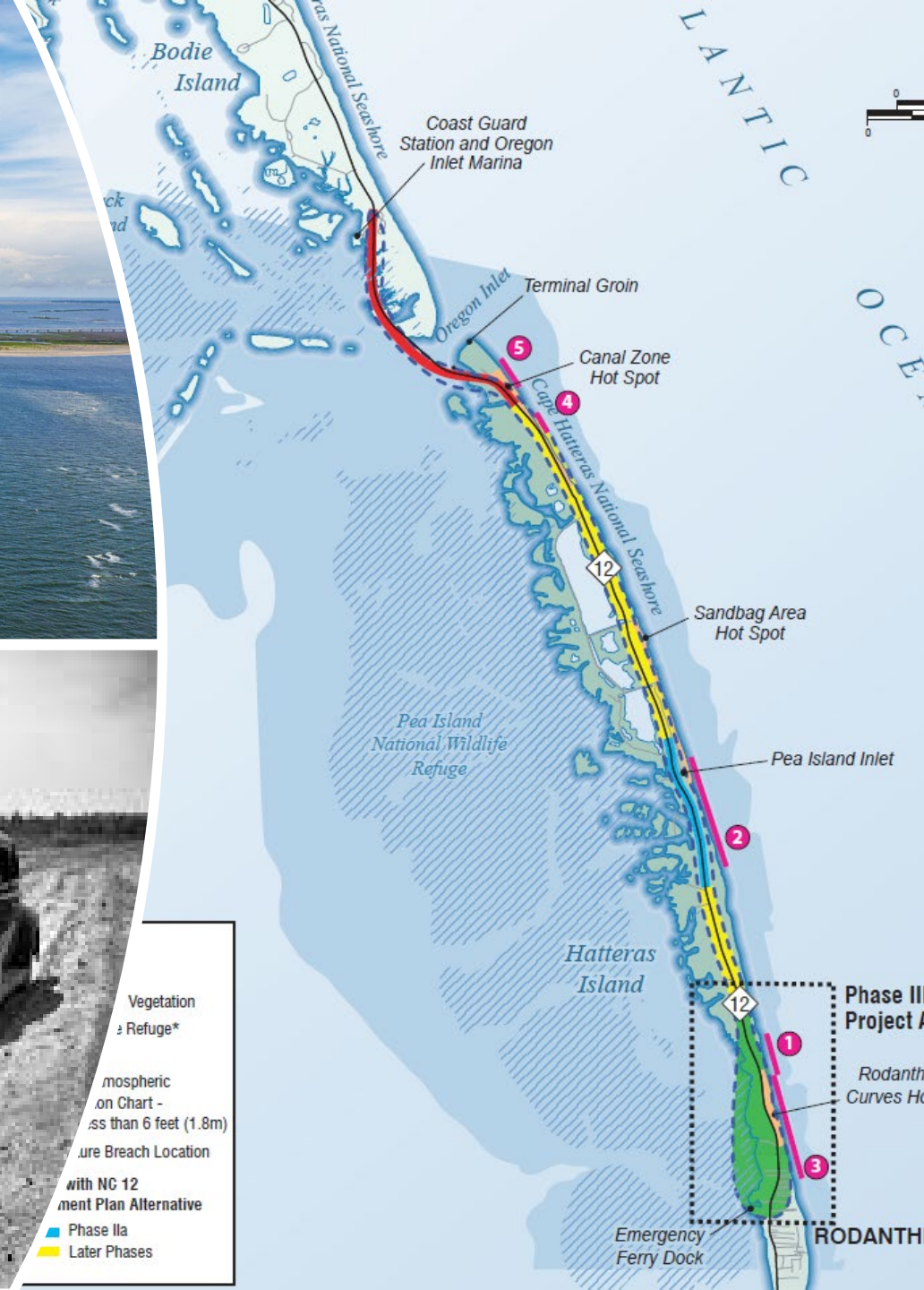


History: NC 12 PEL Study Area

- Focus on 11 miles
- Oregon Inlet to Rodanthe Bridge
- Hurricane in 1846 Created Oregon Inlet
- Sand Road until paved in the 1950s and 60s
- Bonner Bridge opened in 1963, connecting the island

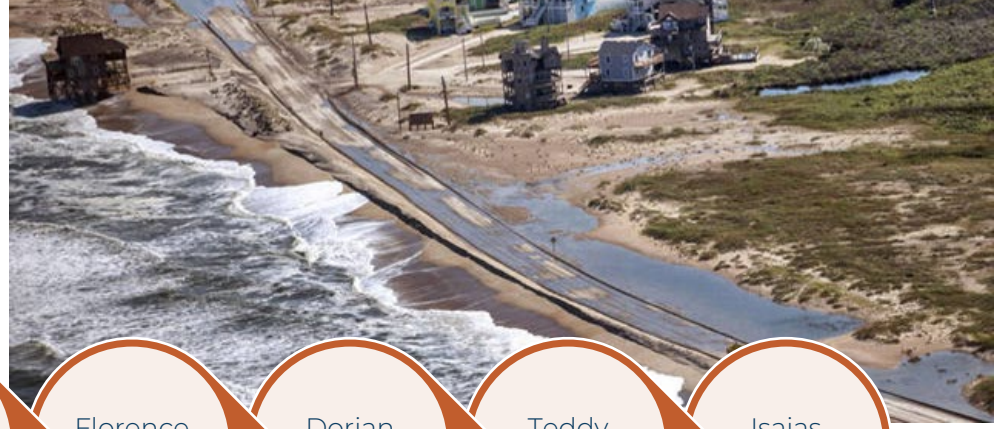






Last 25 years of Storms & Impact on NC 12





Floyd (1999)
- Cat 2, $300B damage statewide, NC 12 closed, dune destruction

Isabel (2003)
- Cat 2, 8-10' overwash covering NC 12, extensive dune damage

Nor'Ida (2009)
- Ida remnant, PI overwash
- Dune loss, pavement damage at S-curves.
- Half mile NC 12 relocated west (2,000' w/i existing easement)

Irene (2011)
- Cat 1, Severed NC 12, new inlets on PI at New Inlet and S-curves.
- Road closed 1.5 months, significant property loss

Sandy (2012)
- Cat 1, NC12 closed from Bonner Bridge to Rodanthe, no comms.
- Dune & pavement loss at S-curves

Arthur (2014)
- Cat 2, temp NC12 shut down from sound side flooding, Whalebone Jct to Buxton

Matthew (2016)
- Cat 1, Hazardous travel, immense flooding, property loss

Florence (2018)
- Cat 3, Set rainfall records, NC 12 impassable, destroyed dunes

Dorian (2019)
- Cat 2, closed NC 12 on Ocracoke, power outages, trapped residents, closed ferries & visitor centers

Teddy (2020)
- Offshore Cat 4, closed NC 12 and Basnight bridge for days, severe beach erosion, dune breaches.

