Administrative Action

Environmental Assessment

US Department of Transportation, Federal Highway Administration
North Carolina Department of Transportation

Pea Island Long-Term Improvements
Bonner Bridge Replacement Project Phase IIa

Federal-Aid No. BRNHF-0012(55)
NCDOT Project Definition: 32635
STIP Project No. B-2500A
Dare County, North Carolina

Submitted Pursuant to the National Environmental Policy Act 42 U.S.C. § 4332(2)(c)
and 49 U.S.C. § 303

Cooperating Agencies
US Coast Guard/US Army Corps of Engineers
US Fish and Wildlife Service/National Park Service

2/8/13 FOR
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The proposed project is the construction of a bridge to replace the Herbert C. Bonner Bridge in Dare County, the demolition and removal of Bonner Bridge, and improvements to NC 12 between the community of Rodanthe and Oregon Inlet. This EA focuses on the improvement of NC 12 in the vicinity of the new Pea Island inlet that formed during Hurricane Irene in August 2011. It identifies and assesses changes in the setting and the project in this area since the approval of the project's Record of Decision in December 2010 and identifies a preferred approach for improving NC 12 in this area.

Comments on this EA are due by _____ and should be sent to Gregory J. Thorpe, Ph.D. at the above address.

Pea Island Long-Term Improvements
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Environmental Assessment

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NC 12 Replacement of the Herbert C. Bonner Bridge

(Including NC 12 Long-Term Improvements South to Rodanthe)

Federal-Aid No. BRNHF-0012(55)
NCDOT Project Definition: 32635
STIP Project No. B-2500 and B-2500A
Dare County, North Carolina

PROJECT COMMITMENTS

All Project Commitments listed in the December 2010 Record of Decision (ROD) are still in effect. The following text lists the Project Commitments (using the same commitment numbers that were used in the ROD) with direct applicability to Phase IIa. No new commitments were added, but two of the commitments listed below (Project Commitments 20 and 26) were revised.

Highway Design Branch and Technical Services Division

2. Bicycle Accommodations. The Cape Hatteras National Seashore (Seashore) management plan supports the use of bicycles along NC 12. All bridges associated with the detailed study alternatives (including the Preferred Alternative) would have 8-foot (2.4-meter) wide shoulders that would be safer for bicycle and pedestrian traffic than Bonner Bridge's 2-foot (0.6-meter) wide shoulders. In addition, a bicycle-safe bridge rail on the bridges also would provide increased safety for bicyclists. New roadway would have 4-foot (1.2-meter) paved shoulders, which would be safer for use by bicycle and pedestrian traffic than the existing NC 12's unpaved shoulders.

Highway Design Branch and Division 1

4. Sedimentation and Erosion Control. All waters in the project area are classified as SA waters (Class A salt waters) with a supplemental classification of High Quality Waters (HQW). The most stringent application of the Best Management Practices (BMPs) is expected where highway projects affect receiving waters of special designation, such as HQW. Also, impacts to adjacent areas of SAV and/or wetlands should be minimized. Therefore, sedimentation and erosion control measures shall adhere to the Design Standards in Sensitive Watersheds [15A NCAC 04B.0124(b)-(e)]. Prior to construction, the design-build contractor will submit the proposed sediment and erosion control plans for each stage of construction to the North Carolina Department of Transportation (NCDOT) and permitting agencies for review.

5. Pile Placement. Bridge piles in open water would be jetted to the tip elevation (depth of the tip of the pile). Bridge piles over land would be jetted or driven. Potential damage to wetlands, SAV, and Oregon Inlet from jetting spoils will be minimized to the extent practicable.

Highway Design Branch, Project Development and Environmental Analysis Branch, and Division 1

8. Design Coordination. NCDOT would invite NPS and USFWS, as well as the other agencies represented on the project's National Environmental Policy Act/Section 404 of the Clean Water Act (NEPA/Section 404) Merger Team (a full list of agencies on the Merger Team is shown on page 8-6 of the FEIS), to participate in the development of project design and mitigation strategies as a part of the permit application process for each phase of the project.

11. Night-time Construction. Because construction activities could occur 24-hours-a-day, construction areas could be lit to daylight conditions at night. NCDOT would work with NCDENR-DMF, NMFS, NPS, and USFWS to determine other areas near project construction where night lighting would need to be avoided or limited. Night lighting also would not be used close to areas where people sleep, including the campground at the northern end of the project area and the Rodanthe area at the southern end. Night lighting also will meet the requirements specified to protect sea turtles contained within Commitment 26.a.

12. Manatee Protection. Construction contracts would require compliance with USFWS's Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters (June 2003).

13. Sea Turtle and Smalltooth Sawfish Protection. NCDOT will comply with NMFS's March 23, 2006, *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS, 2006) that restrict in-water construction-related activities when these protected species are observed in the project area. However, NMFS and NCDOT agree that bridge construction or demolition activities do not need to stop when a protected species is sighted in the proximity of construction if the construction activities are not in the water. The in-water moratorium prohibits pile installation and removal and activities associated with bridge construction and demolition when listed species are present in the water, but does not restrict terrestrial activity.

20. Atlantic and Shortnose Sturgeon (revised). Conservation measures to protect shortnose sturgeon would include no hopper dredging and measures to minimize habitat degradation. Such measures would include Best Management Practices (BMPs) involving use, storage, and disposal of construction/demolition materials to

minimize short-term turbidity or water quality degradation during over-water construction in Oregon Inlet and during periodic maintenance. Construction and demolition activities associated with Phase I of the project would be completed as quickly as possible in order to minimize deterring spawning sturgeon from entering Oregon Inlet. In addition, the project would incorporate BMPs to reduce habitat degradation from stormwater runoff pollution. The same conservation measures will be applied to the Atlantic sturgeon.

Highway Design Branch, Project Development and Environmental Analysis Branch, Division 1, Right-of-Way Branch, and Technical Services Division

21. Utilities. Project development and construction activities would be coordinated with utility providers in the project area in order to prevent interruption of local utility services. The following utility providers currently serve the project area: Dare County (water service); Sprint Communications (telephone service); Charter Communications (cable television service); and Cape Hatteras Electric Membership Association (electric power service).

Project Development and Environmental Analysis Branch

23. Programmatic Agreement. As per the requirements of Section 106 of the National Historic Preservation Act of 1966, FHWA, the North Carolina State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), and NCDOT, along with the consulting parties (Dare County, the North Carolina Aquarium Society, USFWS, NPS, and the Chicamacomico Historical Association), developed a Programmatic Agreement (PA) stipulating measures that FHWA will ensure are carried out during the design and construction of the Selected Alternative to mitigate adverse impacts to the historic cultural resources. The final PA (see Appendix D of the 2010 ROD) was signed by the signatory agencies on November 15, 2010. NCDOT would carry out the stipulations in this agreement.

24. Seabeach Amaranth. Since the favored habitat of the seabeach amaranth is highly ephemeral, a survey of the project area would be conducted for the habitat of this species at least one year prior to initiating bridge construction activities. It would occur as needed for each construction phase.

Highway Design Branch, Project Development and Environmental Analysis Branch, Division 1, and Bridge Management Unit

25. Piping Plover. NCDOT will implement the following nondiscretionary measures that include the terms and conditions outlined in the *Biological and Conference Opinion*s (USFWS, 2008):

    a. All construction equipment and personnel must avoid all bird closure areas within the Seashore and Refuge.

All future routine maintenance activities of bridge structures that would occur within or adjacent to current or future plover nesting areas must occur outside the nesting season (April 1 to July 15).

All future repair work on bridge structures that would occur within or adjacent to current or future plover nesting areas must occur outside the nesting season (April 1 to July 15) unless emergency or human safety considerations require otherwise. In this event, the area must be surveyed for nesting plovers and avoided to the extent possible.

b. During the construction of Phases II, III and IV of the Phased Approach/ Rodanthe Bridge Alternative (*if it is implemented under the NC 12 Transportation Management Plan [Selected]*), keep all construction equipment and activity within the existing right-of-way.

   Do not moor any construction barges within 300 feet (91.4 meters) of the following islands: Green Island, Wells Island, Parnell Island, Island MN, Island C, the small unnamed island immediately east of Island C, Island D, and Island G (see Figure 1 in the *Biological and Conference Opinion*s in Appendix E of the FEIS).

c. All dredge spoil excavated for construction barge access must be used to augment either existing dredge-material islands or to create new dredge-material islands for use by foraging plovers. This must be accomplished as per the specifications of the North Carolina Wildlife Resources Commission. The point of contact is Sue Cameron at 910-325-3602. If the dredge material is used outside the current defined action area, the action area is assumed to be expanded to cover the beneficial placement of the material.

d. To the maximum extent practical, while ensuring the safety of the traveling public, limit or avoid the use of road signs or other potential predator perches adjacent to plover nesting or foraging areas. Where signs or other structures are necessary, determine if alternative designs would be less conducive for perching on by avian predators (gulls, crows, grackles, hawks, etc.). For example, minimize or avoid the use of large cantilever signs in favor of smaller and shorter designs.

26. <u>Sea Turtles (green sea turtle, leatherback sea turtle, and loggerhead sea turtle) (revised)</u>. NCDOT will implement the following nondiscretionary measures that include the terms and conditions outlined in the *Biological and Conference Opinion*s (USFWS, 2008):

    a. All construction equipment and personnel must avoid all marked sea turtle nests.

Construction material and equipment staging areas must not be located seaward of the artificial dune.

All future routine maintenance activities of bridge structures that would occur within or adjacent to current or future sea turtle nesting habitat, and which would require vehicles or equipment on the beach or the use of night lighting (excluding navigation lights required by the US Coast Guard), must occur outside the nesting season (May 1 to November 15).

All future repair work of bridge structures that would occur within or adjacent to current or future sea turtle nesting habitat, and which would require vehicles or equipment on the beach or the use of night lighting (excluding navigation lights required by the US Coast Guard) must occur outside the nesting season (May 1 to November 15) unless emergency or human safety considerations require otherwise. In this event, the area must be surveyed for sea turtle nests and avoided to the extent possible.

b. Provide an opportunity for USFWS or a USFWS designee to educate construction contractor managers, supervisors, foremen and other key personnel and resident NCDOT personnel with oversight duties (division engineer, resident engineer, division environmental officer, etc.) as to adverse effects of artificial lighting on nesting sea turtles and hatchlings, and to the importance of minimizing those effects.

c. During turtle nesting season (May 1 to November 15), use the minimum number and the lowest wattage lights that are necessary for construction.

   During turtle nesting season, portable construction lighting must be amber-colored LED lights with a predominant wavelength of approximately 650 nanometers.

   During turtle nesting season, utilize directional shields on all portable construction lights, and avoid directly illuminating the turtle nesting beach at night.

   During turtle nesting season, all portable construction lights must be mounted as low to the ground as possible.

   During turtle nesting season, turn off all lights when not needed.

d. For Phases II, III and IV if developed as defined by the Phased Approach/ Rodanthe Bridge Alternative (*if it is implemented under the NC 12 Transportation Management Plan [Selected]*), on the ocean side, design the bridge structure in a manner which will shield the beach on the east side from direct light emanating from passenger vehicle headlights. For the small portion of Phase I over land on

Hatteras Island, retrofit the bridge structure at the time that Phase II connects with Phase I. The specific design of the bridge will be developed in consultation with USFWS prior to re-evaluation of the environmental document for Phase II.

e. Avoid retrofitting the bridges and approach roads with permanent light fixtures in the future (excluding navigation lights required by the US Coast Guard).

In addition, NCDOT does not anticipate the use of explosives during construction or demolition of the existing bridge. NCDOT's contractor will use pipeline or clamshell dredging, rather than a hopper dredge to minimize effects to sea turtles. No permanent light fixtures will be installed on the bridge or the approaches (with the exception of navigation lights as required by the US Coast Guard).

Project Development and Environmental Analysis Branch

28. Section 4(f). If a later phase of the Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative (Selected) requires the use of a Section 4(f) property, then FHWA would complete an additional Section 4(f) analysis prior to FHWA's approval of the later phase. The 2009 Revised Final Section 4(f) Evaluation would be reviewed to verify the status of Section 4(f) resources, the effects(s) from the proposed response strategies on the Section 4(f) resource, "use" determinations, and, if necessary, a revised least overall harm analysis.

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1.0 Introduction

The Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative (PBC/TMP Alternative) is the Selected Alternative for the NC 12 Replacement of the Herbert C. Bonner Bridge over Oregon Inlet (Bonner Bridge Replacement Project), which is included in the State Transportation Improvement Program (STIP) as STIP Project No. B-2500. The components of the PBC/TMP Alternative are detailed in the December 2010 Record of Decision (ROD). It consists of Phase I, the replacement of the Bonner Bridge over Oregon Inlet, and future phases that provide for the long-term maintenance of NC 12 from Oregon Inlet to Rodanthe. The North Carolina Department of Transportation (NCDOT) has started work on Phase I of the PBC/TMP Alternative; a design-build contract for the construction of the new bridge was awarded in July 2011.

The project phase under consideration is Phase IIa of the PBC/TMP Alternative. As discussed in Section 3.3.2 of the 2010 ROD, the PBC/TMP Alternative did not specify a particular action at that time on Hatteras Island beyond the limits of Phase I because of the inherent uncertainty in predicting future conditions within the dynamic coastal barrier island environment. Instead, the PBC/TMP Alternative addresses the study and selection of future actions on Hatteras Island beyond the limits of Phase I through a comprehensive NC 12 Transportation Management Plan (TMP). The TMP is guiding the implementation of future phases of the project through 2060. By actively monitoring the conditions in the Bonner Bridge Replacement Project (B-2500) project area and delaying final decision-making as set forth in the TMP, the environmental impacts beyond Phase I can be better quantified, minimized, and mitigated. This process is somewhat analogous to a tiered National Environmental Policy Act (NEPA) study, in that the entire end-to-end impacts have been studied, but the detailed selection of a portion of the action is being delayed. The measures incorporated into the TMP to assist in the study and selection of future actions on Hatteras Island beyond the limits of Phase I are described in detail in Section 1.2.

In addition to the measures incorporated into the TMP related to guiding the implementation of future phases of the PBC/TMP Alternative, Project Commitment 16 in Appendix A of the 2010 ROD indicated that final decisions on future phases of the PBC/TMP Alternative would be developed through interagency collaboration and under the requirements of NEPA as project area conditions warrant. Hurricane Irene hit the North Carolina coast on August 27, 2011, and breached NC 12 in two locations – in northern Rodanthe (the "Rodanthe breach") and within the Pea Island National Wildlife Refuge (Refuge) approximately six miles south of Oregon Inlet (the "Pea Island inlet"). Hurricane Irene was a powerful and destructive tropical cyclone that affected a significant portion of the east coast of the United States, as well as the Caribbean.

As a result of the damage caused by the storm within the Bonner Bridge Replacement Project (B-2500) project area and the "temporary" nature of the current repairs, NCDOT

initiated Phase II (B-2500A and B-2500B) of the Bonner Bridge Replacement Project (B-2500) to implement long-term improvements to NC 12 in the two breach areas pursuant to the 2010 ROD. This Environmental Assessment (EA) is intended to fulfill the requirements of NEPA for the Pea Island inlet area (B-2500A or "Phase IIa"). A separate NEPA document will be prepared for the Rodanthe area (B-2500B or "Phase IIb"). The proposed Phase IIa is consistent with the objectives for later phases of the PBC/TMP Alternative as described in Section 3.3.2 of the 2010 ROD.

The project area for the Bonner Bridge Replacement Project (B-2500) is shown in Figure 1, along with the location of Phases I and II (both IIa and IIb) of the PBC/TMP Alternative. The Phase IIa (B-2500A) project area also is shown in Figure 1. The Bonner Bridge Replacement Project (B-2500) project area starts at the southern tip of Bodie Island and extends south to the community of Rodanthe. The boundaries of the project area were chosen to include the Bonner Bridge over Oregon Inlet, as well as NC 12 between Oregon Inlet and the community of Rodanthe, an area that is at risk because of shoreline erosion. The Phase IIa project area includes the area between about the southern end of the Refuge's South Pond and the northern end of the 2.1-mile section of NC 12 in the southern half of the Refuge that is not expected to be threatened by shoreline erosion prior to 2060 (see Figure 1). This area includes the new Pea Island inlet, as well as the entire area identified in the 2008 Final Environmental Impact Statement (FEIS) for this study area as geologically susceptible to breaches (see Figure 1).

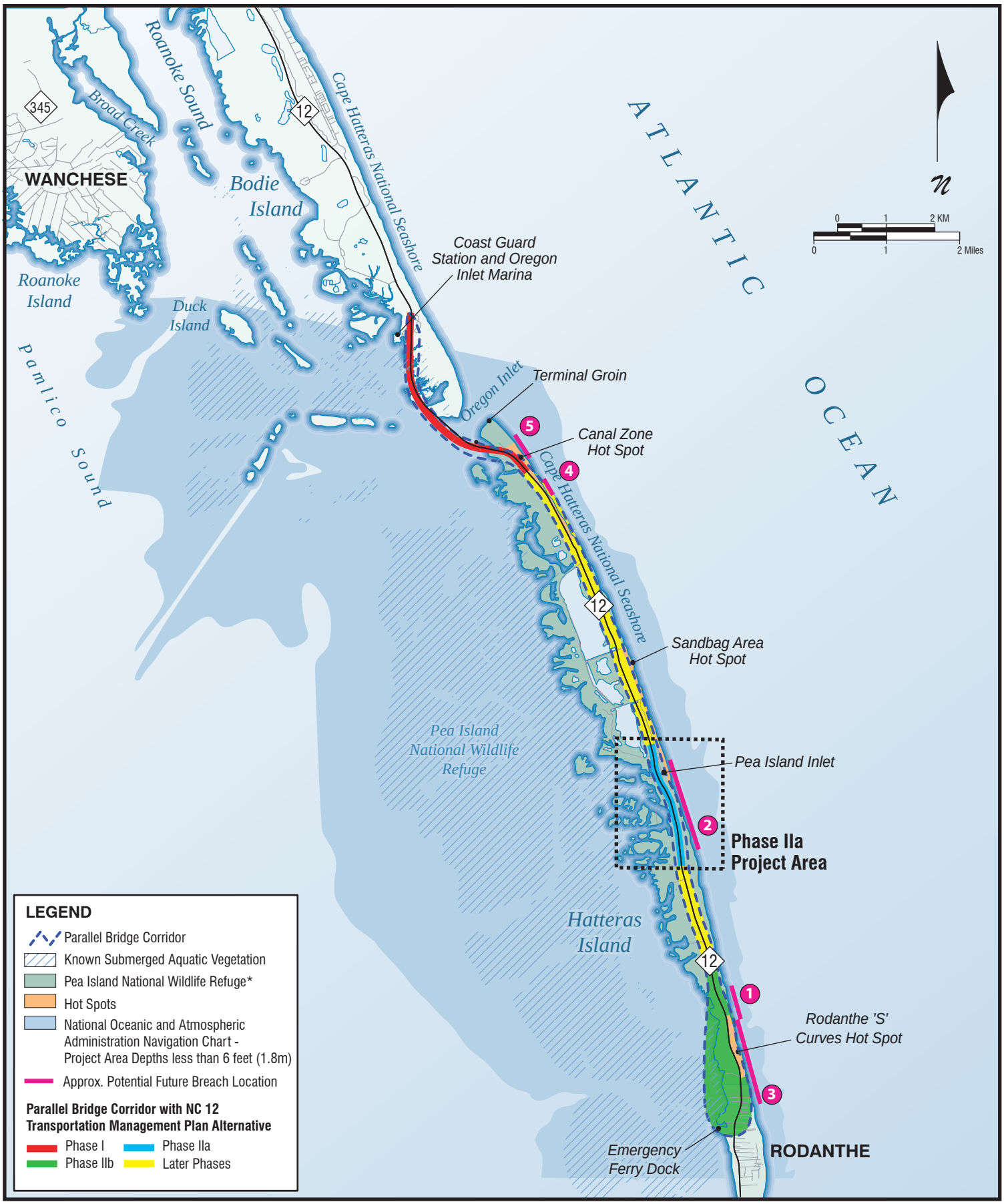
1.1 Purpose of the Environmental Assessment

The purpose of this EA for Phase IIa is to identify and assess changes in the setting, project, and impacts that may have occurred since the ROD was issued on December 10, 2010. This EA for Phase IIa is established on the previous NEPA documentation for the Bonner Bridge Replacement Project (B-2500) as its basis. The previous NEPA documentation includes:

- Final Environmental Impact Statement (FEIS) and Section 4(f) Evaluation signed in September 2008.
- Revised Final Section 4(f) Evaluation signed in October 2009.
- Environmental Assessment signed in May 2010.
- Record of Decision issued in December 2010.

The findings of these documents are incorporated into this EA by this reference.

The purpose of this EA also is to provide documentation of compliance with NEPA in accordance with the PBC/TMP Alternative. The limits of the Phase IIa project area in the



PARALLEL BRIDGE CORRIDOR WITH NC 12 TRANSPORTATION MANAGEMENT PLAN ALTERNATIVE

Figure 1

context of the PBC/TMP Alternative are shown in Figure 1. This EA includes the following:

- A description of the Phase IIa alternative screening process, including the steps followed (including scoping), alternatives considered, screening findings, and several additional studies conducted to identify changed conditions in the project area.

- A description of the Preferred Alternative for Phase IIa (Bridge within Existing NC 12 Easement Alternative) that was selected by the Federal Highway Administration (FHWA), NCDOT, and the Merger Team.

- An update of the assessment of the Preferred Alternative, including a description of changes in the environmental setting since the release of the 2010 ROD; a description of the impacts of the Phase IIa Preferred Alternative; a discussion of costs and financing; and a discussion of the effects that the changes in setting, Phase IIa impacts, and costs and financing findings have on the Bonner Bridge Replacement Project (B-2500) as a whole. The need for describing changes in the environmental setting since the release of the 2010 ROD is primarily the result of Hurricane Irene in August 2011 and the formation of the Pea Island inlet. The effects of Hurricane Sandy in October 2012 also are accounted for in the updated information on the environmental setting.

- An evaluation of the October 2009 Revised Final Section 4(f) Evaluation (Revised 4(f) Evaluation) that documents FHWA's approval of the Phase IIa Preferred Alternative, including: Section 4(f) properties in the Phase IIa project area; the proposed alternative for Phase IIa; impacts to Section 4(f) properties, including use of the Refuge as a result of the implementation of the Phase IIa Preferred Alternative; analysis of avoidance alternatives; the least harm analysis; and all possible planning to minimize harm.

- A description of public and agency scoping conducted during the consideration of Phase II, including responses to scoping comments.

- An analysis of and preliminary conclusion on the need to prepare a supplemental Environmental Impact Statement (EIS).

The findings contained within this EA and subsequent review of this EA by the public and environmental resource and regulatory agencies will be used to determine whether or not these changes or circumstances would result in significant environmental impacts that were not evaluated in the 2008 FEIS, the 2010 EA, and the 2010 ROD. If the agency conclusion is that these changes or circumstances would result in significant environmental impacts not evaluated in the previous NEPA documentation, then a supplemental EIS will be prepared.

FHWA and NCDOT will make this EA available for a period of 30 days to provide resource agencies and the public an opportunity to review and comment. Comments received will be reviewed and taken into account prior either to the determination to prepare a supplemental EIS or to the approval of a ROD for Phase IIa.

1.2 Description of PBC/TMP Alternative

The PBC/TMP Alternative was identified in the 2010 ROD as the Selected Alternative for the Bonner Bridge Replacement Project (B-2500). The PBC/TMP Alternative includes the replacement of the existing Bonner Bridge with a new Oregon Inlet bridge parallel to and west of the Bonner Bridge as Phase I of the project. A design-build contract for Phase I was awarded in July 2011.

The PBC/TMP Alternative calls for the study and selection of future actions on Hatteras Island beyond the limits of Phase I through a comprehensive NC 12 Transportation Management Plan. The PBC/TMP Alternative includes the following measures:

- NCDOT will fund and implement an on-going coastal monitoring program on Hatteras Island within the project study area (i.e., Oregon Inlet to Rodanthe). The results presented in the monitoring program's annual reports will be used to determine when planning of future phases of the project should begin. The program was initiated in early 2011.

- NCDOT will fund and implement a periodic Refuge habitat/NC 12 vulnerability forecasting study in consultation with the US Fish and Wildlife Service (USFWS) with a at least a five-year recurrence. Through this program, NCDOT and USFWS will work together to develop and assess alternative future scenarios including possible site-specific events and remedies. This program is based on the outcome of the coastal monitoring program, so it will begin soon since the results of the monitoring program through 2011 have now been published (as discussed in Section 2.6.3).

- NCDOT and FHWA will use the results of the coastal monitoring program and the periodic Refuge habitat/NC 12 vulnerability forecasting study to determine when the environmental review for each phase should be initiated and what alternative actions should be studied in detail. This assessment will be performed after the completion of each report prepared as part of the coastal monitoring program and after each iteration of the vulnerability study. In other words, based on the measures included in the PBC/TMP Alternative, the conditions in the Bonner Bridge Replacement Project (B-2500) project area will be constantly re-assessed to determine whether the next project phase should be implemented.

- The NEPA/Section 404 Merger Process will be used to study, select, and finalize future phases. (The NEPA/Section 404 Merger Process is described in Section 6.2.)

2.0 Description of Phase IIa Alternatives Analysis

2.1 NC 12 Alternatives Included in the Parallel Bridge Corridor with NC 12 Transportation Management Plan (PBC/TMP) Alternative

The alternatives listed below were previously assessed within the Parallel Bridge Corridor in the 2008 FEIS and 2010 EA. They are included in the PBC/TMP Alternative as potential phases beyond Phase I and are representative of the range of potential impacts of the PBC/TMP Alternative. Section 2.10 of the 2008 FEIS describes these Parallel Bridge Corridor alternatives in detail. In addition, Section 2.1 of the 2010 EA describes updates to the designs of several of these alternatives so as to address agency concerns about impacts to the Rodanthe Historic District. The alternatives are:

- Nourishment Alternative – NC 12 would remain in its current location and beach nourishment (combined with dune enhancement) would be used to maintain an adequate protective beach and dune system. Nourishment would occur in four locations, likely repeated at four-year intervals.

- Road North/Bridge South Alternative – NC 12 would be relocated as a road west of the forecast 2060 high-erosion shoreline in the north end of the Refuge. At the south end of the Refuge and in Rodanthe, NC 12 would be placed on a bridge west of Hatteras Island.

- All Bridge Alternative – NC 12 would be relocated onto a bridge west of the forecast 2060 high-erosion shoreline in the north end of the Refuge. At the south end of the Refuge and in Rodanthe, NC 12 would be placed on a bridge west of Hatteras Island.

- Phased Approach Alternatives – NC 12 would be elevated in its current easement onto a series of bridges within the Refuge and in Rodanthe. There are two options for the Phased Approach in Rodanthe. The Phased Approach/Rodanthe Nourishment Alternative includes a bridge that ends just south of the Refuge border and the use of beach nourishment to stabilize NC 12 in Rodanthe. The Phased Approach/Rodanthe Bridge Alternative includes a bridge in Rodanthe that ends just north of the Rodanthe Historic District (no beach nourishment).

All of these alternatives remain potential options for future phases, reflecting several basic approaches to addressing project need, including: addressing the threat to existing NC 12 by protecting the road from the natural forces (e.g., ocean overwash and beach erosion) that create the need for improvements; moving the road west on a road away from the shoreline affected by current and future erosion; and moving NC 12 to a bridge

either in the existing easement or west away from the shoreline affected by current and future erosion.

Based on the original alternatives listed above, four alternatives were considered as possible long-term improvements for the Phase IIa Pea Island inlet study area. As a Phase IIa alternative, all four alternatives would extend from the southern-most Refuge pond south to a point where NC 12 is not threatened by the forecast 2060 high-erosion shoreline (i.e., approximately 2.4 miles). This distance includes the entire area identified in the 2008 FEIS for this study area as geologically susceptible to breaches. The four alternatives considered for study at the Pea Island inlet are:

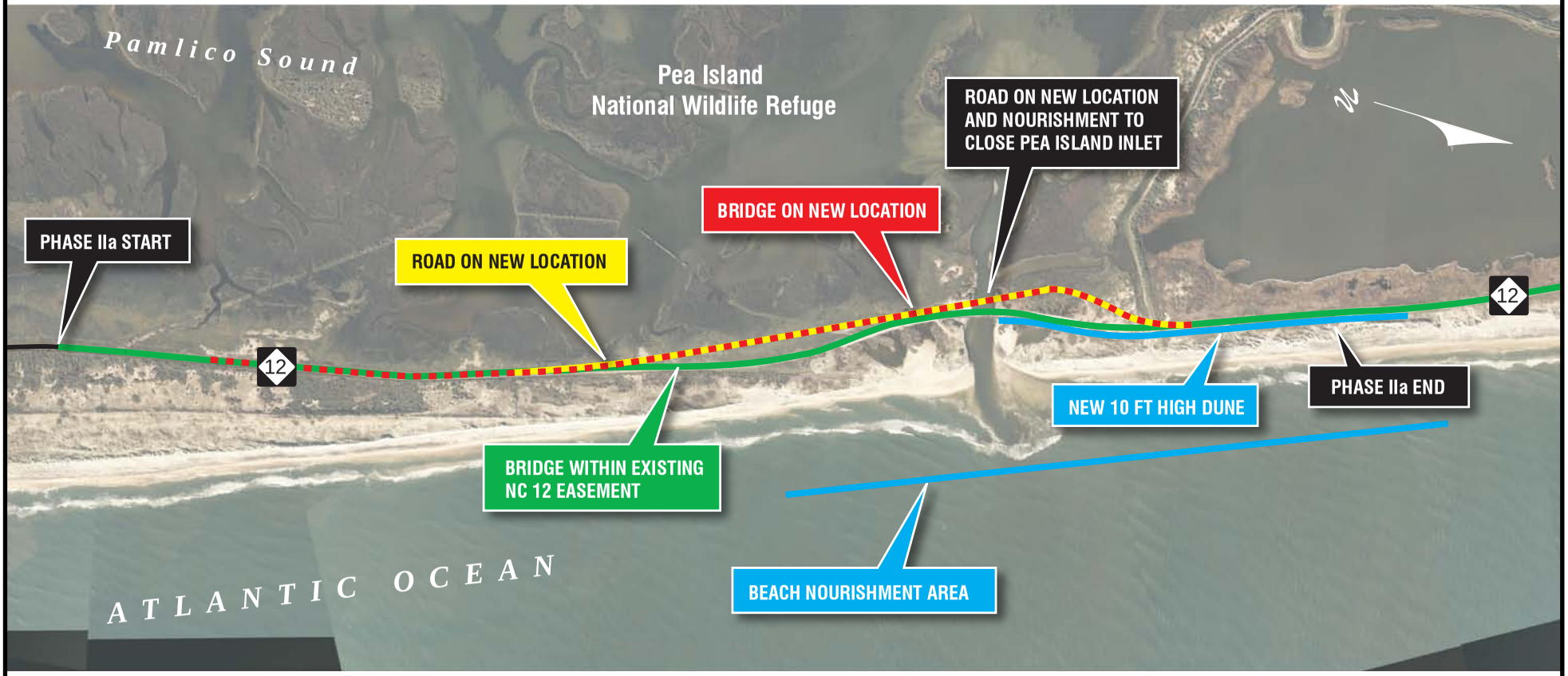
1. Beach Nourishment;
2. Bridge on New Location (from All Bridge Alternative);
3. Road on New Location (from Road North/Bridge South Alternative); and
4. Bridge within Existing NC 12 Easement (Phase III of Phased Approach Alternatives).

In the remainder of this EA for Phase IIa, these alternatives will be identified by their Phase IIa descriptive names above rather that the names used in previous environmental documentation. These four alternatives are illustrated in Figure 2. Figure 2 includes the alternatives assessed within the Parallel Bridge Corridor in the 2008 FEIS and 2010 EA that are included in the PBC/TMP Alternative as potential options for future phases. It does not include alternatives to the PBC/TMP Alternative that were suggested during scoping for this EA (i.e., the Pamlico Sound Bridge Corridor, the Ferry Alternative, and the bridge from Rodanthe to either Stumpy Point or Roanoke Island). Section 2.3 describes these alternatives and the reasons each was not studied in detail in this EA.

2.2 Scoping

Scoping activities completed as part of Phase II included an October 18, 2011 Merger Team meeting, the October 2011 Peer Exchange meeting, and three Citizens Informational Workshops:

- The October 18, 2011 Merger Team meeting was an informational/scoping meeting. The purposes of the meeting were for NCDOT to inform the Merger Team members about the initiation of Phase II following Hurricane Irene, as well as to allow agency representatives to provide scoping comments on impact issues and alternatives related to the two breach sites (i.e., Pea Island inlet and Rodanthe). The action items identified at the meeting were to: further address the merits of a Ferry Alternative (see Section 2.3.2); consult with the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act (ESA) of 1973 regarding the Atlantic sturgeon (see Sections 4.1.4 and 4.2.4.4); revisit the cost and financing of a bridge in the Pamlico Sound Bridge Corridor (see Section 2.6.1); and consider a "Seven-Mile



0 0.25 0.5 0.75 KM

0 0.25 0.5 Mile

Aerial date: October 21, 2011

Road on New Location
Bridge on New Location
Bridge within Existing NC 12 Easement
Beach Nourishment

ALTERNATIVES CONSIDERED

Figure 2

Bridge Alternative" (see Section 2.3.4). This meeting is described in Section 6.2.2.

- The purposes of the October 24 and 25, 2011 Peer Exchange meeting were to get feedback from a panel of coastal scientists and engineers on the four Parallel Bridge Corridor alternatives under consideration for the Phase IIa project area, as well as to get their suggestions on other potential alternatives for consideration (see Section 2.6.2 for a summary of the Peer Exchange meeting). In response to this request, the USFWS-Refuge representative suggested a "Seven-Mile Bridge Alternative" as a possible additional option (see Section 2.3.4 for a detailed discussion of the Seven-Mile Bridge Alternative, including the additional coordination that took place with USFWS-Refuge related to this alternative).

- Citizens Informational Workshops were held in Manteo (December 5, 2011) at the Dare County Administration Building, in Rodanthe (December 6, 2011) at the Rodanthe-Waves-Salvo Community Center, and in Ocracoke (January 5, 2012) at the Community Center. The purposes of the three workshops were to provide the public with an opportunity to review and revisit the alternatives considered in the 2008 FEIS and the 2010 EA, to consider their potential implementation at the two breach sites, and to suggest other alternatives that might be considered. Environmental issues also were discussed. These workshops are described in Section 6.1.1. Scoping comments were made related to project need and timing; reconsideration of the Pamlico Sound Bridge Corridor; reconsideration of a Ferry Alternative; consideration of bridges to Rodanthe originating at either Stumpy Point or Roanoke Island; potential impacts and merits of relocating NC 12 on a bridge either in a new NC 12 easement (within the Refuge or Pamlico Sound) or in the existing easement; potential impacts and merits of relocating NC 12 as a surface road; potential impacts and merits of beach nourishment; concerns about the length of the temporary bridge; utility relocation along NC 12; the potential impacts of a "Seven-Mile Bridge" Alternative; and the legality of phased decision-making.

2.3 Other Alternatives Considered Based on Public and Agency Comment During Scoping

Some public and agency scoping comments received at and following the December 2011 and January 2012 Citizens Informational Workshops for Phase II suggested that three alternatives previously rejected as detailed study alternatives be revisited: the Pamlico Sound Bridge Corridor Alternative, the Ferry Alternative, and a bridge from Rodanthe to either Stumpy Point or Roanoke Island. The following sections briefly describe each of these alternatives and the reasons that each was eventually screened out of additional study for Phase IIa.

2.3.1 Pamlico Sound Bridge Corridor

The Pamlico Sound Bridge Corridor consisted of a proposed bridge through Pamlico Sound (located as far as 5 miles to the west of Hatteras Island) that would have been approximately 17.5 miles in length. The total project length would have been 18 miles, including the bridge, as well as the approach roads at the northern and southern ends of the bridge structure. The southern terminus of the bridge would have been within the community of Rodanthe on Hatteras Island, and the northern terminus would have been at the northern terminus of the Bonner Bridge on Bodie Island, within the Cape Hatteras National Seashore (Seashore).

Section 2.2 of the 2010 EA describes in detail the reasons that the Pamlico Sound Bridge Corridor was eliminated as a detailed study alternative. The 2010 EA, as well as the 2009 Revised Final Section 4(f) Evaluation (Appendix G, beginning on page B-143 of the 2010 EA), concluded that this alternative would have to be funded over multiple STIP cycles in order to be constructed; however, this is not reasonable because the phases of the new bridge could not be opened to traffic until construction of the entire bridge was completed, and delaying replacement of the Bonner Bridge would ultimately create a safety issue because of its extremely low sufficiency rating (4 out of 100). In addition, delaying the start of construction of a replacement bridge until funds are available also would not be reasonable because of the poor condition of the Bonner Bridge. It is not possible to build this alternative in a single construction phase because funding a 17.5-mile bridge would require NCDOT to defer much needed maintenance improvements and other construction projects throughout Division 1 for a significant period of time. The Revised Final Section 4(f) Evaluation and the 2010 EA concluded that the Pamlico Sound Bridge Corridor was not a prudent alternative.

However, comments received following the Phase II Citizens Informational Workshops expressed continued support for the Pamlico Sound Bridge Corridor by six citizens and one organization (Southern Environmental Law Center). In addition, the US Army Corps of Engineers (USACE), in a January 5, 2012 letter, asked that NCDOT update the estimated costs of the Pamlico Sound Bridge Corridor Alternative.

Based on these comments, as well as USACE's request to revisit the estimated costs, NCDOT completed an updated cost estimate for a Pamlico Sound bridge. The 2012 cost estimates and financial analyses are presented in an October 24, 2012 report prepared by NCDOT titled *Bonner Bridge – NC 12 Transportation Management Plan Phase II – Pamlico Sound Bridge Corridor Cost Analysis*. This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/. The updated cost estimates were based on data generated by three independent consulting firms (AECOM Technical Services of NC, Michael Baker Engineering, and Armeni Consulting Services) with experience in the design and estimation of bridge replacement and design-build projects. The three consulting firms each provided updated construction

cost estimates for two scenarios of a Pamlico Sound bridge (see Section 2.6.1.2). The final design-build price of the Bonner Bridge replacement (Phase I of the PBC/TMP Alternative), as well as changes in the costs of materials and labor since the 2007 detailed estimates, were also considered in the 2012 figures. The methodology used to develop the updated cost estimates for the Pamlico Sound Bridge Corridor, as well as an analysis of funding sources, are described in detail in Section 2.6.1. The analysis of the 2012 Pamlico Sound Bridge Corridor estimates revealed that circumstances have not changed such that the Pamlico Sound Bridge Corridor would be a practicable alternative to the PBC/TMP Alternative. FHWA reviewed the updated costs in the October 2012 report and determined that the estimates were reasonable, based on current cost data. In addition, FHWA and USACE agreed with the conclusion reached by NCDOT that circumstances have not changed such that the Pamlico Sound Bridge Corridor is a practicable (under Section 404 of the Clean Water Act) or prudent (under Section 4(f) of the US Department of Transportation [USDOT] Act of 1966) alternative to the PBC/TMP Alternative. This issue was resolved during an October 29, 2012 meeting between USACE, FHWA, and NCDOT.

2.3.2 Ferry Alternative

A Ferry Alternative was first examined during the 1991 feasibility study for the Bonner Bridge Replacement Project (B-2500), but was not studied in detail in the 2008 FEIS for the reasons discussed in Section 2.2.6 of the 2008 FEIS. NCDOT concluded in the 2008 FEIS that the Ferry Alternative would:

- Result in a decrease in the present level of traffic service across Oregon Inlet, assuming ferry capacity was limited by a single ferry channel with no less than 10-minute headways between ferry arrivals and departures. (This was considered the minimum safe headway for a single ferry channel in order to minimize the risk that the ferries would collide.)

- Require extensive dredging to maintain a navigation channel approximately 3 miles long across Oregon Inlet (assuming a direct route from a Bodie Island terminal and around Bodie Island to a Hatteras Island terminal near the southern terminus of Bonner Bridge). This length would increase to as much as 18 miles if the Hatteras Island terminal for this alternative were placed at the existing emergency ferry dock at Rodanthe. The dredging needed to construct and maintain a ferry channel would substantially impact the natural environment (i.e., benthos, fisheries, and submerged aquatic vegetation [SAV]).

- Be substantially more expensive than a bridge alternative.

As a result of these drawbacks and limitations, FHWA and NCDOT determined that the Ferry Alternative was not a reasonable transportation alternative. As a result of infrastructure and coastal conditions within the Bonner Bridge Replacement Project (B-2500) project area following Hurricane Irene in August 2011, and pursuant to the

process set forth in the 2010 ROD, FHWA and NCDOT initiated planning for Phase II in accordance with the TMP and the NEPA/Section 404 Merger Process. An informational/ scoping Merger Team meeting was held in October 2011 in which participants were asked to provide comments on the portions of NC 12 breached during Hurricane Irene and the alternatives developed to date through the Bonner Bridge Replacement Project (B-2500) environmental studies. Three scoping Citizens Informational Workshops were also held in December 2011 and January 2012 to solicit public comments and suggestions for Phase II.

Resulting from the scoping process, the potential use of ferries was again suggested by six citizens and the Southern Environmental Law Center. In addition, the US Environmental Protection Agency (USEPA) requested that the use of ferries be reconsidered, and provided a partial list of vessels that it believed should be considered as part of the alternatives analysis.

As a result of the comments and requests for information, the Ferry Alternative was re-evaluated by FHWA with assistance from NCDOT, including:

- Updated assumptions for the Ferry Alternative, re-engaging NCDOT's Ferry Division personnel as appropriate;
- Updated cost estimates for a "modern" Ferry Alternative using conventional vessels;
- Considered using high-capacity, high-speed ferries; and
- Considered privatizing a ferry system for Hatteras Island in lieu of public-funded infrastructure.

The results are documented in a January 2013 report prepared by FHWA and NCDOT titled *Bonner Bridge – NC 12 Transportation Management Plan Phase II, Reconsideration of the Ferry Alternative Report for NC 12 Replacement of Herbert C. Bonner Bridge*. This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov /projects/bonnerbridgephase2/.

2.3.2.1 *Assumptions for the 2013 Ferry Alternative*

The historical assumptions underlying the Ferry Alternative were examined and updated as appropriate. The 2008 FEIS estimated the year 2002 annual average daily traffic (AADT) to be 5,400 vehicles per day (vpd) that cross Oregon Inlet using Bonner Bridge. A review of NCDOT AADT maps for the years 2001 to 2011 indicated that the AADT on Bonner Bridge has averaged around 5,200 vpd, with upward and downward fluctuations from year to year. Based on this review, FHWA and NCDOT concluded that the estimated AADT of 5,400 vpd used in previous NEPA documents is reasonably

close to actual conditions for analysis purposes. This AADT corresponds to an annual demand of approximately 2 million vehicles per year.

The 2008 FEIS also assumed the use of a Hatteras Class ferry vessel in the implementation of the Ferry Alternative based on prior discussions with the NCDOT Ferry Division. FHWA conferred with the NCDOT Ferry Division in late 2011 and throughout 2012 to reassess the use of a Hatteras Class ferry vessel, which is no longer being built. The NCDOT Ferry Division advised FHWA that, based on the vessel models currently in NCDOT's fleet, an updated analysis should assume a River Class ferry vessel would be used. A River Class vessel is capable of transporting 38 vehicles at a loaded draft depth of 4.5 feet. This draft depth is among the lowest of any conventional (or high-speed) vessels and, as a result, would require less dredging than other watercraft. Channel depth requirements would be approximately 10 to 12 feet.

Finally, previous conceptual ferry routes in the Bonner Bridge Replacement Project (B-2500) project area had ferry terminals located on Bodie Island to the north and Hatteras Island to the south. FHWA conferred with the NCDOT Ferry Division to revisit the conceptual route location, based in part on scoping comments from the Southern Environmental Law Center suggesting a potential route from the mainland to Hatteras Island, or a combination of routes from Bodie Island and the mainland to multiple points on Hatteras Island. Although such routes would have some potential technical advantages over a Bodie Island to Hatteras Island route, the purpose and need for the project cannot be met by these routes. Hence, FHWA and NCDOT developed conclusions based on a conceptual ferry route connecting Bodie Island directly to Hatteras Island.

2.3.2.2 *Conclusion for Updated "Conventional" Ferry Option*

Previous NEPA studies for the Bonner Bridge Replacement Project (B-2500) concluded that a Ferry Alternative from Bodie Island to Hatteras Island could not serve the current or future traffic demand of Hatteras Island based on a maximum safe operating capacity analysis. That maximum safe operating capacity analysis assumed ferry operations within only one navigation channel. The 2008 FEIS acknowledged that an additional ferry route could be operated in tandem with the conceptual route between Bodie Island and Rodanthe, but concluded that such a route would not be viable because of the increased need for ferry vessels and the additional dredging that would be necessary to maintain a second navigation channel.

FHWA and NCDOT have found no evidence that the demand to access Hatteras Island has substantively decreased following Hurricane Irene; nor is it expected to decrease in the long-term. Under the conditions that a Ferry Alternative would need to continue to serve approximately 2 million vehicles per year, the NCDOT Ferry Division estimates that 38 River Class vessels would be needed to provide the needed transport service.

This would more than double the number of vessels currently in use by the entire NCDOT Ferry Division.

Although the present demand for access between Hatteras Island and Bodie Island could be accommodated, the Ferry Alternative would still have serious flaws related to the stated purpose and need for the project. Diminished convenience to motorists would be expected because of ferry capacity constraints. Some motorists would be forced to structure their trips to avoid peak travel times or to forego travel between Hatteras Island and Bodie Island altogether. Provision of emergency and medical services would be adversely affected, emergency evacuation times increased, and public services such as waste management would be altered. These conclusions were reached in previous NEPA documents regarding a Ferry Alternative and remain valid for an alternative using state-of-the-industry conventional ferry vessels.

The NCDOT Ferry Division prepared a new estimate of the cost to provide service for 2 million vehicles per year across Oregon Inlet. The total estimated cost for installing, operating, and maintaining a ferry system that would service the current traffic demand for the first year is $664 million. Each year after, normal annual recurring costs are estimated to be $94.5 million. If this route were to be operated and maintained at the current traffic carrying capacity for the 50-year project life, the total estimated cost rises to $6.3 billion. These costs include the vessels, crew, docks, supporting facilities (including a new shipyard), terminal basin dredging, maintenance, and vessel replacement at 30 years.

From this information, FHWA and NCDOT concluded, once again, that the Ferry Alternative would be substantially more expensive than any other transportation alternatives under consideration. FHWA also notes that if a ferry service were divided between multiple origins and destinations as one commenter suggested, the cost of the service would not be reduced in that the same quantities of personnel and equipment would be required. In fact, it is likely that costs would increase because of the provision and maintenance of multiple ferry channels.

Previous NEPA documents had concluded that the Ferry Alternative would have significant impacts on the natural environment because of the extensive dredging that would be necessary to create and maintain the ferry channel and basins. FHWA and NCDOT reexamined this conclusion in light of any potential updates that may have been needed as a result of advances in conventional ferries or changes to the conceptual route. Although a Hatteras Class vessel was assumed for the Ferry Alternative in previous NEPA documents, the NCDOT Ferry Division now advises that a River Class vessel would be used along this route. Regardless of the change in vessel, the channel depth that would be required remains within the range of 10 to 12 feet in the main channel and approaches, with deeper dredging required in the ferry basins. Previous analyses had already accounted for extending the ferry route from a total length of

approximately 3 miles to a total length of approximately 18 miles to bypass areas prone to breaching and overwash between the northern end of Hatteras Island and Rodanthe.

Based on the updated analysis, it is still expected that the dredging that would be needed to construct and maintain an 18-mile-long route from the Oregon Inlet Marina Complex (Bodie Island) to Rodanthe would substantially and permanently impact SAV, shallow water habitat, primary and secondary nursery areas, and shell bottom habitat.

2.3.2.3 *Consideration of High-Speed Vehicle Ferries*

During the scoping process for Phase II of the Bonner Bridge Replacement Project (B-2500), some government agencies and members of the public suggested that advances in high-speed, high-capacity ferries could potentially make the Ferry Alternative competitive with other options studied in detail in the previous NEPA documents. FHWA conducted research on specific vessels suggested by commenters and further expanded its research to other high-speed ferry vessels in use in the United States and internationally. Relevant statistics on specific watercraft are included in a January 2013 report prepared by FHWA and NCDOT titled *Bonner Bridge – NC 12 Transportation Management Plan Phase II, Reconsideration of the Ferry Alternative Report for NC 12 Replacement of Herbert C. Bonner Bridge*. This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.

Two quadrimaran high-speed ferries that have similar vehicle-carrying capacity to NCDOT's River Class conventional vessels (38 vehicles), the CNM Evolution (Quebec, Canada, 30 vehicles) and Lake Express Ferry (Wisconsin-Michigan, 46 vehicles), have draft depths of 5 feet and 8.3 feet, respectively. These draft depths are equal to or greater than the draft depths for conventional vessels currently used by the NCDOT Ferry Division. In addition, the required channel depths for these high-speed vessels would likely have to be greater than those for conventional vessels to safely accommodate the higher cruising speed.

Other high-speed vehicle ferries with greater vehicle-carrying capacities (up to 341 vehicles) were researched by FHWA. However, all had draft depths ranging between 7.8 feet and 13.75 feet, notably deeper than a conventional River Class ferry vessel. Large expanses of Pamlico Sound on the western side of Hatteras Island have water depths less than 10 feet. Because the draft depths and required channel depths for high-speed ferries equal or exceed those for conventional vessels, the expected dredging requirements for these vessels make further consideration unreasonable. The updated research conducted by FHWA did not identify any vessel that meets all of the necessary requirements to be considered as a suitable alternative to NCDOT's River Class conventional vessels (e.g., shallow draft, high-speed, and capable of carrying large volumes of cars and trucks). Therefore, after examining the data gathered, FHWA concluded that advances in high-speed, high-capacity vehicle ferries have not yet

reached a level that would make a Ferry Alternative competitive with other options in the Bonner Bridge Replacement Project (B-2500) project area.

2.3.2.4 *Consideration of High-Speed Passenger-Only Ferries*

It was suggested during Phase II scoping that passenger-only high-speed ferries should be considered as an alternative for the Bonner Bridge Replacement Project (B-2500). However, FHWA and NCDOT concluded that passenger-only vessels would not be a reasonable full-service transportation alternative given the rural character of the towns and villages along North Carolina's Outer Banks. Some commenters referred to passenger-only ferries that are used in New York City and Seattle, Washington as examples of viable passenger ferry concepts. In those metropolitan areas, the transportation infrastructure beyond the ferry terminals (e.g., mass transit, taxi service, sidewalks, etc.) makes passenger ferries a viable means of transportation for urban residents. New York City and Seattle also benefit from multiple other modes of access (rail, sea, roadway, and large airports). Again, however, the character, development, resources, and transportation infrastructure of the Outer Banks stands in stark contrast to that of areas where passenger-only systems are successful. The communities on Hatteras Island need a way for not only people to get to the island, but also freight, equipment, durable goods, supplies, food, and commercial products. As a result, FHWA and NCDOT concluded that passenger-only ferries would not meet the full-service transportation needs of the communities on Hatteras Island or the travelling public along the Outer Banks.

2.3.2.5 *Consideration of Privatized Ferry System*

During Phase II scoping, it was suggested that a privately owned and operated ferry system should be considered because the costs of new ferry technologies would be borne by the private sector, not the government. However, it is not reasonable to presume that a private ferry system could provide the needed capacity to service the communities on Hatteras Island without encountering the environmental and economic challenges (e.g., extensive dredging and extraordinarily high costs) that also would be attributable to a publicly-funded Ferry Alternative.

If private operators provided a ferry system, they would expect to make a profit. If they could not, the ferry service would need to be subsidized by the State of North Carolina. To meet the 50-year cost of transporting 2 million vehicles per year via ferry (i.e., $6.3 billion), and without factoring in any profit margin, the average one-way ferry trip would cost approximately $63 per vehicle (or $126 round-trip). In comparison, the highest price currently charged by NCDOT for a passenger vehicle is $15 one-way (or $30 round-trip).

2.3.2.6 *Conclusions*

Based on the additional research and analysis of ferries that was completed in 2013 to address comments from USEPA and others, the reasons that the Ferry Alternative was eliminated from detailed study remain valid, as follows:

- A Ferry Alternative that accommodates the current annual traffic demand, 2 million vehicles per year, would still diminish convenience to motorists because of vessel travel speeds and loading logistics. Motorists wishing to access Hatteras Island and Bodie Island would be forced to alter timing of trips or even forgo travel between the islands at times. The provision of basic emergency, medical, and public services would also be adversely affected by the Ferry Alternative.

- The Ferry Alternative would be far more expensive than the alternatives studied in detail.

- The Ferry Alternative would require extensive dredging in Oregon Inlet and Pamlico Sound to create and maintain navigation channels. The dredging depth that would be required with a River Class vessel remains within the range of 10 to 12 feet in the main channel and approaches, with deeper dredging required in the ferry basin. Since advances in conventional ferries have not resulted in a reduction in vessel draft depths that would change the required channel depth, it is still expected that the dredging that would be needed to construct and maintain an 18-mile-long route from the Oregon Inlet Marina Complex (Bodie Island) to Rodanthe would significantly and permanently impact SAV, shallow water habitat, primary and secondary nursery areas, and shell bottom habitat. The expected magnitude of dredging and associated impacts to shallow-water resources make the use of conventional vessels as an alternative unreasonable.

- Advances in high-speed, high-capacity vehicle ferries have not yet reached a level that would make such a Ferry Alternative competitive with other options in the Bonner Bridge Replacement Project (B-2500) project area. The draft depths of the vessels researched by FHWA are equal to (at best) or greater than draft depths for the conventional vessels currently in use by the NCDOT Ferry Division. The dredging requirements for conventional vessels have been determined by FHWA and NCDOT to be prohibitively high, and the dredging requirements for high-speed vehicular ferries would offer no advantage over conventional vessels.

- Passenger-only vessels are not a reasonable transportation alternative given the rural character of the towns and villages along North Carolina's Outer Banks. Commenters referred to passenger ferries that are used in New York City and Seattle, Washington for mass transit as examples of viable passenger-only ferry concepts. In those metropolitan areas, the transportation infrastructure beyond the ferry terminals (e.g., mass transit, taxi service, sidewalks, etc.) makes passenger

ferries a viable means of transportation for urban residents. However, the character, development, resources, and transportation infrastructure of the Outer Banks stands in stark contrast to that of both New York City and Seattle. As a result, passenger-only ferries would not meet the full-service transportation needs of the communities on Hatteras Island or the travelling public along the Outer Banks.

- Regarding a private ferry system, it is not reasonable to presume that a private ferry system could provide the needed capacity to service the communities on Hatteras Island without encountering the environmental and economic challenges discussed above related to a publicly-owned ferry system.

Based on the 2013 re-evaluation of the Ferry Alternative, FHWA and NCDOT determined that the use of ferries to meet the transportation needs of Hatteras Island remains an unreasonable transportation alternative.

2.3.3 Bridge from Rodanthe to Either Stumpy Point or Roanoke Island

Public comments received from two citizens following the Phase II Citizens Informational Workshops expressed continued support for a bridge from Rodanthe to either Stumpy Point or Roanoke Island. However, neither of these proposed alternatives would meet the project's purposes and needs. The Final Section 4(f) Evaluation in the 2008 FEIS examined a bridge from Rodanthe to either Roanoke Island (near Wanchese) or the mainland (at Stumpy Point) as an alternative to avoid the use of Seashore lands (see Section 5.3.2 of the 2008 FEIS). However, it was determined that only the Roanoke Island terminus (near Wanchese) of such an alternative would avoid using Section 4(f) property because the mainland terminus (at Stumpy Point) would require using land from another Section 4(f) property – the Alligator River National Wildlife Refuge (ARNWR). As discussed in Section 5.3.2 of the 2005 Supplemental Draft Environmental Impact Statement (SDEIS), a mainland terminal at Stumpy Point would cause environmental impacts to ARNWR because of the anticipated upgrades to US 264 and SR 1100, such as wider lanes and shallower curves that would be required to safely accommodate increased traffic volumes. The total distance between US 64 and SR 1100 along US 264 is approximately 12.5 miles, and US 264 passes through ARNWR for approximately 11 miles of this distance. The additional right-of-way required to widen US 264 would use land from ARNWR. The additional right-of-way required also would lead to the loss of wetlands along almost the full 12.5 miles of US 264 to be widened, resulting in a taking of as much as 15 acres of wetlands by NCDOT. Further, the improvements to SR 1100 between US 264 and the existing emergency ferry terminal at Stumpy Point would use land from ARNWR for a distance of 0.4 mile. In addition, the improvements to SR 1100 would impact the Stumpy Point community because the roadway would be brought closer to homes that currently line SR 1100, and some residents would be displaced. The introduction of thoroughfare traffic volumes into the community would disrupt the community's character. Therefore, this also is not a reasonable alternative for the Bonner Bridge Replacement Project (B-2500).

The bridge from Rodanthe to Roanoke Island also was determined not to be a feasible and prudent Section 4(f) avoidance alternative for the same reasons that were explained in Section 5.3.2 of the 2008 FEIS: it would not meet the project's purposes and needs; it would result in severe disruption to the established community of Wanchese; it would result in the loss of a direct connection from Hatteras Island to the only hospital serving the area located on Bodie Island, which would severely impact the operations of emergency services from Hatteras Island; and it would require substantial utility relocation. Therefore, this also is not a reasonable alternative for the Bonner Bridge Replacement Project (B-2500).

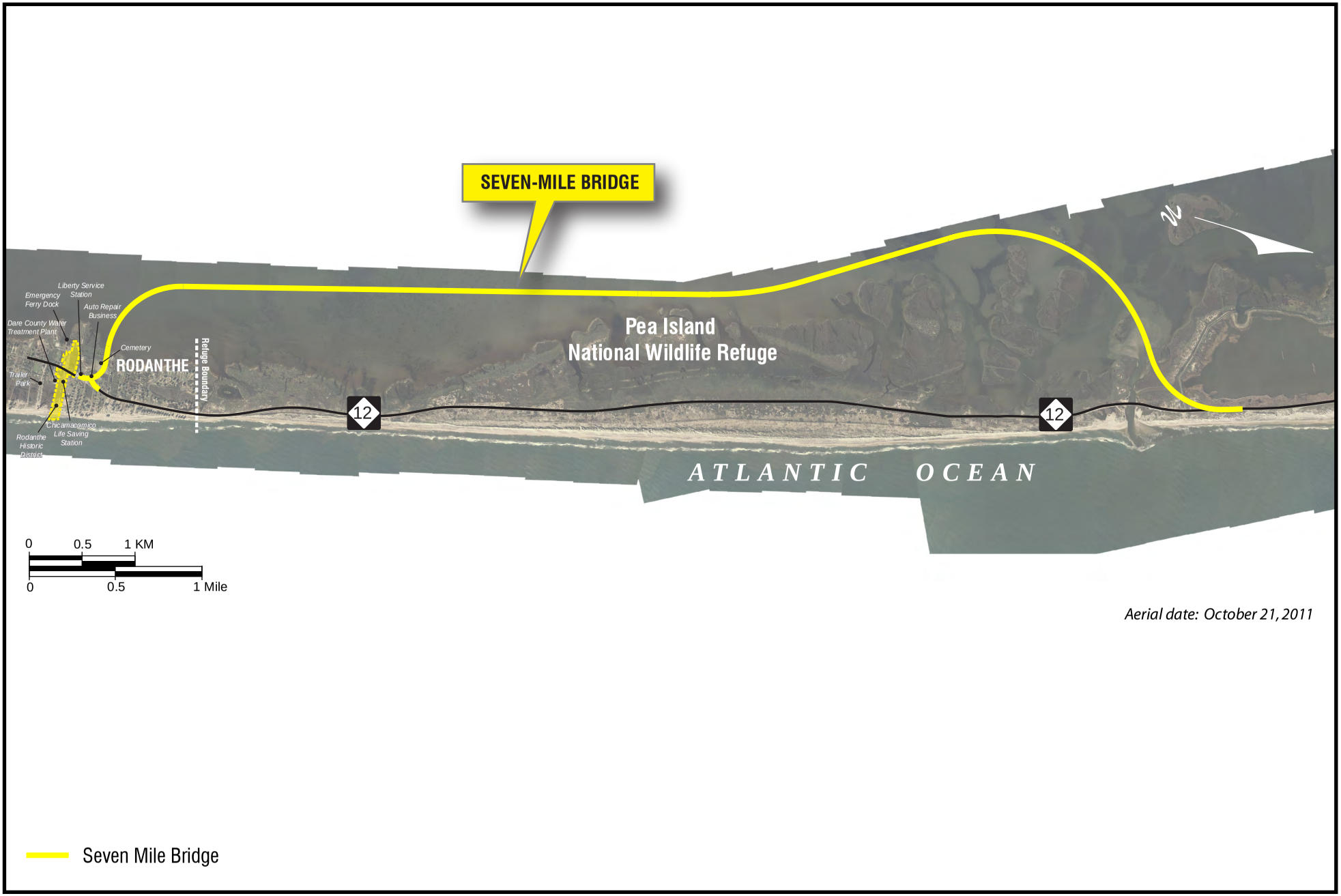
2.3.4 Seven-Mile Bridge Alternative

At the October 24 and 25, 2011 Peer Exchange meeting (see Section 2.6.2), a bridge beginning north of the Pea Island inlet through Pamlico Sound and ending in Rodanthe was suggested by the USFWS-Refuge representative as a possible alternative to address both Phase II breach sites . This alignment was suggested because the "Seven-Mile Bridge" would relocate NC 12 from the southern portion of the Refuge (i.e., south of the ponds) and could possibly be considered by USFWS-Refuge to be a "minor modification" to the existing NC 12 easement.

At the December 15, 2011 Merger Team meeting, the Team agreed that, although there were several issues that NCDOT still needed to consider concerning the USFWS-Refuge-proposed Seven-Mile Bridge Alternative (e.g., whether NCDOT could fund construction and long-term maintenance), NCDOT and USFWS-Refuge should move forward with further discussions about this alternative to determine if it should be pursued further with the Merger Team. As conceptualized, the general alignment of the Seven-Mile Bridge Alternative involved NC 12 leaving the Refuge at the southern end of the ponds, just north of the Pea Island inlet. It would extend westward beyond the Refuge and Seashore western boundaries and continue south to Rodanthe for a distance of about 7 miles. This alternative would substantially reduce the portion of NC 12 within the Refuge. Potential complications regarding the Seven-Mile Bridge Alternative included minimizing the amount of new easement that would be required to safely enable NC 12 to leave the Refuge at the southern end of the ponds, cost, and the environmental impacts within Pamlico Sound, the Seashore, and the Refuge.

At a field review meeting attended by USFWS-Refuge, USACE, and NCDOT staff on January 11, 2012, USFWS-Refuge provided NCDOT with a proposed location where the Seven-Mile Bridge might be allowed to leave the existing easement, cross Refuge lands, and enter the Pamlico Sound. Based on this meeting, NCDOT developed a conceptual alignment (see Figure 3) for the Seven-Mile Bridge Alternative.

In developing the conceptual alignment for the Seven-Mile Bridge Alternative that would minimize the new easement required for NC 12, the following assumptions were made:



SEVEN-MILE BRIDGE ALTERNATIVE

Figure 3

- Follow the location suggested by USFWS-Refuge as closely as possible and minimize the amount of Refuge land used.

- Place NC 12 onto a bridge by the time it leaves the current easement.

- Use a design speed of 55 mph (the speed limit on NC 12 through the Refuge). This determines the alignment of the horizontal curves used in the design of the bridge, including transitioning from the existing NC 12 easement into Pamlico Sound.

These assumptions take into account the need to minimize the use of Refuge lands, as well as the need to provide a project that meets design criteria appropriate for safe vehicle operation on NC 12.

The conceptual design developed by NCDOT showed the proposed new NC 12 easement (100 feet in width) impacting approximately 2,960 linear feet (this is a distance of almost 0.6 mile) of Refuge property, or an area totaling approximately 6.7 acres. The length of existing NC 12 easement that could be returned to the Refuge if the Seven-Mile Bridge Alternative was implemented is approximately 5.8 miles, or an area totaling approximately 70.7 acres.

A meeting was held between NCDOT, FHWA, USACE, and USFWS-Refuge on February 9, 2012 to discuss the conceptual design developed by NCDOT for the Seven-Mile Bridge Alternative. At this meeting, the concerns of the various agencies involving the Seven-Mile Bridge Alternative were discussed (see bulleted list below next paragraph). Based on these concerns, NCDOT, FHWA, and USFWS agreed that the Seven-Mile Bridge Alternative should be dropped from further consideration. USFWS agreed that from its perspective, no further information or analysis was needed for this alternative. The agencies also agreed that NCDOT would prepare a meeting packet for the March 21, 2012 Merger Team meeting containing cost information for the Seven-Mile Bridge Alternative, along with documentation as to why it should not be considered for further evaluation for Phase II.

At the March 21, 2012 Merger Team meeting, NCDOT presented its recommendation to the Team that the Seven-Mile Bridge Alternative should not be carried forward as a detailed study alternative or the Preferred Alternative because it was unreasonable, based on the following concerns:

- Construction costs and non-affordability. The high construction costs (between approximately $289 and $440 million) would have a substantial impact on NCDOT's current financial commitments (see Section 2.6.1.3). As a result, this alternative was unaffordable. At the meeting, NCDOT said that it recognizes that the construction costs of the individual alternatives at the Pea Island inlet and at Rodanthe added together equal approximately 2/3 of the construction costs of the Seven-Mile Bridge Alternative. However, the construction of those individual alternatives could be

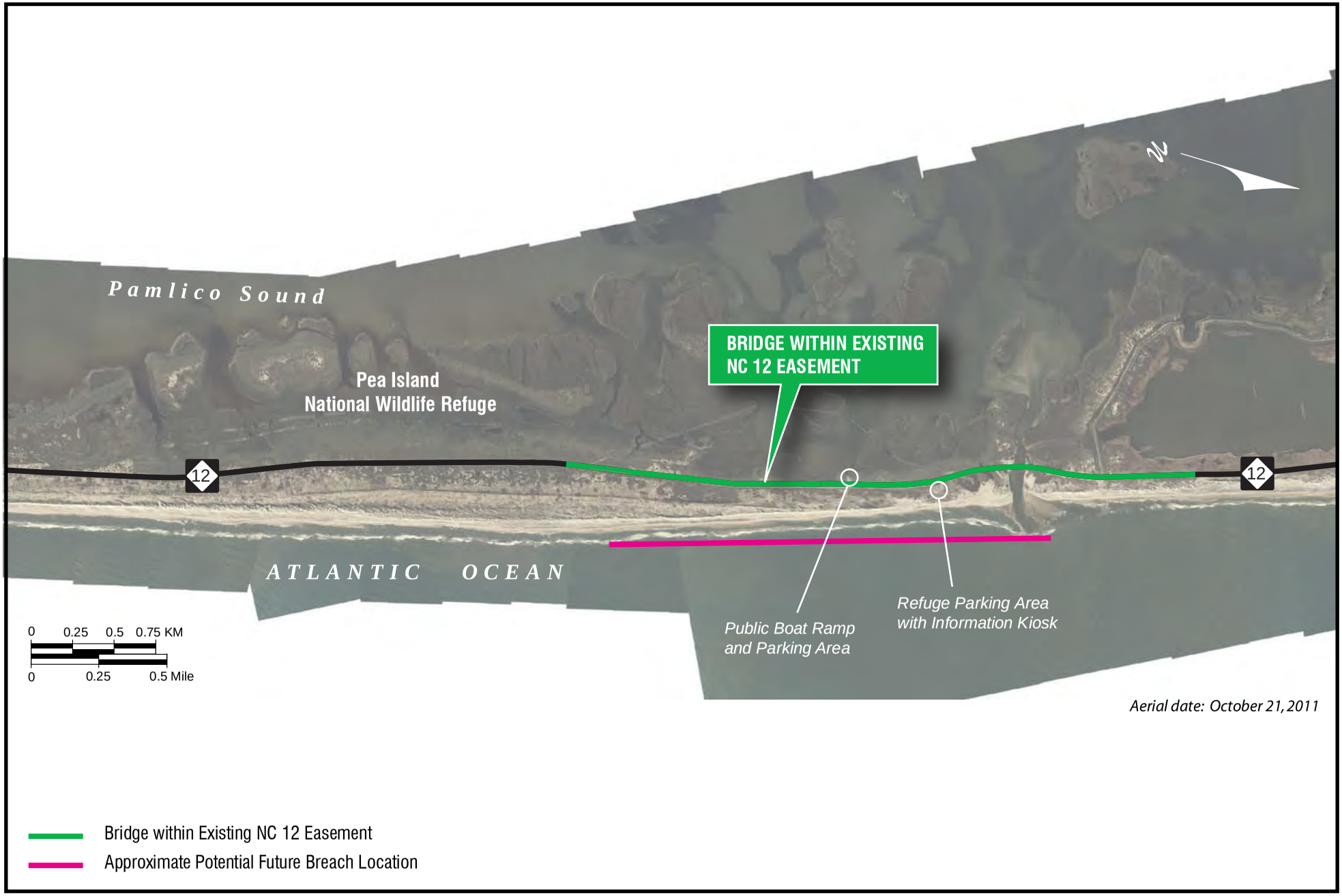
phased, and each phase could be opened to traffic prior to the completion of the other phase. While construction of the Seven-Mile Bridge could be phased, the entire bridge could not be opened to traffic until all phases of construction were completed.

- Impacts to the dike around the southern-most Refuge pond. This is a feature of the Refuge's National Register-eligible historic landscape. FHWA determined that if the Seven-Mile Bridge Alternative would cross the dike, the crossing would be a permanent use of a resource that contributes to the Refuge's National Register-eligibility.
- Impacts to SAV habitat in Pamlico Sound. SAV beds occur throughout the shallow portions of Pamlico Sound (and near the Oregon Inlet), and form a complex and important ecosystem. The portion of Pamlico Sound immediately behind Hatteras Island is primarily SAV habitat. The Seven-Mile Bridge Alternative would be situated within this habitat for most of its length. The presence of the bridge also could influence the location and the amount of SAV in this area.

At the March 21, 2012 Merger Team meeting, USFWS-Refuge confirmed its February 9, 2012 agreement to move forward with Phase II without the Seven-Mile Bridge Alternative when it did not object to FHWA's and NCDOT's proposal to carry forward the Bridge within Existing NC 12 Easement Alternative (Phase IIa Preferred Alternative). (See Section 6.3.5 and the meeting minutes and issues briefs contained in Appendix A.) USFWS-Refuge stated at the March 21, 2012 meeting that it appreciated that NCDOT conducted further analyses of the Seven-Mile Bridge Alternative, because it was an option that USFWS-Refuge felt needed to be considered.

2.4 Phase IIa Preferred Alternative (Bridge within Existing NC 12 Easement) and Reasons It Is Preferred

At the November 14, 2012 Merger Team meeting, the Team reached consensus that, from among the alternatives described above, the Bridge within Existing NC 12 Easement Alternative (see Figure 4) would be carried forward as the sole detailed study alternative and the Least Environmentally Damaging Practicable Alternative (LEDPA) for Phase IIa. The LEDPA also is FHWA's and NCDOT's Preferred Alternative in this EA. FHWA, NCDOT, USACE, the North Carolina Department of Environment and Natural Resources (NCDENR)-Division of Water Quality (DWQ), the North Carolina Department of Cultural Resources (NCDCR), and NCDENR-Division of Coastal Management (DCM) signed the Merger Team concurrence forms. USEPA, USFWS, USFWS-Refuge, NMFS, the National Park Service (NPS), NCDENR-Division of Marine Fisheries (DMF), and the North Carolina Wildlife Resources Commission (NCWRC) abstained (see Section 6.2 for the Merger Process definition of abstention). The concurrence forms are included in Appendix A.



BRIDGE WITHIN EXISTING NC 12 EASEMENT ALTERNATIVE

Figure 4

The Phase IIa Preferred Alternative would involve building a bridge in the existing NC 12 easement approximately 2.1 miles in length to replace the existing surface road and the temporary bridge over the Pea Island inlet. The total approximate length of Phase IIa (including approaches) is 2.4 miles.

The reasons for the selection of the Phase IIa Preferred Alternative include: it would be designed to account for the potential expansion and migration of the current inlet in the future; it would bridge the entire area considered geologically susceptible to breaches in the Pea Island inlet area (see Figure 4); it would account for shoreline movement in the area; it would bridge wetlands in the area; and it would have fewer adverse impacts than the other Parallel Bridge Corridor alternatives that were considered for this phase (see discussion below). Herein, the Phase IIa Preferred Alternative is described in detail in Chapter 3.0, and its potential impacts are discussed in Section 4.2.

The remaining alternatives discussed in Section 2.1 were eliminated from further consideration for the following reasons:

- Beach Nourishment – This alternative was eliminated because of uncertainties related to the availability of a suitable sand source over the project's estimated 50-year life (i.e., through 2060); it would necessitate the closure of the Pea Island inlet by NCDOT; it would not adequately protect NC 12 from potential future breaches/ inlets (either from ocean or sound-side [such as Hurricane Irene] storm surges, although the dunes associated with this alternative would reduce the risk of a breach occurring) in this area since NC 12 would remain at-grade; it would not allow natural island processes to occur; and, based on the opinions of USFWS representatives, it is not likely to be found compatible with the Refuge's mission and purpose.

- Road on New Location – This alternative was eliminated because it would necessitate the closure of the Pea Island inlet; it would not adequately protect NC 12 from the formation of potential future inlets in this area since NC 12 would remain at-grade and would be susceptible to breaches either from ocean or sound-side (such as Hurricane Irene) storm surges; and, based on the opinions of USFWS representatives, it is not likely to be found to be compatible with the Refuge's mission and purpose.

- Bridge on New Location – This alternative was eliminated because, based on the opinions of USFWS representatives, it is not likely to be found to be compatible with the Refuge's mission and purpose, and it would impact an historic resource – the southern dike around a Refuge pond.

2.5 Phase IIa Preferred Alternative Cost and Financing

Following the December 15, 2011 Merger Team meeting, NCDOT updated the construction cost estimates for the Phase II alternatives under consideration. Consistent with the cost estimates included in the 2008 FEIS, a "low" and "high" construction cost estimate was prepared to reflect a range of possible structure types and construction techniques. The Phase IIa Preferred Alternative's construction cost was estimated to range from $86 million to $127 million (2011 dollars). In May 2012, NCDOT developed an additional construction cost estimate for this alternative that is based on the proposed final design. This new estimate is $98 million (2012 dollars), including removal of the temporary bridge. No right-of-way cost is expected with the Phase IIa Preferred Alternative.

Phase IIa would be funded through existing federal and state funding sources available to transportation projects and allocated to Division 1 in the STIP. In addition, FHWA advised NCDOT that a portion of the cost of Phase II (including Phase IIa and Phase IIb) may be eligible for reimbursement under federal Emergency Relief[1] (ER) funding. The amount of ER funding available for Phase II will depend upon the scope of the long-term solution as compared to the original damage as a result of the storm. FHWA estimates that 34 percent of the long-term solution at the Pea Island inlet site (Phase IIa) will be eligible for ER funding.

Phases I (Bonner Bridge Replacement), IIa (Pea Island inlet) and IIb (Rodanthe breach) have all been allocated funding in the current (2012 to 2018) STIP. Therefore, the construction of Phase I should proceed as soon as all permits are received, and Phase II would be implemented as soon as possible to meet the construction contract award deadline of August 2013 to qualify for ER funding.

2.6 New Studies

2.6.1 New Cost Estimates for the Pamlico Sound Bridge Corridor

The Pamlico Sound Bridge Corridor Alternative was dropped from consideration as a detailed study alternative in the 2010 EA. As stated in Section 2.2 of the 2010 EA (pages 2-11 to 2-12): "To summarize the detailed Refuge avoidance alternative analysis

[1] The FHWA Emergency Relief Program is a special program from the Highway Trust Fund for the repair or construction of federal-aid highways and roads on federal lands that have suffered serious damage as a result of natural disasters or catastrophic failures from an external cause. The funding supplements the commitment of resources by states to help pay for unusually heavy expenses resulting from extraordinary conditions (i.e., damage to highways must be severe, occur over a wide area, and be unusually expensive to the highway agency).

contained in Appendix G of the Revised Final Section 4(f) Evaluation, implementation of any of the Pamlico Sound Bridge Corridor alternatives would require financing in its entirety a single construction phase costing between $942.9 million and $1.441 billion (2006 dollars). The project could not be financed by phasing construction (i.e., spreading out the cost over many years) because much of the 17.5-mile (28.2-kilometer) long bridge would be approximately 5 miles (8 kilometers) west of Hatteras Island in Pamlico Sound, so there would be no point at which to tie a partial bridge into existing NC 12 to make it operational. Funding construction of a 17.5-mile (28.2-kilometer) long bridge would create a unique maintenance problem of extraordinary magnitude for NCDOT as it would have to defer much needed improvements on the remainder of the state highway system in North Carolina for a significant period of time. Therefore, the Pamlico Sound Bridge Corridor alternatives are not carried forward as detailed study alternatives because they are not feasible and prudent avoidance alternatives."

The winning design-build bid for Phase I of the Bonner Bridge Replacement Project (B-2500) was $216 million, which is approximately 18 percent lower than the low Phase I construction cost estimate reported in Section 3.4 of the 2010 ROD ($265 million). Based on this lower cost, NCDOT was asked by USACE in a January 5, 2012 letter to provide an updated cost estimate and construction timeline for the Pamlico Sound Bridge Corridor Alternative, as well as to identify any additional revenue sources that could be used to fund that alternative. In addition, the Southern Environmental Law Center submitted a letter to NCDOT on January 20, 2012 in which it estimated the cost of the Pamlico Sound Bridge Corridor to be $553 million to $846 million. In response to these requests and comments, NCDOT reassessed the cost estimates and funding options for the Pamlico Sound Bridge Corridor in conjunction with Phase II scoping in order to determine whether the estimated costs for a Pamlico Sound bridge had changed enough to change previous practicability and prudence conclusions related to Section 404 of the Clean Water Act and Section 4(f) of the Department of Transportation Act of 1966. The new cost estimates and financial analyses were presented in an October 24, 2012 report prepared by NCDOT titled *Bonner Bridge – NC 12 Transportation Management Plan Phase II – Pamlico Sound Bridge Corridor Cost Analysis*. This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.

The cost analysis revealed that, over the four-year estimated construction period to build a bridge in the Pamlico Sound Bridge Corridor, the cost would be between $900 million and $1.172 billion with the Curved Rodanthe Terminus Alternative, and between $896 million and $1.166 billion with the Intersection Rodanthe Terminus Alternative. This would require at least 94 percent of the projected NCDOT Division 1[2] budget for years

[2] NCDOT Division 1 includes the following counties: Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Martin, Northampton, Pasquotank, Perquimans, Tyrrell, and Washington.

2014 to 2020. Alternative financing sources and methodologies also were assessed, including a longer construction period, toll revenue, Public-Private Partnerships, Transportation Infrastructure Finance and Innovation Act (TIFIA) loans, exemption from the state's Equity Formula under the Mobility Fund legislation, and changes under the Moving Ahead for Progress in the 21st Century (MAP 21) Act. However, no viable source or funding system was identified that would adequately fund construction of the Pamlico Sound Bridge and allow NCDOT to finance its operational needs statewide. Thus, a Pamlico Sound bridge remains extraordinarily expensive, impracticable, non-feasible, and imprudent. Information supporting the conclusions of the cost analysis and alternative financing study are presented in Sections 2.6.1.2 and 2.6.1.3, respectively.

The cost and financing study process was as follows:

- A review of all cost estimates developed during the Bonner Bridge Replacement Project's (B-2500) NEPA process. This review included construction, right-of-way, operations, and maintenance costs associated with the Pamlico Sound Bridge Corridor Alternative.

- Development of an updated (2012) cost estimate, accounting for changes in unit construction material prices, inflation, and in the design requirements and recommendations since the 2007 detailed cost estimates were prepared. As part of this effort, NCDOT solicited independent construction cost estimates from three national engineering consulting firms with experience in bridge construction projects. NCDOT then developed a new construction cost estimate based on data from the three engineering firms and the winning design-build bid for Phase I of the project.

- The new (2012) construction cost estimate was combined with new estimated costs for bridge demolition and operations and maintenance of a Pamlico Sound bridge to provide an updated estimate of all costs associated with a bridge in the Pamlico Sound Bridge Corridor for a 50-year service life.

- A review of federal and state funding sources that could be used to fund both the construction and maintenance of STIP Project No. B-2500 in order to determine the impact of the Pamlico Sound Bridge Corridor Alternative on NCDOT's Division 1 budget.

2.6.1.1 *Cost Estimate History*

NCDOT has prepared a series of estimates that account for the costs associated with the actual construction, the purchase of property, and the operations and maintenance of a bridge within the Pamlico Sound Bridge Corridor over the project's anticipated 50-year service life. The cost estimates (since 2002) are summarized in Table 1 and Table 2 for the two Pamlico Sound Bridge Corridor alternatives.

Table 1. Pamlico Sound Bridge Corridor Curved Rodanthe Terminus

Year	Reason	Construction Cost		Operations and Maintenance[2]	Right-of-Way
		Low	High		
2003	Preliminary Cost	$294,300,000		N/A	$5,601,000
2005	SDEIS	$416,800,000		$1,200,000	$6,890,000
2007	SSDEIS	$933,500,000	$1.4 billion	$356,400,000	$6,890,000
2007	Verification	$997,000,000		N/A	N/A
2008	FEIS[1]	$933,500,000	$1.4 billion	$356,400,000	$6,890,000
2009	Section 4(f)[1]	$933,500,000	$1.4 billion	$356,400,000	$6,890,000
2010	EA & ROD[1]	$933,500,000	$1.4 billion	$356,400,000	$6,890,000

[1]Document used the 2007 SSDEIS estimate. A preliminary update was prepared in March 2009; in this estimate, the Pamlico Sound Bridge Corridor was estimated to cost between $1.059 billion and $1.625 billion (2009 dollars).
[2]All costs through 2060.

Table 2. Pamlico Sound Bridge Corridor Intersection Rodanthe Terminus

Year	Reason	Construction Cost		Operations and Maintenance[2]	Right-of-Way
		Low	High		
2003	Preliminary Cost	$292,600,000		N/A	$2,102,000
2005	SDEIS	$414,200,000		$900,000	$5,245,000
2007	SSDEIS	$929,000,000	$1.4 billion	$356,000,000	$5,245,000
2007	Verification	$997,000,000		N/A	N/A
2008	FEIS[1]	$929,000,000	$1.4 billion	$356,000,000	$5,245,000
2009	Section 4(f)[1]	$929,000,000	$1.4 billion	$356,000,000	$5,245,000
2010	EA & ROD[1]	$929,000,000	$1.4 billion	$356,000,000	$5,245,000

[1]Document used the 2007 SSDEIS estimate. A preliminary update was prepared in March 2009; in this estimate, the Pamlico Sound Bridge Corridor was estimated to cost between $1.059 billion and $1.625 billion (2009 dollars).
[2]All costs through 2060.

NCDOT reviewed each construction cost estimate prepared for the Pamlico Sound Bridge Corridor Alternative and the assumptions associated with each estimate. Changes in the construction cost estimates typically occurred for the following reasons:

- Changes in unit prices associated with bridge construction (NCDOT estimates the construction cost of a bridge based on cost per square foot of bridge deck, not unit prices), primarily as a result of inflation;
- The application of design-build, construction risk, and other inflationary factors, which were updated with each estimate based on other similar project bids nationwide; and
- Changes in design assumptions for a bridge in the Pamlico Sound Bridge Corridor, including the bridge's dimensions and terminus options.

The construction costs substantially increased between the 2005 SDEIS and the 2007 Supplement to the Supplemental Draft Environmental Impact Statement (SSDEIS). NCDOT revised the construction cost estimates prior to the 2007 SSDEIS based on feedback from several contracting and consulting industry representatives and data on continuing inflationary pressure. The 2007 SSDEIS estimate reflected changes to the unit construction material prices and the addition of design-build inflation factors to account for this construction delivery method. NCDOT hired Finley Engineering in 2007 to conduct an independent preliminary construction cost estimate. The Finley Engineering estimate ($997 million) was consistent with those prepared by NCDOT. FHWA reviewed both the 2007 SSDEIS and the Finley Engineering construction cost estimates for the Pamlico Sound Bridge and determined them to be appropriate.

The operations and maintenance cost estimates (including maintenance of bridge, roadway, and traffic operations equipment recommended for long bridges) increased substantially between the 2005 SDEIS and 2007 SSDEIS. The 2005 estimate was found to inadequately account for the inspection and maintenance costs that would be required for a 17.5-mile structure in a marine environment. The 2007 estimate was developed on a unit (per-mile) basis in order to account for the length of the structure; it also included the cost of annual bridge inspections and maintenance, as well as a one-time major bridge rehabilitation project during the 50-year service life.

The 2007 SSDEIS construction, right-of-way, and operations and maintenance cost estimates were not updated for the 2008 FEIS because NCDOT still considered them to be valid. In 2009, FHWA determined that the Pamlico Sound Bridge Corridor Alternative was not a feasible and prudent avoidance alternative under Section 4(f) because, as stated on page 21 of the Revised 4(f) Evaluation (page B-21 of the 2010 EA), funding its construction "would create a unique maintenance problem of extraordinary magnitude for NCDOT as it would have to defer much needed improvements on the remainder of the State highway system in North Carolina for a significant period of

time." Therefore, the Pamlico Sound Bridge Corridor Alternative was not carried forward for further detailed study. Following this decision, NCDOT did not include any further updated cost estimates for this alternative prior to the approval of the 2010 ROD.

2.6.1.2 *Updated Cost Estimate*

NCDOT selected three consulting firms (AECOM Technical Services of NC, Michael Baker Engineering, and Armeni Consulting Services) with experience in the design and estimation of bridge replacement and design-build projects to provide updated construction cost estimates for two scenarios involving a long bridge in Pamlico Sound. Both construction cost update scenarios were based on the 2007 construction cost estimate that was prepared by Finley Engineering (see Section 2.12.1.2 of the 2008 FEIS on page 2-135). The first scenario, an update of Finley's estimate (to 2012 values), accounted for current unit material prices only. The second scenario, a more detailed update, accounted for both current unit material prices and any changes in design and construction requirements that were not included in the 2007 Finley estimate. The second scenario was based on the Bonner Bridge Replacement Project (B-2500) Phase I Final Request for Proposals. A summary of the estimates provided by the three firms is presented in Table 3.

Table 3. Summary of 2012 Contractor Estimates

Firm	Scenario 1[1]	Scenario 2
AECOM	$699,968,092	$1,068,068,482
Armeni	$749,868,482	$1,017,719,740
Baker	$809,258,154	$1,024,832,643

[1]As shown in Table 1, Finley Engineering's original 2007 estimate on unit material prices only was $997 million.