Isaias (2020)
- Cat 1, wind gusts, power outages and flooding



Helene (2024)
- Tropical Storm, storm surges, flooding, and damage to NC 12 on Ocracoke.

Erin (2025)
- Offshore Cat 2, Erosion, storm surge and overwash, NC 12 closures, lengthy Ocracoke reopenings

Imelda & Humber-to (2025)
- Offshore, closed sections of NC 12 on Ocracoke, erosion, 6 homes collapsed in Buxton

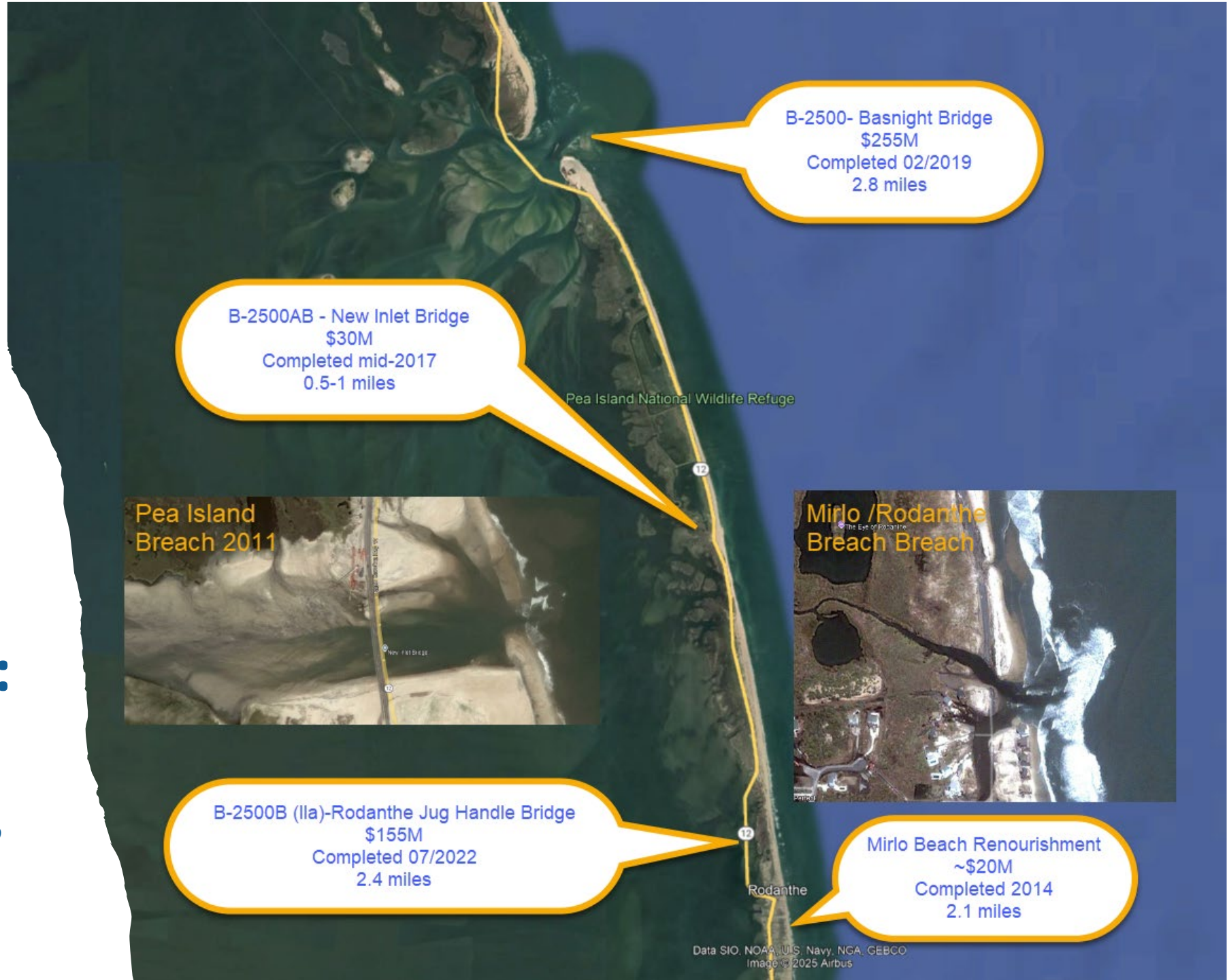
Nor'east-er/Coast-al Storm (2025)
- Massive dune loss and flooding, road closures on Pea Island, home collapses in Buxton.

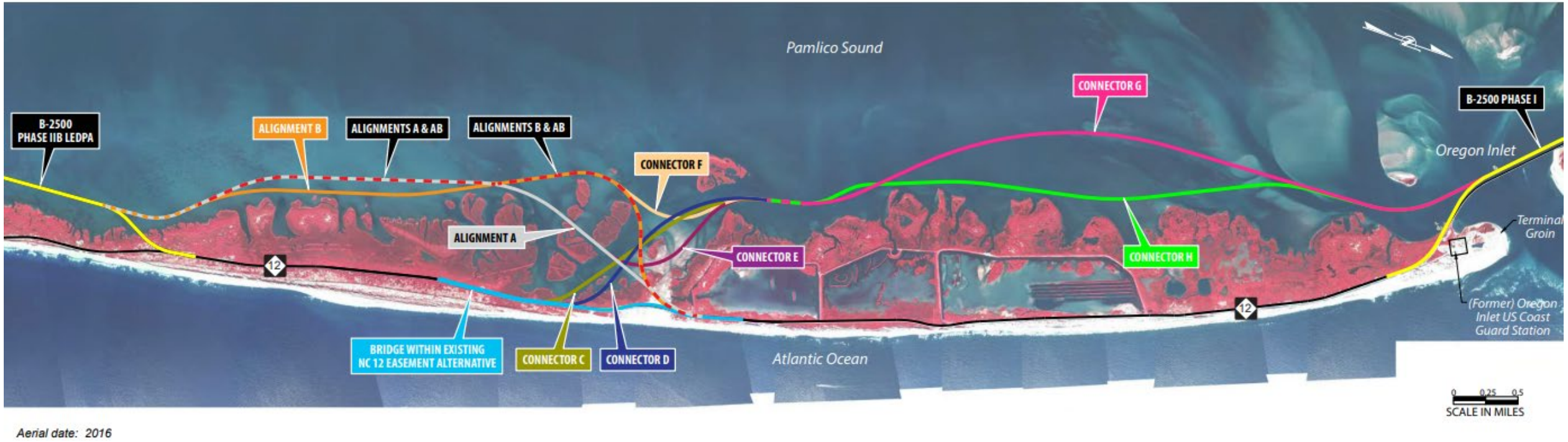
Nor'easter (Sept. 2026)
- 1,000-ft of NC 12 destroyed
- Persistent inundation in Canal Zone
- PINWR Visitors Center parking lot damaged



Recent DOT Project History: PEL Study Area

Last 10 years of road work to manage island erosion





Aerial date: 2016

Building Blocks for PEL: Previous Planning Efforts

Basnight Bridge:

2010 EA & ROD

B-2500

"Parallel Bridge Corridor with NC 12 Transportation Management Plan"

New Inlet Bridge & Beach Renourishment:

2013 Environmental Assessment & ROD (Phase IIa, B-2500A)

"*Bridge within Existing Easement Alternative*"

2015 Settlement

Phase I and Phase IIb will be planned, designed, and contracted so as not to preclude the addition of a later extension into the Pamlico Sound to the south or to the north.