NCDOT then used the three consulting firms' estimates to develop new construction cost estimates for the Pamlico Sound Bridge Corridor alternatives with varying termini. The unit structure costs that are used in the NCDOT estimates were averages of the three estimates prepared by the consulting firms and the winning design-build bid for Phase I of Bonner Bridge Replacement Project (B-2500). The revised NCDOT construction cost estimates range from $878 million to $1.150 billion for a bridge with a Curved Rodanthe Terminus, and $876 million to $1.146 billion for a bridge with an Intersection Rodanthe Terminus.

The 2008 FEIS construction cost estimates were $933.5 million to $1.426 billion for a bridge with a Curved Rodanthe Terminus, and $929.1 million to $1.418 billion for a bridge with an Intersection Rodanthe Terminus. The updated NCDOT estimates are between 6 percent (low estimate) and 18 percent (high estimate) lower than the

construction costs for the Pamlico Sound Bridge Corridor Alternative presented in the 2008 FEIS.

The updated 2012 project costs for the Pamlico Sound Bridge Corridor alternatives that would need to be funded in the initial STIP project include the cost of bridge construction[3] determined by NCDOT, plus the costs for Bonner Bridge demolition, right-of-way acquisition, and operations equipment installation (see Table 4). Ongoing operations and maintenance would not be a part of the initial STIP project. The Bonner Bridge demolition cost was estimated at $10 million. Right-of-way costs ($6,890,000 for a bridge with a Curved Rodanthe Terminus and $5,245,000 for a bridge with an Intersection Rodanthe Terminus) were based on the estimates presented in the 2008 FEIS. The updated 2012 costs to install operations equipment to address safety concerns related to monitoring traffic and weather conditions on the bridge (e.g., closed circuit television cameras, variable message signs, highway advisory radio, and wind speed sensors) was estimated to be $5,085,000. The updated total 2012 project costs that would be funded in the initial STIP project (i.e., not including ongoing operations and maintenance) are $900 million to $1.172 billion for a bridge with a Curved Rodanthe Terminus, and $896 million to $1.166 billion for a bridge with an Intersection Rodanthe Terminus (see Table 4).

NCDOT also reassessed the ongoing operations and maintenance costs associated with the proposed 50-year service life, and determined it would cost $374 million for both Pamlico Sound Bridge Corridor alternatives (see Table 4), as compared to $356.1 to $356.4 million presented in the 2008 FEIS. These are costs associated with maintenance of the roadway approaches, annual bridge inspection/maintenance, one major rehabilitation, and traffic operations equipment recommended for long structures. With ongoing operations and maintenance costs for a 50-year service life included, the total 2012 estimated costs of the Pamlico Sound Bridge Corridor alternatives are $1.274 billion to $1.546 billion for a bridge with a Curved Rodanthe Terminus, and $1.270 billion to $1.540 billion for a bridge with an Intersection Rodanthe Terminus (see Table 4).

The estimated total 2012 costs for a bridge in the Pamlico Sound Bridge Corridor do not include costs associated with wetland and SAV mitigation, which would be funded at the time of construction. These estimates also do not include the additional non-highway public costs presented in the 2008 FEIS in Tables 2-11 and 2-12. The non-highway public costs considered were utility relocation, terminal groin removal (if

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[3] In its estimates, NCDOT assumed that the section of the Pamlico Sound Bridge that would span the navigable section of Oregon Inlet would be constructed with a segmental superstructure because of the height of the bridge and the ability to form longer span lengths with a segmental superstructure. It was assumed that the remainder of the bridge would be constructed using conventional I-beam girders.

Table 4. Construction, Maintenance, and Right-of-Way Cost Estimate (50-year service life)[1]

	Curved Rodanthe Terminus		Intersection Rodanthe Terminus	
	Low	High	Low	High
Construction	$878 million	$1.150 billion	$876 million	$1.146 billion
Bonner Bridge Demolition	$10 million		$10 million	
Right-of-Way[2]	$6,890,000		$5,245,000	
Operations (Installation)	$5,085,000		$5,085,000	
Subtotal (initial STIP project)	**$900 million**	**$1.172 billion**	**$896 million**	**$1.166 billion**
Operations and Maintenance (Ongoing, 50-years)	$374 million		$374 million	
Total	**$1.274 billion**	**$1.546 billion**	**$1.270 billion**	**$1.540 billion**

[1]Does not include costs associated with wetland and SAV mitigation, which would be funded at the time of construction. Estimate does not include the additional non-highway public costs assessed in the 2007 SSDEIS and 2008 FEIS.
[2]2007 SSDEIS estimate.

required), (former) Oregon Inlet US Coast Guard Station relocation (if required), Refuge visitor center relocation, and Refuge alternate access costs (as a result of the loss of direct access to the Refuge from NC 12).

2.6.1.3 *Funding*

The Bonner Bridge Replacement Project (B-2500) is eligible for federal transportation funding under the federal Bridge Program, the National Highway System program, the Surface Transportation Program, and the Equity Bonus program. Approximately 80 percent of the costs of all phases of the Bonner Bridge Replacement Project (B-2500) would ultimately be paid with federal transportation dollars. The remaining 20 percent of the construction costs would be funded with state transportation dollars through the North Carolina Highway Trust Fund. The separate North Carolina Highway Fund would be used to fund the ongoing maintenance and inspection of the Bonner Bridge Replacement Project (B-2500) after it is constructed.

The STIP is NCDOT's schedule for all major transportation improvement projects and their anticipated cost for a period of seven years. For the next STIP cycle (2014 to 2020), NCDOT estimates that $8.327 billion will be available for the entire state. The state's Equity Formula requires that STIP funds be distributed equitably among NCDOT's 14 divisions using a formula that factors population and the number of intrastate highway miles requiring improvements (see North Carolina General Statutes § 136-17.2A(a)).

Based on the Equity Formula calculation for the next STIP period (2014 to 2020) and on funds remaining from previous STIP periods, NCDOT's Division 1 (the 14-county area within which the Project is located) is estimated to have $953 million available for all transportation needs over the seven year period, (including new construction, large maintenance projects, roadway resurfacing, bridge replacements, and small projects).

NCDOT would need to have between $900 million and $1.172 billion over the four-year estimated construction period to fund the Curved Rodanthe Terminus option and between $896 million and $1.166 billion available over the same period to fund the Intersection Rodanthe Terminus option. In view of the $953 million estimated to be available between 2014 and 2020, construction of a Pamlico Sound bridge would require at least 94 percent of the Division 1 budget for those years. This assumes that the winning bid is consistent with NCDOT's low cost estimate for the bridge. Even if demolition of the Bonner Bridge and the installation of operations equipment were postponed to the next STIP period, a Pamlico Sound bridge would still require at least 93 percent of the Division 1 budget. Construction of a Pamlico Sound bridge would require NCDOT to defer much needed maintenance improvements and other construction projects throughout Division 1 for a significant period of time. A decision to build the Pamlico Sound Bridge is not reasonable in consideration of the projected bridge costs and the Division 1 projected budget.

The estimated high cost would exceed the amount available to Division 1 by $219 million. The percentage of the total Division 1 budget required to build a Pamlico Sound bridge would increase if NCDOT does not receive all of the revenue it currently estimates receiving for the 2014 to 2020 STIP. If the Pamlico Sound Bridge Corridor were implemented, and assuming the contract awarded was consistent with NCDOT's low estimate for the project, only a few small bridge replacements or other small projects could be funded amongst the 14 counties that comprise Division 1 during the 2014 to 2020 STIP period.

In addition to the initial construction cost of the Pamlico Sound Bridge Corridor, NCDOT estimates that a minimum of $5.9 million would be required annually to maintain the roadway approaches and the new bridge. That annual cost would increase by $84 million for a one-time major bridge rehabilitation project during the 50-year service life. Maintenance would have to be funded through the North Carolina Highway Fund.

When considering other funding sources, the following was found:

- Phasing the construction over a longer time period would allow for cost management. However, this is not a reasonable option because the new bridge could not be opened to traffic until construction of the entire bridge was completed, and delaying construction would ultimately create a safety issue because of the

extremely low sufficiency rating (4 out of 100) of Bonner Bridge and the short expected life cycle (5 years) of the temporary bridge over the Pea Island inlet.

- Project delivery through Public-Private Partnerships would require a project to have an outside stream of revenue in order to guarantee a return on investment. As the Pamlico Sound Bridge would not be tolled, state bonds would have to be issued against future state revenues, which would require a statewide public referendum.

- Use of TIFIA loans also would require a project to have an outside stream of revenue in order to guarantee a return on investment. The current capacity of Federal-aid backed Grant Anticipation Revenue Vehicles (GARVEE) bonds would not be adequate to fully fund the Pamlico Sound Bridge construction.

- Exemptions from the state's Equity Formula under the Mobility Fund legislation are for projects that "relieve congestion and enhance mobility" (see North Carolina General Statutes § 136-188(a)) . The Pamlico Sound Bridge project is not eligible for these funds.

- On July 6, 2012, President Obama signed into law MAP 21, which authorized federal transportation funding for fiscal years 2013 and 2014. NCDOT does not expect a notable increase in federal funding availability as a result of MAP 21. The law consolidates the Federal Fund programs from which NCDOT currently receives funds, but does not substantially change the amount of revenue that NCDOT will receive.

Finally, as of 2012, even without a 17.5-mile bridge in place, Division 1 is already experiencing a shortage of maintenance funding, in part because of the number of bridges within Division 1 that currently require more frequent maintenance because of their location within a coastal environment. The impact of the Pamlico Sound Bridge would grow over time, and would become more substantial as additional rehabilitation and maintenance is needed over the project's life.

Therefore, the construction of a Pamlico Sound bridge would still present a unique problem of extraordinary magnitude to NCDOT, reaffirming the conclusions in the 2009 Revised Final Section 4(f) Evaluation and the 2010 EA that the Pamlico Sound Bridge Corridor Alternative is neither a feasible and prudent nor practicable alternative.

2.6.2 Peer Exchange Meeting

2.6.2.1 *Meeting Purpose and Expected Outcomes*

On October 24 and 25, 2011, NCDOT assembled a panel of coastal science and engineering experts from FHWA, USACE, USFWS-Refuge, and several universities. As a part of the PBC/TMP Alternative, NCDOT committed to work together with USFWS to develop and assess alternative future scenarios, including possible site-specific events and remedies, in part through the implementation of a periodic Refuge habitat/NC 12

vulnerability study (see Section 3.3.2 of the 2010 ROD on page 14 and Project Commitment 17 in the 2010 ROD's Project Commitments on page A-3). USFWS also participated in the Phase II scoping process (see Section 6.2.2). The panel of experts was convened as a part of meeting this commitment in the context of the changes in the settings at both Pea Island and Rodanthe as a result of Hurricane Irene. The purposes of the meeting were to:

- Evaluate the changes in the setting at both Pea Island and at Rodanthe as a result of Hurricane Irene;
- Provide engineering advice regarding the design constraints of long-term options at both locations; and
- Identify any concerns regarding the future maintenance of NC 12.

The outcomes that NCDOT expected to gain from the meeting included:

- An evaluation of previous project area coastal and natural resource studies;
- A forecast of changes to the area setting;
- Recommendations of long-term options for the Pea Island site and the Rodanthe site; and
- Recommendations regarding future monitoring of coastal conditions.

2.6.2.2 *Peer Exchange Panel Members*

In order to assemble a Panel of coastal scientists and engineers with the knowledge and skill sets to assist decision-makers, NCDOT and FHWA, along with USFWS, suggested individuals to invite to participate in the Panel based on areas of expertise. The goal in selecting Panel members was to obtain a range of experience while also having those with specific knowledge of the project area. The Panel members who participated in the meeting were:

Dr. Robert Dolan
Professor
Department of Environmental Sciences
University of Virginia

Dave Henderson
Senior Hydraulic Engineer
FHWA

Dr. Margery Overton
Professor of Coastal and Environmental Engineering
Department of Civil, Construction, and Environmental Engineering
NC State University

Dr. Stan Riggs
Professor of Geology
Thomas Harriot College of Arts and Sciences
East Carolina University

Spencer Rogers
Coastal Construction and Erosion Specialist
NC Sea Grant

Dr. Max Sheppard
President
Ocean Engineering Associates, Inc.
Professor Emeritus
Coastal and Oceanographic Engineering Department
University of Florida

Dr. Greg Williams
Chief, Engineering Branch
USACE – Wilmington District

Dennis Stewart
Refuge Biologist
USFWS-Refuge

Staff members from NCDENR-DCM, FHWA, and NCDOT also attended the meeting to provide technical expertise and project background information, as well as to assist in facilitating the meeting.

2.6.2.3 *Peer Exchange Meeting Conclusions*

The Panel's overall general findings and recommendations relevant to Phase IIa were:

- Both the Pea Island and the Rodanthe breaches were caused by a soundside storm surge as a result of Hurricane Irene passing west of Hatteras Island in Pamlico Sound.

- Pea Island Inlet

  - At the Pea Island inlet, there will continue to be a risk of future beach erosion and storm-dependent inlet formation.

- The future of the Pea Island inlet, including whether it will close on its own or remain open, is uncertain. There was agreement that if the inlet remained open, it would migrate to the south. The inlet should be monitored and actions taken to protect the temporary bridge as needed. Sheet piling could be used to help close the inlet or help keep it from moving farther south.

- If constructing a bridge in the existing NC 12 easement, the height of the bridge should be determined based upon waves, tides, storm surge, and overwash. The bridge should span the New Inlet Complex (area geologically prone to inlet formation).

- The Panel agreed that nourishment is not a good long-term solution at the Pea Island inlet because it would not address the area's susceptibility to inlet formation.

- The Panel did not come to a consensus as to whether filling the inlet and re-building the NC 12 roadway in the existing easement was a good long-term solution, but the USFWS-Refuge representative did not like the idea of closing the inlet because of the Refuge's preference to let natural processes occur.

- Two other options, each suggested by individual panelists, were the construction of a bridge in the Pamlico Sound from just north of the Pea Island inlet to Rodanthe (approximately 6 to 7 miles in length) and the expansion of the existing NCDOT ferry system. The "Seven-Mile Bridge" through the Pamlico Sound is discussed in detail in Section 2.3.4.

- The Panel recommended possible strategies and data collection activities to assist with future coastal monitoring efforts in the Phase IIa project area, including monitoring the Pea Island inlet's future performance.

The Panel's findings and recommendations for the Rodanthe breach site will be documented and considered in a future NEPA document for Phase IIb. The Panel's full list of findings and recommendations, along with a summary of the Panel discussions at the Peer Exchange meeting, is presented in the final report *NC 12 Transportation Management Plan – Phase II, Peer Exchange Meeting for NC 12 Replacement of Herbert C. Bonner Bridge* (FHWA and NCDOT, June 2012). This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.

2.6.3 Updated 2060 Shoreline Forecast and Other Coastal Conditions Updates

A component of the PBC/TMP Alternative, selected for implementation in the 2010 ROD, is a coastal monitoring program that is designed to assist the agencies in deciding when the planning efforts for future phases of the Bonner Bridge Replacement Project

(B-2500) should begin. The coastal monitoring program includes detailed annual monitoring reports that summarize data collected by NCDOT and other state and federal agencies.

The study area for the coastal monitoring program includes the study areas for both the existing terminal groin monitoring program (developed in conjunction with USFWS, per the Permit issued in June 1989) and the Bonner Bridge Replacement Project (B-2500). The coastal monitoring program study area begins approximately one mile north of Oregon Inlet (at the Oregon Inlet Marina) and extends 12.5 miles south of Oregon Inlet to the community of Rodanthe. The monitoring program study area includes the entire width of Hatteras Island between the ocean and soundside shorelines. The coastal monitoring program considers changes in coastal conditions related to:

- Ocean and estuarine shorelines;
- Island elevation and dune crest;
- Beach sand volume;
- Vegetation;
- Erosion rate update; and
- Critical buffer and vulnerability present and forecast as it relates to storm events, NCDOT maintenance of NC 12, and the Hurricane Irene and Barrier Island breaches.

Updated coastal conditions data for the Bonner Bridge Replacement Project (B-2500) project area was collected related to the above topics starting in early 2011. The updated 2011 coastal conditions data is published in the report titled *Coastal Monitoring Program, NC 12 Transportation Management Plan, TIP Project B-2500, 2011 Update* (Overton, 2013). This data included new shoreline position data through the end of 2011. Based on this updated data, the forecast 2060 high-erosion shoreline included in the 2008 FEIS was updated; however, the new shoreline data had no impact on alternatives development for Phase IIa. A comparison of the 2060 high-erosion shoreline forecast from the 2008 FEIS (using data through June 2004) and the updated forecast (using data through 2011) is shown in Figure D-1 in Appendix D.

2.6.4 Bird Surveys

Beginning in October 2011, bird surveys were conducted twice a month at Oregon Inlet and at the Pea Island inlet by NCDOT biologists to record shorebird use of these areas. As of November 13, 2012, bird surveys had occurred on 63 days and a total of 52 species (primarily of waterbirds) had been observed. Of all bird individuals observed, the most numerous were sanderling (*Calidris alba*), gulls (*Laridae*), and terns (*Sternidae*). A single piping plover (*Charadrius melodus*) was observed on four separate dates near the Pea

Island inlet. A colony of least terns (*Sterna antilarum*) numbering over 100 birds, along with at least one pair of American oystercatchers (*Haematopus palliates*), nested and used the south side of the Pea Island inlet within the high ground where the Refuge offices were located and the sand flat area (unpublished NCDOT preliminary data).

NCDOT initiated a year-long study in December 2011 to assess bird mortality associated with bridges in coastal northeastern North Carolina, including the Bonner Bridge. The study includes a total of six bridges ranging from 1.1 miles (Washington Baum Bridge over the Roanoke Sound) to 5.2 miles (Virginia Dare Bridge over the Croatan Sound) long, as well as a segment of NC 12 in the Refuge. Data gathered from this study will provide background data for bridge design considerations for Phases I, IIa, and IIb. Preliminary data from surveys conducted as part of the study between December 2011 and November 13, 2012 reported a total of 358 bird mortalities (no duplicate mortality counts between surveys), with gulls (four species) comprising about 87 percent of the total mortalities. The majority of these gulls were immature. A total of 81 mortalities (the majority of which were immature gulls) were documented on the Bonner Bridge during these surveys. During the surveys, over 1,600 birds (mostly gulls) were observed either perched on the railings of the bridges surveyed, or soaring in the wind currents above the bridges (unpublished NCDOT preliminary data).

3.0 Description of Phase IIa Preferred Alternative – Bridge within Existing NC 12 Easement

The Phase IIa Preferred Alternative, the Bridge within Existing NC 12 Easement Alternative (see Figure 4), would involve building a bridge in the existing NC 12 easement to replace the existing surface road and the temporary bridge over the Pea Island inlet. The total length of the proposed project is approximately 2.4 miles. The bridge component, approximately 2.1 miles in length, is designed to account for the potential expansion and migration of the current inlet in the future, and it bridges the entire area considered geologically susceptible to breaches in the Pea Island inlet area (see Figure 4). It would start near the southern end of the Refuge's South Pond, within the southern portion of the Sandbag Area Hot Spot (see Figure 1), continue to the south past the southern end of the area considered susceptible to breaches in the Pea Island inlet area, and end at the northern end of the 2.1-mile section of NC 12 in the southern half of the Refuge that is not expected to be threatened by shoreline erosion prior to 2060 (see Figure 4). The Phase IIa Preferred Alternative has the following characteristics:

- Two 12-foot lanes with 8-foot shoulders on the bridge, similar to Phase I of the Bonner Bridge Replacement Project (B-2500).
- Located on the ocean side of the NC 12 easement except in the area of the temporary bridge, where it would be on the sound side. The temporary bridge was placed on the ocean side of the NC 12 easement.
- 110- to 120-foot main spans with 60-foot approach spans.
- Approach fills at each end of the bridge (including an approximately 150-foot-long fill section at the south end of the bridge and a 200-foot-long fill section at the north end) with the fill held by a retaining wall where needed to keep approach fills within the NC 12 easement.
- Pile foundation with a footer cast on top of the piles at the existing ground line topped by a pier used to support the bridge spans.
- There would be 15.8 feet of clearance under most of the bridge spans above mean high water (17 feet from zero elevation). This is lower than what was assumed in the 2008 FEIS (25 feet of clearance under the bridge spans above mean high water). The lower bridge elevation is based on additional site analysis performed by NCDOT of the Phase IIa project area. (Section 4.2.1 discusses in more detail the reasons for the higher bridge heights that were recommended in the 2008 FEIS, as well as the additional site analysis of the Phase IIa project area performed by NCDOT that lead

to the reduced bridge height for the Phase IIa Preferred Alternative's bridge.) The bridge deck would be at an elevation of approximately 23 feet. For approximately 900 feet in the area of the temporary bridge, the Phase IIa Preferred Alternative's bridge deck would be at an elevation of approximately 32 feet to accommodate trucks on the traffic maintenance road as it passes under the new bridge deck.

- Bicycle safe bridge rail. Section 6.6 discusses the required agency coordination with respect to the design of the bridge rail.

- Runoff would be collected from the ends of the Phase IIa bridge and piped to a riprap apron, which would drain to roadside swales to promote infiltration. Bridge drainage for the main bridge spans would be from scuppers (openings) at the outer edges of the deck. The bridge would be high enough to allow wind to disperse the scupper discharge before it reaches the ground or inlet surface.

- Construction activity would be primarily confined to the existing NC 12 easement, including a temporary traffic maintenance road. However, approximately 3.84 acres of temporary construction easement would be needed to construct Phase IIa. A narrow temporary construction easement would be needed for the entire length of the project on at least one side of the existing NC 12 easement, and on both sides in four locations for short distances. Except in the area of the temporary bridge, the easement would be approximately 5 feet wide. The purpose of this narrow easement would be primarily to provide room for construction workers to erect erosion control measures (fencing) along the edge of the existing NC 12 easement; a small portion would be occupied by the temporary traffic maintenance road. In the temporary bridge area, the easement would be needed to aid in the placement of temporary shoring along the edge of the existing NC 12 easement and to remove the temporary bridge and its associated shoring and riprap. Temporary construction easements also would be requested for staging areas placed at the existing paved boat ramp and paved parking area just south of the Pea Island inlet (see Figure 4). A pile jetting pipe would be placed between NC 12 and the Pamlico Sound on a 10-foot wide temporary easement at one location. Two additional jetting pipes would be used at the paved boat ramp easement and in the permanent easement at the Pea Island inlet.

- Two proposed temporary work bridges over Pea Island inlet would be built in the course of construction. One work bridge would be placed in the same location as the permanent bridge and used to move construction equipment from one side of Pea Island inlet to the other. The other would be built near the end of the project east of the existing temporary bridge (within the limits of the temporary construction easement) for use in removing the existing temporary bridge.

- Construction is anticipated to last from 3 to 3.5 years, including removal of the temporary bridge.

4.0 Environmental Update

4.1 Updated Affected Environment

This section updates affected environment information presented in Chapter 3 of the 2008 FEIS for the Phase IIa project area illustrated in Figure 1. The need for updates is primarily the result of Hurricane Irene in August 2011 and the formation of the Pea Island inlet. The effects of Hurricane Sandy in October 2012 also are considered based on field observations and post-Hurricane Sandy aerial photography. This chapter includes updated information on:

- Parks and recreation/wildlife refuges;
- Coastal conditions;
- Wetlands and open water habitat;
- Protected species; and
- Essential fish habitat (EFH).

4.1.1 Parks and Recreation/Wildlife Refuges

The Phase IIa project area is wholly within the Pea Island National Wildlife Refuge (Refuge). The Refuge is characterized by ocean beach, dunes, upland, fresh and brackish water ponds, salt flats, and salt marsh. It is inhabited by an extensive number of bird species, as well as a variety of mammals, reptiles, and amphibians. A variety of recreational opportunities also exist within the Refuge, including fishing, birding, surfing, walking, kayaking, and going to the beach (sunbathing). The detailed characteristics of the Refuge are described in Section 3.5.2 of the 2008 FEIS.

The Pea Island inlet was caused by Hurricane Irene in August 2011. It is located approximately 1,650 feet south of the southern dike around the Refuge's southern-most pond (see Figure 5). The formation of the Pea Island inlet coincided with the location of the driveway to the Refuge's headquarters on the eastern side of NC 12 (see Figure 5). The driveway was washed away by the breach. Prior to Hurricane Irene, there were three Refuge headquarters buildings at this site. The buildings were south of the inlet and were not damaged by the initial breach, but some southward migration of the inlet since the storm caused the northern-most building to collapse soon after the storm. The other two buildings at the site have since been demolished by USFWS because of the threat of further southward migration of the inlet.

As shown in Figure 5, there also are two other Refuge facilities in the vicinity of the Pea Island inlet: a parking area with an information kiosk approximately 1,250 feet to the

Aerial date: April 13, 2012

LAND USE
PEA ISLAND INLET AREA

Figure 5

south of the inlet and a boat ramp approximately 3,100 feet to the south of the inlet. Neither of these facilities were damaged by the breach; however, the parking area is just south (approximately 100 feet) of the southern end of the approximately 2,450-foot-long section of NC 12 that was replaced as a result of damage from the hurricane (see Figure 5). Opportunities for direct access to the Refuge from the NC 12 shoulder have been reduced in the Pea Island inlet area as a result of the temporary bridge and associated guard rail, as well as a result of the Refuge's decision to restrict access to the area around the inlet. However, much of this area was previously off-limits to the general public because of the presence of the Refuge's headquarters.

Hurricane Sandy in October 2012 had no notable effect on Refuge facilities in the Phase IIa project area. However, the storm caused sand overwash to enter the Refuge's ponds at several locations north of the Phase IIa project area.

4.1.2 Coastal Conditions

Coastal processes drive the physical changes in the Pea Island inlet area. This section documents historic trends and existing conditions, including:

- Inlet formation;
- Inlet migration;
- Inlet depth;
- Shoreline changes for Hatteras Island; and
- The natural and manmade factors that drive inlet and shoreline changes.

Finally, this section describes potential future conditions, including the Hatteras Island shoreline through 2060.

Shoreline material was derived from information in the report titled *Bonner Bridge Replacement – Parallel Bridge Corridor with NC 12 Maintenance – Shoreline Change and Stabilization Analysis* (Overton and Fisher, June 2005). In addition, updated 2011 shoreline material was derived from information in the report titled *Coastal Monitoring Program, NC 12 Transportation Management Plan, TIP Project B-2500, 2011 Update* (Overton, 2013), which presents updated coastal conditions data for the Bonner Bridge Replacement Project (B-2500) project area that was collected starting in early 2011 as part of the coastal monitoring program. As part of the coastal monitoring program, NCDOT compiled new shoreline position data through the end of 2011. The potential future breach findings are based on available research materials and discussions at the 2011 Peer Exchange meeting (see Section 2.6.2). Observations on the effect of Hurricane Sandy based on aerial photography are included.

Existing coastal conditions for the entire Phase II project area are described in Section 3.6 of the 2008 FEIS; this discussion includes the location of floodplains, Oregon Inlet migration, changes in the Oregon Inlet gorge (deepest part) alignment and location, historic shoreline changes, factors that drive inlet and shoreline changes, the Hatteras Island shoreline through 2060 (based on data through June 2004), potential breach locations, and forecast Oregon Inlet movement through 2085. Many of the decisions related to phasing and the starting and ending points of various phases of the PBC/TMP Alternative were based on a forecast 2060 high-erosion shoreline from Oregon Inlet to Rodanthe and locations geologically susceptible to breaches. The 2060 high-erosion shoreline forecast was updated in 2012 using shoreline change data through the end of 2011 (Overton, 2013). Changes between the 2060 high-erosion shoreline assumed in the 2008 FEIS and the updated forecast are presented in this section.

4.1.2.1 *Formation of the Pea Island Inlet*

In August 2011, Hurricane Irene created breaches on NC 12 at two locations – within the Refuge (Phase IIa project area) and within northern Rodanthe (Phase IIb project area). Hurricane Irene produced a soundside (western shore) storm surge. The Pea Island inlet occurred at an opening in the marsh islands west of Hatteras Island, at a point of low topography. During the Peer Exchange meeting in October 2011, panel members noted that the Pea Island inlet is part of the New Inlet channel complex (see the approximate potential future breach location shown on Figure 4), which consisted of multiple channels in the vicinity of the former New Inlet. Contributing factors in the formation of the inlet were topography and geological formations.

Temporary repairs at the Pea Island inlet consisted of building a temporary bridge over the inlet that is 662 feet long with 200 feet of sheet piling around the end bents. All work was within the existing easement with the exception of the excavation of fill material within the Refuge south of the terminal groin, the placement of the bridge bents that extend outside the eastern easement boundary, and the use of sandbag fill material from the beach face below the mean high water line. NCDOT acquired permits from USFWS, USACE, NCDENR-DCM, and NCDENR-DWQ and prepared a Type 1 (checklist) Categorical Exclusion (CE) for the temporary bridge, fulfilling the requirements of NEPA. The CE, approved in September 2011, demonstrated that the temporary bridge would have no significant environmental impact.

Based on November 2011 aerial photography, the inlet was approximately 273 feet wide (just east of NC 12). In April 2012, the inlet was approximately 235 feet wide. Aerial photography from August 2012 showed the inlet width at NC 12 to be approximately 220 feet. Aerial photography taken since Hurricane Sandy in October 2012 shows an inlet width of approximately 300 feet.

4.1.2.2 *Potential for Pea Island Inlet Migration or Closure*

The evolution of the Pea Island inlet from August to December 2011 was evaluated using aerial photography, and NCDOT is continuing to monitor the inlet's evolution. Inlet migration is evident since the Pea Island inlet first opened in August 2011. The Pea Island inlet area initially included additional overwash areas, which created ponds, or fingers, off of the inlet that rapidly filled in or closed by early September 2011.

According to experts who participated in the Peer Exchange meeting in October 2011, southward migration of the inlet is consistent with historical trends. Inlet migration could have an influence on the stability of the temporary bridge, because southward migration of the inlet could extend beyond the southern end of the temporary bridge before its planned service life is over.

In the months following Hurricane Irene, there was some movement of the southern shoulder of the inlet. This movement was stabilized with the installation in 2012 of additional riprap (rock), sheet pile, sandbags, and sand along the southern approach to the temporary bridge by NCDOT in order to preserve the integrity of the temporary bridge. NCDOT discussed stabilization methods with the environmental agencies and coordinated with FHWA to determine that the CE approved for temporary bridge construction was sufficient to address the NEPA requirements associated with the additional riprap and sandbags around the southern abutment of the temporary bridge. NCDOT is monitoring changes to the Pea Island inlet and intends to retrofit the temporary bridge and road protection systems, as needed, so that the temporary bridge can fulfill its function until a long-term project (Phase IIa) is completed. During Phase IIa design and construction, NCDOT will obtain the necessary environmental permits and follow the NEPA process should further stabilization be needed. The location of the inlet did not change as a result of Hurricane Sandy in October 2012, but the channel did widen as a result of the storm.

Following two nor'easters in November 2012, extensive shoaling was observed at the mouth of the Pea Island inlet and very little flow was observed through the inlet. At the Peer Exchange meeting in October 2011, panel members had differing opinions regarding whether the inlet may close naturally in the future. It was suggested that the inlet may close rapidly, because the pilings of the temporary bridge could influence sediment transport behavior resulting in inlet closure. Conversely, storm surges associated with future storms (such as that from Hurricane Sandy in October 2012) that are reflected in past storm trends indicate a high activity period of storms in the area for this decade, which could keep the inlet open. Also, smaller channels created by Hurricane Irene at the Pea Island inlet would likely fill in naturally, and an offshore shoal would grow over time near the inlet if it remains open. Although the panel did not come to a consensus as to whether the Pea Island inlet will close naturally, the panel did agree that future performance of the inlet, whether movement or closure, would

depend on storm activity, storm surge and direction, sand placement/displacement, and tide range.

The panel indicated that the Pea Island inlet section of NC 12 will continue to be vulnerable to future storm-related damages irrespective of whether the current Pea Island inlet closes. The panel also indicated this area is likely more vulnerable to inlet formation than to beach erosion. Therefore, a long-term action, such as the Phase IIa Preferred Alternative, would be appropriate even if the current Pea Island inlet were to close naturally in the near-term.

4.1.2.3 *Inlet Depth*

In October 2011, NCDOT estimated the inlet depth to be 3 to 4 feet at high tide.

In January 2012, digital terrain model (DTM) data collected by NCDOT indicated the inlet depth ranged between approximately 5 feet to 12 feet. The depth data were collected from longitudinal transects (lines approximately perpendicular to the Hatteras Island shorelines) obtained during high tide. In general, channel depth is about 5 to 7 feet below high water west of the temporary bridge and about 5 to 6 feet below high water east of the bridge to the inlet opening. The deepest area encountered by transects is a 150-foot wide area roughly in the middle of the channel that is 10 to 12 feet deep, which extends approximately 400 feet to the west of the temporary bridge.

4.1.2.4 *Island Shoreline Changes*

Ocean to Estuarine Shorelines

As a part of the shoreline monitoring program both the ocean shoreline and estuarine (Pamlico Sound) shoreline are determined and the width of the island is calculated. The width is defined as the distance along a transect from the ocean shoreline to the estuarine shoreline.

Hatteras Island widths, based on January 2011 data, reveal that the area where Pea Island inlet formed was within the narrowest 10 percent of the Hatteras Island transects examined (Overton, 2013). The primary changes in island width between January 2011 and December 2011 were the result of the introduction the Pea Island inlet and ocean shoreline changes (the estuarine shoreline was without significant erosion during this period).

Beach Sand Volume and Dune Height

In the Phase IIa project area, NC 12 is vulnerable to overwash because of narrow beaches and low dune heights. Overwash vulnerability increases near the Sandbag Area Hot Spot just north of the Pea Island inlet area (as described in Section 1.1.3 of the 2008 FEIS).

The changes in beach sand volumes from the edge of the NC 12 pavement to the mean high water elevation are apparent, particularly in the wide dune field area between Pea

Island inlet and the north side of Rodanthe. When examining beach sand volume data from the August 2, 2011 to October 21, 2011, it is noted that the most substantial changes in volume occurred in the beach area adjacent to Pea Island inlet, with beach sand volume losses up to nearly 100 cubic yards per foot (Overton, 2013).

Dune height changes during Hurricane Irene were small because of the low oceanside storm surge and waves. However, Hurricane Sandy in October 2012 resulted in more than three miles of dunes being lost or severely damaged between Oregon Inlet and Rodanthe.

4.1.2.5 *Natural Factors Affecting Inlet and Shoreline Changes*

Storms

The North Carolina coast is subject to two types of severe windstorms: extra-tropical nor'easters and hurricanes. Nor'easters, with accompanying high tides and waves, can rapidly erode the shoulders of the Pea Island inlet. Nor'easters are fairly common in the Outer Banks area, with between 30 and 35 of varying severity hitting the coast each year. Hurricanes may be responsible for major coastal changes, such as inlet openings and closings and gorge shifts, but the accumulated impact of nor'easters on this section of the coast also is notable. Recent hurricanes affecting the Bonner Bridge Replacement Project (B-2500) project area were Hurricane Irene in August 2011 and Hurricane Sandy in October 2012. Hurricane Irene passed west of the Bonner Bridge Replacement Project (B-2500) project area in Pamlico Sound. Hurricane Sandy passed east of the project area in the Atlantic Ocean.

Winds

Winds produce either an increase or decrease in water levels depending upon wind direction. Storm surges associated with winds from hurricanes and extra-tropical lows could have dramatic impacts on the Pea Island inlet by generating water level differences between the sound and the ocean, which potentially could be more than 10 feet.

Sand Bypassing

Sand is driven naturally by waves and currents along the coast until its movement is interrupted by an obstruction, such as a tidal inlet or a large manmade structure such as a jetty. These obstructions tend to trap the sand and can cause the downdrift shoreline to erode as it is starved of its former supply of sand. Eventually, the obstruction becomes filled with sand, and sand movement resumes. This is known as sand bypassing. For a tidal inlet, such as the Pea Island inlet, a common natural bypassing method is movement of sand along the large ebb tidal shoals (sand bar resulting when tides flow away from the shore) that follow a curved path out into the ocean and span from one side of the inlet to the other. Following two nor'easters in November 2012, extensive shoaling was observed at the mouth of the Pea Island inlet and very little flow was observed through the inlet.

4.1.2.6 *Shoreline through 2060 between Oregon Inlet and Rodanthe*

As part of the coastal monitoring program, updated coastal conditions data for the Bonner Bridge Replacement Project (B-2500) project area was collected starting in early 2011. The updated coastal conditions data included updated shoreline position data that was compiled using NCDOT aerial photography of the project area (Overton, 2013). Using this updated data, the forecast 2060 high-erosion shoreline used in the 2008 FEIS was updated to reflect coastal conditions through the end of 2011. The updated 2060 forecast shows long-term shoreline changes based on an analysis of aerial photography and historic topographic sheets from the US Coast and Geodetic Survey dating from 1946 to 2011 (a 65-year time period). The differences between the 2008 FEIS and current forecast 2060 high-erosion shorelines shown in Appendix D can primarily be attributed to the new shoreline data collected between 2004 and 2011 and its effect on the forecast rate of shoreline change.

In addition, the methodology for forecasting future shorelines was reviewed and improvements were made. Data updates and refinements in methodology are an expected part of the monitoring program. The following improvements were made in the modeling methodology:

- A decision was made to base the PBC/TMP Alternative's monitoring program on the transects used in the Oregon Inlet Terminal Groin Monitoring Study (conducted as a part of the groin's Special Use Permit since the groin's construction in 1989), thus necessitating a change from the transects used in the 2004 shoreline forecast study. This resulted in transects spaced at 150-foot intervals rather than the 500- to 1,000-foot intervals used in the 2004 study. This change allows more subtle forecast shoreline location variations to be shown. However, it did not have a notable overall effect on the shoreline forecast because (with the exception of the Pea Island inlet formation) notable differences in a shoreline did not occur over distances of 1,000 feet or less.

- Shoreline data over time was used to project (using linear regression[4]) future shoreline conditions in both 2004 and 2011. However, in 2004, linear regression was used to determine the forecast rate of shoreline change (amount of change by year); that rate was then applied to the last recorded shoreline position in June 2004. In 2011, the linear regression line (1946 to 2011) was continued into the future irrespective of its relationship to the last recorded shoreline position in 2011. This refinement in the forecasting methodology was done to take advantage of improvements since 2004 in the computer programs used in making the forecasts and offers a more refined result.

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[4] Linear regression is the mathematical creation of a straight line that reflects trends found in point data; in this case, shoreline location by year.

- While an analysis of the shoreline change rate indicates erosion at most of the transects' locations, some locations indicate accretion (shoreline moving oceanward). In 2004, such locations were illustrated in the results as stable (no shoreline movement). There was one such section in 2004 between the current Phase IIa Preferred Alternative's southern terminus and the Rodanthe 'S' Curves Hot Spot. For the ongoing monitoring program, shoreline change rates are updated as new data is collected and change in both erosion and accretion patterns are noted. For this reason, the 2011 forecasts need to show accretion rather than a stable shoreline. This change in methodology made no difference in the PBC/TMP Alternative project definition between Phase IIa and Rodanthe because with either assumption, the forecasts show no need for improvement through 2060 in this accretion area.

In comparison to the 2008 FEIS shoreline forecasts (using data through June 2004), the updated 2060 high-erosion shoreline (using data through 2011) shows:

- Less forecast erosion (approximately 250 to 600 feet less) from Oregon Inlet to a point close to the southern end of the Refuge's North Pond, including within the Canal Zone Hot Spot.

- Similar erosion as previously forecasted from a point close to the southern end of the Refuge's North Pond to Pea Island inlet. This is the area of the Sandbag Area Hot Spot.

- Up to approximately 100 feet more forecast erosion in the Pea Island inlet area.

- Similar forecast erosion south of the Pea Island inlet area to the Rodanthe 'S' Curves Hot Spot.

- Similar forecast erosion in the Refuge portion of the Rodanthe 'S' Curves Hot Spot and less erosion (approximately 300 to 450 feet less) in Rodanthe. The current shoreline in the vicinity of the Refuge boundary is between the 2020 average-erosion shoreline and the 2010 high-erosion shoreline presented in the 2008 FEIS – this is the location where existing NC 12 is most threatened by shoreline erosion in the Bonner Bridge Replacement Project (B-2500) project area.

A comparison of the 2060 high-erosion shoreline forecast from the 2008 FEIS (using data through June 2004) and the updated forecast (using data through 2011) is shown in Figure D-1 in Appendix D.

4.1.3 Wetlands and Open Water Habitat

Wetlands and open water habitat are discussed in Section 3.7.4 of the 2008 FEIS, as well as Section 4.1 of the *Natural Resources Technical Report* (CZR, Incorporated, 2008). A total of 20 biotic communities were mapped within the entire Bonner Bridge Replacement

Project (B-2500) project area based on 2003 to 2005 field surveys, including ten wetland biotic communities and one jurisdictional open water community.

In 2012, NCDOT updated the wetland delineations for the Dredge and Fill Permit application for Phase I (the new Oregon Inlet bridge), for use in evaluating Phase II impacts, and to evaluate future phases of the Bonner Bridge Replacement Project (B-2500). Section 404 jurisdictional and Coastal Area Management Act (CAMA) coastal wetland boundaries were updated, and NPS wetland boundaries were determined. The revised wetland boundaries were approved by USACE, NCDENR-DCM, and NPS. The Phase IIa impact assessment presented herein uses these new wetland delineations. It should be noted that these updates were completed and approved prior to Hurricane Sandy in October 2012. Field reviews after Hurricane Sandy showed that in the Phase IIa project area affected by the Phase IIa Preferred Alternative, the wetland delineations were essentially unchanged by the hurricane.

As part of this updated analysis of jurisdictional areas within the Pea Island inlet area, some of the upland communities listed in that document were consolidated, and some wetland communities were also merged (e.g., black needle rush, brackish marsh, and smooth cordgrass became marsh) because of the complex and mosaic nature of the occurrence of these communities. In addition to marsh, two of the previously described wetland biotic communities (salt shrub/grasslands and maritime grassland) were designated as an additional CAMA variant community. The CAMA designation identifies communities that receive tidally influenced flooding and contain species subject to regulation as "coastal wetlands," a category of Areas of Environmental Concern (AEC). These two CAMA variant communities, plus the marsh community, contain "AEC coastal wetlands" which are subject to jurisdiction by NCDENR-DCM under CAMA.

Within the Phase IIa project area, Section 404 jurisdictional areas occur within six wetland biotic communities and five open water communities (see Table 5). Open water categories consist of open water, impoundment, pool, ditch, and culvert. "Impoundment" is consistent with a previous open water mapping category and represents the managed water levels within the South Pond on the Refuge. Pools include small bodies of water formed as a result of Hurricane Irene near the new inlet area and also several small interdunal ponds between NC 12 and the primary dune in the southern portion of the Phase IIa project area. Pools are not regularly connected to other waters and are mostly permanent or frequently flooded. Rainfall is the most common source of input for the pools. Ditches and culvert areas are mostly maintained areas found in association with NC 12. All other open water areas include the waters of Pamlico Sound, waters associated with the new Pea Island inlet, nearshore ocean, and some ditches that are directly connected to the sound. Open water includes intertidal

Table 5. Comparison of Existing (2012) and FEIS (2008) Biotic Communities within the Phase IIa Project Area

Biotic Community	Existing (2012) (acres)	FEIS (2008) (acres)
Open water	53.36	19.41
Open water – impoundment	47.98	49.75
Open water – pool	3.56	0.00
Open water – ditch	1.68	0.00*
Open water – culvert	0.01	0.00*
Upland beach	50.58	39.94
Upland dune	76.71	82.36
Upland man-dominated	23.50	30.56
Wetland black needlerush	0.00	55.29
Upland black needlerush	0.00	1.29
Wetland maritime grassland	15.49	6.40
Upland maritime grassland	50.04	5.37
Wetland overwash	0.00	0.11
Upland overwash	0.27	0.90
Wetland maritime shrub thicket	7.72	57.31
Upland maritime shrub thicket	44.08	149.19
Wetland salt shrub/grassland	0.00	16.92
Upland salt/shrub grassland	0.00	10.98
Wetland maritime shrub/grassland	24.06	0.00
Upland maritime shrub/grassland	31.53	0.00
CAMA marsh	68.78	0.00
CAMA wetland maritime grassland	0.34	0.00
CAMA wetland salt shrub/grassland	26.07	0.00
TOTAL	**525.76**	**525.78**

*Area included within previously reported open water category.
Note: The difference in the two totals reflects rounding.

areas and some man-modified areas (i.e., dug-out or excavated areas within natural marsh).

A comparison of the previous biotic communities mapping and the updated mapping within the approximate 525-acre Phase IIa project area (see Table 5) shows an 8.4 percent increase in Section 404 jurisdictional areas (approximately 1.2 percent in wetlands and 7.2 percent in open waters); including a 7.6 percent increase in areas regulated as coastal marsh (CAMA AEC area) by NCDENR-DCM. In general, most changes between the two evaluations are associated with the maritime shrub thickets (upland and wetland), which occupied 39 percent of the project area in the 2008 FEIS, but occupy about 10 percent of the Phase IIa project area in 2012. The reduction in the area of maritime shrub thickets may be as a result of less protection from salt spray and/or storm damage, allowing grasses to become co-dominant or more prevalent within these former shrub-dominated communities. Many areas formerly occupied by maritime shrub thickets are now occupied by maritime shrub/grassland, salt shrub/grassland, and maritime grassland communities, thus acreages for many of these communities increased in the updated mapping. Additionally, when the new inlet breach occurred, several shrub thickets were lost and/or covered with sand.

Biotic community updates were done prior to Hurricane Sandy in October 2012. Sand overwash from Hurricane Sandy did overwash into wetlands and other biotic communities. Field checking after Hurricane Sandy revealed that in the Phase IIa project area, the wetland delineations were not changed by the hurricane.

4.1.4 Protected Species

The *Biological Assessment* (BA) (FHWA and NCDOT, 2008) for the Bonner Bridge Replacement Project (B-2500), as well as Section 3.7.7 of the 2008 FEIS, addressed twelve species granted protection under Section 7 of the ESA of 1973 and critical habitat for one species, the piping plover, which occurs near Oregon Inlet. These protections were designated by USFWS and/or NMFS, a division of the National Oceanic and Atmospheric Administration (NOAA). In February of 2012, one additional species beyond those assessed in the 2008 BA, the Atlantic sturgeon (*Acipenser oxyrinchus*), was designated as "endangered" and granted protection by NMFS. The Atlantic sturgeon is discussed in greater detail in Section 4.2.4.4.

Although narrower and shallower than Oregon Inlet, Pea Island inlet allows a new potential avenue for the five protected sea turtle species and two species of protected sturgeon to access the Pamlico Sound and waters beyond the Sound. Areas adjacent to the Pea Island inlet also provide new potential habitat for use by two primarily terrestrial species, seabeach amaranth (*Amaranthus pumilus)* and piping plover (*Charadrius melodus*). Other than the Atlantic sturgeon, all of these species were addressed in detail in the 2008 BA, which is the focus of this entire report.

New foraging and potential nesting habitat for piping plovers and other beach nesting birds was created as a result of Hurricane Irene and subsequent storms, including Hurricane Sandy. The beaches adjoining the inlet areas and the open, bare sandy overwash areas east of NC 12 serve as ephemeral habitat areas that provide potential nesting habitat for the piping plover and other early successional beach nesters, such as the least tern (*Sternula antillarum*), the American oystercatcher (*Haematopus palliatus*), and several other waterbird species. Several least tern nesting colonies, which sometimes nest in association with piping plovers, were documented in the NCDOT bird surveys referenced in Section 2.6.4 (conducted from December 2011 through November 2012) along NC 12 between Oregon Inlet and the new Pea Island inlet. Many least terns, and at least one pair of American oystercatchers, also used as a nesting area in 2012 the area formerly occupied by the Refuge headquarters buildings, just south of the Pea Island inlet.

Designated critical habitat for wintering piping plover exists in the Oregon Inlet area. Pea Island inlet contains, or will contain if it remains an open inlet, the constituent elements of critical habitat for wintering piping plover; however, these elements are not designated as critical habitat at this time. The NCDOT bird surveys referenced in Section 2.6.4 have documented 35 piping plover sightings (31 at Oregon Inlet and 4 at the Pea Island inlet) since the formation of the Pea Island inlet, primarily for foraging and resting. This species is likely to continue to be attracted to the habitat types they favor in the Pea Island inlet area, if the inlet remains open.

4.1.5 Essential Fish Habitat

Since the preparation of the *Essential Fish Habitat Assessment* (CZR, Incorporated, 2008) for the Bonner Bridge Replacement Project (B-2500), as well as Section 3.7.6.3 of the 2008 FEIS (beginning on page 3-91), red drum (*Sciaenops ocellatus*) is no longer managed by the South Atlantic Fisheries Management Council (SAFMC), and no new species have become managed by SAFMC or other state or federal fisheries management entities. The formation of the Pea Island inlet did increase, within the inlet itself, the area of some EFH elements, including marine water column, estuarine water column, and intertidal flats. Two additional EFH elements have the potential to develop and/or be affected as a result of the inlet formation: SAV and estuarine emergent wetlands. Migration and deposition of sand on the sound side of the Pea Island inlet have the potential to create new and/or different areas of habitat that could support new marsh development. However, water depths and currents have the potential to affect distribution and favorable habitat for these sound-side communities. In general, waters less than six feet deep within the sound are potential SAV habitat, although high-energy and high current areas are less favorable than more protected areas. Based on the latest available SAV mapping, 2007 data from the Albemarle-Pamlico National Estuary Program (APNEP), no SAV occurs within the Phase IIa project area. Comparison of these 2007 SAV data with aerial photography taken since development of the inlet reveals some SAV area

appears to have been covered by sand deposited in areas west of the newly-formed inlet, outside the Phase IIa project area.

Hurricane Sandy did not substantially alter, or introduce any new, EFH elements in the Pea Island inlet area.

4.2 Updated Impacts of the Phase IIa Preferred Alternative

This section updates the impact discussions presented in Chapter 4 of the 2008 FEIS and Section 2.3.3 of the 2010 EA. It focuses on updates relevant to Phase IIa of the Bonner Bridge Replacement Project (B-2500). Changes in impacts are primarily associated with changes in the affected environment resulting from Hurricane Irene, in particular the introduction of the Pea Island inlet. The characteristics of the Phase IIa Preferred Alternative evaluated in this EA, the Bridge within Existing NC 12 Easement Alternative, would be similar to what was defined in the 2008 FEIS as the potential Phase III of the Phased Approach alternatives, in that both alternatives consist of a bridge within the existing NC 12 easement. Thus, there are few changes in the impacts discussed in the 2008 FEIS as a result of Phase IIa project design changes, but are instead the result of changes in Phase IIa project area conditions. The following direct impact types have changes in impacts from that presented in the 2008 FEIS and are addressed in this section:

- Visual impacts;
- Cultural resource impacts;
- Parks and recreation impacts; and
- Natural systems impacts.

Hurricane Sandy in October 2012 did not introduce any notable new or changed environmental elements to the Phase IIa project area that would affect the Preferred Alternative for Phase IIa. As explained below, changes in impacts discussed in this section do not represent new, significant impacts not previously identified in the 2008 FEIS.

Indirect and cumulative impacts findings contained in Section 4.12 of the 2008 FEIS are unchanged. In terms of indirect impacts, as discussed in Section 4.12.5 of the 2008 FEIS, construction of a project in the Parallel Bridge Corridor would not induce changes in development trends, because the project does not have an economic development purpose and is consistent with local area land use plans. In addition, it would not serve a specific land development, would be unlikely to stimulate land development having complementary functions, and would be unlikely to influence substantial intraregional

land development location decisions since it would replace an existing two-lane facility with a new two-lane facility. Finally, it is not being introduced to an area with notable natural features that could be lost to development.

In terms of cumulative impacts, based on discussions in Section 4.12.6 of the 2008 FEIS:

- Phase IIa would not interfere with the Outer Banks Task Force's goal to implement a long-term solution to the effect of shoreline erosion and ocean overwash on NC 12 at the three hot spot locations in the Bonner Bridge Replacement Project (B-2500) project area.

- Phase IIa would change access within the Refuge in that there would be no direct access to the Refuge from the Phase IIa bridge, as described in Section 4.2.3.

- Phase IIa would not interfere with the benefits to USACE dredging offered by Phase I of the PBC/TMP Alternative.

- Phase IIa would not change the potential impact of the PBC/TMP on the preservation of the (former) Oregon Inlet US Coast Guard Station. Phase IIa would help maintain access to the station from the southern part of Hatteras Island.

- Phase IIa would not change the need to retain the terminal groin at Oregon Inlet that is associated with the PBC/TMP Alternative.

- With Phase IIa, the options for future relocation of utilities along NC 12 (moving them back multiple times in response to shoreline erosion, or moving them back once to beyond the 2060 high-erosion shoreline) would still be available as described for the Phased Approach alternatives.

- With Phase IIa, the cumulative effect of habitat loss or change on the ecological integrity of the Outer Banks would be the same as with the Phased Approach alternatives assessed in the 2008 FEIS except for additional pile and shading impact associated with bridging the Pea Island inlet (which did not exist when the 2008 FEIS's impact assessment was prepared). This minimal additional impact is documented in the sections below. Like the Phased Approach alternatives, the Phase IIa Preferred Alternative also would place NC 12 on a bridge in the existing easement, resulting in the least initial direct impact to natural habitat as compared to the other PBC/TMP Alternative future phase options. Natural shoreline processes would be allowed to take place. The shoreline would erode underneath the bridge. Like the Phased Approach alternatives, ultimately the Phase IIa Preferred Alternative would have portions over the beach and in the ocean, with the associated direct impacts described in the balance of this section.

The affects described below for the Phase IIa Preferred Alternative would be in addition to those associated with building the existing temporary bridge in 2011. All work for that bridge was within the existing NC 12 easement with the exception of the excavation of fill material within the Refuge south of the terminal groin, the placement of some bridge bents outside the eastern easement edge, and the use of sandbag fill material from the beach face below the mean high water line. NCDOT acquired permits from USFWS, USACE, NCDENR-DCM, and NCDENR-DWQ and prepared a Type 1 CE for the temporary bridge, fulfilling the requirements of NEPA. The CE, approved in September 2011, demonstrated that the temporary bridge would have no significant environmental impact.

4.2.1 Visual Impacts

Section 4.3.2 of the 2008 FEIS indicated that a bridge in the existing NC 12 easement in the Phase IIa project area would be a sizable new linear man-made feature that would represent an intrusion into the landscape of the Refuge. Based on safety requirements developed by a FHWA and American Association of State Highway and Transportation Officials (AASHTO) joint committee after Hurricane Katrina related to wave and water forces on bridges, the 2008 FEIS indicated that the bridge deck would be at an elevation of approximately 33.5 feet above mean sea level (approximately 30 feet above ground), allowing for the bottom of the superstructure to be a minimum of 25 feet above mean high water. However, as part of the design of the Phase IIa Preferred Alternative's bridge, additional site analysis was performed by NCDOT of the Phase IIa project area to determine the necessary bridge heights. This analysis was done in coordination with members of the committee who originally developed the Hurricane Katrina safety requirements. Based on the results of this analysis, it was determined that it would be sufficient for the Phase IIa Preferred Alternative's bridge to have 15.8 feet of clearance between mean high water and the bottom of the superstructure, instead of 25 feet. In addition, the deck would be at 23 feet above mean sea level instead of 33.5 feet. However, for approximately 900 feet in the area of the temporary bridge, the Phase IIa Preferred Alternative's bridge deck would be at an elevation of approximately 32 feet to accommodate trucks on the traffic maintenance road as it passes under the new bridge deck. Therefore, the visual impacts assumed in the 2008 FEIS would remain, but would be lessened because of the shorter bridge heights.

4.2.2 Cultural Resource Impacts

This section describes the effects of the Phase IIa Preferred Alternative on historic and archaeological resources, in accordance with Section 106 of the National Historic Preservation Act of 1966 (36 *Code of Federal Regulations* [CFR] Part 800). Of the four resources listed on or eligible for inclusion in the National Register of Historic Places (NRHP), as discussed in Section 4.4.1 of the 2008 FEIS, only one resource would be affected by the Phase IIa Preferred Alternative – the Pea Island National Wildlife Refuge. The other resources listed in the 2008 FEIS are the (former) Oregon Inlet US Coast Guard

Station building at Oregon Inlet and the Rodanthe Historic District and Chicamacomico Life Saving Station in Rodanthe.

With Phase IIa, the nature of the Adverse Effect would be the visual impact of the Preferred Alternative on the historic landscape of the Refuge. As discussed in Section 4.3.2 of the 2008 FEIS, the bridge would introduce a sizable new, elevated, linear, man-made feature through the Refuge. As noted above in Section 4.2.1, the bridge deck for the Phase IIa Preferred Alternative would be lower than that defined for a bridge within the existing NC 12 easement in the 2008 FEIS.

Despite the lower elevation of the Phase IIa Preferred Alternative's bridge, it would stand in contrast with the natural character of the Refuge. The Phase IIa Preferred Alternative's bridge would dominate views from the dunes lining the beach and, as the dunes disappear over time, it would also dominate views of the beach and, ultimately, the ocean. The bridge would be uncharacteristic of the existing undeveloped and protected setting of the Refuge, which makes it rare along the eastern US seaboard in terms of views and a resource for recreational activities.

The Phase IIa Preferred Alternative would be mostly south of the Refuge ponds (see Figure 1), so it would not affect access to the nature trails in the northern ponds area. The dikes in that area were built by the Civilian Conservation Corps in 1933.

4.2.3 Parks and Recreation Impacts

4.2.3.1 *Land Use*

The Phase IIa Preferred Alternative would be built and maintained within the existing NC 12 easement. Thus, no new Refuge lands would be permanently used by this alternative. The disturbance within the existing easement would be similar to that presented for the Phased Approach alternatives (also calling for a bridge in the existing easement) in the 2008 FEIS. The Phase IIa Preferred Alternative would permanently affect 1.47 acres of Refuge land within the existing NC 12 easement from fill and pile placement. In addition, the temporary construction easements described in Chapter 3.0 would temporarily affect 3.84 acres of Refuge land outside the existing easement, but this land would be restored after construction is completed, if required as a part of a Refuge Special Use Permit. The unnecessary section of the existing NC 12 roadway and the temporary bridge spanning the Pea Island inlet would be removed.

4.2.3.2 *Recreational Use*

As with the Phased Approach alternatives discussed in the 2008 FEIS, direct motor vehicle access to the Refuge would be eliminated for the length of the bridge component of the Phase IIa Preferred Alternative (2.1 miles) (see Figure 4). Also, as with the Phased Approach alternatives discussed in the 2008 FEIS, motor vehicle access would be lost to the public boat ramp and the public parking lot near Pea Island inlet (see Figure 4). Sacrificing direct motor vehicle access in favor of eliminating the need for artificial

dunes to maintain a surface road is the preference of USFWS, which has indicated in the past that it will allow for some form of replacement access to the Refuge and its facilities where direct access from a surface road is lost in Phase IIa and future phases of the Bonner Bridge Replacement Project (B-2500). New opportunities for parking will be discussed with the Refuge during impact mitigation planning. The boat ramp is not an official Refuge or Seashore facility, and it would be difficult to reach without paved road access. NCDOT will address this impact in mitigation discussions with the Refuge.

As the beach erodes as a part of natural coastal processes, the Phase IIa Preferred Alternative's bridge would be located first over the beach and then in the ocean. As a result, several recreational activities that occur on Hatteras Island, including fishing, hiking, surfing, wind surfing, kite boarding, swimming, ocean kayaking, and birding, would be affected by the bridge, as mentioned in Section 4.5.3.3 of the 2008 FEIS, in addition to the loss of direct Refuge access resulting from replacing the road with a bridge. As with the Phased Approach alternatives discussed in the 2008 FEIS, bridge piles in the ocean could change the types of fish that congregate around the shore. To the extent that certain sections of the bridged roadway would be over the beach, beach and water activities would be affected, but not precluded where it is safe, by the presence of the bridge and bridge piles. Once Phase IIa bridge piles are in the ocean, the ability to surf in the area affected would be eliminated. Ultimately this would be the case for the entire 2.1-mile Phase IIa bridge. The piles would change how and where the waves break, which would interfere with the swells in such a way that the waves would no longer be conducive to good surfing. In addition, the presence of bridge piles in areas where the bridge would be less than 150 feet from shore would be a safety hazard to surfers and other recreational ocean users.

4.2.4 Natural Systems Impacts

4.2.4.1 *Surface Waters and Water Quality*

Waters associated with the Pea Island inlet are classified as SA waters (Class A saltwaters) with a supplemental classification as High-Quality Waters (HWQ). Construction-related water quality impacts to the open water of the inlet could result in temporary increases in turbidity; however, given the dynamic nature of the waters in the inlet, a temporary increase in turbidity likely would not be notable as the flux of water through the inlet would reduce the potential for any permanent water quality problems. Much of the Phase IIa Preferred Alternative would occur over land; therefore, direct water quality impacts during construction would be of a smaller temporal and spatial scale. If the Pea Island inlet were to close before construction begins, these impacts would not occur.

Runoff from the highway would be a potential source of pollutants to the Pea Island inlet and adjacent waters (i.e., the Atlantic Ocean and Pamlico Sound). To minimize the potential impact of project pollutants, a stormwater management plan would be developed in association with NCDENR-DWQ and other state and federal

environmental resource and regulatory agencies during final bridge design and in the process of obtaining related permits. NCDOT's current stormwater management plan for the Phase IIa bridge is the same as for Phase I (the new Oregon Inlet bridge). Runoff would be collected from the ends of the Phase IIa bridge and piped to a riprap apron, which would drain to roadside swales to promote infiltration. Bridge drainage for the main bridge spans would be from scuppers (openings) at the outer edges of the deck. The bridge would be high enough to allow wind to disperse the scupper discharge before it reaches the ground or inlet surface.

As discussed in Section 4.7.2.2 of the 2008 FEIS (page 4-82), once over the ocean as a result of beach erosion, a bridge built in the existing NC 12 easement (Phased Approach alternatives) could permanently affect water quality in the near-shore area by increasing the amount of highway runoff in locations where the bridge would extend east of the 2060 high-erosion future shoreline. This impact would occur with the Phase IIa Preferred Alternative, which places NC 12 on a bridge in the existing easement. Best Management Practices (BMPs) discussed in Section 4.7.2.2 of the 2008 FEIS (page 4-82) for a bridge built in the existing NC 12 easement would apply to the Phase IIa Preferred Alternative.

4.2.4.2 *Biotic Communities*

Biotic communities in the study area would be impacted permanently and temporarily as a result of project construction. The impacts to biotic communities in the Phase IIa project area are presented in Table 6.

All permanent impacts to biotic communities would occur within the existing NC 12 easement. The Phase IIa Preferred Alternative would permanently impact 12.36 acres of biotic communities, including 1.46 acres of fill and pile impacts and 10.90 acres as a result of shading from the bridge. Of the 12.36 acres of permanent impacts, approximately 82 percent (1.19 acres) of the pile impact and 72 percent (7.80 acres) of the shading impact would occur in man-dominated areas.

The majority of the temporary impacts to biotic communities would occur within the existing NC 12 easement and are located in upland, previously disturbed/maintained areas in the man-dominated community. The project also contains approximately 20 "slivers" of temporary impact adjacent to the existing NC 12 easement where a 3.84-acre additional temporary construction easement is required in order to construct both the bridge and the temporary detour road. The impact within these "slivers" totals 3.30 acres, as indicated in Table 6.

The characteristics of the Phase IIa Preferred Alternative would be similar to what was defined in the 2008 FEIS as the potential Phase III of the Phased Approach alternatives, in that both alternatives consist of a bridge within the existing NC 12 easement. Thus, the total biotic community impacts for the Phase IIa Preferred Alternative are similar to the comparable section of the Phased Approach alternatives.

Table 6. Impacts to Biotic Communities in the Phase IIa Project Area

Biotic Community	Subject to Section 404 Jurisdic-tions?	Permanent Fill and Pile (acres)	Permanent Shading (acres)	Temporary Easement (acres)[1]
Open water	Yes	0.04	1.00	0.06
Upland beach	No	0.00	0.13	0.14
Upland dune	No	0.00	0.00	0.00
Upland man-dominated	No	1.19	7.80	1.18
Wetland black needlerush	Yes	0.00	0.00	0.00
Upland black needlerush	No	0.00	0.00	0.00
Wetland maritime grassland	Yes	0.00	0.00	0.06
Upland maritime grassland	No	0.00	0.44	0.29
Wetland overwash	Yes	0.00	0.00	0.00
Upland overwash	No	0.00	0.01	0.01
Wetland maritime shrub thicket	Yes	0.00	0.00	0.09
Upland maritime shrub thicket	No	0.22	1.40	0.39
Wetland salt shrub/grassland	Yes	0.00	0.00	0.00
Upland salt shrub/grassland	No	0.00	0.00	0.00
Wetland maritime shrub/grassland	Yes	0.00	0.00	0.20
Upland maritime shrub/grassland	No	0.00	0.11	0.69
CAMA marsh	Yes	0.00	0.00	0.13
CAMA wetland maritime grassland	Yes	0.00	0.00	0.00[2]
CAMA wetland salt shrub/grassland	Yes	0.01	0.01	0.06
TOTAL BIOTIC COMMUNITY IMPACTS		**1.46**	**10.90**	**3.30**

[1]Impacts within the 3.84-acre temporary construction easement only. As indicated in the text above, there also would be temporary impacts within the existing NC 12 easement. The majority of the temporary impacts in the existing NC 12 easement are in upland, previously disturbed/ maintained areas in the man-dominated community.
[2]Impact less than 0.005 acre.

4.2.4.3 *Wetlands and Open Water Habitat*

The Phase IIa Preferred Alternative would permanently impact 0.01 acre of wetlands and 0.04 acre of open waters, and temporarily impact 1.12 acres of wetlands and 0.28

acre of open waters. There also would be 0.42 acre of hand clearing in wetlands for the project.

Within the above described impacts, the following impact amounts would occur in CAMA wetlands: 0.01 acre of permanent fill, 0.33 acre of temporary fill, and 0.17 acre of hand clearing.

The open water impacts result from the presence of the Pea Island inlet, which was not present when impacts to open water were assessed in the 2008 FEIS.

4.2.4.4 *Protected Species*

Protected species and habitat for protected species addressed in the 2008 BA occur in association with the new Pea Island inlet. Descriptions and details on these species and associated habitat are found in the 2008 FEIS (Section 4.7.9) and the 2008 BA. The current status of consultation under Section 7 of the ESA of 1973 is described in Section 6.4.

The open water habitat associated with the new Pea Island inlet formed since the 2008 BA, and serves as another potential avenue for aquatic species to travel between the ocean and sound. As documented in Appendix A of the 2008 BA, the potential impacts to sea turtles in the aquatic environment are temporary construction disturbance, highway runoff, and, once the Phase IIa bridge piles are in the ocean, predation on hatchlings by fish attracted to piling habitat. The potential impacts to sturgeon are temporary construction disturbance and highway runoff.

NMFS, in an August 4, 2008 letter (see page A-63 of the 2008 BA), states the following in regards to the shortnose sturgeon: "NMFS believes shortnose sturgeon are unlikely to be present in the project area…" In the same letter NMFS states that the potential effects of the Bonner Bridge Replacement Project (B-2500) on sea turtles are "discountable and/ or insignificant" because of the following reasons: the construction guidelines to be followed; sea turtles are highly mobile and will avoid the area during Oregon Inlet bridge construction; hopper dredges would not be used during Oregon Inlet bridge construction; sea turtles could still forage under the Oregon Inlet bridge after construction; the Oregon Inlet area does not provide habitat considered outstanding; turbidity associated with Oregon Inlet bridge construction would be limited to dredging and pile driving; and the broad width of Oregon Inlet means sea turtle passage would not be impeded by the completed Oregon Inlet bridge.

Although there are no records of sea turtles or sturgeon species using the Pea Island inlet and the fact that these species usually prefer deeper water inlets, potential use of the inlet by these species could occur. Open water acreage of the Pea Island inlet directly affected by the Phase IIa Preferred Alternative's bridge would constitute new acreage affected by an inlet bridge, but only 0.04 acre would be permanently affected by the bridge piles.

Because the effects of the project in the Phase IIa area would be similar to or less than the effects to the same protected species and habitats in the vicinity of Bonner Bridge as a result of Phase I (the new Oregon Inlet bridge), and the additional open water acreage impact associated with the Pea Island inlet would be less than 0.34 acre, it is expected that the direct, indirect, interrelated, and cumulative effects as described in the 2008 BA would remain unchanged for the protected species addressed in that document. Both the Phase IIa area and the Phase I area include open water inlets and shorelines adjacent to the inlets that include habitat suitable for piping plover nesting. Therefore, the biological conclusions for the protected species addressed in the 2008 BA also are assumed to remain unchanged as a result of the Phase IIa Preferred Alternative.

Regarding the piping plover, changes to the environmental setting in the vicinity of the Pea Island inlet increased the acres of potential nesting and foraging habitat directly affected by the PBC/TMP Alternative. The temporary disturbance impacts resulting from construction of the Phase IIa Preferred Alternative's bridge over the Pea Island inlet would be similar to those resulting from construction of Phase I (the new Oregon Inlet bridge) over Oregon Inlet since both areas include shorelines adjacent to the inlets that include habitat suitable for piping plover nesting (see Section 4.7.9.1 of the 2008 FEIS beginning on page 4-120). Phase IIa would use less than 1 acre of potential nesting or foraging habitat. As at Oregon Inlet, construction noise/vibration could affect nesting. As with the Phased Approach alternatives, shoreline erosion could create habitat that could have been used by piping plovers that instead would be shaded by the Phase IIa bridge as the shoreline erodes. Currently no nests of piping plover have been recorded in the vicinity of the Pea Island inlet. While potential nesting and foraging habitat has increased in the vicinity of the Pea Island inlet since the 2010 ROD, an incidental take of piping plover nests during construction would not increase because no nests or nesting behavior have been documented near the Pea Island inlet. Furthermore, construction over the inlet is planned to occur on the western side of the temporary bridge, outside of potential piping plover nesting habitat.

In addition to the species previously addressed, the recently listed Atlantic sturgeon occurs in the area and has the potential to use aquatic habitats within the Pea Island inlet area. The Atlantic sturgeon, having similar habitat and migration routes as the shortnose sturgeon (*Acipenser brevirostrum*) addressed in the 2008 FEIS, occurs in the project area. Although more common than the shortnose sturgeon, it is estimated that fewer than 300 spawning Atlantic sturgeon adults reside within each river system in North Carolina. Therefore, the biological conclusion for the Atlantic sturgeon is the same as for the shortnose sturgeon. NMFS previously determined that the biological conclusion for the shortnose sturgeon was "May Affect, Not Likely to Adversely Affect"

(letter dated August 4, 2008). Additional supporting information on the newly listed species, the Atlantic sturgeon, is presented below.

- **Atlantic sturgeon** (*Acipenser oxyrinchus*) Federal Status – Endangered
  State Status – Special Concern

  Biological Conclusion: MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT

  Among the most primitive of the bony fishes, the Atlantic sturgeon is an anadromous species that inhabits the lower sections of larger rivers and coastal waters of the Atlantic coast, moving into freshwater only to spawn in the spring. A bottom dweller and benthic feeder, it prefers areas with soft substrate and vegetated bottom for most of the year. At spawning, the fish requires fast current and rough bottoms. Five distinct population segments of Atlantic sturgeon have been identified, including: Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic. The South Atlantic and Carolina populations of the Atlantic sturgeon were listed in the Federal Register (77 FR 5914) as endangered on February 6, 2012.

  Historically, Atlantic sturgeon were abundant in most North Carolina coastal rivers and estuaries, with the largest fishery in the Roanoke River/Albemarle Sound system and the Cape Fear (Kahnle et al., 1998). Landing records from the late 1800s indicate that Atlantic sturgeons were very abundant in the Albemarle Sound, and North Carolina as a whole supported an estimated 7,200 to 10,500 adult females (Armstrong and Hightower, 2002; Secor, 2002). Currently it is estimated that fewer than 300 spawning adults reside within each river system in North Carolina (Atlantic Sturgeon Status Review Team [ASSRT], 2007). ASSRT (2007) indicates there are many records of Atlantic sturgeon from the Neuse River, Tar River, and Pamlico Sound. Between April 2004 and December 2005, the NCDENR-DMF Observer Program documented the capture of 12 Atlantic sturgeon (ASSRT, 2007).

  Suitable habitat exists within the Bonner Bridge Replacement Project (B-2500) project area, and records document the species within Dare County. However, the rarity of occurrence in Albemarle and Pamlico sounds, and because the fish prefer deep spots during the day and move to tidal flats for the night in the summer and early fall (Jackson et al., 1992), reduces the likelihood that the proposed project would adversely affect this species. In addition, any occurrence of this species within the Bonner Bridge Replacement Project (B-2500) project area (including the Pea Island inlet) would likely be short-term and in conjunction with annual spring migrations, further decreasing the likelihood that the project would adversely affect this species.

  The variety of conservation measures that would be implemented to reduce potential impacts associated with sea turtles also would serve as conservation measures for the Atlantic sturgeon. Open waters of the project area serve primarily

as transitional habitat for sturgeon as they pass between the ocean and inland waterways for spawning. The Phase IIa project is not likely to adversely affect or jeopardize the continued existence of the Atlantic sturgeon because:

- Activities in the project area would not occur in any documented spawning areas. These areas occur in large rivers in areas of flow between the salt wedge and the fall line.
- Migration routes from spawning grounds to estuaries should not be impeded by a bridge.
- Atlantic sturgeon are assumed to occur and forage; however, few impacts are expected because of the mobility of this species and its anticipated avoidance of construction/disturbance areas.
- Indirect impacts from construction may include a reduction in forage quality as a result of bottom disturbance and siltation, water quality degradation, and some noise/vibration effects. However, none of these indirect impacts should jeopardize the continued existence of the Atlantic sturgeon population in North Carolina.

4.2.4.5 *Essential Fish Habitat*

The potential impacts (short-term, long-term, permanent, and potential species-specific) to EFH addressed in the 2008 FEIS (Section 4.7.6.2) and the *Essential Fish Habitat Assessment* (CZR, Incorporated, 2008) as it relates to Phase I (replacement of the Bonner Bridge) will be similar for the new Pea Island inlet area since both areas have the same EFH types and Phase I and Phase IIa would involve the same type of activities in those habitats. The EFH impacts would be the result of pile presence and bridge shading. Approximately 0.05 acre of EFH would be permanently impacted, including 0.04 acre of open waters from permanent piles within the new Pea Island inlet and 0.01 acre of permanent fill in CAMA wetlands. Alteration of estuarine/marine waters, intertidal flats, and some estuarine emergent wetlands would result directly from shading (0.32 acre) with a new structure over the Pea Island inlet. Bridge and pile presence may result in several indirect impacts, including changes to: water flow; sediment grain size and topography; and light levels of the area underneath the bridge and for some distance surrounding the bridge. These changes are expected to have a minimal adverse effect on EFH and managed species. Temporary construction related impacts on marine and estuarine waters associated with the inlet may result from noise and turbidity, sediment removal, and burial of organisms. Temporary impacts would affect 0.60 acre of EFH, including 0.33 acre of CAMA wetlands from temporary fill, 0.17 acre of CAMA wetlands from hand clearing, and 0.10 acre of open waters from temporary construction bridges. Although some minor adverse impacts to EFH would occur during the construction

phases, the impacts would be temporary and are not expected to result in significant short-term or long-term adverse effects on managed species.

The Phase IIa Preferred Alternative would bridge the entire area considered susceptible to breaches in the Pea Island inlet area (approximately 2 miles). Therefore, EFH would remain bridged even if the inlet moves from its current location or if a different new inlet were to form in this area in the future.

4.3 Effect of the Phase IIa Preferred Alternative on the PBC/TMP Alternative

Changes since the findings of the 2010 ROD based on the above analysis of the Phase IIa Preferred Alternative are primarily associated with changes in the affected environment resulting from Hurricane Irene (in particular the introduction of the Pea Island inlet). Hurricane Irene and its impact on this part of the project area resulted in the following effects:

- Bringing into Phase II a section of NC 12 that, from a shoreline erosion perspective, was not expected to require improvement until after 2020, as noted in the 2008 FEIS in Section 2.10.2.5 on page 2-125.
- Introducing EFH and marine protected species habitat into the Phase IIa project area in the form of the Pea Island inlet (if the inlet remains open).
- Introducing potential piping plover nesting habitat into the Phase IIa project area in the form of the beaches adjoining the inlet (if the inlet remains open).
- Making minor changes in the forecast 2060 high-erosion shoreline, with increased potential erosion south of the Pea Island inlet and no or little change in potential erosion north of the inlet (see Appendix D).
- Altering the location of Hatteras Island habitat types around the Pea Island inlet.
- Destruction or demolition of the Refuge headquarters.
- Introduction of the temporary bridge over the Pea Island inlet.

Hurricane Sandy in October 2012 did not introduce any notable new or changed environmental elements to the Phase IIa project area.

The characteristics of the Phase IIa Preferred Alternative would be similar to what was defined in the 2008 FEIS as the potential Phase III of the Phased Approach alternatives in that both alternatives consist of a bridge within the existing NC 12 easement. The minimal differences between the designs of the two bridges consist of the location of the northern bridge terminus (the Phase IIa bridge would be slightly longer to the north),

the alignment within the existing easement (in the area around the temporary bridge, the Phase IIa bridge would be on the west side of the easement because the temporary bridge is on the east side), and the height (the Phase IIa bridge would be lower). Hurricane Sandy did not introduce any changes that would affect the design of the Phase IIa Preferred Alternative. Thus, few changes in impacts from the 2008 FEIS are associated with the presence of the Pea Island inlet.

4.3.1 Updated Impacts in the Phase IIa Area

The above changes in the setting and other factors introduced the following changes in potential impacts:

- Lessened, but still sizable, visual impacts on the Refuge. Bridge heights were re-evaluated during design of the Phase IIa Preferred Alternative's bridge (see Section 4.2.1) and are now lower than in the 2008 FEIS. Visual impacts contribute to the conclusion that, like the Phased Approach alternatives, the Phase IIa Preferred Alternative would have an Adverse Effect on the Refuge as an historic resource.

- An open water pile impact where the Phase IIa Preferred Alternative would cross the Pea Island inlet. The potential impact to natural resources would be similar in kind to that of construction associated with Phase I of the project, and Phase IIa would result in 0.04 acre in additional permanent impact.

- Additional potential for protected species impact with the addition of marine animal aquatic habitat and piping plover nesting habitat to the Pea Island inlet area, although the types of impact that could occur when these species are present are unchanged. Therefore, the biological conclusions for those species addressed in the 2008 FEIS and 2008 BA also are expected to remain unchanged. Although more common than the shortnose sturgeon, it is estimated that fewer than 300 spawning Atlantic sturgeon adults reside within each river system in North Carolina. Thus, for the reasons listed in Section 4.1.4, the potential for impacts to the newly listed Atlantic sturgeon are essentially the same as for the shortnose sturgeon assessed in the 2008 FEIS and 2008 BA.

- EFH impact similar to that of Phase I of the project at the point where the Phase IIa Preferred Alternative would cross the Pea Island inlet.

- The need for temporary construction easement (3.84 acres), needed in part to maintain traffic on, and eventually remove, the temporary bridge. In the temporary bridge area, the easement would be needed to aid in the placement of temporary shoring along the edge of the existing NC 12 easement and to remove the temporary bridge and its associated shoring and riprap. A Special Use Permit for this easement would be obtained from the Refuge.

4.3.2 Updated Costs

Phase IIa is expected to cost $98 million. The Phase IIa Preferred Alternative is similar to what was defined in the 2008 FEIS as the potential Phase III of the Phased Approach alternatives in that both alternatives consist of a bridge within the existing NC 12 easement. Thus, changes in design characteristics are not a factor affecting the cost of the overall project. Factors affecting the overall project cost since the costs presented in Table 2-7 and Table 2-8 of the 2010 EA, aside from the cost of materials and labor, are:

- Traffic maintenance challenges because of the presence of the temporary bridge.
- The cost of removal of the temporary bridge and associated features.

4.3.3 Impact of Implementation of All Phases of the PBC/TMP Alternative

This section addresses how the implementation of the Phase IIa Preferred Alternative would affect the potential total impact of all phases of the PBC/TMP Alternative. The construction of the Phase IIa Preferred Alternative would have the following potential effect on the environmental impacts of the implementation of all phases of the PBC/TMP Alternative (selected for implementation in the 2010 ROD):

- At its southern terminus, the Phase IIa Preferred Alternative would end at the northern end of the 2.1-mile section of NC 12 in the southern half of the Refuge that is not expected to be threatened by shoreline erosion prior to 2060 (see Figure 4). At this section of NC 12 south of Phase IIa, and north of Phase IIb, no improvements to NC 12 are anticipated as a part of the PBC/TMP Alternative unless coastal conditions warrant. This area south of Phase IIa and north of Phase IIb also is not geologically prone to breaching. The southern end of Phase IIa is the same as was assumed in the 2008 FEIS impact assessment for all phases beyond Phase I. With the Seven-Mile Bridge Alternative dropped from further consideration, Phase IIa has no influence on Phase IIb.
- North of Phase IIa, the Phase IIa Preferred Alternative would connect to a section of NC 12 that is within the forecast 2060 high-erosion shoreline, and this part of NC 12 likely would be replaced as a part of the PBC/TMP Alternative. Considering each of the alternatives assessed in the 2008 FEIS that represent the range of potential impacts for the complete PBC/TMP Alternative, the potential impacts of a future phase north of the Phase IIa Preferred Alternative would be affected as follows:
  - <u>Nourishment</u>. Nourishment could be used to protect the northern end of the Phase IIa Preferred Alternative as a part of a future phase north of Phase IIa,

with the impacts as defined in the 2008 FEIS[5]. The Nourishment Alternative is illustrated in Figure 2-18 of the 2008 FEIS.

- Road North/Bridge South. This alternative would involve relocating NC 12 as a surface road north of Phase IIa to a point behind the forecast 2060 high-erosion shoreline. The Road North/Bridge South Alternative is illustrated in Figure 2-19 of the 2008 FEIS. To connect the Phase IIa Preferred Alternative to a relocated surface road, the Phase IIa Preferred Alternative would need to be extended as a bridge in a manner that leaves the existing NC 12 easement and brings the bridge to a point west of the forecast 2060 high-erosion shoreline, where it could then meet a relocated NC 12 as a surface road. The impacts of such an alignment would be a combination of those of the Phased Approach and Road North/ Bridge South alternatives. Those impacts are documented in the 2008 FEIS[6]. There are no unique natural resource, cultural resource, or Refuge facility features in this area that were unaffected by the Phased Approach and Road North/Bridge South alternatives that would be affected by making the connection described.

- All Bridge. The All Bridge Alternative follows the alignment of the Road North/ Bridge South Alternative but on a bridge. Thus, this alternative would involve relocating NC 12 as a bridge north of the Phase IIa Preferred Alternative to a point behind the forecast 2060 high-erosion shoreline. The All Bridge Alternative is illustrated in Figure 2-20 of the 2008 FEIS. To connect the Phase IIa Preferred Alternative to a bridge west of the existing NC 12 easement, the Phase IIa Preferred Alternative would need to be extended in a manner that leaves the existing NC 12 easement and brings the bridge west to a point west of the forecast 2060 high-erosion shoreline, where it could then meet a relocated NC 12 as a bridge. The impacts of such an alignment would be a combination of the Phased Approach and All Bridge alternatives[7]. Those impacts are documented in the 2008 FEIS. There are no unique natural resource, cultural resource, or Refuge facility features in this area that were unaffected by the Phased Approach

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[5] As indicated in Chapter 4 of the 2008 FEIS, the Nourishment Alternative's impacts north of Phase IIa would include impacts to Refuge lands, biotic communities, wetlands, unique and rare habitats, benthic communities, EFH, terrestrial and aquatic wildlife, and protected species.

[6] As indicated in Chapter 4 of the 2008 FEIS, the Road North/Bridge South Alternative's impacts north of Phase IIa would include impacts to Refuge lands, biotic communities, wetlands and open water habitat, Refuge historic features, and terrestrial and aquatic wildlife.

[7] As indicated in Chapter 4 of the 2008 FEIS, the All Bridge Alternative's impacts north of Phase IIa would include impacts to Refuge lands, biotic communities, wetlands and open water habitat, Refuge historic features, and terrestrial and aquatic wildlife.

and All Bridge alternatives that would be affected by making the connection described.

- Phased Approach. In this case, the Phase IIa Preferred Alternative's bridge would be extended north within the existing NC 12 easement with the characteristics and impacts described for the Phased Approach alternatives in the 2008 FEIS and for Phase IIa when not in the vicinity of Pea Island inlet. The Phased Approach alternatives are illustrated in Figure 2-21 of the 2008 FEIS.

- The PBC/TMP Alternative calls for the study and selection of future actions on Hatteras Island beyond the limits of Phase I through a comprehensive NC 12 Transportation Management Plan. This approach takes into account the inherent uncertainty in predicting future conditions within the dynamic coastal environment. The PBC/TMP Alternative and the components of its comprehensive NC 12 Transportation Management Plan are described in Section 1.2. The implementation of plan components began in early 2011 and will continue until the PBC/TMP Alternative is completed.

Based on the above considerations, the expected nature and extent of environmental impacts of the potential future phases of the PBC/TMP Alternative are not expected to change with the implementation of the Phase IIa Preferred Alternative.

4.4 Phase IIa Permits and Approvals

Construction of Phase IIa will require the permits and approvals listed below. Federal funding for this project is expressly conditioned upon compliance with all permitting terms and conditions:

US Coast Guard Permit

Under the authority of Section 9 of the Rivers and Harbors Act of 1899 and the General Bridge Act of 1946 (as well as other legislation), the US Coast Guard (USCG) is responsible for approving the locations and plans for bridges and causeways over navigable waterways. NCDOT anticipates USCG Advance Approval under 33 CFR 115.70 for the replacement of the temporary bridge over the Pea Island inlet.

US Army Corps of Engineers Permits

Under Section 404 of the Clean Water Act, USACE is responsible for issuing permits for discharges of dredged or fill material in waters of the United States, including fill placed in connection with bridge and road construction and the disposal of construction debris. The anticipated impacts to wetlands as a result of Phase IIa construction are discussed in Section 4.2.4.3.

Under the requirements of the Rivers and Harbors Act of 1899, a Section 10 permit is required for the construction of any structure in or over any navigable water of the

United States, the excavation/dredging or deposition of material in these waters, or any obstruction or alteration in a "navigable water." Such a permit, however, is not required for a bridge. Bridges are authorized by USCG under Section 9 of the Rivers and Harbors Act of 1899. USACE will determine if a Section 10 permit is necessary for Phase IIa.

US Fish and Wildlife Service Permits and Approvals

A permit would be required for the temporary construction easements necessary to construct Phase IIa. The exact terms and conditions, as well as appropriate compensatory mitigation, will be determined during the permitting process.