Rodanthe/ Jughandle Bridge:

2016 Revised EA & ROD (Phase IIb, B-2500B)

"*Bridge on New Location Alternative*"

Other relevant studies

Coastal Monitoring Studies 2011-2024

2017 Phase IIa (B-2500A) Alternative Study Report

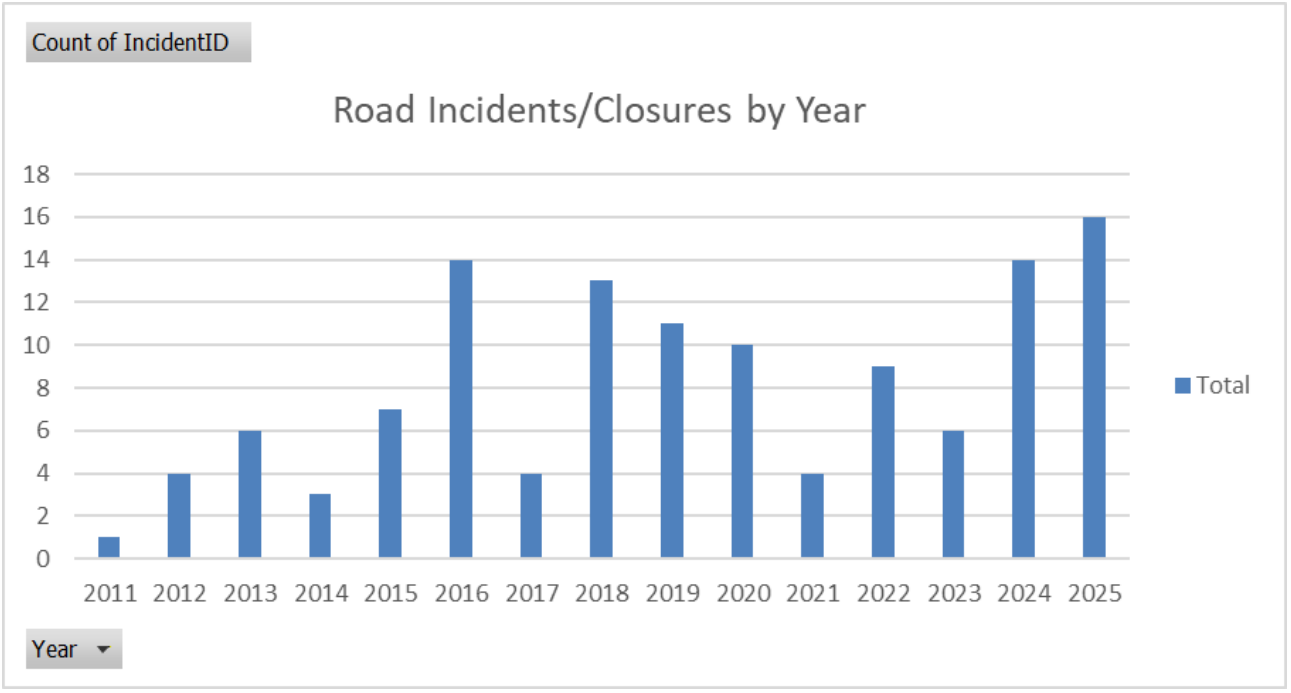
2023 NC 12 Task Force Final Report – Identifying Pea Island / Canal Zones as most vulnerable.



Division Maintenance:

$72 M over last 15 years





Economic Impacts

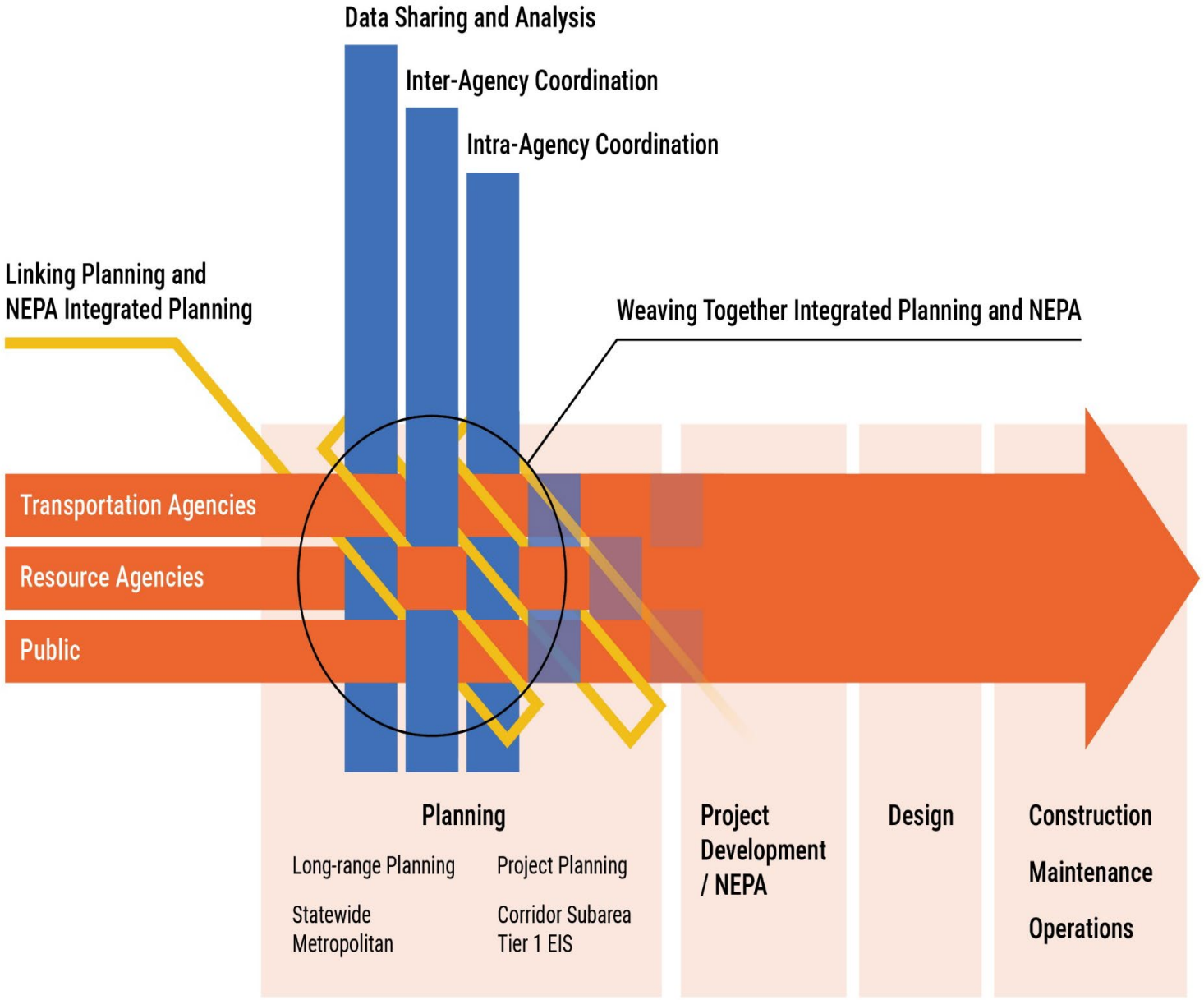
Annual tourism revenues
$2B Dare
$61M Hyde

Goods and services

Emergency and community needs

What is PEL and what are the Benefits?

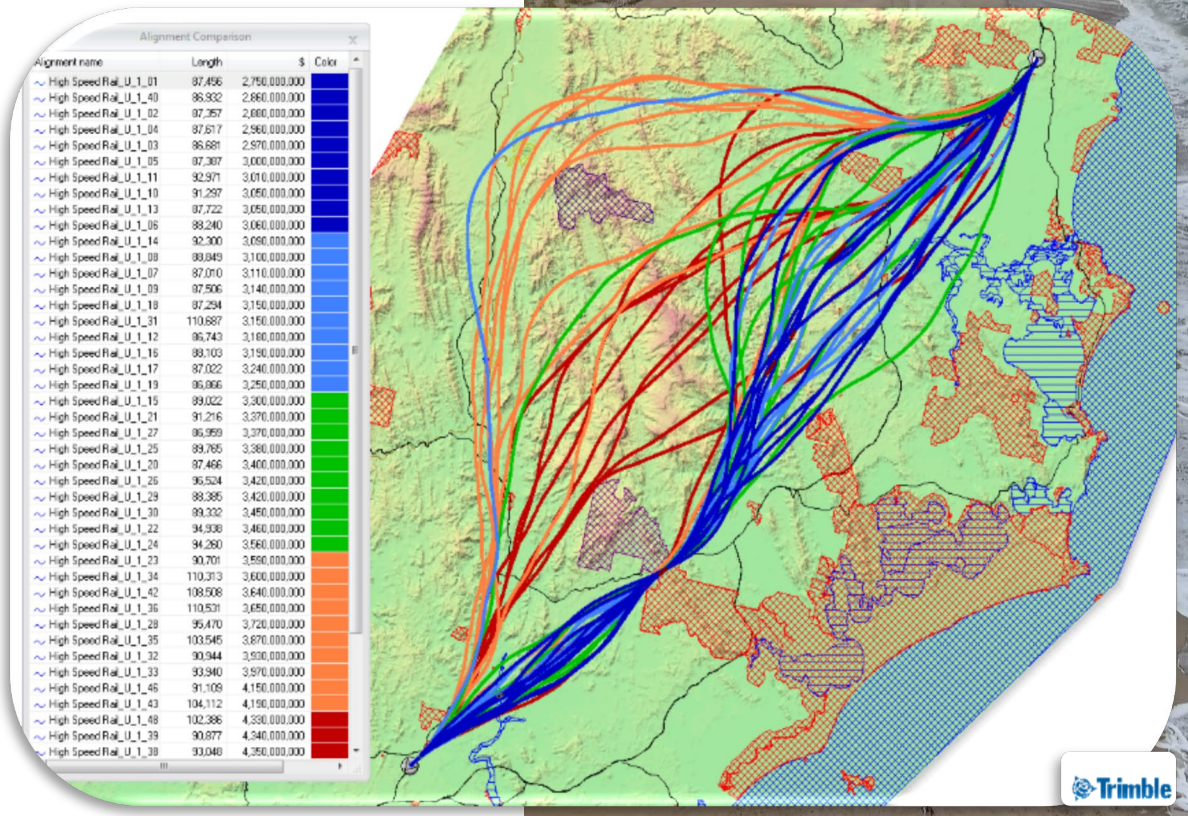
- Authorized under several federal legal pathways
- Early coordination & alternative analysis
- Jump start for selection and construction of a viable alternative



Source: FHWA.

Elements of the PEL SAND Plan

- Robust public and resource agency involvement
  - 3-part screening process to evaluate solutions
  - Build consensus
- Use of existing data and new technology
  - Academic monitoring data from 30+ years
  - Hydrodynamic modeling of likely storm scenarios & impact
  - Quantm™ alignment optimization software



Team Structure

Leadership	Core Team	Project Team	Stakeholder Groups	Technical SMEs	Academia
Role: Provide overall strategic guidance, policy direction, facilitate alignment for the PEL process; and help resolve issues requiring executive-level coordination.	*Role: Guide overall study direction, methodology, and schedule; coordinate technical activities; align study milestones with FHWA and NCDOT requirements.*	*Role: Serve as the decision-making body for the study; review interim study results; collaborate to reach consensus on major technical and policy decisions.*	*Role: Provide local knowledge/ perspectives; participate in public meetings and review draft alternatives to help shape context-sensitive solutions.*	*Role: Offer discipline-specific expertise to support data review, screening criteria refinement, and technical validation of concepts.*	*Role: Contribute scientific research and data resources to inform modeling and analysis; serve as partners in innovation and peer review for technical findings.*
• State / federal agency leadership • Tribal leadership	• NCDOT • FHWA • Stantec • USFWS • NPS	• Core Team • Merger agencies (USACE, NCDEQ, NCWRC, NCDWR, NCDCM, NCDMF, NCSHPO, NMFS, USEPA, USCG, etc.) • NCDOT Ferry Division • Local officials (Dare Co, Hyde Co, Albemarle RPO) • Dare Co Consultant (Trogden, Greer Beaty) • Tribal representatives (THPO, others) • NC Aquarium	• NC 12 Task Force • Business owners • Utility Providers (Cape Hatteras Electric Cooperative, Tidelands Electric, Brightspeed, others) • Environmental advocacy groups (SELC, NC Coastal Federation, Coastal Wildlife Refuge Society, National Wildlife Refuge Association, others) • Community organizations (Bridge Moms, Outer Banks Anglers Club, other, HOAs, Ocracoke Access Alliance, others)	• NCDOT (EAU, PMU, ECAP, OSPP, Hydraulics, Roadway, Ferry Division, Geotech, others) • NC Division FHWA • Consultants (Stantec, CATLIN, ICE Teams, RKK, others) • NC Office of Recovery & Resiliency • Others	• ECU Coastal Science Institute • NC State University • UNC Chapel Hill • UNC Wilmington • UNC Charlotte • Duke • UVA

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Project Timeline

(Jan 2026 = Month 1)