Coastal Area Management Act Permit

A CAMA permit is required from NCDENR-DCM since the project involves construction along the oceanfront and in AEC.

NCDENR-Division of Water Quality Certification

A 401 Water Quality Certification (as mandated under Section 401 of the Clean Water Act) would be required from NCDENR-DWQ. The 401 certification process is coordinated with the 404 and CAMA processes.

NCDENR-Division of Water Quality Stormwater Permit

A NCDENR-DWQ Stormwater Permit is required for development activities that require either a Sediment and Erosion Control Plan or a CAMA Major Development Permit.

Other Permitting/Approval Actions and Consultations

FHWA and NCDOT will continue to coordinate with the permitting agencies throughout the Phase IIa final design and permitting process and during construction. FHWA also will coordinate with USFWS and NMFS on any Section 7 of the ESA of 1973 concerns that arise during final design and construction; consultation under Section 7 will be re-initiated with either of these agencies if it becomes necessary. FHWA and NCDOT also will carry out the stipulations of the Section 106 National Historic Preservation Act Programmatic Agreement (Appendix D of the 2010 ROD) and will coordinate with the other Signatory and Concurring Parties, as necessary, during the final design, permitting, and construction processes.

5.0 Section 4(f) Evaluation for Phase IIa

The purpose of this chapter is to assess whether the detailed study alternative being considered for Phase IIa of the Bonner Bridge Replacement Project (B-2500) in the Pea Island inlet area affects the findings of the October 2009 Revised Final Section 4(f) Evaluation (Revised 4(f) Evaluation), by determining if the Phase IIa Preferred Alternative would use Section 4(f) property and providing the information and analysis necessary for FHWA to approve any such use. The Revised 4(f) Evaluation was included in the 2010 EA as Appendix B, and its findings are summarized below in Section 5.1. The Phase IIa Preferred Alternative is described in Section 5.2.

Section 4(f) of the USDOT Act of 1966, as amended (49 U.S.C. § 303), states that USDOT may not approve the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site, unless a determination is made that the project will have a *de minimis* impact, or unless a determination is made that:

1. There is no feasible and prudent avoidance alternative, as defined in 23 CFR 774.17, to the use of land from the property; and

2. The action includes all possible planning, as defined in 23 CFR 774.17, to minimize harm to the property resulting from such use.

The following sections are included in this chapter:

- October 2009 Revised Final Section 4(f) Evaluation Findings;
- Proposed Alternative for Phase IIa;
- Section 4(f) Properties in the Phase IIa Project Area;
- Impact to Section 4(f) Properties;
- Analysis of Avoidance Alternatives;
- Effect on the Least Harm Analysis;
- Effect on All Possible Planning to Minimize Harm; and
- Conclusion.

5.1 October 2009 Revised Final Section 4(f) Evaluation Findings

As discussed in Section 4.0 of the 2010 ROD, the Revised 4(f) Evaluation determined that all six of the Parallel Bridge Corridor alternatives, including the PBC/TMP Alternative, would require a use of the Refuge. The Refuge qualifies as a Section 4(f) property as it is a wildlife refuge and a historic site that is eligible for the NRHP. The Revised 4(f) Evaluation concluded that Section 4(f) applies to the Refuge as an historic property (see pages 8 to 15 of the Revised 4(f) Evaluation [pages B-8 to B-15 of 2010 EA Appendix B]). The Revised 4(f) Evaluation determined that Phase I would use approximately 3.2 acres of Refuge land. In addition, it was determined that for future phases, all of the Parallel Bridge Corridor alternatives considered may have a use of Refuge lands (see Table 1 of the 2010 ROD).

The Revised 4(f) Evaluation also determined that all six of the Parallel Bridge Corridor alternatives, including the PBC/TMP Alternative, would use approximately 6.3 acres from the Seashore, but Section 4(f) is not applicable to this impact because there exists a substantial history of joint planning and development for the co-existence of the Seashore and the roadway.

In addition to reaching the conclusions noted above, the Revised 4(f) Evaluation identified the location and characteristics of the Section 4(f) properties in the project area, described the applicability of Section 4(f) to these properties, discussed avoidance alternatives, presented a least overall harm analysis, and addressed the measures taken to minimize harm.

Based upon the Revised 4(f) Evaluation, FHWA determined in the 2010 ROD that there was no feasible and prudent alternative to the use of land from the Pea Island National Wildlife Refuge for the construction of Phase I of the project, and that the PBC/TMP Alternative would cause the least overall harm and includes all possible planning to minimize harm to the Refuge.

This chapter addresses the Section 4(f) considerations to the Refuge. No changes in the characteristics of this resource related to its eligibility for inclusion in the NRHP have occurred since the Revised 4(f) Evaluation, including the effects of Hurricane Irene (August 2011) and Hurricane Sandy (October 2012).

5.2 Proposed Alternative for Phase IIa

FHWA and NCDOT propose to advance Phase IIa of the PBC/TMP Alternative as a long-term solution to the sections of NC 12 damaged by Hurricane Irene. Long-term solutions would be designed to account for the Pea Island inlet, its potential to move southward, and, if it closes, its potential to reopen. After Hurricane Irene, a temporary

bridge was built over the Pea Island inlet. The temporary bridge is 662 feet long with 5 spans and 4 internal bents, with 200 feet of sheet piling around the endbents (i.e., the foundation at the end of the bridge structure). NCDOT is monitoring changes to the Pea Island inlet and intends to retrofit bridge and road protection systems, as needed, so that the temporary bridge can fulfill its function until a long-term Phase IIa project is completed. The bridge is considered temporary because it consists of a steel superstructure, which will eventually corrode in the salt water environment of the Outer Banks. From this perspective, a maximum structural life of five years is estimated for the temporary bridge. In addition, the temporary bridge spanned the Pea Island inlet as it existed shortly after Hurricane Irene. However, based on past history of inlets in this area and the views of the participants in the 2011 Peer Exchange meeting, there is the possibility that the Pea Island inlet will move southward. It also could close naturally.

The 2010 ROD identified the PBC/TMP Alternative as the Selected Alternative. Implementation of Phase I of this alternative, replacement of the Herbert C. Bonner Bridge over Oregon Inlet, is underway. The proposed Phase IIa Preferred Alternative is consistent with the objectives for later phases of the PBC/TMP Alternative as described in Section 3.3.2 of the 2010 ROD. The 2010 ROD indicates that the PBC/TMP Alternative addresses the study and selection of future actions on Hatteras Island beyond the limits of the Phase I Oregon Inlet bridge replacement through a comprehensive NC 12 TMP. The TMP will guide the implementation of future phases of the project through 2060. By actively monitoring the conditions in the Bonner Bridge Replacement Project (B-2500) project area and delaying decision-making as set forth in the TMP, the environmental impacts beyond Phase I can be better quantified, minimized, and mitigated.

The Phase IIa Preferred Alternative, the Bridge within Existing NC 12 Easement Alternative (see Figure 4), would involve building a bridge in the existing NC 12 easement to replace the existing surface road and the temporary bridge over the Pea Island inlet. The total length of the proposed project is approximately 2.4 miles. The bridge component, approximately 2.1 miles in length, is designed to account for the potential expansion and migration of the current inlet in the future, and it bridges the entire area considered geologically susceptible to breaches in the Pea Island inlet area (see Figure 4). The characteristics of the Phase IIa Preferred Alternative are described in detail in Chapter 3.0.

5.3 Section 4(f) Properties in the Phase IIa Project Area

5.3.1 Description of Properties

There are two Section 4(f) properties in the Phase IIa project area, the Cape Hatteras National Seashore (the Seashore) and the Pea Island National Wildlife Refuge (the Refuge). The Seashore stretches north to south across three islands: Bodie, Hatteras, and Ocracoke. The Seashore contains 30,319 acres of land and 70 miles of open, virtually

unspoiled beach. The State of North Carolina donated approximately 10,000 acres of the Seashore's land. The characteristics of the Seashore are described in detail in Section 3.5.1 of the 2008 FEIS. The Revised 4(f) Evaluation determined that Section 4(f) is not applicable to impacts to the Seashore.

The Refuge is located within the Seashore. The primary purpose of the Refuge is to serve as a refuge and breeding ground for migratory birds and other wildlife. The Refuge is comprised of ocean beach, dunes, upland, fresh and brackish water ponds, salt flats, and salt marsh. The objectives of the Refuge are to:

- Provide nesting, resting, and wintering habitat for migratory birds, including the greater snow geese and other migratory waterfowl, shorebirds, wading birds, raptors, and neotropical migrants.
- Provide habitat and protection for endangered and threatened species.
- Provide opportunities for public enjoyment of wildlife and wildlands resources. Public use programs focus on interpretation, environmental education, wildlife observation, wildlife photography, and fishing." (Pea Island National Wildlife Refuge web site, August 18, 2008.)

In addition to being a wildlife refuge, it also is a significant publicly owned recreation area and a significant historic site eligible for inclusion in the NRHP.

The characteristics of the Refuge are described in detail in Section 3.5.2 of the 2008 FEIS. The Phase IIa project area is wholly within the Refuge. The Revised 4(f) Evaluation concluded that Section 4(f) applies to the Refuge as an historic property (see pages 8 to 15 of the Revised 4(f) Evaluation [pages B-8 to B-15 of 2010 EA Appendix B]).

5.3.2 Effect of Hurricane Irene and Hurricane Sandy on the Refuge in the Phase IIa Project Area

The Pea Island inlet was created within the Phase IIa project area by Hurricane Irene. It is approximately 1,650 feet south of the southern dike around the Refuge's southern-most pond. Specific features that contribute to the Refuge's eligibility for inclusion in the NRHP are man-made dikes (that create the ponds) and dunes. These are representative of the Civilian Conservation Corps' efforts on the Outer Banks to protect and revitalize man-made resources such as the historic ponds. The dikes were not affected in the Phase IIa project area as a result of Hurricane Irene, but they were damaged to the north of the Phase IIa project area. Dunes were lost at the Pea Island inlet when the inlet was opened, and damaged along the shoreline adjacent to the inlet, but the dunes were not affected in much of the Phase IIa project area. However, the damage to the dikes and dunes did not change the Refuge's NRHP eligibility, and both remain contributing features to this eligibility.

The formation of the Pea Island inlet coincided with the location of the driveway to the Refuge's headquarters on the eastern side of NC 12 (see Figure 5). The driveway was washed away by the breach. In addition, prior to Hurricane Irene, there were three Refuge headquarters buildings at this site. The buildings were south of the inlet and were not damaged by the initial breach, but the slight southward migration of the inlet since the storm caused the northern-most building to collapse soon after the storm. The other two buildings at the site have since been demolished by USFWS because of the threat of further southward migration of the inlet. The headquarters buildings were not a contributor to the Refuge's NRHP eligibility.

As shown in Figure 5, there also are other Refuge facilities in the vicinity of the Pea Island inlet, including a parking area with an information kiosk approximately 1,250 feet to the south of the inlet and a boat ramp approximately 3,100 feet to the south of the inlet. Neither facility contributes to the Refuge's NRHP eligibility. Neither facility was affected by the breach; however, the parking area is just south (approximately 100 feet) of the southern end of the approximately 2,450-foot-long section of NC 12 that was replaced as a result of damage from the hurricane. Opportunities for direct access to the Refuge from the NC 12 shoulder have been reduced in the Pea Island inlet area as a result of the temporary bridge and associated guard rail, as well as a result of the Refuge's decision to restrict access to the area around the inlet. However, much of this area was previously off-limits to the general public because of the presence of the Refuge's headquarters.

The storm surge resulting from Hurricane Sandy passed through the Phase IIa project area. Some dunes were damaged in the vicinity of the Pea Island inlet, but were not affected in much of the Phase IIa project area. The dikes were not affected in the Phase IIa project area. Thus, both the dunes and dikes continue to be contributing features to the Refuge's NRHP eligibility. No other features in the Refuge were affected by Hurricane Sandy.

5.4 Impact to Section 4(f) Properties

The three potential uses of the Refuge as an historic resource are: permanent incorporation of land, temporary use, and constructive use. A constructive use of Section 4(f) property is only possible in the absence of a permanent incorporation of land or a temporary occupancy of the type that constitutes a Section 4(f) use. Constructive use occurs when the proximity impacts of a project on an adjacent or near-by Section 4(f) property, after incorporation of impact mitigation, are so severe that the activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs when the protected activities, features, or attributes of the Section 4(f) property are substantially diminished. As a general matter, this means that the value of the resource, in terms of its Section 4(f) purpose and significance, will be meaningfully reduced or lost.

5.4.1 Permanent Incorporation of Land

The Phase IIa Preferred Alternative, once completed, would be confined to the existing NC 12 easement. Thus, there would be no permanent incorporation of land.

5.4.2 Temporary Occupancy

It is currently expected that a Special Use Permit for 3.84 acres of temporary construction easement would be requested from the Refuge. A narrow temporary construction easement would be needed for the entire length of the Phase IIa project on at least one side of the existing NC 12 easement, and on both sides in four locations for short distances. Except in the area of the temporary bridge, the easement would be approximately 5 feet wide. The primary purpose of this narrow easement would be to provide room for construction workers to erect erosion control measures (fencing) along the edge of the existing NC 12 easement. In the temporary bridge area, the easement would be needed to aid in the placement of temporary shoring along the edge of the existing NC 12 easement and to remove the temporary bridge and its associated shoring and riprap. Temporary construction easements also would be requested for staging areas placed at the existing paved boat ramp and paved parking area just south of the Pea Island inlet (see Figure 4). A pile jetting pipe would be placed between NC 12 and the Pamlico Sound on a 10-foot wide easement at one location. Two additional jetting pipes would be used at the paved boat ramp easement and in the easement at the Pea Island inlet.

A temporary occupancy does not constitute a Section 4(f) use when all of five conditions listed in 23 CFR 774.13(d) are satisfied. The five conditions and evidence that all five are met in the case of the Phase IIa Preferred Alternative are:

1. Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land.

   Although the Special Use Permit would be for the duration of Phase IIa construction, no one part of the permitted easement would be used for the duration of the project. The narrow 5-foot-wide easement would be used primarily during the installation and removal of erosion control fencing. The easement in the temporary bridge area would be used primarily during the removal of the temporary bridge. The jetting pipe easement would be used only during bridge pile placement. The paved boat ramp and paved parking area would not need to be used for staging (i.e., storage of equipment and supplies) for the entire duration of the project.

2. Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal.

   The scope of work for the 3.84-acre temporary construction easement would be confined to use for a small portion of the temporary traffic maintenance road, the movement of construction personnel, and the movement and storage of equipment.

No features that contribute to the eligibility of the Refuge as an historic resource would be affected.

3. There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis.

   No features that contribute to the eligibility of the Refuge as an historic resource would be affected either on a temporary or permanent basis.

4. The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project.

   The wildlife habitat used would be restored as per the conditions of the Refuge and its Special Use Permit.

5. There must be documented agreement of the officials (Refuge and the North Carolina State Historic Preservation Officer [SHPO] in this instance) with jurisdiction over the Section 4(f) resource regarding the above conditions.

   The Refuge agreed in an e-mail dated February 7, 2013 (see Appendix A) that the first four conditions were met. SHPO agreed in an e-mail dated December 14, 2012 (see Appendix A).

Therefore, since all five conditions would be met, the temporary construction easement associated with the construction of the Phase IIa Preferred Alternative would not constitute a Section 4(f) use.

5.4.3 Constructive Use

In the Revised 4(f) Evaluation, FHWA concluded that the Parallel Bridge Corridor with Phased Approach/Rodanthe Bridge Alternative would constructively use the Refuge as an historic property. The Phase IIa Preferred Alternative has similar characteristics to Phase III of the Parallel Bridge Corridor with Phased Approach/Rodanthe Bridge Alternative, in that it is a bridge in the existing easement. The minimal differences between the designs of the two bridges consist of the location of the northern bridge terminus (the Phase IIa bridge would be slightly longer to the north), the alignment within the existing easement (in the area around the temporary bridge, the Phase IIa bridge would be on the west side of the easement because the temporary bridge is on the east side), and the height (the Phase IIa bridge would be lower).

As indicated in the Revised 4(f) Evaluation on page 17 (page B-17 in the 2010 EA), FHWA based its conclusions on review of available documentation pertaining to why the Refuge is eligible for the NRHP; its significance; what elements of the historic landscape were constructed by the Civilian Conservation Corps (and where the extent to

which those elements still exist and have not been altered); and the proximity of the alternative to the significant elements of the historic landscape that are still extant. FHWA also considered the extent to which the visual impact of the alternative could be lessened through mitigation measures, such as by requiring careful attention to the design details of the bridge structure, or through landscaping. FHWA found that: the historic landscape of the Refuge is a rare example of its type; it is nationally significant; a number of contributing elements are extant and in fair condition; although threatened by weather, the historic landscape is protected from development because of its location within the Seashore and Refuge; and the introduction of a bridge structure up to 33 feet in height across the entire length of the Refuge in a location nearly adjacent to most of the significant contributing elements that still exist (dikes and dunes) would be a substantial visual intrusion for which little mitigation is possible. Thus, the proximity impacts from this alternative would be so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) would be substantially impaired.

As noted above, the Revised 4(f) Evaluation assumed a bridge deck height of 33 feet. However, bridge heights were re-evaluated during design of the Phase IIa Preferred Alternative's bridge and, as a result, the bridge deck would be approximately 23 feet high for much of Phase IIa. In the Pea Island inlet area, it would be approximately 32 feet high.

Despite the lower elevation of the Phase IIa Preferred Alternative's bridge, the still tall bridge structure would stand in contrast with the natural character of the Refuge and its historic features of dikes and dunes. A tall bridge has never previously been a part of Refuge views. The Phase IIa Preferred Alternative's bridge would dominate views from the dunes lining the beach and, as the dunes disappear over time, it would also dominate views of the beach and ultimately the ocean. It would be uncharacteristic of the existing undeveloped and protected setting of the Refuge that makes it rare along the eastern US seaboard in terms of views and a resource for recreational activities. Therefore, the Phase IIa Preferred Alternative would have a constructive use of the Refuge, just as was found for the Parallel Bridge Corridor with Phased Approach/Rodanthe Bridge Alternative in the Revised 4(f) Evaluation.

5.5 Analysis of Avoidance Alternatives

Circumstances have not changed such that avoidance alternatives exist. This section addresses for the avoidance alternatives considered in the 2008 Final Section 4(f) Evaluation (see Chapter 5 of the 2008 FEIS) and in the Revised 4(f) Evaluation for the Bonner Bridge Replacement Project (B-2500), an additional potential avoidance alternative applicable to Phase IIa only, and the No-Build Alternative. Neither a ferry from Bodie Island at Oregon Inlet to Rodanthe nor a bridge or ferry from Stumpy Point to Rodanthe would be an avoidance alternative. The development of a ferry terminal on

Bodie Island at Oregon Inlet would use land from the Seashore. As discussed in Section 2.3.3, a mainland bridge terminal at Stumpy Point would cause environmental impacts to ARNWR because of the anticipated upgrades to US 264 and SR 1100, such as wider lanes and shallower curves that would be required to safely accommodate increased traffic volumes. Such upgrades also would be required to accommodate increased traffic volumes traveling to a ferry terminal at Stumpy Point.

5.5.1 Avoidance Alternatives Previously Considered

The 2008 Final Section 4(f) Evaluation concluded that the following potential avoidance alternatives were not feasible and prudent: Rehabilitate Bonner Bridge Avoidance Alternative and Bridge from Rodanthe to Roanoke Island Avoidance Alternative. These alternatives were not re-addressed in the Revised 4(f) Evaluation. There have been no changes in the condition of Bonner Bridge or the setting of the Rodanthe to Roanoke Island Alternative, as described in the 2008 Final Section 4(f) Evaluation in Sections 5.3.1 and 5.3.2 of the 2008 FEIS that would necessitate revisiting the conclusion on these alternatives.

The Rehabilitate Bonner Bridge Avoidance Alternative was determined not to be a feasible and prudent avoidance alternative for several reasons. It would fail to meet the purpose and need for the project as it would not include long-term maintenance and protection to NC 12 south of Oregon Inlet, which is frequently threatened by shoreline erosion and overwash, including the needs currently present in the Phase IIa project area. In addition, the rehabilitation of Bonner Bridge would present unacceptable safety, maintenance, and operational problems for the traveling public for several reasons. First of all, a rehabilitation alternative that dealt with Bonner Bridge deterioration and scour would be an ongoing effort disruptive to traffic operations on the bridge, and not a one-time project to extend the life of Bonner Bridge for many years. Second, the narrow navigation span zone of Bonner Bridge would remain. Finally, the existing Bonner Bridge was not designed to withstand the impact of a dredge, a vessel type that regularly operates near the bridge.

The Bridge from Rodanthe to Roanoke Island Avoidance Alternative was determined not to be a feasible and prudent avoidance alternative because it would not meet the project's purpose and need, result in severe disruption to the established community of Wanchese, severely impact the operations of emergency services from Hatteras Island, and require substantial utility relocation.

The Revised 4(f) Evaluation also indicated that FHWA determined that the Pamlico Sound Bridge Corridor is not a feasible and prudent avoidance alternative to using the Refuge because the cost of all of the Pamlico Sound Bridge Corridor alternatives would be of an extraordinary magnitude in consideration of the funding available to NCDOT to operate, improve, and maintain its State highway system. A detailed analysis is contained in Appendix G of the Revised 4(f) Evaluation (beginning on page B-143 of the

2010 EA). The analysis in Appendix G of the Revised 4(f) Evaluation was based on costs and funding information in 2006 dollars, but bridge costs have changed since 2006. Thus, a new cost and funding analysis was conducted in 2012. The findings of the new cost and funding analysis are presented in an October 24, 2012 report prepared by NCDOT titled *Bonner Bridge – NC 12 Transportation Management Plan Phase II—Pamlico Sound Bridge Corridor Cost Analysis.* This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/. The findings of the October 2012 report are summarized in Section 2.6.1.

Based on the October 2012 report's cost and funding findings, as well as the funding source findings contained in Appendix G of the Revised 4(f) Evaluation, FHWA reassessed the Revised 4(f) Evaluation's conclusion related to a bridge in the Pamlico Sound Bridge Corridor. Types of funding sources considered in both analyses included: federal program funds, state funds, general obligation bonds, and toll revenue bonds. Public-Private Partnerships, TIFIA loans, and other innovative financing programs also were considered. FHWA concluded that its determination presented in the Revised 4(f) Evaluation remains valid: "the Pamlico Sound Bridge Corridor Alternative would not be a feasible and prudent avoidance alternative as defined in 23 CFR 774.17."

5.5.2 Additional Phase IIa Avoidance Alternative

The constructive use of the Refuge described above in Section 5.4.3 resulted from a substantial visual intrusion for which little mitigation is possible. That visual intrusion would be associated with the height of the Phase IIa Preferred Alternative's bridge. One alternative would avoid this impact – close the Pea Island inlet and rebuild NC 12 as a surface road. However, such an alternative would not be feasible and prudent because it would not meet the third project purpose presented in Section 1.2 of the 2008 FEIS: "Provide a replacement crossing that will not be endangered by shoreline movement through year 2050." Although it is feasible to close the Pea Island inlet, it would not be prudent in that it would be a temporary and not a long-term solution. The risk would remain that an inlet would reopen, once again breaching any surface road.

5.5.3 No-Build Alternative

With the No-Build Alternative, the temporary bridge over the Pea Island inlet would be removed at the end of its life (about five years) and NC 12 would be severed in that there would be no way to cross the Pea Island inlet in a motor vehicle except at times when the Pea Island inlet might be closed. Such an alternative would not be feasible and prudent because it would not meet the first project purpose presented in Section 1.2 of the 2008 FEIS: "Provide a new means of access from Bodie Island to Hatteras Island for its residents, businesses, services, and tourists prior to the end of Bonner Bridge's service life." A severed NC 12 would preclude access from Bodie Island to Hatteras Island south of the Pea Island inlet, which is the location of all residents, businesses, and services, and the destination of the bulk of tourists visiting Hatteras Island.

5.5.4 Avoidance Alternatives Conclusion

Therefore, based on the determinations from the 1993 DEIS, the 2005 SDEIS, the 2007 SSDEIS, the 2008 FEIS/Final Section 4(f) Evaluation, the Revised 4(f) Evaluation, and the above findings, there is no feasible and prudent avoidance alternative to the use of the Section 4(f) property needed to construct Phase IIa of the PBC/TMP Alternative.

5.6 Effect on the Least Harm Analysis

The 2008 FEIS, the 2010 EA, and the Revised 4(f) Evaluation all assessed the entire Bonner Bridge Replacement Project (B-2500) from the south end of Bodie Island to Rodanthe. The least harm analysis presented on pages 22 to 27 of the Revised 4(f) Evaluation (pages B-22 to B-27 of the 2010 EA) used seven factors to reach a determination as to least overall harm. These factors are:

1. The ability of the alternatives to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
2. The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
3. The relative significance of each Section 4(f) property;
4. The views of the official(s) with jurisdiction over each Section 4(f) property;
5. The degree to which each alternative meets the purpose and need for the project;
6. After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
7. Substantial differences in costs among the alternatives.

No changes have occurred in the Bonner Bridge Replacement Project (B-2500) project area or its potential PBC/TMP Alternative phases related to those seven factors since the Revised 4(f) Evaluation that would alter FHWA's findings.

5.7 Effect on All Possible Planning to Minimize Harm

The Revised 4(f) Evaluation identified project-specific minimization of harm efforts for Phase I and future phases of the Bonner Bridge Replacement Project (B-2500). Table 7 summarizes the measures to minimize harm that are also listed on pages 27 to 34 of the Revised 4(f) Evaluation (pages B-27 to B-34 of the 2010 EA) for Phase I and their current implementation status. NCDOT has begun work on the mitigation commitments made in the Programmatic Agreement (PA) that was signed by NCDOT, FHWA, SHPO, and the Advisory Council on Historic Preservation (ACHP). As noted in Table 7, these

Table 7. Phase I Impacts, Mitigation Measures, and Current Status

Impacts/Mitigation Measures in Revised 4(f) Evaluation	Status
Cape Hatteras National Seashore on Bodie Island	
Consultation with NPS will be conducted throughout the final design process.	NCDOT has actively coordinated with NPS for the past two years to develop the conditions that will be attached to the Special Use Permit as well as on the design of the project.
Use of Seashore Land	
• Acres Used: 6.3	12.3 acres
• Acres Returned: 6.3	12.2 acres
Note: The 6.3 acres did not include a 100-foot easement surrounding the new bridge when over marsh islands in Pamlico Sound since it was unclear at the time whether a 100-foot easement existed at this location. This easement area is included in the new status numbers, which are the use agreed to by NPS during final design. Adjustments were made in the bridge alignment during final design, but the use of Seashore lands is essentially the same.	
Access to Seashore facilities on Bodie Island will be maintained during construction.	Access to the Oregon Inlet Fishing Center, campground, and beach will be maintained during construction. NCDOT committed, when needed, to closing entrances only at non-peak times of the year. Final details are being discussed with NPS.
Impacts to the campground and Oregon Inlet Marina will be minimized during construction.	The current design shows only minor shoulder improvements and driveway entrance repaving in these areas. No staging or parking will occur within these facilities. NCDOT committed, when needed, to closing entrances only at non-peak times of the year.
NPS will agree to the wetland mitigation plan.	Mitigation planning is being done in association with NPS. The restoration will be done at the Bodie Island Lighthouse Pond, where 50 plus acres will be restored by rehabilitation to its former function as a brackish marsh through physical and chemical treatment of phragmites around the pond. This treatment will continue until the phragmites is reduced to a condition and coverage such that future management can be assumed by NPS.
New Oregon Inlet Bridge	
8-foot-wide shoulders and bicycle safe rail	This is being done as specified in the 2008 FEIS.
Dredging disposal plan that minimizes impacts and creates foraging habitat for piping plovers.	There are no plans to dredge at this time, so no specific dredge disposal plan has been developed. However, if dredging is needed, disposal will be done in accordance with project commitments.
Maximum bridge height on Hatteras Island: 33 feet above mean sea level (approximately 38 feet to the top of rail)	The maximum bridge height is now 44 feet above mean sea level to the top of rail. The increased height reflects final decisions on the location of the navigation zone.

Table 7 (concluded). Phase I Impacts, Mitigation Measures, and Current Status

Impacts/Mitigation Measures in Revised 4(f) Evaluation	Status
Pea Island National Wildlife Refuge on Hatteras Island	
Consultation with USFWS will be conducted throughout the final design process.	NCDOT has actively coordinated with USFWS for the past two years to develop the conditions that will be attached to the Special Use Permit as well as on the design of the project. NCDOT also is doing this for Phase II.
Use of Refuge Lands	
• Total Acres Used: 3.08 permanently for both new easement and to maintain access to the NPS parking lot	1.15 acres permanently for both new easement and to maintain access to the Refuge parking lot.
• Total Acres Returned: 2.70	3.33 acres
• Distance of bridge terminus west of the existing easement: 216.5 feet	0 feet (new easement adjoins the existing easement)
Mitigate wetlands acres filled: 1.0	0.51 acre
Preserve public fishing access currently on Bonner Bridge.	A portion of Bonner Bridge will be retained for use as a fishing pier with International Building Code (IBC) compliant handrails to be installed. Currently this pier is planned to be approximately 1,050 feet long.
Maintain access to the NPS parking lot at end of bridge.	Access is being maintained by providing a turn movement off of NC 12 onto SR 1257 and then off of SR 1257 onto a new access road to the parking lot.
Maintain reasonable public fishing access during construction.	The public will be allowed to use the existing fishing catwalks on the existing bridge during construction for as long as is deemed safe. The catwalks on the west side of the bridge may need to be shut down for a portion of the construction time. Fishing will not be available when the portion of Bonner Bridge that will remain is being converted to its use as a fishing pier.
Use of 7.08 acres of the (former) Oregon Inlet US Coast Guard Station property owned by the state for construction staging.	On-site construction staging will be limited to SR 1257 (road to the [former] Oregon Inlet US Coast Guard Station). The main staging area will be on a portion of the NPS parking lot and adjacent to a grassy area.

commitments are currently being fulfilled and further efforts to minimize harm are proceeding. An environmental review commitment was included in Section 3.3.2 of the 2010 ROD in lieu of the proposed Partnership Agreement described in the Revised 4(f) Evaluation.

To the extent that the specific commitments to minimize harm apply to Phase IIa, they will be implemented by NCDOT and FHWA, including:

- Under Section 106 of the Historic Preservation Act of 1966, stipulations in the Section 106 Programmatic Agreement presented in the 2010 ROD in Appendix D, in particular the bridge rail (stipulation #IIB). Commitment made to SHPO.

- Under Section 7 of the ESA of 1973, commitments included in this EA (see Project Commitments starting on page iii) related to night- time lighting (#11), manatee protection (#12), sea turtle and sawfish protection (#13), and protected species conservation measures (#20, #24, #25, and #26). Commitment made to USFWS and NMFS.

- Related to EFH, commitments included in this EA (see Project Commitments starting on page iii) related to protection of SAVs (#3 and #27) and sedimentation and erosion control (#24). Commitment made to NMFS.

- Related to minimizing impact to the Refuge, the commitment included in this EA (see Project Commitments starting on page iii) related to design coordination (#8). Commitment made to Refuge representatives.

NCDOT stated in Merger Team meetings its plans to minimize harm in relation to Phase IIa by:

1. Confining construction to the existing NC 12 easement and limited temporary easements;

2. Adhering to the coastal and environmental monitoring commitment through the coastal monitoring program (Project Commitment 17);

3. Adhering to permit requirements with respect to dewatering and stormwater discharges (and not pumping to wetlands and beach);

4. Minimizing discharge of contaminates and trash; and

5. Working with USFWS, NMFS, and NCDENR-DCM to minimize the impacts of the spoil that would be generated from jetting the permanent bridge piles (impacts, water source, and spoil disposal).

Table 8 summarizes Phase IIa impacts and mitigation measures, and their current implementation status.

Table 8. Phase IIa Impacts, Mitigation Measures, and Current Status

Impacts/Mitigation Measures	Status
General	
Consultation with USFWS will be conducted throughout the final design process.	NCDOT has actively coordinated with USFWS since Hurricane Irene in relation both to temporary repairs to NC 12 and Phase IIa (see Sections 6.2, 6.3, and 6.4). Coordination will continue through final design and the permit process.
Use of Refuge Lands	
• Total Acres Used	The Phase IIa Preferred Alternative would have a temporary use of 3.84 acres for a construction easement. There would be no permanent use of lands outside the existing NC 12 easement.
• Total Acres Returned	Not applicable since no permanent use of Refuge lands.
Mitigate wetlands acres filled	The permanent wetland impact of the Phase IIa Preferred Alternative is currently estimated to be 0.01 acre. This impact was discussed with the Merger Team, including USFWS, and will be finalized at Concurrence Point 4A.
Other Refuge Impacts	
Access to the public parking area (with an information kiosk).	Motor vehicle access would be lost to the public boat ramp and the public parking area with the Phased IIa Preferred Alternative. New opportunities for parking will be discussed with the Refuge during impact mitigation planning. The boat ramp is not an official Refuge or Seashore facility, and it would be difficult to reach without paved road access. NCDOT will address this impact in future mitigation discussions with the Refuge.
Access to the public boat ramp.	

In addition to the general commitments listed above and in Table 8 for Phase IIa, FHWA and NCDOT will work with the appropriate agencies to develop and implement specific commitments that may come from planned additional consultation as the Phase IIa design and permit processes progress. Therefore, all possible planning to minimize harm has or will be done for Phase IIa.

5.8 Conclusion

The Revised 4(f) Evaluation indicated that the PBC/TMP Alternative proposed that the construction of Phase I of the Bonner Bridge Replacement Project (B-2500) proceed as soon as possible. The implementation of Phase I is underway. The Revised 4(f) Evaluation also stated that FHWA and NCDOT proposed to use approximately 3.08 acres of the Pea Island National Wildlife Refuge for Phase I. The current proposal is to use approximately 1.15 acres of Refuge land permanently for new permanent easement; however, approximately 3.33 acres of land would be returned to the Refuge, so a net of approximately 2.18 acres of land would be gained by the Refuge for Phase I. The current proposal also calls for temporary use during construction of approximately 1.96 acres of Refuge land.

NCDOT awarded a contract to a design-build contractor for Phase I. When developing the proposed final design for the new Oregon Inlet bridge, the design-build contractor identified exact alignment and pier placement for Phase I based on engineering design, construction techniques, and coordination with NCDOT, FHWA, NPS, USFWS, and other environmental resource and regulatory agencies.

The Revised 4(f) Evaluation indicated that the study and selection of future actions on Hatteras Island beyond the limits of Phase I will be undertaken as follows:

- "When the coastal and environmental monitoring indicates a future problem for the transportation corridor, the Merger Team will convene for purposes of identifying an appropriate response strategy. Such response strategy(ies) will be culled from the alternatives currently studied (including the 'No Action' Alternative as required by NEPA), as these represent the range of possible solutions. The Section 4(f) Evaluation will be reviewed to verify the status of Section 4(f) resources, the effect(s) of the proposed response strategies on the 4(f) resources, 'use' determinations and, if necessary, a revised least overall harm analysis."

  This commitment is now being met for Phase IIa, as described in this EA. The intent of the PBC/TMP Alternative is to provide a long-term solution for the Bonner Bridge Replacement Project (B-2500). The decision to move forward with a long-term solution in the Pea Island inlet area as Phase IIa was made in response to the effects on this portion of the Bonner Bridge Replacement Project (B-2500) project area caused by Hurricane Irene.

- "If a later phase of the Preferred Alternative requires the use of Section 4(f) property, additional Section 4(f) analysis would be undertaken prior to FHWA's approval of the later phase. Thus, if FHWA approves the Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative, an express commitment will be made in the ROD to complete additional Section 4(f) analysis before all later phases of the

project are implemented, if the later phase would use additional Section 4(f) property."

This commitment has been met for Phase IIa by the re-evaluation of the Revised 4(f) Evaluation presented in this chapter.

- "In addition, FHWA and NCDOT commit to coordinate with USFWS-Pea Island National Wildlife Refuge and NPS to develop a Partnership Agreement (or other mutually-agreed upon mechanism) to set up protocols to follow prior to NCDOT implementing future actions beyond Phase I."

  The mechanism being used to fulfill this commitment was presented in the 2010 ROD beginning on page 14 under the subheading "Environmental Review for Future Phases." FHWA and the environmental resource and regulatory agencies serving on the Merger Team agreed that this approach was preferred over the Partnership Agreement originally proposed by FHWA.

- "These actions address transportation management through 2060 with a plan to monitor conditions on NC 12 and the affected environment and modify management actions so as to minimize the adverse impacts to the Refuge resources while maintaining NC 12 as a viable transportation facility. Future construction actions within the project corridor would be evaluated based on future conditions of resources in the project area in cooperation with the appropriate environmental regulatory and resource agencies and the public in a process stipulated in the Partnership Agreement."

  This commitment is being fulfilled in terms of progress on the implementation of Phase I, planning for Phase IIa, and the monitoring efforts underway by NCDOT to identify the timing of future phases. The mechanisms being used to coordinate with appropriate environmental agencies were presented in the 2010 ROD beginning on page 14 under the subheading "Environmental Review for Future Phases." These mechanisms consist of:

  – Reviewing the status of the project in complying with environmental laws.

  – Using the results of the coastal monitoring program, the updated shoreline erosion predictions, and the Refuge habitat/NC 12 vulnerability study, in consultation with representatives of the Refuge and the Merger Team, to determine: when an environmental review for each individual future phase of action will be initiated; the limits of the action area; potential actions that should be considered for the location; and measures to minimize and mitigate impacts.

Based on the above Section 4(f) re-evaluation, as well as the findings of the Revised 4(f) Evaluation that the PBC/TMP Alternative is the alternative that causes the least overall

harm, the Selected Alternative (PBC/TMP Alternative) for the Bonner Bridge Replacement Project (B-2500) remains valid. There are no prudent and feasible alternatives to avoid the use of the Pea Island National Wildlife Refuge. The PBC/TMP Alternative (including the Phase IIa Preferred Alternative) causes the least overall harm. The PBC/TMP Alternative (including the Phase IIa Preferred Alternative) includes all possible measures to minimize harm.

6.0 Comments and Coordination

6.1 Public Meetings and Activities

6.1.1 Citizens Informational Workshops for Scoping

As a part of scoping for Phase II, three Citizens Informational Workshops were held in December 2011 and January 2012 to:

- Provide the public with an opportunity to review and revisit the alternatives considered in the 2008 FEIS and the 2010 EA for the locations that were later breached by Hurricane Irene (Pea Island and Rodanthe), including the decision-making factors, such as cost and impacts, associated with each alternative.

- Obtain scoping feedback from the public regarding ideas, thoughts, and suggestions about the alternatives assessed in the 2008 FEIS and 2010 EA and other alternatives that might be considered.

The public was informed of the two December 2011 Citizens Informational Workshops in a November 2011 Bonner Bridge Update newsletter. The workshops also were advertised on the project web site, in local newspapers and media outlets in the project area, and through NCDOT's Twitter site for NC 12 repairs (http://twitter.com /NCDOT_NC12). The newsletter indicated that those who could not attend a workshop could write the study team or call the toll-free project information line with comments and questions. Subsequent to the December 2011 workshops, residents living in Ocracoke Island requested that NCDOT hold a third Citizens Informational Workshop in January 2012. All three workshops were informal, and the public was invited to come at any time during a three-hour period to view displays of the alternatives then under consideration for both Phase II areas.

The Citizens Informational Workshops were held in Manteo (December 5, 2011) at the Dare County Administration Building, in Rodanthe (December 6, 2011) at the Rodanthe-Waves Salvo Community Center, and in Ocracoke (January 5, 2012) at the Community Center. A total of 238 persons (45 in Manteo, 135 in Rodanthe, and 58 in Ocracoke) registered their presence at the workshops. A total of 77 citizens and one non-governmental organization (NGO) made comments (written, e-mail, or telephone) at and following the Citizens Informational Workshops. The public comments and responses to the comments applicable to Phase IIa, or the Bonner Bridge Replacement Project (B-2500) in general, are presented in Appendix C. All comments and responses regarding Phase IIb will be presented in a future NEPA document specifically addressing that phase. The original correspondence received is included in Appendix B, along with the newsletter and material presented at the workshops.

Representatives from USFWS-Refuge attended the December 5, 2011 workshop in Manteo. A representative from USACE attended the December 6, 2011 workshop in Rodanthe. A representative from the Office of US Senator Richard Burr attended the January 5, 2012 workshop in Ocracoke. A representative from the Albemarle Rural Planning Organization (RPO) was present at workshops in Rodanthe and Ocracoke.

A set of Public Hearings is planned to discuss the findings of this EA for Phase IIa. Another set of Public Hearings is planned in association with the release of a future NEPA document for Phase IIb (the Rodanthe breach area).

6.1.2 Newsletters

NCDOT issued a Bonner Bridge Update newsletter in November 2011. The newsletter was mailed to everyone on the Bonner Bridge Replacement Project's (B-2500) mailing list, which includes Hatteras Island property owners, individuals on the Refuge's mailing list, and individuals who attended past Citizens Informational Workshops.

The newsletter discussed the two breaches of NC 12 caused by Hurricane Irene in August 2011, ongoing work by NCDOT to temporarily restore traffic flow on NC 12, and the alternatives then under consideration for long-term improvements at both Phase II areas. The newsletter also indicated how to contact the study team, including the toll-free telephone number (see below). A copy of the newsletter is included in Appendix B.

Another newsletter will be mailed prior to planned public hearings.

6.1.3 Toll-Free Telephone Number

The project's toll-free telephone number was provided in the newsletter. It is answered by a senior member of NCDOT's consultant team (led by Parsons Brinckerhoff), and provides a means for citizens to obtain answers to questions about the Bonner Bridge Replacement Project (B-2500) and to make individual comments at any time during the study. The phone number is 1-866-803-0529, and it has been available throughout the 2005 SDEIS, 2007 SSDEIS, 2008 FEIS, 2010 EA, and 2010 ROD preparation portions of the study. This toll-free telephone number will continue to be open at least until the NEPA process associated with Phase IIb is complete.

6.1.4 Web Sites

The newsletter provided a web site and social media resources by which those interested could view information about the damage to NC 12 from Hurricane Irene and NCDOT's efforts to temporarily restore NC 12 to service. Since the publication of the November 2011 newsletter, NCDOT created a new web site for Phase IIa, as well as a web site for all of the NC 12 projects along the Outer Banks. The web sites and other social media resources are:

- Bonner Bridge Replacement Project (B-2500) Phase II Web Site – http://www.ncdot .gov/projects/bonnerbridgephase2/

- NC 12 Projects Web Site – http://www.ncdot.gov/nc12/. (Note that this web page includes links to all NC 12-related NCDOT projects, including the Phase II link above and a link to information on Phase I, the new Oregon Inlet bridge.)
- NC 12 Recovery Web Site – www.ncdot.org/travel/nc12recovery
- NC 12 Twitter Feed – http://twitter.com/NCDOT_NC 12
- Repairing NC 12 Blog – http://nc12repairs.blogspot.com/
- NC 12 Facebook Page – https://www.facebook.com/NCDOTNC12

6.2 NEPA/Section 404 Merger Team Meetings and Outcomes

The NEPA/Section 404 Merger Process is a streamlining effort that helps to avoid duplication of effort between the NEPA and the Clean Water Act Section 404 processes, since USACE must meet the requirements of NEPA in order to issue a dredge and fill permit under the Clean Water Act. Stakeholders can reach concurrence or agreement; non-concurrence or disagreement; or abstention.[8] The goal of the Merger Process is to obtain stakeholder concurrence on key issues during the NEPA study so that those decisions do not need to be revisited during application for a USACE permit.

The Merger Process includes the following concurrence points:

1. Concurrence on purpose and need;

2. Concurrence on the alternatives to be evaluated in detail in the environmental document;

2A. Concurrence on the approximate length of any proposed bridges to minimize impacts to wetlands and streams, and preliminary alignment review for each detailed study alternative;

3. Concurrence on the Least Environmentally Damaging Practicable Alternative (LEDPA);

[8] The Merger Process guidelines define abstention as follows: "… abstain means that a team member does not actively object to a concurrence point but the agency representative does not sign the concurrence point form. The process may continue and the agency representative agrees not to revisit the concurrence point. Written justification for abstaining from a concurrence point should be provided to the project team within 5 days of the concurrence meeting."

4A. Concurrence that all efforts were made to avoid and minimize harm to USACE jurisdictional resources (streams and wetlands) to the maximum extent practicable;

4B. Concurrence on the 30 percent complete hydraulic design; and

4C. Concurrence on permit drawings after the hydraulic design is complete and prior to Section 404 permit application.

For more details on the Merger Process, see Section 8.3.1 of the 2008 FEIS.[9]

The sections that follow summarize the Merger Team meetings that took place during the Phase II study to date, and particularly those aspects related to Phase IIa. The full minutes for these meetings and concurrence forms are presented in Appendix A.

6.2.1 August 31, 2011 Merger Team Meeting

The August 31, 2011 Merger Team meeting for the Bonner Bridge Replacement Project (B-2500) was held to determine issues and discuss response strategies for the emergency repair of the damage caused by Hurricane Irene to NC 12 on Hatteras Island in order to re-open NC 12 to traffic as early as possible. The purposes of the meeting were to:

- Educate participants on the damage caused by Hurricane Irene to NC 12 on Hatteras Island;
- Inform participants of the discussions, considerations, and planning that transportation officials have had to that date regarding the damage and possible scenarios for response and repair;
- Discuss potential repair scenarios; and
- Identify next steps and an associated timeline.

Two temporary repair options were then discussed for the Pea Island breach: 1) filling the two small channels created by the storm and erecting a temporary bridge over the large channel and 2) filling all three channels and not doing beach nourishment. For the Rodanthe breach, NCDOT recommended that all channels be filled.

Merger Team feedback included:

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[9] The current Merger Team members are: NCDOT; FHWA; USACE; USEPA; USFWS (Raleigh Office); USFWS—Pea Island National Wildlife Refuge; NMFS; NPS—Cape Hatteras National Seashore; NCDENR-DCM; NCDENR-DMF; NCDENR-DWQ; NCWRC; NCDCR; and the Albemarle RPO. USCG is not a signing team member, but is sent information before and following all NEPA/Section 404 Merger Team meetings.

- Confine construction to the existing NC 12 easement limits. The consensus was that keeping repairs within the existing NC 12 easement would facilitate rapid review and permitting of temporary repairs.

- NCDENR-DCM, USFWS-Refuge, and USFWS indicated the following regarding permit requirements:

  - NCDENR-DCM said it would use their Emergency Permit procedures, provided that the repair is for the purpose of opening the road and re-establishing safe transportation.

  - USFWS-Refuge said that it could use an Emergency Special Use Permit. The process would be less complicated if the actions to restore transportation are confined to the existing NC 12 easement. However, minor work outside the easement could be permitted if necessary for public safety.

  - USFWS said that it would follow emergency consultation procedures for any threatened and endangered species protected by Section 7 (e.g., sea turtles).

- NCWRC and other agencies indicated upland sources for fill sand were the best, followed by dredge material from existing channels. It was mentioned that preapproved sites such as the one at Avon were acceptable.

- Temporary bridge structures on pile foundations would be acceptable. However, hardened structures such as abutments for bridge ends would be a concern and were not preferred.

- Sand bags for armoring would be acceptable, depending on the location and extent of use. Agencies would need specific design details for drawings in permit applications for approval.

- NCDOT and NCDENR-DCM would consult on contractor access from Rodanthe to Pea Island. A contractor could request a temporary bridge at Rodanthe for the purpose of allowing the contractor to transport equipment and materials to the Pea Island site.

- No special restrictions or requirements apply to pumping of water from channels at Rodanthe, as long as the water is not pumped directly into wetlands or the beach. Discharge of contaminates and trash needs to be minimized as much as possible.

- Dune reconstruction is allowable under a CAMA Emergency Permit if dunes were present prior to the storm.

- No navigation (at the Pea Island inlet) is required by NCDENR-DCM under the Emergency Permit procedures.

- NCDOT would consult with USCG to determine whether it would require a permit for the ebb and flow of tide at the Pea Island inlet.

The process for permanent repairs was discussed as follows:

- As outlined in the PBC/TMP Alternative, the Merger Team will consider options for the permanent repair of the damaged sites on NC 12. As part of this process, a panel of coastal science experts would be formed to advise FHWA, NCDOT, and the Merger Team.

- NCDOT would establish a timeline for addressing the permanent repair decisions.

The minutes for the August 31, 2011 Merger Team meeting are included in Appendix A.

6.2.2 October 18, 2011 Merger Team Meeting

The October 18, 2011 Merger Team meeting was an informational/scoping meeting for Phase II. The purpose of the meeting was for NCDOT to inform the Merger Team members about the start of the Phase II studies of long-term repairs at the two areas along NC 12 that were breached by Hurricane Irene in August 2011 (i.e., Pea Island inlet and Rodanthe). Agency representatives were asked to provide scoping comments related to impact issues and alternatives related to the two breach sites prior to NCDOT's initiation of these studies.

NCDOT proposed, as a starting point, the alternatives used in the 2008 FEIS to establish the range of potential impacts for phases of the PBC/TMP Alternative after Phase I. These are:

- Nourishment Alternative

- Road North/Bridge South Alternative

- All Bridge Alternative

- Phased Approach Alternatives

These alternatives are described in Section 2.1 of this document.

The impact issues expressed by agency representatives with respect to the Pea Island inlet included the following:

- USFWS indicated that a compatibility determination is needed for alternatives that deviate from the existing NC 12 easement. Beach nourishment could be compatible only if suitable sand is used; relocating the road or constructing a bridge outside the existing easement would not be allowed without a compatibility determination. USFWS also expressed concern that the natural westward migration of barrier

islands was not being allowed, and that NCDOT should consider wetland mitigation in Pamlico Sound to assist with the barrier island migration process. USFWS also stated that further monitoring of the new inlet area would be needed to determine how it will affect habitat within the Refuge, but noted that the introduction of the inlet was part of the natural process of a barrier island.

- NCDCR reiterated previous comments that bridging alternatives are incompatible with the surrounding historic landscape of the Refuge under Section 106 of the Historic Preservation Act of 1966. Beach nourishment would likely be the only alternative that would not have an Adverse Effect under Section 106.

- NCDENR-DCM stated concerns about any beach nourishment alternative, particularly with respect to finding an adequate sand source that would provide suitable material for a long-term nourishment program. Any road or bridge on new location would be subject to NCDENR-DCM's ocean setback requirements, and the designs for any retaining walls would need to be reviewed to ensure they do not conflict with state hardened structure laws. NCDENR-DCM also noted the potential impacts to coastal wetlands and other sensitive habitats, which will require mitigation.

- NCDENR-DWQ reiterated previous comments on the alternatives and stated that road and bridge alternatives on new location are more of a concern than those options in the existing easement. NCDENR-DWQ is concerned about potential wetland impacts and proposed stormwater runoff treatment plans for the options on a new location. The long-term source of sand for a beach nourishment option also may be an issue because of the potential impacts that the quality of sand would have on benthic macroinvertibrates on the beach.

- NMFS said that its issues of concern were similar to those discussed earlier in the NEPA process. One concern is the potential impact to fisheries that would result from any work in the surf zone. Because any of the options will likely impact NMFS resources, NMFS will require appropriate mitigation. Another NMFS issue of concern would likely be impacts to protected sea turtles and the Atlantic sturgeon, which at the time of the meeting was proposed for listing as a protected species (it is now listed).

- NPS said that the Phase II alternatives generally will not affect Seashore property. However, the 1958 deed between North Carolina and the United States transferred public trust of the area from mean low tide to mean high tide to NPS. Therefore, NPS would have an interest in beach nourishment in that area.

- NCDENR-DMF said that most of its concerns were similar to those of NMFS. In addition, if nourishment is chosen, it would have concerns about placement of material in the coastal zone. A construction moratorium could be necessary during

the summer months because of potential impacts to the Atlantic and shortnose sturgeon. NCDENR-DMF would prefer that the Pea Island breach remain open in order to allow for continued fish passage.

- NCWRC reiterated previous comments on the alternatives, noting that NCWRC generally wants to allow natural island processes to occur in order to sustain habitat. NCWRC had similar concerns as the other agencies about any long-term nourishment alternative and had questions about the study area proposed for each breach site.

- USACE said that its issues of concern were similar to those expressed during the earlier NEPA studies. The agency's major concerns include a potential suitable sand source for nourishment alternatives, wetland mitigation for any of the alternatives, potential impacts to endangered species, and resolving potential agency conflicts with several of the alternatives.

- The USEPA Merger Team representative was unable to attend the meeting, but submitted concerns about the construction of additional bridges on a dynamic barrier island. The use of additional bridges was not USEPA's plan for long-term adaptation. USEPA noted that the use of non-highway, non-bridge options (specifically a ferry alternative) should be reexamined. As discussed in Section 2.3.2, prior to the meeting, the USEPA representative suggested reconsideration of a ferry as an alternative to the PBC/TMP Alternative.

Several issues raised and the alternatives discussed at this meeting, as well as at the subsequent meeting on December 15, 2011 (see Section 6.2.3), required additional evaluation (which has been completed). These issues are:

- Reassessment of the Ferry Alternative (see Section 2.3.2).

- The need for Section 7 consultation on the Atlantic sturgeon, which was added to the federal protected species list after the release of the 2010 ROD (see Section 4.1.4).

- Revisiting the costs of the Pamlico Sound Bridge given that the final bid for Phase I was lower than was assumed in cost analyses presented in Appendix G of the 2009 Revised Final Section 4(f) Evaluation (included in Appendix B of the 2010 ROD). Given the change in the cost for Phase I, the practicability of the Pamlico Sound Bridge from the perspective of cost needed to be reexamined (see Section 2.6.1).

- Consideration of a "Seven-Mile Bridge Alternative," which would involve building a bridge in Pamlico Sound from just north of the Pea Island inlet to Rodanthe (see Section 2.3.4).

NCDOT also presented its proposed Phase II schedule and asked the Merger Team members to work with NCDOT so that the schedule can be maintained. FHWA noted that the types of alternatives studied, the results of the expert panel meeting, an assessment of changes to the Phase II project area, and additional interagency and public coordination would determine what future NEPA documentation is prepared for Phase II of the project. This EA is the required documentation for the Phase IIa—Pea Island inlet area.

The minutes for the October 18, 2011 Merger Team meeting are included in Appendix A.

6.2.3 December 15, 2011 Merger Team Meeting

The December 15, 2011 Merger Team meeting was the initial Concurrence Point (CP) 2/2A meeting for Phase II of the Bonner Bridge Replacement Project (B-2500). The purposes of the meeting were to determine the alternatives to be studied in detail (CP 2) for Phase II at the two breach areas (i.e., Pea Island inlet and Rodanthe), as well as to discuss any additional bridging decisions associated with the detailed study alternatives (CP 2A).

At this meeting, the Merger Team:

- Reviewed the Beach Nourishment, Bridge on New Location, Road on New Location, and Bridge within Existing NC 12 Easement alternatives for the Phase IIa project area.
- NCDOT summarized the results of the October 2011 Peer Exchange meeting (see Section 2.6.2) and the Citizens Informational Workshops held on December 5 and 6, 2011 (see Section 6.1.1).
- After discussion of the four alternatives presented, there was conceptual agreement on the Bridge within Existing NC 12 Easement as the alternative to carry forward for detailed study at the Pea Island inlet.
- Recommended that further work be done to explore an approximate seven-mile bridge extending west of the Refuge (see Section 2.3.4) as an alternative that would address both the Phase IIa and Phase IIb long-term needs.
- Draft CP 2/2A forms for the two Phase II project areas were distributed to the Merger Team members. It was agreed that the Merger Team members would discuss the issues internally as soon as possible, if needed, and then fax the completed forms to NCDOT should they decide to concur on the alternatives conceptually agreed to at the meeting.

Following the meeting, agencies submitted comments to NCDOT regarding the CP 2/2A agreement, including a comment from USACE about the cost of the alternatives under

consideration, and a request for further detail on the costs of each option and how those options would be funded (see Section 2.6.1). USFWS-Refuge indicated that it would need to determine what alignments could be considered as minor modifications of the existing easement.

The minutes for the December 15, 2011 Merger Team meeting are included in Appendix A.

6.2.4 March 21, 2012 Merger Team Meeting

The purpose of the March 21, 2012 Merger Team meeting was for the Merger Team to attempt to reach consensus on CP 2/2A, 3, and 4A for the two Phase II project areas. Also discussed with the Merger Team was the agreement at the December 15 Merger Team meeting to look at the merits of a Seven-Mile Bridge, as suggested by USFWS, that would address both parts of the Phase II study area.

After describing the recommended alternative and alternatives that were not recommended for detailed study, NCDOT asked each agency to provide its position on NCDOT's CP 2/2A and CP 3 recommendations (the Bridge within Existing NC 12 Easement) for the Pea Island inlet study area. The final result was that six agencies abstained, two did not concur, three concurred, and one agency (NMFS) was not prepared to make a decision yet. NCDOT said that because there are so many abstentions at this point, and because a few agencies have further work to do and need more information from NCDOT before making a decision, the Phase II project will not be elevated at this point. The reasons agencies abstained or did not concur are presented in the meeting minutes and issue briefs in Appendix A.

Agencies requiring additional information to make decisions on the concurrence points were asked to contact NCDOT so that any additional materials could be timely provided. NCDOT agreed to meet individually with any agency that abstained to address that agency's questions and concerns before the next meeting.

The minutes for the March 21, 2012 Merger Team meeting are included in Appendix A.

6.2.5 May 16, 2012 Merger Team Meeting

The purpose of the meeting was informational. NCDOT discussed with the Merger Team agencies, and received feedback regarding, a design for NCDOT's proposed Preferred Alternative for Phase IIa. The design issues discussed would likely affect the permit applications for the proposed project. They also are a factor in the findings of this EA. These issues include the use of temporary construction easements, utility placement, and use of retaining walls, jetting, and other design-related issues.

NCDOT presented plans for a temporary shift of NC 12 to maintain traffic during permanent bridge construction and the proposed permanent bridge. NCDOT also discussed the spoil that would be generated from jetting the bridge piles, inquired about

agency jurisdiction over the boat ramp that would no longer be accessible from NC 12 after the completion of Phase IIa, and asked the agencies about re-grading the NC 12 easement and the temporary easement after construction is completed.

USFWS requested Section 7 consultation related to jetting impacts. NMFS and NCDENR-DCM indicated that they would like to discuss further the preferred water source for pile-jetting operations, as well as pump location and where to run the pipes, and develop a joint position on these issues. NCDENR-DCM said that it would have to issue permits for the utility relocations even if wetlands are not impacted.

The minutes for the May 16, 2012 Merger Team meeting are included in Appendix A.

6.2.6 November 14, 2012 Merger Team Meeting

At the March 21, 2012 Merger Team meeting, FHWA and USACE did not concur with NCDOT's proposed detailed study alternatives for Phase II. They indicated that NCDOT needed to complete a re-evaluation of the cost of the Pamlico Sound Bridge Corridor to determine if the conclusion reached in the 2010 EA – that this alternative was not practicable from the perspective of Section 404 of the Clean Water Act or feasible and prudent from the perspective of Section 4(f) of the Department of Transportation Act of 1966 – remained valid. The updated cost analysis was completed in October 2012. As discussed in Section 2.6.1, the 2012 cost analysis reaffirmed that NCDOT is unable to fully fund a Pamlico Sound bridge. On October 29, 2012, NCDOT met with FHWA and USACE to discuss the re-evaluation of the Pamlico Sound Bridge Corridor. FHWA and USACE agreed with both NCDOT's updated cost and funding findings and that the Pamlico Sound Bridge Corridor Alternative remains not practicable or feasible and prudent. Both FHWA and USACE concurred that the Bridge within Existing NC 12 Easement Alternative should be the sole detailed study alternative for this EA, the LEDPA, and thus the Preferred Alternative. At the November 14, 2012 Merger Team meeting, FHWA, NCDOT, USACE, NCDENR-DWQ, NCDCR, and NCDENR-DCM signed the Phase IIa concurrence forms for CP2, CP2A, and CP3. USEPA, USFWS, USFWS-Refuge, NMFS, NPS, NCDENR-DMF, and NCWRC abstained. The concurrence forms are included in Appendix A.

The November 14, 2012 Merger Team meeting also addressed issues related to CP 4A (avoidance and minimization options) for the Pea Island inlet Preferred Alternative, including:

- Temporary and permanent wetland impacts;
- Temporary construction easements;
- Temporary bridge removal;
- Pile jetting spoil disposal and water source;

- Storm management plan; and
- Bridge rail design.

NCDOT agreed to draft a CP 4A concurrence form based on the meeting's CP 4A discussions and circulate it to the Merger Team for comment. It also was agreed that:

- NCDOT will develop a written plan for jetting operations and present it to the Merger Team for review.
- NCDENR-DMF will gather information on types of screens available for preventing larval fish impacts when obtaining water from the inlet or sound during jetting and provide it to NCDOT.
- NCDOT will work with NCDENR-DCM and USFWS-Refuge on options for jetting spoil disposal.
- FHWA will schedule a meeting including NCDOT, SHPO, and USFWS to discuss bridge rails in accordance with Bonner Bridge Replacement Project (B-2500) Section 7 and Section 106 commitments.

The status of wetland and SAV mitigation for Phase I was discussed. It was agreed:

- The Phase I design-build contractor will check to see if the proposed SAV mitigation sites are within the Refuge Proclamation Boundary (area in Pamlico Sound adjacent to the Refuge where hunting is not permitted).
- NCDOT will provide the pertinent agencies with the final Phase I wetland mitigation plan.

Finally, NCDOT described the status of post-Hurricane Sandy NC 12 repairs.

The minutes for the November 14, 2012 Merger Team meeting are included in Appendix A.

6.3 Additional Coordination with Merger Team Agencies

6.3.1 October 6, 2011 Meetings with USFWS-Refuge and NPS

The purpose of these meetings was to discuss the details of permits needed for Phase I. Phase II was discussed, but the meetings primarily dealt with Phase I.

6.3.2 December 1, 2011 Meeting with USEPA and FHWA

The purpose of this meeting was to discuss USEPA's comments on the study of a Ferry Alternative instead of the PBC/TMP Alternative selected for implementation in the 2010

ROD. NCDOT Ferry Division staff also attended the meeting. The topics that the group discussed included: dredging requirements; acreage needed for ferry terminals; ferry vessels currently used by NCDOT and their applicability to the Pamlico Sound environment; the costs of other ferry vessels; and the initial findings of FHWA's and NCDOT's efforts to compile additional information on the life cycle costs of ferries and the merits of catamaran ferries. USEPA agreed that the Ferry Alternative should not be considered further based on this discussion. See Section 2.3.2 of this EA for a discussion that re-affirms why the Ferry Alternative is not a reasonable alternative.

6.3.3 January 6, 2012 Meetings with USFWS-Refuge and NPS

The primary purpose of the meeting with USFWS-Refuge was to discuss permitting issues associated with Phase I. The Seven-Mile Bridge Alternative and the alignment of the Rodanthe Bridge on New Location Alternative for Phase IIb also were discussed.

The purpose of the NPS meeting was to discuss permitting issues associated with Phase I. Phase II was not discussed.

6.3.4 January 11, 2012 Field Review Meeting with USFWS-Refuge

The purpose of this field meeting was to visit the proposed locations and discuss the alignments of the Seven-Mile Bridge Alternative and the Rodanthe Bridge on New Location Alternative for Phase IIb. The focus was on the points where the alternatives would leave the existing NC 12 easement and travel into Pamlico Sound and out of the Refuge. USFWS indicated their preferred alignment parameters and NCDOT agreed to consider their feasibility from the perspective of its design criteria.

6.3.5 February 9, 2012 Meeting with USFWS-Refuge

The purposes of the meeting were to discuss the Seven-Mile Bridge Alternative proposed by USFWS and to reach agreement with USFWS on eliminating it as an option. NCDOT's conceptual design of the Seven-Mile Bridge Alternative did not match USFWS's recommended alignment parameters that possibly would have been considered a minor modification by USFWS. NCDOT's design eliminated the tight curves preferred by USFWS to minimize the amount of acreage of land from the Refuge that NCDOT would use to construct the new roadway. These changes by NCDOT were needed to meet safety demands; however, these changes in the design and location of the Seven-Mile Bridge caused impacts that were higher than the impacts considered acceptable by USFWS.

FHWA explained that it may not approve the Seven-Mile Bridge Alternative as presented. Potential alterations were discussed, but the increased impacts to the Refuge and increased structural costs as a result of some alterations to the bridge were considered undesirable by both USFWS and NCDOT. USFWS, FHWA, and NCDOT agreed to rule out the Seven-Mile Bridge Alternative because it is not a reasonable and practicable alternative. USFWS did not request any further data or analysis regarding

this option. Section 2.3.4 provides a detailed discussion of the Seven-Mile Bridge Alternative, including the additional coordination that took place with USFWS-Refuge related to this alternative.

The environmental issues of concern with the design of the Seven-Mile Bridge Alternative are also concerns with the design of the Rodanthe Bridge on New Location Alternative. USFWS indicated concerns with the alignment that could involve permitting issues. NCDOT agreed to further examine this alignment. This issue has not been resolved as of the date of this EA, and will be addressed in a future NEPA document for Phase IIb.

6.4 Endangered Species Act Consultation

As a part of finalizing the Phase II alternatives for implementation, including the Phase IIa project that is the subject of this EA, FHWA will consult with USFWS and NMFS in compliance with Section 7 of the ESA of 1973.

Section 7 consultation was completed for the Bonner Bridge Replacement Project (B-2500). As indicated in the 2010 ROD, the PBC/TMP Alternative was found likely to disturb nesting on the beach by the piping plover, primarily in critical habitat areas near Oregon Inlet. It also is likely to disturb nesting on the beach by the leatherback sea turtle, green sea turtle, and loggerhead sea turtle. It is not likely to adversely affect turtles in the ocean. If phases beyond Phase I of the PBC/TMP Alternative involve beach nourishment, the nourishment could affect seabeach amaranth habitat. It was agreed that Section 7 consultation would be reopened as the features of future phases are finalized, if needed. USFWS issued *Biological and Conference Opinion*s (BO) (USFWS, 2008) related to the piping plover, loggerhead sea turtle, green sea turtle, and leatherback sea turtle, as well as critical habitat for wintering piping plovers in the Oregon Inlet areas. NCDOT will implement several nondiscretionary measures that include the Terms and Conditions outlined in the 2008 BO. They were presented in the Project Commitments in Appendix A of the 2010 ROD and amended as needed at the front of this document. NCDOT also coordinated with NMFS as documented in Sections 4.7.9 and 8.11 of the 2008 FEIS and Section 3.6.3 of the 2010 EA.

The primary change that could affect threatened and endangered species is the formation of the Pea Island inlet. The inlet could be used by sea turtles, as well as the shortnose and Atlantic sturgeon, and the shoulders of the inlet are potential nesting habitat for piping plover (see Section 4.1.4). Given that the characteristics of the Phase IIa Preferred Alternative's bridge over the Pea Island inlet are similar to the characteristics of the new bridge over Oregon Inlet, as discussed in Section 4.2.4.4, the type and potential severity of impact of the Phase IIa Preferred Alternative is expected to be similar to the impact identified during the previous Section 7 consultation. Further, the non-discretionary measures, which include Terms and Conditions for minimizing

impacts for Phase IIa, are expected to be similar or the same as those committed to in the 2010 ROD.

In January 2013, FHWA and NCDOT provided an update to USFWS on changes in impacts to threatened and endangered species resulting from the proposed Phase I final design. Based on proposed refinements to the Phase I project alignment, design, and construction methodology since the 2008 BO was issued, FHWA also requested re-initiation of formal consultation under Section 7 of the ESA with respect to reassessing the effects of the Bonner Bridge Replacement Project (B-2500) to federally-listed species. Specifically, FHWA requested a modification to one of the Terms and Conditions related to sea turtles of the 2008 BO so that amber-colored LED lighting could be used during construction in place of the lighting indicated in the 2008 BO (see Project Commitment 26.c in the Project Commitments in Appendix A of the 2010 ROD). In a January 22, 2013 letter to FHWA (see Appendix A), USFWS agreed to this change in the Terms and Conditions of the 2008 BO. The USFWS letter (see Appendix A) provides further details on the agency coordination that took place related to this issue. In addition, Project Commitment 26.c (see page vii) has been updated to reflect the agreed upon change to construction lighting as a result of this additional Section 7 consultation.

6.5 Essential Fish Habitat Coordination

As a part of finalizing the Phase II alternatives for implementation, including the Phase IIa Preferred Alternative that is the subject of this EA, FHWA will coordinate with NMFS regarding EFH. The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.) requires federal agencies to consult with the US Secretary of Commerce on all actions or proposed actions authorized, funded, or undertaken by the agency that might adversely affect EFH. This is done through NMFS. NMFS is represented on the NEPA/Section 404 Merger Team.

The primary change that could affect EFH is the formation of the Pea Island inlet. The formation of the Pea Island inlet did increase within the inlet itself the area of some EFH elements including marine water column, estuarine water column, and intertidal flats. Two additional EFH elements have the potential to develop and/or be affected as a result of the inlet formation: SAV and estuarine emergent wetlands (see Section 4.1.5). The impacts associated with this change are addressed in Section 4.2.4.5. Only small increases in EFH impact result from the presence of the Pea Island inlet. The Phase IIa Preferred Alternative would bridge the entire area considered susceptible to breaches in the Pea Island inlet area (approximately 2 miles). Therefore, EFH would remain bridged even if the inlet moves from its current location or if a different new inlet were to form in this area in the future.

6.6 Section 106 of the National Historic Preservation Act Coordination

Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. § 470f) affords consideration of those properties that are listed or eligible for listing in the NRHP. The Phase IIa Preferred Alternative is similar in its characteristics to the Phased Approach alternatives described in the 2008 FEIS, and the nature of its Adverse Effect is the visual impact on the historic landscape of the Refuge and loss of access to Refuge features.

Phase IIa would introduce a sizable new linear man-made feature for approximately 2.1 miles through the Refuge (i.e., the length of the bridge component of the Phase IIa Preferred Alternative). The bridge deck generally would be at an elevation of approximately 23 feet. For approximately 900 feet in the area of the temporary bridge, the Phase IIa Preferred Alternative's bridge deck would be at an elevation of approximately 32 feet to accommodate trucks on the traffic maintenance road as it passes under the new bridge deck. Both these numbers are lower than the 33.5 feet that was assumed in the 2008 FEIS.

As discussed in Project Commitment 23 in the Project Commitments in Appendix A of the 2010 ROD, FHWA, SHPO, ACHP, and NCDOT, along with the consulting parties (Dare County, the North Carolina Aquarium Society, USFWS, NPS, and the Chicamacomico Historical Association), developed a Programmatic Agreement (PA) stipulating measures that FHWA will ensure are carried out during the design and construction of the PBC/TMP Alternative to mitigate adverse impacts to the historic cultural resources. NCDOT, FHWA, and SHPO signed the Programmatic Agreement (PA) on historic resource impacts and mitigation in November 2010 (see Appendix D of the 2010 ROD). NCDOT is in the process of fulfilling the commitments made in the PA in parallel with preparations to start construction of Phase I of the Bonner Bridge Replacement Project (B-2500). The PA is applicable to the entire Project, and Stipulation #VI of the PA requires further consultation for future phases if there is:

- A change in the historic status of properties.
- Identification of a new alternative.
- Change in an existing alternative that would result in a different "effects determination" for an historic property.
- Selection of a new Preferred Alternative.

None of these conditions are met with Phase IIa or within its setting. A representative of SHPO (from NCDCR) serves on the NEPA/Section 404 Merger Team, concurred with the

Preferred Alternative for Phase IIa, and has had an opportunity to indicate if any of the above conditions were met or indicate that additional consultation was desired.

Stipulation #IIA of the PA discusses bridge design within the Refuge, in particular the design of the bridge rail. As discussed under this stipulation, prior to completion of the final design within the Refuge, NCDOT will afford SHPO, USFWS, and NPS an opportunity to review and comment on the plans and specifications for the parapet and bridge rail.

6.7 List of Agencies, Organizations, and Persons to Whom Copies of the Environmental Assessment are Sent

The agencies and interest groups listed below will be sent a copy of this EA with a request for comments. These agencies and interest groups also were sent a copy of the 2008 FEIS, 2010 EA, and 2010 ROD. The availability of the EA will be announced via a newsletter sent to those on the project's mailing list and in advertisements within local media outlets. The EA also will be available on the project web site (http://www.ncdot .gov/projects/bonnerbridgephase2/). Public hearings will be held to gather additional comments on the EA. Comments on the EA will be addressed in subsequent documentation.

Federal Agencies

Advisory Council on Historic Preservation

Federal Emergency Management Agency

Federal Energy Regulatory Commission

US Army Corps of Engineers

US Coast Guard—5th District

US Department of Agriculture—Natural Resources Conservation Service

US Department of Commerce—National Oceanic and Atmospheric Administration—National Marine Fisheries Service

US Department of Health and Human Services

US Department of Housing and Urban Development

US Department of the Interior—Office of the Secretary; US Fish and Wildlife Service (Pea Island National Wildlife Refuge and Raleigh Field Office); Keeper of the National Register; National Park Service; US Geological Survey

US Environmental Protection Agency, Region IV (Environmental Review Branch)

State Agencies

North Carolina Department of Administration—State Clearinghouse

North Carolina Department of Cultural Resources—Division of Archives and History

North Carolina Department of Environment and Natural Resources—Division of Air Quality; Division of Coastal Management; Division of Land Resources; Division of Marine Fisheries; Division of Parks and Recreation; Division of Water Quality

North Carolina Wildlife Resources Commission

Local Governments and Agencies

Albemarle Regional Planning and Development Commission (Albemarle Rural Planning Organization)

Area Development Coordination Agency (ADCA)

County of Dare—Chair, Dare County Commissioners; Dare County Manager; Emergency Management Agency

Mayor of Duck

Mayor of Kill Devil Hills

Mayor of Kitty Hawk

Mayor of Manteo

Mayor of Nags Head

Mayor of Southern Shores

Oregon Inlet and Waterways Commission

Local Interest Groups

Audubon North Carolina

Carolina Electric Cooperatives

Center for Biological Diversity

Coastal Wildlife Refuge Society

Conservation Council of North Carolina

Dare County Tourist Bureau

Defenders of Wildlife

Eastern Surfing Association, Outer Banks District

Environmental Defense Fund

Friends of Hatteras Island

Hatteras Civic Association

Hatteras Island Business Association

National Parks Conservation Association

North Carolina Coastal Federation

North Carolina Fisheries Association

Outer Banks Chamber of Commerce

Pamlico – Tar River Foundation

Sierra Club, North Carolina Chapter

Southern Albemarle Association

Southern Appalachian Biodiversity Project

Southern Environmental Law Center

Public Review Locations

Dare County Libraries in Hatteras Village, Kill Devil Hills, and Manteo, North Carolina

Dare County Planning and Inspections Satellite Office in Buxton, North Carolina

Fessenden Recreation Center in Buxton, North Carolina

NCDOT Resident Engineer's Office in Manteo, North Carolina

Ocracoke School and Community Library in Ocracoke, North Carolina

7.0 Conclusion

This Environmental Assessment (EA) documents changes associated with the Bonner Bridge Replacement Project (B-2500), as well as changes to the project environment, as they relate to the planned Phase IIa.

- From the analysis contained in Chapter 4.0, FHWA believes that the Phase IIa Preferred Alternative does not result in new, significant impacts to the human and natural environments not previously identified in the 2008 FEIS and 2010 EA. This is the case because this alternative represents a portion of the Phased Approach alternatives assessed in their entirety in the 2008 FEIS, impacts introduced by the Pea Island inlet are similar to those assessed for the Phase I bridge over Oregon Inlet in the 2008 FEIS, and impacts associated with the Pea Island inlet can be mitigated in the same or similar manner as described in the 2008 FEIS and 2010 EA.
- From the analysis contained in Chapter 5.0, FHWA believes that the conclusions in the 2009 Revised Final Section 4(f) Evaluation (included as Appendix B in the 2010 EA) remain valid and the analysis in Chapter 5.0 does not suggest any new, significant impacts not previously identified in the 2008 FEIS and 2010 EA.
- The analysis summarized in Section 2.6.1 and fully documented in an October 24, 2012 report prepared by NCDOT titled *Bonner Bridge – NC 12 Transportation Management Plan Phase II—Pamlico Sound Bridge Corridor Cost Analysis*, re-affirms that the Pamlico Sound Bridge Corridor is not a practicable or feasible and prudent alternative. This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.
- The analysis summarized in Section 2.3.2 and fully documented in the January 2013 report prepared by FHWA and NCDOT titled *Bonner Bridge – NC 12 Transportation Management Plan Phase II, Reconsideration of the Ferry Alternative Report for NC 12 Replacement of Herbert C. Bonner Bridge*, re-affirms that the Ferry Alternative is not a reasonable or practicable alternative. This report is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.

Based on this analysis and on coordination with state and federal environmental resource and regulatory agencies, FHWA believes that the changes identified and assessed in this EA would not result in new, significant impacts not previously identified in the 2008 FEIS, 2010 EA, or 2010 ROD.

FHWA now seeks input on the content and tentative conclusions identified in this EA. Once public and agency input have been received and considered, FHWA will determine whether a Supplemental EIS will be prepared.

8.0 List of References

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Appendix A

NEPA/404 Concurrence Forms, Merger Team Meeting Minutes, and Agency Correspondence

A. NEPA/404 Concurrence Forms, Merger Team Meeting Minutes, and Agency Correspondence

NEPA/404 CONCURRENCE FORMS A-2

MERGER TEAM MEETING MINUTES A-5

August 31, 2011 Merger Team Meeting Minutes A-5

October 18, 2011 Merger Team Meeting Minutes A-13

December 15, 2011 Merger Team Meeting Minutes A-27

March 21, 2012 Merger Team Meeting Minutes A-43

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AGENCY CORRESPONDENCE

US Fish and Wildlife Service, Response To FHWA's Request For Re-Initiation of Formal Section 7 Consultation (January 22, 2013) A-100

US Fish and Wildlife Service, Correspondence Agreeing that the Phase IIa Construction Easement is a Temporary Occupancy from the Perspective of Section 4(f) (February 7, 2013) A-102

NC Department of Cultural Resources, Correspondence Agreeing that the Phase IIa Construction Easement is a Temporary Occupancy from the Perspective of Section 4(f) (December 14, 2012) A-104

Section 404/NEPA Merger Project Team Agreement
Concurrence Point No. 2: Alternatives to be Studied in Detail and Concurrence Point 2A: Bridging Decisions and Alignment

Project No./TIP No./Name/Description:

Federal Project Number: BRS-2358(15)
WBS No.: 32635
TIP Project Number: **B-2500A**
Description: **Replacement of the Herbert C. Bonner Bridge (Bridge No. 11) over Oregon Inlet in Dare County (Phase II of the Parallel Bridge Corridor with NC 12 Transportation Management Plan)**

The Project's Merger Team has concurred on this date of October 29, 2012 that the following alternative will be evaluated further for the Pea Island inlet component of Phase II of the subject project:

- Bridge within Existing NC 12 Easement

USACE William J. Bilkovic — NCDOT Elizabeth A. Smyre

USEPA ____ Abstain ____ — USFWS ____ Abstain ____

NCDWQ ____ — NCWRC ____ Abstain ____

SHPO Renee Gledhill-Earley — FHWA Clarence W. Coleman Jr.

NMFS ____ Abstain FR — NCDMF ____ Abstain KH

NPS ____ Abstain TB — NCDCM Doug V Huggett

USFWS-PINWR ____ Abstain ____

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Section 404/NEPA Merger Project Team Agreement
Concurrence Point No. 2: Alternatives to be Studied in Detail and Concurrence Point 2A: Bridging Decisions and Alignment

Project No./TIP No./Name/Description:

Federal Project Number: BRS-2358(15)
WBS No.: 32635
TIP Project Number: **B-2500B**
Description: **Replacement of the Herbert C. Bonner Bridge (Bridge No. 11) over Oregon Inlet in Dare County (Phase II of the Parallel Bridge Corridor with NC 12 Transportation Management Plan)**

The Project's Merger Team has concurred on this date of October 29, 2012 that the following alternatives will be evaluated further for the Rodanthe breach component of Phase II of the subject project:

- Bridge on New Location
- Bridge within Existing NC 12 Easement

USACE	William J. Bilkerson	NCDOT	Elizabeth A. Smyre
USEPA	Abstain	USFWS	Abstain
NCDWQ		NCWRC	Abstain
SHPO	Renee Gledhill-Earley	FHWA	Clarence W Coleman Jr.
NMFS	Abstain FR	NCDMF	Abstain KH
NPS	Abstain TB	NCDCM	Doug V Huggett
USFWS-PINWR	Abstain		

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Section 404/NEPA Merger Project Team Agreement
Concurrence Point No. 3:
Least Environmentally Damaging Practicable Alternative

Project No./TIP No./Name/Description:

Federal Project Number: BRS-2358(15)
WBS No.: 32635
TIP Project Number: B-2500A
Description: Replacement of the Herbert C. Bonner Bridge (Bridge No. 11) over Oregon Inlet in Dare County (Phase II of the Parallel Bridge Corridor with NC 12 Transportation Management Plan)

The Project's Merger Team has concurred on this date of October 30, 2012 that the following alternative is the Least Environmentally Damaging Practicable Alternative for the Pea Island inlet component of Phase II of the subject project:

- Bridge within Existing NC 12 Easement

USACE William J. Bichlecore NCDOT Elizabeth A. Lacy

USEPA Abstain CR USFWS Abstain KJ

NCDWQ [illegible] NCWRC Abstain [illegible]

SHPO Renee Gledhill-Earley FHWA [illegible]

NMFS Abstain FR NCDMF Abstain KH

NPS Abstain TB NCDCM Doug V Huggett

USFWS-PINWR Abstain [illegible]

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MEETING INFORMATION	
Meeting Description:	Hurricane Irene Emergency Repair of Breaches on NC 12 on Hatteras Island, Dare County
Meeting Purpose:	To identify issues and determine next for emergency repair to NC 12 caused by Hurricane Irene
Meeting Date:	August 31, 2011
Date of Notes	September 6, 2011

A meeting was held on August 31, 2011 at 1:30 pm to discuss response strategies to repair damage caused by Hurricane Irene to NC 12 in Dare County on Hatteras Island. A list of those participating at the meeting and by conference call is attached. The storm caused separate breaches located in the Pea Island National Wildlife Refuge at the maintenance facilities and in Rodanthe near the S-curves. The goal of the meeting was to inform all stakeholders about the damage to NC 12, present recommended temporary repair strategies, identify the required permits and actions required by resource agency partner and to the issues and constraints associated with obtaining the necessary permits/actions, and to lay the framework for developing long-term solutions.

The Selected Alternative in the Record of Decision for the Bonner Bridge Replacement is the Parallel Bridge with NC 12 Transportation Management Plan (TMP). The NC 12 TMP calls for Phase I (Oregon Inlet bridge) to be built as soon as possible, followed by interagency and appropriate public coordination prior to the implementation of later phases as coastal conditions warrant. The details of the later phases will be determined, reevaluated, and documented through collaboration with the Merger Team and other stakeholders, including the public. Due to the storm damage caused by Hurricane Irene, NCDOT and FHWA recognized that the NC TMP process needed to be initiated to (1) do necessary repairs to re-open NC 12 to traffic as early as possible, and to (2) to develop and have the Merger Team participate in decisions regarding long-term strategies along NC 12 within the next 3-6 months.

Donna Dancausse served as Moderator of the meeting and led the introductions. Jim Trogdon and Terry Gibson opened the meeting and summarized purposes and objectives of the meeting, as shown in the attached agenda. Terry Gibson thanked everyone for attending on short notice and summarized the objectives of the meeting. Jim Trogdon also provided opening remarks that focused on the objectives of the meeting.

Don Lee, State Roadside Environmental Engineer, provided a presentation (attached) that showed breach locations at (1) Pea Island – in the Refuge near the maintenance facilities, and (2) Rodanthe, near the S-curves. The presentation provided details about the Pea Island breach first by showing a series of photographs that indicated flow conditions, along with the width and depth of the breaches. The presentation then provided the same details about the breach at Rodanthe.

Once the information about the breaches at the two locations was provided, Don presented the options for temporary repair for both breaches. The Pea Island breach location was discussed first. Two options for temporary repair were discussed:

1. Option 1 - Fill the two small channels created by the storm, and erect a temporary bridge over the large channel. Bridge could be rented or purchased.
2. Option 2 - Fill all channels. Do not do beach nourishment.

NCDOT expressed that their recommendation is to implement Option 1. A temporary bridge is preferable mainly due to the size of the large channel and the associated water flow.

Next, Don discussed temporary repair of the Rodanthe breach. NCDOT's recommended that all channels associated with this breach be filled.

Terry Gibson asked the resource agency representatives to express their thoughts, concerns, and potential constraints regarding NCDOT's proposals. A summary of concerns and potential constraints to an expedited process for re-opening this segment of NC 12 to traffic is provided below.

Summary of Feedback on Temporary Repair Options

1. **Confine construction to Right of Way (ROW) limits:** Consensus is that keeping repairs within the ROW would facilitate rapid review and permitting of temporary repairs. This position was specifically communicated by NCDENR, CAMA, USACE, USFWS (Refuge).

- CAMA will use their Emergency Permit procedures, provided that the repair is for the purpose of opening the road and re-establishing safe transportation. Use of the Emergency Permit procedures requires that the construction and repair be within the parameters that existed prior to the storm, meaning within the ROW and only replacing features that existed prior to the storm. Filling outside the template necessary to protect the road could complicate the permitting process and would take additional time. However, the permitting process for emergency repairs to restore traffic and protect the road within previously stated parameters could be handled expeditiously. CAMA offered assistance to ensure timely permit processing.
- The Refuge Manager can use their agency's Emergency Special Use Permit. The process would be less complicated if the actions to restore transportation are confined to the existing ROW. However, minor work outside the easement may be permitted if necessary for public safety
- **Actions of concern** which would require more extensive agency coordination:
    - Design and construction that is outside the existing ROW.

2. **Wildlife Resource Commission and other agencies asked about the identified source of sand for fill.** NCDOT did not have a definite sand source at the time, but asked for preferences. Agencies indicated upland sources were the best, followed by dredge material from existing channels. It was mentioned that preapproved sites such as the one at Avon was acceptable. However testing and acceptance of other sites, especially dredged sand may be required for use as fill material.

3. **Temporary bridge structures on pile foundations would be acceptable.** However, hardened structures such as abutments for bridge ends would be a concern and not preferred.

4. **Sand bags for armoring would be okay, depending on location and extent of use**. Agencies would need specific design details for drawings in permit applications for approval.

5. **NCDOT and CAMA will consult on contractor access from Rodanthe to Pea Island**. A contractor may request a temporary bridge be at Rodanthe for the purpose of allowing the contractor to transport equipment and materials to the Pea Island site.

6. **Section 7 Emergency Procedures:** USFWS would follow emergency consultation procedures for any Threaten and Endangered species protected by Section 7 (e.g., Sea Turtles).