Task	Timeline (Months)																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Project Management																		
Project Kickoff	■																	
Project Team Formation		■																
PEL Framework		■	■															
Core Team Meetings, Project Updates, Reporting	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Agency Coordination & Public Engagement																		
Public Involvement Plan		■	■	■														
Agency Coordination & Merger Process (CP1, CP2)							■					■						
Project Team Meetings (up to 10)						■		■		■			■		■	■	■	■
Public Meetings (3 rounds)				■				■			■							
Small Group Meetings (up to 5)									■		■			■	■		■	
Ongoing & Virtual Public Engagement		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Planning-Level and Environmental Considerations																		
Previous Plan Review & Data Collection	■	■																
Draft Purpose and Need Statement					■	■	■	■										
Hydrodynamic & Geomorphological Modeling					■	■	■	■	■	■	■	■	■					
Design Studies (NbS, Geotech, Bike/Ped, Access, Noise, CIA)									■	■	■	■	■					
Alternatives Development & Screening																		
Quantm workshop and Alternatives Screening (Levels 1-3)				■	■	■		■	■	■			■	■	■			
Implementation Strategies & Tools																		
Phasing, NEPA/Permitting Timetable, Organizational, Funding												■	■		■	■	■	
Study Development																		
PEL Report, Questionnaire, Compliance Matrix											■	■	■		■	■	■	■

What have we done so far?

- Public Meeting Series #1 , April 2026
- Local Officials Meeting, April 2026
- Project Team Meetings x 1
- Core Team Meetings x 14
- Scientific Advisory Meetings x 2
- Concurrence Point 1 signed

  Purpose & Need
- Preliminary Concept Screening
- Concept-Level Preliminary Alignments



(Credit: Kip Tabb, Island Free Press)

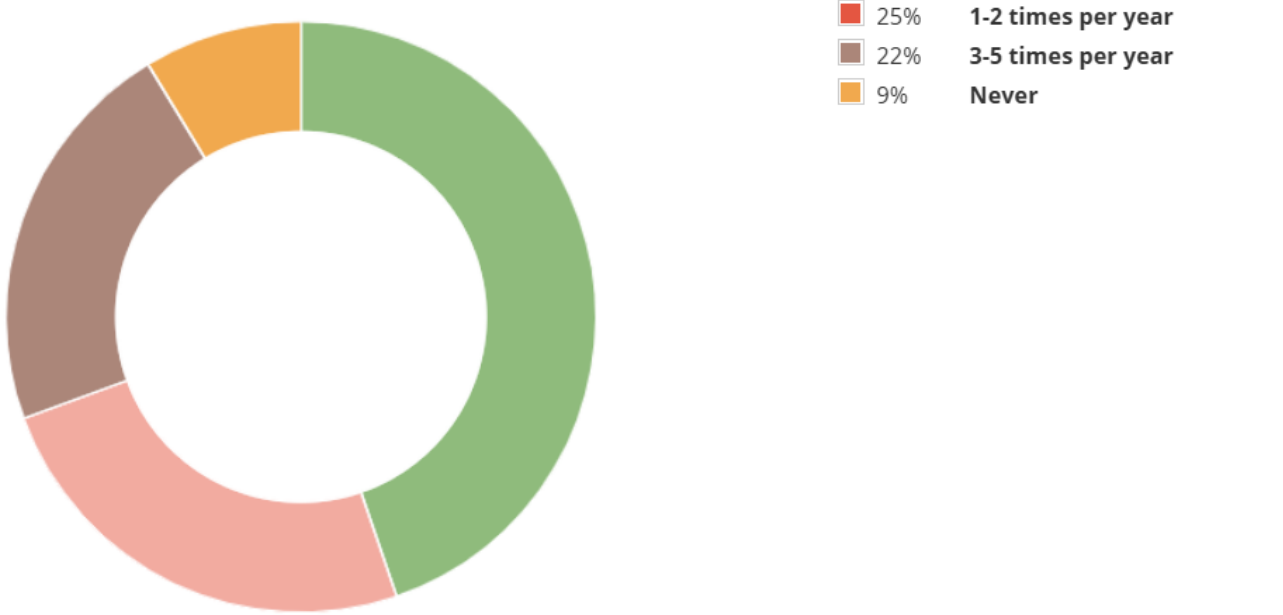
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Public Survey Results

3. When N.C. 12 is closed or restricted, which impacts are most significant to you? three)

57%	Emergency access
40%	Evacuation/Storm Preparedness
38%	Deliveries or daily needs/supplies
37%	Tourism or business revenue
36%	Medical appointments
25%	Work or school travel
14%	Other
13%	Ferry reliance

2. How often do you personally experience delays or closures on N.C. 12 between Oregon Inlet and Rodanthe due to inclement weather and related events (overwash, flooding, erosion, sand blocking the road, etc)?



Purpose and Need

- Reliability and regional connectivity
- Public land management access on Pea Island
- Corridor resilience and reduced vulnerability

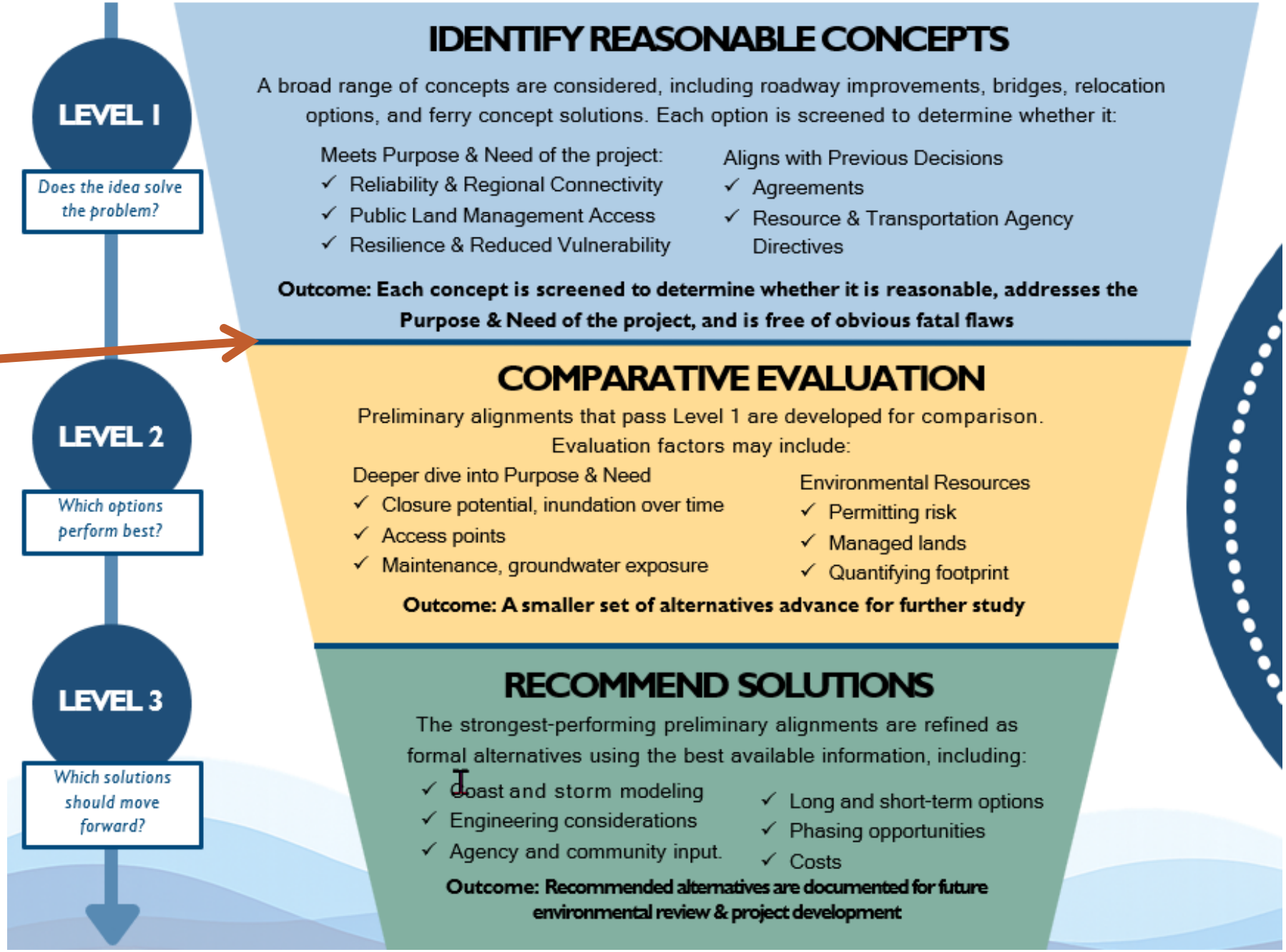
The Project Team concurred on this date of 9/26/2026 with the purpose of and need for the proposed project as stated above and study area as shown in attached figure.