7. **Pumping of water from channels at Rodanthe:** No special restrictions or requirements apply as long as the water is not pumped directly into wetlands or beach. Discharge of contaminates and trash needs to be minimized as much as possible.

8. **Dune reconstruction is allowable** under CAMA Emergency Permit if dunes were present prior to the storm.

9. **No navigation (at the Pea Island breach) is required by CAMA** under the Emergency Permit procedures.

10. **NCDOT to consult with the US Coast Guard:** Need to determine whether the U. S. Coast Guard (USCG) will require a permit for the ebb and flow of tide at the Pea Island site. Also, need to determine if the USCG will need documentation on property ownership along the damage areas.

The USACE commented that the temporary repair designs need to consider the changing conditions and storm seasons. Specifically, he recommended that temporary designs should be planned to last more than three to six months.

The Deputy Secretary for the Department of the Environment and Natural resources noted that it appeared everyone was in consensus with NCDOT's approach to perform emergency repairs to restore traffic.

Terry Gibson summarized the temporary repair next steps listed below:

- **NCDOT Point of Contact**: Jerry Jennings (office: 252-482-7977; cell: 252-312-7372) is the primary POC for questions and communications from the resource agencies. Jerry will be responsible for coordinating/involving appropriate NCDOT representatives depending on the topic.
- By Friday 9/2/11, NCDOT will provide design information and permit applications packages. The focus will be to complete documentation for Rodanthe first.

The process for permanent repairs is as follows.

- As outlined in the NC 12 Transportation Management Plan in the Bonner Bridge Replacement Record of Decision, the Merger Team will assess and determine options for the permanent repair of the NC 12 Dare County damage sites. As part of this process, a committee of coastal science experts will be formed to advise the Merger Team. NCDOT agreed to provide a list of proposed members to the Merger Team. The Refuge Manager and other can offer names to add to the panel. Coordination on the permanent solution will begin after the temporary repairs have been implemented. However, decisions will need to be made within 3-6 months because the temporary improvements are expected to be reliable for only 18 months.
- The Project Development and Environmental Analysis (PDEA) Branch will generate a list of Coastal Science Committee members and share with the resources agencies for their input by the end of next week.
- PDEA will establish a timeline for addressing the permanent repair decision.

The meeting adjourned at approximately 3:40 pm.

ATTACHMENT #1

Repair of Breaches on
NC 12 Caused by Hurricane Irene
August 31, 2011
Merger Team Meeting
Agenda

NC 12 Dare County
Hurricane Irene Damage and Response
August 31, 2011
1:30

Agenda

Meeting Purposes

- Educate participants on the damage incurred by Hurricane Irene to NC 12 Dare County
- Inform participants of the discussions, considerations and planning that transportation officials have had to date regarding the damage and possible scenarios for response and repair
- Inform participants of potential repair scenarios and get input on the scenarios
- Identify next steps and an associated timeline

Agenda

1. **Introductions & review meeting purpose**

2. **Overview of damage to NC 12 Dare County**

3. **Overview of what transportation officials have done and considered so far**

4. **Explanation of Repair Scenarios**
    - **Breach #1**
    - **Breach #2**

5. **Input, feedback from participants on scenarios**

6. **Identification of next steps, actions and timeframes**

ATTACHMENT #2

Repair of Breaches on
NC 12 Caused by Hurricane Irene
August 31, 2011
Merger Team Meeting
List of Meeting Participants

Name	Agency
Gregory Griffith	USACE
Greg Williams	USACE
Philip Payonk	USACE
Stephanie Mason	FEMA
Mike Hill	FEMA
Joe Stanton	NCEM
Steve Sollod	NCDCM
Cathy Brittingham	NCDCM
Paul Garrett	NCDOT-Bridge Management
Daniel Holderman	NCDOT-Bridge Management
Chris Dillon	NCWRC
David Wainwright	NCDWQ
Jer Warren	NCDOT-Roadside Envir
Gena Neal	NCDOT
Travis Wilson	NCWRC
Mallory Martin	NCWRC
Brian Wrenn	NCDWQ
David Lekson	USACE
Bill Biddlecome	USACE-Washington
Scott C. McLendon	USACE
Christopher A. Militscher	USACE-Raleigh
Renee Gledhill-Early	NCSHPO/DCR
Doug Huggett	NCDCM
Ron Lucas	FHWA-NC Division
Clarence Coleman	FHWA-NC Division
Jeffery J. Crow	NCDCR
John Sullivan	FHWA-NC Division
Terry Gibson	NCDOT-State Hwy Admin
Manly Wilder	NCDENR
Gary Jordan	USFWS
Pete Benjamin	USFWS
Victor Barbour	NCDOT-Technical Services
Keith Johnston	NCDOT-Photogrammetry
Rodger Rochelle	NCDOT-Trans Pgm Mgmt
Shannon Lasater	NCDOT-Highway Admin's Office
Ken Pace	NCDOT-Roadside Envir
Art McMillan	NCDOT-Highway Design
Beth Smyre	NCDOT -PDEA

Brian Yamamoto	NCDOT-PDEA
Rob Hanson	NCDOT-PDEA
Greg Thorpe	NCDOT-PDEA
Amy Simes	NCDENR
Kenneth Taylor	NCDENR-DLR-NC Geological Survey
David Hering	NCDOT-Trans Pgm Mgmt
Elizabeth Lusk	NCDOT-PDEA-Nat Envir
Phil Harris	NCDOT-PDEA-Nat Envir
Tyler Stanton	NCDOT-PDEA-Nat Envir
Garcy Ward	NCDWQ
Lamar Sylvester	NCDOT-Construction Unit
Edward Parker	FHWA-NC Division
Jerry Jennings	NCDOT-Division Engineer-Div1
Melissa Midgett	Senator Hagen's Office
Ricky Greene	NCDOT Chief's Engineers Office
Daniel Keel	NCDOT Operations
Will Beatty	FHWA-NC Division
Jon Nance	NCDOT Operations
Randy Boyd	NCDOT-Hydraulics
Jerry Lindsey	NCDOT-Hydraulics
Tom Drda	FHWA-NC Division
Greg Perfetti	NCDOT-Structure Design
David Chang	NCDOT-Hydraulics
Dave Henderson	FHWA Headquarters
Jim Trogdon	NCDOT-CEO
Bobby Lewis	NCDOT-Chief of Staff
Anthony Roper	NCDOT-Deputy Secretary-Admin

Participants via conference call included:

Name	**Agency**
Ken Jolly	USACE
Tom MacKenzie	USFWS – Southeast Region
Pete Jerome	USFWS – Southeast Region
Mike Bryant	USFWS – Pea Island National Wildlife Refuge (PINWR)
Michelle Andotra	FHWA Legal Counsel
Sterling Baker	NCDOT-Div 1 Edenton
Bob Capehart	NCDOT-Div 1 Edenton
Clay Willis	NCDOT-Div 1 Edenton
Earl Dubin	FHWA – NC Division
Dennis Stewart	USFWS – PINWR
Scott Lanier	USFWS – PINWR
David Pike	USFWS
Mike Murray	NPS and Others
Ron Sechler	NOAA Fisheries
Bill Brazier	USCG
Pablo Hernandez	NCDOT-Div 1 Manteo

ATTACHMENT #3

Repair of Breaches on
NC 12 Caused by Hurricane Irene
August 31, 2011
Merger Team Meeting
<u>Presentation</u>

To: October 18, 2011 Bonner Bridge Merger Team Meeting Attendees

From: Bobby Norburn, Parsons Brinckerhoff

Date: March 6, 2012

Subject: **Meeting Minutes – October 18, 2011 NEPA/Section 404 Merger Team Meeting for the Bonner Bridge Replacement Project (TIP No. B-2500)**

Attendees:

Gary Jordan	USFWS – Raleigh Field Office
Pete Benjamin	USFWS – Raleigh Field Office
Dennis Stewart	USFWS – Pea Island National Wildlife Refuge
Ken Jolly	US Army Corps of Engineers
Bill Biddlecome	US Army Corps of Engineers
Linda Rimer	US Environmental Protection Agency
Ron Sechler	National Marine Fisheries Service
Mike Murray	National Park Service
Clarence Coleman	FHWA – NC Division
Ron Lucas	FHWA – NC Division
John Sullivan	FHWA – NC Division
Edward Parker	FHWA – NC Division
Unwanna Dabney	FHWA – NC Division
Jill Stark	FHWA – NC Division
Donna Dancausse	FHWA – NC Division
Manly Wilder	NCDENR
Cathy Brittingham	NCDENR – DCM
Doug Huggett	NCDENR – DCM
Kevin Hart	NCDENR – DMF
Brian Wrenn	NCDENR – DWQ
David Wainwright	NCDENR – DWQ
Travis Wilson	NC Wildlife Resources Commission
Shannon Deaton	NC Wildlife Resources Commission
Renee Gledhill-Earley	NCDCR – SHPO
Ramona Bartos	NCDCR – SHPO
Jeffrey Crow	NCDCR – SHPO
Jim Trogdon	NCDOT – Chief Operating Officer
Bobby Lewis	NCDOT – Chief of Staff
Terry Gibson	NCDOT – State Highway Administrator
Greg Thorpe	NCDOT – PDEA
Beth Smyre	NCDOT – PDEA
Brian Yamamoto	NCDOT – PDEA
Rob Hanson	NCDOT – PDEA
Karen Capps	NCDOT – PDEA
Brittney Kelly	NCDOT – PDEA
Drew Joyner	NCDOT – Human Environment Unit

Mary Pope Furr	NCDOT – Human Environment Unit
Steve Mitchell	NCDOT – Natural Environment Unit
Chris Rivenbark	NCDOT – Natural Environment Unit
Kathy Herring	NCDOT – Natural Environment Unit
Julie Hunkins	NCDOT – Quality Enhancement Unit
Debbie Barbour	NCDOT - Preconstruction
Gary Lovering	NCDOT – Roadway Design
Jerry Jennings	NCDOT – Division 1
Dara Demi	NCDOT – Communications Office
David Hering	NCDOT – Transportation Program Management Unit
John Page	Parsons Brinckerhoff
Bobby Norburn	Parsons Brinckerhoff

Opening Remarks

The meeting started at 9:30 AM at the conclusion of the Interagency Leadership Team (ILT) meeting. Bill Biddlecome opened the meeting, noting that it was being held for informational purposes. The purpose of the meeting was to allow agencies to express their issues and concerns related to the two areas that were breached by Hurricane Irene (Pea Island and Rodanthe) because NCDOT is starting to study long-term NC 12 repairs in these areas. Bill said that Donna Dancausse with the Federal Highway Administration (FHWA) would help facilitate the meeting. Following introductions, Bill turned the meeting over to Beth Smyre.

Beth Smyre (NCDOT) reiterated that this was an informational meeting and that there would be no Concurrence Point (CP) agreement to sign today. With the completion of the temporary repairs at the two breach areas, NCDOT is now focusing on the long-term solutions for these sites, which will constitute Phase II of the Bonner Bridge project. However, prior to starting to study any long-term solutions, NCDOT wanted to identify agencies' environmental concerns as they relate to the current site conditions, as well as to identify specific actions and steps that NCDOT needs to take, in cooperation with the agencies, during the Phase II study. She said that the meeting information packet included discussion questions for today's meeting. NCDOT also wants agency feedback on the proposed accelerated schedule for the project. She noted that agencies can repeat concerns expressed previously during the preparation of the Bonner FEIS, EA, and ROD, but that NCDOT also wants to hear new concerns related to the Phase II areas. She then turned the meeting over to Jim Trogdon.

Jim Trogdon (NCDOT) opened by thanking the agency representatives for their cooperation and rapid response with respect to coordinating the emergency repairs after the storm. He went through the timeline of the series of events that occurred between the time the storm hit on August 27, 2011 and the re-opening of NC 12 to traffic at the Pea Island breach on October 10, 2011. Notably, thanks to agency cooperation, a Merger Meeting was held on August 31, and NCDOT had the necessary permits by September 2. He said that NCDOT appreciated the openness of the discussions during this process because this allowed them to aggressively

pursue resolutions to any issues or concerns. He added that the Governor has asked that long-term solutions for both sites be identified within 4 to 6 months.

Jim showed pictures of repairs at both sites, noting that the NC 12 recovery website also has additional pictures. He reiterated that the teamwork between NCDOT and the agencies was a success, and that this process showed the public that government can work together efficiently, comply with regulations, and get things done. He said that the life expectancy of the existing temporary bridge is about 5 years, but within 3 years, if needed, the contractor can retrofit it again to increase its life expectancy. He noted that emergency funding is available for 2 years to fund temporary repairs, but after this period a permanent solution must be ready to be implemented. Based on this, NCDOT wants to work with the agencies and identify issues and resolve them, but that the team needs to work together expeditiously in order to get the permanent solutions implemented in the required timeframe – in other words, a solution is needed in months, not years. He noted that the locals wanted a permanent solution in place by next Easter because their economy relies on NC 12, but NCDOT has told them that this was probably not possible. Finally, Jim said that while the temporary ferry helped with access for emergency services to the parts of Hatteras Island that had lost access to the mainland, the temporary ferry service is not able to handle the total traffic demand for access to Hatteras Island.

Beth Smyre discussed the Selected Alternative from the ROD – the NC 12 Transportation Management Plan (NC 12 TMP). She reviewed the components of the NC 12 TMP, which include:

- Coastal monitoring program;
- Refuge habitat/NC 12 vulnerability forecasting study;
- Environmental review process/determine alternatives for study; and
- Use the NEPA/Section 404 Merger Process to study, select, and finalize future phases.

She said that NCDOT has moved forward with the first two components of the NC 12 TMP, and that part of the purpose of today's meeting is to seek input from the agencies in keeping with the last two items in this list.

Terry Gibson (NCDOT) presented NCDOT's proposed schedule for long-term repairs as part of Phase II as follows:

- Informational Merger Team Meeting – October 18, 2011
- Convene Expert Panel Meeting to Discuss Coastal Conditions – October 24-25, 2011
- Merger Team Meeting (CP 2/2A) – December 2011
- Public Involvement – December 2011
- Merger Team Meeting (CP 3) – January 2012
- Contract Award for Pea Island Breach – August 2012
- Design-Build Contract Award for Rodanthe – December 2012

Terry said that the previous meeting with the Merger Team on August 31 had been a big help in getting the temporary solutions expeditiously implemented, and that NCDOT told state legislators about the cooperation that was exhibited at this meeting. He said that NCDOT can sell the temporary bridge back after three years. He said that the temporary ferries were not able to run on some days because of low water levels and that the overall cost of operating the temporary ferries was reduced by working quickly to open the temporary bridge.

With respect to the long-term solution at the Rodanthe breach area, Terry noted that it will likely be more difficult to identify because of the adjacent homes and increased public interest. Finally, he noted that a design-build contract is likely to be used for the permanent repairs at Rodanthe.

Beth said that Phase I (replacement of the Bonner Bridge) of the project is still moving forward; the CP 4B Merger Meeting for Phase I will be held in December 2011. Therefore, both phases of the project will be moving forward at that same time.

Issues/Constraints at Pea Island

Beth reviewed the alternatives that were considered in past studies that could be considered for the Pea Island breach:

- Beach nourishment
- Roadway on new location (to the west)
- Bridge in easement
- Bridge on new location (to the west)

She then turned the meeting over to Donna Dancausse (FHWA) to moderate the discussion of agency issues and concerns in the Pea Island breach area. Donna went around the room and asked each agency representative for their input on issues at the Pea Island breach. The agency input received is summarized below.

Dennis Stewart (USFWS – Pea Island National Wildlife Refuge) said that a compatibility determination is needed for any alternative that deviates from the existing NC 12 easement. The Refuge would determine whether or not the deviation from the existing easement would detract from the purpose of the Refuge. If a project is compatible, then the Refuge can issue a permit (with stipulations). If it is found by the Refuge to not be compatible, it cannot be allowed on the Refuge. Alternatives that require only minor modifications to the existing easement for safety (e.g., straightening out a curve) are allowed with a compatibility determination, but relocating the road or building a bridge outside of the existing easement is not considered a minor modification and would not be allowed. Beach nourishment may be found compatible only if a proper source of sand is used and monitored appropriately. Dennis said that a bridge within the existing easement, combined with any minor road modifications, if needed, is probably the only alternative that USFWS would find to be compatible. He added

that the Merger Process is completely separate from the compatibility determination process, as he has stated in the past. Whether or not a compatibility determination is issued is at the discretion of the Refuge, irrespective of what the Merger Team discusses and decides. In addition, a recent feasibility report by NCDOT showed that a permanent structure within the existing NC 12 easement is feasible.

Renee Gledhill-Earley (NCDCR – SHPO) said that her concerns with Phase II were expressed during the Phase I studies. Because the Refuge is an historic landscape, Section 106 and Section 4(f) apply to Refuge impacts. The specific impacts of each alternative would need to be assessed individually once they are identified, but bridges have been determined to be incompatible with the historic landscape. In addition, moving the road to the west would impact the ponds and ruin the existing landscape. She thought that beach nourishment would probably be the only alternative that would not trigger an Adverse Effect from the perspective of Section 106. With any of the bridge alternatives, the view (both within the Refuge and of the Refuge) and the character of the landscape would be ruined by the introduction of features incompatible with the existing landscape; these alternatives would be considered an Adverse Effect. This also applies to bridges within the existing NC 12 easement.

David Wainwright (NCDENR – DWQ) said that his concerns with Phase II also were expressed during the Phase I studies. He is primarily concerned about wetlands impacts and mitigation of these impacts, especially if an alternative on new location is chosen. In addition, treatment of stormwater runoff from new roadway and bridge facilities is a concern. The long-term source of sand for beach nourishment also may be an issue due to concerns about the quality of the sand and its impacts on benthic macroinvertebrates on the beach which birds feed upon. Brian Wrenn (NCDENR – DWQ) added that both road and bridge alternatives on new location are of more concern to DWQ than alternatives in the existing NC 12 easement.

Dennis Stewart discussed climate change issues, especially rising sea level, and the natural westward migration of barrier islands with respect to wetland impacts and the difficulty with mitigating these impacts on a barrier island. The barrier islands should be allowed to migrate. He thinks the team should consider creating wetlands and shallow water habitat in the sound to the west of the island to assist the natural migration of the island to the west. In this way we would work with the natural processes rather than against them.

Doug Huggett (NCDENR – DCM) said that with respect to beach nourishment, standards will need to be met with respect to sand compatibility. There is also concern about the amount of sand that would be required for a long-term beach nourishment solution. He also questioned whether or not beach nourishment would actually address the problem since breaches occur not only from the ocean side, but from the sound side as well; NCDOT should get the coastal experts to help address this issue. He added that sampling sand from various sources to find sand that is compatible for beach nourishment could take time. He further questioned that even if compatible sand is found, whether or not there would be enough for a long-term beach nourishment solution, as beach nourishment could be required frequently. DCM would send

an expert to analyze the sand sources that NCDOT identifies, which would take possibly two to four months with an aggressive schedule. There also would be a lot of details to work out with a nourishment program (timing restrictions, mitigation, etc.). With regard to the new roadway and bridge alternatives, one issue of concern to DCM would be meeting ocean setback requirements (3 times the erosion rate, or about 180 feet to 360 feet from the first line of stable vegetation). If setbacks cannot be met, a variance would be required from the NC Coastal Resources Commission (CRC); an appeal for a variance adds several months to the schedule after the original CAMA permit has been denied. Another issue of concern is with the design of any bridges that could be considered hardening of the shoreline – no hardened erosion control measures are allowed; retaining walls would not be considered hardened erosion control structures as long as they were designed only for retaining wall purposes. A final issue of concern is the potential for impacts to coastal wetlands and other sensitive coastal habitats. These impacts would have to be mitigated.

Ron Sechler (National Marine Fisheries Service) said that the issues of concern to NMFS also were similar to those submitted during the Phase I studies. Impacts to fisheries as a result of work in the surf zone with any of the alternatives are one issue of concern. In addition, there could be an adverse impact to SAV in the sound as a result of enhancing the natural westward island migration. This is a trade-off of the benefits discussed earlier of allowing this natural process to occur, and it would need to be considered as part of the analysis of alternatives. Ron said that no matter which alternative is chosen, there likely will be impacts to NMFS resources, so NMFS will require appropriate mitigation. For example, the surf zone and the estuarine habitat are both Essential Fish Habitat, with different species, so alternatives in the water on either side of the island would affect NMFS resources. A bridge in the existing NC 12 easement may have less impact than some of the other options. Beth asked Ron to contact NMFS management in St. Petersburg to alert them to NCDOT's accelerated schedule for Phase II and possibly help accelerate threatened and endangered species consultation with NMFS. Ron said that he would do this, but that he could not guarantee any results. Beth said for him to let NCDOT know what type of information we could possibly supply now, if any, to help expedite NMFS coordination.

Pete Benjamin (USFWS – Raleigh Field Office) added that another NMFS issue of concern would likely be impacts to protected sea turtles and the Atlantic sturgeon, which is proposed for listing. These species could be affected by in-water construction and beach nourishment. He said that once a species is proposed for listing, a "conference opinion" is required. In the future, Fritz Rohde with NMFS would need to be contacted.

Mike Murray (National Park Service) said that he thinks that the Phase II alternatives will generally not affect Seashore property. However, the 1958 deed transferred public trust of the area from mean low to mean high tide to NPS. Therefore, NPS would have an interest in beach nourishment in that area. In addition, beach nourishment in northern Rodanthe could affect the Refuge, so NPS would have an interest in that alternative. NPS hopefully would not

object to such nourishment, but would want to be involved in the discussions. In general, he thought that NPS would probably not object to beach nourishment and the repair of dunes.

Kevin Hart (NCDENR – DMF) said that most of his concerns were similar to those of NMFS. In addition, if nourishment is chosen, DMF would have concerns about the placement of material in the coastal zone. A construction moratorium also could be necessary during the summer months (April 1 – November 15) because of potential sturgeon impacts. NCDOT would be required to use compatible sand for beach nourishment. DMF would not have any objections to alternatives within the existing NC 12 easement. Kevin said that DMF would prefer to leave the Pea Island breach open to allow for fish passage. Also, DMF would require avoidance and minimization of impacts to DMF resources. Finally, DMF has a sturgeon expert on staff that is tracking sturgeon migration and can provide additional information, if needed.

Travis Wilson (NC Wildlife Resources Commission) also said that his previous comments were still valid. He said that NCWRC generally wants to allow natural island processes to occur in order to sustain habitat. He wanted to know if a road relocation alternative, on its own, in the area of the Pea Island breach is viable, or if it would need to be considered in concert with nourishment or a bridge. With respect to beach nourishment, NCWRC has the same concerns as have already been expressed by the other agencies. He questioned how the amount of sand needed for beach nourishment as determined from previous studies changed based upon the impacts from Hurricane Irene. Additionally, he wanted to know if NCDOT had determined the new project limits for Phase II, and if there were any other areas based on erosion that met the thresholds discussed as part of the NC 12 TMP. With respect to Travis' question about whether a road relocation alternative would be viable on its own, Beth responded that this would be a part of the discussions next week with the panel of coastal experts. She also said the project limits would be discussed. She said that any additional areas identified that could need improvements within 5 years because of erosion could possibly be considered for Phase II. She added that the public and the Governor want NCDOT to move forward and make decisions on these two areas as soon as possible. About 20 years have been spent looking at the alternatives studied in Phase I, but now NCDOT needs to move forward. In addition, NCDOT needs the agencies to identify issues early and raise questions as soon as possible given the aggressive project schedule.

Pete Benjamin said that the placement of sand (including type and frequency) with the beach nourishment alternative is of concern because of the impacts to benthic fauna and invertebrates that are a food source to birds. This constitutes a permanent impact to the Refuge that USFWS may not approve. The expert panel needs to look at the dynamics of the new inlet because more needs to be known. USFWS also wants the experts to look at the impacts of the changing environment (e.g., nor'easters, other climate conditions, etc.) on the Refuge. With respect to the process for coordinating with USFWS during the next phase, Pete said it is important for NCDOT to continue to coordinate with the Refuge (i.e., Dennis and Mike), but Section 7 coordination must be done with the Raleigh Field Office (i.e., Pete and Gary). In addition, USFWS has manpower issues that could affect their ability to meet NCDOT's

proposed accelerated schedule for Phase II. He said that there are limits to what they can do with the resources available. This is compounded by the emergencies that frequently pop up on NC 12. It was noted that NMFS has a similar situation with respect to manpower. Pete said that NCDOT's NEPA document needs to be adequate for USFWS to be able to make their compatibility determinations, or they will have to seek additional information or prepare their own NEPA document. In addition, the alternatives must be adequately studied, or USFWS may have to study them further. Dennis emphasized that if NEPA does not adequately address their specific processes, they would prepare their own document, which would affect the schedule. These processes include: a package prepared for the Realty Division and reviewed by the Regional Director; an Environmental Action Statement, which can reference an acceptable NEPA document; and an archaeological resource consultation in addition to Section 7 consultation. USFWS regulations require that an alternative must be found incompatible if not enough information is provided to address their requirements.

Clarence Coleman (FHWA) said that FHWA wants the NEPA documentation to meet NPS, USFWS, and USACE documentation requirements. He said that FHWA wants to continue the same relationship as before with FHWA as the lead agency and NPS, USFWS, and USACE as Cooperating Agencies.

Beth Smyre asked Pete Benjamin if USFWS had determined how the breach is affecting habitat. Pete responded that overall USFWS considers it to be a neutral change because it is part of the natural process for a barrier island. He said that some birds like inlet areas for nesting habitat, and that fisheries resources will be using the inlet to move between the sound and the ocean. More may be known in the spring about the implications of the breach, but historical records suggest that it could become bird habitat. It is also unknown how the breach will change over time, but it is a natural feature. Gary Jordan added that there are shorebirds already using the new inlet habitat. Beth requested that USFWS and other agencies think about this and let them know if there is anything more or different that needs to be considered at this site given the changes in the landscape/seascape at this location. Pete responded that he would get back to NCDOT on this issue.

Beth Smyre said that Chris Militscher (USEPA) was unable to attend today's meeting, but that he had sent her an e-mail (see attached) discussing his concerns that she will forward to the Merger Team. She also read parts of the e-mail to the attendees.

Ron Lucas (FHWA) said that FHWA intends to comply with all applicable laws and regulations during the Phase II studies. He said that they will meet with the agencies as needed to make sure this happens. They also intend to ensure that the commitments made in the ROD are met, including the coastal monitoring program and habitat and vulnerability analysis commitments.

It was noted that the Albemarle RPO should be included in the Phase II planning process; Steve Lambert is the RPO's contact.

Renee Gledhill-Earley said that with respect to FHWA's discussion of making sure the commitments in the ROD are met, she would like a copy of the Transportation Management Plan. Beth responded that NCDOT is working on the formal plan for the coastal monitoring program. John Sullivan added that it is described in the ROD and discussed some of its features (coastal monitoring, having experts identify the changes in the island and habitat, what does the modeling say, what the 50-year forecast is, etc.). How to provide transportation over that 50-year period will be based on the results of this work. Beth added that NCDOT is building on the structure of the NC 12 TMP as discussed in the ROD, and noted that the section of the ROD describing the NC 12 TMP is included in the meeting packet.

There was a discussion of long-term planning for maintaining NC 12 rather than what some agencies perceived as just continually responding to emergencies. Mike Murray asked about funding issues related to NC 12 long-term planning. John Sullivan responded that emergency funds can only be used to re-open NC 12 after a storm. Other sources of funding must be used for long-term maintenance. Dennis Stewart said that costs for fixing the road after a storm also are incurred by other agencies, not just by NCDOT. All of these costs should be considered as part of the overall cost for maintaining NC 12. He also questioned how to plan for the future costs of all agencies in responding to these situations since future storms will damage NC 12 again. It was discussed that both an incident command system to coordinate future NC 12 emergency response in an organized manner, as well as an accounting system for future emergency response to account for the total costs of all agencies, should be considered. It was discussed that during crisis situations, such as the recent storm, conflicting information often circulates as to what NCDOT is considering with respect to NC 12. Jim Trogdon responded that if the information did not come from Jerry Jennings, it should be considered "hearsay" because Jerry is the primary contact for NCDOT's NC 12 emergency response efforts. Clarence added that some of Dennis' concerns are addressed by the NC 12 TMP. Jim also added that NCDOT's plan moving forward is to allow for more dynamic NC 12 emergency response strategies.

Bill Biddlecome (US Army Corps of Engineers) said that he also has similar concerns to those expressed by USACE during the Phase I studies. He supports what the other agencies have been saying and USACE will make sure to comply with their regulations when making permit decisions. He said that the urgency of implementing the NC 12 TMP has obviously changed as a result of Hurricane Irene. He listed the following as some of the major concerns that he has moving forward: sand source and the amount of sand needed for nourishment; wetlands impacts (and mitigation) with road relocation alternatives; endangered species impacts; resolving competing issues of some of the agencies with some alternatives (e.g., SAV vs. wetland impacts); and the Section 106 conflict with bridge alternatives.

Bill also said that we should not pursue solutions without considering the likely outcome. For example, if the USFWS will not be able to find a particular alternative compatible, we should not spend too much effort studying that alternative. It was discussed that the Phase I studies seemed to reveal potential conflicts between the NEPA/Merger Team process and the USFWS

compatibility determination process. John Sullivan responded that he did not think there was a conflict, because if an alternative is not compatible with the Refuge, then the Merger Team should drop the alternative. Bill responded that during the Phase I studies the Merger Team continued to study alternatives that were not compatible. He suggested that this is an issue that he would discuss with his agency's counsel. He also asked if there is an appeals process where alternatives can be removed from consideration if they are not "compatible." Pete Benjamin said that part of the problem is that decisions are often elevated to upper management when an issue cannot be resolved by the Merger Team, and then the project continues forward after the elevation process without buy-in from the team members – this is where the Merger Process sometimes fails. It was discussed that the Merger Process generally works well on most projects because of the good coordination that occurs, but questions were raised concerning how it will work for Phase II when we are facing similar issues as before. There are issues that are still unresolved at the Merger Team level, and this could continue to cause project delays. Donna Dancausse asked if there were some alternatives still under consideration that really are not compatible. Beth Smyre said that we should not judge the Merger Process based on this project because it works well on most other projects. Pete agreed that he thinks it is a good process, but that it has not always worked well on the Bonner Bridge project. Donna said that maybe the Merger Interagency Leadership Team (ILT) should identify "lessons learned" from the Phase I studies and develop a strategy for making decisions if they are not able to make it. This study could also be used for other difficult Merger Process projects.

Issues/Constraints at Rodanthe

Beth Smyre discussed the alternatives that were assessed in past studies in the Rodanthe area that could still be considered in Phase II:

- Beach nourishment
- Bridge within existing NC 12 easement
- Bridge on new location (extending into the sound)

Donna went around the room and asked each agency representative for their input on issues at Rodanthe. The agency input received is summarized below (note that most of the agency representatives said that their concerns were the same as at the Pea Island breach – only agencies with additional input for the Rodanthe area are included below).

Beth said that public involvement would be a more important component of the Rodanthe area study than for the Pea Island breach, including working with Rodanthe property owners and visitors. Ron Lucas agreed that public involvement would be an important component of the Phase II studies. Clarence Coleman said that NCDOT public involvement efforts could be coordinated with resource agency public involvement requirements (e.g., by using combined public workshops, public notices, etc.), if desired. Bill Biddlecome said that public involvement is part of the Merger Process. Debbie Barbour asked if the public involvement process also could be used to advertise permits since the two processes are so close together –

this could help to speed up the process. Bill said that he thought the two processes could be combined since there must be a public notice for permits. He also said that a public hearing is not required for permits unless there is something to be gained by holding a hearing. There was a discussion of the public notice needs and requirements of various agencies. It was discussed that the public involvement and permitting processes should be combined, to the extent possible, in order to try and avoid unnecessary delays and stay on the accelerated schedule.

Doug Huggett said that with respect to offshore sand sources for beach nourishment, if the source is outside of DCM's three-mile jurisdictional limit, then the Federal Bureau of Ocean Energy Management (OEM) would have jurisdiction. Even taking vibracores (i.e., to study sand suitability) from sand sources outside the three-mile limit would have to be coordinated with OEM. Doug said that this could complicate and lengthen the permitting process. He also said that sandbags are not allowed to be incorporated as a permanent part of the project. If sandbags are used, they can only be used as a temporary solution (up to five years).

Mike Murray said that the Refuge is not concerned with beach nourishment in Rodanthe, but they would be involved if the nourishment extends into the intertidal zone. However, Dennis Stewart added that based on the pictures of the damage that were shown earlier, most work may actually be located within the Refuge just north of Rodanthe, so the same rules that he discussed earlier for the Refuge would apply.

Dennis said that he had heard a rumor that NCDOT is considering a seven-mile bridge from north of the Pea Island breach to Rodanthe. He said that if such an alternative minimized the impact on the Refuge, it could possibly be found to be a minor modification that could be compatible. Jim Trogdon responded that NCDOT has not discussed a seven-mile bridge. He added that NCDOT is waiting to get input from the coastal experts before deciding what alternatives to pursue at the Pea Island breach.

Renee Gledhill-Earley asked if Hurricane Irene had caused any changes in Rodanthe that would impact the location of the southern end of the Bridge South Alternative in relationship to the Rodanthe Historic District. She also said that the Chicamacomico Lifesaving Station sustained minor damage from the hurricane.

Summary of Input and Identification of Actions/Next Steps

Beth Smyre handed out the proposed agenda for the expert panel meeting and asked if there were any comments. She added that she had already heard several issues that were raised at today's meeting that she will add to the proposed agenda. She said that there were three main parts to the proposed agenda: purposes, expected outcomes, and the participant list. Beth noted that the purposes of the expert panel meeting do not include discussing legal issues that are addressed by the Merger Team agencies. NCDOT will be seeking input from the expert panel on how they should proceed with Phase II. She again emphasized that the agenda is still

a draft, so the Merger Team should send her any suggestions, specific questions, or resource materials/studies that they would like the panel to consider. She added that because of the scheduling and logistical issues of planning this meeting in such a relatively short time period, she was not able to invite more experts to participate on the panel.

Donna Dancausse showed the proposed Phase II schedule again and reviewed the next steps in the process. Beth said that the summary report for the expert panel meeting would be provided to the Merger Team for review and comment. It was discussed that the type of NEPA document that will be prepared depends on the types of alternatives that are selected for study. Clarence Coleman said that the next steps in the NEPA process also will depend on the results of the expert panel meeting, as well as an assessment of the changes in the study area's existing conditions as a result of Hurricane Irene. However, the agencies should keep in mind that a ROD was already completed. In addition, interagency and public coordination will be important factors in the process. He said that FHWA will keep the Merger Team informed on what is being proposed for NEPA compliance.

Beth said that Merger Team members should let her know as soon as possible if they need anything from NCDOT so that the aggressive schedule (for both Phases I and II) can be maintained.

Bill Biddlecome said that the next Merger Team meeting is scheduled for December 15.

Donna thanked the meeting participants for their time, in particular the ILT members who attended today's meeting.

file no.: 3301-2.7.2

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From: Militscher.Chris@epamail.epa.gov [mailto:Militscher.Chris@epamail.epa.gov]
Sent: Wednesday, October 12, 2011 11:03 AM
To: Smyre, Elizabeth A
Cc: mueller.heinz@epa.gov
Subject: Re: B-2500 Merger Team Meeting, October 18

Beth: Due to previous personal commitments I will not be able to attend the meeting. I may be able to call in if my situation allows.

Regarding your questions, I offer some general responses:

1. EPA has previously identified its environmental concerns for building additional bridges along a dynamic, barrier island. Hurricane Irene did not identify any specific new issues but only re-affirmed that more isolated bridges between NC 12 pavement will not provide a long-term solution to the maintenance problems identified by FHWA & NCDOT in its past NEPA documents. New inlets will also form in the future at the vulnerable spots identified by the coastal geology experts retained by the NCDOT. EPA referred to an 'adaptive' management plan for future phases in consideration of future storm events, documented sea-level rise, and yearly coastal erosion along the barrier islands. The barrier islands are gradually 'retreating' and re-shaping. Additional bridges at <u>future</u> breaches and new inlet sites along miles and miles of barrier island sands is not the long-term adaption that EPA was referring to.

2. These short-term 'get NC 12 open again' alternatives are not believed to be a permanent solution.

3. No. EPA Wetlands branch also reviewed the USACE public notice in expedited fashion and did not identify any specific, short-term environmental concerns.

4. Yes.

- What expertise does the panel have with respect to evaluating non-bridge, non-highway, ferry alternatives? As with many past meetings, NCDOT Ferry Division representatives are not frequently present at the Merger meetings.

- Is the NCDOT Ferry Division looking to obtain low-draft, high speed ferries?

- What progress has been made with the USCG concerning certification of these low-draft, high speed ferries in the U.S.?

- Why can other developed countries us these low-draft, high speed ferries but reportedly the U.S. cannot? Is it a procurement or funding issue?

- Dredging issues and needs are often raised by the transportation agencies for the conventional NCDOT ferries. Would there be substantial dredging required if low-draft, high speed ferries were obtained?

- Will this non-highway alternative been given a documented 'hard look' by the selected panel?

- Ocracoke Island was also impacted by Hurricane Irene. Were there problems with evacuating N.C. residents off of this island via ferry? Does the Ferry Division have a severe storm evacuation contingency plan for the barrier islands it serves?

Thanks. Again, I'll try to call in if possible.

To: December 15, 2011 Bonner Bridge Merger Team Meeting Attendees

From: Bobby Norburn, Parsons Brinckerhoff

Date: March 6, 2012

Subject: **Meeting Minutes – December 15, 2011 NEPA/Section 404 Merger Team Meeting for Phase II of the Bonner Bridge – NC 12 Transportation Management Plan (TIP No. B-2500)**

Attendees:

Gary Jordan	USFWS – Raleigh Field Office
Pete Benjamin	USFWS – Raleigh Field Office
Dennis Stewart	USFWS – Pea Island National Wildlife Refuge
Mike Bryant	USFWS – Pea Island National Wildlife Refuge
Scott Lanier	USFWS – Pea Island National Wildlife Refuge
Bill Biddlecome	US Army Corps of Engineers
Chris Militscher	USEPA
Ron Sechler	National Marine Fisheries Service
Mike Murray	National Park Service
Clarence Coleman	FHWA – NC Division
Ron Lucas	FHWA – NC Division
Kevin Wright	FHWA – NC Division
Donnie Brew	FHWA – NC Division
Cathy Brittingham	NCDENR – DCM
Doug Huggett	NCDENR – DCM
Braxton Davis	NCDENR – DCM
Kevin Hart	NCDENR – DMF
Brian Wrenn	NCDENR – DWQ
David Wainwright	NCDENR – DWQ
Amy Simes	NCDENR
Travis Wilson	NC Wildlife Resources Commission
Renee Gledhill-Earley	NCDCR – SHPO
Steve Lambert	Albemarle RPO
Bobby Lewis	NCDOT
Greg Thorpe	NCDOT – PDEA
Beth Smyre	NCDOT – PDEA
Brian Yamamoto	NCDOT – PDEA
Rob Hanson	NCDOT – PDEA
Brittney Kelly	NCDOT – PDEA
Drew Joyner	NCDOT – Human Environment Section
Martha Hodge	NCDOT – Human Environment Section
Phil Harris	NCDOT – Natural Environment Section
Steve Mitchell	NCDOT – Natural Environment Section
Chris Rivenbark	NCDOT – Natural Environment Section
Kathy Herring	NCDOT – Natural Environment Section

LeiLani Paugh	NCDOT – Natural Environment Section
Michael Turchy	NCDOT – Natural Environment Section
Elizabeth Lusk	NCDOT – Natural Environment Section
Mark Staley	NCDOT – Roadside Environmental Unit
Mark Laugisch	NCDOT – Roadside Environmental Unit
Ray McIntyre	NCDOT – STIP Unit
Kerry Morrow	NCDOT – Transportation Planning Branch
Michael Valiquette	NCDOT – Geotechnical Engineering Unit
Chris Kreider	NCDOT – Geotechnical Engineering Unit
Jerry Lindsey	NCDOT – Hydraulics Unit
Glenn Mumford	NCDOT – Roadway Design
Gary Lovering	NCDOT – Roadway Design
Jerry Jennings	NCDOT – Division 1
Bob Capehart	NCDOT – Division 1
Benjetta Johnson	NCDOT – Traffic Management Unit
Dara Demi	NCDOT – Communications Office
David Hering	NCDOT – Transportation Program Management Unit
Lance Winslow	NCDOT – Ferry Division
Tim Hayes	Parsons Brinckerhoff
Bobby Norburn	Parsons Brinckerhoff
Rick Kanaski	USFWS – Southeast Region *(by phone)*

Opening Remarks

The meeting started at 1:00 PM in the Structure Design Conference Room at NCDOT Century Center. Bill Biddlecome opened the meeting by stating the purpose was to discuss Concurrence Point 2/2A for Phase II of the Bonner Bridge Replacement Project. He said that the merger team members should have received a copy of the meeting packet prior to the meeting. Bill asked the meeting attendees to introduce themselves, and then turned the meeting over to Beth Smyre.

Project Status

Beth reviewed the purpose of the meeting, which was to discuss long-term solutions for the areas on NC 12 that were breached by Hurricane Irene (i.e., the Phase II study areas). She said that the meeting's goal is to reach concurrence regarding which alternatives to carry forward for detailed study at each Phase II site (Concurrence Point 2) and to discuss any additional bridging concerns with each option carried forward (Concurrence Point 2A).

Beth discussed the peer exchange meeting that was held on October 24 and 25, 2011. Eight coastal engineers and scientists participated in the meeting wherein there were three main topics of discussion: the current coastal conditions in the project area as a result of damage from Hurricane Irene; identification of design parameters for long-term solutions at each

breach site; and recommendations on future coastal studies for the entire project area as part of the coastal monitoring program. She noted that a summary of the key points heard at the peer exchange meeting is included in the meeting packet. Beth said that the full report from the meeting is not yet complete, but it will be distributed to the merger team and made available to the public after the participants review the draft. Mike Murray asked why the experts were not asked to make a recommendation on an alternative at each Phase II site. Beth responded that the panelists were not asked to make design recommendations because there are both permitting and science-related issues involved in selecting a recommended alternative at each site, and NCDOT did not want to cause a conflict between those issues.

Beth summarized the public workshops held on December 5 and 6, 2011. (A summary of the public workshop efforts is also included in the meeting packet.) She discussed the public comments received to date; as of December 13, a total of 31 citizens had submitted comments. Most of the public comments were related to the Rodanthe study area. The Nourishment Alternative was the most favored alternative among the public in the Rodanthe area with their reasons being that the other alternatives may either prevent them from accessing their properties, or may also ruin the character of the community. Only eight of the comments dealt specifically with the breach at Pea Island. Public comments are due by January 20, 2012, two weeks following a third public workshop on Ocracoke Island.

Beth reviewed the Phase II study areas. She discussed that the alternatives being considered in Phase II are the same alternatives that were analyzed in the previous NEPA studies for the Bonner Bridge Replacement Project. However, only the portions of these alternatives in the two breach sites are being re-analyzed for Phase II.

Chris Militscher asked if Phase II was previously intended to include only the Rodanthe area. Bill mentioned the figure showing the Phased Approach Alternative in the FEIS that showed the Pea Island breach as being in Phase III. Beth said that while Bill's statement was correct for the Phased Approach Alternative, that alternative was not the Selected Alternative in the Record of Decision (ROD). The Selected Alternative did not specify the location and timing of future phases, but rather indicated that future phases would be determined by monitoring coastal conditions. Chris asked Beth if the Sandbag Area Hot Spot would be included in Phase II or Phase III. Beth responded that it most likely would be included in Phase III, depending upon the results of the coastal monitoring program currently underway.

Beth discussed the impact assessment tables for the alternatives in the two Phase II study areas. She said that the information included as Tables 1 and 2 of the meeting packet is based upon the information contained in the previous NEPA studies for the these alternatives, but only for the current Phase II study areas.

Beth explained the costs table in the meeting packet. She explained that it was not yet possible to provide the costs for each Phase II site, so the costs shown are for the entire lengths of the alternatives (as studied during the NEPA process) to the south of Phase I (i.e., the cost of the

Bonner Bridge replacement was removed for each alternative). She said that the costs will be updated for the alternatives carried forward for detailed study at each site.

Discussion of Alternatives at the Pea Island Breach

Beth discussed the Pea Island breach alternatives as described in the meeting packet. She again explained that the impacts listed in the handout were based only on the Phase II sections of the overall ROD alternatives. She described each alternative and how it is referenced in the impact table in the meeting packet (i.e., names and extents of impacts reflected). Chris asked about the approximate length of the Bridge on New Location alternative. Beth responded that all of the alternatives in the Pea Island breach area are approximately two miles long. With respect to the Bridge within Existing NC 12 Easement option, Beth said that there was no breach when this alternative was originally developed. Therefore, from a constructability standpoint, NCDOT must determine how the permanent bridge can be built while keeping traffic flowing on the temporary bridge. Whether or not this can be done without going outside the existing easement has not been definitively answered and is still being addressed.

Gary Jordan asked about the protected species impacts in the tables. He questioned the "none likely" notations associated with the protected species impacts of several alternatives as listed in Tables 1 and 2. Bobby Norburn said that this was worded similar to the impact summary in the ROD, but we will look more closely at this wording to see if it is correct.

Beth asked for a CP2 discussion on the alternatives at the Pea Island breach area to determine what alternatives should be carried forward. Mike Murray asked what type of NEPA document was going to be prepared. Clarence Coleman responded that it would be a Re-Evaluation at a minimum, but it was still under discussion as to what would be prepared. The NEPA document would be some appropriate way of documenting the decision-making process, and it may depend on the outcome of today's meeting. Bill asked about the timeframe for making the decision on the document type. Clarence said that an evaluation of the project-specific issues and the outcome of agency coordination will determine the document type, but FHWA is still unsure at this time. He said that the type of NEPA document always depends on the issues to be addressed.

Dennis Stewart discussed corrections that are needed in the meeting packet related to USFWS comments at the previous Merger Meeting (i.e., first bullet point on page 5 of the merger packet). He said that the summary of the USFWS comments on the process through which the alternatives would have to go through in order to be acceptable to the USFWS-Refuge was oversimplified. He said that any alternative that deviates from the easement has to first qualify as a minor modification of the existing easement in order to receive consideration by the USFWS-Refuge. If the alternative is not deemed a minor modification, then it will not be allowed. If it does qualify as a minor modification, then a further compatibility review will be conducted to determine whether the alternative is compatible with the Refuge's mission and purpose. For the Nourishment Alternative, for example, a viable sand source that meets the

Refuge's standards for beach nourishment material would have to be proven before the alternative could be deemed acceptable. He also pointed out that there are a limited number of times that minor modifications can be made within the Refuge due to the cumulative impacts of multiple minor modifications.

Beth asked if the Nourishment Alternative is still a viable option for this site. Dennis asked about the specific parameters associated with the Nourishment Alternative. Beth explained that based on the previous NEPA studies, it would include sand placement every four years and the rebuilding of dunes every 12 years. However, these parameters would be updated based on current conditions and tailored to account for the needs of the specific project location. Beth also noted that further sand studies would be needed in order to determine potential sand sources; the study completed in 2009 by the NC Geological Survey would be used to assist this effort.

Renee Gledhill-Earley asked Dennis if any of the Pea Island breach alternatives would meet the USFWS standards. Dennis and Mike Bryant responded that none of the alternatives that are outside of the existing easement would meet USFWS standards for a minor modification of the existing easement. Mike said that he would find none of the alternatives to be compatible, except for the bridge in the existing easement, unless someone comes up with alternatives that involve acceptable minor modifications.

Based on that USFWS input, Clarence stated that the team could screen out all alternatives unless they include an acceptable minor modification. The USFWS representatives agreed. Beth asked the team if they agreed to drop all of the alternatives outside of the existing easement (i.e., only the Bridge within Existing NC 12 Easement option would be retained). There were no objections.

Chris asked if we need a Section 106 avoidance alternative, as the option remaining had been determined to have an Adverse Effect under Section 106. Renee stated that she understood that the team was not carrying forward an option that avoided any Section 106 impacts. Clarence said that this is not a new study and that a Section 4(f) avoidance alternative was previously evaluated and determined not to be prudent. The alternatives previously considered will be re-evaluated for Phase II.

Bill asked about the source of funding for Phase II. Ray McIntyre responded that federal Emergency Relief (ER) funds could be used for a portion of the project funding. Clarence agreed. Bill asked how much is available in ER funding. Clarence responded that there is a limited pot of ER funding available for use in the entire country, so it may not be available when NCDOT needs it. It is not an immediate reimbursement system; Ray said this is standard practice. Bill asked if this would affect other projects in the state. Ray responded that it would as this part of the project is not included in the current STIP. It was asked if it is true that NCDOT only has two years after a storm to acquire ER funds. Clarence responded that this is

generally true and is part of the reason why NCDOT wants to move forward quickly in order to ensure that the project will be eligible for the funds.

Mike Murray asked if this was the funding strategy for future phases. Beth responded that it was not – this is a special situation, but not how we want to handle future phases. We are trying to move forward quickly to qualify for ER funds to repair hurricane damage, but we will let the coastal monitoring program tell us when future phases and associated funds will be needed to allow for STIP budgeting.

Bill asked if the coastal monitoring program and natural erosion were discussed at the expert panel meeting. Beth responded that they were discussed at the meeting, including that erosion is somewhat storm dependent and is hard to predict. Dennis discussed that modeling for the impacts of future storms is possible, but we cannot predict exactly when the storms will occur. It was also discussed that there was no consensus reached with the coastal experts at the peer exchange meeting as to whether or not the Pea Island breach would close on its own.

Renee asked about the Section 4(f) "use" of the Refuge if the alternative stays in the existing easement. Clarence said that it had been determined in the previous studies that it would be a constructive use. The Section 4(f) documentation from the previous NEPA studies will be reevaluated for the analysis of the bridge in the existing easement.

Brian Wrenn said that the use of the word "expected" in the tables in the meeting packet related to the "Anticipated Need for Refuge Compatibility Determination" is confusing. NCDOT will replace the word "expected" with "required" to address this issue.

Rob Hanson discussed that the urgency in making a decision has to do not only with the availability of ER funds, but also with the tenuous nature of the temporary repairs. Based on this concern, a permanent fix is needed as soon as possible.

Clarence said that FHWA could agree to carrying forward only the bridge in the existing easement.

Discussion of Alternatives at the Rodanthe Breach

Beth discussed the four alternatives for the Rodanthe breach site. The four alternatives are also described in the meeting packet.

Dennis said that the Bridge on New Location would not be considered a minor modification as currently shown, but that it could possibly be modified so that it would be. However, if this alternative is chosen and a minor modification is also needed at the Pea Island breach, this would be a problem due to the cumulative impacts of multiple minor modifications. Mike Bryant said that the Bridge on New Location would cross approximately 3,200 feet of the Refuge as currently shown, which is not acceptable.

Cathy Brittingham asked why the southern terminus of the Bridge on New Location was not located further to the south. Beth explained that the current location was based on the presence of the historic district and the emergency ferry terminal just to the south. The Bridge on New Location is approximately 2.5 miles long. Renee said that the boundaries of the historic district may need to be reevaluated post Hurricane Irene. Clarence said that NCDOT (Mary Pope Furr) has started to do that, and she said that the fish house adjacent to the emergency ferry terminal was almost completely destroyed.

Mike asked if the design of the Bridge on New Location could be adjusted. Beth responded that it could be adjusted. Dennis will consider this issue further (i.e., the possible adjustment of the alignment so that it would be a minor modification) and also discuss with USFWS management.

Beth said that erosion rates are higher in the Rodanthe area, so nourishment may not be a viable option; this is consistent with what was heard at the peer exchange meeting. She also said that if USFWS is willing to consider the option of a bridge on new location if the bridge could be redesigned to qualify as a minor modification, NCDOT would like the opportunity to attempt to do so.

Mike Murray said that NPS will struggle with beach nourishment near the Refuge. He discussed the history of the deeds for the Refuge, including the clause in the 1958 deed that states that the State reserved the right to build and maintain roads in the Refuge. He also said that NPS is responsible for the intertidal zone and usually does not allow beach nourishment in other parts of the country, with few exceptions. It typically becomes a large and expensive process. He thought that NPS policy likely would result in an objection to beach nourishment in northern Rodanthe, but he was not positive about this. Beth asked about any NPS sand compatibility requirements for nourishment. Mike said NPS rarely deals with this issue, so they would likely adopt the Refuge's research and position on this issue. Beth asked Mike to send her information on NPS' policy on beach nourishment.

Chris asked where the temporary bridge is over the breach in Rodanthe. It was stated that there is no temporary bridge, but rather the breach was filled in. Chris asked how the design lengths for the bridge alternatives in this area were determined. It was discussed that the bridges for the alternatives in this area were designed to cover both the anticipated shoreline location and the two predicted breach locations in this area as discussed in the previous NEPA studies.

Chris asked about logical termini. Beth said we are fairly confident about the location and length of the portion of NC 12 unaffected by beach erosion through 2060 that begins at the northern end of the Rodanthe alternatives, so it is a logical northern end point for the Rodanthe alternatives.

Beth said that NCDOT recommends dropping the alternatives that include beach nourishment in the Rodanthe area, even recognizing the public comments already received, and likely still

to come, in support of beach nourishment. She added that one reason the public comments favor beach nourishment is because of the concern that a bridge option may either prevent residents from accessing their properties, or may also ruin the character of the community. Removing the nourishment options would leave two alternatives in the Rodanthe area – Bridge within Existing NC 12 Easement and Bridge on New Location. USFWS representatives noted the concern of whether the design of the Bridge on New Location could be modified so that it is acceptable.

The issues related to the Bridge within Existing NC 12 Easement option being potentially located in the surf zone in the future were discussed. There are currently no examples of this in the country, but it could be done based on the results of the engineering analyses that were completed during the original NEPA process. Doug Huggett said that there would be policy hurdles to overcome related to having a bridge in the surf zone. Beth asked for information on what those issues would be. Doug noted the example of the hardened structure restriction, as none are allowed in the surf zone.

Ron Sechler said that NMFS also has concerns about a bridge located in the surf zone. Beth requested that NMFS and other agencies provide these issues in writing to NCDOT, as she has previously requested, in order to allow NCDOT to address these issues moving forward.

Renee asked how access to adjacent homes in Rodanthe would be provided with the Bridge within Existing NC 12 Easement. Beth explained the design of this alternative includes two one-lane service roads to provide access to properties adjacent to the bridge.

Chris asked about the homes in northern Rodanthe that were destroyed by Hurricane Irene, as well as what would protect the remaining homes with the bridge options that were being discussed. Mike Bryant said that nothing is protecting them now. It was discussed that NCDOT maintains the existing right-of-way, including clearing sand, but it is up to the homeowners to maintain their access to NC 12, including clearing sand as needed from their property. Chris said if there will be no homes in the future in this area, then it does not make sense to maintain access to this area by providing service roads with no protection that would have to be maintained. It was discussed that there are still homes there now, so for now the service roads are needed. Doug said that the sandbags currently installed in this area to protect portions of NC 12 would have to be removed once NC 12 is moved because they are not intended to be permanent, but rather were allowed only for the purpose of protecting NC 12.

Cathy asked if an alternative had been considered that would extend further to the south to get to more stable land near the pier. Beth reiterated her previous answer related to the location of the southern terminus for the Bridge on New Location. She also discussed the implications of the shoreline erosion forecasts with respect to the current designs.

Mike Murray and Beth discussed future shoreline locations. Beth said that Appendix E in the FEIS included figures that showed the future predicted shorelines.

Beth summarized what she thought was the agreement on which alternatives would be kept for further study in each Phase II study area:

- Pea Island Breach – Bridge within Existing NC 12 Easement.
- Rodanthe Breach – Bridge on New Location and Bridge within Existing NC 12 Easement.

There were no objections on what would be carried forward.

USFWS Option for Combining Both Phase II Areas

Beth described an option proposed by Dennis Stewart at the peer exchange meeting that would combine both Phase II study areas into one project by building an approximately seven-mile-long bridge along the back side of the island. This bridge would include both breach locations. Dennis further elaborated on this option. He said that USFWS may be able to justify a minor modification leaving the Refuge just north of the Pea Island breach as soon as possible, and then continuing on a bridge through the sound to Rodanthe. He said that he thinks there is a possibility that if individual projects are pursued for each Phase II study area, as well as for future phases, USFWS will likely have to approve multiple minor modifications to account for all of the individual study areas, which could be problematic; this option would construct one longer project that would require only one minor modification. Beth asked if there were any concerns with this option.

Ron said that the NMFS would be concerned with seagrass impacts in the sound, as well as with impacts to estuarine bottom that serves as essential fish habitat (EFH). Doug said that they may have concerns once the alternative is more clearly defined, but they had no specific objections at this point beyond the concerns that they have already expressed with the other similar alternatives. Bill said USACE would be concerned with wetlands impacts in the part of the Refuge that would be crossed. Mike Murray said that since this alternative had not been analyzed previously, the agencies would require further documentation of the potential impacts before making a decision. The alternative will be evaluated to the same level of detail as the other alternatives.

In response to a question, Dennis described the possible bird impacts with this option.

Beth asked the agencies to think about any further concerns they might have with this option. She said that there are also several issues that NCDOT still needs to consider concerning this option. For example, it is not yet known whether or not NCDOT will be able to afford its construction and long-term maintenance. Additionally, further study of this alternative would require delaying the schedule for selecting and constructing a long-term solution at the two breach sites. The implications of a schedule change must be considered because there is still an “emergency” situation in the two Phase II study areas. Beth said that, as of now, NCDOT intends to work with the USFWS on this option to determine if a suitable alignment can be developed. The USFWS would conduct a field review to determine what areas of the Refuge

could be included in a minor modification of the existing easement. USFWS and NCDOT will decide if this option should be pursued further with the Merger Team. If the decision is made to pursue this option, then NCDOT will come back to the Merger Team to request official approval. The Merger Team agreed that NCDOT should move forward with discussions with USFWS about this option.

Summary of Discussions and Concurrence on Detailed Study Alternatives to Carry Forward for Further Evaluation

Beth again summarized the detailed study alternatives to be carried forward based on today's discussions. Bill asked if NCDOT expected the agencies to sign a CP2 agreement today; Beth responded that NCDOT wanted to get signatures at the meeting.

Pete Benjamin said that he and Mike Bryant would like to discuss the tentative detailed study alternatives further with USFWS upper management before signing the agreement. Bill also said that he would like to discuss the detailed study alternatives further with USACE upper management before signing. Beth asked how long it would take to hear back from these agencies. Bill responded that USACE could provide a response by next Monday (December 19). USFWS responded that they could have a response in approximately a week or two.

FHWA representatives said that they agreed with moving forward with the proposed detailed study alternatives from today's meeting.

Dennis said that if NCDOT decides to build the Bridge on New Location in the Rodanthe area and USFWS grants a minor modification, it would likely preclude USFWS granting any additional minor modifications for alternatives under consideration for future phases in the Refuge.

Beth printed and distributed a draft Concurrence Point 2/2A form for Phase II based on the outcome of today's meeting (see attached) to the team members. Based on the feedback received from some agency representatives that they needed to consult senior staff members before coming to a final decision, it was agreed that the team members would discuss the issues internally as soon as possible, if needed, and then fax the completed forms to NCDOT should they decide to concur on the alternatives agreed to at the meeting.

The meeting was adjourned at 3:00 PM.

file no.: 3301-2.7.2

J:\PLANNING\Bonner SDEIS\2011 Reevaluations\Merger Meetings\CP2 Merger Meeting (12-15-11)\Bonner Merger Team Meeting Minutes (12-15-11)- FHWA review draft (2-2-12).docx

December 15, 2011 1:00 pm – 3:00 pm

BONNER BRIDGE – NC 12 TRANSPORTATION MANAGEMENT PLAN PHASE II CP 2/2A MERGER TEAM MEETING

Meeting Purposes

- To determine what alternatives to study in further detail for Phase II (CP 2)
- To discuss any additional bridging decisions that accompany alternatives (CP 2A)

Peer Exchange Meeting

- Held October 24th and 25th
- Panel of coastal engineers and scientists
- Discussed coastal conditions as a result of the damage from Hurricane Irene
- Identified design parameters for long-term solutions at each breach site
- Recommendations on future coastal studies for entire project area

Public Workshops

- Held December 5th and 6th in Manteo and Rodanthe, respectively
  - Manteo – 45 attendees
  - Rodanthe – 135 attendees
  - Ocracoke – scheduled for January 5, 2012
- Introduced Phase II of the Project
- Discussed the design options under consideration at each site
- Public comments due by January 20, 2012

Phase II

- Parallel Bridge Corridor with NC 12 Transportation Management Plan
  - Phase I: Construction of new Bonner Bridge over Oregon Inlet
  - Coastal monitoring program
  - Phase II: long-term solutions for both the Pea Island and Rodanthe breach sites

Impact Assessment

- Based on information available as of 2010 ROD
- Costs are for entire length of options (between Oregon Inlet and Rodanthe)
- Impacts, costs will be updated for each option carried forward

Alternatives: Pea Island

- Beach nourishment
- Bridge on new location (from All Bridge Alternative)
- Road on new location (from Road North/Bridge South Alternative)
- Bridge within existing NC 12 easement (Phase III of Phased Approach Alternative)

Alternatives: Rodanthe

- Beach nourishment
- Bridge on new location (southern portion of Road North/Bridge South and All Bridge Alternatives)
- Bridge within existing NC 12 easement (Phase II of Phased Approach/Rodanthe Bridge Alternative)
- Bridge within existing NC 12 easement and beach nourishment (Phase II of Phased Approach/Rodanthe Nourishment Alternative)

Phase I
US Coast Guard Station
Duck Island
Oregon Inlet
Canal Zone Hot Spot
ATLANTIC OCEAN
N
Pea Island National Wildlife Refuge
Sandbag Area Hot Spot
Phase II Study Area - Pea Island Breach
Pamlico Sound
Hatteras Island
12
Rodanthe "S" Curves Hot Spot
Phase II Study Area - Rodanthe Breach
Emergency Ferry Dock
RODANTHE
0 1 2 KM
0 1 2 Miles

Section 404/NEPA Merger Project Team Agreement
Concurrence Point No. 2: Alternatives to be Studied in Detail and Concurrence Point 2A: Bridging Decisions and Alignment

Project No./TIP No./Name/Description:

Federal Project Number: BRS-2358(15)
WBS No. 32635
TIP Project Number: **B-2500**
Description: **Replacement of the Herbert C. Bonner Bridge (Bridge No. 11) over Oregon Inlet in Dare County (Phase II of the Parallel Bridge Corridor with NC 12 Transportation Management Plan)**

The Project's Merger Team has concurred on this date of December 15, 2011 that the following alternatives will be studied in detail for Phase II of the subject project:

Pea Island:

- Bridge within Existing NC 12 Easement

Rodanthe

- Bridge on New Location
- Bridge within Existing NC 12 Easement

USACE _____ NCDOT_____

USEPA_____ USFWS_____

NCDWQ_____ NCWRC _____

SHPO_____ FHWA_____

NMFS_____ NCDMF_____

NPS_____ NCDCM_____

USFWS-PINWR_____

DRAFT

PARSONS BRINCKERHOFF

Memorandum

To: March 21, 2012 Bonner Bridge Merger Team Meeting Attendees

From: Bobby Norburn, Parsons Brinckerhoff

Date: July 25, 2012

Subject: Meeting Minutes – March 21, 2012 NEPA/Section 404 Merger Team Meeting for Phase II of the Bonner Bridge – NC 12 Transportation Management Plan (TIP No. B-2500)

Attendees:

Gary Jordan	USFWS – Raleigh Field Office
Pete Benjamin	USFWS – Raleigh Field Office
Dennis Stewart	USFWS – Pea Island National Wildlife Refuge
Bill Biddlecome	US Army Corps of Engineers
Chris Militscher	US Environmental Protection Agency
Ron Sechler	National Marine Fisheries Service
Pace Wilber	National Marine Fisheries Service *(by phone)*
Mike Murray	National Park Service
Ron Lucas	FHWA – NC Division
Cathy Brittingham	NCDENR – DCM
Doug Huggett	NCDENR – DCM
Stephen Lane	NCDENR – DCM
Paul Williams	NCDENR – DCM
Kevin Hart	NCDENR – DMF
David Wainwright	NCDENR – DWQ
Brian Wrenn	NCDENR – DWQ *(by phone)*
Amy Simes	NCDENR
Travis Wilson	NC Wildlife Resources Commission
Renee Gledhill-Earley	NCDCR – SHPO
Jim Trogdon	NCDOT – Chief Operating Officer
Victor Barbour	NCDOT – Technical Services
Greg Thorpe	NCDOT – PDEA
Beth Smyre	NCDOT – PDEA
Brian Yamamoto	NCDOT – PDEA
Rob Hanson	NCDOT – PDEA
Karen Capps	NCDOT – PDEA
Brittney Kelly	NCDOT – PDEA
Drew Joyner	NCDOT – Human Environment Section
Phil Harris	NCDOT – Natural Environment Section
Chris Rivenbark	NCDOT – Natural Environment Section
Michael Turchy	NCDOT – Natural Environment Section
Elizabeth Lusk	NCDOT – Natural Environment Section
Mark Laugisch	NCDOT – Roadside Environmental Unit
Kerry Morrow	NCDOT – Transportation Planning Branch
Greg Perfetti	NCDOT – Structures Management Unit
Lonnie Brooks	NCDOT – Structures Management Unit

Kevin Fischer	NCDOT – Structures Management Unit
Michael Valiquette	NCDOT – Geotechnical Engineering Unit
Chris Kreider	NCDOT – Geotechnical Engineering Unit
Jerry Lindsey	NCDOT – Hydraulics Unit
Marshall Clawson	NCDOT – Hydraulics Unit
Glenn Mumford	NCDOT – Roadway Design
Gary Lovering	NCDOT – Roadway Design
Jerry Jennings	NCDOT – Division 1
Pablo Hernandez	NCDOT – Division 1
Bob Capehart	NCDOT – Division 1
Clay Willis	NCDOT – Division 1
Dara Demi	NCDOT – Communications Office
David Hering	NCDOT – Transportation Program Management Unit
John Page	Parsons Brinckerhoff
Bobby Norburn	Parsons Brinckerhoff

Purpose of Meeting

The purpose of the March 21, 2012, Merger Team Meeting (Meeting) was to attempt to reach consensus on several Concurrence Points (CP) for the two Phase II study areas, as follows: 1) Pea Island inlet – CP 2/2A, CP 3, and CP 4A; and 2) Rodanthe breach – CP 2/2A. The Meeting packet, sent to Merger Team members on March 12, 2012, provided further detail on the CPs that NCDOT hoped to address. Based on discussions at the December 15, 2011, Merger Meeting, the Merger Team tentatively agreed to carry forward the following alternatives for detailed study:

- Pea Island inlet:
  1. Bridge within Existing NC 12 Easement

- Rodanthe breach:
  1. Bridge on New Location
  2. Bridge within Existing NC 12 Easement

Figure 2 in the Meeting packet shows the Phase II proposed detailed study alternatives. In addition, the attached NCDOT meeting presentation includes slides that show the alignments of these alternatives.

NCDOT also discussed the agreement at the December 15 meeting to look at the merits of a Seven-Mile Bridge, as suggested by USFWS, that would address both parts of the Phase II study area. The Meeting packet and the attached slides both include graphics showing the proposed alignment for the Seven-Mile Bridge. It was also noted that the Meeting packet summarized comments received from several agencies after the December 15 meeting regarding the tentative CP 2/2A agreement.

Decisions and Action Items

1. Summary of agency positions on NCDOT's CP 2/2A and CP 3 recommendations (the Bridge within Existing NC 12 Easement) for the Pea Island inlet study area:

- USFWS-Refuge – Abstain
- NPS – Abstain
- NCDENR-DWQ – Concur
- FHWA – Does not Concur
- USFWS – Abstain
- NCDENR-DCM – Concur
- USACE – Does not Concur
- NMFS – No Decision Yet
- NCDENR-DMF – Abstain
- NCWRC – Abstain
- USEPA – Abstain
- NCDCR-SHPO – Concur

2. Summary of agency positions on NCDOT's CP 2/2A recommendations (the Bridge within Existing NC 12 Easement and the Bridge on New Location) for the Rodanthe breach study area:

- USFWS-Refuge – Abstain
- NPS – Abstain
- NCDENR-DWQ – Concur
- FHWA – Does not Concur
- USFWS – Abstain
- NCDENR-DCM – Concur
- USACE – Does not Concur
- NMFS – No Decision Yet
- NCDENR-DMF – Abstain
- NCWRC – Abstain
- USEPA – Abstain
- NCDCR-SHPO – Concur

3. The agencies that abstained from making a decision or did not concur on the CPs for the Phase II study areas were instructed to send to NCDOT a brief documenting the reasons for its abstention or non-concurrence per Merger Process procedures (i.e., within five days).

4. The next eastern Merger Meeting was scheduled for April 10, and NCDOT expressed hope that the Team could make final decisions on CPs on that date so that the projects can proceed. Agencies requiring additional information so as to reach a decision on the CPs were asked to contact NCDOT so that any additional materials could be timely provided. NCDOT agreed to meet individually with any agency that abstained to so as to address that agency's questions and concerns before the next meeting.

Meeting Highlights

Discussion of Seven-Mile Bridge Alternative

NCDOT presented a conceptual alignment for the "Seven-Mile Bridge" Alternative, which was first discussed with the Merger Team on December 15. This alternative was originally suggested to NCDOT by USFWS-Refuge at the October 2011 coastal experts panel meeting. USFWS-Refuge had suggested this alternative when NCDOT was applying for permits for the temporary bridge and had asked a NCDOT representative what it was considering as a long-term solution. The NCDOT representative responded that NCDOT was considering putting a bridge in the sound. This response led USFWS-Refuge to conceive and inquire at the panel meeting about a possible "Seven-Mile Bridge" Alternative. The Seven-Mile Bridge would bypass both Phase II sites to the west by relocating NC 12 onto a bridge in Pamlico Sound. At a field visit attended by staff from USFWS, USACE, and NCDOT in January 2012, USFWS provided NCDOT with a suggested alignment for this alternative. Based on this information, NCDOT developed a horizontal design for the alternative (see attached slide). However, NCDOT's alignment varied slightly from USFWS' suggestion as a result of design speed/horizontal curve requirements. The Seven-Mile Bridge would end in Rodanthe at the same location as the Rodanthe – Bridge on new Location Alternative. The Merger Team had no questions about the design of the alternative.

One benefit of this alternative would be that although approximately 6.7 acres of new easement would be needed from the Refuge, approximately 70.7 acres of existing NC 12 easement could be returned to the Refuge.

NCDOT discussed its concerns and those of FHWA with the Seven-Mile Bridge Alternative (these concerns were summarized in the Meeting packet). These concerns led to NCDOT's recommendation that the Seven-Mile Bridge Alternative not be carried forward as a detailed study alternative. These concerns are:

- Construction cost and non-affordability. The high construction cost (between approximately $289 and $440 million) would have such a substantial impact on NCDOT's current financial commitments and financial program, that it was judged not affordable. NCDOT said it recognizes that the costs of the individual alternatives at Pea Island and Rodanthe added together equal at least 2/3 of the cost of the Seven-Mile Bridge, but the construction of those individual alternatives could be phased while construction of the Seven-Mile Bridge could not be phased. This is similar to the reasons in favor of the Parallel Bridge Corridor with Phased Approach Alternative versus the Pamlico Sound Bridge Corridor.

- Impacts to the dike around the southern-most Refuge pond. This is a feature of the Refuge's National Register-eligible historic landscape. The Revised Final Section 4(f) Evaluation (October 2009) concluded that a bridge in the existing NC 12 easement would have a constructive use of the Refuge as an historic resource. FHWA concluded in relation to the Seven-Mile Bridge Alternative that crossing the dike would be a permanent use of a resource that contributed to the Refuge's National Register-eligibility and thus a greater effect.

- Impacts to submerged aquatic vegetation (SAV) habitat in Pamlico Sound. Pamlico Sound immediately behind Hatteras Island is primarily SAV habitat. The Seven-Mile Bridge Alternative would cross such habitat for most of its length, including in parallel with the portion of NC 12 in the Refuge that is not expected to be threatened by erosion or inlet creation within the project's 60-year time horizon. This section of NC 12 is between the Pea Island inlet and Rodanthe breach areas.

The meeting conversation related to the Seven-Mile Bridge Alternative and NCDOT's recommendations are presented in the paragraphs that follow.

USFWS-Refuge stated that it appreciates that NCDOT conducted further analyses of the Seven-Mile Bridge Alternative because it was an option that USFWS-Refuge felt needed to be considered. NCDOT responded that all alternatives that are suggested as part of the Merger Process have to be seriously considered.

[Note that NCDOT and USFWS previously met on February 9, 2012 to further discuss NCDOT's concerns, as stated above, with the Seven-Mile Bridge Alternative. At the February 9 meeting, NCDOT and USFWS agreed that the Seven Mile Bridge should be dropped from further consideration based on these concerns. USFWS agreed that from its perspective no further information or analysis was needed for this alternative if NCDOT can document that it is not affordable. It was also agreed that NCDOT would prepare a meeting packet for the March 21, 2012 Merger Team meeting containing cost information for the Seven-Mile Bridge, along with documentation as to why it should not be considered for further evaluation for Phase II.]

NCDENR-DMF asked whether the cost of the bridge potentially being in the surf zone was factored into the costs. NCDOT responded that the potential for the bridges to be in the surf zone in the future was considered in the structural assumptions used to generate the costs for the alternatives within the existing NC 12 easement at both Phase II study areas. The Seven-Mile Bridge would not be located in the surf zone.

NCDENR-DWQ questioned how long it would take to build the Seven-Mile Bridge. Based on the estimated construction times of other alternatives, NCDOT estimates that construction could take three to four years.

NCDENR-DCM asked if the cost of maintaining NC 12 was included in the cost calculations for the current alternatives. NCDOT responded that although previous alternatives cost analyses included total project cost estimates through 2060 (i.e., the design year of the project), this type of analysis has not been completed yet for the current alternatives (i.e., only up-front construction and right-of-way costs are included in the current cost estimates).

NPS asked what the panel of coastal experts said about building a bridge that would be in the surf zone in the future – did they think this would be a good long-term option? At the panel meeting, NCDOT heard more concern from the panel about a bridge in the surf zone in the Rodanthe portion of Phase II than the Pea Island portion because erosion rates are so much higher in Rodanthe. Several of the coastal experts also did not think that beach nourishment would be a good idea at Rodanthe because of the high erosion rate.

USACE asked about staging construction of the Seven-Mile Bridge to spread out the cost. NCDOT responded that the Seven-Mile Bridge could not be phased to spread out the cost

because it would not be operational until fully completed. However, the individual projects at both of the two Phase sites could be opened to traffic before the other is completed, so they could be phased (i.e., not built at the same time). This would allow the costs to be spread out over time. In addition, because the Seven-Mile Bridge would not be operational until fully completed, phasing it would require keeping traffic on the temporary bridge for a longer period of time, which would likely require obtaining more permits for efforts to stabilize the temporary bridge. The temporary bridge has been in operation for approximately six months and NCDOT has already completed one additional round of work to stabilize the bridge.

NCDCR-SHPO asked why the concerns about Section 4(f) impacts were greater for the Seven-Mile Bridge than for some of the other alternatives at the Pea Island inlet. NCDOT responded that the Section 4(f) concerns are less for the Bridge within Existing NC 12 Easement than for the other detailed study alternatives at the Pea Island inlet (i.e., the Bridge on New Location and the Road on New Location) and the Seven-Mile Bridge because these alternatives would be outside of the existing NC 12 easement. FHWA added that it had voiced concerns about the Section 4(f) impacts of all of the alternatives under consideration at the Pea Island inlet because they all impact the Refuge, but the impacts of the alternatives outside of the existing easement, including the Seven-Mile Bridge on the dike that was built by the Civilian Conservation Corps around the southern-most Refuge pond, posed a greater Section 4(f) concern since the dikes are a contributing element to the historic landscape. The alternatives outside of the existing NC 12 easement, including the Seven-Mile Bridge, would cross over the dike, and could also touch it, whereas the Bridge within Existing NC 12 Easement would not impact the dike. The Bridge within Existing NC 12 Easement would have a constructive use of the Refuge, but not a physical use of the Refuge as with the Seven-Mile Bridge.

USEPA asked whether the current study is a tiered study with respect to the original Bonner Bridge Replacement project. USEPA thinks it is a tiered study, but FHWA and NCDOT responded that it is not. A tiered EIS includes as its first tier a general impact assessment of alternatives associated with a larger multiple project program. The second tier documents are a detailed assessment of alternatives to implement individual projects within the preferred larger program. NCDOT said that the 2010 Record of Decision (ROD) was a detailed impact assessment for the entire Bonner Bridge Replacement Project (Rodanthe to Bodie Island) and that the Pea Island and Rodanthe locations are the second phase of the project. NCDOT's current plan for each Phase II site is to perform an environmental review, similar to a Re-Evaluation but it could end up being another EA or EIS depending on the level of impact at each of the two Phase II sites, and then prepare a new ROD for each site. FHWA added that the updated conditions (i.e., as a result of Hurricane Irene) in the two Phase II study areas need to be studied to determine if there are any new significant issues or impacts that would require the preparation of a new EIS to document these changes and take them into consideration when issuing new RODs.

NPS asked whether there would be any agency comments as part of the Re-Evaluations. NCDOT responded that much of the information that would be in any initial document is already included in the Merger packets done to date, noting the opportunity that the Merger process provides to agencies to comment. NPS said that the previous FEIS/ROD were completed with an assumption of future unknown conditions. Now that there are changed settings as a result of the Hurricane Irene breaches, NPS is surprised that NCDOT/FHWA are not planning to do an Environmental Assessment since that is what NPS would do, but NPS

also understands that different agencies have different approaches to complying with NEPA requirements.

USEPA said that there is no regulatory requirement for public and agency review of Re-Evaluations and new RODs, so NCDOT should just send USEPA copies of the final documents to let it know what is decided if a new EA is not prepared. USEPA asked why the Merger Team was involved in Phase II because agencies have no legal mandate to comment on a Re-Evaluation and new ROD. There only is a mandate for EAs and Environmental Impact Statements. NCDOT responded that the NC 12 Transportation Management Plan Alternative (NC 12 TMP) includes a process for developing and making decisions on future phases of the project. This process includes commitments to a monitoring program (which has started), a Refuge vulnerability study, a review of future project area conditions (which is currently underway), using the Merger Process to make decisions (which is what is being done now), and consulting with the public (which was done in December and January). The reason that we are here today is that NCDOT is following the process that was established as part of the NC 12 TMP, no matter what kind of NEPA document is ultimately needed for Phase II.

NCDOT summarized the updated impact assessment for the two Phase II study areas contained in the Merger Meeting packet. The impacts were updated based on changes in existing conditions in the study area, as well as revisions to the alignments of some of the alternatives. For example, the design of the Bridge on New Location in Rodanthe has been revised since the FEIS/EA, and the updated impact assessment is based on the revised design. NCDOT also discussed the updated wetland delineations and construction cost estimates that are currently being prepared.

Discussion of CP 2/2A and CP 3 for Pea Island Inlet Study Area

NCDOT presented its CP 2/2A recommendation in the Pea Island inlet area – the Bridge within Existing NC 12 Easement. Since only one detailed study alternative is recommended, NCDOT said that CP 3 concurrence on the Bridge within Existing NC 12 Easement also was appropriate at this time. The recommended alternative was described, including that the proposed bridge's southern terminus was located to account for the FEIS' predicted 2060 high erosion shoreline, as well as the possible southward migration of the inlet. The alternatives not recommended for detailed study also were noted.

NCDCR-SHPO asked why the alternative extends so far north. NCDOT responded that the alternative bridges the inlet and then needs to gradually come down to grade. NCDENR-DCM asked about the end point and future shoreline erosion. NCDOT responded that the bridge could be extended in future phases, depending upon the extent of shoreline erosion or other coastal conditions. USFWS-Raleigh asked about the height of the bridge with the recommended detailed study alternative, and NCDCR-SHPO asked about the navigation height under the bridge. NCDOT responded that based on a re-evaluation of possible storm conditions, the bridge would have 17 feet of clearance rather than the 25 feet assumed in the FEIS. NCDENR-DCM added that the navigation rights at the Pea Island inlet are not traditional or established, so it is a different situation than for typical inlet navigation rights issues and no special navigation needs are present here.

NCDENR-DCM emphasized it is concerned about the Bridge within Existing NC 12 Easement at the Pea Island inlet being located in the surf zone in the future. NCDOT should not take this as meaning that NCDENR-DCM will not issue a permit for the alternative, but there is still a

concern. The concern is not from a NEPA standpoint, but rather for regulatory issues related to a hardened structure being located in the surf zone. NCDOT responded that the recommended alternative at the Pea Island inlet is one phase of the Phased Approach, which was studied in prior NEPA documents, so it believes that it has already thoroughly assessed the recommended alternative; however, post-Irene conditions in the study area also are being re-assessed as part of Phase II. NCDENR-DCM reiterated that it is concerned with bridges in the surf zone in general, but agreed that there may not be a better long-term option at the Pea Island inlet.

USEPA asked about the condition of the temporary bridge on NC 12 over the inlet. NCDOT-Division 1 discussed the existing conditions at the inlet, that an additional stabilization project had been done, and the bridge was functioning fine. USEPA asked about the expected lifespan of the temporary bridge. NCDOT responded that the temporary bridge's lifespan is expected to be about three to five years, after which significant repair or replacement will likely be needed. It is not intended as a 50-year solution.

Summary of Agency Responses to NCDOT's CP 2/2A and CP 3 Recommendations for Pea Island Inlet Study Area

NCDOT asked each agency to provide its position on NCDOT's CP 2/2A and CP 3 recommendations (the Bridge within Existing NC 12 Easement) for the Pea Island inlet study area:

- USFWS-Refuge (Abstain) – USFWS-Refuge abstained because it does not believe that it has enough information to make a decision yet. In particular, more information is needed about the administrative process for Phase II (i.e., what NEPA documentation will be prepared for Phase II at both study areas). However, USFWS-Refuge has said consistently throughout the years that it does not have a problem with anything that NCDOT does within the existing NC 12 easement as long as it does not jeopardize the purpose of the Refuge.
- NPS (Abstain) – NPS abstained because it does not have any direct regulatory or land ownership responsibility on this issue, and also because it is not yet comfortable with the Phase II study process. For example, NPS thought that more information is needed about the additional environmental studies that will be performed for Phase II. NCDOT noted that although it would be providing some additional detail, as well as responding to public and agency comments, the Meeting packet contains much of the Phase II impact analysis at the Pea Island inlet. NCDOT asked NPS if there was a particular concern about the information in the Meeting packet. NPS responded that it wanted more time to look at the information in the packet.
- NCDENR-DWQ (Concur) – NCDENR-DWQ asked about the wetland impacts with the recommended LEDPA for the Pea Island inlet area. NCDOT responded that the wetland impacts would be approximately 0.1 acre based upon pre-storm wetland delineations. NCDENR-DWQ said that because the wetland impact will be minimal and the inlet is being bridged (i.e., to address potential "stream" impacts), it concurs with NCDOT's recommendations for CP 2 and CP 3. However, NCDENR-DWQ does not want it said that

it thought that this was the best option, but rather it wants NCDOT to bear the responsibility of this bridge when it is in the breakers with waves crashing over it.

- FHWA (Does Not Concur) – FHWA could not concur today because an updated alternatives cost analysis has not been completed to address the questions in USACE's letter (included in the packet). NCDOT asked when the updated cost analysis would be completed. FHWA responded that it should be completed soon. FHWA added that the updated cost analysis would be included in the NEPA documentation for Phase II as part of the Section 4(f) re-analysis of avoidance alternatives. NCDENR-DCM asked if the Seven-Mile Bridge was included in this cost analysis. FHWA responded that it was not included, but that discussion is ongoing. FHWA noted that they are aware that bridge costs may have possibly decreased since the last set of cost estimates was completed.
- USFWS (Abstain) – USFWS abstained for the same reasons given by USFWS-Refuge.
- NCDENR-DCM (Concur) – There is an exemption in NCDENR-DCM's beach front development standards that allows the construction of the Bridge within Existing NC 12 Easement at the Pea Island inlet as long as all other environmental concerns are also addressed. NCDENR-DCM also reiterated that it has concerns with this alternative being on the beach and in the ocean because this is a prime management concern of the CAMA, but it believes that there are no better options at the Pea Island inlet.
- USACE (Does Not Concur) – USACE received a draft response letter to its questions related to updating the alternatives cost analysis, but it wants the final response letter before concurring on CP 2 and CP 3. NCDOT noted that it is waiting on FHWA's analysis to finish the updated cost analysis and response letter. USACE has some concerns based on an initial reading of the draft response letter, but it has not yet discussed these concerns internally with upper management. USACE will prepare a formal response once it receives NCDOT's response letter and have time to consider the information presented in the letter.
- NMFS (No Decision Yet) – NMFS will defer questions about the specifics of the NEPA process for the Phase II studies to the other Merger Team members that have already raised questions about the process at today's meeting. NMFS was not prepared to cast a vote today because it wanted to have further internal discussions about this decision, but it is leaning towards concurring with NCDOT's recommendations on CP 2 and CP 3. NCDOT's recommended alternative does not seem to be a smart alternative, but it is probably acceptable within the confines of NMFS' regulations. NCDOT asked if there were any remaining concerns it could address. NMFS responded that it was interested in the scope of the Essential Fish Habitat study.
- NCDENR-DMF (Abstain) – NCDENR-DMF abstained, but it has concerns about the bridge being located in critical fish habitat in the future as the shoreline continues to erode.
- NCWRC (Abstain) – NCWRC abstained on CP 2 and CP 3 because it does not believe that the decision falls within its purview.
- USEPA (Abstain) – USEPA is concerned that it is being taken out of the decision-making process based on the process that is being followed for the Phase II studies. USEPA believed that its concurrence is not needed based on the process that is currently being followed for Phase II (i.e., preparation of new RODs based on a re-evaluation, for which

there is no regulations requiring agency comment, instead of preparation of new RODs based on a revised EA or EIS, for which regulations require agencies be given the opportunity to comment). USEPA will prepare a letter to document the reasons for its abstention.

- NCDCR-SHPO (Concur) – NCDCR-SHPO concurred with NCDOT's CP 2 and CP 3 recommendations.

The final result was that six agencies abstained, two did not concur, three concurred (in addition to NCDOT), and one agency (NMFS) was not prepared to make a decision yet.

NCDOT said that because there are so many abstentions at this point, and because a few agencies have further work to do and need more information from NCDOT before making a decision, the project will not be elevated at this point. However, the next eastern Merger Meeting is on April 10 and NCDOT would like the Team to be able to make a final decision on concurrence at that time so that the project can proceed. If another date on the calendar works better for some agencies, the agency should let NCDOT know so that it can try to reschedule the meeting. NCDOT also reminded the agencies that abstained that it should send NCDOT a brief documenting the reasons for its abstention per Merger Process procedures (i.e., within five days). Any agency that needs additional information from NCDOT before being able to make its decision should let NCDOT know as soon as possible what information it needs. If necessary, NCDOT will meet individually with any agency that abstained to address its concerns before the next meeting.