USACE	DocuSigned by: Kyle Barnes 2E861E75567C4BD...	NCDOT	Signed by: CA084B4A6412432...
USEPA	Signed by: Amanetta Somerville 4A37089ED457408...	NCDWR	Signed by: Paul Nyarko 1053F16ABDFB487...
SHPO	Signed by: 4FB75D0E8DB3479...	NCWRC	Signed by: Travis Wilson 3FD515BD277C4C9...
NCDMF	Signed by: Charlie Deaton 325F55AEEBDB4C2...	FHWA	Signed by: Seth Wilcher 9967A500F8714F0...
NMF	Signed by: Steven D Giordano 77A45CBAE81B495...	USCG	
NCDCM	Signed by: Cathy Brittingham 2938F48E731C402...	NPS	Signed by: David E. Hallac 98E94E8DC915497...
USFWS-PINWR	Signed by: Rebekah Martin A2E6E40196B8447...	ARPO	Signed by: Ethan Sommers 2293F1E3BE914F2...
USFWS-ES	Signed by: Gary Jordan 17897BBD813144D...		



Screening Process

We are here



Reasonable Concept Screening

Draft Level 1 Screening Matrix

Concepts	Evaluation Factors				Outcome
	Prior Decisions	P&N 1: Reliability & Connectivity	P&N 2: Access for Management of Public Lands	P&N 3: Resilience & Vulnerability	
No-Build Alternative	P	F	P	F	BASELINE
Elevate Roadway Within Easement	P	P	P	P	PASS
Elevate on Bridges Within Easement	P	P	P	P	PASS
Elevate Roadway Outside Easement	P	P	P	P	PASS
Elevate on Bridges Outside Easement	P	P	P	P	PASS
Sound Bridge	P	P	P	P	PASS
Relocate West of Ponds	F	P	F	P	ELIMINATE
Passenger-only Ferry	F	F	F	P	ELIMINATE
Vehicle Ferry	F	F	F	P	ELIMINATE

Pass (P) Fail (F)

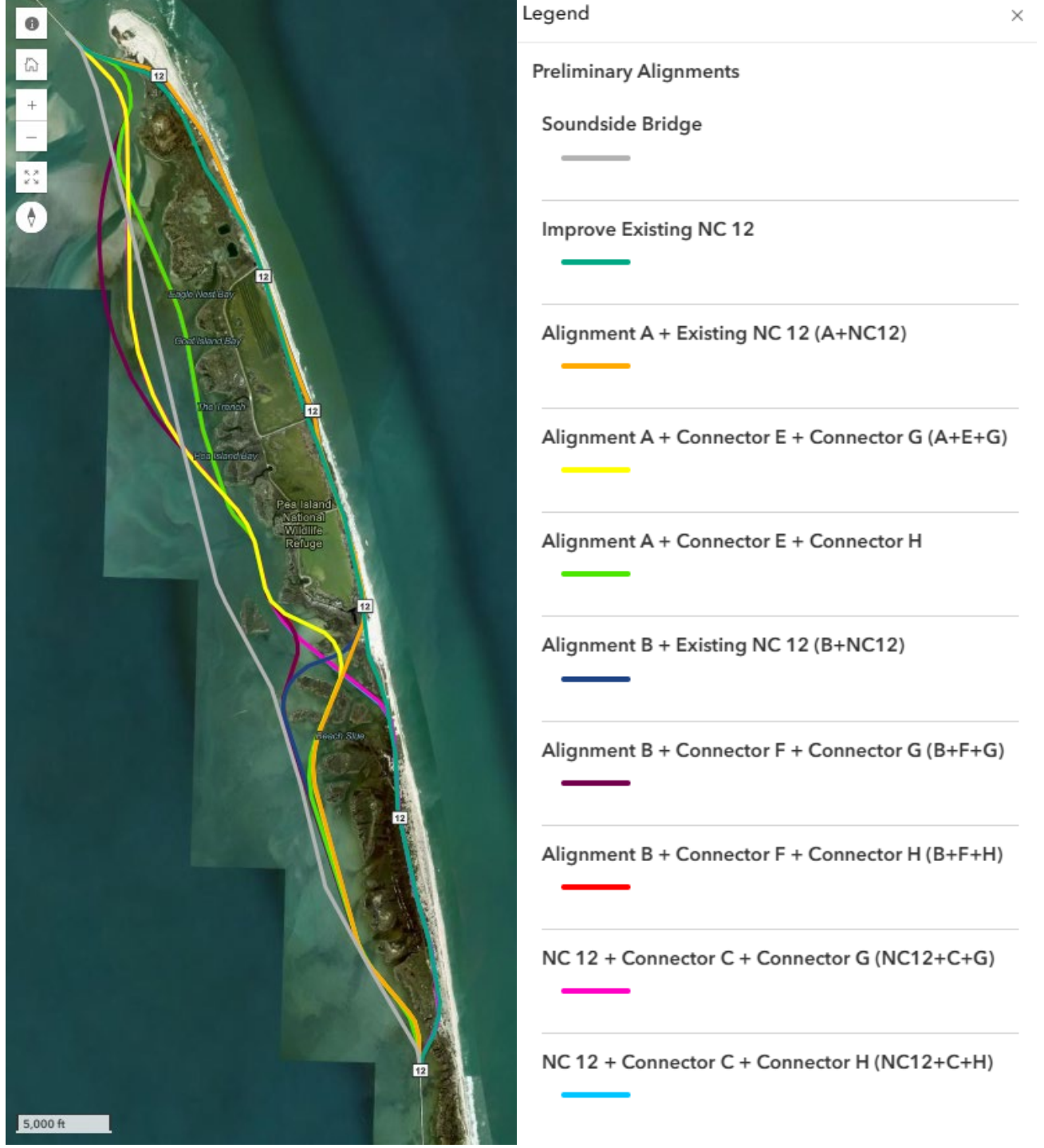
See slide 2 for evaluation criteria definitions.