NCDENR-DCM said that NCDOT should check with each agency representative for potential conflicts before scheduling the next Merger Team meeting. NCDOT responded that it would do that to the extent possible, but that it has to move ahead on the Pea Island inlet site, and that is the reason for going through the process of setting up the master Merger Team meeting calendar.

USACE asked if the agencies that abstained or concurred today needed to attend the next meeting. NCDOT responded that all of the Merger Team agencies need to attend the next meeting because once the decision on CP 2 and CP 3 is finalized, the Merger Team needs to proceed directly into discussions of CP 4A for the Pea Island inlet because of the issues discussed earlier in today's meeting related to the temporary bridge at this site.

USEPA asked for a copy of NCDOT's final response letter to USACE related to the issue of updating the alternatives cost analysis.

Discussion on CP 4A for Pea Island Inlet Study Area

NCDOT asked if there were any questions or comments on the CP 4A discussion in the handout for the Pea Island inlet study area. There were no comments. Concurrence was not requested because it had not yet been achieved for CP 2/2A and CP 3.

Discussion of CP 2/2A for the Rodanthe Breach Study Area

NCDOT presented slides showing the alignments of the two proposed Phase II detailed study alternatives at Rodanthe – Bridge on New Location and Bridge within Existing NC 12 Easement. NCDOT also discussed the changes made to the Bridge on New Location

Alternative since the FEIS/EA. These changes included revising the location and design of the northern terminus of the bridge within the Refuge to minimize the amount of new easement needed in the Refuge, as well as to minimize impacts to the adjacent wetlands mitigation site. With these revisions to the design, only 2.8 acres of new easement would be needed in the Refuge, whereas 17.7 acres of existing NC 12 easement would be returned.

NCDCR-SHPO asked about the status of the post-Hurricane Irene re-analysis of the boundaries of the Rodanthe Historic District that had been discussed at the previous Merger Team meeting. NCDOT responded that the re-analysis had been completed and resulted in no changes to the boundaries of the District.

NCDENR-DCM asked if the bridge components of NCDOT's recommended detailed study alternatives at Rodanthe could be extended to the south in the future so that the southern end of the bridges would be beyond the predicted 2060 shoreline (i.e., since these alternatives were shortened in the 2010 EA to avoid impacts to the Rodanthe Historic District). NCDOT responded that the southern end of the 2010 EA design of the Bridge within Existing NC 12 Easement included a stubbed full height bridge for possible future extension, and that it would also be possible to extend the Bridge on New Location to the south in the future.

USEPA asked about the updated business relocations discussed in the Merger Meeting packet. Parsons Brinckerhoff responded that the updated business relocations are based on the outcome of a January 2012 field survey of existing community conditions in Rodanthe, including current business locations. The primary change was that a multi-business building taken by the Bridge on New Location had been reconfigured into space for fewer businesses.

USEPA asked what is being proposed for the LEDPA for the Rodanthe portion of the project. NCDOT responded that it depends, in part, on the comments received at today's meeting. NCDOT is trying to move forward as quickly as possible on the Pea Island portion, but very soon after that, probably in a few months, NCDOT wants to come back for a LEDPA meeting on the Rodanthe portion (probably a 3/4A Merger Meeting).

NCDOT presented its CP 2/2A recommendation at the Rodanthe breach study area – the Bridge within Existing NC 12 Easement and the Bridge on New Location.

Summary of Agency Responses to NCDOT's CP 2/2A Recommendation for Rodanthe Breach Study Area

NCDOT asked each agency to provide its position on NCDOT's CP 2/2A recommendation for the Rodanthe breach study area:

- USFWS – Refuge (Abstain) – USFWS-Refuge abstained for the same reasons given for the Pea Island inlet area. With respect to the Bridge within Existing NC 12 Easement, USFWS-Refuge still has some concerns about temporary construction easements, staging areas, the timing of construction, and other similar issues. With respect to the Bridge on New Location, USFWS-Refuge is concerned that with NCDOT's proposed alignment, the departure from the Refuge may be more than a minor modification. USFWS-Refuge would have to have the design files of the alignment presented so it can overlay that alignment on top of previous alignments proposed by USFWS-Refuge and NCDOT, and then it will

make a determination of whether it will consider to be a minor modification the Bridge on New Location as presented at the Merger Meeting.

- NPS (Abstain) – NPS thought that the two recommended alternatives were acceptable, but asked what the NEPA re-evaluation would look like.
- NCDENR-DWQ (Concur) – NCDENR-DWQ concurred with NCDOT's CP 2/2A recommendation.
- FHWA (Does Not Concur) – FHWA could not concur today for the same reasons given previously for the Pea Island inlet study area.
- USFWS (Abstain) – USFWS agreed with the position of USFWS-Refuge.
- NCDENR-DCM (Concur) – NCDENR-DCM concurred with NCDOT's CP 2/2A recommendation, but with caveats. NCDENR-DCM could have a problem with the Bridge within Existing NC 12 Easement because in the future it would be in the ocean. Since there is not an existing bridge at the Rodanthe breach, the bridge in the existing easement alternative may violate NCDENR-DCM regulations once it is in ocean. NCDENR-DCM management is having internal discussions about the legality of the bridge in the existing easement at the Rodanthe breach. It is also concerned that the bridge in the existing easement at Rodanthe will be even further in the ocean in the future than at the Pea Island inlet because of the higher erosion rate at the Rodanthe breach.
- USACE (Does Not Concur) – USACE could not concur today for the same reasons given for the Pea Island inlet decisions.
- NMFS (No Decision Yet) – NMFS was not prepared to make a decision today because it wanted to have further internal discussions about NCDOT's CP 2/2A recommendation.
- NCDENR-DMF (Abstain) – NCDENR-DMF abstained and will provide more comments in an e-mail or a letter.
- NCWRC (Abstain) – NCWRC abstained for the same reasons given for the Pea Island inlet area.
- USEPA (Abstain) – USEPA abstained for the same reasons given for the Pea Island inlet area.
- NCDCR-SHPO (Concur) – NCDCR-SHPO concurred with NCDOT's CP 2/2A recommendation.

USEPA asked about the regulatory basis for including "Panoramic views of Pamlico Sound from homes along shoreline in Rodanthe would be affected" as a visual impact for the Bridge on New Location in Table 1 of the Merger Meeting packet. NCDOT responded that this is a community impact, not a Section 4(f) impact. USEPA asked why this type of impact was not discussed on other projects with interchanges that it has been involved with, and added that it seems that sometimes the impacts being reported in the tables are not comparing "apples to apples." USEPA thinks that only regulatory driven impacts should be included in the impact tables in Merger Meeting packets, and also that it appears that NCDOT is picking and choosing on certain projects as to what is reported as an impact. NCDCR-SHPO pointed out how the table is organized with Community and Visual Impacts separate from Cultural Resource Impacts. NCDOT responded that it is also trying to address public concerns by including this type of impact, but that it could not cite the regulatory basis for showing this impact. NCDOT asked if this would affect USEPA's decision. USEPA responded that it would

not. NCDOT added that it is trying to show the full range of impacts to the Merger Team by including this type of information.

NCDOT asked each agency that abstained from making a decision or did not concur on NCDOT's CP 2/2A recommendations for the Rodanthe breach area to provide a letter within five business days documenting the reasons for its abstention or non-concurrence. USFWS-Raleigh asked about the standard format for these letters. NCDOT responded that the agencies should use the same format that has been used in the past, and that it will resend that format to each agency for its use.

NCDOT discussed the Phase II project schedule and next steps. NPS asked for a definition of "complete NEPA documentation," which was shown on the "Schedule/Next Steps" slide. NCDOT responded that NCDOT would complete the environmental review in whatever format was needed, and also noted that if there was an additional public comment period, the schedule shown in the slide would change. Following the NEPA document, NCDOT/FHWA would submit a new ROD.

USFWS-Raleigh asked NCDOT about a previous Phase II conversation related to bridge rails. NCDOT responded that it knows that further Section 7 coordination is needed. USFWS-Raleigh and NCDOT agreed that this coordination would need to be done within the next month.

NCDENR-DCM asked if the Phase II projects would be built by a design-build contractor. NCDOT responded that a design-build contractor would be used for the Rodanthe project, but not for the Pea Island project.

NCDCR-SHPO said that all of the agencies that want to be involved in the discussion on bridge rails should participate in a joint meeting on the issue (i.e., rather than NCDOT meeting separately with individual agencies). NCDOT responded that it and FHWA would convene a joint meeting with the relevant agencies. It was noted that FHWA is taking the lead on this issue.

The meeting was adjourned at 5:00 PM.

Copies of all Abstention and Non-Concurrence Issue Briefs that were received following the meeting are attached. To date, no Issue Brief has been received from NMFS.

file no.: 3301-2.7.2

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Attachments

March 21, 2012 3:00 pm – 5:00 pm

BONNER BRIDGE – NC 12 TRANSPORTATION MANAGEMENT PLAN – PHASE II MERGER TEAM MEETING

Phase II

Meeting Purposes

To reach consensus on the following Concurrence Points (CP):

- Pea Island – CP 2/2A (finalize the list of alternatives for Phase II, including additional bridging decisions), CP 3 (LEDPA), CP 4A (avoidance and minimization)
- Rodanthe – CP 2/2A (finalize the list of alternatives for Phase II, including additional bridging decisions)

December 15th CP 2/2A Merger Meeting

Summary

- Discussed Phase II Alternatives
  - Pea Island:
    - Beach Nourishment
    - Bridge on New Location
    - Road on New Location
    - Bridge within Existing NC 12 Easement
  - Rodanthe:
    - Beach Nourishment
    - Bridge on New Location
    - Bridge within Existing NC 12 Easement
    - Bridge within Existing NC 12 Easement and Beach Nourishment
- Introduced potential new alternative (7-mile bridge)

→ Bridge within Existing NC 12 Easement

→ Bridge on New Location; Bridge within Existing NC 12 Easement

Seven-Mile Bridge Alternative

- Covers both Phase II sites
- Reduces the amount of NC 12 easement within the Refuge
- Concerns include amount of new easement required, cost, and impacts to Pamlico Sound

Seven-Mile Bridge Alternative

Phase II Alternatives Eliminated from Further Study – Seven Mile Bridge

Impact Assessment

- Updated since December meeting
  - Results of January field visit
  - Rodanthe – Bridge on New Location design
- Construction costs for each Phase II option developed
- Updated wetland delineations underway for Phase II sites

Concurrence Recommendations
Pea Island

- Recommended for evaluation (CP 2/2A):
  - Bridge within Existing NC 12 Easement
- Recommended for elimination:
  - Beach Nourishment
  - Road on New Location
  - Bridge on New Location
  - Seven-Mile Bridge

Pea Island: Bridge Within Existing NC 12 Easement

Phase II Proposed Detailed Study Alternatives – Bridge within Existing NC 12 Easement - Pea Island Inlet

Concurrence Recommendations
Pea Island

- Recommended for LEDPA (CP 3):
  - Bridge within Existing NC 12 Easement
- Avoidance and Minimization (CP 4A):
  - Wetlands, EFH bridged
  - Adhere to all Section 7 commitments
  - Minimize impacts due to jetting
  - Consistent with Phase I CP 4A
  - Temporary construction easements

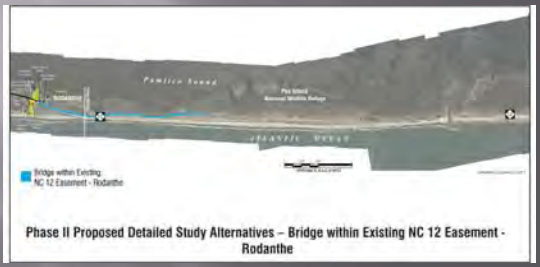
Revisions to Rodanthe: Bridge on New Location Alternative

- Revised northern terminus design/location
- Minimizes the amount of new easement and impacts to mitigation site
- Reduces amount of new NC 12 easement (2.8 acres) and returns 17.7 acres of existing easement

Rodanthe: Bridge on New Location

Phase II Proposed Detailed Study Alternatives – Bridge on New Location - Rodanthe

Rodanthe: Bridge Within Existing NC 12 Easement



Phase II Proposed Detailed Study Alternatives – Bridge within Existing NC 12 Easement - Rodanthe

Concurrence Recommendations Rodanthe

- Recommended for evaluation (CP 2/2A):
  - Bridge on New Location
  - Bridge within Existing NC 12 Easement
- Recommended for elimination:
  - Beach Nourishment
  - Bridge within Existing NC 12 Easement and Beach Nourishment
  - Seven-Mile Bridge

Schedule/ Next Steps

- Pea Island:
  - Complete NEPA documentation (April 2012)
  - Submit permit applications (May 2012)
  - Award construction contract (November 2012)
- Rodanthe:
  - Hold CP 3/4A meeting
  - Complete NEPA documentation
  - Submit permit applications
  - Award design-build construction contract

Phase II Alternatives Eliminated from Further Study

Phase II Proposed Alternatives for Evaluation

FHWA Merger Non-Concurrence Brief
March 29, 2012

To: Beth Smyre,
NCDOT – PDEA

Project Name and brief description: Bonner Bridge Replacement Project - Phase II

Last Concurrence Point: N/A for Phase II

Date of Last Concurrence: N/A for Phase II

Date of Concurrence meeting: March 21, 2012

Explain what is being proposed and your position including what you object to.

The Phase II concurrence points that FHWA object to are listed below:

Pea Island Site

Concurrence Point 2 - Alternative to be studied in detail (Bridge within easement)
Concurrence Point 2a - Bridging decisions
Concurrence Point 3 - Least Environmental Damaging Practicable Alternative (LEDPA)
Concurrence Point 4a - Minimization

Rodanthe Site

Concurrence Point 2 - Alternatives to be studied in detail (Bridge on existing easement and Bridge on New Location)
Concurrence Point 2a - Bridging decisions

Explain the reasons for your potential non-concurrence. Please include any data or information that would substantiate and support your position.

Updated cost estimates for the Pamlico Sound Bridge Alternative were not completed prior to the merger meeting as previously agreed in response to a request made by the U. S. Army Corps of Engineers (USACE).

List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation. Please attach a copy of the relevant portion of the law or regulation or provide an email address where the documents may be located.

National Environmental Policy Act (NEPA) regulations as outlined in 23 CFR 771

What alternative course of action do you recommend?

Update the cost estimates prior to seeking further concurrence.

Merger 01 Process
Issue Briefing Format

Prepared by the U.S. Army Corps of Engineers, 3/26/2012

1. Project Name and brief description: **Bonner Bridge – NC 12 Transportation Management Plan – Phase II (Pea Island and Rodanthe), Dare County; TIP No. B-2500**

2. Last Concurrence Point (*signed*): **Phase II – none; CP 1 for B-2500 signed 7-31-02**

3. Explain what is being proposed and your position including what you object to. **CP2/2A, and 3 for the Pea Island portion of Phase II of the above project. This alternative involves bridging within the existing NC Highway 12 easement.**

   CP 2/2A for the Rodanthe portion of Phase II of the above project. This is two alternatives involving bridging on new location or bridging within the existing NC Highway 12 easement.

   The Corps of Engineers is not ready to concur with the above concurrence points until NCDOT provides information requested by the Corps in a letter dated January 5, 2012. The Corps will make a final determination on the above concurrence points once an official response is received from NCDOT.

4. Explain the reasons for your potential non-concurrence. Please include any data or information that would substantiate and support your position.

   The Corps of Engineers has not received an official response to its January 5, 2012 from the NCDOT. The Corps is asking for additional information pertaining to funding, updated cost estimates, and timelines for Phase I and II of the project as well as updated costs and timelines to construct the Pamlico Sound Bridge.

5. List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation. Please attach a copy of the relevant portion of the law or regulation or provide an email address where the documents may be located.

   33 CFR 320.4 General Policies or Evaluating Permit Application

   40 CFR Part 230 – Section 404(b)(1) Guidelines Alternatives Requirements - These guidelines provide the Corps with discretion for determining the necessary level of analysis to support a conclusion as to whether or not an alternative is practicable. The guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less impact on the

aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."

6. What alternative course of action do you recommend?

   NCDOT needs to provide the Corps with the requested information so the Corps can make a determination whether or not certain alternatives studied to date are practicable as it relates to the Section 404(b)(1) Guidelines.

NEPA/Section 404 Merger Process
Abstention Brief

March 26, 2012

To: Beth Smyre, P.E., NCDOT Project Manager

THRU: Heinz J. Mueller, Chief, NEPA Program Office

Cc: Merger Project Team

From: Christopher A. Militscher, REM, CHMM, USEPA Merger Representative

1. Project Name and brief description: **Bonner Bridge – NC 12 Transportation Management Plan – Phase II (Pea Island and Rodanthe), Dare County; TIP No. B-2500**

2. Last Concurrence Point (*signed*): **Phase II – none; CP 1 for B-2500 signed 7-31-02**

3. Explain what is being proposed and your position including what you object to. **The NCDOT proposes two bridge alternatives at Rodanthe and one bridge alternative at PINWR breach. NCDOT proposes to utilize the issued ROD and Transportation Management Plan for Phase II alternatives. Based upon the Merger meeting on 3/21/12, no new NEPA documents are being considered for issuance to reviewing and permitting agencies or the public. The anticipated impact to jurisdictional resources from the proposed new bridges is less than 0.2 acres (potentially a Nationwide Permit).**

4. Explain the reasons for your potential non-concurrence. Please include any data or information that would substantiate and support your position. **Without substantial regulatory review responsibilities under either NEPA or Section 404 of the Clean Water Act, EPA has a very limited technical role in Phase II activities. Unless the USACE determines otherwise, and requires an Individual Permit for Phase II, or the FHWA determines that additional NEPA documentation is required beyond the ROD, EPA is abstaining from future Phase II concurrence points.**

5. List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation. Please attach a copy of the relevant portion of the law or regulation or provide an email address where the documents may be located. **Not applicable. See comments above**. **EPA has previously provided technical comments on the DEIS, FEIS and other documents regarding the transportation agencies purpose and need to build additional bridges on this barrier island.**

6. What alternative course of action do you recommend? **For EPA: None. The NCDOT should continue working with the FHWA and USACE (non-concurring) and other Federal agencies on their respective requirements for Phase II.**

Section 404/NEPA Merger 01 Issue Brief

Submitted by: National Park Service (NPS), Cape Hatteras National Seashore
Subject: B-2500, Phase II concurrence points – NPS Abstention
Date: March 28, 2012

1. Project Name and brief description: Bonner Bridge – NC 12 Transportation Management Plan – Phase II (Pea Island and Rodanthe), Dare County; TIP No. B-2500

2. Last Concurrence Point (*signed*): There have been no prior concurrence points for Phase II.

3. Explain what is being proposed and your position including what you object to.

- Pea Island Inlet Area – CP2/2A and 3: NCDOT recommends only one alternative, Bridge within the Existing NC12 Easement Alternative, be carried forward for further evaluation and that it be selected as the Least Environmentally Damaging Practicable Alternative (LEDPA). NPS abstains.
- Rodanthe Breach Area– CP2/2A: NCDOT recommends two alternatives, Bridge on New Location and Bridge within Existing NC 12 Easement, be carried forward for further evaluation. NPS abstains.

4. Explain the reasons for your abstention. Pea Island National Wildlife Refuge (Refuge) is managed by the U.S. Fish and Wildlife Service (FWS). NPS defers to the FWS on matters affecting the Refuge.

5. List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation. Not applicable for abstention.

6. What alternative course of action do you recommend? NPS recommends that NCDOT continue working with the FHWA and USACE (non-concurring) and FWS on their respective requirements for Phase II.

Section 404/NEPA Merger 01 Issue Brief

Submitted by: USFWS, Raleigh Field Office

1. **Project Name and brief description**: B-2500, Bonner Bridge Replacement Project, Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative - Phase II at new Pea Island Inlet

2. **Last Concurrence Point and Date**: There have been no prior concurrence points for Phase II. Concurrence Point 1 was skipped for Phase II.

3. **Explain what is being proposed and your position including what you object to.** NCDOT recommends that the Bridge Within Existing NC 12 Easement Alternative be the only alternative carried forward for Concurrence Point 2/2A at the Pea Island Inlet, and thus recommends that this be selected as the LEDPA for Concurrence Point 3. NCDOT requests concurrence with these recommendations. The USFWS, Raleigh Field Office abstains from these two concurrence points.

4. **Explain the reasons for your abstention.** The USFWS has always preferred a long bridge within the Pamlico Sound. The USFWS has consistently stated our concerns with bridges that will eventually be located in the beach surf zone. Merger Process decision makers have moved forward despite our lack of agreement. Although we are not actively objecting to either of NCDOT's current recommendations, our long-held positions on this project do not allow for us to agree with NCDOT's recommendations. Therefore, we choose to abstain from these specific decision points.

5. **List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation.** We are not aware of any; though the process by which NCDOT intends to document compliance with the National Environmental Policy Act (NEPA) remains unclear to us. Accordingly, the extent to which the USFWS can rely on NCDOT and Federal Highway Administration NEPA documentation to support regulatory determinations we must make also remains unclear.

6. **What alternative course of action do you recommend?** Since we are abstaining from these decision points, we have no recommendations for alternative courses of action beyond those stated over the last ten or so years.

Section 404/NEPA Merger 01 Issue Brief

Submitted by: USFWS, Raleigh Field Office

1. **Project Name and brief description**: B-2500, Bonner Bridge Replacement Project, Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative - Phase II at Rodanthe Breach Area

2. **Last Concurrence Point and Date**: There have been no prior concurrence points for Phase II. Concurrence Point 1 was skipped for Phase II.

3. **Explain what is being proposed and your position including what you object to.** NCDOT recommends that the Bridge on New Location and the Bridge Within Existing NC 12 Easement Alternatives be carried forward for Concurrence Point 2/2A. NCDOT requests concurrence with this recommendation. The USFWS, Raleigh Field Office abstains from this concurrence point.

4. **Explain the reasons for your abstention.** The USFWS has always preferred a long bridge within the Pamlico Sound. The USFWS has consistently stated our concerns with bridges that will eventually be located in the beach surf zone. There are still questions as to whether a bridge on new location could be found compatible under the National Wildlife Refuge System Improvement Act. Merger Process decision makers have moved forward despite our lack of agreement. Although we are not actively objecting to NCDOT's current recommendation, our long-held positions on this project do not allow for us to agree with NCDOT's recommendations. Therefore, we choose to abstain from this specific decision point.

5. **List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation.** For the Bridge on New Location Alternative, the National Wildlife Refuge System Improvement Act of 1997 would be invoked. Also, the process by which NCDOT intends to document compliance with the National Environmental Policy Act (NEPA) remains unclear to us. Accordingly, the extent to which the USFWS can rely on NCDOT and Federal Highway Administration NEPA documentation to support regulatory determinations we must make also remains unclear.

6. **What alternative course of action do you recommend?** Since we are abstaining from this decision point, we do not recommend any alternative courses of action beyond those stated over the last ten or so years.

Section 404/NEPA Merger 01 Issue Brief

Submitted by: USFWS, Pea Island National Wildlife Refuge

1. **Project Name and brief description:** B-2500, Bonner Bridge Replacement Project, Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative - Phase II at new Pea Island Inlet

2. **Last Concurrence Point and Date:** There have been no prior concurrence points for Phase II. Concurrence Point 1 was skipped for Phase II.

3. **Explain what is being proposed and your position including what you object to:** NCDOT recommends that the Bridge Within Existing NC 12 Easement Alternative be the only alternative carried forward for Concurrence Point 2/2A at the Pea Island Inlet, and thus recommends that this be selected as the LEDPA for Concurrence Point 3. NCDOT requests concurrence with these recommendations. The USFWS, Pea Island National Wildlife Refuge abstains from these two concurrence points.

4. **Explain the reasons for your abstention:** The USFWS has always preferred a long bridge within the Pamlico Sound. The USFWS has consistently stated our concerns with bridges that will eventually be located in the beach surf zone. In addition there is insufficient information presented with regards to how the proposed projects would affect Refuge habitat either directly, indirectly, or cumulatively. Merger Process decision makers have moved forward despite our lack of agreement. Although we are not actively objecting to either of NCDOT's current recommendations, our long-held positions on this project do not allow for us to agree with NCDOT's recommendations. Therefore, we choose to abstain from these specific decision points.

5. **List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation:** We are not aware of any; though the process by which NCDOT intends to document compliance with the National Environmental Policy Act (NEPA) remains unclear to us. Accordingly, the extent to which the USFWS can rely on NCDOT and Federal Highway Administration NEPA documentation to support regulatory determinations we must make also remains unclear.

6. **What alternative course of action do you recommend?** Since we are abstaining from these decision points, we have no recommendations for alternative courses of action beyond those stated over the last ten or so years.

Section 404/NEPA Merger 01 Issue Brief

Submitted by: USFWS, Pea Island National Wildlife Refuge

1. **Project Name and brief description:** B-2500, Bonner Bridge Replacement Project, Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative - Phase II at Rodanthe Breach Area

2. **Last Concurrence Point and Date:** There have been no prior concurrence points for Phase II. Concurrence Point 1 was skipped for Phase II.

3. **Explain what is being proposed and your position including what you object to:** NCDOT recommends that the Bridge on New Location and the Bridge Within Existing NC 12 Easement Alternatives be carried forward for Concurrence Point 2/2A. NCDOT requests concurrence with this recommendation. The USFWS, Pea Island National Wildlife Refuge abstains from this concurrence point.

4. **Explain the reasons for your abstention:** The USFWS has always preferred a long bridge within the Pamlico Sound. The USFWS has consistently stated our concerns with bridges that will eventually be located in the beach surf zone. There are still questions as to whether a bridge on new location could be found compatible under the National Wildlife Refuge System Improvement Act. In addition there is insufficient information presented with regards to how the proposed projects would affect Refuge habitat either directly, indirectly, or cumulatively. Merger Process decision makers have moved forward despite our lack of agreement. Although we are not actively objecting to either of NCDOT's current recommendations, our long-held positions on this project do not allow for us to agree with NCDOT's recommendations. Therefore, we choose to abstain from these specific decision points.

5. **List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation:** For the Bridge on New Location Alternative, the National Wildlife Refuge System Improvement Act of 1997 would be invoked. Also, the process by which NCDOT intends to document compliance with the National Environmental Policy Act (NEPA) remains unclear to us. Accordingly, the extent to which the USFWS can rely on NCDOT and Federal Highway Administration NEPA documentation to support regulatory determinations we must make also remains unclear.

6. **What alternative course of action do you recommend?** Since we are abstaining from these decision points, we have no recommendations for alternative courses of action beyond those stated over the last ten or so years.

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Marine Fisheries

Beverly Eaves Perdue
Governor

Dr. Louis B. Daniel III
Director

Dee Freeman
Secretary

TO: Beth Smyre
THROUGH: Anne Deaton AD
FROM: Kevin Hart KH
DATE: March 26, 2012
SUBJECT: B-2500- Bonner Bridge NC12 Merger Abstention

1. **Project Name and brief description: Bonner Bridge – NC 12 Transportation Management Plan – Phase II (Pea Island and Rodanthe), Dare County; TIP No. B-2500**

2. **Last Concurrence Point (*signed*): Phase II – none; CP 1 for B-2500 signed 7-31-02**

3. **Explain what is being proposed and your position including what you object to [abstain from].**

- Pea Island Site- NCDOT has proposed to bridge NC 12 in the existing easement (footprint). The NCDOT has not provided alternative designs for consideration at CP2. At this time the NCDMF has abstained from signing the merger document. The only alternative that has been provided is on USFWS land and is outside of DMF's jurisdiction and will have no direct impacts on DMF's resources.

- Rodanthe site- The NCDOT has proposed either building a bridge in a new location (soundside of the outer banks) or bridge within the existing easement. At this time the NCDMF has abstained from signing the merger document.

4. **Explain the reasons for your potential non-concurrence [abstention]. Please include any data or information that would substantiate and support your position.** The NCDOT alternatives that have been suggested to be carried forward were based on USFWS refuge compatibility and NCDOT and federal funding issues. Commenting based on these two issues, excluding consideration of long-term impacts to surf zone and estuarine resources, is outside of DMF's jurisdiction.

5. **List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation. Please attach a copy of the relevant portion of the law or regulation or provide an email address where the documents may be located.** Not applicable.

6. **What alternative course of action do you recommend?** Although the DMF has no alternative course of action to recommend, we will stay involved in the merger process.

CC: Bill Biddlecombe, USACE
Chris Militscher, USEPA

Ron Sechler, NMFS
Pete Benjamin, USFWS
Mike Bryant, USFWS-PINWR
Travis Wilson, WRC
Brian Wrenn, DWQ
Doug Huggett, DCM
Mike Murray, NPS
Clarence Coleman, FHWA
Renee Gledhill-Earley, SHPO

From "Merger01: Roles and Responsibilities" guidance document:

"If an organization decides to either non-concur or abstain, that organization is responsible for documenting its reasons in writing and providing that documentation to all Project Team Members within 5 business days of the Project Team meeting."

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

MEMORANDUM

TO: Beth Smyre, Project Planning Engineer, NCDOT
NC Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27699-1548

And

Bill Biddlecome, Merger Team Co-Chair, USACE
Washington Regulatory Field Office
P.O. Box 100
Washington, NC 27889-1000

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: March 26, 2012

SUBJECT: B-2500 Phase II abstention

Project Name and brief description: Bonner Bridge – NC 12 Transportation Management Plan – Phase II (Pea Island and Rodanthe), Dare County; TIP No. B-2500

Last Concurrence Point (signed): Phase II – none; CP 1 for B-2500 signed 7-31-02

Explain what is being proposed and your position including what you object to:

- Pea Island - CP2/2A, 3: NCDOT recommends bridging within the existing NC 12 easement to be carried forward as the Least Environmentally Damaging Practicable Alternative. NCWRC will abstain from the subject concurrence points.
- Rodanthe - CP2/2A: NCDOT recommends both bridging on new location and bridging within Existing easement alternatives to be carried forward for further evaluation. NCWRC will abstain from the subject concurrence points.

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

Explain the reasons for your potential non-concurrence. Please include any data or information that would substantiate and support your position: The deciding factors for selection of the recommended alternatives were based primarily on the ability to fund the project and the compatibility of an alternative with the refuge. Both of those criteria are outside the commenting purview of WRC; therefore it is appropriate that we abstain from these decision points and allow the appropriate agencies to move forward with the selection of alternatives.

List any relevant laws or regulations that you believe would be violated or jeopardized if the proposed action were implemented and explain the basis for violation. Please attach a copy of the relevant portion of the law or regulation or provide an email address where the documents may be located: Not applicable for abstention brief.

What alternative course of action do you recommend: By abstaining we do not object to the progression of this project in the Merger 01 Process, and we will continue to participate in the planning process including future concurrence points.

Ec:

Chris Militscher, USEPA
Ron Sechler, NMF
Pete Benjamin, USFWS
Mike Bryant, USFWS-PINWR
Brian Wrenn, DWQ
Doug Huggett, DCM
Kevin Hart, DMF
Mike Murray, NPS
Clarence Coleman, FHWA
Renee Gledhill-Earley, SHPO
Melba McGee, DENR

PARSONS BRINCKERHOFF

Memorandum

To: May 16, 2012 Bonner Bridge Merger Team Meeting Attendees

From: Bobby Norburn, Parsons Brinckerhoff

Date: September 11, 2012

Subject: Meeting Minutes – May 16, 2012 NEPA/Section 404 Merger Team Informational Meeting for Phase II of the Bonner Bridge – NC 12 Transportation Management Plan (TIP No. B-2500)

Attendees:

Gary Jordan	USFWS – Raleigh Field Office
Pete Benjamin	USFWS – Raleigh Field Office
Mike Bryant	USFWS – Pea Island National Wildlife Refuge *(by phone)*
Bill Biddlecome	US Army Corps of Engineers
Chris Militscher	US Environmental Protection Agency
Ron Sechler	National Marine Fisheries Service *(by phone)*
Mike Murray	National Park Service *(by phone)*
Ron Lucas	FHWA – NC Division
Cathy Brittingham	NCDENR – DCM
Doug Huggett	NCDENR – DCM
Stephen Lane	NCDENR – DCM
Paul Williams	NCDENR – DCM
Kevin Hart	NCDENR – DMF
David Wainwright	NCDENR – DWQ
Brian Wrenn	NCDENR – DWQ
Amy Simes	NCDENR
Travis Wilson	NC Wildlife Resources Commission
Renee Gledhill-Earley	NCDCR – SHPO
Jim Trogdon	NCDOT – Chief Operating Officer
Greg Thorpe	NCDOT – PDEA
Beth Smyre	NCDOT – PDEA
Brian Yamamoto	NCDOT – PDEA
Brittney Kelly	NCDOT – PDEA
Drew Joyner	NCDOT – Human Environment Section
Martha Hodge	NCDOT – Human Environment Section
Phil Harris	NCDOT – Natural Environment Section
Kathy Herring	NCDOT – Natural Environment Section
Chris Rivenbark	NCDOT – Natural Environment Section
Michael Turchy	NCDOT – Natural Environment Section
Steve Mitchell	NCDOT – Natural Environment Section
Mark Staley	NCDOT – Roadside Environmental Unit
Hardee Cox	NCDOT – STIP Unit
Ray McIntyre	NCDOT – STIP Unit
Lonnie Brooks	NCDOT – Structures Management Unit
Kevin Fischer	NCDOT – Structures Management Unit
Michael Valiquette	NCDOT – Geotechnical Engineering Unit

Chris Kreider	NCDOT – Geotechnical Engineering Unit
Marshall Clawson	NCDOT – Hydraulics Unit
Kevin Moore	NCDOT – Roadway Design Unit
Gary Lovering	NCDOT – Roadway Design Unit
Steve Kite	NCDOT – Work Zone Traffic Control
David Boyd	Utilities Unit
Corey Bousquet	Utilities Unit
Christina Vokeley	Utilities Unit
Marico Hafeez	Utilities Unit
Jerry Jennings	NCDOT – Division 1
Pablo Hernandez	NCDOT – Division 1
Clay Willis	NCDOT – Division 1
John Page	Parsons Brinckerhoff
Bobby Norburn	Parsons Brinckerhoff

Meeting Purpose

The purpose of the meeting was informational. NCDOT discussed with the Merger Team agencies, and received feedback regarding, a design for the Bridge within Existing NC 12 Easement Alternative at the Pea Island inlet, which is currently NCDOT's recommended alternative for the site. The design issues discussed would likely affect the permit applications for the proposed project. These issues include the use of temporary construction easements, utility placement, use of retaining walls, jetting, and other design-related issues.

Decisions and Action Items

Given the meeting's purpose, there were no decisions made at the meeting. However, there were several Action Items that the agencies indicated below agreed to follow-up on after the meeting:

1. USFWS-Refuge will ask the Refuge maintenance supervisor what he knows about the maintenance history of the Refuge boat ramp on the west side of NC 12 south of the Pea Island inlet, and will inform NCDOT about the outcome of this conversation.

2. NCDENR-DMF will investigate how much commercial fishing occurs at the Refuge boat ramp to assist in determining the ramifications of impacts to the ramp.

3. NMFS and NCDENR-DCM will further discuss the preferred water source for pile-jetting operations, as well as pump location and where to run the pipes. The two agencies will try to develop a joint position on these issues and will inform NCDOT of the outcome of these discussions.

4. USFWS will further discuss internally whether or not NCDOT should re-grade the NC 12 easement and the temporary easement after construction is completed, and will inform NCDOT of the outcome of these discussions.

Meeting Highlights

NCDOT reviewed the major discussion items from the March 21, 2012 Merger Team meeting. Although many agencies abstained from Concurrence Points (CP) 2/2A and 3 for the Phase II Pea Island inlet area, and two agencies did not concur (FHWA and USACE), there seemed to be general agreement that the Bridge within Existing NC 12 Easement is the only alternative that should be carried forward for detailed study. NCDOT is currently working on a response letter to USACE to address its comments so that USACE and FHWA can then concur on CPs 2/2A and 3 for the Pea Island inlet. Once the USACE response letter is complete, NCDOT will circulate the CP 2/2A and 3 forms for signature. To date, all abstention briefs have been received, except one from the NMFS.

NCDOT said that because it seemed that the Bridge within Existing NC 12 Easement is likely the only alternative at the Pea Island inlet, NCDOT has been moving forward with the design of this alternative at its own risk. The design has advanced to the point where NCDOT is prepared to discuss it with the Merger Team members and provide them with an opportunity to ask questions and give feedback. The NCDOT Roadway Design Unit (RDU) reviewed the current design of the Bridge within Existing NC 12 Easement Alternative. The total length of the alternative is approximately 2.3 miles, including a bridge length of approximately 2.1 miles. The proposed bridge and temporary detour required to maintain traffic would remain within the existing NC 12 easement.

NCDOT-RDU showed two sets of plan sheets – one for the temporary detour and one for the proposed permanent bridge. The temporary detour would remain in place during construction of the entire permanent bridge. RDU explained that although the temporary detour would be constructed entirely within the existing easement, an additional 5 feet of temporary easements are required for silt fence installation throughout the majority of the project. Also two small areas (200 feet long and 600 feet long) within the project limits were identified where existing ground elevations differ from the proposed detour grade. In these areas an additional 5 to 10 feet of temporary easement would be required to maintain the slopes of the detour. As the detour approaches the existing temporary bridge, temporary shoring along the easement line would be required to maintain the detour slopes within the existing easement. Because of the pavement slope of the temporary detour, the majority of drainage runoff from the detour would remain within the existing NC 12 easement.

NCDOT-RDU also discussed the proposed permanent bridge. To construct both the temporary detour and the bridge within the existing easement, the alignment of the permanent bridge would be offset toward the ocean but would transition to the sound side of the existing NC 12 easement as it approaches Pea Island inlet. This is required to maintain traffic on the existing temporary bridge while constructing the proposed permanent bridge. RDU also discussed traffic phasing and transitioning of the detour to accommodate construction of the piles for the permanent bridge. In this same transition area the permanent bridge deck would need to be raised to accommodate truck traffic on the detour. The bridge deck elevation would increase from its normal elevation of approximately elevation 25 feet to approximately elevation 32 feet and then transition back to elevation 25 feet. Deck drains on the permanent bridge would drain directly onto the existing NC 12 easement.

It was noted that the post-Hurricane Irene verified wetlands are shown on the plans. NCDOT-RDU reviewed the plan sheets one by one to show the location of the slope stake lines, easement, and temporary easement.

NCDOT-RDU discussed the characteristics of the ends of the proposed bridge, including the bridge end plan and profile sheets and the three bridge typical sections: retaining wall section, transition bridge section, and full bridge section. The design of the bridge would be the same on both ends. The superstructure of the transition bridge would use cored slabs as opposed to the girders used on the rest of the bridge.

USFWS-Raleigh asked about the length of the retaining walls. NCDOT-RDU responded that they are about 150 feet long and 13 feet tall at their highest point.

NCDOT-RDU said that the next step in the bridge design is to assemble a set of plans to accompany a permit application, but NCDOT is requesting feedback from the Merger Team agencies so that potential issues can be addressed prior to permit application.

NCDOT-PDEA asked how long is the section of bridge that would be 32 feet high. NCDOT-RDU did not have that information at the time. *[It is 900 feet.]*

NCDOT-RDU asked which agency has jurisdiction over the boat ramp on the west side of NC 12 south of the inlet. NPS responded that the boat ramp (called the New Inlet Parking and Boat Ramp) is not maintained by the NPS (i.e., it is not on the NPS property list). USFWS-Refuge said that the area is not on its property list either, but is on Refuge lands. USFWS-Refuge indicated that the boat ramp's origin is not known, but the public uses it for access to Pamlico Sound for kayaking, fishing, crabbing, and other recreational activities. The signs posted at the boat ramp reflect both NPS and USFWS regulations, and the current uses of the boat ramp reflect NPS' purpose of public use of the Refuge. USFWS issues permits for commercial use of the boat ramp. NCDOT-PDEA asked about permits that have been issued for maintenance of the boat ramp. USFWS-Refuge responded that no permit has been issued for maintenance of the boat ramp in the last 16 years, but the agency will ask the maintenance supervisor, who has been with the Refuge for about 30 years, about the maintenance history of the boat ramp.

NCDOT-Structures Management Unit (SMU) discussed the bridge's structural design. NCDOT had Ocean Engineering Associates, Inc. analyze storm surge in the project area to assist with the bridge design. The results of this analysis indicated that the bridge needed a minimum vertical clearance of 17 feet to account for storm surge (i.e., 1 foot above the 16-foot maximum predicted storm surge). The retaining walls at both ends of the bridge are needed because the bridge superstructure needs to be above the storm surge. Both the main bridge and transition bridge superstructure would be above 16 feet. The transition sections (retaining wall and transition bridge) at both ends would allow the bridge to be extended in the future depending on shoreline change. NCDOT-SMU emphasized that the intent of the retaining walls is not to provide a hardened structure to prevent coastal erosion. The walls are to support transition section fill. NCDOT-SMU also indicated that the retaining walls would be strong enough to withstand the impact of a storm surge. NCDOT-SMU added that it would like to get feedback from the Merger Team agencies on the planned retaining walls.

NCDOT-SMU showed a typical section for a bridge bent with piles. The piles are approximately 110 feet long for the full length of the bridge. The entire length of the bridge is being designed to account for the possibility that any part of the bridge could be over a migrating Pea Island inlet or, as a result of beach erosion, in the ocean in the future (i.e., assumes that the soil supporting the piles would be at a lower elevation around the piles in an inlet or in the ocean than on land). Piles must be jetted into place. NCDOT-SMU added that it also would like to get feedback from the Merger Team agencies as to their thoughts on jetting, including what type of restrictions, if any, would be required.

USFWS-Raleigh asked about the amount of embedment at the retaining walls. NCDOT responded that the embedment would be approximately 1.5 to 2 times the height of the wall.

NCDOT-SMU showed a typical section for the bridge deck including the bicycle safe bridge rail, as well as a typical section for the bridge superstructure.

USFWS-Raleigh noted that, as a result of the Section 7 coordination, there is a requirement for blocking vehicle headlights on the bridge so the light at night will not disturb the sea turtle nesting process. NCDOT-SMU responded that NCDOT was aware of this requirement. USFWS-Raleigh referred to the conclusions contained in the Biological Opinion on this issue. NCDOT-PDEA said that NCDOT is working on addressing this requirement. In response to a question about whether light from headlights should be blocked on both sides of the bridge, USFWS-Raleigh responded that it was only needed on the ocean side of the bridge, but could still be done on both sides.

NCDCR-SHPO asked about mitigation for bird impacts on the bridge. USFWS-Raleigh added that this was not part of the Biological Opinion, but it is still an issue of concern.

NCDOT discussed the spoil that would be generated from jetting the bridge piles. The quantity would be approximately 20,000 to 25,000 cubic yards for the entire bridge. NCDOT asked the agencies for guidance on what the agencies can do, or have to do, to dispose of this spoil. NCDENR-DCM asked about containment of the jetting spoil. NCDOT responded that containment of the jetting spoil would be a requirement in the contractor's contract. NCDENR-DCM asked if jetting of piles would be required for the full length of the bridge. NCDOT responded yes. USFWS-Raleigh requested Section 7 consultation related to jetting impacts. NCWRC said that the jetting spoil was probably not suitable for bird islands because of clay in the spoil, and asked if the geotechnical analysis results revealed subsurface clay layers in the project area. NCDOT responded yes. NCDENR-DCM said that based on the North Carolina dredge/fill law, the material should not be moved off-site. The intention of the law is to prevent sand from being removed from the system in order to preserve the sand mass of the island. However, NCDENR-DCM has no authority to mandate this, so it would be NCDOT's preference as to what to do with the spoil.

USFWS-Raleigh asked if NCDOT had determined how to get water for jetting to the construction site. NCDOT-Division 1 responded that the contractor could pump water from the inlet if this would be acceptable to the agencies. The pumping of water would be continuous while the jetting equipment is running, and the volume of water needed to be pumped would be about 1,000 to 1,500 gallons/minute.

NCDENR-DMF said that it may have concerns with that amount of water being pumped from the inlet for that length of time because of the potential impact on larval transport in the inlet. The group discussed pumping water from the sound versus the ocean, as well as where to locate the pump and run the pipes. NCDENR-DCM said that the sound is a more sensitive habitat than the ocean. NMFS suggested that it and NCDENR-DCM should get together to discuss this issue and try to develop a joint position for the two agencies.

USFWS-Raleigh asked if pumping from the ocean would require the system to be moved multiple times along the beach. NCDOT-RDU responded that the system could potentially be set-up and not moved during the course of construction, if that is what the agencies would allow. NCDOT-SMU added that a pre-determined allowable number of moves, such as distance increments based on the length of the project, could be established.

USFWS-Raleigh asked how long jetting would last. NCDOT-SMU responded that because the project would be let as Design/Bid/Build, it would take longer to construct, probably 3 to 4 years. In addition, limiting construction activities to the 100-foot easement would require the bridge piles to be installed sequentially rather than installing piles for multiple bents at once. However, possibly only 1 to 2 years would be needed for the actual pile jetting activities.

NCDOT-SMU asked about potential time restrictions for pumping. NCDENR-DMF responded that spring is the time of the year when potential larval impacts could be the greatest.

NCDENR-DCM discussed the potential permitability problems related to the water source for jetting. All three water source options (i.e., sound, ocean, and inlet) have potential permitability issues to be addressed during the permitting process. NCDOT could apply using all three options and the permit could include conditions for each option. NCDOT-SMU asked for further explanation of what would be “possible” versus what would be “off limits” with respect to a water source, so that NCDOT could inform the contractor of the available options.

NCWRC said that the inlet could close, so it is possible that another water source would be needed. NCWRC asked if a pipe could be run to the ocean outside of the easement.

NCWRC asked about the efficiency of recapturing the water used for jetting. NCDOT-Division 1 said that it could possibly be done, but not efficiently.

USFWS-Raleigh asked if one “permanent” pump (i.e., in one location for the life of the project) could be set-up near the ocean and the water piped from there for the full length of the project. NCDOT-Division 1 answered that the problem with this option could be piping the water across the inlet because the temporary bridge may not be able to handle the additional load of the water pipe. USFWS-Raleigh asked if one pump could be set-up at each end of the project. NCDOT-Division 1 thought this might be possible.

NCDOT-RDU asked the agencies about re-grading the NC 12 easement and the temporary easement after construction is completed. In other words, what should the NC 12 easement look like after the bridge is built? USFWS responded that the agency would like to get back to NCDOT on this question.

USACE asked how many acres of wetlands would be affected. NCDOT-RDU responded that the impacts were relatively small, but the exact amount would need to be checked.

USACE said that from its perspective, the easement should be returned to its existing grade once construction is completed, or mitigation should be performed for any changes in the existing grade that affect wetlands.

NCDOT-RDU and NCDOT-Utilities Unit discussed utility impact issues as a result of the proposed project. NCDOT-Utilities Unit said that lack of funding for utility relocations work, in particular for Century Link, is an issue. However, although there is no money available yet for utility relocations, no other problems have been identified with respect to the needed relocations.

NCDOT-SMU asked if there is any flexibility in the regulations with respect to the design of the retaining walls. NCDENR-DCM responded that there is an exception to the hardened structures rule for the protection of existing bridges. In addition, NCDENR-DCM determined that this exception also applies to the temporary bridge and could be applied to the new Oregon Inlet and Pea Island inlet bridges. NCDENR-DCM is still concerned about the ocean reaching the retaining walls and causing a transfer beach erosion impacts. For this project, however, this issue is probably not as much of a concern as is typical in these situations. The reason for this is transferring beach erosion impacts may be the least of the problems that would occur should the ocean reach the retaining walls.

NCDENR-DCM said that it would have to issue permits for the utility relocations even if wetlands are not impacted.

NCDCR-SHPO said that Section 106 coordination would have to be re-opened if the bridge rails are changed from what was agreed upon in the FEIS/ROD.

NCDENR-DCM asked about next steps and timing for the project. NCDOT-PDEA said that the current best guess is that NCDOT would submit permit applications for Pea Island (Phase IIa) sometime in the fall. Rodanthe (Phase IIb) would be sometime after Pea Island.

NCDENR-DMF will investigate how much commercial fishing occurs at the Refuge boat ramp to assist in determining the ramifications of impacts to the ramp. It was discussed that the ramp may no longer be accessible in the future once the new bridge is built.

USACE asked what Dare County thought about the importance of maintaining access to the boat ramp. Parsons Brinckerhoff said that the County has in the past favored shifting NC 12 as a road to the west away from the ocean so that access throughout the Refuge would remain relatively unchanged. In the past the Refuge has indicated that they would provide alternative access to the Refuge if NC 12 were to be removed from the Refuge. NCDOT-RDU added that NCDOT is assuming as of now that the ramp would no longer be accessible upon construction of a bridge in this area.

USFWS-Raleigh said that NCDOT should discuss pumping for jetting with the USFWS-Raleigh office because it is a Section 7 issue (i.e., do not coordinate only with USFWS-Refuge).

The meeting was adjourned at 3:00 PM.

file no.: 3301-2.7.2

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PARSONS BRINCKERHOFF

Memorandum

To: November 14, 2012 Bonner Bridge Merger Team Meeting Attendees

From: Bobby Norburn, Parsons Brinckerhoff

Date: December 13, 2012

Subject: Meeting Minutes – November 14, 2012 NEPA/Section 404 Merger Team Meeting for Phase II of the Bonner Bridge – NC 12 Transportation Management Plan (TIP No. B-2500)

Attendees:

Gary Jordan	USFWS – Raleigh Field Office
Dennis Stewart	USFWS – Pea Island National Wildlife Refuge
Bill Biddlecome	US Army Corps of Engineers
Chris Militscher	US Environmental Protection Agency *(by phone)*
Fritz Rohde	National Marine Fisheries Service *(by phone)*
Thayer Broili	National Park Service
Clarence Coleman	FHWA – NC Division
Ron Lucas	FHWA – NC Division
Cathy Brittingham	NCDENR – DCM
Doug Huggett	NCDENR – DCM
Paul Williams	NCDENR – DCM
Kevin Hart	NCDENR – DMF
David Wainwright	NCDENR – DWQ
Amy Simes	NCDENR
Travis Wilson	NC Wildlife Resources Commission
Renee Gledhill-Earley	NCDCR – SHPO
Steve Lambert	Albemarle Regional Planning Organization
Jamie Shern	NCDOT
Greg Thorpe	NCDOT – PDEA
Beth Smyre	NCDOT – PDEA
Brian Yamamoto	NCDOT – PDEA
Karen Kendig	NCDOT – Natural Environment Section
Kathy Herring	NCDOT – Natural Environment Section
Chris Rivenbark	NCDOT – Natural Environment Section
Morgan Weatherford	NCDOT – Natural Environment Section
Mike Sanderson	NCDOT – Natural Environment Section
Mark Staley	NCDOT – Roadside Environmental Unit
Dara Demi	NCDOT – Communications Office
Kerry Morrow	NCDOT – Transportation Planning Branch
Greg Perfetti	NCDOT – Structures Management Unit
Kevin Fischer	NCDOT – Structures Management Unit
Michael Valiquette	NCDOT – Geotechnical Engineering Unit
Marshall Clawson	NCDOT – Hydraulics Unit
Kevin Moore	NCDOT – Roadway Design Unit
Gary Lovering	NCDOT – Roadway Design Unit
Chandrakant Sura	NCDOT – Congestion Management

Steve Kite	NCDOT – Work Zone Traffic Control
Jerry Jennings	NCDOT – Division 1
Pablo Hernandez	NCDOT – Division 1 *(by phone)*
Mark Fonseca	CSA International *(by phone)*
John Page	Parsons Brinckerhoff
Bobby Norburn	Parsons Brinckerhoff

Meeting Purpose

The purposes of the meeting were to:

1. **Finalize concurrence on CP 2/2A and 3 for the Pea Island site (B-2500A) and CP2/2A for the Rodanthe site (B-2500B)**. In March, the team voted on these concurrence points, with the vote at four concurrences (NCDOT, NCDENR-DWQ, NCDENR-DCM, SHPO), seven abstentions (EPA, USFWS-Raleigh, USFWS-Refuge, NPS, NMFS, NCWRC, NCDENR-DMF) and two non-concurrences (USACE, FHWA). Prior to the meeting, NCDOT resolved the concerns of USACE and FHWA, and all three agencies signed the concurrence forms. The intent was to get the remaining signatures on the forms at today's meeting. (Copies of the updated forms were provided to team members in advance of the meeting.)
2. **Discuss and reach concurrence on CP 4A for the Pea Island site**. The avoidance and minimization issues were discussed on pages 9 and 10 of the March meeting packet (which was provided to team members in advance of the meeting). Proposed discussion topics at today's meeting for CP 4A included, but were not limited to: wetland impacts (permanent and temporary), impacts to Essential Fish Habitat and protected species, and temporary construction easements.
3. **Update the team on the current status of Phase II (both sites).**
4. **Update the team on the wetland and SAV mitigation for Phase I of the project.**

Decisions and Action Items

There were several decisions made at the meeting, as follows:

1. NCDOT, NCDENR-DWQ, NCDENR-DCM, SHPO, FHWA and USACE signed the CP 2/2A and CP 3 forms for the Pea Island inlet site to affirm their concurrence, and USFWS-Refuge, NPS, USFWS-Raleigh, NMFS, NCDENR-DMF, NCWRC, and USEPA initialed the form to affirm their abstention.
2. NCDOT, NCDENR-DWQ, NCDENR-DCM, SHPO, FHWA and USACE signed the CP 2/2A form for the Rodanthe breach to affirm their concurrence, and USFWS-Refuge, NPS, USFWS-Raleigh, NMFS, NCDENR-DMF, NCWRC, and USEPA initialed the form to affirm their abstention.
3. Based on the agency concerns expressed at today's meeting, NCDOT decided not to request a concurrence vote on CP 4A at the Pea Island inlet. NCDOT would draft a concurrence form based on discussions at the meeting and circulate it to the team for comment.

There also were several Action Items that were agreed upon:

Phase IIa (Pea Island Inlet Site)

1. NCDOT will develop a plan for jetting operations and present it to the Merger Team for review.

2. NCDENR-DMF will gather information on types of screens available for preventing larval fish impacts when obtaining water from the inlet or sound during jetting and provide it to NCDOT.

3. NCDOT will work with NCDENR-DCM and USFWS-Refuge on options for jetting spoil disposal.

4. FHWA will schedule a meeting between NCDOT, SHPO, and USFWS to discuss bridge rails in accordance with existing Section 7 and Section 106 commitments.

5. NCDOT will work with the USFWS-Refuge and the NPS on options for relocating the New Inlet boat ramp.

Phase I (Oregon Inlet Bridge Replacement)

1. CSA International will check to see if the proposed SAV mitigation sites are within the Refuge Proclamation Boundary.

2. NCDOT-NES will provide the pertinent agencies with the final Phase I wetland mitigation plan.

Phase II Concurrence Point Meeting Highlights

USACE said that NCDOT had provided the updated cost information for the Pamlico Sound Bridge Corridor per its request at the March 21, 2012, Merger Team meeting (as stated in USACE's January 5, 2012 letter to NCDOT).

The sections below summarize the meeting discussion topics (a copy of the slide show used at the meeting is attached):

1. NC 12 Repair Update

   NCDOT-Division 1 gave an update on the status of NC 12 repairs following Hurricane Sandy. NCDOT-Division 1 noted that all of the damage was a result of ocean side flooding and overwash, as opposed to the sound side flooding caused by Hurricane Irene.

   The damaged area in the Canal Zone Hot Spot was approximately 3 miles long. The dunes were destroyed, but the pavement that was covered by sand was not damaged and has now been cleared.

The temporary bridge at the Pea Island inlet held up well in the storm, but approximately 1,000 feet of pavement was damaged south of the bridge.

There was also extensive pavement damage in the Mirlo Beach area and the artificial dunes were completely destroyed. The sandbags under the artificial dunes through the hot spot also were undermined by the storm. As opposed to previous storms, the beach in this area still has not recovered as a result of several subsequent storms that have struck the area. NCDOT-Division 1 said that this area had the worst damage as a result of Hurricane Sandy. A temporary detour for four-wheel drive vehicles was created to the west of NC 12, but it has been closed at high tide. NCDOT-Division 1 said that it cannot give a date as of yet for re-opening this section of NC 12 – some good weather is needed before substantial progress can be made. USFWS-Refuge added that based on its observations, the NC 12 easement is in the swash zone. USACE asked if the lack of beach recovery changes NCDOT's plans for repairing NC 12 damage in this area. NCDOT-Division 1 responded that it is not sure yet, but it could.

The Bonner Bridge itself held up well. Work is ongoing to replace some tensioning strands in the bridge deck that were damaged, but other than that there were no major problems.

2. Phase II

Project numbers B-2500A (Pea Island) and B-2500B (Rodanthe) have been added to the TIP. NCDOT-PDEA presented a summary of the detailed study alternatives that were tentatively agreed to at the March 21, 2012, Merger Team meeting. For the Pea Island inlet, NCDOT proposed a single detailed study alternative, the Bridge within Existing NC 12 Easement Alternative. For the Rodanthe breach, NCDOT proposed two detailed study alternatives, the Bridge on New Location and the Bridge within Existing NC 12 Easement. The Merger Team member votes at the March 21, 2012, Merger Team meeting were as follows on CP 2/2A (at both sites) and CP 3 (Pea Island):

- Concur: NCDOT, NCDENR-DWQ, NCDENR-DCM, and SHPO.
- Non-Concur: FHWA and USACE.
- Abstain: USFWS-Refuge, NPS, USFWS-Raleigh, NMFS, NCDENR-DMF, NCWRC, and USEPA. (Note that NMFS did not actually vote at the March 21, 2012 meeting, but subsequently sent NCDOT an e-mail stating that it would abstain.)

FHWA and USACE reached concurrence on these points on October 29, 2012, after NCDOT provided updated cost information on the Pamlico Sound Bridge Corridor.

NCDOT-PDEA said that it was now preparing Environmental Assessments for both Phase II project areas rather than Re-Evaluations. NCDOT-PDEA noted that this addressed one of the agency concerns that had been expressed at the March Merger Meeting.

USACE asked if any agencies were going to change their vote. USEPA responded that it could change its vote based on the change in the type of NEPA documents that were being prepared.

USACE asked if additional wetland delineation updates were needed to reflect post-Hurricane Sandy conditions. NCDOT sent biologists to the project area on November 14, 2012, to examine the changes as a result of the storm. NCDOT is not recommending additional delineations as of yet, but the field work is not yet complete.

NCDOT-PDEA noted that the Albemarle RPO was not included on the concurrence forms (since the original vote was taken prior to the August 1, 2012, effective date for adding the RPO as a signatory agency), but said that the RPO would be included on any subsequent concurrence votes.

At the end of the meeting, all participants present at the meeting signed (concur) or initialed (affirm abstention) the concurrence forms.

3. CP 4A – Pea Island

The topics discussed as part of CP 4A (avoidance and minimization) for Pea Island included: wetland impacts, temporary construction easements (TCEs), temporary bridge removal, pile jetting spoil disposal, pile jetting water source, and stormwater collection.

a. Wetland Impacts

The updated wetland impacts at the Pea Island inlet are: 0.01 acres of permanent fill and 1.12 acres of temporary fill. NCDOT-PDEA noted that these impacts were based on post-Hurricane Irene delineations that were completed in the Summer of 2012, and that it is in the process of checking the wetland boundaries post-Hurricane Sandy.

NCDENR-DCM asked about the duration of temporary wetland impacts. NCDOT responded that the TCEs are expected to be in place for approximately 2 to 3 years. NCDENR-DCM said that this may be a longer period of time than can be considered temporary impacts. NCDOT-NES said the “permanent” nature of the impacts also depends on the soil types involved. NCDOT-PDEA asked if NCDENR-DCM was concerned about what the temporarily impacted areas would look like after they were restored. NCDENR-DCM said that they have not seen any drawings yet. NCDOT-PDEA responded that none have been sent out. NCDOT-PDEA added that NCDOT is not sure that a CP 4B/4C meeting is needed, but the team should think about whether they agree with NCDOT on this issue. NCDOT-PDEA said that the impacts seem straight-forward, so today’s meeting would be used to allow agencies to ask questions.

b. Temporary Construction Easements (TCE)

A total of approximately 2.53 acres of TCE would be needed on both sides of the existing NC 12 easement, but most would be in the area near the temporary bridge.

NCDOT-RDU presented plan sheets showing the TCE and discussed its features and dimensions, as well as changes to the TCE since the plans that were shown to the Merger Team at the May 16, 2012 Merger Team meeting. The TCE is generally 5 feet wide for most of its length. However, the updated plans include additional TCE on the ocean side of the NC 12 easement in the vicinity of the temporary bridge because NCDOT feels it will be needed in order to facilitate removal of the temporary bridge. NCDOT-RDU noted that the temporary bridge piles will hopefully be removed using a vibratory hammer, but jetting could be necessary if vibration does not work. NCDOT-RDU said that the TCE also was adjusted at the Refuge access road on the dike around the southern-most Refuge pond to allow large trucks associated with Refuge operations to get completely off of NC 12 when stopped in front of the gate across the road. Additional TCE also has been added at the paved information kiosk parking lot on the east side of NC 12 south of the temporary bridge, as well as around the paved New Inlet boat ramp and parking lot. NCDOT wants to use these two existing paved areas as staging areas, so the TCE was added to accommodate this. The TCE at the boat ramp parking lot extends into the sound because NCDOT wants to use this as a pumping site for obtaining water for jetting. NCDOT-RDU said that these lots would be permanently closed at the start of construction. The closure is permanent because with Phase IIa, direct access to NC 12 from these sites would be lost.

NCDENR-DMF asked if the New Inlet boat ramp would be replaced. NCDOT-PDEA responded that NCDOT currently has no plans to replace the boat ramp. USFWS-Refuge added that there is not another deep enough area to the south along the sound shoreline for launching most boats (i.e., other than canoes and kayaks). The current boat ramp is within the former New Inlet, so it is in a deeper area, but the sound gets shallower to the south closer to Rodanthe. USFWS-Refuge also noted that NPS would need to be involved in any decision to possibly relocate the boat ramp since it has jurisdiction in the sound adjacent to Hatteras Island.

NCDOT-RDU indicated that it would need to work with the Refuge regarding restoring the temporary easement and the existing NC 12 easement. Pavement would be removed. NCDOT also could remove the associated fill. USFWS-Refuge indicated that as long as the fill has compatible sand, it would not necessarily need to be removed. Any fill in wetlands would need to be removed. There were no objections from the merger team on any of the proposed TCE.

c. Temporary Bridge Removal

NCDOT-SMU discussed temporary bridge pile removal. NCDOT-SMU said that its preference is to use a vibratory hammer to do this, but jetting could be required. NCDOT-SMU also discussed that temporary bridge sheet pile removal would probably be done mid-construction, and that other temporary shoring (i.e., sandbags) would be installed in place of sheet pile when constructing the permanent bridge.

NCDENR-DCM said that it is not in favor of cutting-off the piles at ground level – they should be completely removed. NCDENR-DCM added that jetting within the inlet, if required, should be done on the outgoing tide to keep sediment from flowing towards the sound and into the Refuge.

USFWS-Raleigh indicated that it could not concur on CP 4A until issues related to construction lighting and the bridge railing were resolved with respect to turtle impacts. FHWA indicated that information would be provided within the next few days, but did not think construction lighting was a CP 4A issue.

NCDOT-PDEA added that a technical memorandum on the effects of the NC 12 Transportation Management Plan Alternative on the recently listed Atlantic sturgeon is being prepared and would be provided soon to USFWS and NMFS for comment as part of Section 7 consultation. FHWA will schedule a meeting with USFWS and NMFS to discuss Section 7 issues.

The bridge bents for the temporary bridge and the permanent bridge were discussed. NCDOT-SMU reiterated that NCDOT plans to remove all structural components associated with the temporary bridge (i.e., piles, sheeting, riprap, etc.). NCDOT-Division 1 said that the jetting effort is less for removing old piles than for installing new ones. It was indicated that jetting on the outgoing tide would be preferred. NCDOT-Division 1 indicated that commitment would be acceptable for temporary pile removal.

NCDENR-DMF asked if the Pea Island inlet was being used by any fish species and the possibility of a construction moratorium if this was an issue. NMFS responded that it did not know if the inlet was being used by any fish species.

d. Pile Jetting – Spoil Disposal

NCDOT's preference is to dispose of jetting spoils onsite, but no spoils would be disposed of within wetlands. The entire Phase IIa project is expected to create approximately 25,000 cubic yards of jetting spoil.

NCDENR-DCM asked about the jetting spoil containment boxes that are being used for Phase I – would this be appropriate for Phase II? NCDOT-PDEA responded that

the boxes are going to be used only in wetland and SAV areas, but are not needed here because of limited wetland impact.

USFWS-Refuge said that in the big picture the volume of jetting spoil is not that much and that it is probably not a good idea to take sand off of the island.

NCDOT's analysis of the subsurface soils in the Phase IIa project area indicated that at a depth of approximately 40 feet the sand turns grey because it has never been exposed to the atmosphere. NCDOT will check to see if any data from the geotechnical investigations of the area could provide more information on the potential jetting spoil material.

NCDENR-DCM discussed that the specific details of the spoil disposal will need to be worked out, but that it is probably a good idea to keep it on the island. NCDENR-DCM will need more information on the type of sediment to work out the details on where it should be disposed of (e.g., within the existing easement, on the dikes around the ponds, or elsewhere in the Refuge).

NCWRC said that it doesn't think the bird islands would be an appropriate disposal site because, as of now, it appears that the spoil would not be compatible. However, if further analysis reveals that the spoil is compatible, the bird islands could be a potential disposal site.

USFWS-Raleigh and NCDOT-PDEA discussed that beach disposal of the spoil is not an option.

NCDOT-RDU said that all spoil will stay within the existing NC 12 easement during jetting operations. NCDOT-RDU added that the contractor will be responsible for containing it within the easement using appropriate methods, unless the decision is made that it is wanted elsewhere.

NCDOT-PDEA asked if there were any questions about jetting spoil created within the Pea Island inlet and whether it should be contained. NCDOT is not going to contain spoil within the Oregon Inlet for Phase I, so NCDOT's thought was that it would not be contained in the Pea Island inlet either. In response, NCDENR-DCM said that it does not think that the spoil could be contained and reiterated that NCDOT should make sure the jetting operation is timed with the outgoing tide.

e. Pile Jetting – Water Source

NCDOT's preference is to use water from the inlet or the sound, not the ocean, for jetting. A minimum of three sites will be needed to serve as water sources. In addition, approximately 1.5 to 2 feet of water depth is needed for the intake pipe.

NCDENR-DCM asked how much water will be needed. NCDOT-Division 1 responded that approximately 400 to 500 gallons per minute will be needed. NCDOT-Division 1 added that one bridge pile can be jetted into place in approximately 60 minutes, so jetting operations would require up to approximately 30,000 gallons of water per pile.

NCDENR-DMF said that the time of year that jetting will take place is important with respect to potential impacts on larval fish using the inlet to enter the sound. NCDENR-DMF asked how long jetting operations would last. It was discussed that jetting operations are expected to last 2 to 3 years, and that they would occur year round.

NCDOT-SMU discussed that Pamlico Sound is a better source for obtaining water for jetting than the Atlantic Ocean because of the challenges in accessing the beach, including moving equipment in the sand.

NCDENR-DMF asked about the habitat type in the sound at the proposed water in-takes. At USFWS-Raleigh's request, NCDOT-Division 1 stated that the pipes could be laid by hand rather than by using heavy equipment. NCDOT-Division 1 added that the pumps should be as close to the water in-takes as possible, but it expects them to be near the existing easement to facilitate installation and maintenance.

It was asked if there are types of screens that can be placed over the water in-takes to prevent larval fish impact. NCDENR-DMF responded that there were, but it was not sure of the specifications that would be needed for such screens. NCDENR-DMF also said that there would be a lower risk of impacts in the winter months. NMFS added that because the Pea Island inlet is relatively new and small, there may be less concern about impacts from jetting to larval fish.

NCDOT-PDEA suggested that NCDOT would develop a plan for jetting operations based on the discussions at today's meeting and present it to the Merger Team. The potential for using something similar to a coffer dam around the pipe intake was discussed as a means to be sure the pipe intake was 18 inches to 2 feet off the bottom of the sound or inlet. NCDENR-DMF will gather information on types of screens available for preventing larval fish impacts from jetting and provide it to NCDOT.

f. Stormwater Management Plan

NCDOT-Hydraulics Unit discussed NCDOT's proposed stormwater management plan. It is the same as for the Phase I Oregon Inlet bridge. Bridge runoff would be collected through drains at the ends of the Phase IIa bridge and piped to a riprap apron, where it would then drain to roadside swales. As with the Bonner Bridge, open scuppers would be used to collect bridge runoff along the main spans of the bridge and dump water to the ground or water surface, but the wind would dissipate the water before it lands.

4. Other Issues

USFWS-Raleigh discussed bridge rail design issues. USFWS-Raleigh said that it has two issues of concern related to bridge rail design – disturbance to sea turtles on the beach from vehicle headlights on the bridge and bird mortality from being hit by vehicles on the bridge. USFWS-Raleigh noted that the commitment in the Biological Opinion is related to the turtle impacts, but that bird mortality is not a Section 7 issue. NCDOT-PDEA noted that NCDOT-NES is scheduled to complete its bird mortality study in December. USFWS-Raleigh said that the bridge rail design issue is complicated because turtles and birds have competing needs with respect to the design. NCDCR-SHPO discussed the Section 106 Programmatic Agreement (PA) related to this issue. NCDCR-SHPO said that is important for all of the agencies that have an interest in this issue to meet at one time and discuss and understand each other's needs. FHWA indicated that this would be done.

NCDOT-RDU reiterated construction staging areas and post-construction site conditions.

USFWS-Raleigh asked if the width of the beach changed as a result of Hurricane Sandy. USFWS-Refuge discussed its observations on this issue. USFWS-Raleigh said that the width of the adjacent beach is important to the consideration of the easement's post-construction site conditions in a particular area because areas with narrow beaches are more likely to experience more rapid future shoreline erosion. The easement in areas adjacent to narrow beaches will likely end up in the ocean sooner, so the post-construction conditions are not as important as in areas with wider beaches and less rapid shoreline erosion.

5. Schedule/Next Steps

NCDOT-PDEA discussed the current schedule for the Pea Island inlet site:

- Complete Environmental Assessment (November 2012)
- Hold Public Meetings (December 2012)
- Complete Record of Decision (January 2013)
- Submit permit applications
- Award construction contract (March 2013)

The schedule for the Record of Decision is contingent upon a determination by FHWA and NCDOT that a Supplemental EIS is not required. NCDOT is proposing not to have a CP 4B/4C meeting for the Pea Island inlet site unless the Merger Team requests otherwise.

It was discussed that the schedule has not been finalized for the Rodanthe breach site, but the next steps are:

- Hold CP 3/4A meeting
- Complete Environmental Assessment/Record of Decision
- Submit permit applications
- Award design-build construction contract

NCDENR-DCM said that it is concerned with the schedule for the Pea Island inlet site with respect to allowing sufficient time to obtain CAMA permits.

USFWS-Raleigh said that it is concerned with the schedule with respect to allowing sufficient time to complete Section 7 formal consultation, as well as the fact that so many government agency employees are on vacation in December, during the review period for the Environmental Assessment.

NCDOT-PDEA said that the schedule for the Rodanthe breach site needs to be discussed further with FHWA before it is finalized, but NCDOT tentatively hopes to complete the EA in March 2013.

NCDOT-PDEA said that it was not going to ask for a CP 4A concurrence vote for the Pea Island inlet site today based on the agency concerns expressed at the meeting.

Phase I Status Update Meeting Highlights

SAV Mitigation

Mark Fonseca (of CSA International, NCDOT's SAV mitigation contractor) presented a slideshow titled "Bonner Bridge Seagrass Mitigation" (see attached slides). The presentation included the following topics:

- **Relationship of seagrass landscape patterns to waves and currents** – Seagrass landscapes in North Carolina respond to increasing waves and currents by becoming increasingly fragmented. In addition, seagrass landscape patterns follow a predictable relationship with wave energy regime, and it is theorized that this can be exploited to create new ecosystem services by increasing seagrass cover.
- **SAV mitigation strategy** – The SAV mitigation strategy is to reduce wave energy on open water, patchy seagrass beds to facilitate bed coalescence and increase cover per unit area of seafloor. This will create substantial amounts of non-discounted acre-years of seagrass service "lift." Research has revealed that manipulation of seagrass wave energy regimes produced landscapes consistent with model forecasts. In addition, bathymetry is all-important for wave modeling. As many seagrass beds do not have accurate bathymetry, it must be developed to make forecasts of wave regimes.
- **Approximate location of potential sites for Bonner Bridge seagrass mitigation plan** – Final wave modeling is still underway to confirm selection of site, but the strategy should create approximately 1.28 acres of new seagrass cover.

- **Wave break design to meet five year removal target** – A fence-like design will be used to break the waves around the SAV mitigation sites. The fence may not extend to the seafloor and would incorporate mesh to keep out rays but allow access to small fish, shrimp, and crabs.
- **Project requirements** – Include the following: USACE requires no permanent structures, so wave break structures will be removed at the end of five years; other permitting, as required; protection of the sites from other possible disturbances; signage to inform purpose of projects and deter impacts; five years of monitoring; and contingencies (e.g., maintenance of structures).
- **Current status** – Completed: initial site surveys and selection; bathymetry collection in post processing; Upcoming: wave modeling to classify energy regime of sites; confirm site selection; wave break design; permitting and subcontracting for wave breaks; limited transplanting; and monitoring.

NCDENR-DCM asked if there would be further monitoring of the sites after the wave breaks are removed. CSA International responded that this was not in its current contract, but was an issue that needs to be addressed. CSA International added that this is the only place in the world where this type of work is occurring. NCDOT-NES said that there would be continued monitoring after the wave breaks are removed, but it was not sure if the monitoring would be done in-house by NCDOT, or if CSA International would be used for this work. NCDOT-NES added that it recognizes the importance of continued monitoring after the wave breaks are removed.

NCDENR-DCM said that it is concerned with public access issues related to the areas that will be blocked-off by the wave breaks because the sound is a Public Trust Water. NCDENR-DCM said that if the number of structures required for the wave breaks is four (essentially forming a box around the SAV mitigation site), this is a concern – one wave break would be acceptable, but adding more and blocking off an area is a concern. CSA International indicated that the number of wave breaks will depend on the direction of the wave energy.

USFWS-Refuge said that if the mitigation sites are within the Refuge Proclamation Boundary, then it would be concerned about the risk of disturbing birds. CSA International responded that it would do further research on the location of this boundary, but this issue did not come up in the original GIS analysis that CSA International completed of the study area.

NPS asked about the maintenance of the wave breaks. CSA International responded that this has been considered. CSA International said that the wave breaks need to be well marked and maintained, and that local contractors will be used to regularly maintain the structures.

NCDENR-DCM said that the proposed SAV mitigation sites, as discussed today, will require a permit modification to the Phase I Oregon Inlet bridge replacement permit. NCDENR-DCM added that this should not be a problem as long as all of the pertinent agencies are in agreement and any concerns are addressed.

Wetland Mitigation Update

NCDOT-NES discussed the current status of wetland mitigation for Phase I. There were no major agency comments on the last draft of the mitigation plan, so NCDOT-NES is now considering it to be final. NCDOT-NES said it would send out a copy of the final mitigation plan to the team.

NCDOT-NES said that NCDOT-Division 1 met with representatives from Dominion Power to discuss spraying enhancements. Dominion is on board with the enhancements, but additional discussions are still needed with NPS. Additional meetings are also needed with NPS to discuss other potential contract provisions, such as preferred spraying windows and setbacks from boardwalks for spraying.

NCDOT is completing internal review of the Wetland Statement of Findings for Phase I (prepared as part of the NPS permit application), and it will be submitted to NPS once this review is completed.

In response to a question as to whether the area in the Bodie Island pond area that NCDOT identified for phragmites control got bigger this summer, NCDOT-NES responded that the initial approximately 50-acre area has not yet been re-delineated, but NCDOT-NES would try to do that this spring.

The type of herbicide to be used was discussed, including one called “Habitat.”

The meeting was adjourned at 4:00 PM.

file no.: 3301-2.7.2

J:\PLANNING\Bonner SDEIS\2011 Reevaluations\Merger and Other Agency Meetings\November 14, 2012 Merger Meeting\Bonner Merger Team Meeting Minutes (11-14-12) - second draft 11-29-12.docx

November 14, 2012 1:00 pm – 4:00 pm

Bonner Bridge – NC 12 Transportation Management Plan - Phase II Merger Team Meeting

Meeting Purposes

- Finalize concurrence on Pea Island- CP2/2A, CP 3 and Rodanthe- CP 2/2A
- Reach concurrence on Pea Island- CP 4A (Avoidance and Minimization)
- Update on Phase I wetland/ SAV mitigation

NC 12 Repair Update

Canal Zone, October 30

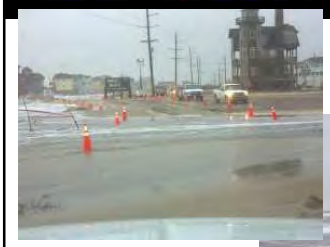
NC 12 Repair Update

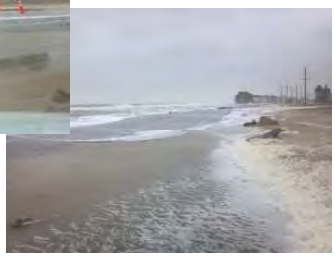
Temporary Bridge, October 30

NC 12 Repair Update

Mirlo Beach, November 8

NC 12 Repair Update





Mirlo Beach, November 14

Phase II

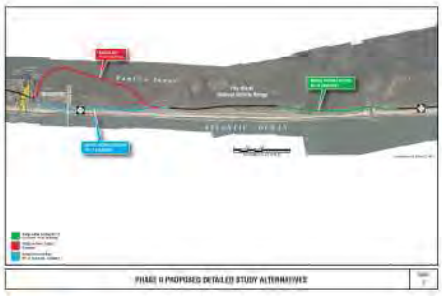
CP 2/2A Summary

- Phase II Alternatives
  - **Pea Island**:
    - Beach Nourishment
    - Bridge on New Location
    - Road on New Location
    - Bridge within Existing NC 12 Easement
  - **Rodanthe**:
    - Beach Nourishment
    - Bridge on New Location
    - Bridge within Existing NC 12 Easement
    - Bridge within Existing NC 12 Easement and Beach Nourishment
- "Seven-mile" bridge alternative

→ Bridge within Existing NC 12 Easement

→ Bridge on New Location; Bridge within Existing NC 12 Easement

Phase II Proposed Alternatives for Evaluation



Prior Concurrence Vote (March)

- CP 2/2A (both sites), CP 3 (Pea Island)
  - Concur: NCDOT, NCDWQ, NCDCM, SHPO
  - Non-Concur: FHWA, USACE
  - Abstain: USFWS- Refuge, NPS, USFWS, NMFS, NCDMF, NCWRC, USEPA
- FHWA, USACE reached concurrence on October 29

CP 4A – Pea Island

- Topics:
  - Wetland Impacts
  - Temporary Construction Easements
  - Temporary Bridge removal
  - Pile jetting- Spoil disposal
  - Pile jetting- Water source
  - Stormwater collection

Wetland Impacts

- Updated impacts:
  - 0.01 acres permanent fill (Bent #67)
  - 1.12 acres temporary fill
- Impacts based on post-Irene delineations (Summer 2012)
- NCDOT to check wetland boundaries post-Sandy

Temporary Construction Easements

- Approximately 2.53 acres on both sides of existing easement
- Most in area near temporary bridge

Temporary Bridge Removal

- Pile removal
  - Preference to use vibratory hammer
  - Jetting may be required
- Sheet pile removal
  - Anticipated mid-construction
  - Other temporary shoring (sandbags) would be installed in place of sheet pile

Pile jetting- Spoil disposal

- Preference to dispose of jetting spoils onsite
- No spoils would be disposed of within wetlands
- Jetting spoils within inlet

Pile jetting- Water source

- Preference to use water from inlet or sound
- Minimum of three sites needed
- Approximately 1.5-2 feet of water depth needed for intake pipe

Stormwater Management Plan

- Plan is same as for Phase I- Oregon Inlet bridge
- Collect runoff from ends of bridge
  - Piped to rip rap apron
  - Drain to roadside swales
- Open scuppers for main spans of bridge

Other Issues

- Bridge barrier/ rail
- Construction staging areas
- Post-construction site conditions

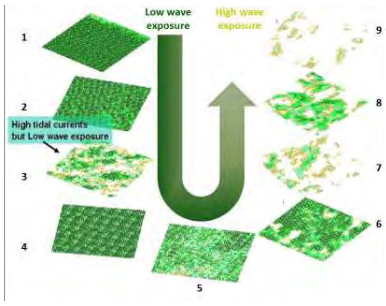
Schedule/ Next Steps

- Pea Island:
  - Complete Environmental Assessment (November 2012)
  - Hold Public Meetings (December 2012)
  - Complete Record of Decision (January 2013)
  - Submit permit applications
  - Award construction contract (March 2013)
- Rodanthe:
  - Hold CP 3/4A meeting
  - Complete Environmental Assessment/ Record of Decision
  - Submit permit applications
  - Award design-build construction contract

Bonner Bridge Seagrass Mitigation

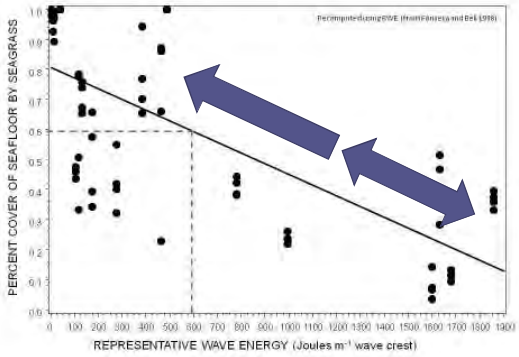
Oregon Inlet, Northern Outer Banks, North Carolina

Mark Fonseca, Ph.D., Senior Ecologist



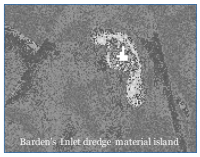
Peer Reviewed Literature Basis

Fonseca et al., 1983; Fonseca and Bell 1998; Fonseca et al. 1998; Fonseca et al. 2000; Kelly et al. 2001; Fonseca et al. 2002; Bell et al. 2006; Fonseca et al. 2007

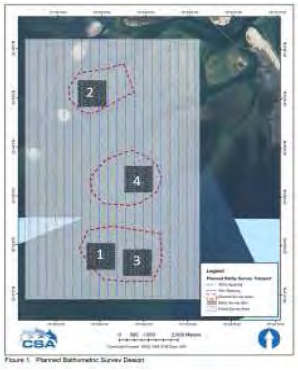


Mitigation Strategy

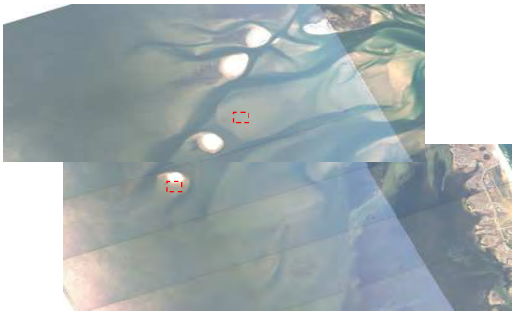
- Reduce wave energy on open water, patchy seagrass beds to facilitate bed coalescence and increase cover per unit area seafloor
- This will create substantial amounts of non-discounted, acre - years of seagrass service 'lift'



Mitigation Strategy (Cont.)

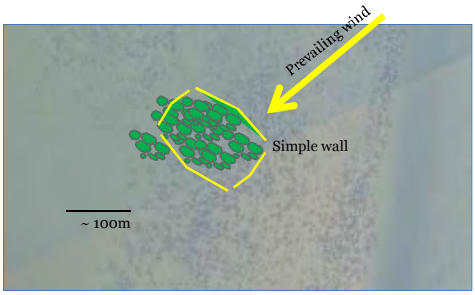


Mitigation Strategy (Cont.)



Mitigation Strategy (Cont.)

- Create ≥ 1.28 acres of new seagrass cover



Mitigation Strategy (Cont.)

- Wave break design to meet 5-yr removal target

Project Requirements

- USACE requires no permanent structures (structures will be removed at the end of 5 years)
- Sites
  - Avoid ownership conflicts (e.g., private lands, National Seashore)
- Other permitting, as required
  - We will work with agencies to obtain any required permits
- Protection from other possible disturbances
  - Avoid potentially shifting channels and vessel traffic
  - Temporary bioturbation fencing (as a contingency, below)
- Signage to inform purpose of project and deter impacts
  - Reflective, informative signs
  - Perimeter buoys / lights
- 5 years of monitoring
  - Twice a year initially; annually thereafter
  - Random assessment of BBL coverage by species stratified by wave energy level
- Contingency
  - Wave break maintenance – 1 major re-service
  - Bioturbation exclusion
  - Sign, light, and buoy maintenance

Status

Completed

- Initial site surveys and selection
- Bathymetry collection– in post processing

Upcoming

- Wave modeling to classify energy regime of sites
- Confirm site selection
- Wave break design
- Permitting and sub-contracting for wave break
  - Estimated start spring 2013
- Limited transplanting
- Monitoring

Questions?

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

January 22, 2013

John F. Sullivan, III, P.E.
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

Dear Mr. Sullivan:

The U.S. Fish and Wildlife Service (Service) has received your January 10, 2013 request for reinitiation of formal consultation under Section 7 of the Endangered Species Act (ESA) for the replacement of Bonner Bridge over Oregon Inlet in Dare County, North Carolina, TIP No. B-2500, Federal Aid Project No. BRS-2358(15). Your letter and the accompanying Technical Memo dated November 9, 2012 were received on January 11, 2013.

The Service issued a Biological Opinion (BO) for this project on July 10, 2008. The BO assessed the effects of the project on the federally listed piping plover (*Charadrius melodus*), loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), and critical habitat for wintering piping plovers. Since the issuance of the BO, the project alignment, design and construction methodology have been refined, thus necessitating a reassessment of the effects to federally listed species. In addition, the Federal Highway Administration has requested a modification of one of the Terms and Conditions of the BO.

On July 2, 2012, a field meeting and lighting demonstration was held on-site to discuss potential changes in the use of construction lights and their effects on sea turtles. During that meeting the Service agreed that amber-colored LED construction lights with a predominant wavelength of ~650nm were preferable to the low-pressure sodium-vapor lights previously agreed to. In the BO, Sea Turtle - Term and Condition 3, in part, currently reads "During turtle nesting season, portable construction lighting must be of the low-pressure sodium-vapor type." As per your request, the Service amends this portion of the Term and Condition to read "During turtle nesting season, portable construction lighting must be amber-colored LED lights with a predominant wavelength of ~650nm." The remaining portion of Sea Turtle - Term and Condition 3 and all other Terms and Conditions remain in effect.