WORKING DRAFT

Preliminary Alignments

- Evaluation in progress as part of Level 2 screening
- Optimized soundside bridge and improve existing NC 12 alignments
- Includes alignments from 2017 Alternatives Study Report

Online GIS Viewer



Next Steps *

- Continuing Alternatives screening
- Continuing project, core, leadership, and academic team meetings
- Public Meeting Series #2, November 2026
- Public Meeting Series #3, April 2027
- Concurrence Point 2 (Recommeded Alternatives), May 2027
- PEL Study Report, June 2027
- Finding a viable alternative is the goal line, the future will require more work.

** Subject to change*



September 2026 Nor’easter

Storm Timeline: Sept. 24 – Oct. 3, 2026

THURS, SEP 24 · early a.m.

Road closed

Extreme tides breach dunes near Pea Island Visitor Center; NC 12 closed Basnight Bridge to Rodanthe

FRI, SEP 25

Peak storm conditions

Up to 4 ft of water and deep sand on road; 18-ft waves offshore; overwash continues each high tide

SAT, SEP 26 · 7 p.m.

State of Emergency

Dare County declares State of Emergency for Hatteras Island; limited entry

SUN, SEP 27

Emergency ferry & repairs begin

Stumpy Point–Rodanthe emergency ferry activated (first since 2013); crews rebuild dune as tides ease

TUES, SEP 29 · 3 p.m.

First one-way traffic

One-lane gravel detour opens northbound; alternating traffic by automated signals

WED, SEP 30 · 7 a.m.

Southbound access

Southbound opens to residents and essential traffic; ferry stays on 24-hour schedule

THURS, OCT 1 · 7 a.m.

Visitors return

Hatteras Island entry restrictions lifted; Dare County State of Emergency remains in effect

SAT, OCT 3

Two-way traffic restored

Both lanes repaved and reopened ahead of schedule; dune and shoulder work continue

Sources: NCDOT press releases and NC 12 updates; Dare County Coastal Storm Bulletins; WRAL; AccuWeather; ABC11; Outer Banks Voice.

Storm Impacts and Response



Overwash on Sept. 24 (left) and dune rebuilding (right). Photos: NCDOT live cams

~1,000 ft
of NC 12 damaged

9 days
closure to full two-way traffic

1st
emergency ferry activation since 2013

- Dunes breached; ~500 ft of pavement initially found undermined, ultimately ~1,000 ft repaired
- Worst Pea Island damage in 13+ years, comparable to Hurricanes Irene (2011) and Sandy (2012)
- Road access to Hatteras Island cut off
- Ferry accommodates ~25 vehicles per 2-hour trip
- Pea Island Visitor Center parking lot severely damaged
- Storm evaluated by Stantec Hydraulic modeling team- comparison to a storm with 5- or 10-year recurrence interval (has a one in five statistical change of occurring every year)
- Late October Nor'easter essentially repeated this same damage and activated the emergency ferry again

Storm Response Costs

Cost category	Amount ($)	% of total costs
Staff time — Standard Labor Costs	$154,197	7%
Equipment rental — Standard Equipment Rental	$11,643	1%
Payments to contractors — Payments Under Purchase Order	$648,401	31%
Other costs (materials, meals, vehicle parts, signs, and paint)	$17,981	1%
Emergency Ferry	$250,000	12%
Sandbags	$1,002,500	48%
Total recorded costs (10/19/26)	$2,084,722	100%

Questions?



PEL Authority

- 23 U.S.C. § 168 (Integration of Planning and Environmental Review)

- 23 U.S.C. § 139 and 23 CFR 450 authorize agencies to:
  - Establish project Purpose & Need during planning
  - Identify and screen the range of reasonable alternatives prior to NEPA
  - Engage cooperating and participating agencies, tribes, and the public during planning
  - Adopt planning decisions and analyses into the subsequent NEPA document

- FHWA PEL guidance (23 CFR 450, Appendix A) provides the framework agencies follow to carry out this authority

- What this means for the NC 12 SAND Plan:
  - Team has statutory authority to develop the Purpose & Need Statement
  - Full Range, Reasonable, and Recommended alternatives can be screened and carried into NEPA
  - Concurrence Points 1 and 2 formalize agency agreement under the Merger Process

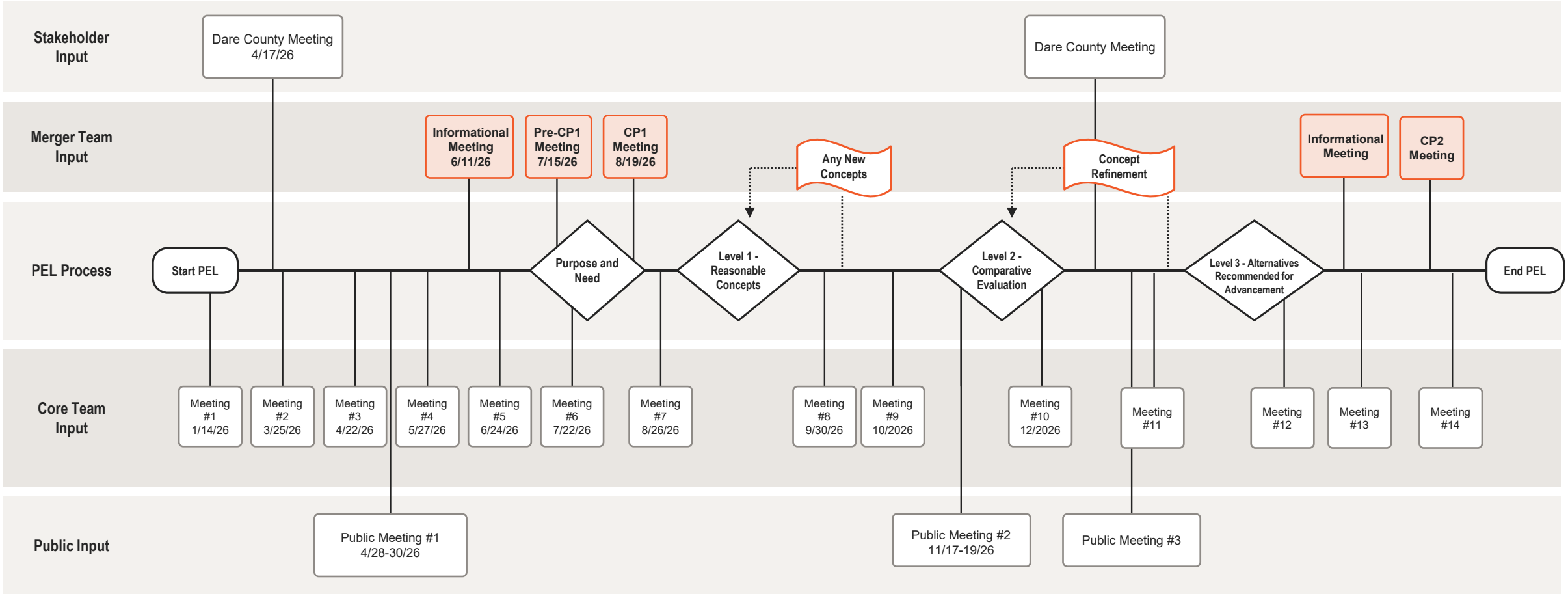
Key References:

23 U.S.C. § 168 — Integration of Planning and Environmental Review

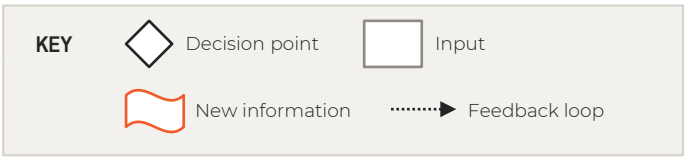
23 U.S.C. § 139 — Efficient Environmental Reviews

23 CFR 450, Appendix A — FHWA PEL Guidance

How Agency, Stakeholder, and Public Input Shapes the PEL Process



This graphic shows how input is gathered at each stage of the PEL process. NCDOT and FHWA present methodology, concepts, preliminary alignments, and other project materials and data; agencies, the Core Team, and the public provide input that informs how those products are considered in the decision-making process.



PEL Framework

✓ Completed ○ In Progress • Next up

	Months 1-3	Months 4-6	Months 7-9	Months 10-12	Months 13-15	Months 16-18
Core Team • NCDOT • FHWA • Stantec • USFWS • NPS	✓ Project initiation ✓ Public Involvement Plan ✓ Data collection and compilation ✓ Quantm model and initial concepts	✓ Initiate coastal modeling and other technical studies ✓ Draft Purpose & Need Statement ✓ Draft Evaluation Criteria	○ Coastal modeling validation/calibration and baseline conditions modeling ○ Level 2 screening (Reasonable Alternatives)	• Coastal model runs for conceptual alternatives • Level 3 screening (Recommended Alternatives)	• Phasing scenarios • NEPA/permitting timetables • Potential funding sources	• Draft and Final PEL Report • PROTECT grant close-out documentation
		← Iterative screening and comparison of alternatives →				
Project Team • Core Team • Merger agencies • Local government • Tribal representatives	✓ Project Team formation ✓ Consensus on PEL framework ✓ Input on issues and potential solutions	✓ Project informational meeting	✓ Concurrence Point 1 ✓ Level 1 screening of Full Range of Alternatives	• Project informational meeting / update	• Project informational meeting • Concurrence Point 2 • Mitigation strategies • Level 3 screening review • NEPA transition	• Project informational meeting • Finalize implementation strategies
Tech. SMEs/Academia	✓ Share baseline data	✓ Input on baseline data	← Provide input on alternatives screening →			• Review PEL products
Stakeholder Groups	✓ Share baseline data	✓ Input on baseline data	← Provide local knowledge and perspectives →			• Review PEL products
Public	✓ Project website rollout ✓ Ongoing virtual engagement	✓ Update website content ✓ Public meetings (project history, existing conditions, goals) ✓ Ongoing virtual engagement	○ Ongoing virtual engagement ○ Update website content	• Public meetings (Level 1 screening results, Prelim Level 2 results, other)	• Update website content • Ongoing virtual engagement • Public Meetings (Level 3 screening results)	• Review PEL products

Reliability and Regional Connectivity

Improve reliability on NC 12 in the study area and promote regional connectivity by providing consistent daily and emergency access

Needs addressed

- NC 12 is the only land-based route through the corridor
- Frequent closures and overwash events reduce public confidence in the corridor's reliability, particularly among visitors
- Short-term repairs restore functionality without reducing underlying exposure, and even minor storms increasingly trigger closures and repair work
- Residents, businesses, and visitors depend on continuous access between Bodie Island and Hatteras Island
- Reliable access supports: 1) emergency response and evacuation efforts 2) tourism as Dare County's primary economic driver and 3) essential infrastructure management, including power and broadband connectivity

Public Land Management Access on Pea Island

Maintain access on Pea Island for public land management agencies, including USFWS Pea Island National Wildlife Refuge (PINWR), NPS Cape Hatteras National Seashore (CHNS), and other public agencies

- Needs addressed
  - Repeated roadway repairs, dune stabilization, and other temporary measures create ongoing disturbance in a sensitive ecological setting. Access disruptions affect refuge and seashore management, function, and recreational use for federal, state and local agencies
  - This could include, but not to preclude:
    - USFWS requires corridor access for PINWR public access, species management, migratory bird habitat restoration, and monitoring
    - NPS requires corridor access for CHNS visitor services, resource protection, and facility maintenance
    - The Oregon Inlet terminal groin and habitat restoration ponds, Bonner Bridge pier, and Oregon Inlet Life-Saving Station require reliable maintenance and operation access

Corridor Resilience and Reduced Vulnerability

Enhance corridor resilience and reduce vulnerability

- Needs addressed
  - A more resilient long-term approach is needed that accommodates natural barrier island dynamics, including inlet migration, overwash processes, and landward migration
  - Solutions should allow natural island processes to occur throughout the study area without disrupting transportation access
  - Future coastal change, costs, and lack of funding create magnified uncertainty in this setting
  - Near-term solutions must not preclude long-term options

NC12 Vulnerability & Definitions-

- *230-foot critical buffer*
  - *A 230-foot "safety distance" measured eastward from the road edge to the seashore.*
  - *This is how much space is necessary to ensure the road won't face routine wave and storm damage.*
- *2060 Shoreline Zone*
  - *Where models predict the shoreline may be by 2060.*
  - *Based on the pattern of erosion that NCDOT has measured for 35+ years on Pea Island and established academic research.*
- *"Hot Spots"*
  - *These are the most vulnerable sections of the roadway, identified over 35+ years of measurements on Pea Island.*
  - *Based on road damage history and lack of 230' critical buffer or adequate dune protection.*
- *Potentially vulnerable*
  - *Sections of the roadway that may lose their 230-foot critical buffer or adequate dune protection before 2060.*