After reviewing the project design and construction methodology changes detailed in the submitted Technical Memo, the Service agrees with your conclusion that the changes do not alter the previous effects determinations for listed species and critical habitat. In addition, the Service believes that the amount or extent of incidental take anticipated, as addressed in the BO, will not

be changed for the worse. With some of the design changes (e.g. no longer using old U.S. Coast Guard Station property as a staging area), the amount of incidental take may possibly be decreased. With the exception noted above, we believe that all Reasonable and Prudent Measures and Terms and Conditions of the BO are still appropriate and adequate.

This concludes formal consultation on the action outlined in your January 10, 2013 request for reinitiation of formal consultation. As provided in 50 CFR section 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Pete Benjamin
Field Supervisor

Electronic copy:
Bill Biddlecome, USACE, Washington, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Atlanta, GA
Beth Smyre, NCDOT, Raleigh, NC
Michael Turchy, NCDOT, Raleigh, NC
Clay Willis, NCDOT, Edenton, NC
Sandy MacPherson, USFWS, Jacksonville, FL
Dennis Stewart, USFWS, Manteo, NC
Scott Lanier, USFWS, Manteo, NC
Ken Graham, USFWS, Atlanta, GA

From: Bryant, Mike [mailto:mike_bryant@fws.gov]
Sent: Thursday, February 07, 2013 3:21 PM
To: Coleman, Clarence (FHWA)
Cc: Pete Jerome; Barbara West; Scott Lanier; Dennis Stewart; Pete Benjamin; Gary Jordan; Darrell Echols; Steve Thompson
Subject: FHWA's temporary occupancy determination for Phase IIa of B-2500 - Request for agreement on 4(f) determination

Clarence,
After consultation with my Atlanta DOI Solicitor's Office I am prepared to respond to the request in a December 6, 2012 letter from Mr. Ron Lucas with the FHWA to Mr. Dennis Stewart with the FWS.

I. My response is limited to the specific request.
II. FHWA and NCDOT are asking for a temporary easement to perform such tasks related to the overall construction such as erecting erosion control structures, placing temporary shoring, staging areas, and pipe placement. These actions would all be temporary in nature. FHWA asserts that this "easement" would be a temporary occupancy and thus not a "use" of the Refuge requiring approval under Section 4(f) of the Department of Transportation Act of 1966. FHWA cites the 4(f) implementing regulations at 23 C.F.R. 774.13(d), which set forth the criteria for a temporary occupancy:
(1) Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in the ownership of the land;
(2) Scope of the work must be minor, i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal;
(3) There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;
(4) The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project; and
(5) There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

It appears that the FHWA/NCDOT request cites the correct legal authority. The request represents that the proposed occupancy would meet all of these criteria. To the best of my knowledge, the "easement" does meet all of these criteria. Therefore, as the "official with jurisdiction over the 4(f) resource," I can satisfy criterion (5) by documenting such agreement and providing it to FHWA/NCDOT.

III. I wish to make it clear in my response that by "4(f) resource," I mean the Refuge both as a historic property and as a National Wildlife Refuge.

IV. By way of this email, per your request, this is my notification to FHWA of my concurrence with your request which indicates my agreement with FHWA's determination, and as part of this notification I specify that after receiving a request from NCDOT for a permit and, assuming the proposed use is determined to be compatible, I would issue a Special Use Permit (SUP) rather than an easement being issued. I would not be conveying any kind of recordable property interest but rather, in effect, a license.

V. Finally, I note that the issuance of a SUP will be an agency action that would require NEPA analysis, intra-agency consultation under the ESA, and possibly other environmental due diligence (for instance, the occupancy area contains some wetlands, meaning possible Section 404 consultation with the Corps). However, to the extent that these issues have already been considered in the compliance process for the construction project as a whole, there may be no need to repeat them, or at most you would have to incorporate the results of the earlier analysis by reference into a shorter compliance document. In either case, the administrative record for the permit issuance should document the nature of the environmental compliance.

I hope this meets your need. If you have questions please contact me. Please have NCDOT request the permit as soon as possible because I will need time to process the request.

Michael R. Bryant
Project Leader
Coastal North Carolina
National Wildlife Refuges Complex
P.O. Box 1969
100 Conservation Way
Manteo, NC 27954
mike_bryant@fws.gov
252-473-1131 ext 222
fax 252-473-1668
cell 252-216-7505

From: Clarence.Coleman@dot.gov [mailto:Clarence.Coleman@dot.gov]
Sent: Friday, February 08, 2013 10:54 AM
To: Gledhill-earley, Renee
Cc: Hanson, Robert P; Yamamoto, Brian F; Smyre, Elizabeth A; Ron.Lucas@dot.gov
Subject: RE: Temporary easements-Bonner Phase IIa

Renee:

Your 12/14/12 and 12/19/12 emails below document the SHPO's agreement with FHWA's temporary easement determination. For your information, I received an email from USFWS yesterday (2/7/13) documenting their agreement on this determination.

I appreciate your cooperation. If you have any questions, please let me know.

Thanks,
Clarence

From: Gledhill-earley, Renee [mailto:renee.gledhill-earley@ncdcr.gov]
Sent: Wednesday, December 19, 2012 11:26 AM
To: Coleman, Clarence (FHWA)
Subject: FW: Temporary easements-Bonner Phase IIa

If you need something other than this. Or, something more formal, let me know as we also consider this a temporary easement rather than use.
Renee
--
Renee Gledhill-Earley
Environmental Review Coordinator
NC State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617
Phone: 919-807-6579 Fax: 919-807-6599
http://www.hpo.dcr.state.nc.us
Special Notice: To expedite review of your project, you may wish to follow the directions found at http://www.hpo.ncdcr.gov/er/er_email_submittal.html for submitting requests via email.
This message does not necessarily represent the policy of the Department of Cultural Resources. E-Mail to and from me, in connection with the transaction of public business, is subject to the North Carolina Public Records Law (N.C.G.S. 132) and may be disclosed to third parties.

From: Gledhill-earley, Renee
Sent: Friday, December 14, 2012 11:11 AM
To: 'Ron.Lucas@dot.gov'; dennis_stewart@fws.gov
Subject: RE: Temporary easements-Bonner Phase IIa

That is my understanding, but seems the final decision is with USFWS.
Renee

--
Renee Gledhill-Earley
Environmental Review Coordinator

NC State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617
Phone: 919-807-6579 Fax: 919-807-6599
http://www.hpo.dcr.state.nc.us
Special Notice: To expedite review of your project, you may wish to follow the directions found at http://www.hpo.ncdcr.gov/er/er_email_submittal.html for submitting requests via email.
This message does not necessarily represent the policy of the Department of Cultural Resources. E-Mail to and from me, in connection with the transaction of public business, is subject to the North Carolina Public Records Law (N.C.G.S. 132) and may be disclosed to third parties.

From: Ron.Lucas@dot.gov [mailto:Ron.Lucas@dot.gov]
Sent: Thursday, December 13, 2012 4:11 PM
To: Gledhill-earley, Renee; dennis_stewart@fws.gov
Subject: Temporary easements-Bonner Phase IIa

Hello to all. I just wanted to see if you had the opportunity to review information regarding the temporary easements and our determination that this would be considered a "temporary occupancy" in regards to section 4(f) of the USDOT Act of 1966.

Ronald G. Lucas, Jr., P.E.
Preconstruction and Environment Engineer
Federal Highway Administration - North Carolina Division
(919)747-7019

Appendix B

Public Involvement Materials and Correspondence

B. Public Involvement Materials and Correspondence

NOVEMBER 2011 NEWSLETTER **B-2**

WORKSHOP HANDOUT **B-3**

PUBLIC WORKSHOP DISPLAY BOARDS **B-12**

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Issue No. 6 November 2011

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

Bonner Bridge Update

TIP Project No. B-2500 Dare County, North Carolina

NCDOT STARTS PHASE II OF BONNER BRIDGE REPLACEMENT PROJECT

Hurricane Irene hit the North Carolina coast on Aug. 27 and breached NC 12 in two locations – northern Rodanthe and within the Pea Island National Wildlife Refuge. The North Carolina Department of Transportation (NCDOT) has completed temporary repairs at the two breach sites and reopened NC 12 to traffic on Oct. 10. With traffic restored to the area, NCDOT has started work on long-term solutions for these two sites, which are considered Phase II of the Bonner Bridge Replacement Project. Before any decisions are made on long-term fixes, NCDOT wants to hear what the citizens think about the design options under consideration.

PUBLIC WORKSHOPS SCHEDULED

Public workshops are scheduled for Dec. 5 in Manteo and Dec. 6 in Rodanthe. These workshops will provide the public with an opportunity to learn more about the design options under consideration for each breach site. **The same information will be available at both workshops.**

The workshops will be informal, with the public welcome to drop in any time between 4 p.m. and 7 p.m. to view displays of the design options. Study team members will be available to explain them and answer any questions. The public is urged to share their ideas, thoughts, and suggestions with study team members.

If you cannot attend a workshop, you may write the study team or call the toll-free project information line with your comments or questions. See the second page of this newsletter for the names and numbers of the study team contacts.

NCDOT will provide auxiliary aids and services under the Americans with Disabilities Act for disabled persons who wish to participate in these workshops. Anyone requiring special services should contact the study team.

Bulletin Board

BONNER BRIDGE CITIZENS INFORMATIONAL WORKSHOPS

December 5, 2011
4:00 – 7:00 PM
MANTEO
Dare County Administration Building
954 Marshall Collins Drive
Manteo, NC

December 6, 2011
4:00 – 7:00 PM
RODANTHE
Rodanthe-Waves-Salvo Community Center
23186 Myrna Peters Road
Rodanthe, NC

LONG-TERM OPTIONS UNDER CONSIDERATION FOR BOTH BREACH SITES

The design options studied as part of the Bonner Bridge Replacement Project represent the range of what could be built in future phases along NC 12 between Oregon Inlet and Rodanthe. Using this information, NCDOT has established several possible options for fixing the two breaches for the long term.

For the Pea Island breach, these options include:

- Beach renourishment;
- Building a bridge within the existing NC 12 easement; and
- Building a bridge or road on a new location to the west of the existing road.

For the Rodanthe breach, these options include:

- Beach renourishment;
- Building a bridge within the existing NC 12; and
- Building a bridge or road on a new location to the west of the existing road, possibly extending into Pamlico Sound.

Continued on next page

Long-Term Options Under Consideration for Both Breach Sites (continued from page 1)

After analyzing the changes to existing conditions in the project area as a result of Hurricane Irene, NCDOT will re-evaluate the impacts of these design options to determine the best long-term solutions for both breach sites. Comments received from state and federal environmental resource and regulatory agencies, as well as from the public, will also help guide the development of the Phase II designs.

BONNER BRIDGE REPLACEMENT STATUS

In the December 2010 Record of Decision (ROD) for the Bonner Bridge Replacement Project, NCDOT agreed to construct a new bridge over Oregon Inlet that is parallel to, and just west of, the current Bonner Bridge as Phase I of the project. The new bridge over Oregon Inlet is currently in the design phase, with construction scheduled to begin in January 2013. The new bridge is set to open to traffic in spring 2015.

For more information about the damage to NC 12 from Hurricane Irene and NCDOT's efforts to temporarily fix it, visit *www.ncdot.org/travel/nc12recovery*, follow our NC 12 Twitter feed at *http://twitter.com/NCDOT_NC12*, or go to our Repairing NC 12 blog at *http://nc12repairs.blogspot.com/*. You may also visit the Bonner Bridge Replacement Project web page at *www.ncdot.org/projects/bonnerbridgerepairs*.

Feel Free to Contact the Study Team

If you have any questions or wish to be added to our newsletter mailing list, please call **Bobby Norburn** or **John Page** on our **Toll-Free Project Information Line, 1-866-803-0529**. You may also write the study team at:

Ms. Beth Smyre
NC Department of Transportation
Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548
bsmyre@ncdot.gov

-- or --

Mr. Bobby Norburn
Parsons Brinckerhoff
434 Fayetteville Street
Suite 1500
Raleigh, NC 27601
norburn@pbworld.com

North Carolina Department of Transportation
Project Development and Environmental Analysis Unit
Attention: Beth Smyre
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

Bonner Bridge Public Workshops

TIP Project No. B-2500 Dare County, North Carolina

WELCOME to the Bonner Bridge – Phase II Public Workshops

Monday, December 5, 2011

4:00 p.m. to 7:00 p.m.
Dare County Administration Building
954 Marshall Collins Drive, Manteo

Tuesday, December 6, 2011

4:00 p.m. to 7:00 p.m.
Rodanthe-Waves-Salvo Community Center
23186 Myrna Peters Road, Rodanthe

Thursday, January 5, 2012

5:00 p.m. to 7:00 p.m.
Ocracoke Community Center
1009 Irvin Garrish Highway, Ocracoke

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PURPOSE OF PUBLIC WORKSHOP

Today's workshop is an important step in the North Carolina Department of Transportation's (NCDOT) procedure for making you, the public, a part of the project development process. The purpose of the workshop is to obtain public input on Phase II of the Bonner Bridge Replacement project. NCDOT is holding three workshops, but the same information will be available at all of the workshops.

Hurricane Irene hit the North Carolina coast on August 27, 2011 and breached NC 12 in two locations – northern Rodanthe and within the Pea Island National Wildlife Refuge. NCDOT completed temporary repairs at the two breach sites and reopened NC 12 to traffic on October 10, 2011. With traffic restored to the area, NCDOT has started work on long-term solutions for these two sites, which combined are considered Phase II of the Bonner Bridge Replacement Project. However, before any decisions are made on long-term fixes, NCDOT wants to hear what you think about the design options under consideration.

Today's workshop is intended to provide you with an opportunity to learn more about the design options under consideration for each breach site. The workshop will be informal, with the public welcome to drop in at any time during the scheduled hours to view displays of the design options. Study team members will be available to explain the design options and answer any questions. You are urged to share your ideas, thoughts, and suggestions with study team members at today's workshop. You may also make comments or ask questions by filling out the comment sheet attached to this handout and leaving it in the comment box, mailing it by January 20, 2012 to the study team at one of the addresses shown below, or calling the toll-free project information line (1-866-803-0529).

Ms. Beth Smyre
NCDOT – Project Development
and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548
E-mail: bsmyre@ncdot.gov

Mr. Bobby Norburn
Parsons Brinckerhoff
434 Fayetteville Street
Suite 1500
Raleigh, NC 27601
E-mail: norburn@pbworld.com

After the comment period ends on January 20, 2012, all comments will be reviewed by the NCDOT Bonner Bridge project team. The information you provide will help NCDOT develop the project by including input from all stakeholders prior to project decisions being made. NCDOT considers a number of factors, including the public's comments, in making decisions.

PROJECT DESCRIPTION

NCDOT proposes to construct a bridge to replace the Herbert C. Bonner Bridge (Bonner Bridge) in Dare County, demolish and remove existing Bonner Bridge, and improve NC 12 between the community of Rodanthe and Oregon Inlet.

The Federal Highway Administration (FHWA) and NCDOT issued the decision document for the Bonner Bridge Replacement Project, which is called a Record of Decision (ROD), on December 20, 2010. It selected the Parallel Bridge Corridor with NC 12 Transportation Management Plan as the alternative for the project. This alternative includes:

- Construction of a new parallel bridge ("short bridge") across Oregon Inlet as soon as possible (Phase I of the project); and
- The implementation of a coastal monitoring program on Hatteras Island between Oregon Inlet and Rodanthe to determine when and what to build for future phases of the project.

As a result of the damage caused by Hurricane Irene, Phase II of the project will develop long-term solutions for the two sections of NC 12 breached during the storm. The coastal monitoring program will continue during the planning and implementation of Phase II to determine the areas that later phases of the project should address.

The Bonner Bridge Replacement Project study area, along with the location of Phases I and II of the project, is shown on Figure 1 on the next page.

SUMMARY OF HURRICANE IRENE REPAIRS

NCDOT completed temporary repairs to the damage caused by Hurricane Irene and reopened NC 12 to traffic on October 10 – just seven weeks after the storm hit. Six miles south of Oregon Inlet within the Pea Island National Wildlife Refuge, crews installed a temporary metal bridge to span the largest breach on the Refuge, while filling in the three smaller breaches with sand. The bridge is a two-lane Mabey Universal Bridge manufactured with a modular design that allowed it to be assembled quickly. Although the bridge is a temporary solution and will require frequent maintenance, its strength and durability will allow it to remain in place for many years to keep traffic flowing.

In Rodanthe, crews filled in the breach with sand and used sandbags to stabilize sections of the roadway. The dunes on the east side of the roadway that were damaged were repaired.

Figure 1

WHAT ARE THE ALTERNATIVES UNDER CONSIDERATION?

Under the Parallel Bridge Corridor with NC 12 Transportation Management Plan, the options that were studied for the section of NC 12 between Oregon Inlet and Rodanthe may be used in future sections of the project. These options were presented to the public as part of the Parallel Bridge Corridor at public hearings in November 2005, March 2007, and July 2010. Those options were called:

- Nourishment Alternative – NC 12 would remain in its current location, and beach nourishment (combined with dune enhancement) would be used to maintain an adequate protective beach and dune system. Nourishment would occur in four locations, likely repeated at four-year intervals.
- Road North/Bridge South Alternative – NC 12 would be relocated as a road west of the forecasted 2060 high erosion shoreline in the north end of the Refuge. At the south end of the Refuge and in Rodanthe, NC 12 would be placed on a bridge west of Hatteras Island.
- All Bridge Alternative – NC 12 would be relocated onto a bridge west of the forecasted 2060 high erosion shoreline in the north end of the Refuge. At the south end of the Refuge and in Rodanthe, NC 12 would be placed on a bridge west of Hatteras Island.
- Phased Approach Alternatives – NC 12 would be elevated in its current easement onto a series of bridges within the Refuge and in Rodanthe. There are two options for the Phased Approach in Rodanthe. The Phased Approach/Rodanthe Nourishment Alternative includes a bridge that ends just south of the Refuge border and the use of beach nourishment to stabilize NC 12 in Rodanthe. The Phased Approach/Rodanthe Bridge Alternative includes a bridge in Rodanthe that ends just north of the Rodanthe Historic District (no beach nourishment).

Based on the alternatives above, NCDOT has proposed several possible options for fixing the two breaches for the long-term.

For the Pea Island breach, these options include:

- Beach nourishment;
- Building a bridge within the existing NC 12 easement;
- Building a bridge on a new location to the west of the existing road; and
- Building a road on a new location to the west of the existing road.

For the Rodanthe breach, these options include:

- Beach nourishment;
- Building a bridge within the existing NC 12 easement;
- Building a bridge within the existing NC 12 easement and beach nourishment; and
- Building a bridge on a new location in Pamlico Sound.

These options are shown on Figures 2 and 3 on the following pages and in detail on the maps available at tonight's meeting.

Figure 2

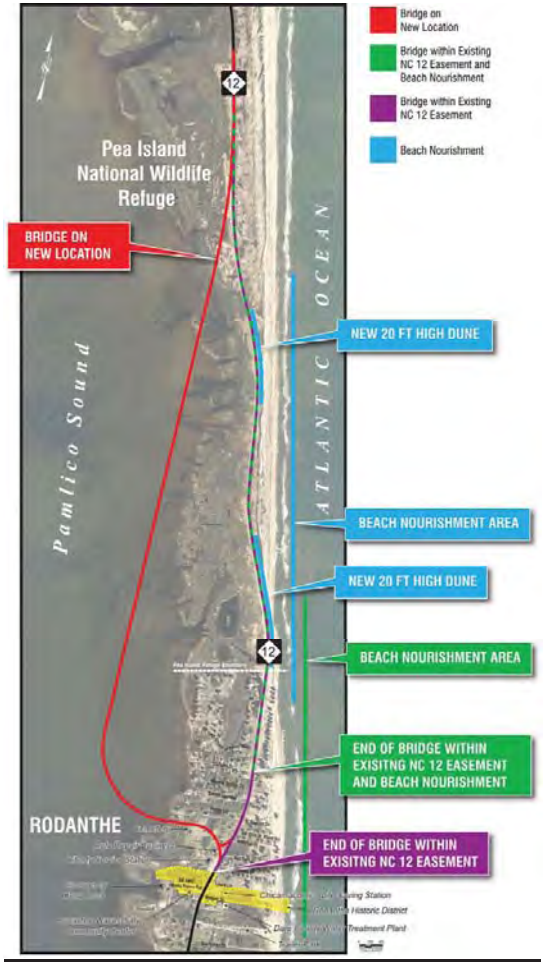


Figure 3

After analyzing the changes to existing conditions in the project area as a result of Hurricane Irene, NCDOT will re-evaluate the impacts of these design options to determine the best long-term solutions for both breach sites. Comments received from state and federal environmental resource and regulatory agencies, as well as from the public, will be used to determine which options should be studied further and ultimately which options are selected for each site.

IMPACT ANALYSIS

Tables 1 and 2 on the following pages illustrate the potential impacts of each option for the two breach sites. The information presented here is based on studies conducted for the project prior to Hurricane Irene; NCDOT will update this impact information to account for the current environmental conditions for those options that are chosen for further study. Only the most current information available will be used to select the final option for each site.

Included in the analysis of each site in Tables 1 and 2 is a list of potential concerns with each option that could prohibit the option from being studied further. These concerns are based on comments to NCDOT made by either the federal and state agencies associated with the project, or by coastal engineers and scientists that NCDOT has consulted with during the life of the project.

PROJECT COSTS

The contract for the final design and construction of the new Oregon Inlet bridge (Phase I of the project) was awarded in July 2011 at a cost of $215.8 million.

The project's Record of Decision (ROD) presented a range of costs for different options for maintaining NC 12 between Oregon Inlet and Rodanthe. At that time, the costs of the Parallel Bridge Corridor alternatives (not including the cost of the new Oregon Inlet bridge) were as shown in Table 3 on page 11.

Long-term bridging options for the Pea Island Breach site are estimated to cost between $97 million and $147 million (2006 dollars); these costs represent only the initial construction cost of a new bridge.

Long-term bridging options that span the Rodanthe Breach site only are estimated to cost between $114 million and $240 million (2006 dollars); these costs represent only the initial construction cost of a new bridge.

Because the beach nourishment and road relocation options extend beyond the immediate breach areas, cost estimates for those options are not immediately available.

Updated construction cost estimates for the two breach sites will be prepared for the long-term options that are chosen for further detailed study.

Table 1. Phase II Impacts – Pea Island Breach Area

	Beach Nourishment	Bridge on New Location	Road on New Location	Bridge within Existing NC 12 Easement
Community and Visual Impacts				
Visual Impact	None	Sizeable visual intrusion into the landscape of the Refuge.	None	Sizeable visual intrusion into the landscape of the Refuge.
Anticipated Need for Refuge Compatibility Determination	Compatibility Determination expected (for all alternatives that use Refuge lands outside the existing NC 12 easement).	Compatibility Determination expected (for all alternatives that use Refuge lands outside the existing NC 12 easement).	Compatibility Determination expected (for all alternatives that use Refuge lands outside the existing NC 12 easement).	No Compatibility Determination required.
Cultural Resource Impacts				
Pea Island National Wildlife Refuge (historic site)	No Adverse Effect.	Adverse Effect because the relocation of NC 12 would intrude into the existing dikes and ponds, and because of the elevation of the bridge as it passes through the Refuge.	Adverse Effect because the relocation of NC 12 would intrude into the existing dikes and ponds.	Adverse Effect because of the elevation of the bridge as it passes through the Refuge.
Parks and Recreation Impacts				
General Refuge Access	Little change in access. Refuge facilities protected from future beach erosion.	Direct access to some Refuge facilities lost.	Paved road access maintained but with some changes.	Direct access to some Refuge facilities lost.
Coastal Conditions Impacts				
Potential for Breach and Need for Closing Breach to Maintain NC 12	If additional breach occurs, breach would need to be closed.	Potential (and current) breach areas bridged. No expected need to close future breaches.	If additional breach occurs, breach would need to be closed.	Potential (and current) breach areas bridged. No expected need to close future breaches.
Natural Resources Impacts				
Biotic Communities Fill and Pile Impacts, acres (hectares)				
• **Wetlands**	0.8 (0.3)	0.1 (0.1)	3.0 (1.2)	0.1 (0.1)
• **Uplands – Natural and Man Dominated**	2.7 (1.1)	1.6 (0.6)	10.5 (4.2)	1.2 (0.5)
• **Aquatic Bottom**	0.0 (0.0)	0.0 (0.0)	0.2 (0.1)	0.0 (0.0)
Total	3.5 (1.4)	1.7 (0.7)	13.7 (5.5)	1.3 (0.5)
Wetlands shaded, acres (hectares)	0.0 (0.0)	1.1 (0.4)	0.0 (0.0)	0.2 (0.1)
Protected Species Impacts	Likely disturbance to piping plover and sea turtles nesting on beach; not likely to adversely affect in ocean. Beach nourishment could affect seabeach amaranth habitat.	None likely.	None likely.	None likely.
Potential Constraints	Not likely to be found compatible with Refuge's mission and purpose; sand quality and sand availability for a long-term solution is a concern; at least partial filling of breach would be required.	Not likely to be found compatible with Refuge's mission and purpose.	Not likely to be found compatible with Refuge's mission and purpose; at least partial filling of breach would be required.	None

Table 2. Phase II Impacts – Rodanthe Area

	Beach Nourishment	Bridge on New Location	Bridge within Existing NC 12 Easement	Bridge within Existing NC 12 Easement and Beach Nourishment
Community and Visual Impacts				
Residential Relocations	0	2	6	0
Business Relocations	0	5	7	0
Cemetery Impacts	None	Proposed right-of-way would cross cemetery, but no known gravesites would be affected.	None	None
Anticipated Need for Refuge Compatibility Determination	Compatibility Determination expected (for all alternatives that use Refuge lands outside the existing NC 12 easement).	Compatibility Determination expected (for all alternatives that use Refuge lands outside the existing NC 12 easement).	No Compatibility Determination required.	Compatibility Determination expected (for all alternatives that use Refuge lands outside the existing NC 12 easement).
Rodanthe Community Cohesion and Accessibility	No impact.	No impact.	0.8 mile (1.3 kilometers) of bridge would bisect community and make vehicle access more circuitous.	0.3 mile (0.5 kilometer) of bridge would bisect community; access more circuitous
Noise Impact (estimated number of sensitive receptors affected)	2 residential receptors exceeding FHWA NAC	3 residential receptors exceeding FHWA NAC, and 3 residential receptors (including 1 of the 3 exceeding FHWA NAC) and 1 business receptor with substantial noise increases	3 residential receptors exceeding FHWA NAC	2 residential receptors exceeding FHWA NAC
Visual Impact	None	Panoramic views of Pamlico Sound from homes along shoreline in Rodanthe would be affected.	Sizeable visual intrusion into the landscape of the Refuge; views in Rodanthe near the Refuge affected.	Sizeable visual intrusion into the landscape of the Refuge; views in Rodanthe near the Refuge affected.
Cultural Resource Impacts				
Rodanthe Historic District and Chicamacomico Life Saving Station	No Effect.	No Adverse Effect; the alternative ends outside the district, so cultural resources would not be directly affected; alternatives would be within view of resources, but view also currently includes modern commercial and residential structures.	No Adverse Effect; the alternative ends outside the district, so cultural resources would not be directly affected; alternative would be within view of resources, but view also currently includes modern commercial and residential structures.	No Effect
Pea Island National Wildlife Refuge	No Adverse Effect.	Adverse Effect because the alternatives would leave the existing NC 12 easement, and because of the elevation of the bridge as it passes through the Refuge.	Adverse Effect because of the elevation of the bridge as it passes through the Refuge.	Adverse Effect because of the elevation of the bridge as it passes through the Refuge.

Table 2 (concluded). Phase II Impacts – Rodanthe Area

	Beach Nourishment	Bridge on New Location	Bridge within Existing NC 12 Easement	Bridge within Existing NC 12 Easement and Beach Nourishment
Parks and Recreation Impacts				
General Refuge Access	Little change in access. Refuge facilities protected from future beach erosion.	Bridge through Pamlico Sound in southern portion of Refuge would reduce access in that area.	Bridge in existing NC 12 easement in southern portion of Refuge would reduce access in that area.	Bridge in existing NC 12 easement in southern portion of Refuge would reduce access in that area.
Length of NC 12 Outside the Existing Easement within the Refuge	None.	0.7 mile (1.1 kilometers)	None.	None.
Coastal Conditions Impacts				
Potential for Breach and Need for Closing Breach to Maintain NC 12	Nourishment would reduce the risk of a breach. Any breaches through the Refuge would need to be closed.	Potential breach area north of Rodanthe bridged. No expected need to close future breaches.	Potential breach area north of Rodanthe bridged. No expected need to close future breaches.	Potential breach areas bridged. Phases II and III may need to be accelerated, if a breach occurred before all four phases are completed.
Natural Resources Impacts				
Biotic Communities Fill and Pile Impacts, acres (hectares)				
• **Submerged Aquatic Vegetation (SAV)**	0.0 (0.0)	0.1 (0.1)	0.0 (0.0)	0.0 (0.0)
• **Wetlands**	0.0 (0.0)	2.0 (0.8)	0.0 (0.0)	0.0 (0.0)
• **Uplands – Natural and Man Dominated**	11.2 (4.5)	5.6 (2.2)	7.2 (2.9)	2.8 (1.1)
Total	11.2 (4.5)	7.7 (3.1)	7.2 (2.9)	2.8 (1.1)
Wetlands and SAV Shaded, acres (hectares)				
• **Wetlands**	0.0 (0.0)	1.5 (0.6)	0.0 (0.0)	0.0 (0.0)
• **SAV**	0.0 (0.0)	5.3 (2.1)	0.0 (0.0)	0.0 (0.0)
Protected Species Adversely Affected	Likely disturbance to piping plover and sea turtles nesting on beach; not likely to adversely affect in ocean. Beach nourishment could affect seabeach amaranth habitat.	None likely.	None likely.	Likely disturbance to piping plover and sea turtles nesting on beach; not likely to adversely affect in ocean. Beach nourishment could affect seabeach amaranth habitat.
Potential Constraints	Not likely to be found compatible with Refuge's mission and purpose; sand quality and sand availability for a long-term solution in an area with a rapid erosion rate is a concern; would require extensive dredging to acquire the sand needed; would have to be repeated frequently.	Not likely to be found compatible with Refuge's mission and purpose.	Rapid erosion rate in this area may cause portions of the structure to be in the surf zone or offshore in the future.	Same concerns as with beach nourishment option; in addition, rapid erosion rate in this area may cause portions of the structure to be in the surf zone or offshore in the future.

Table 3. Total Highway Costs through 2060*
(Costs for Alternatives to Maintain NC 12 between Oregon Inlet and Rodanthe, including the Two Breach Sites)

	Low	High
Beach Nourishment	$407,745,000	$657,260,000
Road North/Bridge South	$330,958,000	$412,958,000
All Bridge	$791,108,000	$1,063,108,000
Phased Approach/Rodanthe Nourishment	$816,068,000	$1,136,320,000
Phased Approach/Rodanthe Bridge	$797,459,000	$1,076,113,000

* All costs are in 2006 dollars. These estimates include the costs of project construction, maintenance, and mitigation.

RIGHT-OF-WAY PROCEDURES

Construction of Phase I (the new Oregon Inlet bridge) of the project will not require the purchase of land from private property owners. However, Phase II of the project within Rodanthe could require the purchase of private property and relocation of homes and businesses. Specific acquisitions will depend on the alternative selected.

After the final design of any future phase(s) is complete, the proposed right-of-way limits will be staked on the ground. If you are an affected property owner, a Right-of-Way Agent will contact you and arrange a meeting. The agent will explain the plans and advise you as to how the project will affect you. The agent will inform you of your rights as a property owner. If permanent right-of-way is required, professionals who are familiar with real estate values will evaluate or appraise your property. The evaluations or appraisals will be reviewed for completeness and accuracy; then, the Right-of-Way Agent will make a written offer to you. The current market value of the property at its highest and best use when appraised will be offered as compensation. The Department of Transportation must:

1. Treat all owners and tenants equally.
2. Fully explain the owner's rights.
3. Pay just compensation in exchange for property rights.
4. Furnish relocation advisory assistance.

Right-of-Way Agents are available at tonight's meeting to answer your questions.

RELOCATION ASSISTANCE

If you are a relocatee, that is, if your residence or business is to be acquired as part of the project, additional assistance in the form of advice and compensation is available. You will be provided with assistance on locations of comparable housing and/or commercial establishments, moving procedures, and moving aid. Moving expenses may be paid for you. Additional monetary compensation is available to help homeowners cope with mortgage increases, increased value of comparable homes, closing costs, etc. A similar program is available to assist business owners. The Right-of-Way Agent can explain this assistance in greater detail.

WHAT'S NEXT FOR PHASE II?

After reviewing comments from citizens as well as input from a panel of coastal engineers and scientists, NCDOT and FHWA will meet with the project's "merger team," which includes members of federal and state agencies with interests in the project. That group is scheduled to meet in December and determine what options will be studied further for each site.

The merger team will meet again in early 2012 to determine the final option for each site. NCDOT and FHWA will then complete any required environmental documentation and apply for the appropriate environmental permits.

NCDOT expects to issue a construction contract for the Pea Island Breach site in August 2012, and a construction contract for the Rodanthe Breach site in December 2012.

In the meantime, NCDOT will continue the current coastal monitoring program of the entire project area to determine when future phases of the project should be implemented.

STATUS OF PHASE I (OREGON INLET BRIDGE)

A design-build contract for Phase I (the new Oregon Inlet bridge) was awarded in July. The contractor is currently working on the final design of the new bridge. Once all of the necessary environmental permits have been received, the contractor will start construction of the new bridge; construction is scheduled to start in January 2013. The new bridge is expected to be opened in the Spring of 2015, with all remaining work (including the demolition of the current bridge) to be completed in 2016. More information about Phase I of the project is available at tonight's meeting, and additional workshops will be scheduled in 2012 so that the contractor can answer your questions about the construction of the new bridge.

ADDITIONAL INFORMATION

As mentioned above, please leave comments in the comment box at the hearing or send them to Ms. Beth Smyre at the address on page 2.

For more information on NC 12 and the Bonner Bridge Replacement Project:

- Visit www.ncdot.org/travel/nc12recovery
- Follow our NC 12 Twitter feed at http://twitter.com/NCDOT_NC12
- Go to our Repairing NC 12 blog at http://nc12repairs.blogspot.com/
- Visit www.ncdot.org/projects/bonnerbridgerepairs
- Or call John Page or Bobby Norburn at the Project Hotline (toll-free): 1-866-803-0529.

Title VI Public Involvement Form

Completing this form is completely voluntary. You are not required to provide the information requested in order to participate in this meeting.

Meeting Type: Public Workshops **Location:** Manteo/Rodanthe/Ocracoke	**Date:** 12/05/11, 12/06/11, 01/05/12
TIP No.: B-2500 **Project Description:** Bonner Bridge Replacement Project	

In accordance with Title VI of the Civil Rights Act of 1964 and other civil rights provisions of Federal statutory law, the North Carolina Department of Transportation (NCDOT) assures that no person(s) affected by its programs, policies, or activities, shall be excluded from participation in, denied the benefits of, or subjected to discrimination on the grounds of race, color, national origin, disability, age, income, or gender.

This form helps the State DOT meet its statutory obligations for data collection and public involvement under Title VI and NEPA. Please place completed forms in the designated box on the registration table or mail it to the NCDOT Office of Civil Rights, Title VI Section at 1511 Mail Service Center, Raleigh, NC 27699-1511.

Completed forms will be held on file at the NCDOT as part of the public record.

Zip Code: _____

Street Name:
(i.e. Main Street) _____

Total Household Income:

- ☐ Less than $12,000
- ☐ $12,000 – $19,999
- ☐ $20,000 – $30,999
- ☐ $31,000 – $46,999
- ☐ $47,000 – $69,999
- ☐ $70,000 – $93,999
- ☐ $94,000 – $117,999
- ☐ $118,000 or greater

Gender: ☐ Male ☐ Female

Age:

- ☐ Less than 18
- ☐ 18-29
- ☐ 30-44
- ☐ 45-64
- ☐ 65 and older

Disabled: ☐ **Yes** ☐ **No**

Race/Ethnicity:

- ☐ White
- ☐ Black/African American
- ☐ Asian
- ☐ American Indian/Alaskan Native
- ☐ Native Hawaiian/Pacific Islander
- ☐ Hispanic/Latino
- ☐ Other (please specify): _____

National Origin: (if born outside the U.S.)

- ☐ Mexican
- ☐ Central American: _____
- ☐ South American: _____
- ☐ Puerto Rican
- ☐ Chinese
- ☐ Vietnamese
- ☐ Korean
- ☐ Other (please specify): _____

For further information regarding Title VI or this process, please contact the NCDOT Title VI Section at (919) 508-1808 or toll free at 1-800-522-0453, or by email at slipscomb@ncdot.gov.

Thank you for your cooperation!

NCDOT Office of Civil Rights
Title VI Section
1511 Mail Service Center
Raleigh, NC 27699-1511

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME:

ADDRESS:

E-MAIL:

COMMENTS AND/OR QUESTIONS:

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

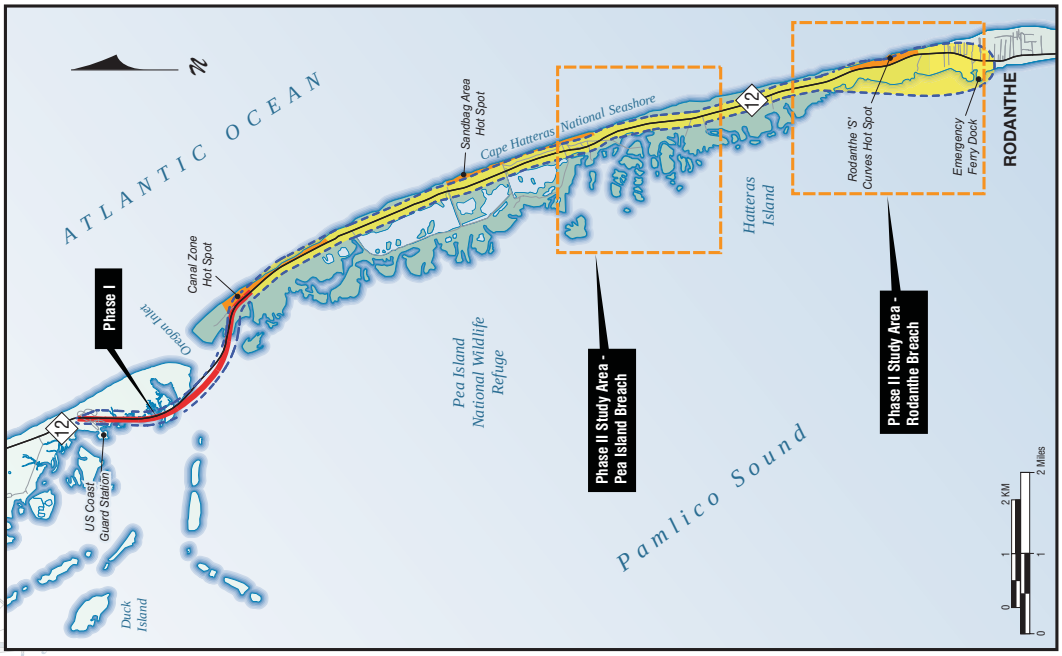
Email: bsmyre@ncdot.gov

Ms. Beth Smyre, PE
NCDOT - PDEA
1548 Mail Service Center
Raleigh, NC 27699-1548

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

Phase II Study Areas

Bonner Bridge Replacement Project



TIP Project No. B-2500

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

Welcome

Bonner Bridge Phase II Public Workshops

December 5 and 6, 2011

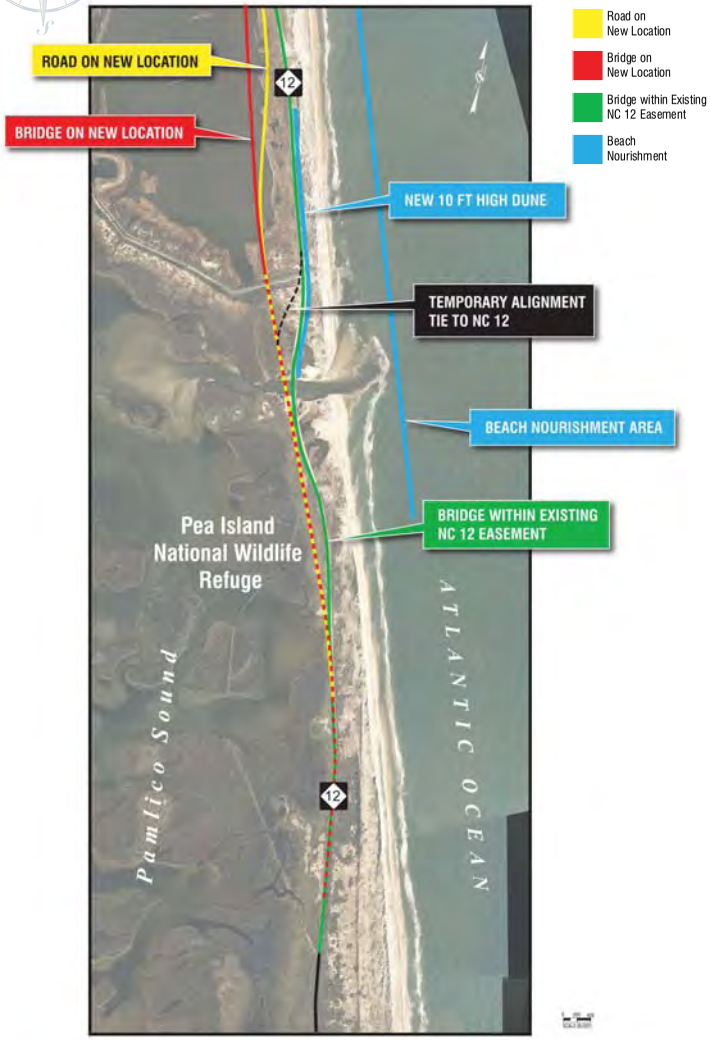
TIP Project No. B-2500

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

Phase II Study Areas

Pea Island Breach



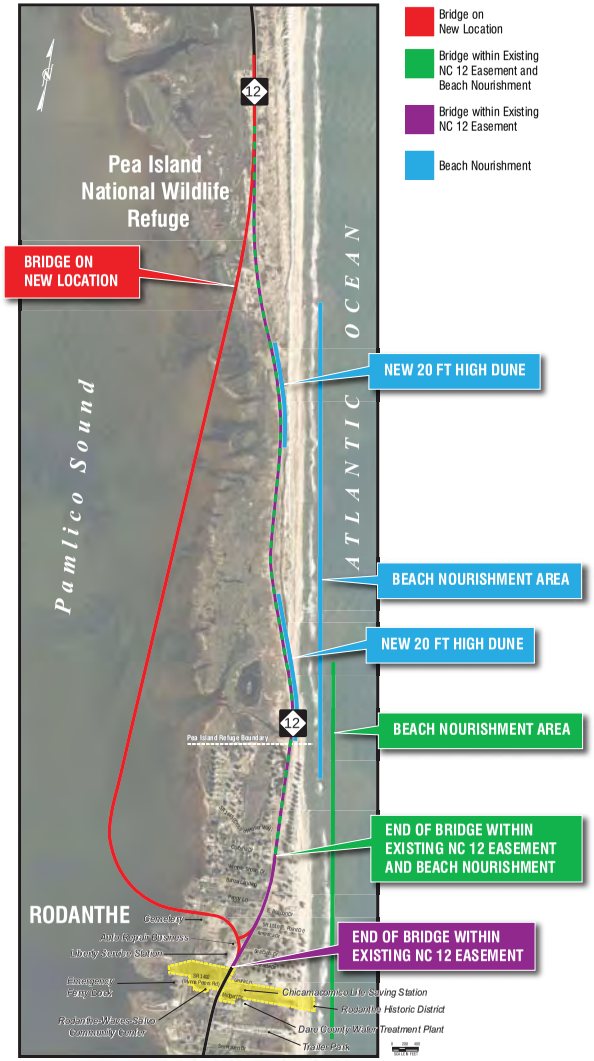
TIP Project No. B-2500

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

Phase II Study Areas

Rodanthe Breach



TIP Project No. B-2500

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

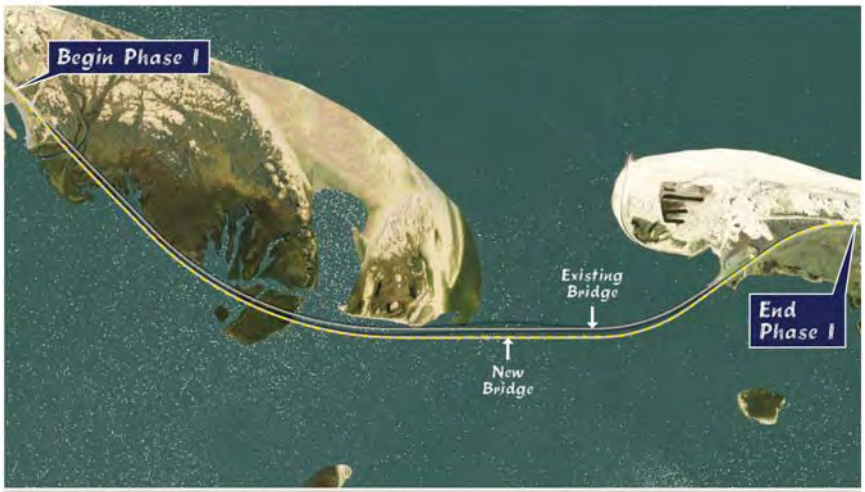
REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

Phase I (New Oregon Inlet Bridge)

Photo Simulations

View of Channel Spans

New Bridge (looking south)



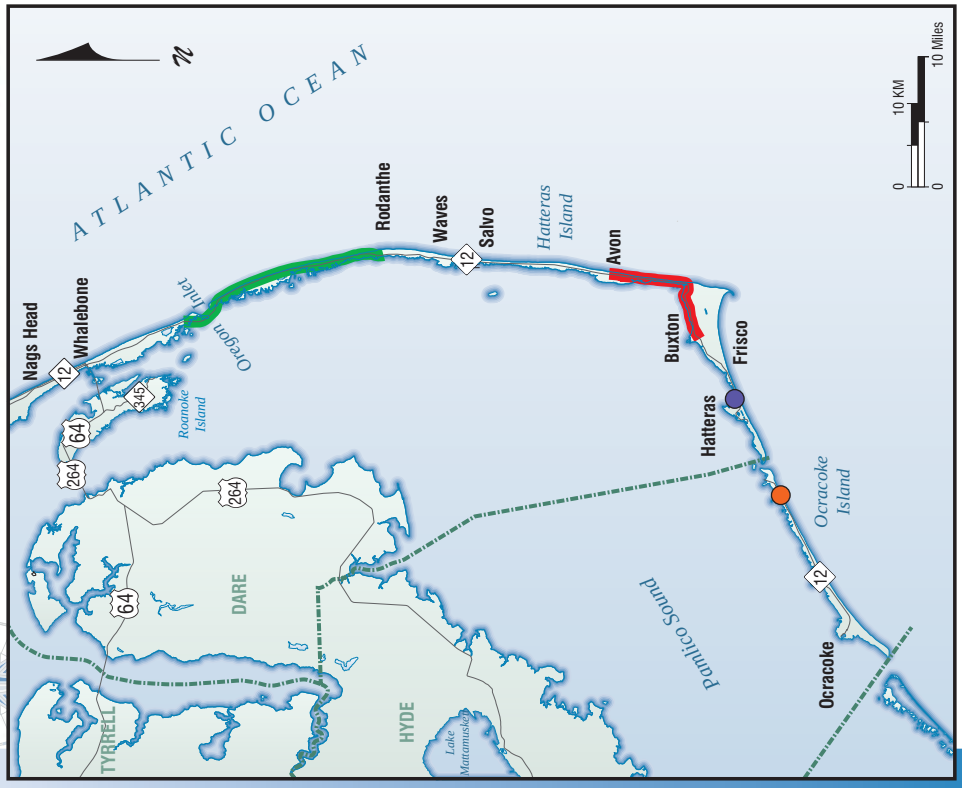
Plan View of Project Area

TIP Project No. B-2500

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

REPLACEMENT OF THE HERBERT C. BONNER BRIDGE (BRIDGE NO. 11) ON NC 12 OVER OREGON INLET

NCDOT Projects on North Carolina's Outer Banks



NCDOT Projects

- Bonner Bridge Replacement Project (STIP No. B-2500)
- Buxton to Avon Planning and Environmental Studies for Maintaining Roadway (STIP No. R-4070B)
- Ocracoke Island Hot Spot Interim Improvements (STIP No. R-3116A)
- Hatteras Village Hot Spot Interim Improvements (STIP No. R-3116B)

TIP Project No. B-2500

BONNER BRIDGE

TIP B-2500

Public Workshop Schedule

Dec 5th in Manteo

Dare Co. Administration Building

Public Workshop – 4 p.m. to 7 p.m.

Dec 6th in Rodanthe

Rodanthe-Waves-Salvo Community Center

Public Workshop – 4 p.m. to 7 p.m.

Jan 5th in Ocracoke

Ocracoke Community Center

Public Workshop – 5 p.m. to 7 p.m.

BONNER BRIDGE

TIP B-2500

WELCOME!

Public Workshops:
December 5 and 6, 2011 and January 5, 2012

BONNER BRIDGE

TIP B-2500

Public Workshops

- Informal – Speak one-on-one with project team members
- Consists of several "Stations"
- Opportunity to provide written comments

BONNER BRIDGE

TIP B-2500

Public Workshop Goals

1. Introduce Phase II of the Bonner Bridge Replacement Project
2. Discuss the Pea Island and Rodanthe design options
3. Hear your comments and concerns

BONNER BRIDGE

TIP B-2500

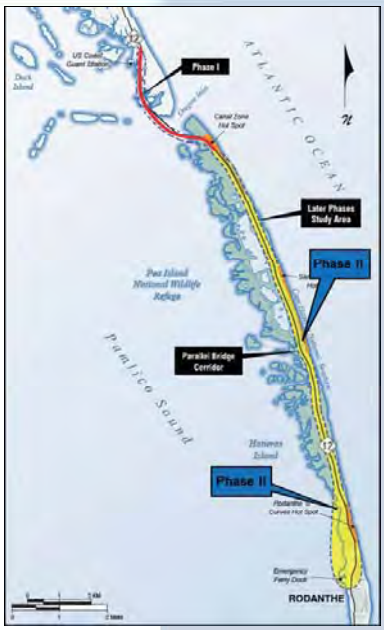
Pea Island Repairs

- Installed temporary bridge at breach site
- Installed sheet piles and sand bags to protect ends of bridge and roadway
- Sand used to fill smaller breaches

BONNER BRIDGE

TIP B-2500

- Parallel Bridge Corridor with NC 12 Transportation Management Plan
  - Phase I: Construction of new Bonner Bridge over Oregon Inlet
  - Coastal monitoring program
  - Phase II: Long-term solutions for both the Pea Island and Rodanthe breach sites

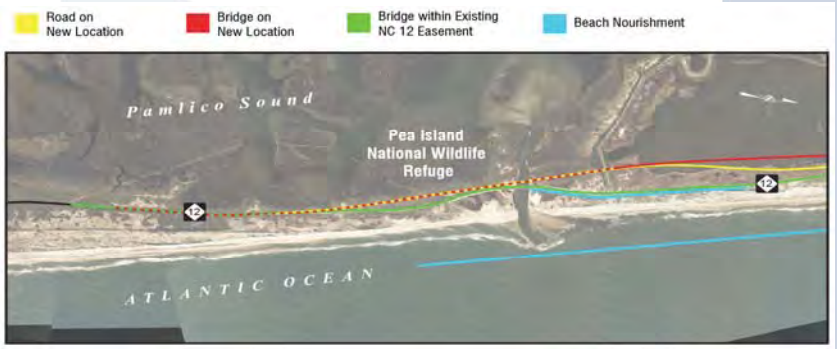


BONNER BRIDGE

TIP B-2500

Alternatives: Pea Island

- Beach nourishment
- Bridge within easement
- Bridge on new location
- Road on new location



BONNER BRIDGE

TIP B-2500

Rodanthe Repairs

- Used sand to fill in breaches
- Stockpiled sand for dune reconstruction
- Installed sand bags along the S-curves

BONNER BRIDGE

TIP B-2500

Impact Analysis

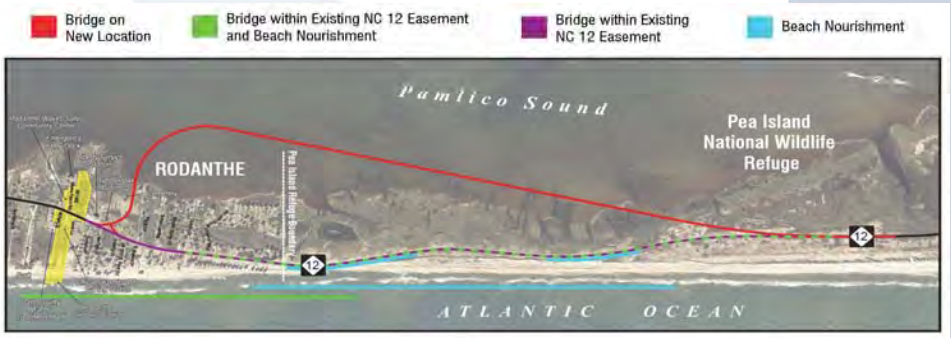
- Natural environment
  - Wetlands, endangered species, habitat
- Human environment
  - Property relocations, community services
- Coastal conditions
  - Shoreline position, potential for another breach
- Compatibility with federal lands
- Funding

BONNER BRIDGE

TIP B-2500

Alternatives: Rodanthe

- Beach nourishment
- Bridge within easement
- Bridge on new location



BONNER BRIDGE

TIP B-2500

Next Steps

1. Comments reviewed and addressed
2. State and federal agencies meet to discuss design options
3. NCDOT will complete any further studies and acquire permits
4. Contract awarded for Pea Island – August 2012
5. Contract awarded for Rodanthe – December 2012

BONNER BRIDGE

TIP B-2500

Right-of-Way Acquisition

- No private property acquired for Phase I
- Phase II could require property acquisition and the relocation of homes and businesses in Rodanthe
- See the right-of-way agent here tonight if you have questions

BONNER BRIDGE

TIP B-2500

For More Information on NC 12:

Hurricane Irene recovery efforts web page:
www.ncdot.org/travel/nc12recovery

Twitter: **http://twitter.com/NCDOT_NC12**

Blog: **http://nc12repairs.blogspot.com/**

Bonner Bridge Replacement Project web page:
www.ncdot.org/projects/bonnerbridgerepairs

BONNER BRIDGE

TIP B-2500

Status of Phase I

- Replacement of Bonner Bridge
- Currently in the design stage
- Start of Construction: January 2013
- Open to traffic: Spring 2015

BONNER BRIDGE

TIP B-2500

THANK YOU!

BONNER BRIDGE

TIP B-2500

Drop your comments in the box

E-mail your comments

Mail your comments

Comments are being accepted until **January 20, 2012**; however, NCDOT encourages citizens to submit their comments as soon as possible

BONNER BRIDGE

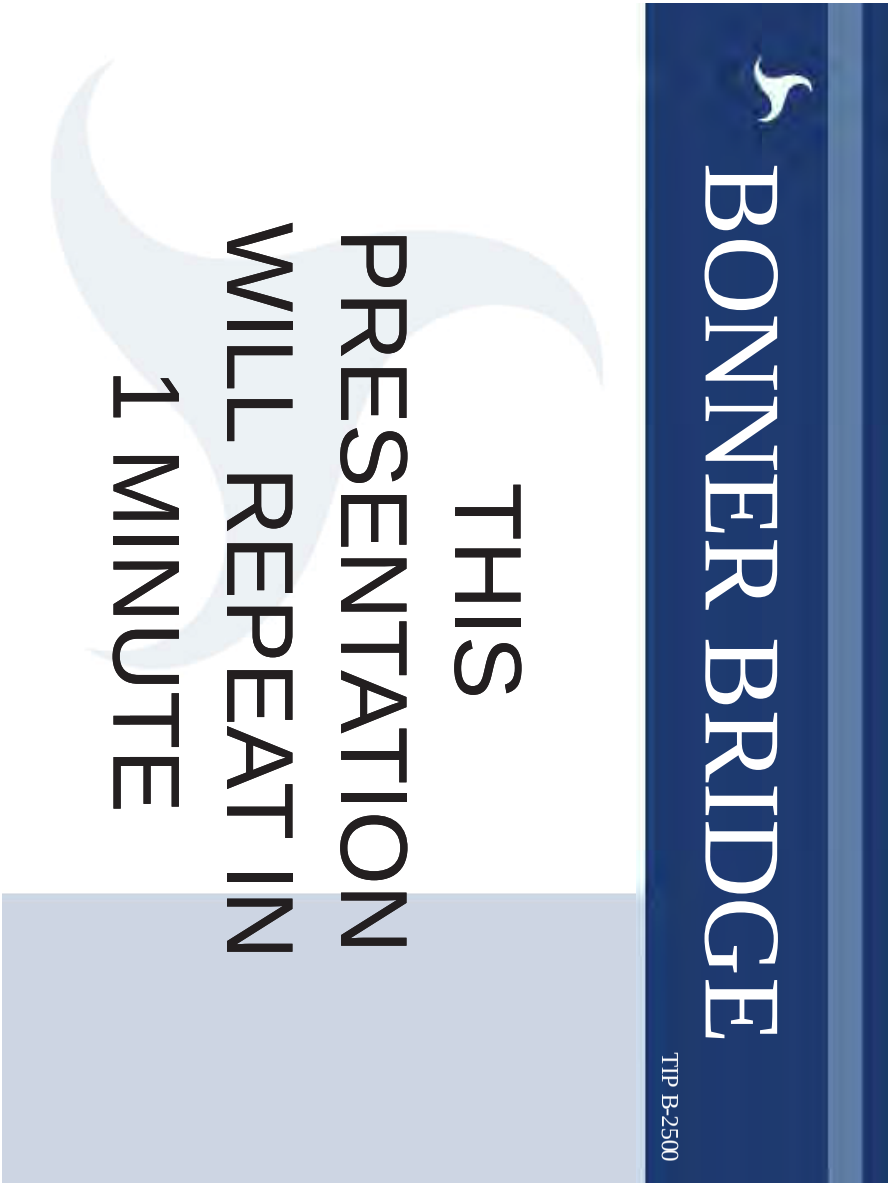
TIP B-2500

THIS PRESENTATION WILL REPEAT IN 2 MINUTES

BONNER BRIDGE

TIP B-2500

Please Proceed to the Main Area



Smyre, Elizabeth A

From: Tom Bartley <tom@bartleycorp.com>
Sent: Friday, December 09, 2011 5:17 PM
To: Smyre, Elizabeth A
Subject: Southgate Dr Rodanthe

Dear Ms. Smyre,
My wife and I own an oceanfront home at 23210 Southgate Dr. Rodanthe. Southgate Dr is a non county maintained "street" between East Corbina Dr and East Beacon Drive.
After studying the two bridge alternatives within the right of way, it is not clear to me how our property (plus our neighbors) would be accessed. If the bridge were in fact to be 25 ft in elevation, I can't imagine how a transition could be accomplished. If you could please write back addressing this issue, I would be very grateful.
Thank you.
Tom Bartley
301-252-0568

Smyre, Elizabeth A

From: Tom Bartley <tom@bartleycorp.com>
Sent: Monday, December 12, 2011 6:04 PM
To: Smyre, Elizabeth A
Subject: Re: Southgate Dr Rodanthe

Beth,
Thanks for your quick and informative response. So many time when one contacts government officials the response takes a long time.I remember seeing the side roads on an earlier version of the maps, but must of missed it on the version I looked at on Friday. I fully understand the three options now. I am a concrete contractor is the DC-Maryland area who is generally pro development. So faced with the three choices an elevated bridge passing by Southgate would be my least favorite alternative as it would impact our area more than the other two. Thanks again.
Tom Bartley
On Mon, 12 Dec 2011 18:56:20 +0000
"Smyre, Elizabeth A" <bsmyre@ncdot.gov> wrote:
> Tom-
> Thank you for your comment and question. For the option called "Bridge
> Within Existing NC 12 Easement and Beach Nourishment," any bridging
> would end far enough north of Southgate Drive such that there would be
> no change to the NC 12 roadway in that location. The proposed beach
> nourishment area for that option extends south until just past the
> Chicamacomico Lifesaving Station, so it would be on the ocean side of
> the properties on Southgate Drive.
>
> For the "Bridge Within Existing NC 12 Easement," the section of NC 12
> would be on a bridge that would continue farther south (it ends just
> north of the Liberty Service
> Station) than the option above. Access to Southgate Drive would be
> maintained through a set of one-lane, one-way service roads on either
> side of the new bridge. There is no beach nourishment included with
> this option (that's why the bridge goes farther south).
>
> The maps that we presented last week are available on the NC 12
> Recovery web page at:
>
> http://www.ncdot.org/travel/nc12recovery/
>
> Look under the "Rodanthe Breach Design Options." If you have any
> further questions or comments, please let me know!
> Thanks,
> Beth
>
> ----------
> ***Please note my phone number has changed, effective March 30, 2011-
> see below.***
>
> Beth Smyre, P.E.
> Project Planning Engineer
> NC Department of Transportation

> Project Development & Environmental Analysis Branch
> 1548 Mail Service Center
> Raleigh, NC 27699-1548
> (919) 707-6043
>
>
> -----Original Message-----
> From: Tom Bartley [mailto:tom@bartleycorp.com]
> Sent: Friday, December 09, 2011 5:17 PM
> To: Smyre, Elizabeth A
> Subject: Southgate Dr Rodanthe
>
> Dear Ms. Smyre,
> My wife and I own an oceanfront home at 23210 Southgate Dr. Rodanthe.
> Southgate Dr is a non county maintained "street" between East Corbina
> Dr and East Beacon Drive.
> After studying the two bridge alternatives within the right of way,
> it is not clear to me how our property (plus our neighbors) would be
> accessed. If the bridge were in fact to be 25 ft in elevation, I can't
> imagine how a transition could be accomplished. If you could please
> write back addressing this issue, I would be very grateful.
> Thank you.
> Tom Bartley
> 301-252-0568
>
> _____
>
> Email correspondence to and from this sender is subject to the N.C.
> Public Records Law and may be disclosed to third parties.

Smyre, Elizabeth A

From: rpbauer@aol.com
Sent: Friday, December 09, 2011 12:06 PM
To: Smyre, Elizabeth A
Subject: NC 12 Comment

Greetings,
I live on Hatteras Island.
I have reviewed the plans for the long term plans for NC12.

To me the science, and the conditions actually in place on Pea Island suggest the only responsible action is to abandon NC 12 north of Mirlo.
Regardless of politics or engineering, Mother Nature is taking over up there.
NCDOT will clearly build highways & bridges to nowhere on Pea Island.

Once we abandon NC 12 north of Mirlo we have 2 choices:

1. Build a 17 mile causeway bypassing Pea Island entirely
2. Expand a permanent ferry service from mainland to Rodanthe.

I do recognize that the causeway approach might not provide a positive cost/benefit result.
The debt service may just be too great for Hatteras Island to absorb.
Then we should have a ferry.

Anything else seems irresponsible use of taxpayer monies.
In today's day, we must find a way to spend where it makes sense and recognize where it doesn't.
Sometimes we just need to say no.
Can we find such leadership?

Thanks,

Bob Bauer

Smyre, Elizabeth A

From: Abbott, Steve
Sent: Tuesday, January 17, 2012 10:46 AM
To: Smyre, Elizabeth A
Subject: Contact us comment for you

Rob Beedie Phone: (757)633-7445 Email: Rob@GlobalSurfNetwork.com

Comment History
Tracking Number: KX6140G1C2

Sent By: Rob Beedie Date/Time: 1/14/2012 8:56 AM
Comment:
To Whom It May Concern:

I could write a book on why this area (Pea Island to S-turns) should be preserved for future generations to enjoy and the importance in keeping free and open access to the beaches but instead I'm leaving a link to a short video, https://www.facebook.com/video/video.php?v=2359968642934 ,that I would like to share with you in hopes that it motivates each of you that are decision makers to do the right thing in regards to protecting the basic rights of the people, that being, each of our rights to Life, Liberty, and Pursuit of Happiness.

Education is the key in helping make this suggestion work and our children, your children, and all of America will thank you for many years to come if through your leadership you act positively for the people by understanding their request and supporting freedom at its very core.

https://www.facebook.com/video/video.php?v=2359968642934

Sincerely,

Rob Beedie, GSN
Global Surf Network

www.GlobalSurfNetwork.com

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Comments on NC12 Repair Alternatives - Rodanthe

Submitted by: Mark & Linda Bowers
Dare County Address: 27222 N Sunrise Ct, Salvo NC
Mailing Address: 137 Mount View Dr. Afton VA 22920
Email: mbalntel@cfw.com
Date: Jan 18, 2012

Let us first express our thanks to NCDOT and all involved parties for their continuing effort in maintaining and repairing NC12 over so many years. This effort is not only the construction work and maintenance that continues, but all of the meetings and work that goes into an issue that has many demands and pressures for different solutions. So please keep up the good work and accept our thanks! We feel that NC12 is a vital ink to allow many people to enjoy this unique area of the USA, and should be maintained.

The factors which we list below seem to us to be very important, but yet do not appear to be on the list of factors being considered in the published information. We are not advocating the removal of other factors, but we do feel that the factors below need to be added and given high weight.

1. Maintaining a RoW for NC12 through the complete length of Pea Island - Our strongest recommendation is for a solution that maintains North Carolina's legal right to a road right-of-way within the whole length of Pea Island. We are urging you to select a solution that meets this criteria above all others, because, in our view, the political situation that changes from generation to generation will make it impossible to re-establish a new ROW once it is relinquished. Keeping the road within Pea Island is key legal point to maintaining this RoW in our view.

2. Bridge repair costs, length of time, and difficulty - A strong additional constraint is the cost of any sound bridge solution. There is continued advocacy to remove NC12 from Pea Island. In coming to understand the history of the ROW for NC12 on Pea Island and the solutions for the Bonner Bridge, it is becoming clear that the advocates of eliminating NC12 from Pea Island and moving it to a bridge out in the sound give little or no consideration of long term maintenance cost and difficulty. The cost of bridge repairs in any form is extremely high in comparison to land based road repair work, and such bridge repairs are very slow, especially out in a large body of water where all work must be done from large barges with shallow draft. In our view, such maintenance costs and difficulties have not been give due weight in such discussion.

3. Bridge accidents and blockage - Accidents on long bridges present a greater safety hazard, with a higher probability of lane blockage, and are harder to clear than accidents on road, particularly for vehicle fires. This factor becomes even more important in the case of emergency evacuations, which are a regular occurrence on Hatteras Island, and especially when there are 10's of thousands of visitors on the island. Land based road solutions offer many possibilities to move traffic quickly around accidents, simply because any crew with a tow rope can move a damaged vehicle quickly out of the way, and there is much more flexibility and room to move around. Having a land based road solution as much as possible and limiting the total bridge mileage seems a common sense way to be able to maintain critical evacuation routes.

These factors are not a direct endorsement of any particular proposed solution, **although it does lead us to advocate for rejection of the bridge out over the sound around Rodanthe, either the shorter one proposed or the longer one recently suggested by USFWS.**

Amongst the solutions proposed, we urge the working group to select either the short bridge in north Rodanthe within the existing ROW with or without beach nourishment, or the road rebuild with beach nourishment.

We also believe that the solutions involving beach nourishment have been prematurely removed from consideration, and should be re-considered. Only the lack of proper sand should eliminate this option in our view. We do recognize that there may be some effect on habitat, but the total area effected is small compared to the whole beach length in PINWR and in CHNSRA. Thus it should not have any substantial or lasting impact on habitat or species populations, the effect would be not be permanent, the area would recover and provide natural habitat for intervals between nourishment, and it is quite minor in comparison to the impacts of pond construction and continued maintenance in PINWR, for example.

Thank you.

Linda Bowers Mark Bowers

Smyre, Elizabeth A

From: mbaIntel@cfw.com
Sent: Thursday, January 19, 2012 10:32 AM
To: Smyre, Elizabeth A
Attachments: Comments on NC12 Repair Alternatives.doc

HI Ms. Smyre,

Please find a Word document attached to this email containing our thoughts, and recommendations on the proposed solutions for NC12 repairs around Rodanthe. We will be following up with a mailed hardcopy, with our signatures.

Thanks, and keepup the good work,

Mark & Linda Bowers

Smyre, Elizabeth A

From: Brock, Thomas <Thomas.Brock@cpschools.com>
Sent: Tuesday, January 10, 2012 10:53 AM
To: Smyre, Elizabeth A
Subject: RE: Road to Rodanthe

The road to s-turns and Rodanthe are iconic. Surfers from all over VA and NC have appreciated the ability to stop and surf. I understand the need for a bridge. I just hope they pick the shorter of the two. Thanks for your help in this matter.

Thomas G. Brock
P.E. Teacher at Rena B. Wright
thomas.brock@cpschools.com

From: Smyre, Elizabeth A [mailto:bsmyre@ncdot.gov]
Sent: Monday, January 09, 2012 3:01 PM
To: Brock, Thomas
Subject: RE: Road to Rodanthe

Thomas-
I have read the article that you are referring to, and I think the petition that you are looking for is located here:

http://www.thepetitionsite.com/1/preserve-future-access-to-s-turns/#13261388869231&action=udata&udata=false

You are also welcome to send me directly any comments you might have on the NC 12 projects.
Thanks,
Beth

Beth Smyre, P.E.
Project Planning Engineer
NC Department of Transportation
Project Development & Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) 707-6043

From: Brock, Thomas [mailto:Thomas.Brock@cpschools.com]
Sent: Friday, January 06, 2012 2:39 PM
To: Smyre, Elizabeth A
Subject: Road to Rodanthe

Greetings,

Read the article on espn regarding the bridge options to (or around) Rodanthe. The link posted redirects to the current page. Could you please respond with a link so that I may sign and forward to my friends. Thank you for all of your work!

Thomas G. Brock
P.E. Teacher at Rena B. Wright
thomas.brock@cpschools.com

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COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: FRANK & JUDE BROWN

ADDRESS: POB 475 OCRACOKE, NC 27960

E-MAIL: frankandjude@embarqmail.com

COMMENTS AND/OR QUESTIONS:

We favor BRIDGE at a New location for both beach areas. Get away from the ocean beach; building roads & bridges that can withstand the sound surges and be back from surf impact

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: Ross Byrd <rossebyrd@gmail.com>
Sent: Thursday, January 12, 2012 10:24 AM
To: Smyre, Elizabeth A
Subject: bridge next to pappy lane

Hi Beth,

I hope I am seeing this email to the right person. Mark Haines passed your email along to me. We also own a home on Pappy Lane in Rodanthe and I just wanted to say we are very concerned about the option that would involve a bridge coming right next to our homes. In an already struggling economy and real estate market our property values would take an even more substantial hit and our ability to rent would be irreversibly damaged. That rental ability is all that most of us have to hold on to. All of us on Pappy Lane, as far as I can tell, would be in serious financial turmoil with regard to our properties. And that is not to mention the effect on all other sound-side homes to the north of us. The traffic pattern, it seems, would also be a major issue.

I do realize, of course, that my complaint is at bottom quite self-seeking. I'm sure the concerns of a the property value of a few people pales in comparison to the drastic need to solve this crisis. That makes sense. I do realize how completed and difficult this decision must be. What can we do to help encourage another option? It seems to me that the bridge within the easement would be far better. What is the downside there? Thank you for reading this. - Ross

--
Ross Byrd
Campus Minister
Christ Episcopal Church
(757) 274-8998

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500

[redacted]
HYDE COUNTY

NAME: BRIAN CARTER

ADDRESS: PO BOX 693 OCRACOKE NC 27960

E-MAIL: BCARTER @ HYDECOUNTYNC.GOV

COMMENTS AND/OR QUESTIONS:

MY REQUEST IS THAT NO MATTER WHAT IS DONE, THAT EMERERGENCY SERVICES (ME - THE EMERGENCY SERVICES DIRECTOR) BE ADVISED IN ADVANCE OF ANY AND ALL CHANGES THAT COULD [redacted] EFFECT THE TRANSPORT OF SICK OFF THE ISLAND OR IN THE EVENT I NEED TO REQUEST RESOURCES TO OCRACOKE

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: James Charlet <hatterasjames@gmail.com>
Sent: Monday, December 19, 2011 1:09 PM
To: Smyre, Elizabeth A
Subject: Comment sheet, NC 12 workshop, Rodanthe
Attachments: COMMENT SHEET NC 12, 2011.doc

COMMENT SHEET

Bonner Bridge Replacement Project

Public Workshops – Phase II

TIP No. B2500

Dare County

NAME:

James Charlet

ADDRESS:

PO Box 362, SALVO 27972

EMAIL:

hatterasjames@gmail.com

COMMENTS AND/OR QUESTIONS:

Over 15 years ago, I read in our local paper a "Letter to the Editor" written by David Stick offering solutions to Hatteras Island's NC 12 problems. In all the time since I have heard many more "solutions" but none more sensible. He made his points more eloquently than I shall render here, but in essence those points were :

1. We all know where the "hot spots" are: the Canal Zone, New Inlet area, just north of Rodanthe, just north of Buxton and just north of Hatteras Village. So stop giving money away to outsiders to form studies to tell us exactly that.

2. Build bridges and/or causeways NOW over those spots and let the tide roll!

3. For budgeting purposes, phase the construction projects from north to south. This is also the order of most frequent breeches and overwashes.

4. Once new inlets are inevitably formed, they really are outlets, thereby giving the Sound more places to exit and thus reducing or lessening the amount of soundside flooding.

5. This system of roads-bridges-islands has a long history of success in the Florida Keys, which is in a far harsher climate and covers a much greater distance.

For at least 15 years, this sage advice has been ignored. It is time to be sensible.

Smyre, Elizabeth A

From: jcochol <jcochol@aol.com>
Sent: Saturday, December 17, 2011 9:17 AM
To: Smyre, Elizabeth A
Subject: Pea Island/Mirlo Beach

We would like to express our opinion regarding the long term options being presented for access to Hatteras Island. We have been coming to Hatteras for twenty five years and own two properties in Avon. We are recently retired and plan to spend more time in one of our homes there.

In the previous ongoing discussions regarding the Oregon Inlet Bridge replacement we were in favor of the bridge and causeway option that was on the table. In reviewing the current options for Phase II of this project we would support the "beach nourishment" option for the Pea Island and Mirlo Beach areas as the best proposed solution.

Thank you for your time.

John & Corry Cochol

(585) 394-8974

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: Mary Ann Cohen

ADDRESS: PO Box 237, Rodanthe, NC 27968

E-MAIL: none

COMMENTS AND/OR QUESTIONS:

After attending the workshop in December, elevated roadways and the bridge going over the Pamlico Sound seems like the most logical way of preserving Rt 12 passage way off Hatteras Island. The bridge would be the least disruption for those home and business owners that live on Route 12.

Thank you and good luck
Mary Ann Cohen

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: April Contestable

ADDRESS: POB 88 SALVO NC 27972

E-MAIL: aprilisin@gmail.com

COMMENTS AND/OR QUESTIONS:

① Ultimately, a long bridge would be most efficient and it should be lined with windmills (like Jeanette's Pier) and have platforms for recreational fishing. ② The entrance to Rodanthe could "possibly" benefit from beach renourishment ~~but~~ and if this is the best COST Alternative, it would be worth a try. However, direct ingress to "historical Rodanthe" is a GREAT option. ③ Pea Island breech would most benefit from the plan with the most bridge 'ala' Fla. Keys.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Thank you for hearing & considering these comments. I have lived here and observed shifting sand patterns since 1989.

Smyre, Elizabeth A

From: Abbott, Steve
Sent: Thursday, December 15, 2011 2:23 PM
To: Smyre, Elizabeth A
Subject: NC 12

Comment Details

From: Mariner and Donna Cox **Phone:** (540)659-8590 **Email:** marinercox@comcast.net

Print

Comment History
Tracking Number: 573CRW4UEE

Sent By: Mariner and Donna Cox **Date/Time:** 12/15/2011 1:12 PM
Comment:
WE own a home on Bluefish Ct in Hatteras Colony, Avon, NC. As Outer Banks property owners we strongly support Beach nourishment as the option of choice for long-term Route 12 recovery. We believe that this option offers the logical, cost-effective method of returning Route 12 to its pre-Irene condition and along with the already selected Bonner Bridge replacement option, is in the best interests of the Owners and residents of the Outer Banks, and all residents of the State of North Carolina. Further, we believe that this option adequately addresses the concerns of the various environmental groups.

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Smyre, Elizabeth A

From: Dave Dawson <dawbiz@yahoo.com>
Sent: Sunday, January 22, 2012 9:14 PM
To: Smyre, Elizabeth A
Subject: Long term fix for Route 12 Hatteras Island

Beth Smyre,

I will be brief. The answer to saving our highway is to stabilize the beach. Bridges and constantly moving the road are all temporary fixes at best.Pumping sand to stabilize the beach is also temporary. North Carolina needs to change the law against using hardened structures to stabilize the beach. This was an antiquated tactic the envioronmental community used in order to control building density through the back door instead of local zoning. We have been asking the State to "sink a ship" for 40 years. This means use a ship, barge or rocks to build a breakwater, jetty, groin or whatever it takes to slow down the current and let our beach build up. Every time a ship washes close to the shore the beach builds out to it in a matter of days. We've seen it over and over again. This is a simple and less expensive solution and anyone who says it won't work is lying. Look what the Arabs have built in Dubai. I'm not advocating building cities in the ocean; only that the technology is there to fix our problems and to not do so is neglectful on the part of the State. Not only will the State not help us, they won't give us a permit to help ourselves(except for the millionaires who got a variance to build groins at Bald Head to protect their golf course-the groins worked by the way).It's time for North Carolina to protect all of it's citizens and visitors by taking care of the coastline. Can you imagine any other coastal state ignoring their coast the way this State has? Business here actually survived the recession fairly well except for the times when people can't get here because our road is out(again!).

Dave Dawson - Buxton NC

Smyre, Elizabeth A

From: Greg & Janet Duncan <gregjanetcamden@yahoo.com>
Sent: Monday, December 12, 2011 9:07 PM
To: Smyre, Elizabeth A
Subject: NC-12 and Bonner Bridge

Ms. Beth Smyre,

I live in Camden Co. on the water. I've been here for 35 yrs, I'm concerned with both the cost of maintaining NC12 and that the ferry system wasn't publicly offered/considered as an alt. way of providing access to the areas South of Oregon Inlet. During Irene the water level in the Pasquotank dropped 12 inches. This is not normal for a storm with winds from the NE. Water usually recedes 3-4 feet. That was a large impoundment of water in the Albermarle Sound. We saw the damage on the backside of the OBX. My concern is with larger dunes to protect NC12 the water surge will not be able to retreat to sea fast enough to stop flooding up the Albermarle's northern rivers as the storms past. I understand tourism, Fishing, hometown feelings and other issues But with the rising sea level for the next 50 years, even as small as NC-20 calls for, the economy, the narrowness of Pea Is. I think people are not looking at the whole issue. I would like to see the ferry system fully explored. Most of the towns would change, adapt, and survive to become great places to visit just as Ocracoke has. I have lots of memories of Jockeys ridge, Oregon Inlet, Hatteras, the beaches south to South Carolina over my life, 23 years in the Coast Guard flying and boating along the coast. All the "Sights" have changed looks and locations greatly in that time fixed bridges and roads don't stand a chance.

Thank you for your time, Merry Christmas.

Greg Duncan

Smyre, Elizabeth A

From: Bob <808bob.finch@gmail.com>
Sent: Friday, January 06, 2012 4:28 PM
To: Smyre, Elizabeth A
Subject: Pea Island access

Future highway plans must include access for surfing one of America's treasures--the Hatteras surf sites. I am a long time NC resident now living in Hawaii. But I always return to these breaks when back east. Unquestionably, surfers have a huge impact on the economy of the Outer Banks. Thanks for the opportunity to comment.

Bob Finch,
P. O. Box 1873
Kailua, HI. 96734

I'm a twentieth century man and I don't want to be one with an iPhone

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: DAVID L. FRUM

ADDRESS: P.O. BOX 280/42 SARAH ELLEN LANE, OCRACOKE, NC 27960

E-MAIL: davefrum@hotmail.com.

COMMENTS AND/OR QUESTIONS:

I BELIEVE THE BEST SOLUTION TO THE ENTIRE BONNER BRIDGE/HIGHWAY IN DILEMMA IS TO TAKE THE POSITION THAT IT WILL BE TOO COSTLY AND NOT POSSIBLE TO MAINTAIN THE NEW BRIDGE AND THE ROAD IN THEIR PRESENT LOCATIONS. ALL THE COASTAL GEOLOGISTS, AND ANYONE WHO HAS BEEN HERE MORE THAN A WEEKEND KNOW THAT STRIP OF BARRIER ISLAND FROM OREGON INLET TO RODANTHE IS VERY DYNAMIC AND SUBJECT TO THE WORST CONDITIONS DUE TO IT PERPENDICULAR ORIENTATION TO NORTHEAST WINDS. I WOULD BE SURPRISED IF THE PROJECT PROPOSED COULD EVER BE COMPLETED THROUGH PEA ISLAND. THE NARROWEST OF THE ISLAND AND THE EROSION THAT HAVE TAKEN THE BEACHES MEAN THE BIGGEST PROBLEMS WILL OCCUR FROM THIS POINT ON.

Comments may be mailed by January 20, 2012 to:

(CONTINUED ON NEXT PAGE)

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

I WOULD LIKE TO PROPOSE THAT THE DOT AND ENGINEERING FIRMS TAKE THE POSITION THE NATIONAL PARK SERVICE TOOK WITH THE CAPE HATTERAS LIGHTHOUSE. AFTER YEARS OF TRYING TO STOP NATURE AND TRYING TO MANIPULATE THE SHORELINE RELATED TO A PERMANENT STRUCTURE, THEY GAVE UP AND MOVED IT. I THINK THIS IS THE POSITION THAT SHOULD BE TAKEN WITH HIGHWAY 12.

I PROPOSE THAT ENGINEERING BE APPLIED TO CONSTRUCTING A BRIDGE TO THE WEST OF THE BARRIER ISLANDS FROM JUST NORTH OF RODANTHE. THE BEST SOLUTION, IN MY OPINION, WOULD BE TO BUILD THE ROAD EITHER TO THE SOUTH END OF ROANOKE ISLAND, EAST OF WANCHESE AND CONNECTED TO US 64 AT SKYCO OR WEST ACROSS THE SOUND TO NEAR STUMPY POINT OR SANDY BAY. I FEEL THIS BRIDGE, THOUGH VERY COSTLY IN ORIGINAL CONSTRUCTION, COULD BE MORE EASILY MAINTAINED AND WOULD BE LESS VULNERABLE TO WAVE ACTION. IT WOULD BE IN THE SOUND RATHER THAN ON THE BEACH FACE.

SHOULD THIS PLAN BE PUT INTO EFFECT, OREGON INLET BRIDGE WOULD NOT HAVE TO BE BUILT, THE ROAD COULD BE ABANDONED ACROSS THE PRESENT BRIDGE AND IT COULD BE REMOVED AFTER CONSTRUCTION. OREGON INLET COULD BE ALLOWED TO DEVELOP WHEREVER IT DOES BECAUSE IT WOULD NOT HAVE TO BE MAINTAINED IN PLACE BENEATH THE HIGH RISE OF THE BRIDGE. THE CHANNEL COULD BE WHEREVER IT FALLS ELIMINATING THE ENTIRE PROBLEM OF KEEPING OREGON INLET WHERE NATURE DOES NOT WANT IT TO BE, ELIMINATING THE NEED FOR JETTIES OR DREDGING.

HIGHWAY 12 THROUGH THE PEA ISLAND REFUGE COULD BE ABANDONED PLEASING THE U.S. FISH AND WILDLIFE SERVICE WHO DOESN'T WANT IT THERE ANYWAY. THE ISLAND IN THAT SECTION WOULD RAPIDLY REVERT TO A NATURAL SYSTEM, DUNES COULD DEVELOP WHEREVER THEY MAY, THE BEACHES WOULD WIDEN AND OVERWASH WOULD OCCUR BUT IT WOULD NOT MATTER SINCE THERE WOULD BE NO ROAD TO MAINTAIN. THE TEMPORARY BRIDGE AT THE NEW NEW INLET WOULD BE UNNECESSARY AGAIN BECAUSE THERE WOULD BE NO ROAD.

PLEASE CONSIDER THESE RECOMMENDATIONS CAREFULLY. THINK OF THE HUNDREDS OF MILLIONS OF DOLLARS IT WILL TAKE TO MAINTAIN THE ROAD THROUGH A PLACE IT PROBABLY CANNOT RELIABLY BE DEPENDED ON TO STAY. A ROAD ACROSS THE SOUND WEST OF THE BARRIER WILL REQUIRE MUCH SIMPLER CONSTRUCTION AND WOULD HAVE REASONABLE ASSURANCE REMAINING FOR YEARS TO COME.

David L Shum

Smyre, Elizabeth A

From: Herbert Gaskill <hsgaskill@mun.ca>
Sent: Thursday, December 15, 2011 9:32 AM
To: Smyre, Elizabeth A
Subject: Bonner Bridge

Dear Ms Smyre -

My wife and I are local home owners, 26248 Wimble Shores Dr. We live in our NC home during the winter; at other times it is a rental.

Almost every year since 2003, we have had a major washout at S-curves requiring major repairs to the roadbed. Every year there have been periods during which Hwy 12 was closed due to overwash. Every year we watch as hundreds of tons of sand are trucked in to S-curves (beach nourishment), only to be washed away in an instant by the forces of nature. We have seen Hwy 12 closed for as long as a week due to wash out at S-curves from a Nor'easter.

We have examined the proposals for HWY 12. We believe that only proposals which guarantee continuous access are viable. Clearly, proposals that require "beach nourishment" are not in this category. We believe that a solution should be implemented ASAP. This rules out proposals that could become subject to law suits, i.e., proposals that place the roadbed outside existing easements.
On this basis we support the proposal described as "Bridge within Existing NC 12 Easement" shown in purple in Figure 3 of "Bonner Bridge Public Workshops" document handed out on Tues, Dec. 6 at the meeting in Rodanthe.

Thank you,

Herb and Cathy Gaskill

Herbert S Gaskill,
Professor, retired

15 Forest Ave
Mt Pearl, NL A1N 1P2
709-368-5218

PO Box 477
Rodanthe, NC
252-987-2298

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Smyre, Elizabeth A

From: Rob Gerritsen <rob@xore.com>
Sent: Wednesday, December 14, 2011 2:40 PM
To: Smyre, Elizabeth A
Cc: Scott Leggat
Subject: NC 12 Recovery Efforts

Dear Ms. Smyre,
Thank you very much for the Meeting Packet related to the Bonner Bridge – Phase II Workshops. It is a comprehensive and informative document.

I have a question and a comment.

My question regards the costs in Table 3. The language used implies that these are simple total expenditures through 2060. Does that mean that you did not use a discount rate to reflect the so-called time value of money? Since some alternatives require spending most of the money up front, and others do not, I suspect that using an appropriate discount rate might make a significant difference in the comparative costs.

My own preference is the beach nourishment option. It has a very low visual impact and a very low impact on existing residences and businesses.

Because beach nourishment expends money gradually over time, it also has a lower opportunity cost than any of the other alternatives. If any of the other alternatives end up having unforeseen negative effects or don't work as well as expected, we will only discover that after having spent a very large amount. If it turns out that beach nourishment has some unexpected negative effects, it can be terminated and other options considered before extremely large sums have already been expended. Because it has these lower opportunity costs it is a less riskier alternative.

I have been an owner of an ocean front property in Avon since 1990.

Regards,
-Rob

Rob Gerritsen, PhD
President
Exclusive Ore Inc.
www.xore.com
PO Box 1024
Blue Bell, PA 19422

(215) 643-3110

Smyre, Elizabeth A

From: Gery, Michael <michael.gery@carolinacountry.com>
Sent: Thursday, January 19, 2012 1:54 PM
To: Smyre, Elizabeth A
Subject: NC Hwy 12

These are my comments on the proposals to rebuild NC Hwy 12 on Pea Island.

All of these proposals are far riskier and more expensive than the sensible alternative which was – without explanation – excluded from the winter presentations in Dare County and Ocracoke: the so-called "long bridge" that would connect to Rodanthe. The long bridge was the preferred alternative in 2003 when nearly all agencies involved saw its wisdom. To build a series of bridges and causeways on a moving strip of sand, and through a national wildlife, not only will subject the refuge and its beaches to being a construction zone for years, but also is asking for a long future of frustration and expense, and exposes taxpayers to unneeded expense in court. I ask the DOT to abandon these alternatives as presented this winter in workshops I attended, and to instead reconsider the long bridge. People will be able to reach Pea Island without a dangerous bridge and doomed highway, just as we reach Core Banks, Portsmouth Island, Ocracoke, Shackleford Banks, Bald Head Island, Hammocks Beach and other barrier islands.

****
Michael E.C. Gery
104 Seatone Lane
Manteo, NC 27954

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: Harry Gilbert

ADDRESS: P.O. Box 850, Ocracoke, NC 27960

E-MAIL: info@theanchorageinn.com

COMMENTS AND/OR QUESTIONS:

I would prefer the "Bridge on New Location" at both locations. If not "Road on New Location" if above is not possible.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Hyde ~~Dare~~ County

NAME: H.W. Gilbert III

ADDRESS: P.O. Box 850, Ocracoke, NC 27960

E-MAIL: info@theanchorageinn.com

COMMENTS AND/OR QUESTIONS:

I previously made a comment at the Rodanthe workshop and, after further review and a better understanding of the permitting process I would like to change my comment. At Pea Island I would like to see a "Bridge within Existing NC12 Easement" mainly due to permitting issues. At the Rodanthe area I would like to see "Bridge on New Location" due to the fact that ~~the~~ this area has always been a problem area. ~~because~~ because of the rapid beach erosion.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: Leslie Gilbert

ADDRESS: PO Box 850 Ocracoke NC 27960

E-MAIL: info@theanchorageinn.com

COMMENTS AND/OR QUESTIONS:

Prefer Bridges on New locations → which would be more permanent.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: Abbott, Steve
Sent: Thursday, December 15, 2011 11:00 AM
To: Smyre, Elizabeth A
Subject: Another NC 12 from Contact us

Suzan (Mrs. James E.) Griffin **Phone:** (757)229-5235 **Email:** sjgriffin@widomaker.com

Print

Comment History
Tracking Number: 87WEN3LN24

Sent By: Suzan (Mrs. James E.) Griffin **Date/Time:** 12/14/2011 6:47 PM
Comment:
I am writing to ask you to support beach nourishment for the Outer Banks (especially to aid Highway 12). We are owners of property there and we implore you to find a solution to transportation and erosion issues on our beautiful Outer Banks. This is as close as you can get to heaven and we ask that you find a solution to the many issues facing the area in regard to transportation. Thank you for your consdieration and hard work. I will anxiously await news of your meetings and look for outstanding conclusions from your group. Nobody does it better than NC...please live up to that belief.

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Smyre, Elizabeth A

From: Abbott, Steve
Sent: Thursday, December 15, 2011 2:25 PM
To: Smyre, Elizabeth A
Subject: NC 12

By the way, I'm already responding to these in Contact Us, just saying, "Thank you for the comments. They are being forwarded to the DOT staff working on the project."

Steve

From: Raymond C.Grimm **Phone:** (540)635-2404 **Email:** rgrimm@shentel.net

Comment History
Tracking Number: PAG55C9RWI

Sent By: Raymond C.Grimm **Date/Time:** 12/15/2011 11:50 AM
Comment:
I am a Dare county OBX property owner since 1980. My wife and I own and rent several homes in Mirlo, and an ocean front on East Point Drive. We have watched homes disappear in front of the oceanfront. As a matter of fact, we were third lot back when we first built our cottage. Beach nourishment would have saved many of these homes, and I urge your consideration of this option for the Rodanthe area and the homes in Mirlo Beach.
Regards,
Ray and Lani Grimm, Front Royal, VA

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Norburn, Robert E.

From: Norburn, Robert E.
Sent: Friday, December 09, 2011 11:20 AM
To: Smyre, Elizabeth A
Subject: Bonner Citizen Contact

I received an information line call from Mark Haines, who is a Rodanthe property owner. He was concerned about the long-term options at Rodanthe. He said he favors either beach nourishment, or the bridge in existing easement with beach nourishment, because these are the only options that will protect the homes in northern Rodanthe from long-term beach erosion. He said that he also attended the workshops and plans on submitting written comments, which I encouraged him to do so. He also asked about the project schedule, which I explained to him. He is already on the project mailing list.

Bobby Norburn
Transportation Engineer/Planner
Parsons Brinckerhoff
434 Fayetteville Street, Suite 1500
Raleigh, NC 27601
919-836-4081 (office)
919-836-4099 (fax)

norburn@pbworld.com

www.pbworld.com

Smyre, Elizabeth A

From: Haines, Mark <mark.haines@transcendata.com>
Sent: Sunday, December 11, 2011 10:33 PM
To: Smyre, Elizabeth A
Cc: Haines, Mark
Subject: Bonner Bridge Replacement Project Phase II Public Workshop Comment Sheet
Attachments: NC 12 Feedback.pdf

Hi Beth!

Attached you will find my feedback regarding the Bonner Bridge Replacement Project Phase II. I would appreciate it if you can confirm receipt of my email and attached comment sheet.

If you have any issues opening the attachment, please let me know.

Thanks,

Mark Haines
513-604-6641

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

Name: **Mark Haines**
Address: **3087 Palomino Trail, Mason OH 45040**
E-mail: meh@iti-global.com

Comments and/or Questions:

My name is Mark Haines. I am a part time resident and rental property owner on Hatteras Island. I attended both the Manteo and Rodanthe workshops. Like everyone else involved, I have concerns about the solution that will be chosen. I submitted initial comments, but since the merger team has decided to eliminate both options which include beach nourishment, I am submitting additional feedback.

Trying to keep this to the point and short, here is my feedback associated with the Rodanthe S-Curves area.

1. Reconsider beach nourishment. It needs to be done regardless.
2. Solve the issue within the current easement.
3. Consider ending the bridge / elevated roadway in Mirlo Beach. This minimizes impact to current property owners which should be a very high consideration. Extending South on 12 can be done in the future when and if necessary. It also eliminates the congestion around the Liberty Gas station with the current option.
4. If you feel the need for the "Rodanthe Bridge on New Location", connect back onto 12 prior to any houses to avoid all of the issues associated with current property owners, along with what I would expect to be a long and lengthy legal battle.
5. Allow public comments on the final recommendation and decision on what to do. This will allow the public to provide specific feedback such as:
    a. Include a bikeway or walking path along the new road or bridge
    b. Input on access points crossing 12 to the ocean
    c. Cosmetic features which might minimize the eye soar any new bridge or elevated roadway might cause.
    d. Create an elevated section on a possible bridge to allow recreational access to the open sound.
6. Communicate with those in the immediate area (Northern Rodanthe) that you are serious about implementing a solution which minimizes the impact to their property values. Eliminating beach nourishment sent the wrong message.

Smyre, Elizabeth A

From: Haines, Mark <mark.haines@transcendata.com>
Sent: Thursday, January 19, 2012 12:07 PM
To: Smyre, Elizabeth A
Cc: Haines, Mark
Subject: Bonner Bridge Replacement Project Phase II Public Workshop Comment Sheet
Attachments: NC 12 Feedback 1-19-2012.pdf

Hi Beth!

Attached you will find additional feedback regarding the Bonner Bridge Replacement Project Phase II. I would appreciate it if you can confirm receipt of my email and attached comment sheet.

If you have any issues opening the attachment, please let me know.

Thanks,

Mark Haines
513-604-6641

Mark Haines
ITI TranscenData
513.604.6641
meh@iti-global.com

Visit our New Website: http://www.transcendata.com

Smyre, Elizabeth A

From: Ted Hamilton <tedsalvo@earthlink.net>
Sent: Thursday, January 12, 2012 7:11 AM
To: Smyre, Elizabeth A; norburn@ncdot.gov
Subject: Comments on Proposed NC 12 Improvements

The following are my comments on NC 12 proposed solutions in the Pea Island area.

1. Many of us have never seen a really definitive reason why NCDOT now has trouble getting permits from USFWS to move the road from its current right of way. In 1988 the road was relocated well to the West of the then right of way in the S-Curve area. Again in 1996 the same type of relocation occurred in the Sand Bag area.

What has changed to make this type of movement more difficult if not impossible????

It is one thing if it has resulted from new law but a whole different matter if it is just new DOI and/or USFWS policy. If the latter, that should be seriously challenged by the state in order to provide the best long term solution for a given area of the route. I have even seen articles indicating deeds exist that give the state basically right of way where ever it is needed, although some environmental groups disagree.

The public should be informed definitively as to the reason for this right of way difficulty, because common sense says that in general the farther West (away from the surf zone) the road is located, the better the long term survival.

2. Any solution should carefully consider the impact on electric rates to relocate power lines in order to provide reliable maintenance access. In 2007 CHEC estimated that an approximate 42% rate increase would be required to fund the relocation of the line on or near the then proposed 17 mile bridge that bypassed Pea Island. No doubt a similar increase would be needed if the now USFWS proposed 7 mile long bridge was to be built. I say similar increase because the increase would not be directly proportional to bridge length because design, environmental impact studies, etc would be similar in cost regardless of bridge length.

3. Any solution should carefully consider the impact on public access to areas of Pea Island. When the 17 mile bridge was first proposed NCDOT indicated they would obviously not maintain any sort of road on Pea Island. USFWS indicated they certainly would not maintain any sort of paved access and further indicated they would likely require the pavement be removed. In addition USFWS indicated that individual access by private vehicles would likely not be allowed, but would most likely go with a 4WD bus system similar to that used at Back Bay in VA.

Such access limitations as above would be unacceptable. At a minimum private vehicle access by at least 4WD vehicles on sand roads similar to the Interdunal Road near Cape Point and Pole Road at Hatteras Inlet should be provided for.

Now that said let me be clear in my expectations. If, for example, the 7 mile bridge proposed by USFWS is built, I would expect to see a sand road from the North end of Rodanthe to the South side of the new Pea Island Inlet and a sand road from the North terminus area of the bridge to the North side of the new Pea Island Inlet. But if, for example, an inlet was eventually formed at the S-Curve area, or any other area, I would not expect any bridging or fill of such an inlet to accommodate a sand road. We should at least start with reasonable sand road access and let new inlets dictate what access remains over time. Such access should be agreed to by USFWS as part of this process and factored into the road improvement decisions. It should not be left undecided and for USFWS to decide in the future as they indicated during discussions on the 17 mile bridge.

4. Any bridge / raised roadway solutions should carefully look at what wind restrictions may be needed and their impact on travel / access. I refer you to wind restrictions on the Chesapeake Bay Bridge Tunnel as examples of a similarly exposed roadway that is purposely not used as an evacuation route because of the wind restrictions.

Now having said all the above, I think the following are the best compromise solutions that would address my 4 concerns.

For Pea Island Breach:

Bridge on new location. This requires only a short section of new right of way, moves the road further from the surf zone (beyond the 2060 erosion zone) in the area of the breach (particularly to the South as inlets tend to migrate South; eg. Oregon Inlet), places it on a bridge so the current inlet can be left for sound water outflow relief from potential sound flooding and provides better interconnect to the North if the conceptual road / bridge (or portions thereof) ever need to be built to the North.

And any improvement should consider access to the boat ramp at New Inlet. We should not loose access to this boat ramp.

For Rodanthe Breach:

Bridge in Pamlico Sound. It seem foolish to build anything within the current easement, knowing it will soon be in the surf zone; (ie the easement is within the 2060 erosion zone) . The history of this area includes Loggerhead Inlet in this general location and sooner, rather than later, this area will be breached badly. When it is badly breached, it would obviously be better that any bridging in the area was not eventually in the surf zone.

Ted A. Hamilton
6 Jib Ct
Hampton VA 23664

Property owner in Salvo NC for 40 years

Cheers Ya'll

Ted A. Hamilton
(aka Salvo Jimmy)

Smyre, Elizabeth A

From: Ted Hamilton <tedsalvo@earthlink.net>
Sent: Tuesday, January 17, 2012 6:20 AM
To: Smyre, Elizabeth A
Subject: RE: Comments on Proposed NC 12 Improvements

Two other comments came to mind similar to comments on electric power supply.

I recall Charter has for years wanted a fiber optic system on Hatteras Island but has been prohibited from putting a cable on the present Bonner Bridge because of weight considerations. I believe they will be allowed to use the replacement bridge. Any solution should consider how such a fiber optic system would be accomodated, including access for maintenance.

Likewise, CenturyLink phones are underground, at least within the villages. I don't know if underground cables are used on Pea Island, but if so, that needs to be accomodated. In addition consideration of providing for upgrade to the phone system to fiber optic should be included in any solution.

-----Original Message-----
>From: Ted Hamilton <tedsalvo@earthlink.net>
>Sent: Jan 14, 2012 12:39 PM
>To: "Smyre,Elizabeth A" <bsmyre@ncdot.gov>
>Subject: RE: Comments on Proposed NC 12 Improvements
>
>Thanks for the reply.
>
>Re the 1997 law and USFWS: I recall that law is fairly general and not real specific thus making it open to wide interpretation which is what I think DOI / USFWS is doing in this case. It's hard for me to imagine that where releiable access is needed for the health, welfare and safety of residents and visitors, particularly during medical emergencies and storm events requiring evacuation, that such need would not trump even the letter of this 1997 law. It makes no sense to expenf funds staying strictly within the present right of way knowing that in a relatively short time the road would be in peril.
>
>BTW you did not address the issue of these "old" deeds supposedly giving the state access as needed without regard to "present" right of way. That, if true, would also seem to trump even this 1997 law.
>
>
>-----Original Message-----
>>From: "Smyre, Elizabeth A" <bsmyre@ncdot.gov>
>>Sent: Jan 13, 2012 11:02 AM
>>To: Ted Hamilton <tedsalvo@earthlink.net>
>>Subject: RE: Comments on Proposed NC 12 Improvements
>>
>>Ted-
>>Thank you for your comments! To answer some of the questions included in your email:
>>
>>- In 1997, Congress passed the National Wildlife Refuge System Improvement Act of 1997, which is an update of a similar law from the 1960's. This law stipulates how the US Fish & Wildlife Service makes decisions on activities within the Refuge system. The 1997 Act restricted what activities the USFWS could consider allowing within a Refuge;

essentially, any activity must now be consistent with the mission and purpose of that Refuge. New large-scale road and bridge construction outside of the existing NC 12 easement, as you can imagine, aren't necessarily consistent with the mission of a wildlife refuge, so we've been told that they would not be allowed. Therefore, road relocations that were allowed prior to 1997 wouldn't be allowed today. We've discussed this act and its implications to our project alternatives in our previous environmental documents for the project.
>>
>>- We work closely with the Cape Hatteras Electric Co. on determining the potential impacts of our alternatives on their utility easements. We provide them with copies of all our environmental documents, and any information they provide us on potential rate increases is considered as part of the overall decision.
>>
>>- We do consider the impacts of our alternatives on the ability to access the Refuge and the Seashore. Certainly, any bridging option at either of the breach sites will restrict access to the Refuge in those locations.
>>
>>Again, thank you for your comments, and please let me know if you have any other comments or questions!
>>Thanks,
>>Beth
>>
>>----------
>>Beth Smyre, P.E.
>>Project Planning Engineer
>>NC Department of Transportation
>>Project Development & Environmental Analysis Unit
>>1548 Mail Service Center
>>Raleigh, NC 27699-1548
>>(919) 707-6043
>>
>>
>>-----Original Message-----
>>From: Ted Hamilton [mailto:tedsalvo@earthlink.net]
>>Sent: Thursday, January 12, 2012 7:11 AM
>>To: Smyre, Elizabeth A; norburn@ncdot.gov
>>Subject: Comments on Proposed NC 12 Improvements
>>
>>The following are my comments on NC 12 proposed solutions in the Pea Island area.
>>
>>1. Many of us have never seen a really definitive reason why NCDOT now has trouble getting permits from USFWS to move the road from its current right of way. In 1988 the road was relocated well to the West of the then right of way in the S-Curve area. Again in 1996 the same type of relocation occurred in the Sand Bag area.
>>
>>What has changed to make this type of movement more difficult if not impossible????
>>
>>It is one thing if it has resulted from new law but a whole different matter if it is just new DOI and/or USFWS policy. If the latter, that should be seriously challenged by the state in order to provide the best long term solution for a given area of the route. I have even seen articles indicating deeds exist that give the state basically right of way where ever it is needed, although some environmental groups disagree.
>>
>>The public should be informed definitively as to the reason for this right of way difficulty, because common sense says that in general the farther West (away from the surf zone) the road is located, the better the long term survival.
>>
>>2. Any solution should carefully consider the impact on electric rates to relocate power lines in order to provide reliable maintenance access. In 2007 CHEC estimated that an approximate 42% rate increase would be required to fund the relocation of the line on or near the then proposed 17 mile bridge that bypassed Pea Island. No doubt a similar

Smyre, Elizabeth A

From: Abbott, Steve
Sent: Wednesday, December 14, 2011 4:46 PM
To: Smyre, Elizabeth A
Subject: NC 12 comment

Hi,

Here is one from Contact Us

Steve

Tim sorrells **Phone:** (443)789-9176 **Email:** drsorrells@yahoo.com

Print

Comment History
Tracking Number: 50VJSMBQUY

Sent By: Tim sorrells **Date/Time:** 12/14/2011 4:37 PM
Comment:
I am in support of beach nourishment as a potential solution to the problem in Mirlo Beach and Rte 12. I favor this over the construction of bridges . I feel we should try nourishment first and if ut becomes obvious that is is not working, then talk about bridge alternatives. I own a house in Waves,NC so I obviously have a personal investment here. Thank you, Tim Sorrells

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increase would be needed if the now USFWS proposed 7 mile long bridge was to be built. I say similar increase because the increase would not be directly proportional to bridge length because design, environmental impact studies, etc would be similar in cost regardless of bridge length.
>>
>>3. Any solution should carefully consider the impact on public access to areas of Pea Island. When the 17 mile bridge was first proposed NCDOT indicated they would obviously not maintain any sort of road on Pea Island. USFWS indicated they certainly would not maintain any sort of paved access and further indicated they would likely require the pavement be removed. In addition USFWS indicated that individual access by private vehicles would likely not be allowed, but would most likely go with a 4WD bus system similar to that used at Back Bay in VA.
>>
>>Such access limitations as above would be unacceptable. At a minimum private vehicle access by at least 4WD vehicles on sand roads similar to the Interdunal Road near Cape Point and Pole Road at Hatteras Inlet should be provided for.
>>
>>Now that said let me be clear in my expectations. If, for example, the 7 mile bridge proposed by USFWS is built, I would expect to see a sand road from the North end of Rodanthe to the South side of the new Pea Island Inlet and a sand road from the North terminus area of the bridge to the North side of the new Pea Island Inlet. But if, for example, an inlet was eventually formed at the S-Curve area, or any other area, I would not expect any bridging or fill of such an inlet to accommodate a sand road. We should at least start with reasonable sand road access and let new inlets dictate what access remains over time. Such access should be agreed to by USFWS as part of this process and factored into the road improvement decisions. It should not be left undecided and for USFWS to decide in the future as they indicated during discussions on the 17 mile bridge.
>>
>>4. Any bridge / raised roadway solutions should carefully look at what wind restrictions may be needed and their impact on travel / access. I refer you to wind restrictions on the Chesapeake Bay Bridge Tunnel as examples of a similarly exposed roadway that is purposely not used as an evacuation route because of the wind restrictions.
>>
>>
>>Now having said all the above, I think the following are the best compromise solutions that would address my 4 concerns.
>>
>>For Pea Island Breach:
>>
>>Bridge on new location. This requires only a short section of new right of way, moves the road further from the surf zone (beyond the 2060 erosion zone) in the area of the breach (particularly to the South as inlets tend to migrate South; eg. Oregon Inlet), places it on a bridge so the current inlet can be left for sound water outflow relief from potential sound flooding and provides better interconnect to the North if the conceptual road / bridge (or portions thereof) ever need to be built to the North.
>>
>>And any improvement should consider access to the boat ramp at New Inlet. We should not loose access to this boat ramp.
>>
>>For Rodanthe Breach:
>>
>>Bridge in Pamlico Sound. It seem foolish to build anything within the current easement, knowing it will soon be in the surf zone; (ie the easement is within the 2060 erosion zone) . The history of this area includes Loggerhead Inlet in this general location and sooner, rather than later, this area will be breached badly. When it is badly breached, it would obviously be better that any bridging in the area was not eventually in the surf zone.
>>
>>Ted A. Hamilton
>>6 Jib Ct
>>Hampton VA 23664

>>
>>Property owner in Salvo NC for 40 years
>>
>>
>>
>>
>>Cheers Ya'll
>>
>>Ted A. Hamilton
>>(aka Salvo Jimmy)
>>
>>_____
>>
>>Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.
>
>
>Cheers Ya'll
>
>Ted A. Hamilton
>(aka Salvo Jimmy)

Cheers Ya'll

Ted A. Hamilton
(aka Salvo Jimmy)

Smyre, Elizabeth A

From: Haug <haug@astound.net>
Sent: Wednesday, December 14, 2011 12:32 PM
To: Smyre, Elizabeth A
Subject: Hwy 12 - Outer Banks

I strongly support the beach nurishment options to create a stable corridor for the road.
Karl and Billi Haug
Owners
Sandbox at Salvo

Smyre, Elizabeth A

From: Bluesadvice@aol.com
Sent: Friday, December 09, 2011 11:49 AM
To: Smyre, Elizabeth A
Subject: Rodanthe road options

Dear Ms. Smyre,

This letter is for the purpose of asking NCDOT to proceed with the beach nourishment option for Highway 12 into Rodanthe. The bridge options, particularly the bridge in the sound, would harm the idyllic atmosphere of Mirlo Beach and the surrounding area. My second choice would be the shorter bridge into Rodanthe along with the beach nourishment option.

The other bridge options are too disruptive to the area, too expensive, and would leave Rodanthe open to further erosion and loss of property value.

Nancy Hawkins

Norburn, Robert E.

From: Smyre, Elizabeth A [bsmyre@ncdot.gov]
Sent: Monday, January 23, 2012 8:57 AM
To: randy hirscher; Norburn, Robert E.
Cc: Office of the Governor; governor.office@governor.ncmail.net; LT. Governor
Subject: RE: Mirlo Beach/Hwy 12 Breach Fix Options

Randy, Julie-
Thank you for your comments on the NC 12 projects. Every comment that NCDOT receives will be carefully considered as the planning process for the projects moves forward. If you have any further comments or questions, please feel free to contact me.
Thanks,
Beth

Beth Smyre, P.E.
Project Planning Engineer
NC Department of Transportation
Project Development & Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) 707-6043

From: randy hirscher [mailto:rhirscher@yahoo.com]
Sent: Friday, January 20, 2012 6:26 PM
To: Smyre, Elizabeth A; norburn@pbworld.com
Cc: Office of the Governor; governor.office@governor.ncmail.net; LT. Governor
Subject: Mirlo Beach/Hwy 12 Breach Fix Options

Ms. Smyre and Mr. Norburn:

I wanted to take the opportunity to contact you to provide my input to the Mirlo Beach Breach Fix Options that are under consideration and which NC DOT and the Office of the Governor will be making a decision about shortly. As one of the ocean front home owners in Mirlo Beach who is directly experiencing the effects of the overwash and erosion that is regularly occuring, and whose property will be directly impacted by any decision that is made on the breach fix option, I am dismayed to hear that beach nourishment option has been eliminated--right from the start--from serious consideration as a viable option to restore the highway while preserving the natural beauty that Hatteras Island is known for around the world. Any of the bridge options that might be chosen, besides being a more costly long-term option and contradicting the natural essence of the Island, will essentially commit our community (Mirlo Beach), including our house, to the sea. The Army Corps of Engineers built an engineering marvel that would stand any test of time when it built the dunes that line the island...that is, until the groin was set up at Oregon Inlet which shut off the natural flow of sand up and down the island. I would ask that NC DOT seriously reconsider the beach nourishment option -- one that is established and maintained like the Army Corp set up. NC DOT has a constant long-term source of sand that is being dredged at Oregon Inlet to maintain any beach nourishment option.

Thank you for you consideration of our comments!

Many best regards,

Randy and Julie Hirscher
22009 Sea Gull Street
Rodanthe, NC 27968

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: MR + MRS Robert Horning

ADDRESS: Po Box 132 OCRACOKE NC 27960

E-MAIL:

COMMENTS AND/OR QUESTIONS:

We strongly recommend building the long bridge - makes absolutely no sense to rebuild the bridge so close to the inlet - Building across the sound where it would be more protected and the road would be more secure seems to be the most logical and sane way to go

Sincerely
Mr & Mrs R Horning

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: Ben Hutchinson <ben.hutchinson@gmail.com>
Sent: Wednesday, December 14, 2011 11:18 PM
To: Smyre, Elizabeth A
Subject: Beach Nourishment Plan

Dear Ms. Smyre,

I am writing you this email to express my support for consideration of the beach nourishment plan in Hatteras Island. I understand that you are meeting about this issue tomorrow, and I would like to add my voice to any others there might be in support of assessing the feasibility of the plan. My family has been coming to the Outer Banks for several decades now, and not only have we regularly supported the rentals-based economy and local businesses there, but we also own property in Rodanthe and are invested heavily in its future. From my understanding of the various proposals, the nourishment plan seems to be well worth considering given its relatively low cost and non-intrusive nature. I hope that you ultimately choose what is best for Rodanthe, and I believe that course of action to include at least looking into the nourishment plan. Many thanks for your time.

Best,
Ben Hutchinson

Smyre, Elizabeth A

From: Beth Hutchinson <beth.b.hutchinson@gmail.com>
Sent: Wednesday, December 14, 2011 11:57 AM
To: Smyre, Elizabeth A
Subject: Mirlo beach nourishment

Dear Ms. Beth Smyre,

Although I do not currently live in North Carolina, I've been vacationing in the Outer Banks for most of my life. I visit at least twice a year, I was married at Bodie Island lighthouse and I consider our family vacation home in Mirlo Beach my second home.

I realize that you will be meeting with other representatives tomorrow as part of a merger team to discuss action regarding solutions for the erosion and transportation issues affecting highway 12 near Mirlo Beach. **I hope you will strongly consider beach nourishment as a solution**. This approach has the potential to preserve the natural beauty of this special place in a *cost-effective, forward-thinking and sensible* way.

Thank you for your time.

Sincerely,
Beth Hutchinson

Smyre, Elizabeth A

From: Hutchinson, Wes <jwhutch@wharton.upenn.edu>
Sent: Tuesday, December 13, 2011 2:09 PM
To: Smyre, Elizabeth A
Cc: Baker, Sterling D; Capehart, Bob; Nance, Jon G; Bouchelle, Tammy; Roseann Verrecchio; mike_bryant@fws.gov; Scott_lanier@fws.gov; dennis_stewart@fws.gov; Office of the Governor
Subject: NC12 in Mirlo Beach - Comments for the Dec 15 meeting of the Bonner Bridge Merger Team
Attachments: MirloBeachErosionOpinion-CSE-1Nov2011.pdf

Beth,

https://sites.google.com/site/mirlobeachnc/home

The above URL links to a website we have developed to inform the general public and specific stakeholders about the opinions of the Mirlo Beach Home Owners Association (MBHOA) regarding the beach nourishment design option for the Rodanthe part of Phase 2. **WE STRONGLY FEEL THE NOURISHMENT OPTION MERITS FURTHER STUDY.** Unless you know exactly where the sand is (and isn't), we cannot see how you can make an informed final decision that is in the best interests of the citizens of the State of North Carolina and all of the others who fins value in the outer banks.

When you and I met at the NCDOT workshop (Monday 12/5/11), you suggested that I put all of our comments in one place. I am sure that individual home owners will contact you separately, but on behalf of MBHOA, I have pasted below "The 10 Top Reasons to Support Beach Nourishment" from our website. I have also pasted below the letter we emailed to you on November 4, 2011, and I have attached the report by Coastal Science and Engineering, which we also sent earlier.

Since you and John Page (PB Americas) indicated at the workshop that the cost of nourishment is difficult to quantify and that you do not attempt to quantify the costs of the bridge options in terms of damage to the local economy (which are qualitatively outlined in the FEIS), please note Reasons #6 and #8, respectively. These are necessarily very approximate estimates; however, we will continue to refine them and update our website as we do more research and consult more with a variety of experts.

After we learn which options have been retained by the Merger Team for further study and receive a copy of the expert report (which you said you would send), we will almost certainly have more comments to submit.

Thanks again for all of your hard work and that of the Merger Team.

--wes

The 10 Top Reasons to Support Beach Nourishment

1. Beauty. The ribbon of sand that is the Outer Banks of North Carolina provides some of the most beautiful beaches in the world, some of the most beautiful wildlife, some of the most beautiful sunrises and sunsets. Nourishment preserves this beauty. Let's be honest, bridges are ugly.

2. Working with nature. Nourishment maintains a beach with sand matched to that beach. Pumping sand back onto a beach is simply using a human force to repair damage done by a natural force -- erosion. No concrete, no steel, no permanent manmade changes to nature.

3. Permanence. It is sometimes said that beach nourishment is not a permanent solution, but that just means that the nourishment must be repeated. This is how New York, New Jersey, and Delaware maintain their beaches (along with many

states and countries). The Final Environmental Impact Statement (FEIS) estimated that the nourishment cycle for Rodanthe would be once every 4 years. However, we will never know until we try it. It could be shorter; it could be longer. Thus, we should nourish as soon as possible to learn the facts.

4. Speed. Nourishment is the fastest way to protect NC 12. The main thing that delays nourishment, is getting the needed permits. In South Nags Head, that took several years, which is about how long it takes to design and build a bridge. We assume that a project this big and important will be fast-tracked by the appropriate government agencies. NC 12 needs protection ASAP!

5. Flexibility. Because nourishment is an ongoing solution, it can be repeated sooner or later depending on conditions. It leaves open the possibility of better solutions 20 years down the road based on new technologies. A bridge can always be built later if experience proves that nourishment is too costly or ineffective. A bridge cannot be "unbuilt" later, if nourishment is shown to be better or if better alternatives emerge. A bridge cannot even be stopped halfway if cost overruns show it to be be much more expensive than expected.

6. Saves money. The cost of a bridge in Rodanthe is $114 million to $240 million (NCDOT estimate in 2006 dollars, $128MM to $270MM in 2011 dollars) and $169 million to $212 million (our estimate in 2011 dollars based on figures provided by Coastal Science and Engineering). However, build a bridge today, pay for it today. Begin beach nourishment and you pay only 1/12 of the total cost today, and the "present value" cost of nourishment is only $106 million to $133 million.

7. Due diligence. The BIG question with nourishment is whether or not sand can be found. This is why nourishment needs to be one of the alternatives selected by NCDOT and the Merger Team on December 15 for additional study. What the experts have said is that there is very little sand in Wimble Shoals (several miles from Rodanthe), but there is a lot of sand in Platt Shoals, which is 6 - 9 miles north and there may be sources of sand in between. Experts also say that even 10 - 20 miles can be economically feasible. We need to know where the sand is!

8. Preserves the Hatteras Island economy. All of the bridge alternatives will have a devastating effect on the cultural and economic life of north Rodanthe (not just Mirlo Beach). Popular uses such as fishing, birding, surfing, wind surfing, and kite boarding will all be negatively affected or eliminated. Vacation rentals and property values will plummet. The Mirlo Beach subdivision alone has a tax value of over $50 million, and the rest of northern Rodanthe is worth at least that much. Thus, the annual tax contribution to Dare Co. is over $400,000. Over the 50-year life of a bridge, that is $20 million. Add to that the rental revenue and retail sales to vacationing renters and it is clear that bridges will result in a substantial financial loss to our community. ... and our community is one of the few that send more tax revenue to Raleigh than is spent here on government services.

9. Rodanthe is the test case for all of OBX. All of Hatteras Island is experiencing erosion problems: private homes in the villages, Pea Island WIldlife Refuge, and the Cape Hatteras National Seashore. What happens in Rodanthe will be a model for everywhere else. Do we really want a policy of simply building bridges and abandoning the current NC12 and the lands it supports? Is it right to just let the island dissolve into the Atlantic, when nourishment might keep the place just like it is now?

10. Send a message. It took 20 years to make a decision about the Bonner Bridge. The North Carolina Department of Transportation and the Federal Highway Administration worked with a Merger Team with representatives from many local, state, and national governmental organizations. But the people who live, work, and play here always come last. We get a month or two of public comment, then a decision is made. It is time for common sense to prevail. Please send a message to everyone who will be in the room when this decision is made and everyone who can directly influence this decision. It is now or never.

The message below was sent 11/4/11:

Jerry, Beth, and others at NCDOT and USFWS,

Thanks again for your responsiveness in providing information in the past and for arranging for Jim Hoadley to attend the meeting on Monday (10/31/11) at Mirlo Beach where NCDOT, USFWS, CHEC, and MBHOA (board members and affected property owners) were represented.

I would like to share two opinions that have emerged among MBHOA members. Opinion 1 involves the more immediate issue of the erosion of private property on the west side of NC 12, and Opinion 2 involves the more long term beach erosion and ongoing damage to NC 12 and private property. Both of these opinions are based on our frequent observations of the area and a preliminary expert report prepared for MBHOA by Coastal Science and Engineering (CSE). Major CSE projects in North Carolina include the beach nourishment project at Nags Head and the Bogue Bank project in Carteret County. Their report is attached to this email for your review.

We would be very interested to know whether or not you share our opinions, and, if not, we hope you will share the evidence that leads you to different conclusions. Overall, our opinion is that NCDOT and USFWS decisions and actions, however well intended and cost effective at the time, have contributed significantly to the extreme erosion damage that occurred during Hurricane Irene. From our common sense perspective, we believe some type of significant assistance from both agencies is appropriate and deserved. Moreover, we hope that the information we are providing assists both agencies in their current decisions about the future of Hatteras Island and that they will fully take into account the likely damage to Mirlo Beach that will almost certainly result from some alternatives under active consideration.

OPINION 1: THE CAUSES OF THE EXTREME EROSION AT MIRLO BEACH DURING HURRICANE IRENE. The erosion in question occurred on the west side of NC12 from Blue Sea Rd. to Green Lantern Ct. and removed most of the sand in that area transforming property that was approximately 4 foot above sea level into a pond whose bottom is now several feet below sea level. Nine Mirlo Beach properties as well as MBHOA roads and common areas were directly affected. All Mirlo Beach properties were indirectly insofar as ocean access is now limited for properties west of NC12. We also believe the power poles in standing water and remaining debris represent a significant safety hazard.

We believe there were **four important causal factors** that created this extreme and focused erosion rather than the diffuse and limited erosion that normally occurs in sound side flooding. **First**, the narrow breach at the boundary of Rodanthe and Pea Island Wildlife Refuge created a singular point of drainage for the 4 - 5 foot of water that flooded the area when the winds from Irene shifted to the southwest. **Second**, this focal breach was most immediately caused by the canal running between the ponds in the Refuge (Paul's Ditch), which significantly increased the water pressure at the point of the breach. (Evidently this canal has been in place for many years and is jointly maintained by NCDOT and USFWS. Several residents noted that it was cleared and re-established just prior to the storm.) **Third**, the sandbags placed on the east side of NC12 just north of the breach formed a dam which prevented overwash or secondary breaches, forcing all of the water through the narrow breach (plus NC12 and elevated beachfront properties south of the breach also acted as a dam). **Finally**, from a broader perspective, this breach (indirectly) and previous ocean side breaches (more directly) were caused by the high beach erosion rate at this "hot spot." Given this, the breach would have been prevented had there been a program of beach nourishment of sufficient scale in prior years. In particular, based on our previous discussions with you, we know that such a project had been planned (at least for study, R-3116D), but was set aside several years ago in deference to the Bonner Bridge plan. Of course, there may have been good budgetary and political reasons for not engaging in beach nourishment in previous years, but it is a fact, nonetheless, that such nourishment would have prevented this damage.

OPINION 2: BEACH NOURISHMENT IS A VIABLE LONG-TERM SOLUTION TO THE RODANTHE HOT SPOT PROBLEM. At our meeting on Monday, Dennis Stewart (USFWS) told us that there had been a high-level, inter-agency meeting about long-term solutions the previous Monday (10/24/11), which he attended. He said that during that meeting evidence was presented that while there was appropriate sand close to Mirlo Beach (e.g., within 3 miles) that this source was not sufficiently large to supply a long-term solution. He also mentioned that a distance of 6 miles was considered, but was thought to be too costly. You will note in the attached CSE report that distances of 10 to 20 miles are sometimes economically viable. Thus, based on the currently limited information that we have about NCDOT plans, we are very concerned that NCDOT is prematurely abandoning beach nourishment in favor of a bridge. We believe that, if only as a matter of due diligence and fairness, NCDOT should also get an analysis from CSE (i.e., more detailed and thorough than the one attached). While there are many experts that can provide valuable input to the NCDOT decision, it is hard to think of anyone with more practical and scientific knowledge of actual nourishment projects on the NC coast.

As we all know, the Governor has mandated that a long-term solution to the NC 12 problem be developed and implemented as soon as possible. Thus, we believe it is important for you to understand our Opinion 2 and for us to understand your opinions and the process you now plan to follow. However, the issues in Opinion 1 are a more immediate concern for us. MBHOA has contacted the necessary agencies to secure permits to fill in the erosion on the west side of NC 12. We have also

secured bids to complete the work. Unfortunately, the MBHOA does not have the funds to complete this project. We have filed for FEMA/SBA loans; however, this process is long, and approval for such loans is not guaranteed. Our current understanding, based on your previous responses, is that NCDOT has no further forms of assistance for us, and our only recourse is to make a legal claim of damage. Is that true? Is that true for USFWS as well? This is not something we are eager to do, except as a last resort. We would much rather find a more cooperative solution. Thus, we need to know that it is our only remaining option before we go down that path. Do you think assistance might be available from some other NC or federal agency?

As always, we deeply appreciate your efforts, the information you have provided, and your willingness to engage in frank and productive discussions.

Sincerely,

Wes Hutchinson
Vice President, Mirlo Beach Homeowners Association

Smyre, Elizabeth A

From: Hutchinson, Wes <jwhutch@wharton.upenn.edu>
Sent: Tuesday, December 13, 2011 9:08 PM
To: Smyre, Elizabeth A
Subject: FW: Mirlo Beach and Phase 2 of the Bonner Bridge Project

FYI.
--
Wes Hutchinson
Stephen J. Heyman Professor
Marketing Dept., 746 Jon M. Huntsman Hall
The Wharton School, University of Pennsylvania
Philadelphia, PA 19104-6340

office: (215) 898-6450
fax: (215) 898-2534

From: Robert Dean <dean@coastal.ufl.edu>
Date: Tue, 13 Dec 2011 20:41:38 -0500
To: John Wesley Hutchinson <jwhutch@wharton.upenn.edu>
Subject: RE: Mirlo Beach and Phase 2 of the Bonner Bridge Project

Hello:

Without knowing all the background information, I believe that "further study for nourishment" should be worthwhile.
I suspect that the "UF expert" that Beth Smyre referenced was Dr. Max Sheppard. However, to the best of myknowledge, he does not work with beach nourishment.

Let me know if I can assist further.

Best regards,

Bob Dean

From: Hutchinson, Wes [mailto:jwhutch@wharton.upenn.edu]
Sent: Tuesday, December 13, 2011 1:29 PM
To: dean@coastal.ufl.edu
Subject: MirloBeach and Phase 2 of the Bonner Bridge Project

https://sites.google.com/site/mirlobeachnc/home

I am the VP of the Mirlo Beach Home Owners Association and several paths have led me to you. As you probably know know the Bonner Bridge merger team will be meeting on Thursday to decide which design options to retain for further study for Phase 2 of the Bonner Bridge Project. While researching beach nourishment, I came across a 2004 report you did with Robert Dolan, at the NCDOT workshop last week Beth Smyre mentioned that one of their experts was from UF (so I googled you, BTW I was on the UF faculty for 13 years before coming to U Penn), and this morning when I asked Tim Kana (Coastal Science & Engineering)

about you, he said, "Bob Dean is revered in our profession and would be a great resource for you." Thus, I would love to know your opinions about beach nourishment as a Phase 2 solution for the Rodanthe hot spot.

As you might expect, the MBHOA is a strong advocate offurther study for nourishment. We think it's worth the time and money to find out exactly where the sand is (or isn't) before a final decision is made. We will be "going public" this afternoon with a website (link is above -- gotta love Google). I am running it by the experts we have contacted for comments and especially to confirm that the facts behind our opinions are right (even though others might arrive at different opinions based on the same facts). We would value any thoughts you might have.

--wes

--
Wes Hutchinson
Stephen J. Heyman Professor
Marketing Dept., 746 Jon M. Huntsman Hall
The Wharton School, University of Pennsylvania
Philadelphia, PA 19104-6340

office: (215) 898-6450
fax: (215) 898-2534

Smyre, Elizabeth A

From: Lynn & Windsor Jacques <frisconc@embarqmail.com>
Sent: Sunday, December 11, 2011 10:12 PM
To: Smyre, Elizabeth A
Subject: comment on the rt12 pea island fix

Lynn & Windsor Jacques
51170 Lassiter Lane
P.O. Box 1025
Buxton, NC 27920-1025
Tel 252-995-3760
e-mail: frisconc@embarqmail.com
Cell Phone 252-995-2125 or 252-305-1040
December 11, 2011

Ms. Beth Smyre, PE
NCDOT - Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Re. Comment concerning the Bonner Bridge replacement project - phase II TIP No. B-2500 Dare county

Ms. Smyre.

My wife & I attended the NCDOT Bonner Bridge Public Workshops meeting in Rodanthe on 12/6/11. I want to compliment you & your staff on presenting a well organized and informative meeting. The NCDOT personnell were knowledgeable & personable.

As you know, the Pea Island road situation is critical to the survival of Hatteras Island, & Dare county as a whole, both economically & socially. We firmly believe that the solutions presented at the meeting to fix the Pea Island situation were stop-gap & temporary at best. If NCDOT, the state, Dare county, the federal government &, most of all, the residents, are serious about providing sustainable access on & off Hatteras Island, we need to reconsider the Pea Island causeway by-pass, which was part of the original Bonner Bridge replacement proposal. During the December 6 meeting, the only reason we were given for not considering the Pea Island by-pass was that it would be too expensive. This being said, there are creative & innovative ways to finance such a project which could include tolls, a special tax on the people who benefit, municipal bonds or private investment. Yes, it will be expensive; & not politically attractive but it should be evaluated. One option that should be considered would be to tie a by-pass into the existing Bonner bridge. The existing bridge may not meet modern design criteria but is being maintained to be safe & useable.

During the meeting, when we mentioned a ferry system around Pea Island, We were told that NCDOT had evaluated a ferry solution & felt that a ferry system could not be engineered which would be able to handle the traffic & therefore did not present it as a viable solution. This answer is a cop-out. Given the gravity of the situation, we need to include a ferry solution as part of the evaluation process. I feel a ferry solution could be engineered & may be the least expensive & the most effective.

Pea Island is a dynamic westward moving, environmentally sensitive sand bar in the Atlantic ocean, the ocean is rising, storms are unavoidable, beach erosion is inevitable, engineering & building a sand dike on this sand

bar is foolish, building a fixed structure behind the dike is fool-hardy.

We would appreciate a response to our comments.

Thanks

Windsor J

Smyre, Elizabeth A

From: Frank A. Jakob <capehatreal@yahoo.com>
Sent: Tuesday, December 06, 2011 7:56 PM
To: Smyre, Elizabeth A
Cc: Jerri Getty; ccjake44@gmail.com; 'Warren Judge'; 'Warren Judge'
Subject: Public Comment Rodanthe Dec 6, 2011 re NC Hay 12 and new Bonner Bridge
Attachments: 12062011 faj proposed stumpy point bridge scan0003.pdf; 12062011a aerial ocean front and sound front Dare co parcels rodanthe scan0004.pdf

Dear Beth Smyre,

I attended the public comment in Rodanthe this evening, December 6, 2011 regarding the construction of the new parallel Bonner Bridge and alternatives on how to maintain NC Highway 12 to Rodanthe. This was the fourth such meeting in the past 6 years and many more of the same meetings I've attended over the past 20 years.
Hopefully we are getting closer to a solution.

After reviewing your site plans and many proposals, I'd like to offer my comments below:

First off, I would like to tell you a little about myself. I have an engineering back ground and worked as a project engineer for 10 years with United Engineers and later, Stone and Webster in the construction of Electrical Power Plants and Steel Mills. I relocated to Rodanthe in 1976 and have been in the development and construction of real estate here for over 30 years. I currently own and operate Cape Hatteras Realty and Construction Corp in Salvo, NC. I'm the broker who was responsible for the sale of Jennet's Fishing Pier and later indirectly Manns Harbor Marina to the State of North Carolina, as well as many similar projects in my 30+ year experience. I have seen the effects of beach erosion on NC Highway 12 thru-out Pea Island and Rodanthe with over 1,800 feet lost due to erosion in one storm (south side of Oregon Inlet circa 1970's). There are many plotted lots in Rodanthe that are now in the ocean, including a 28 unit condo project on S Holiday Ave. The highway has been relocated 3 times since I've lived here, and now there is no land left to relocate it again. After reviewing historical maps from the 17th and 18th century Rodanthe was an inlet for centuries. Trying to combat the natural southerly flow of ocean currents in this hemisphere with beach erosion is a losing battle.

Sometimes you have to step back and take another look to see the forest thru the trees. Attached is a site plan marked "Alternate III" and aerial of Dare County property in Rodanthe . The only reason we have a problem with NC Highway 12 thru Pea Island is because we are ***building a new bridge*** in the ***wrong location***. "Forget a new bridge across Oregon Inlet". Take the funds and build a new 13 mile bridge across the sound from the NC State Ferry terminal in Stumpy Point to the NC State/Dare County Ferry Landing in Rodanthe (behind the community center).Leave Pea Island alone for the wildlife. There would be no need for beach nourishment or maintenance of NC Hwy 12 or property acquisitions.

Let mother nature take care of the Rodanthe and Pea Island Breech. Make it accessible for walk on traffic only. Dare County already owns 9.82 ac sound-front (Rodanthe-Waves-Salvo community center) and 7.33 ac vacant ocean front land across the road from the community center. The county already applied for a grant on the ocean front parcel to build a recreation center with public parking. This would allow public walk-on access along the beach front to Pea Island.

This could be a simple solution to a unsolvable complex problem (and getting bigger).....provided you can get thru the political hoop net. The life line of over 5, 000 Hatteras Island residents and 1,500 hundred Ocracoke residents, including hundreds of small mom and pop businesses and emergency services depend on safe dependable access from Rodanthe.

After all, the State and Feds are almost finished building a new high speed interstate US/NC 64 from I-95 (Rocky Mount, NC) to Manns Harbor/Nags Head, NC which could easily intersect Stumpy Point, NC.

"Bingo"

Please feel free to contact me if you have any questions.

Thanks and Have a Great Day !

"Without hard work, nothing grows but weeds"

Frank

Frank A. Jakob, President Realtor-Broker-Auctioneer

Buyer-Seller Agent & Investment Broker (1031 Tax Deferred Exchanges)

Residential-Commercial-Business Broker

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Residential, Commercial, Land (HUD Certified)

Cape Hatteras Realty and Construction Corp
27013 Third Street
PO Box 249
Salvo, NC 27972

Cell: 252-305-1184

Office: 252-987-2799
Fax: 252-987-2012

e-Mail: **capehatreal@yahoo.com**
Web: **www.CapeHatterasRealty.com**

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www.capehatterasrealty.com

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Smyre, Elizabeth A

From: Thomas Kligge <tdkligge@gmail.com>
Sent: Wednesday, December 14, 2011 11:35 AM
To: Office of the Governor
Cc: Smyre, Elizabeth A; timspear@ncleg.net; Warren Judge; allenb@darenc.com; joshua.bowlen@mail.house.gov; kara_weishaar@burr.senate.gov; aaron_suntag@hagan.senate.gov
Subject: Beach Nourishment

Dear Government Officials, in addition to all information that you probably have received supporting beach nourishment for the Rodanthe area, a quick personal story: In May 2011, my wife and I invested our life savings in our dream house in Mirlo Beach. After exploring the entire eastern coast from Delaware to South Carolina, we both decided this is where we wanted to be. We felt we were safe investing on the west side of Route 12, thinking it would be there to protect us. Now, several options proposed, are threatening the entire northern area of Rodanthe. Please decide to pursue beach nourishment to protect this beautiful and historic area for us and our descendants. Thank you, Tom and Janet Kligge.

Smyre, Elizabeth A

From: Cathy Lane <LANECA@pwcs.edu>
Sent: Thursday, December 15, 2011 3:05 PM
To: Smyre, Elizabeth A
Subject: Beach Nourishment

I am writing to you today with concerns about the proposal to ensure access to Hatteras Island through a beach nourishment project. Because I spend my summers in Hatteras Village and plan to retire there, I am greatly interested in keeping full time access to Hatteras Island available. However, I do have some questions that I would like to see addressed before a decision is made to go ahead with beach nourishment. Those questions are as follows:

1) Where is the sediment coming from? Will it be dredged and pumped onto the beach, or brought by dump trucks? If the sediment is being brought in, how will the eventual erosion of the new material affect the offshore environment? If it is being pumped in, how will the lose of sediment offshore and the dredging affect the offshore environment?
2) What will the size of the sediment be? Will it match the current grain size on the beach or be larger or smaller? Will the sediment be well sorted or poorly sorted? This will make a difference in how quickly the new beach erodes.
3) Will there be mud and silt mixed in? These tend to erode quickly and cause poor water quality directly offshore. In addition, contaminates tend to build in mud and silt.
4) Will the new sediment be compacted more than the existing sediment? Organisms that currently use the beach might not be able to survive if the sediment becomes too compacted.
5) Will a sediment toxicology study be done before the project is started?
6) Will the beach profile be affected? Will the "new" beach be steeper than the existing beach? This will affect how quickly it erodes and what organisms can utilize the beach.
7) Has a biological impact study been done? Will sea turtle nests be affected (sea turtles would be unable to nest on a compacted beach and cannot crawl onto a steep beach profile)? If there is mud and/or silt in the sediment greater than a few %, are there offshore filter feeders (clams, mussels, etc) that could be affected by the resulting poor water quality as the mud and silt erode?
8) Where is the funding coming from?

I thank you for taking the time to read this e-mail. I also thank you in advance for taking the answers to these questions seriously before any decision is made regarding beach nourishment. While, again, I want access to Hatteras Island, I do not want it at an exorbanent cost. Nor do I want the environment harmed to too great an extent. After all, it is for the great beauty of the Outer Banks that I spend my summers there.

Thank you,

Cathy Lane
Oceanography Instructor
Science Department Chair
C.D. Hylton High School

Smyre, Elizabeth A

From: Chris Lazinski <clazinski@gmail.com>
Sent: Thursday, January 19, 2012 3:24 PM
To: Smyre, Elizabeth A
Subject: Comments on the Future of S-Turns

Hello Ms. Smyre,

I'm writing in response to a recent article in ESPN Surfing (http://es.pn/wZBcbh) that details the potential outcomes of NCDOT's planning for the future of the Pea Island and North Rodanthe breach sites. As a resident of Hatteras Island whose employment depends on access to the waters of the ocean and the sound, I urge you to consider the needs of the surfing community in designing the future road structure of the S-Turns area. I teach kiteboarding and surfing lessons full-time for Real Watersports in the town of Waves, and I can attest that a very significant portion of our year-round business comes from tourists who travel to Hatteras Island specifically for surfing or kiting. By designing a road structure that does not easily preserve access to this area, we risk losing at least some of these surfers and kiters to other, more easily accessible riding locations. This risk is unacceptable to an island that was so physically and economically damaged by Hurricane Irene this past August. In years past, the lack of public parking or designated public beach accesses in the S-Turns area has led to conflicts with property owners and a weakening of the dune structure due to constant human traffic. Barring any more large natural events, the surf breaks at the north end of Rodanthe won't be going anywhere, and as a consequence, neither will the surfers. By designing a long-term plan that takes the needs of surfers into account, such as the needs for parking, bathrooms/changing rooms, and designated beach accesses, we can preserve access to these breaks while also pleasing local property owners and helping preserve the dunes in that area. I feel that this win-win-win outcome should be the goal of your design process, and I hope the DOT listens to our concerns.

Best,
Chris Lazinski
Kiteboarding Coach, Real Watersports
www.realwatersports.com

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: Rush Little

ADDRESS: 23310 Hwy 12
Rodanthe, NC 27968

~~**E-MAIL:**~~ Mailing Address PO Box 876
HARDY, VA 24101

COMMENTS AND/OR QUESTIONS:

I oppose the bridge. I own a sound front home in Rodanthe. The bridge would take away the view and looking at traffic not the sound front. Windsurfers will be trying to go over and under bridge which would be dangerous. It would be a lose of revenue

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: SC SEA <scseasurfer@gmail.com>
Sent: Friday, January 06, 2012 12:22 PM
To: Smyre, Elizabeth A
Subject: Surfers' Environmental Alliance (SEA) support for public parking at "S-Curves" surf break on the Outer Banks

SURFERS' ENVIRONMENTAL ALLIANCE (SEA)

The Leading Edge of Coastal Activism

Respectful greetings from Surfers' Environmental Alliance (SEA),

SEA asks that any bridge-building or public transportation project on the Outer Banks include provision for public parking for recreational beach users and surfers. We believe beach access is a public right and public funds should not be used to eliminate or reduce said existing access. This request applies to the S-Curves surf break, in particular. This is a well-known break and used by surfers year-round. Such recreational activities help power the local economy, as well.

As a preliminary matter, Surfers' Environmental Alliance (SEA) is committed to the preservation and protection of the environmental and cultural elements that are inherent to the sport of surfing. Our goals are achieved through grassroots activism, community involvement, education and humanitarian efforts. We engage in projects that strive to conserve the quality of our marine environment, preserve or enhance surf breaks, protect beach access rights, and safeguard the coastal surf zone from unnecessary development. www.seasurfer.org

SEA operates nationally and overseas also when appropriate, so we are extremely interested in the Outer Banks situation. Any public action which reduces water quality, beach access, or surfing access is strongly opposed by all SEA members.

We all urge you to preserves beach access parking for surfers and all other beach users.

Jim Littlefield
West Coast Environmental Projects Director
Surfers' Environmental Alliance (SEA)
www.seasurfer.org

Smyre, Elizabeth A

From: Matthew_McCambridge@bd.com
Sent: Friday, December 09, 2011 4:54 PM
To: Smyre, Elizabeth A
Subject: Rodanthe NC 12 road options,

Dear Ms. Smyre:

This letter is to ask the NCDOT to implement the beach nourishment option for stabilizing Highway 12 into Rodanthe. It makes the most sense economically and would have the least disruptive effect of the four options. In particular, the bridge in the sound would ruin the Mirlo Beach area. As a frequent visitor to the area, I know that it would harm the active sound life that is so popular. Kiteboarders, stand-up paddlers, windsurfers, kayakers, and families enjoying the shallow warm waters would all be harmed by a bridge in the sound.

I fear that any program without beach nourishment would lead to further severe erosion and the gradual elimination of the northern Rodanthe area. Thank you for your considerations.

Very Respectfully,
Matt McCambridge

BD

Matt McCambridge
Distribution / Supply Chain

BD
1 Becton Dr., Franklin Lakes, NJ 07417 USA MC: 017
tel: 201-847-5853
E-mail: Matthew_McCambridge@bd.com Website: www.bd.com

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COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: George Mead

ADDRESS: 27251 Dorr Rd - Salvo

E-MAIL: Geomead@charter.net

COMMENTS AND/OR QUESTIONS:

It seems to me that Beach Nourishment is a lost cause. It seems to be costing a great deal with only temporary results.

A raised structure appears to be an approach that promises longevity in the long run, less overall cost and better reliability.

Thank you

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

So Do What You Have to Do-

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: Gisele Mead

ADDRESS: PO Box 364 Rodanthe NC 27968

E-MAIL: GRMead@CHARTER.NET

COMMENTS AND/OR QUESTIONS:

I think beach nourishment is a terrible waste of money. We need a bridge and not a temporary one. This bridge (whatever kind you choose) needs to be started immediately. Please don't waste any more money repairing the road every time we have a storm. Get off the pot!! Build a bridge.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: Diane Medley <Diane.Medley@mcmcpa.com>
Sent: Wednesday, December 14, 2011 1:27 PM
To: Smyre, Elizabeth A; Tim.Spear@ncleg.net; warrenj@darenc.com; allenb@darenc.com; Office of the Governor; Joshua.bowlen@mail.house.gov; kara_weishaar@burr.senate.gov; aaron_suntag@hagan.senate.gov
Subject: Permanent Solution to Highway 12 Erosion Issues

Importance: High

Dear Government Officials and Other Leaders:

I am writing this email to plead with you to seriously consider the Beach Nourishment proposal currently being discussed for Highway 12. I am a homeowner of three houses on the Outer Banks and I have vacationed there for over 30 years. This area of your state is extremely important to many people who do not live in North Carolina but who go there on a regular basis and spend lots of time and money there every year. This portion of your state has had some misfortune of late with the storms that have damaged the infrastructure. It is very important that you consider this situation and take action now to stabilize and support this portion of your state for the future and future generations.

I appreciate your consideration of this matter and hopefully the solution that can and must occur.

Sincerely,

Diane Medley

MCM
Mountjoy Chilton Medley
Diane B. Medley, CPA-ABV, CVA
Co-Managing Partner
Phone / Fax (502) 882-4303
MAIN PHONE: (502) 749-1900 FAX: (502) 749-1930
2000 MEIDINGER TOWER • 462 SOUTH FOURTH STREET • LOUISVILLE, KY 40202
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Smyre, Elizabeth A

From: Jer Mehta <jmehta@speechsoft.com>
Sent: Wednesday, January 11, 2012 5:09 PM
To: Smyre, Elizabeth A
Subject: RE: Bonner Bridge Replacement Project Phase II - Public Workshop Comments

Hi Beth,

Now that beach nourishment has been dismissed as an option for the Rodanthe S-curve project, I want to go on record as favoring the option to elevate NC 12. I am still very opposed to building a new bridge in the Pamlico Sound as it would have a very negative impact to my sound front home in Rodanthe.

As stated in my email below, a bridge in the Pamlico sound will destroy the charm and character of this unique natural resource and diminish the beauty of the entire area. It will ruin the property values of all the homes in Rodanthe, specifically the sound front homes. Our sound front home on Pappy Lane is right next to the planned termination point of the Pamlico bridge. The chaos, noise and disruption caused during construction will virtually put our rental home out of business. Additionally, this bridge will destroy the areas sport of kite boarding, windsurfing, and sailing, and would ruin the vacation rental business, a source of county revenue. We currently get a lot of rentals in the April, May, June, September and October months from kite boarders, wind surfers. This revenue will be lost for all homes north of the bridges termination point. Furthermore it will ruin the natural beauty of the wildlife refuge as well as the natural environment of the Pamlico sound waters.

Overall the option to build a bridge in the Pamlico Sounds would have a tremendous negative impact on the area that so many people are trying to preserve in its natural state and ruin the businesses and home values in Rodanthe.

Please take this into consideration as you assess the 2 remaining options for Rodanthe. Is there a target date when a decision will be made public?

Regards,
Jer Mehta

From: Smyre, Elizabeth A [mailto:bsmyre@ncdot.gov]
Sent: Monday, December 12, 2011 1:42 PM
To: Jer Mehta
Subject: RE: Bonner Bridge Replacement Project Phase II - Public Workshop Comments

Jer-
Thank you for your comments! Please let me know if you have any further comments or questions.
Thanks,
Beth

Please note my phone number has changed, effective March 30, 2011- see below.

Beth Smyre, P.E.
Project Planning Engineer
NC Department of Transportation
Project Development & Environmental Analysis Branch
1548 Mail Service Center

Raleigh, NC 27699-1548
(919) ***707-6043***

From: Jer Mehta [mailto:jmehta@speechsoft.com]
Sent: Sunday, December 11, 2011 9:57 AM
To: Smyre, Elizabeth A
Subject: Bonner Bridge Replacement Project Phase II - Public Workshop Comments

Hi Ms. Smyre,

Thank you for taking the time to discuss the Bonner Bridge Replacement Project Phase II at the public workshop held 12/5 in Manteo.

My name is Jer Mehta. My husband Morris Neuman and I own a sound front home at 23177 Pappy Lane, Rodanthe and another home at 22197 Green Lantern Court, Mirlo Beach, Rodanthe. Both houses are used as a rental business and the option of a new bridge in Pamlico Sound would destroy our business and investments.

For the Rodanthe breach area, I strongly favor the Beach Nourishment Option and am very opposed to the option of building a new bridge in the Pamlico Sound connecting Pea Island to Rodanthe.

The alternative for a new bridge in the Pamlico Sounds will be abandoning Rodanthe, our beach and destroying our sound. This alternative will have a huge negative impact to our homes, investments and businesses.

The beach is a national resource, unrecoverable once lost. Millions of people come to the beaches to vacation, enjoy fishing and for water sports, providing tourist dollars to the county and the state. All thru the eastern coast, county/state governments help local towns preserve the tourist business e.g. Ocean City MD, Bethany Beach MD. In NY, the beach shoreline is protected via jetties. The beach nourishment effort in Nags Head preserved a lot of investments during this past storm and has helped rejuvenate the image of Nags Head as a tourist destination. Places like Aspen CO spend millions of dollars each year grooming their ski slopes to preserve the tourist business, even though each year the snow melts and has to be replenished. Once the bridge is built, the existing NC 12 will be abandoned and the shoreline erosion will destroy not only the ocean front homes but the homes west of NC 12 (like our home) will be unmaintainable by the owners. The roadway and beach front as you enter Hatteras must not be abandoned. It should be nourished and preserved to showcase the natural beauty of this island and as the gateway to Hatteras.

The Pamlico Sounds is the largest body of water in the US with clear waters and unobstructed views. This bridge in Pamlico sound will destroy the charm and character of this unique natural resource and diminish the beauty of the entire area. It will ruin the property values of all the homes in Rodanthe, specifically the sound front homes. Our sound front home on Pappy Lane is right next to the planned termination point of the Pamlico bridge. The chaos, noise and disruption caused during construction will virtually put our rental home out of business. Additionally, this bridge will destroy the areas sport of kite boarding, windsurfing, and sailing, and would ruin the vacation rental business, a source of county revenue. We currently get a lot of rentals in the April, May, June, September and October months from kite boarders, wind surfers. This revenue will be lost for all homes north of the bridges termination point. Furthermore it will ruin the natural beauty of the wildlife refuge as well as the natural environment of the Pamlico sound waters.

Overall the option to build a bridge in the Pamlico Sounds would have a tremendous negative impact on the area that so many people are trying to preserve in its natural state and ruin the businesses and home values in Rodanthe.

There is continuous dredging to keep the Oregon Inlet open to fishing boats. The Sound is also quite shallow and requires dredging to keep the channel open. This sand should be made available and used to nourish/maintain our shoreline. Jetties should also be considered to preserve our beach.

Beach nourishment will preserve our national treasures - our beaches and a natural Pamlico Sound for thriving vacation business and enjoyment for millions.

After Hurricane Irene, any option but beach nourishment will be akin to abandoning Rodanthe.

Elevating Hwy 12 with beach nourishment seems like the least invasive option after beach replenishment.

Thank you for your consideration.

Regards,

Jer Mehta
914-384-3047 (cell)

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Smyre, Elizabeth A

From: Miale, Rick
Sent: Friday, January 06, 2012 6:10 PM
To: Smyre, Elizabeth A
Subject: S-Turns and parking

I saw the article in ESPN about parking at S-Turns. Since you've asked for comments I'd like to share.

I've surfed since the early 80s. I spent a lot of time on the Outer Banks, usually between Rodanthe and Frisco. Some visits were to go surf, some visits were to go fish. Hatteras is a very important place for me. Anyway, I'd love to see a parking lot at S-Turns. Even if it was inland a bit and required a walk it would beat having parking eliminated. I've always feared parking on 12 as it's dangerous and there are very few parking places in Rodanthe. Most of the streets are private or are too narrow to offer parking. I can understand why people wouldn't want their streets clogged with vehicles - when I lived in Virginia Beach (home) we lived a few blocks away from the water and it was always a zoo. Both sides of the street would be full and at times it was hard for us to pull into our driveway. When the city added some additional parking lots that really helped. The traffic went from the streets into the lots. It was then safe to walk on the streets again. One idea that I'm ok with is paid parking. A few bucks to park all day is a bargain and would help to offset the price of the lot, maybe evening making the town of Rodanthe some extra money in the process.

Thanks for reading this!

Rick Miale
NC Division of Public Health/Early Intervention
www.ncei.org

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Smyre, Elizabeth A

From: bsmyre@ncdot.gov
Sent: Monday, November 28, 2011 5:06 PM
To: Smyre, Elizabeth A
Subject: I have Carbon Copied you on this ContactUs message

Comment History
Tracking Number: WEVO1Y5RTT
Unit Name: Bonner

Sent By: Contact Us Administrator **Date/Time:** 11/27/2011 5:56:52 PM
Comment:
Ronald- Thank you for your comment on the Bonner Bridge project; all comments are important and will be fully considered as we move forward with the next phase of the project. Please let us know if you have any further comments or questions! Thanks, Beth Smyre

Sent By: Ronald Moorse **Date/Time:** 11/27/2011 5:56:52 PM
Comment:
In light of the Hurricane Irene effects, it is my considered opinion that building a new bridge is unwise. Spending $215 million on the bridge will give the people of North Carolina a connector between nowhere and nowhere when the next hurricane hits. It would be better to build ferry terminals: quick and easy to repair at much lower cost.

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Norburn, Robert E.

From: Smyre, Elizabeth A [bsmyre@ncdot.gov]
Sent: Friday, January 20, 2012 4:46 PM
To: Brenda J Morris; Norburn, Robert E.
Cc: Office of the Governor
Subject: RE: DOT options for fix for NC 12, Rodanthe

Brenda, Robert-

Thank you for your comments on the NC 12 projects. Every comment that NCDOT receives will be carefully considered as the planning process for the projects moves forward. If you have any further comments or questions, please feel free to contact me.

Thanks,
Beth Smyre

From: Brenda J Morris [brexmor@optonline.net]
Sent: Friday, January 20, 2012 2:07 PM
To: Smyre, Elizabeth A; norburn@pbworld.com
Cc: Office of the Governor
Subject: DOT options for fix for NC 12, Rodanthe

To: Beth Smyre and Bobby Norburn,

Re: NC 12 fixes

My husband and I own an oceanfront house in Rodanthe, on Seagull Street, in the Mirlo Beach Development. It was built in 1990. We also own a lot across the street on Cross Of Honor Way in the Mirlo Beach development.

My husband, Robert, and I purchased the lot, on Seagull Street, in 1989 and built the house months later in 1990. We intended to rent the house to pay the mortgage and then retire to this area later on. After we built the house, we noticed the beginning of the groin project at the Bonner Bridge area. I remember the project was to build the groin on each side of the inlet, east of Bonner Bridge and put into place a pumping system on each side so as to direct the sand, that was dredged, southward or northward so that the beaches, south and north, do not lose sand from this project. The beaches were not to be starved of sand as a result of this groin and dredging activity. The project was never finished, with only one groin in place and no pumping systems to direct the dredged sand to the ocean. Instead, there are new islands being created every year in the sound, with the sand that is supposed to travel up and down the coastline. NC prohibits "permanent structures" on the beaches, however, this "permanent structure" was allowed to save a broken down building, which does not generate revenue, and to make a convenient route for fishing boats, which caused properties south and north of it to lose their beach sand, as well as property owners to lose their homes on the ocean. This project was only a band-aid for the Bonner Bridge, as it should have been replaced years ago, while the "always delayed" process took place for bridge replacement.

My husband and I have witnessed, since this groin was put in, the deterioration of the beaches in our area as well as the beaches north of us in Nags Head, Kill Devil Hills and Kitty Hawk. We strongly believe that the problems from Hurricane Irene, the inlets that were cut at Pea Island and Mirlo, were largely a result of the stripping of our sand, over the years, caused by the dredging at the Bonner Bridge area which still takes place. We loved the beaches in our area in 1989. We purchased the ocean lot because of this. We know that sand comes and goes every year, however, the escalation has

been speeded up at a ridiculous pace due to the dredging. If you notice, the lifesaving station, that was ready to fall in the water, has a huge island around it now. This is, basically, our lost beach!

Beach nourishment is used all over the US coastline and it works! Look at Atlantic City, NJ and Ocean City, MD. Robert and I believe that replacing the sand on our beaches would not only save NC 12 in this area, but the Mirlo Beach oceanfront homes as well. It took years for us to lose this sand and our beaches are almost non-existent now. The bridge option in the sound, which comes in on Sixteenth of August Street in Mirlo, will definitely destroy all of our properties, as well as the bridge option coming in at the Island Convenience campground. All the properties north of the campground will be left and forgotten. This revenue for the state will be gone, as the roads will be slowly abandoned by the NCDOT! A very large piece of Rodanthe will disappear, from ocean to sound! Both bridge options will affect all properties north of Island Convenience and will also need to be maintained with possible sand replenishment in the future so as to protect NC 12 and the rest of Rodanthe and Waves from disappearing.

Property and sales taxes could be raised to generate the money needed for sand replenishment for the beaches. Since Hatteras Island gives much more to the state, in taxes, than it has ever received, we think it's time to help this island because its beaches are disappearing at an alarming rate. Hatteras Island was once a beautiful island with beautiful beaches and now it looks like a disaster zone after every hurricane or nor'easter that passes by. Hatteras Island has long been neglected by NC state and the Federal Government, that took it over years ago, then promising to maintain it but instead, having FEMA haul away our sand after every disaster instead of putting it back on our beaches.

Robert and I believe that the small bridge at Pea Island, where the ocean cut through north of Mirlo, along with beach nourishment in that area and extending into or thru Mirlo would solve the problem and help the beaches to rebuild themselves from what was stolen from them years ago and continues to be stolen now, the sand!

Respectfully,

Brenda and Robert Morris
29 White Birch Rd.S.
Pound Ridge, NY 10576
914 764-4056

Cc: Governor Beverly Perdue

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Smyre, Elizabeth A

From: Angela Nagele <anagele@gmail.com>
Sent: Wednesday, December 14, 2011 3:45 PM
To: Smyre, Elizabeth A
Subject: Beach Nourishment

Please support Beach Nourishment. It is vital to our commuinity.

Angela Nagele
North Carolina

Smyre, Elizabeth A

From: Abbott, Steve
Sent: Tuesday, January 03, 2012 4:58 PM
To: Smyre, Elizabeth A
Subject: from Contact Us on NC 12

From: Evan Nesch Phone: (252)202-1963 Email: enetsch@gmail.com

Comment History
Tracking Number: OPHXVIO9SY

Sent By: Evan Nesch Date/Time: 12/29/2011 3:32 PM
Comment:
Hi NCDOT Staff,

My concerns and suggestions are relative to the HWY 12 recovery plan, on Hatteras Island, NC.

I have lived in Kitty Hawk, NC for the majority of my life, worked in Rodanthe for the past 6 years in the summers and am now a senior at University of North Carolina at Wilmington, studying environmental science and economics. I have a particular interest in management of coastal areas.

I found out about the workshop on Ocracoke, but unfortunately will be out of the country on Jan. 5th and will not be able to attend. However I would still like to voice my opinion and recommendations if possible. Living on the OBX for the majority of my life and spending a lot of time back and forth between Kitty Hawk and Rodanthe, I have become very familiar with the issues associated with HWY 12. Just a month ago I finished writing a major research paper on management and recovery options for HWY 12, in particular the section for the Oregon Inlet to Mirlo Beach in Rodanthe.

In short, after much research and personal experience over the years, I concluded that small land bridges over problematic areas would be the best solution. I considered the ideas of moving the road west and extending the Bonner Bridge 17 miles in the Pamlico Sound to Rodanthe. Each solution has pros and cons, but by far a series of small land bridges is the best economical and environmentally practical solution. These land bridges would be about 10-12ft above the ground, and allow for general over wash during hurricanes and Nor Easters to wash under the road. The sections of elevated highway would not only be build over areas such as the newly formed inlet at the Ranger Station but also areas the require constant maintenance and are possible was out spots. For example the 2 miles immediately south of Oregon Inlet, where sand is being constantly cleared from the road, and the S-turns area just north of town. Footings for the elevated highway would be deep enough if the area for a small inlet during a storm and a lot of sand was lost from beneath the bridge the bridge would still stand. It would also eliminate annual maintenance and repair costs to these sections of unstable roads.

I would like to share my findings with NCDOT in hopes to help find the best fix for HWY 12 in respect to the economy and doing the best to preserve the Pea Island National Wildlife Refuge. Some areas of HWY 12 are more protected then others, and not every mile of the road needs to be moved. Obviously like any east coast barrier island, Pea Island is moving westward. And eventually after decades the road will be in the ocean. But with the average life span of a bridge being between 50 and 100 years, the phrase "permanent fix" is relative to this time period.

Access to Pea Island would still be available for bird watching, beachgoers, surfing etc, with the

sections of elevated highway, opposed to the long bridge option. Marsh, ponds and migratory bird areas wound not be destroyed by moving the road west either, which protection the valuable marsh and estuarine habitat is a major part of the National Wildlife Refuge's mission. Nor would the upfront cost associated with this option be as high as construction an entirely new bridge, as building small bridges over land is much cheaper than building a long one over water. Reasons for this solution are extensive, and range from safety, to short and long term economic benefits, user convenience, and reasons regarding environmental integrity.

I look forward to hearing back as soon as possible, and would like to help in any way that is needed in this project, and share a more in detailed description of my solution to HWY 12. Environmental Studies is my major, and issues such as coastal development and management is what my degree is intended for, and being a proud resident of the Outer Banks, I hope to see the best solution for HWY 12.

Please email me at enetsch@gmail.com

Or feel free to call me at 252-202-1963. I will not have phone access until January 15th, but will frequently be checking my email.

Thank You,
Evan Netsch

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Smyre, Elizabeth A

From: Morris Neuman <neuman@speechsoft.com>
Sent: Wednesday, December 14, 2011 11:09 AM
To: Office of the Governor; Joshua.bowlen@mail.house.gov; aaron_suntag@hagan.senate.gov; kara_weishaar@burr.senate.gov; Smyre, Elizabeth A; Tim.Spear@ncleg.net; warrenj@darenc.com; allenb@darenc.com
Cc: jmehta@speechsoft.com
Subject: Save our National Treasure and Valuable Resources - Hatteras Island, Rodanthe

Dear Elected Representative

I am writing to all who have been elected by the people of North Carolina to serve the people's interest about a matter that is of immediate importance to the people of North Carolina and all the people of the United States, the conservation of Hatteras Island. The Governor and almost all of you have personally witnessed the devastation of hurricane Irene unleashed on Hatteras island this past August. Now a decision will be made shortly by anonymous parties as to the future of Rodanthe - the Gateway town of Hatteras Island. I implore you all to proactively direct that decision to be in favor of beach nourishment.

If beach nourishment is abandoned as a viable option to consider at this next decision point it effectively abandons the people and businesses of Rodanthe to a future of ongoing erosion of the shoreline and all the tax generating property in that town that we have worked hard and spent millions to develop into one of the unique vacation destination for millions of Americans from all 50 states. It will be a squandering of our nations truly unique natural resources on the scale and level of the Grand Canyon or Yellowstone National Park.

My name is Morris Neuman and I am a home owner in Rodanthe. I came here in 2005 seeking an escape from the urban life of the big city New York. Although discouraged by locals from purchasing in Rodanthe due to erosion issues back then I was taken with the stark beauty and serenity of the area. I can now say that after traveling the whole east coast from Maine to the Florida Keys this slice of nature is truly unique in every way and once lost can never be recreated. Once Rodanthe is allowed to fall to the oceans relentless erosion in due time the neighboring Hatteras Island towns of Waves and Salvo will surely follow. No one can afford to lose such precious real estate.

I will never forget the first time I drove down highway 12 towards Rodanthe. After passing magnificent dunes and undisturbed landscapes of Pea Island I saw the town of Rodanthe on the horizon and it immediately brought to mind the vision Dorothy had when she first saw the Land of Oz on her quest to find the Wizard to get her home. I knew I was home. It is unimaginable that anyone could just make a decision on preserving this magical place based on strict cost analysis ignoring all other considerations that motivate millions of people to vacation here.

In support of our effort to make everyone ware of what Hatteris Island is all about we have created a website "Top 10 Reasons to Support Beach Nourishment", please visit our website http://tinyurl.com/mirlobeach created by the Mirlo Beach Home Owners Association outlining

Do not abandon our beach or our community of Rodanthe and do not destroy the natural beauty of the Pamlico Sound.

Morris Neuman
Speechsoft, Inc.
www.speechsoft.com
914-273-5560 x170
mail:neuman@speechsoft.com

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: JOSEPH F. NOCE

ADDRESS: 714 HARDING HWY, CARNEYS POINT NJ 08069

E-MAIL: joenoce@hotmail.com

COMMENTS AND/OR QUESTIONS:

After viewing the presentations, maps & materials, it seems as though all of the options have positive and negative aspects. After weighing all of the information, I find that the Nourishment alternative makes the most sense, but needs to be more extensive. Without beach nourishment, the village of Rodanthe would eventually die. Nourishment to the beach down to the Rodanthe Pier from the S-Curves area would invigorate the community, provide more beach habitat for wildlife at a fraction of the cost of other alternatives. Rodanthe is the Gateway village to Hatteras Island – It would be tragic to kill it with massive concrete bridges that effectively by pass this iconic village.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: Abbott, Steve
Sent: Wednesday, January 04, 2012 9:40 AM
To: Smyre, Elizabeth A
Subject: Contact Us comment on NC 12

Peter O'Donnell Phone: (772)801-5084 Email: surfset@att.net

Print

Comment History
Tracking Number: MTJ9TG8CUU

Sent By: Peter O'Donnell Date/Time: 12/27/2011 6:27 AM

Comment:
Please consider a park and walk option for the area around Rodanthe due to the numerous good surf spots that access will be lost if bridge option is chosen. This will negatively impact tourism if consideration is not given to access to these beaches. We visit once or twice a year and would consider not coming if you cut off public access to these beaches. We would start a campaign here in Florida to "boycott Hatteras" if a reasonable solution is not found to keep public access to these beaches.

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Smyre, Elizabeth A

From:	Obermeyer Ed <edobermeyer@cox.net>
Sent:	Friday, January 06, 2012 2:52 PM
To:	Smyre, Elizabeth A
Subject:	Roanthe Access
Attachments:	BPwave copy 2.jpeg

I have been surfing since 1964 and totally support full access to EVERYONE on this area of the outer banks. After surfer's surf and even before, they usually go to the local store and spend money on food and other essentials. If the wife is in tow, you can bet she will want more than food from the local economy and will spend serious dollars on clothing's and collectables. Let me know what I can do to help.

Ed Obermeyer
http://www.edobermeyer@cox.net

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Hyde **County**

NAME: BETTY JANE OELSCHLEGEL

ADDRESS: P.O. BOX 366 398 JACKSON CIRCLE OCRACOKE, NC 27960

E-MAIL: bjocracoke@embarqmail.com

COMMENTS AND/OR QUESTIONS:

My first visit to Ocracoke was in 1974. I moved to the island in 1977, when I was 25. I have worked for 35 years to build a life on Ocracoke. I have mortgages, businesses, employees, children and dreams, all dependent on a steady stream of guests to our island. If our life line, called Route 12 is tentative or worse yet, interrupted, the blood ceases to flow and the whole system falls apart. I don't expect this life line to be maintained on the backs of the environment or wildlife. I do expect "the powers that be" to find a middle ground solution. No one had any trouble taking my tax payments, mortgage payments or sales + use responsibilities. It would be unfair and immoral for you to let us dangle in the wind →

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

NCDOT

Ms. Beth Smyre, PE
NCDOT - PDEA
1548 Mail Service Center
Raleigh, NC 27699-1548

I'm begging you to do everything possible to make sure our life line is viable now and in the future.

Thank you,

B J Oelschlegel

B-67

Smyre, Elizabeth A

From: KERIOR@aol.com
Sent: Friday, December 09, 2011 11:13 AM
To: Smyre, Elizabeth A
Subject: Bonner Bridge Replacement Bridge Phase 2

Dear Ms: Smyre:

I am a sound front property owner in the Mirlo Beach area of Rodanthe, NC. I am writing to express my strong support for the Beach Nourishment option. The bridge options, particularly the bridge on the new location in the sound would have a devastating impact on the life in Rodanthe.

This sound front area of Mirlo offers a unique waterfront experience that would be ruined by a bridge in the sound. Kiteboarding and windsurfing are very popular in Mirlo Beach. Even by Hatteras Island standards, Mirlo offers unusually good sailing conditions. In the summer, it gets strong thermal winds and it is also very good for the fall and winter northeast wind directions. This sailing nirvana would be lost if a bridge is put in the sound.

Outside of sailing, the sound bridge would still have a strong detrimental effect on Mirlo Beach. It would ruin the sound side views that attract vacationers and severely harm the property values of all the homes on the sound side of Rt 12.

I strongly disagree with Table 2 of the Phase 2 impacts on the Rodanthe Area. It says the bridge on new location would have no impact on the Rodanthe Cohesion and Accessibility. It will ruin Mirlo Beach and without beach nourishment, it would leave the north end of Rodanthe susceptible to further erosion and lost of property value.

Considering the negative effect on the quality of life in northern Rodanthe and the higher costs of the bridge in the sound, I think the logical choice is to institute the beach nourishment option.

Thank you.

Keith Orr
393 Hannastown Road
Greensburg, PA 15601
724-689-9062

Smyre, Elizabeth A

From: Nelson Paul <nelson@nelsonpaul.com>
Sent: Thursday, November 17, 2011 9:38 AM
To: Smyre, Elizabeth A
Subject: Re: Highway 12 Options Meetings

Dear Ms. Smyre,

My name is Nelson Paul. I am commenting as someone who is knowledgeable of the situation on the Outer Banks having worked with the NC Division of Coastal Management as a Field Representative for their coastal permitting program on the Outer Banks in the 1980's.

Hurricane Irene severely impacted the Outer Banks and severed Highway 12 with a new inlet that NCDOT has chosen to bridge, rather than fill.

Because inlets move, the decision to bridge this inlet, rather than fill the inlet, has created a scenario that will most likely doom the economies of these Outer Banks communities over the next decade. Without an enormous commitment of scarce revenues, the shifting sands of this new inlet will likely make travel on Highway 12 intermittent and undependable.

However, worse than that, the decision to bridge the inlet has created a potential trap for residents and visitors that could likely result in the loss of life.

Imagine a scenario where a Cat 1 storm approaches the Outer Banks in mid-July. While evacuating the island, a vehicle strikes a structural member of the existing temporary bridge, making traversing the inlet by vehicle impossible. The bridge is closed. The NCDOT Ferry Service springs into action, but it is too many people and too little time. The storm increases to a Cat 3 and bears down on the island, roughly following the path of Hurricane Irene.

This is a reasonable scenario that we would have considered when I worked for the NC Division of Coastal Management. In this scenario there could be more than 10,000 people trapped in a life-threatening situation. And from our recent experience with Irene, we can easily see that people could die if it had been a stronger storm. You may want to review what happened on Ocracoke Island with Hurricane Alex in 2004.

Highway 12 being designated as the "Outer Banks National Scenic Byway" exacerbates this life and death situation. The Scenic Byway designation is intended to lure MORE tourists to the area in order to improve the local economy. Through this designation NCDOT is making substantial investments in promoting the Outer Banks as a tourist destination.

If the intent is to lure more people to the Outer Banks through the Outer Banks National Scenic Byway designation, then the responsibility for the safety of these people (as it pertains to the availability of highway transportation) rests squarely on NCDOT. The combination of an NCDOT policy that allows this inlet to remain while simultaneously implementing a NCDOT policy that promotes and encourages tourism on the Outer Banks is very dangerous. This is irresponsible and is unnecessarily endangering the public.

So, in conclusion, the NCDOT designation of the Scenic Byway is at cross purposes with the decision to allow the inlet to remain. If the inlet is allowed to remain, then the Outer Banks National Scenic Byway designation

needs to be suspended until a long-term, permanent solution is established and IMPLEMENTED regarding the inlet.

It is my opinion that this inlet should be filled as soon as possible. And future inlets, should they occur, should be filled also. This is the only long-term, cost-effective solution that MUST be established as official NCDOT policy.

Thank you,
Nelson Paul
(919) 231-4409

----- Original Message -----
From: Smyre, Elizabeth A
To: Nelson Paul
Sent: Wednesday, November 16, 2011 5:22 PM
Subject: RE: Highway 12 Options Meetings

Nelson-
Absolutely! You are welcome to send me any comments you might have.
Thanks,
Beth

Please note my phone number has changed, effective March 30, 2011- see below.

Beth Smyre, P.E.
Project Planning Engineer
NC Department of Transportation
Project Development & Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) ***707-6043***

From: Nelson Paul [mailto:nelson@nelsonpaul.com]
Sent: Wednesday, November 16, 2011 5:11 PM
To: Smyre, Elizabeth A
Subject: Highway 12 Options Meetings

Hi Beth, hope you are doing well today.

Can we submit comments regarding the breaches in Highway 12 through you?

Thank you,
Nelson Paul
(919) 231-4409

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

Smyre, Elizabeth A

From: Dale Petty <dale@surforsound.com>
Sent: Monday, December 12, 2011 3:23 PM
To: Smyre, Elizabeth A
Cc: warrenj@darenc.com; Office of the Governor
Subject: Hatteras Island Hwy. 12 Beach Nourishment

https://sites.google.com/site/mirlobeachnc/

Ms. Smyre,

It is my understanding that the Merger Team will meet this Thursday to decide which Pea Island Hwy. 12 alternative(s) to advance for further study. I own Surf or Sound Realty on Hatteras Island. We manage approximately 450 single family vacation homes on Hatteras Island and accommodate approximately 100,000 visitors to CHNS each year. I am writing to request that beach nourishment be included as one of the alternatives for further study. A safe and reliable corridor is essential for visitor access to Cape Hatteras National Seashore and for Hatteras and Ocracoke Island residents and property owners. Beach nourishment is an appealing option to protect the Hwy. 12 corridor through Pea Island for several reasons. I have attached the link to a web site that highlights the many positive benefits of beach nourishment.

Thank you,

Dale Petty
CEO, Surf or Sound Realty

Smyre, Elizabeth A

From: Lou Ann Phelps <lphelps@selcnc.org>
Sent: Friday, January 20, 2012 5:00 PM
To: Smyre, Elizabeth A
Subject: Bonner Bridge Replacement Project (TIP No. B-2500)
Attachments: 01-20-12 Comments to NCDOT re Phase II Options.pdf

Please see the attached comments submitted on behalf of Defenders of Wildlife, National Wildlife Refuge Association, and the Southern Environmental Law Center, regarding the above-referenced project.

Thank you for your consideration.

Lou Ann Phelps
Administrative Legal Assistant
North Carolina State Bar Certified Paralegal
SOUTHERN ENVIRONMENTAL LAW CENTER
Tel.: (919) 967-1450
Fax: (919) 929-9421
laphelps@selcnc.org

PLEASE NOTE OUR NEW ADDRESS:

601 West Rosemary Street, Suite 220
Chapel Hill, North Carolina 27516-2356

Our telephone, fax, and e-mail addresses have not changed.

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: JAMES F. + VICKI W. PIERSON

ADDRESS: P.O. BOX 1195 OCRACOKE N.C. 27960

E-MAIL:

COMMENTS AND/OR QUESTIONS:

Nice presentation, excellent visuals charts/photos. Looks like a good plan finally. This must happen the Outer Banks would be devasted without the new bridge. Tourism is our lifeline we have alot of issues, but this definitely would be an asset. I hope the completion date of 2015 can be achieved.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Smyre, Elizabeth A

From: hpisek@aol.com
Sent: Friday, December 02, 2011 4:54 PM
To: Smyre, Elizabeth A; norburn@pbworld.com
Subject: Fwd: Dare County Bonner Bridge replacement

I meant to say: "Boys and their TOYS scenario."

-----Original Message-----
From: hpisek <hpisek@aol.com>
To: bsmyre <bsmyre@ncdot.gov>; norburn <norburn@pbworld.com>
Sent: Fri, Dec 2, 2011 12:00 pm
Subject: Dare County Bonner Bridge replacement

P-L-E-A-S-E consider the 17-mile-long bridge. In the long run, it will save the state millions of dollars trying to keep Highway 12 passable on Hatteras Island. It's almost a "boys and their boys" scenario. They have waaay tooo much fun playing with all that construction equipment.

Thank you.

Helen and Irv Pisek
5208 Birch Lane
Kitty Hawk, NC 27949

Smyre, Elizabeth A

From: Warren Powell <wpowell@prestigecapital.com>
Sent: Monday, January 09, 2012 8:15 AM
To: Smyre, Elizabeth A
Subject: Outer Banks

Dear Beth,

I have been traveling to the Outer Banks for the past 30 years primarily to surf and fish. It would be a travesty, if the new road/bridge options did not include some way for people to reach some of the best areas for surfing on the entire East Coast. Some of my greatest memories are crossing the Bonner Bridge and running across the dunes to see amazing surf, and I hope to be able to share these experiences with my 2 sons.

Please consider all access options and understand we spend a good bit of money when traveling to and surfing on the OBX.

Cordially,

Warren Powell

Warren Powell
Sales Director Southeast Region
Prestige Capital Corporation
919-349-2866
201-944-9477 fax
wpowell@prestigecapital.com

Flexible Accounts Receivable Funding Solutions

Smyre, Elizabeth A

From: jpquinn739@comcast.net
Sent: Wednesday, December 14, 2011 5:35 PM
To: Smyre, Elizabeth A
Subject: Rodanthe

Dear Ms. Smyre,
Please take into consideration beach nourishment as opposed to the bridge alternative which will devastate Rodanthe.
Sincerely John Quinn owner of 23176 Pappys Lane Rodanthe.

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: Leslie J Robinson

ADDRESS: PO Box 62 Rodanthe NC 27968

E-MAIL: lesliejoanrobinson@hotmail.com

COMMENTS AND/OR QUESTIONS:

I am for using a smaller bridge at "Sturns" plus beach re-nourishment. It is hard enough to live on this island - please disturb our villages as little as possible - Everything is disappearing as it is - we don't need one fewer convenience store / gas station.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: Harry Schiffman

ADDRESS: PO B 489, Manteo, NC 27954

E-MAIL: sdmarina@embarqmail.com

COMMENTS AND/OR QUESTIONS:

Suggest a trial project on Hatteras Island with the use of a Floating Wave Attenuator such as one developed by Elemental Innovations out of N.J. in area of high impact erosion - If successful, it would greatly enhance the longevity of beach nourishment.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME: [illegible] STARSMAN

ADDRESS: [illegible]

E-MAIL: [illegible]

COMMENTS AND/OR QUESTIONS:

PLEASE SEND ME THE MINUTES FROM THE MERGER MEETING

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Resolution for Immediate and Permanent Repair of Highway 12 on Hatteras Island

Whereas, Commerce on Hatteras and Ocracoke Islands is deemed vital to the economies of Dare, Hyde and surrounding counties; and

Whereas, Highway 12 is essential to the residents, visitors and commerce of Hatteras and Ocracoke Islands; and

Whereas, the bridge being constructed on Highway 12 between Oregon Inlet and Rodanthe is temporary and inadequate to sustain the needs of the residents, visitors, and economies of Hatteras and Ocracoke Islands

BE IT RESOLVED, by the membership of the Albemarle-Pamlico Republican Club representing 14 Northeastern North Carolina counties:

The need exists and it is requested that Highway 12 be immediately and permanently repaired.

ADOPTED unanimously this 6th day of October, 2011.

Bob Steinburg

Bob Steinburg, President

103 South Granville Street

Edenton, N. C. 27932-1831

252-482-2404

RSteinburg@aol.com

www.al-pam.com

Smyre, Elizabeth A

From: CINDY THORNE <cindy_thorne2000@yahoo.com>
Sent: Tuesday, January 17, 2012 9:18 AM
To: Smyre, Elizabeth A
Subject: NC 12

Please keep NC 12 through Pea Island open as close as possible to what is there now. Do not put the 7 mile bridge out in the sound. We are losing enough beach on the National Seashore we can not afford to lose more. I own a house in Salvo and in a few years will be retiring. Pea Island is my favorite place for just walking and shelling. The way it is going now there won't be any place left to access the beach so I guess I wasted all my money on buying a house and who would want to buy it if there is no beach. Please don't give into the environmental people or the
Fish and Wildlife people.

Thank you.

Cindy Thorne
161 Nemec Lane
West Newton, Pa. 15089
724-331-1581

Smyre, Elizabeth A

From: outerbanks@surfrider.org
Sent: Wednesday, December 14, 2011 6:00 PM
To: Smyre, Elizabeth A
Subject: NC 12 options

Dear, Ms. Smyre:

On behalf of the Outer Banks Chapter of the Surfrider Foundation, we would like to offer some comments regarding the breaches along NC 12. While we're currently gathering a more official statement to submit for the comment period that ends January 20, we also understand there is a meeting tomorrow, so we thought we should voice a broad sense of what our overall stance will be. That stance, simply put, is that the DOT work as much as possible toward preserving access to surf breaks surrounding both those breaches, no matter what plan perseveres.

You may not be aware, but those particular stretches of beach are prime surfing areas. Many Outer Banks locals move to the area just to surf the Pea Island coast. And of them all, the area just north of Mirlo -- commonly called S-Turns -- is among the most famous and respected on the entire Eastern Seaboard. (Surfer Magazine named it one of its top 100 surf spots this past year.) This means plenty of surf tourism dollars for the immediate area. Sometimes the only business in the winter months when frequent storms make it a valuable resource for surfers from surrounding states as well.

Most of the time, these surfers park on the side of NC 12, which -- although easy for the surfers -- we also understand can cause conflicts with normal traffic. Our concern is that one of the bridge options will win out without any consideration of the existing surfing population who use the resource. We're hoping NC 12 and Dare County can seize this opportunity to provide some parking and access to prevent future conflict. We're not sure what that solution looks like, but it seems reasonable there is some way to look at all the options and figure out parking and access solutions for each, so that no matter what plan comes to fruition, the existing surfing population --- both local and visitor -- can continue to enjoy the surfing resource and the residents of Rodanthe can benefit from the increased business traffic without any negative impacts.

On behalf of the Surfrider Foundation's 125+ local members -- and 50,000 nationwide members -- we request you consider these options as you move through the decision-making process.

Thank you for the time and consideration. And we will file a more official request before January 20.

Sincerely,

Matt Walker
Vice Chair
Surfrider Foundation, Outer Banks Chapter

Smyre, Elizabeth A

From: Heinz Scheidemandel <hynessch@cox.net>
Sent: Monday, November 28, 2011 7:50 PM
To: Smyre, Elizabeth A

Dear Ms.Smyre:
I have been in Hatteras village for over 50 years and I can assure you the only sensible and financially feasable long term solution is to return to a Ferry System. This is flexible and relatively inexpensive. Everything else is a waste of tax payer's money!
H.Scheidemandel, Falls Curch,Va.

Smyre, Elizabeth A

From: Fred Walters <fewalt@ntelos.net>
Sent: Thursday, December 08, 2011 12:19 PM
To: Smyre, Elizabeth A
Subject: Bridge to nowhere

If the NPS keeps closing beach access, or a total closure is eminent, NO bridge will be needed!!!!!!

Fred Walters
Troutville, Va

Smyre, Elizabeth A

From: John Wasniewski <John@shoshintech.com>
Sent: Friday, January 20, 2012 1:28 PM
To: Smyre, Elizabeth A
Cc: r.matt.walker@gmail.com; ivyray@earthlink.net
Subject: Rodanthe S-Turns Design Comments - Surfrider Foundation
Attachments: RodantheSTurnsAccess.pdf; PreserveSTurnsAccess.xls

Dear Beth Smyre:

On behalf of the Surfrider Foundation (www.surfrider.org), I wish to submit the attached letter and petition listing to the N.C. D.O.T. for consideration of design impacts for the area known as S-Turns in Rodanthe, Dare County. The Excel document list all signers of the petition mentioned in the letter. Especially telling are the individual comments that users of the resource have made from all over the world regarding this site.

S-Turns is a valuable economic and natural resource for North Carolina. Please consider preserving access to this location in all D.O.T. planning.

Sincerely,

John Wasniewski
Chairman
Outer Banks Chapter of the Surfrider Foundation

Smyre, Elizabeth A

From: shelley <sweisberg@cox.net>
Sent: Tuesday, December 20, 2011 11:31 AM
To: Smyre, Elizabeth A
Subject: RE: Beach Nourishment Top Ten Reasons

Dear Beth,

The news from the Merger Team meeting in Raleigh is most disappointing.

As I understand, US Fish & Wildlife is adamantly opposed to Beach Nourishment and would not move forward til it was removed from consideration.

I believe, NCDOT is favoring keeping the bridge in the existing right of way on Pea Island and maintaining a strong position supporting Beach Nourishment to protect both the Bridge and the road.

Meanwhile Rodanthe being in National Park jurisdiction must have a permit issued from NPS.

Perhaps consideration should be given to the source of the disappearing Pea Island - Rodanthe sand…Oregon Inlet's jetty?

Dixon and Pilkey's research (The Corps and the Shore, Island Press, 1996) speaks to the inevitable loss of sand from Rodanthe if only one jetty was constructed. Time has shown this prediction true. Let's stop dredging Pea Island - Rodanthe's sand out of Oregon Inlet. Let's abate the issue of disappearing sand by re-examining the jetty situation.

Please consider investigating the potential. We need your help.

Sincerely,

Shelley & Jeff Weisberg
22012 Sixteenth August St.
Rodanthe, NA 27968

From: Smyre, Elizabeth A [mailto:bsmyre@ncdot.gov]
Sent: Wednesday, December 14, 2011 4:07 PM
To: shelley
Subject: RE: Beach Nourishment Top Ten Reasons

Shelley-
Thank you for your comments! Please let me know if you have any further comments or questions.
Thanks,
Beth

Please note my phone number has changed, effective March 30, 2011- see below.

Beth Smyre, P.E.
Project Planning Engineer

NC Department of Transportation
Project Development & Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) ***707-6043***

From: shelley [mailto:sweisberg@cox.net]
Sent: Tuesday, December 13, 2011 7:54 PM
To: Smyre, Elizabeth A
Subject: Beach Nourishment Top Ten Reasons

Dear Beth,

I am a home owner in Mirlo Beach, a family-oriented community on the outer banks of North Carolina located at the north end of the village of Rodanthe -- the gateway to Hatteras Island. It is a beautiful place to live and vacation.

Right now, however, we are simply trying to survive! We were devastated by Hurricane Irene and are at the center of the debate on beach nourishment versus a bridge at the Rodanthe hot spot on Hatteras Island. Please give beach nourishment the consideration it deserves. Your actions affect our future.

The Top 10 Reasons to Support Beach Nourishment

1.Beauty. The ribbon of sand that is the Outer Banks of North Carolina provides some of the most beautiful beaches in the world, some of the most beautiful wildlife, some of the most beautiful sunrises and sunsets. Nourishment preserves this beauty. Let's be honest, bridges are ugly.

2.Working with nature. Nourishment maintains a beach with sand matched to that beach. Pumping sand back onto a beach is simply using a human force to repair damage done by a natural force -- erosion. No concrete, no steel, no permanent manmade changes to nature.

3.Permanence. It is sometimes said that beach nourishment is not a permanent solution, but that just means that the nourishment must be repeated. This is how New York, New Jersey, and Delaware maintain their beaches (along with many states and countries). The Final Environmental Impact Statement (FEIS) estimated that the nourishment cycle for Rodanthe would be once every 4 years. However, we will never know until we try it. It could be shorter; it could be longer. Thus, we should nourish as soon as possible to learn the facts.

4.Speed. Nourishment is the fastest way to protect NC 12. The main thing that delays nourishment, is getting the needed permits. In South Nags Head, that took several years, which is about how long it takes to design and build a bridge. We assume that a project this big and important will be fast-tracked by the appropriate government agencies. NC 12 needs protection ASAP!

5.Flexibility. Because nourishment is an ongoing solution, it can be repeated sooner or later depending on conditions. It leaves open the possibility of better solutions 20 years down the road based on new technologies. A bridge can always be built later if experience proves that nourishment is too costly or ineffective. A bridge cannot be "unbuilt" later, if nourishment is shown to be better or if better alternatives emerge. A bridge cannot even be stopped halfway if cost overruns show it to be be much more expensive than expected.

6.Saves money. The cost of a bridge in Rodanthe is $114 million to $240 million (NCDOT estimate in 2006 dollars, $128MM to $270MM in 2011 dollars) and $169 million to $212 million (our estimate in 2011 dollars based on figures provided by Coastal Science and Engineering). However, build a bridge today, pay for it today. Begin beach nourishment and you pay only 1/12 of the total cost today, and the "present value" cost of nourishment is only $106 million to $133 million.

7.Due diligence. The BIG question with nourishment is whether or not sand can be found. This is why nourishment needs to be one of the alternatives selected by NCDOT and the Merger Team on December 15 for additional study. What the experts have said is that there is very little sand in Wimble Shoals (several miles from Rodanthe), but there is a lot of sand in Platt Shoals, which is 6 - 9 miles north and there may be sources of sand in between. Experts also say that even 10 - 20 miles can be economically feasible. We need to know where the sand is!

8.Preserves the Hatteras Island economy. All of the bridge alternatives will have a devastating effect on the cultural and economic life of north Rodanthe (not just Mirlo Beach). Popular uses such as fishing, birding, surfing, wind surfing, and kite boarding will all be negatively affected or eliminated. Vacation rentals and property values will plummet. The Mirlo Beach subdivision alone has a tax value of over $50 million, and the rest of northern Rodanthe is worth at least that much. Thus, the annual tax contribution to Dare Co. is over $400,000. Over the 50-year life of a bridge, that is $20 million. Add to that the rental revenue and retail sales to vacationing renters and it is clear that bridges will result in a substantial financial loss to our community. ... and our community is one of the few that send more tax revenue to Raleigh than is spent here on government services.

9.Rodanthe is the test case for all of OBX. All of Hatteras Island is experiencing erosion problems: private homes in the villages, Pea Island WIldlife Refuge, and the Cape Hatteras National Seashore. What happens in Rodanthe will be a model for everywhere else. Do we really want a policy of simply building bridges and abandoning the current NC12 and the lands it supports? Is it right to just let the island dissolve into the Atlantic, when nourishment might keep the place just like it is now?

10.Please listen to those who your decision effects. Our future rest in your hands. Please act responsibly.

Sincerely,

Shelley & Jeff Weisberg
22012 Sixteenth August Street
Rodanthe, NC 27968

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COMMENT SHEET

Bonner Bridge Replacement Project
Public Workshops – Phase II
TIP No. B-2500
Dare County

NAME:

Westervelt, Frederic B.

ADDRESS:

25 Howard St; PO Box 505; Ocracoke, NC 27960

E-MAIL:

fwestervelt@pol.net

COMMENTS AND/OR QUESTIONS:

It would be well if we could, hypothetically, set aside all environmental issues and express the best engineering option- not just alternatives- that would meet the goal. This would sharpen the argument and lead to better decisions. At present we usually find that the environmental objections are introduced preemptively at an early stage, thus cutting off constructive thinking.

Keep your eyes on the prize- the primary goal of maintaining road access. This must trump wildlife- flora and fauna- and the niceties of land management.

USFWS and NPS possessiveness have for too long heavily compromised us. Surely there are ways, legislatively or other, to revise the current climate that have crowned as king the Organic Act of 1916 and subsequent E.O.s .

Current concerns about inadequate dredging of Rollison Channel and Hatteras Inlet are relevant to this project. If this is not attended to properly NC 12 is of no use to Ocracoke. If The Corps of Engineers have no federal funding the State of NC must step in: after all, this is a State road and we are State citizens.

Thank you for your hard work. Good luck.

Comments may be mailed by January 20, 2012 to:

Ms. Beth Smyre, PE
NCDOT – Project Development and Environmental Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548

Email: bsmyre@ncdot.gov

Norburn, Robert E.

From: Page, John
Sent: Wednesday, November 30, 2011 4:27 PM
To: Norburn, Robert E.; Smyre, Elizabeth A
Subject: Bonner Citizen Contact

I received an information line call from an Avon property owner. He was upset that no decision had been made on replacing Bonner Bridge and that the Pea Island breach bridge was too short. I explained that a design-build contractor had been selected to build the replacement Oregon Inlet Bridge. I also indicated that the bridge over the breach was a short-term fix and that NCDOT had started planning the long-term fix. I said one alternative in that area was a 1.5-mile long bridge. I offered to put him on the mailing list and he agreed.

Mr. William E. Wilson
5805 Kipling Court
Baltimore, Maryland 21212-3735

John

John Page, AICP, CEP
Parsons Brinckerhoff
434 Fayetteville Street, Suite 1500
Raleigh, North Carolina 27601
USA
919-836-4076 (office)

pagej@pbworld.com

www.pbworld.com

SOUTHERN ENVIRONMENTAL LAW CENTER

Telephone 919-967-1450 601 WEST ROSEMARY STREET, SUITE 220 Facsimile 919-929-9421
CHAPEL HILL, NC 27516-2356

January 20, 2012

VIA EMAIL AND U.S. MAIL

Ms. Beth Smyre, P.E.
NCDOT - Project Dev. & Env. Analysis Unit
1548 Mail Service Center
Raleigh, NC 27699-1548
bsmyre@ncdot.gov

RE: Bonner Bridge Replacement Project
December 2011 Proposed Options for NC 12 (TIP No. B-2500)

Dear Ms. Smyre:

Thank you for the opportunity to comment on the options proposed by the North Carolina Department of Transportation ("NCDOT") for the "Phase II" portion of the Bonner Bridge replacement project, TIP Project Number B-2500 (the "Project"). These comments are submitted on behalf of Defenders of Wildlife, the National Wildlife Refuge Association, and the Southern Environmental Law Center.

None of the proposed alternatives will provide a viable long-term solution for the ongoing transportation crisis on Hatteras Island. The options will not satisfy Governor Perdue's request for a permanent solution to transport people to the southern Outer Banks. Moreover, they will run afoul of federal law. After two decades of study, it should be clear that the only viable long-term solution is to re-route the transportation corridor off the island onto a bridge that bypasses the most unstable portion of the island and/or onto ferries.

As discussed in more detail below, the Phase II plan is flawed in the following respects:

1. The selected alternative for the Project constitutes illegal segmentation in violation of the National Environmental Policy Act ("NEPA").

2. Outdated, skewed cost estimates can no longer justify construction of a replacement bridge over Oregon Inlet in Phase I and elimination of the Pamlico Sound Bridge alternative as the solution for the entire Project.

3. The problems with each of the individual alternatives being considered for Phase II that have been previously identified still remain and prevent their implementation.

I. General Comments

A. Background

In the Environmental Assessment ("EA") issued May 7, 2010, and the Record of Decision ("ROD") issued on December 10, 2010, NCDOT and FHWA approved and selected an alternative called the "Parallel Bridge Corridor with NC 12 Transportation Management Plan" (the "Selected Alternative"). The Selected Alternative segments the Project into several parts: "Phase I" (an initial replacement bridge over Oregon Inlet) and "Later Phases" (monitoring Highway NC 12 through Pea Island National Wildlife Refuge (the "Refuge") and maintaining it in place while the island on which it is located, Hatteras Island, erodes and moves westward). The EA and ROD also refer to the Later Phases as "Future Phases" and "Phases II-IV," and state they will "mix and match" methods of maintaining the highway from methods previously identified in the NEPA process as well as other, yet-to-be-identified methods.

NCDOT and FHWA selected this alternative and rejected the less environmentally damaging Pamlico Sound Bridge alternative on the theory that the latter was not practical because all of its costs would be borne up front, while the Selected Alternative could proceed in phases, with fewer up-front costs and much of the cost being spread out over decades. Hurricane Irene in August 2011 (along with Tropical Storm Ida in November 2010, and numerous other storms over the years) proved the fallacy of that theory. Hurricane Irene created two new inlets and disrupted NC 12 for seven weeks. One new inlet is located near the mid-point of the Refuge (the "Refuge Inlet") and has been temporarily bridged. A second new inlet is located at the southern end of the Refuge near the village of Rodanthe (the "Rodanthe Breach"), and it has been temporarily filled and shored up with sandbags.[1]

Governor Perdue has asked NCDOT to develop a long-term solution to the problem of maintaining NC 12 through the Refuge. In a series of public meetings beginning December 5, 2011, NCDOT presented alternatives for long-term solutions to the recurring problems caused by breaches of NC 12 in the southern two-thirds of the Refuge, leaving the recurring problems in the northernmost portion of the Refuge to be addressed later. The materials handed out by NCDOT at the public workshops are

[1] We understand that the banks of the Refuge Inlet are already eroding to the point that emergency measures are already being taken to prevent another breach of NC 12. Lauren King, "Lane Closures on N.C. 12 Bridge at Pea Island to Begin Wed.," The Virginian-Pilot (Jan. 17, 2012). We also understand that the fill material and sandbags supporting NC 12 at the Rodanthe Breach are also endangered by ongoing erosion.

hereinafter referred to as the "NCDOT Handout." These comments address those alternatives.

B. Segmentation

According to the EA and ROD, NCDOT and FHWA plan to select the methods for accomplishing the Later Phases from the list of options that were explored in previous NEPA documents but were rejected by federal agencies in the merger process. They may also turn to additional, undisclosed methods that were not revealed or explored in any NEPA document. NCDOT and FHWA plan to delay the decision on which of these methods – each impermissible for various reasons – until the Phase I bridge is already built and renders the maintenance of NC 12 in the Refuge necessary.

However, the damage caused by Hurricane Irene has forced NCDOT and FHWA to confront the unsustainable NC 12 situation sooner than they expected. The Refuge Inlet and the Rodanthe Breach destroyed sections of NC 12 in two of the four locations where government scientists have long predicted new inlets would form. NCDOT and FHWA are now tasked with developing a long-term plan to restore or bridge those two sections of NC 12 as "Phase II," before even beginning construction of Phase I. According to news reports, NCDOT plans to award contracts for the northern-most portion of Phase II by August 2012 and for the Rodanthe area by December 2012. Construction on the Bonner Bridge replacement is not slated to begin until 2013 and is expected to last three years. The fact that Phase I and Phase II will now effectively proceed simultaneously demonstrates that the two phases are one project, the effects of which must be considered together.

Despite the fact that the Merger Team could not fully support any of the alternatives now proposed for Phase II at the time they were originally considered, NCDOT has proffered them again to the public, having failed to develop any different, workable options to keep the highway stable. Yet the problems that prevented the Merger Team from supporting each of these options still remain: they cannot receive necessary permits from various federal and state agencies, they depend upon easements that the State does not own, and/or they cannot be found compatible with the Refuge as required by the National Wildlife Refuge System Improvement Act of 1997 (the "Refuge Act").

NCDOT and FHWA cannot legally ignore the impediments and impacts of the Phase II alternatives by segmenting the difficult, environmentally damaging portions of the Project until there is no other choice but to construct them. Under CEQ's NEPA guidelines, when an agency is considering "connected actions" that "are related to each other closely enough to be, in effect, a single course of action," their impacts must be considered together. 40 C.F.R. §§ 1502.4(a), 1508.25(a). Here, the bridge over Oregon Inlet and the alternatives for addressing the damage inflicted by Hurricane Irene

constitute such "connected actions," and they must be considered a single transportation project, for which the impacts must be considered altogether.

The new breaches/inlets and NCDOT's newly accelerated timetable clarify that NCDOT cannot divide the Project into separate phases and consider only the environmental effects of Phase I at this time without violating NEPA. As we explained in previous comments,[2] NCDOT and FHWA's phased plan constitutes illegal segmentation by evaluating the environmental impacts of the Project piecemeal, and allowing the selection for Phase I to force choices for Phase II. The Project in this case encompasses the entire transportation corridor from Bodie Island to Rodanthe, so evaluating each "phase" of the Project separately violates NEPA. With multiple phases of this Project now underway simultaneously, it is even more apparent that NEPA documentation must evaluate the entire Project as a whole in order to analyze its environmental impacts adequately. A complete evaluation of the Project as a whole must include re-evaluating the choices made concerning Phase I.

To do otherwise – to treat Phase I's replacement bridge as a *fait accompli* when planning Phase II – impermissibly forces the decision on the Later Phases. It irretrievably commits resources to the Phase I replacement bridge in such a way that it forces the Later Phases to go forward without regard to their environmental consequences. If the environmental consequences and costs of the alternatives for the Later Phases had been considered thoroughly and realistically, the agencies would likely have selected a different alternative altogether in the ROD.

Segmentation is also inappropriate because it leaves users of NC 12 and Hatteras Island residents and visitors vulnerable to a foreseeable breach outside the two current Phase II sites. The proposed options do nothing to address the ongoing problems at the Canal Zone hot spot, for example, and another breach may open in or near the S-curves area in the very near future. NCDOT's approach suggests that, as with the Hurricane Irene breaches, it will wait until the next crisis arises before attempting to patch it and then retrospectively attempt to develop a stable solution for that particular site. This piecemeal approach falls far short of the comprehensive, long-term solution for the NC 12 corridor required by NEPA and, furthermore, requested by Governor Perdue.

C. Inaccurate Cost Estimates

The alternatives for Phase II cannot be considered without updated and accurate cost estimates, for all alternatives, including a Pamlico Sound Bridge and modern ferries, as requested by the Corps of Engineers in its letter to NCDOT of January 5, 2012. The Pamlico Sound Bridge alternative cost estimates should include estimates for a version of

[2] Comments dated June 21, 2010, on the EA (pp. 6-9); Comments dated October 27, 2008, on the 2008 Final Environmental Impact Statement ("FEIS") (pp. 25-27).

that bridge that does not travel as far away from Hatteras Island into the sound, but rather incorporates new bridge-building technologies that allow construction closer to the Refuge without harming submerged aquatic vegetation. Such a bridge would be shorter and presumably less expensive than the 17.5-mile version previously priced.

Although the Merger Team selected the Pamlico Sound Bridge alternative for detailed study in 2003 and generally acknowledged it to be the least environmentally damaging alternative, NCDOT and FHWA rejected it in favor of the current approach, arguing that the up-front costs of the long bridge would be too expensive while the phased approach or transportation management plan (TMP) alternatives would supposedly have fewer up-front costs with the majority of costs being spread over decades. This argument no longer justifies rejection of the Pamlico Sound alternative.

As explained above, after Hurricane Irene, Phases I and II will now overlap significantly and progress virtually simultaneously. We have attached a map showing the location of the three portions of the Project that are currently planned, created using data obtained from NCDOT. As is evident from the map, the currently planned Project portions account for at least seven to 10 miles of bridge and two-thirds of the length of the entire Project, leaving little to be accomplished in the Later Phases. In addition, in light of the current rate of erosion of the banks of the Refuge Inlet, we understand that the bridge over that portion of the Refuge might need to be much longer to last more than a few years. Accordingly, the combined up-front costs of the currently planned portions will surely begin to approach the up-front costs of the Pamlico Sound alternative. The fact that NCDOT is proposing to fund three large-scale construction projects simultaneously, even though the total cost of these projects is likely to be comparable to the less environmentally damaging Pamlico Sound Bridge, should compel reconsideration of the prior rejection of the Pamlico Sound Bridge solely on the basis of funding.

The cost estimates provided in the NCDOT Handout (p. 11) date from 2006. Even at that time, federal agencies – including the National Marine Fisheries Service ("NMFS"), Department of the Interior ("DOI"), and the Army Corps of Engineers – questioned the accuracy of those estimates. In 2006, when cost estimates of various alternatives were updated from the 2005 Supplemental Draft Environmental Impact Statement, the cost of the Pamlico Sound Bridge alternative rose inexplicably disproportionately as compared to the other alternatives. Then, in 2011, the Phase I Oregon Inlet replacement bridge contract was awarded for a mere 59% of its previously estimated price. The Pamlico Sound Bridge would likely see similar savings, and might even realize greater savings to the extent that its 2006 estimated price appears to have been inflated relative to the estimates for other alternatives.[3] In addition to the passage of

[3] See, *e.g.*, U.S. Army Corps Comments on Supplement to SDEIS (Apr. 18, 2007), at p. 1 (questioning the 123% increase for the Pamlico Sound Bridge as compared with the 36% increase for the Oregon Inlet bridge).

time, much has changed since the 2006 estimates were generated, including construction costs, recession and inflation, the creation of new inlets in the Refuge, and other changes to the island's geography.

The chart below shows the progression of cost estimates and contracts.

	Short / Parallel Bridge Alternative	**Long / Pamlico Sound Bridge Alternatives**
NCDOT's 2005 Estimates (from NCDOT's Supplemental Draft Environmental Impact Statement, Sept. 12, 2005, p. 2-110)	"All Bridge Alternative" **$493 million** (incl. $191 million for Phase I Oregon Inlet bridge, plus remainder for route to Rodanthe)	**$420 million to $425 million**
NCDOT's 2006 Estimates (from NCDOT's Revised Final Section 4(f) Evaluation, Oct. 9, 2009, pp. 26, 27, Apx. G-3)	Parallel Bridge Alternatives: **$602 million to $1.524 billion** (incl. up to $368 million for Phase I Oregon Inlet bridge, plus remainder for route to Rodanthe)	**$943 million to $1.441 billion**
NCDOT's 2006 Estimates for Phase II only (from NCDOT Handout, p. 11)	**$331 million to $1.136 billion** (for Phase II only)	**N/A**
NCDOT's 2011 Estimates (from NCDOT Handout, p. 7, and article by Bruce Siceloff, News & Observer, 12/15/11, quoting NCDOT)	**$216 million** – contract for Phase I Oregon Inlet bridge **$211 million to $387 million** – NCDOT estimates for Phase II alternatives over new Hurricane Irene breaches Total: **$427 million to $603 million**	**$553 million to $846 million ??** (if actual contract came in at the same 59% discount from 2006 estimate as the Phase I Oregon Inlet bridge)

NCDOT states that it will develop more accurate cost information once the proposed options have been narrowed down through the public comment process and Merger Team meetings. However, this sequence of events deprives the public of vital information it needs before it can accurately evaluate these options. Updated cost information should have been provided to the public at the outset to inform the comments. Moreover, NCDOT and the Merger Team need accurate cost information in order to select or eliminate options reasonably. Waiting until an alternative has been selected to develop

accurate cost information prevents sound agency decision-making and risks impermissible reverse-engineering of cost estimates to support predetermined outcomes.

Moreover, the cost estimates for Phase II provided by NCDOT fail to include key components of the Project. First, all cost estimates should include the cost of replacing the Bonner Bridge (Phase I) since they are part of the same Project. They also should include the costs of foreseeable direct and indirect impacts of these options, including mitigation costs, emergency repairs of storm damage throughout the construction of the phased approach, the permanent ongoing maintenance of an elevated roadway located in the Atlantic Ocean that will result from the phased approach, etc. For instance, NCDOT has incurred costs to restore NC 12 over the two Hurricane Irene breaches and is currently incurring additional costs to shore up the bridge over the Refuge Inlet; these costs should be considered part of Phase II. Finally, despite frequent mentions of a monitoring program in previous NEPA documents, there are no cost estimates provided to reflect the costs of such a program for each of the proposed alternatives. Providing all of this information to reflect the true cost of each alternative would help the agencies and the public fairly compare these alternatives with other alternatives such as a Pamlico Sound Bridge or modern ferry system.

In sum, many factors – including the fact that Phases I and II will proceed nearly simultaneously, the likelihood that the Pamlico Sound Bridge alternative would cost far less than previously estimated, the likelihood that the true cost of Phases I and II will approach that of a Pamlico Sound Bridge, and the possibility that any sources that could fund Phase II might also be available to fund a Pamlico Sound Bridge – all mandate a re-examination and revision of the cost estimates previously provided to the public and the Merger Team.

II. Specific Problems with Each of DOT's Proposals for Pea Island and Rodanthe

Each of the alternatives currently proposed by NCDOT for Phase II is taken from options first proposed in 2005 and analyzed extensively since then. None of these options was eventually selected as the preferred alternative due to the serious legal and/or engineering problems inherent in each of them, and the fact that the same problems remain militates in favor of re-evaluating the plan for the entire Project.

According to the NCDOT Handout, p. 4, the current Phase II "Beach Nourishment" alternative equates to the 2008 FEIS's Nourishment alternative. The current Phase II "Bridge Within Existing NC 12 Easement" alternative equates to the 2008 FEIS's "Phased Approach." The current Phase II "Bridge/Road on New Location" alternatives described in the NCDOT Handout equate to the 2008 FEIS's "Road North/Bridge South" and "All Bridge" alternatives.

Because all of these options are virtually identical to past alternatives rejected by the Merger Team, our specific comments on the current proposed options are similar to (and incorporate by reference) our comments on the 2005 Supplemental Draft Environmental Impact Statement (SDEIS), the 2007 Supplement to the SDEIS, the 2008 FEIS and Section 4(f) Evaluation, the 2009 Revised Final Section 4(f) Evaluation ("Revised 4(f) Evaluation"), and the 2010 EA.

Finally, it is striking that NCDOT essentially concedes it has no viable plan for a long-term solution to transportation problems for the Rodanthe area. NCDOT Chief Operating Officer Jim Trogdon has stated that even after six years of studying the current proposed options for Rodanthe, "there's no alternative that stands out yet."[4] Moreover, even the NCDOT Handout, Table 2 (p. 10), lists "Potential Constraints" that will be fatal to each of the Rodanthe options:

- The Beach Nourishment option is "[n]ot likely to be found compatible with Refuge's mission and purpose; sand quality and sand availability . . . is [sic] a concern," as is the "extensive dredging" that will be required to obtain the sand and the frequency with which nourishment would have to be repeated.
- The Bridge on New Location option is "[n]ot likely to be found compatible with Refuge's mission and purpose."
- The Bridge within Existing NC 12 Easement is subject to a "[r]apid erosion rate" that will result in parts of the elevated structure being "in the surf zone or offshore in the future," a result that was rejected in 1991 as creating serious maintenance problems and an unreliable storm evacuation route that would bear the brunt of an incoming nor'easter or hurricane.
- The Bridge within Existing NC 12 Easement and Beach Nourishment option raises the "[s]ame concerns as with beach nourishment option [i.e., compatibility and sustainability]; in addition, rapid erosion rate in this area may cause portions of the structure to be in the surf zone or offshore in the future."

The significant problems that NCDOT concedes with regard to each of these options demonstrate that none of them presents the viable long-term solution to the NC 12 maintenance problem requested by Governor Perdue. Any long-term solution must include moving the transportation corridor off this vulnerable stretch of Hatteras Island.

[4] Catherine Kozak, *NCDOT Presents Options for Long-Term Highway 12 Repair to the Public*, Island Free Press (Dec. 7, 2011).

A. Problems with Beach Nourishment Alternative

NCDOT proposes to use beach nourishment combined with dune enhancement "to maintain an adequate protective beach and dune system." NCDOT plans to nourish four locations at four-year intervals, though more frequent intervals will likely be required.

1. Practical Difficulties

There are numerous practical impediments to relying on beach nourishment to try to counteract the natural movement of Hatteras Island and the formation of new breaches and inlets. Chief among these is the fact that nourishment tends to accelerate erosion by steepening the beach. This and other problems are described in more detail below.

However, in addition to these general problems, nourishment simply is not a viable option in the area of the temporary bridge over the Refuge Inlet because the inlet there is moving southward and will cause the bridge to collapse. Nourishment will not stop this movement. One of the Fish and Wildlife Service ("FWS") buildings on the south side of the new inlet has already fallen into the inlet, and several more are currently close to collapse and may have already been condemned. Just a few months after the temporary bridge was installed there, the inlet has already migrated so much that it has already become necessary to shore up the bridge. (See footnote 1.) Inlet movement is a natural part of barrier island dynamics, and the new Refuge Inlet may migrate as far south as the location of the former New Inlet. Much more intrusive structural maintenance would be required to try to stabilize the current bridge, which would be found to be incompatible with the Refuge.

Finally, the nourishment options for the Rodanthe Breach are described inconsistently in NCDOT's workshop handout. The Nourishment option's map shows nourishment stopping just south of the Refuge boundary. However, the "Bridge Within Existing NC 12 Easement and Beach Nourishment" option shows nourishment extending south of the Rodanthe Historic District. If nourishment further south will be required for the bridge option, it will be required for the nourishment-alone option as well. Thus, NCDOT appears to understate significantly the geographical extent of the nourishment required for this latter option.

2. Geological and Biological Impacts

The Nourishment and dune enhancement option would harm – both directly and indirectly – protected species with habitat in the Study Area. It would also alter the geological profile of the island in a manner harmful to the natural processes of the barrier islands. The geologic effects of nourishment will narrow the island and will cause further harm to federally protected plants and animals.

Nourishment and dune construction alter the geological profile of the target beach. "[A] steeper beach profile is created when sand is stacked on the beach during the nourishment process. This condition can lead to greater wave energy on the beach and greater beachside erosion." Atlantic States Marine Fisheries Commission, "Beach Nourishment: A Review of the Biological and Physical Impacts" 5 (November 2002). Because of this higher erosion rate with nourishment, the demand for sand increases over time. *Id*. at 6. The combined erosion on the ocean and sound sides of the island will lead to a narrowing of the island, potentially to the point that it can no longer support a highway, mush less the wildlife habitat that is the purpose of the Refuge.

In addition, nourishment and dune construction prevent ocean overwash, leading to further erosion on the sound side, including erosion of sound-side wetlands. Overwash moves sand to the sound side of barrier islands and is an essential part of barrier island dynamics. *See* S.R. Riggs, *et al.*, "North Carolina's Coasts in Crisis: A Vision for the Future" ("Coasts in Crisis"), which explains how nourishment and dune construction contribute to ocean-side erosion and prevent overwash, exacerbating sound-side erosion. This article is available at: http://www.coastal.geology.ecu.edu/NCCOHAZ/downloads/Coasts%20in%20Crisis%20Booklet.pdf.

The impacts of nourishment also extend beyond the visible beach to the near-shore waters and to the offshore areas from which sand is mined. Mining sand offshore can disrupt long-shore sediment transport and the long-term sediment budget for the barrier islands and their adjacent inlets.

Beyond these negative effects on the physical structure of the island, the nourishment option will also negatively impact plant and animal species. Organisms can be harmed by nourishment either directly by sand placement or indirectly through alterations to the beach environment. For example, "birds may be displaced by dredges, pipelines, and other equipment along the beach, or may avoid foraging on the beach if they are aurally affected." Atlantic States Marine Fisheries Commission, "Beach Nourishment: A Review of the Biological and Physical Impacts" (November 2002). Other direct impacts include eggs, hatchlings, and adult birds being crushed by sand. *Id*. Indirect impacts to feeding birds are related to the sediment grain. "If the sediment is too coarse or high in shell content it can inhibit the bird's ability to extract food particles in the sand. Fine sediment that reduces water clarity can also decrease feeding efficiency of birds." *Id*. Other indirect impacts from beach nourishment can include diminished reproductive success, reduction in biomass of prey items, and long-term changes to substrate composition at dredging sites.

Long-term nourishment within the Project area would have additional adverse impacts on federally protected species, including the piping plover and North Carolina's endangered sea turtle species. By suppressing overwash, nourishment leads to loss of

designated critical sound-side feeding habitat and nesting habitat for the federally threatened piping plover. In addition, the nourishment and artificial dune system prevents natural maintenance of existing habitat by increasing vegetative succession. Furthermore, nourishment may result in a narrower, steeper beach profile, reducing the available intertidal area. See National Park Service, Natural Resource Year in Review—2004: Ecosystem Restoration in an Altered Coastal Environment, *available at* http://www.nature.nps.gov/yearinreview/yir2004/01_H.html ("A berm constructed to reduce the potential for island breaching has prevented natural overwash processes and has reduced habitat availability of piping plover.").

Beach nourishment can directly impact endangered sea turtles by burying nests and disturbing nesting turtles. Nourishment also impacts turtles indirectly. Beach nourishment may result in increased sand compaction and hardness and changes in moisture content and beach slope. Furthermore, as discussed above, nourished barrier islands may erode more quickly than natural beaches. This rapid erosion creates escarpments, which hamper access to nesting sites. In a vicious cycle, the rapid erosion may necessitate re-nourishment at more frequent intervals, thereby increasing the likelihood of interference with sea turtle nesting. See Fish and Wildlife Service, Recovery Plan for the U.S. Population of Atlantic Green Turtle, 3, 1991, *available at* http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_atlantic.pdf.

The nourishment option is also unsustainable. Narrowing the island renders it more fragile and makes maintenance of NC 12 even more difficult in the long-term. Not only does erosion accelerate as a result of nourishment, but the costs of nourishment increase greatly over time and the amount of usable sand is limited. NMFS commented that the need for nourishment appeared to be significantly understated and the availability of suitable sand appears to be significantly overstated, which "could affect conclusions about the suitability of the alternatives that have beach nourishment as a component." (FEIS at 8-49 to 8-50). DOI noted in its comments on the nourishment option that "over 500,000 cubic yards of Oregon Inlet sand have been placed along and adjacent to the 'Canal Zone Hot Spot' [alone] *annually* for the past four years, and it has not been sufficient to protect the highway from overwash and sand deposition impacts." FEIS 8-58 (emphasis added). And NCDOT admitted in its response to NMFS and DOI's concerns that it has not adequately studied the sand supply issue to determine whether available and suitable sand sources exist for a project of this magnitude. (Response to Comment, FEIS at 8-59).

3. Inaccurate Cost Estimates

The cost estimates provided for the nourishment option are misleading for several reasons. First, like all the cost estimates provided in the handout, they are now five years out of date. Second, as discussed above, nourishment tends to accelerate beach and sound-side erosion. That means that not only will the need for more sand increase over

time, but the island will become more vulnerable to breaches as it narrows, necessitating expensive emergency repairs. NCDOT has also admitted that nourishment has increased flooding problems in the Canal Zone hot spot area. FEIS at 4-70. Cost estimates should reflect these problems. Due to the massive volume of sand (500,000 cubic yards annually) that has been required even to partially stabilize the Canal Zone hot spot area in recent years, the Department of the Interior noted that "it appears that the estimated beach stabilization and associated costs are understated." FEIS at 8-58.

Finally, the long Pamlico Sound Bridge agreed upon by the Merger Team in 2003 was designed to last 100 years. Providing only a 50-year cost estimate for nourishment disguises the true cost of this option in comparison with a 100-year option like the Pamlico Sound bridge. The equivalent 100-year cost of nourishment would be at least double the current 50-year estimate, or $815,490,000 to $1,314,520,000, and it will likely be much higher when updated cost information is developed and erosion acceleration and other geologic impacts of nourishment are taken into account. When these costs are added to the cost of the Oregon Inlet bridge currently under contract, the nourishment option is significantly more expensive than the Pamlico Sound Bridge alternative.

4. Permitting and Compatibility Problems

It is unlikely that NCDOT will be able to secure necessary permits from the Army Corps of Engineers for the Nourishment alternative. Section 404(a) of the Clean Water Act, 33 U.S.C. § 1344(a), authorizes the Secretary of the Army, acting through the Corps of Engineers, to issue permits for the discharge of dredged or fill materials into navigable waters. Section 404(b)(1) directs the Environmental Protection Agency to issue guidelines ("404(b)(1) Guidelines") defining the circumstances in which dredged or fill material may be discharged into wetlands or other waters. The Corps must deny applications for section 404 permits if the discharge that would be authorized by the permit would not comply with EPA's 404(b)(1) Guidelines. 33 C.F.R. § 320.4(a).

The 404(b)(1) Guidelines prohibit issuance of a permit where:

(i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or

(ii) The proposed discharge will result in significant degradation of the aquatic ecosystem . . . ; or

(iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or

> (iv)There does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.

40 C.F.R. §230.12(a)(3). An alternative to discharge to navigable waters "is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of *overall* project purpose." 40 C.F.R. § 230.10(a)(2) (emphasis added). Where a discharge "is proposed for a special aquatic site" and is not "water dependent," all practicable alternatives to the proposed discharge which do not involve a discharge to a special aquatic site "are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise." 40 C.F.R. § 230.10(a)(3). As a federal wildlife refuge, the area at issue in this case is a special aquatic site, and the use is not "water dependent" since the transportation route could be placed elsewhere, including over Pamlico Sound. 40 C.F.R. §§ 230.2(q-1); 230.40. "If such an alternative exists . . . the [Clean Water Act] compels that the alternative be considered and selected unless *proven* impracticable." *Utahns for Better Transp. v. U.S. Dep't of Transp.*, 305 F.3d 1152, 1188-89 (10th Cir. 2002) (emphasis added).

The fact that NCDOT has a contract for construction of an Oregon Inlet bridge replacement does not preclude this required alternatives analysis, because practicable alternatives must be evaluated relative to the *overall* project purpose. The Pamlico Sound Bridge and the development of a ferry network are two examples of practicable alternatives that fulfill the project purpose with far less impact on the island's ecosystems. The decision to proceed simultaneously with three costly projects in the transportation corridor demonstrates that the funding concerns raised by FHWA in no way proved the Pamlico Sound Bridge impracticable as required by the Clean Water Act. As the Corps of Engineers explained in its letter to NCDOT dated January 5, 2012, "the primary reason [it] believed that the Pamlico Sound Bridge was not a practicable alternative was based on cost estimates and the assertion that the project could not reasonably be funded." If this underlying rationale is proven false and the Pamlico Sound Bridge re-emerges as the least environmentally damaging practicable alternative, the Corps will not be able to issue a § 404 permit for the Selected Alternative or any of its component parts, including the Nourishment option for Phase II.

In addition to these § 404 permitting concerns, the Nourishment option within the Refuge requires depositing sand outside the State's NC 12 easement, and therefore constitutes a use of the refuge under § 4(f) of the Department of Transportation Act of 1966. Use of publicly owned land is prohibited unless "(1) there is no prudent and feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use." 49 U.S.C. § 303(c). Depositing sand on the Refuge beaches is without question a use of the Refuge property. Thus, it is prohibited where

there are prudent and feasible alternatives. For the reasons discussed above, NCDOT's plan to construct three components of the transportation corridor project simultaneously reveals that the up-front funding concerns used to justify the rejection of the Pamlico Sound Bridge as not prudent were in fact arbitrary and capricious, and should be rejected in light of the current situation. Because feasible and prudent alternatives to this use of the Refuge land exist, this option cannot be approved under § 4(f). Even if no feasible and prudent alternatives exist, § 4(f)'s implementing regulations require that "the Administration may approve *only* the alternative that . . . [c]auses the least overall harm." 23 C.F.R. § 774.3(c)(1) (emphasis added). The Nourishment option does not cause the least overall harm, even among NCDOT's current Phase II options.

Moreover, the Nourishment option's use of the Refuge property also triggers a required compatibility determination: "[T]he Secretary shall not initiate or permit a new use of a refuge or expand, renew, or extend an existing use of a refuge, unless the Secretary has determined that the use is a compatible use and that the use is not inconsistent with public safety." 16 U.S.C. § 668dd(d)(3)(A)(i). "Compatible use" "means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge." 16 U.S.C. § 668ee.

> Inherent in fulfilling the System mission is not degrading the ecological integrity of the refuge . . . . The Refuge Manager must consider not only the direct impacts of a use but also the indirect impacts associated with the use and the cumulative impacts of the use when conducted in conjunction with other existing or planned uses of the refuge, and uses of adjacent lands or waters that may exacerbate the effects of a refuge use.

65 Fed. Reg. 62484, 62490 (Oct. 18, 2000).

Here, the direct and indirect impacts of nourishment and dune construction are incompatible with the purpose of the Refuge because would they harm plants and animals in the Refuge as well as the species' ecosystems and designated critical habitat, and they would negatively alter the geological condition of the Refuge land by contributing to increased erosion and island narrowing. NCDOT acknowledges that the Nourishment option is "[n]ot likely to be found compatible with Refuge's mission and purpose." (Handout p. 10).

Finally, the Cape Hatteras National Seashore extends 150 feet offshore of the Refuge, so NCDOT would also need a Special Use Permit from the National Parks Service ("NPS") in order to pursue the Nourishment option. The harmful impacts of nourishment, which result in narrowing the island, are not compatible with the NPS's goal of supporting the natural processes of barrier island dynamics.

B. Problems with Bridge Within Existing Easement Alternative

This "Bridge Within Existing Easement" alternative involves elevating NC 12 onto bridges within the State's current easement and is part of the "Phased Approach" that was effectively rejected by not being designated the preferred alternative in the EA or the selected alternative in the ROD. This option has two components in the current Phase II proposal: a longer, permanent bridge over the Refuge Inlet, along with two bridge options for the Rodanthe Breach site. Though NCDOT's workshop materials do not disclose this, the Phased Approach option may also involve nourishment and the construction of artificial dunes.

NCDOT claims that elevating NC 12 in the Refuge will not use the Refuge so long as the Project stays within its existing easement. As a result, NCDOT claims there are no potential constraints on this option (Handout p. 8). However, this option is highly unlikely to stay within its easement, and even if it does, it will constitute a use of the Refuge that is subject to a compatibility determination.

In a 2007 letter to then-Governor Easley, DOI stated that the Phased Approach would require actual use of Refuge land and therefore was likely incompatible with the Refuge's purpose:

> While the intent is to construct these new bridges within the existing road's right-of-way, we believe this alternative would require *continued maintenance outside of the existing road's right-of-way* through the Refuge until each subsequent phase of bridge construction along NC 12 is completed. Current information also indicates that all 4 phases would require at least 13 years of actual construction during a 28-year timeframe. Based on the information that the Service currently has, *it is unlikely that we could find this alternative to be compatible with the purposes for which the refuge was established*, as required under the Refuge Improvement Act.

Letter from David Verhey, Acting Assistant Secretary for Fish and Wildlife and Parks, to Governor Easley, dated September 11, 2007 (emphasis added).

The Phase II NCDOT Handout and other materials also fail to mention the projected dune-building and maintenance activities through 2030 that were integral to the Phased Approach as it was described in the FEIS (pages 4-70 to 4-72), much less explain how maintenance and any future dune-building will stay within the easement and cause no further encroachment onto the Refuge. Absent credible information to the contrary, it is simply not realistic for NCDOT to claim it will be able to accomplish all of the activities it proposes – new dune construction and maintenance, a temporary road, and constructing a long bridge more than 40 feet wide while keeping the existing highway

open– while staying entirely within its existing easement. It is virtually inevitable that these activities will "use" the Refuge within the meaning of Section 4(f). Moreover, the FEIS acknowledged that the Phased Approach "may require some beach nourishment," which would constitute a further use of Refuge land. (FEIS at 4-107). For all these reasons, it is foreseeable that the Phased Approach will result in actual use of Refuge land.

In addition to these actual uses of Refuge land, this option will constructively use Refuge property as well. The elevated roadway will soon be located on the beach, in the surf, and eventually in the Atlantic Ocean as the island migrates westward. NCDOT acknowledges that the end result of this option will be a long bridge located in the ocean. See FEIS at 4-172. This is an absurd result. The U.S. Army Corps reminded NCDOT in its 2007 comments on the Supplement to the SDEIS that an ocean bridge was rejected in 1991 (in the form of the "East Bridge" alternative) because wave and storm impacts would create unjustifiably high maintenance costs. Those same problems will plague an elevated NC 12 that winds up in the ocean under the Phased Approach as well. Large sections of the proposed bridge will sit in highly dynamic breaker zones, where they will be subject to waves, scour, and severe storms, including nor'easters and hurricanes. Beyond the severe maintenance problems this would create, the route would also fail utterly to provide a safe, reliable storm evacuation route. For this reason alone, this option must be rejected.

Moreover, beyond these problems, the bridge's eventual location in the surf also constitutes a constructive use of the Refuge: "A constructive use occurs when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired." 23 C.F.R. § 774.15(a). An ocean-side bridge will negatively affect Refuge geology, including erosion rates, inlet formation, ocean overwash, etc. Indeed, NCDOT has admitted that the presence of bridge piles on the beach or in the ocean and the accompanying scour effects would create erosion problems and "could accelerate the development of a breach" during storms. The scour area on the ocean floor anticipated by NCDOT to result from the elevated roadway is approximately 15.6 acres. (FEIS at 4-61.) As we discussed in our comments on the FEIS, scour effects from a long ocean-side bridge running parallel to the shore have not been adequately studied and may be much more significant than revealed in the FEIS. Moreover, dune construction and/or nourishment will increase ocean-side erosion, prevent overwash, and increase sound-side erosion, reducing valuable wetland habitat.

The Refuge Act specifically mandates that a compatibility determination consider the direct, indirect, and cumulative impacts on Refuge land and any adjacent land or waters that affect the Refuge use. It is clear that the elevated roadway option will have adverse impacts on the Refuge, and it is therefore subject to a compatibility

determination. For the reasons already discussed, FWS is likely to find the proposed activity is incompatible with the mission and purpose of the Refuge.

This option also would be subject to a compatibility determination even if it did not constitute a physical use of Refuge land under § 4(f). First, this option would use the Refuge as a historic property due to the significant visual impact of an elevated bridge through the length of the Refuge. NCDOT acknowledges that a long bridge through the Refuge or on the beach will create a "sizeable visual intrusion in to the landscape of the Refuge," all the more so in light of new bridge height requirements developed after Hurricane Katrina.

Second, irrespective of § 4(f) use, maintenance of an existing right-of-way is subject to review and approval by the FWS and is restricted to minor actions such as minor expansions or minor realignments to meet safety standards. *See* Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. 62484, 62490 (Oct. 18, 2000). The impacts of a major project to elevate the length of NC 12 through the Refuge will include significant direct and indirect effects and therefore cannot be exempted from a compatibility determination.

Assuming that NCDOT plans to continue this option under a phased approach and thus will not elevate the entire roadway at once, this option will have significant indirect impacts on the Refuge and impermissibly interfere with the FWS's ability to manage the Refuge for the benefit of federally protected species. Because of the unpredictable nature of barrier island dynamics – including inlet/breach formation, shoreline erosion rates and locations, and sound-side erosion – NCDOT's plan to elevate sections of the highway as problems arise will likely occur suddenly and require "temporary" or "emergency" actions that will permanently and adversely affect the Refuge. As has been the case for maintaining NC 12 in the past, these temporary measures include sand bags, beach nourishment, dune rebuilding, dune sprigging, fencing, and road relocation. As NCDOT admitted in the FEIS, it has never conducted these emergency or maintenance measures within the existing right-of-way. Such an approach would also recreate the significant transportation problems and economic losses that Hatteras residents suffered as a result of recent NC 12 breaches, including the six to seven weeks they were cut off in the wake of Hurricane Irene.

In addition to the harmful impacts on Refuge land, an ocean bridge would harm essential fish habitat ("EFH"). NCDOT has stated that the ocean bridge that would result from this option

> could permanently affect diversity and density of some aquatic wildlife within these [ocean] communities . . . . Because of habitat alteration and diminished vegetative growth, shading could impact managed species by locally diminishing the primary producers on which the managed species

> rely for food and cover, thereby resulting in an overall reduction in local carrying capacity. Fish abundance and growth have been found to be lower beneath fishing piers compared to adjacent waters . . . . The high energy around the piles may reduce habitat quality for larval and adult fish, as well as reduce invertebrate species abundance and diversity.

(FEIS at 4-107.) The Magnuson-Stevens Act, 16 U.S.C. § 1801 *et seq.*, requires agencies to consult with the U.S. Secretary of Commerce before undertaking any action that might adversely affect EFH.

In addition, maintenance activities on this bridge in the surf zone "would . . . represent a long-term impact" to EFH and federally protected species. See FEIS at 4-108. Permanent, ongoing maintenance would be a necessity for bridge piles located in the high-energy surf zone, as the vast majority of the elevated roadway would be over the next 50 years, and this intrusive activity would be a major detriment to EFH. Permanent, on-going maintenance of an ocean bridge would also constitute another use of the Refuge, would require a Special Use Permit from the NPS, and likely a section 404 permit from the Army Corps as well.

The dune-building activities associated with this option will disrupt overwash and other barrier island dynamics, as described above in the discussion of the Nourishment option. Once these natural processes are interrupted, the bridge will adversely affect migratory bird and other wildlife habitat. For example, the eventual presence of bridge pilings in the surf or on the beach would impact the quality of nesting habitat for the federally protected piping plover and green and loggerhead sea turtles. Because this result is readily foreseeable, this option is incompatible with the purpose of the Refuge due to the significant negative impacts of a long bridge located on the beach or in the ocean.

Beyond these problems within the Refuge, there are serious legal and logistical problems with elevating the existing roadway in the Rodanthe area as well. By NCDOT's own calculations, a bridge in this area will be located in the breakers by 2020 – *in eight short years* – creating tremendous maintenance and erosion problems. By 2060, NCDOT calculates the bridge could be 930 feet offshore. FEIS at 4-30, 4-62. Cost estimates should reflect the certainty of this section of bridge being located in the Atlantic Ocean. Moreover, as discussed above, the bridge's eventual location in the breakers and offshore would render the bridge unusable as an emergency evacuation route.

A Rodanthe bridge will also create access problems and significant effects on the human environment for property owners and tourists. As one example, NCDOT noted in its 2010 EA that the bridge will have to terminate in a full-height stub so that it can be continued farther into Rodanthe when continuing erosion cuts off planned temporary access ramps. Furthermore, NCDOT concedes that the bridge being in the surf will

impede views and beach access for residents and visitors and likely will accelerate the erosion problems that already threaten structures in Mirlo and Rodanthe, to the detriment of local property owners.

The Bridge with Nourishment option for Rodanthe is not feasible either. It would have the same erosion problems as the longer Rodanthe bridge, and would also require a compatibility determination in order to deposit sand and construct dunes in the Refuge. As NCDOT acknowledges—as well as for the reasons given above—this activity is likely to be found incompatible with the Refuge. (Handout p. 10).

Finally, the cost of this option was estimated by NCDOT to be higher than that of the Pamlico Sound Bridge when the most recent cost estimates were calculated in 2006. The Phased Approach was estimated to cost between $1.171 and $1.497 billion, or between $1.149 billion and $1.524 billion if nourishment was also used in the Rodanthe area. (Rev'd Final 4(f) Evaluation, FEIS at B-26). The Pamlico Sound Bridge, by contrast, was estimated to cost between $942.9 and $1.441 billion. Cost cannot therefore justify rejecting the Pamlico Sound Bridge in favor of this current proposal.

C. Problems with Road or Bridge on New Location West of Existing Easement in the Refuge

NCDOT has conceded that the two options to relocate NC 12 west of its existing easement are not viable because they could not obtain the necessary easements and compatibility determinations. Jim Trogdon has admitted that "[o]n Pea Island, any option that stays in the right of way is preferred, and in some cases, required."[5] Several agencies on the Merger Team rejected these options in 2009 due to their substantial wetlands impacts. Moreover, the NCDOT Handout (p. 8) acknowledges that neither relocation option would be likely to be found compatible with the Refuge. These admissions should have prevented NCDOT from presenting such unrealistic options to the public.

The information provided to the public about these options is also unrealistic because it artificially understates the impacts to wetlands and other lands within the Refuge. The NCDOT Handout states that the wetlands impact for the "Bridge on New Location" option is 0.1 acre and that it is 3.0 acres for the "Road on New Location" option. However, the FEIS reveals that relocating the easement west as proposed by the current options will result in permanent wetlands impacts of 8.5 acres filled for an "All Bridge" option, and between 67.5 and 79.4 acres for a relocated roadway. SDEIS at 4-58, FEIS at 2-73. The workshop handout does not explain this discrepancy. It may stem from the fact that "Phase II" of this option entails temporarily linking the relocated corridor back to existing NC 12 just north of the new Refuge Inlet. However, given that this alignment is admitted to be temporary and will inevitably be replaced by a new

[5] Kozak, "NCDOT Presents Options for Long-Term Highway 12 Repair to the Public," Island Free Press (Dec. 7, 2011).

corridor that extends through the entire length of the Refuge, the true impacts of this option and their implications for the viability of this option must be disclosed to the public. To withhold those impacts until the remainder of the corridor is relocated is another instance of illegal segmentation.

In fact, neither of these options stands any chance of being constructed. Because of their massive impacts on jurisdictional wetlands and other Refuge wildlife habitat described above, these relocation options cannot be approved by FWS or the Army Corps. First, in order to be constructed, NCDOT would have to obtain a new easement for each of these options. FWS could not grant such an easement, however, because these options are manifestly incompatible with the mission and purpose of the Refuge. The huge footprint of a new road or bridge through the length of the Refuge, including cutting through vital waterfowl impoundments, would clearly degrade the ecological integrity of the Refuge as a wildlife habitat and therefore must be found to be an incompatible use.

In addition, there is no viable compensatory wetlands mitigation within the Refuge to offset these impacts. Even if FWS were willing to accept NCDOT's abandonment of its existing easement as partial mitigation – which is unlikely, especially since on information and belief NCDOT plans to undertake no pavement removal or restoration work in the Refuge – the new route would use more acres of the Refuge than the existing easement and thus would require additional mitigation that simply does not exist. *See* EA at 2-24. Mitigation would also be required for the degraded state of the abandoned easement. DOI has reminded NCDOT that "mitigation cannot be used to make an otherwise incompatible proposed use compatible with the mission and purpose directives." FEIS 8-70.

For similar reasons, the Army Corps could not issue a § 404 permit for the massive amount of wetlands fill that these options would necessitate. The existence of other proposed options that would be less harmful to jurisdictional wetlands, in addition to the even less intrusive long Pamlico Sound Bridge or ferry options, preclude the issuance of a § 404 permit for these options.

D. Problems with Bridge in Pamlico Sound Near Rodanthe

The proposed bridge from Rodanthe through the Pamlico Sound was originally proposed as part of the "Road North/Bridge South" and "All Bridge" alternatives. Because it now could also be combined with one of the other proposed options, we discuss it separately from the relocation options covered in the previous section.

No matter which other option the proposed bridge would be linked to, a Rodanthe area bridge would require a new easement through two acres of estuarine emergent wetland areas in the Refuge in order to rejoin the existing NC 12 corridor; such a new easement would likely be denied as incompatible for the reasons given above. Here too,

on-site compensatory mitigation would be impossible because there are no equivalent wetlands NCDOT could restore. For all these reasons, the NCDOT Handout concedes that this option is "[n]ot likely to be found compatible with the Refuge's mission and purpose" and thus it could not be constructed. (Handout at 10).

In addition, the proposed bridge would travel through areas of known submerged aquatic vegetation (SAV), which are also classed as EFH because they provide refuge from predators and foraging areas for juvenile and adult fish. As discussed above, the Magnuson-Stevens Act requires consultation with the Secretary of Commerce before any action is taken that might adversely affect EFH. In this case, the proposed bridge would fill approximately 1.4 acres of SAV (see FEIS at 4-88) and shade 5.3 acres of SAV (Handout at 10).

The bridge would also require a § 404 permit from the Army Corps of Engineers for discharge and fill in jurisdictional waters. Such discharges are not permitted if a practicable alternative exists that would have a lesser adverse impact on the aquatic ecosystem. 40 C.F.R. § 230.10(a)(2). As discussed earlier, the in-corridor Rodanthe bridge, as well as a long Pamlico Sound Bridge or a ferry system, would offer practicable alternatives with lesser adverse impact.

The Rodanthe terminus of this bridge would apparently be in the same location as the Rodanthe Bridge Within Existing NC 12 Easement. As discussed above, NCDOT has acknowledged potential problems with the terminus of the latter option being located seaward of the projected 2060 shoreline. The same problem is likely to affect the Bridge on New Location option, raising its costs and increasing its environmental impact as a result.

Lastly, the proposed bridge would be quite expensive to construct due to the shallow water in the proposed bridge corridor. The water depth is less than six feet for virtually all of the bridge length. NCDOT is prohibited from dredging in SAV areas in order to use barges to construct the bridge, so instead a temporary work bridge would have to be constructed and the proposed bridge built off of that. (FEIS 4-90, 4-177). This is a much more expensive construction method than conventional barge-based bridge construction and likely means the estimates provided in the handout are artificially low.

E. Seven-Mile Bridge in Pamlico Sound Bypassing Rodanthe Breach and Refuge Inlet

Although it was not included in NCDOT Handout or other materials distributed at the public meetings, we understand that NCDOT is also considering a seven-or-more-mile long bridge to bypass the southern half or even two thirds of the Refuge in the Pamlico Sound as yet another alternative for Phase II. We have marked our understanding of the general path of such a bridge in magenta on the attached map.

Because this alternative has not been explained by NCDOT nor evaluated during the NEPA process, it is difficult to comment thoroughly on it. Generally, it represents a step in the right direction insofar as it would remove the transportation corridor from the most unstable portion of Hatteras Island and would eliminate the need for the much of the nourishment, construction, maintenance, and other activities that would constitute use of the Refuge under the Refuge Act. Once the details of this alternative are revealed, however, there may well be problems to be addressed, such as the use of the Refuge land where the northern end of the bridge makes landfall on the Refuge, the maintenance of the remaining miles of NC 12 (especially in the future inlet locations identified by government scientists), impacts on submerged aquatic vegetation on the sound side of the Refuge, harm to EFH, and impacts to wetlands, among other things.

The consideration of this medium-length bridge alternative again raises the issue of cost: if NCDOT has the funding necessary to build both the 2.5- to 3.2-mile Phase I bridge over Oregon Inlet as well as a seven-or-more mile bridge to bypass both the Rodanthe Breach and the Refuge Inlet, why should that money not be spent to build the less environmentally damaging Pamlico Sound Bridge alternative? Such a bridge would bypass the entire Refuge, eliminate impacts to the Refuge, eliminate the need for the Later Phases of the current Selected Alternative, and result in a safe and reliable route predicted to last 100 years.

III. NCDOT Must Reconsider Off-Island Options

As discussed above, the ostensible justification for rejecting a long Pamlico Sound Bridge – its cost – has been disproven. At Governor Perdue's request, NCDOT has accelerated its timetable to try to provide a long-term solution to the breaches caused by Hurricane Irene. As a result, NCDOT now proposes to construct Phase I and Phase II of the Bonner Bridge replacement at once, with three major components, incurring costs that will surely be comparable to the likely contract price of the Pamlico Sound Bridge. Accordingly, that option must now be reconsidered by the Merger Team as the least environmentally damaging alternative, or "LEDPA," and as a feasible and prudent avoidance alternative under § 4(f), because it would cause significantly less environmental harm and would provide a much more stable long-term solution to the current transportation crisis on Hatteras Island.

In addition, however, it is time for NCDOT and the rest of the Merger Team to give serious consideration to a system of modern, high-speed ferries that would link the Hatteras communities to Bodie Island and the mainland. Ferry technology has come a long way since the ferry option was studied in 1991 and dismissed in the 1993 DEIS. For example, quadrimaran ferries already in use elsewhere appear to offer the combination of high speed, extremely shallow draft, and low wake that could meet the needs of transportation across Pamlico Sound. See, e.g., William A. Hockberger, "Quadrimaran

Ferries: High Speed with Shallow Draft," 2033 Transportation Research Record: Journal of the Transportation Research Board at 1-7 (2007).

Privatizing a ferry system for Hatteras Island would introduce competition and multiple route options while allowing the private sector to bear the costs of expensive new ferry technologies. Spreading the transportation burden among multiple routes (and possibly among multiple carriers) would help address the objection that a ferry system could not match the carrying capacity of the Bonner Bridge, since each route would only need to carry a fraction of the total demand by taking passengers directly to their final destination in Rodanthe, Cape Hatteras, Bodie Island, etc.

Finally, ferry terminals located in currently isolated mainland towns like Stumpy Point could have a tremendous positive economic impact on these communities. Ferries would create permanent jobs on the Outer Banks and the mainland while also supporting the creation of other local businesses to serve ferry passengers.

NCDOT's previous response to comments regarding ferries has indicated a resistance to meaningfully considering this option. For example, in its response to comments on the 2010 EA, NCDOT stated that other island communities served exclusively by ferries are "not in any way equivalent" in part because they have been "accessed by boat, ferry or plane for their entire modern histories." (ROD at C-53.) This is not a meaningful reason to refuse to study modern ferry options for Hatteras Island. NCDOT also argued that these other communities have lower permanent and seasonal populations than Hatteras Island, but again, dividing the transportation load currently carried by the Bonner Bridge among multiple ferry routes to key locations on Hatteras Island would alleviate any capacity issues.

One point made in our comments on the EA bears repeating in light of Hurricane Irene: ferry systems provide a much more reliable and resilient transportation option after a major storm. While the Hatteras communities were cut off for over six weeks after Hurricane Irene breached NC 12, ferry service to Ocracoke Island was up and running within days. Hatteras residents and businesses suffered a major economic loss as a result of NCDOT's dependence on the vulnerable stretch of NC 12 through the Refuge. In contrast, an updated ferry system would provide a much quicker recovery from hurricanes during tourist season.

In short, rather than finding reasons to reject ferries out of hand, NCDOT should study this option seriously, investigating other public and private ferry systems in the United States and internationally to determine whether such an option is practicable. NCDOT claimed in its response to comments on the EA that the FEIS provided an adequate discussion of the ferry option, but that discussion, like discussions in previous NEPA documents, appears merely to summarize and repeat assumptions made in a 1991 feasibility study. Given the lack of viable options among those it is currently proposing

for Phase II, NCDOT can no longer afford to dismiss this alternative using out-of-date assumptions, data, and reasoning.

Conclusion

The Merger Team must revisit the entire Bonner Bridge replacement project. The Selected Alternative has proven inadequate because NCDOT has not developed any viable options for NC 12 and has instead been forced to rely upon old options already rejected by the Merger Team. Storm damage and erosion will only continue to reveal the shortcomings of this piecemeal approach. These realities have forced NCDOT to find funding to pursue three simultaneous components of its proposed transportation corridor, but the cumulative costs of these components are without question comparable to other alternatives, including the likely contract price of a long Pamlico Sound Bridge.

A safe and secure Pamlico Sound Bridge, predicted to last 100 years, and/or an updated ferry system, are surely a better use of the money than a series of precarious bridges and roads predicted to last only 50 years and to be beset by erosion and storm damage throughout their useful life. Thus, the Merger Team must reconsider off-island alternatives – including a Pamlico Sound Bridge and ferries – in light of the immense challenges and true costs of maintaining a long-term NC 12 corridor through the Refuge. These options are practicable, feasible, and prudent alternatives that will be far more stable and less environmentally damaging than the options presented to the public in the current Phase II process.

Sincerely,

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Southern Environmental Law Center

Jason Rylander
Senior Staff Attorney
Defenders of Wildlife

Robert Morgan
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Attachment

cc (by e-mail only, with attachment):
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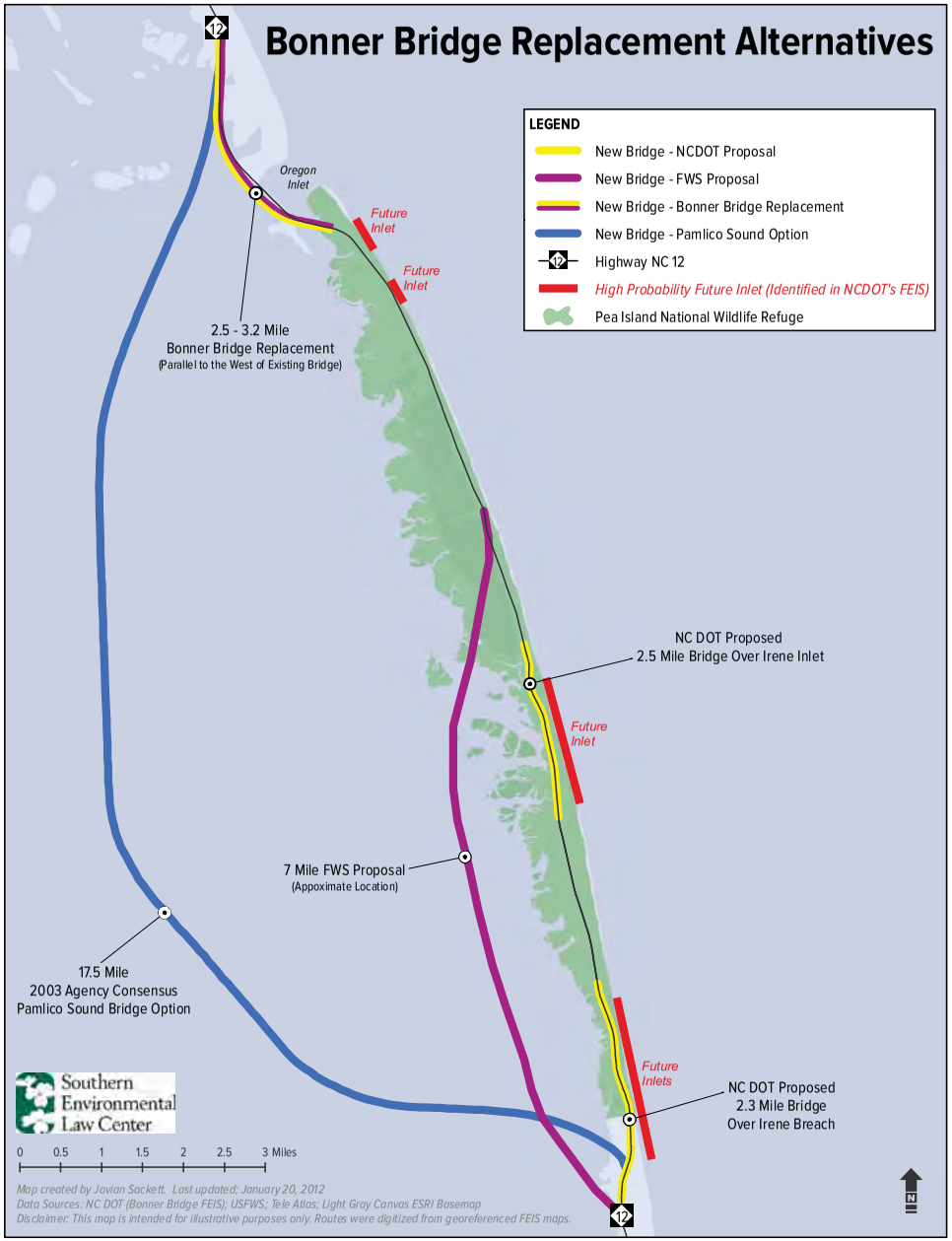

Appendix C

Response to Public and Non-Governmental Organization Scoping Comments on Potential Phase II Alternatives

C. Response to Public and Non-Governmental Organization Scoping Comments on Potential Phase II Alternatives

This appendix responds to the comments received as a result of public scoping efforts in December 2011 and January 2012 at the start of planning for Phase II of the Selected Alternative for the NC 12 Replacement of the Herbert C. Bonner Bridge over Oregon Inlet (Bonner Bridge Replacement Project), State Transportation Improvement Program (STIP) No. B-2500. The Selected Alternative is the Parallel Bridge Corridor with NC 12 Transportation Management Plan Alternative (PBC/TMP Alternative), as documented in the December 2010 Record of Decision (ROD). As a result of damage to NC 12 caused by Hurricane Irene in August 2011 in two locations, the North Carolina Department of Transportation (NCDOT) initiated Phase IIa (B-2500A) of the Bonner Bridge Replacement Project (B-2500) to implement long-term NC 12 improvements pursuant to the PBC/TMP Alternative identified in the ROD. The two locations in which NC 12 was breached by the storm were in northern Rodanthe (the "Rodanthe breach") and within the Pea Island National Wildlife Refuge (Refuge) approximately six miles south of Oregon Inlet (at the "Pea Island inlet"). This Environmental Assessment (EA) is for the Pea Island inlet area ("Phase IIa"). A separate National Environmental Policy Act (NEPA) document will be prepared for the Rodanthe area ("Phase IIb"). However, the public scoping Citizens Informational Workshops held in December 2011 and January 2012 sought comments for both Phase II sites, so most comments are applicable to both Phase IIa and Phase IIb. This appendix provides responses to these comments and those that specifically address Phase IIa. Those that specifically address Phase IIb will be responded to in future NEPA documentation for the Rodanthe breach.

C.1 Public Comments

Citizens Informational Workshops for scoping were held on December 5, 2011 at the Dare County Administration Building in Manteo; December 6, 2011 at the Rodanthe-Waves-Salvo Community Center in Rodanthe; and January 5, 2012 at the Community Center in Ocracoke. Based on the workshop sign-in sheets, attendance at the workshops was as follows: Manteo – 45 people; Rodanthe – 135 people; and Ocracoke – 58 people. As of January 20, 2012, a total of 77 citizens and one non-governmental organization (NGO) made comments (written, e-mail, or telephone) at and following the Citizens Informational Workshops. Of the 78 total comments, 25 comments did not express an alternative preference (i.e., general project-related comments and information requests). A summary of these comments sorted by the alternative favored is in the next section.

Comments not related to a preference for one or more alternatives are presented in the section that follows.

C.1.1 Alternative Favored

A total of 20 commenters expressed a preference for one of the alternatives displayed at the workshops in the Pea Island inlet area (Phase IIa), as follows:

- Beach Nourishment 11
- Bridge on New Location 7
- Road on New Location 0
- Bridge within Existing NC 12 Easement 6

Several commenters expressed support for more than one alternative. This is reflected in the numbers presented above and in those that follow.

A total of 41 commenters expressed a preference for one of the alternatives displayed at the workshops in the Rodanthe area (will be addressed in the EA for Phase IIb), as follows:

- Beach Nourishment 29
- Bridge on New Location 9
- Bridge within Existing NC 12 Easement 7
- Bridge within Existing NC 12 Easement with Beach Nourishment 6

A total of 36 commenters expressed a preference for a different alternative or made a general project-related comment with no alternative preference, as follows:

- Ferry Alternative 6
- Long Bridge (i.e., 17-mile-long bridge) 6
- Bridge from Rodanthe to either Stumpy Point or Roanoke Island 2
- General Project-Related Comments and Information Requests with No Alternative Preference Specified 25

The Outer Banks Chapter of the Surfrider Foundation submitted a petition (with 1,148 signatures) in favor of giving consideration to design options that, at a minimum, provide continued, if not improved, access to the Rodanthe 'S' Curves Hot Spot area for surfing (Phase IIb). The petition did not indicate support for a particular alternative, but it stated that the 'S' Curves Hot Spot area is a top surfing spot in the United States. It also emphasized the contribution of surfing to the local economy.

C.1.2 Public Comment Summary

In addition to comments indicating a preference for one or more alternatives, there were comments addressing the following substantive topics: project need and timing, cost and financing, decision-making considerations, permanent bridges, the temporary bridge over the Pea Island inlet, a permanent bridge over the Rodanthe breach, relocating NC 12 as a road, beach nourishment, other actions to minimize shoreline change, and utilities and emergency services.

1. Project Need and Timing:

   - NC 12 is essential to the residents, visitors and commerce of Hatteras and Ocracoke Islands.
   - The Outer Banks would be devastated without the new Oregon Inlet bridge. Tourism is our lifeline.
   - Ocracoke residents have mortgages, businesses, employees, children, and dreams, all dependent on a steady stream of guests to the island.
   - The solution should be implemented as soon as possible and should avoid lawsuits by remaining within existing NCDOT right-of-way.
   - Concern expressed that no decision had been made about replacing Bonner Bridge.
   - A long-term solution must be implemented to address safety issues (evacuations, motorist accidents and high numbers of tourists) in connection with the current short-term solutions at the breaches.

   Response: *NCDOT agrees that maintaining NC 12 is essential. A design-build contractor has been selected for building Phase I of the Bonner Bridge Replacement Project (B-2500), the new Oregon Inlet bridge. This phase is underway. The Selected Alternative identified in the December 2010 ROD (PBC/TMP Alternative) is a long-term solution. The purpose of current Phase II studies is to identify and then proceed with implementation of the long-term solution at the Pea Island inlet, addressed in this EA, and the Rodanthe breach, to be addressed in future environmental documentation.*

2. Cost and Financing:

   - It will be too costly to maintain the new bridge and road in their current locations.
   - A new bridge is too expensive.
   - There are creative ways to finance the more expensive but more desirable long bridge.

   Response: *Cost and financing are important factors in decisions related to the Bonner Bridge Replacement Project (B-2500) and the PBC/TMP Alternative. Placing NC 12 on a bridge (with piers and bridge spans supporting the road surface) is more expensive than*

relocating the NC 12 pavement on the ground as a road, both in terms of construction and maintenance. However, impacts and coastal conditions dictate serious consideration of bridges. Financing options for a long bridge in the Pamlico Sound Bridge Corridor were considered. They were included in the October 2009 Revised Final Section 4(f) Evaluation (Revised 4(f) Evaluation) presented in Appendix B of the May 2010 EA, beginning on page B-146. These findings were updated in an October 24, 2012 report prepared by NCDOT titled Bonner Bridge – NC 12 Transportation Management Plan Phase II—Pamlico Sound Bridge Corridor Cost Analysis. Over the four-year estimated construction period for a bridge in the Pamlico Sound Bridge Corridor, NCDOT would need between $896 million and $1.172 billion. This would require at least 94 percent of the NCDOT Division 1 projected budget for years 2014 to 2020. A Pamlico Sound bridge remains expensive and funding it is not feasible. The updated 2012 cost estimates and funding source analysis for the Pamlico Sound Bridge Corridor are discussed in detail in Section 2.6.1 of this EA. The full updated cost report for the Pamlico Sound Bridge Corridor is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.

3. Decision-Making Considerations:

- The NC 12 lifeline should not be maintained on the backs of the environment or wildlife. Decision-makers must find a middle ground solution.
- It would be preferable if environmental issues could be set aside in favor of discussing the best engineering options that would meet the project's goals.

Response: *As indicated by the assessment material contained in this EA for the Phase IIa Preferred Alternative, as well as the September 2008 Final Environmental Impact Statement (FEIS) and the 2010 EA, NCDOT considered a broad range of factors in evaluating alternatives. Based on the alternatives evaluation, NCDOT believes that the detailed study alternative under consideration for Phase IIa provides the best balance between meeting the project's goals, affordability, and limiting environmental impacts.*

4. Permanent Bridges:

- Bridging breaches would cause safety concerns because of high tourist levels, potential motorist accidents, and hurricane evacuations.
- Bridging breaches will doom the Outer Banks' economy because the shifting inlets will lead to intermittent and undependable travel along NC 12.
- Building a bridge would be an unwise and expensive endeavor.
- Any solution should carefully consider impacts to public access; at a minimum, public access should be maintained.
- Property access will be changed with new bridges.
- Bridging breaches will negatively impact the Outer Banks economy.
- NC 12 should be elevated along its entire length.

- Bridges/causeways should be built now over the "hot spots." Phase the construction from north to south for budgeting purposes. Once the inlets are formed, they will reduce or lessen sound-side flooding. This system has a long history of success in the Florida Keys.
- Any bridge/roadway should look at wind restrictions (as with the Chesapeake Bay Bridge) and determine what impacts they might have.

  Response: *The differing positions of the commenters are noted. Some favor the use of bridges and some do not. Bridges would be designed to facilitate safe operations and potential inlet presence and change. Access lost in the Refuge by bridging would need to be addressed by the Refuge. Access to private property would be maintained. During hurricane evacuations, county emergency management procedures call for the evacuation to be timed so that all evacuees will have reached a point of safety (shelter) before gale force winds (39 to 54 mph) arrive. Evacuees are off of NC 12, whether on the ground or on a bridge, well before the arrival of gale force winds. The impact of wind on bridge operations has been considered. It was discussed along with other weather-related issues in Section 2.8.2 of the 2008 FEIS, including the applicability of Chesapeake Bay Bridge restrictions.*

  Procedures for the Bonner Bridge Replacement Project (B-2500) phasing decisions are presented in the 2010 ROD in Section 3.3.2. The need at the three hot spots is acknowledged. Both long-term shoreline erosion and the location of areas susceptible to breaches are important factors in deciding the timing and location of future phases.

5. Temporary Bridge—The temporary Pea Island inlet bridge is too short.

   Response: *The temporary bridge was built to bridge the breach and re-open NC 12 as safely, quickly, and efficiently as possible. The proposed permanent bridge would be 2.1 miles long and designed to account for the potential expansion and migration of the inlet within the area geologically susceptible to breaching (opening in the island connecting the Atlantic Ocean with Pamlico Sound) in the Pea Island inlet area. Based on past history of inlets in this area and the views of the participants in the 2011 Peer Exchange meeting, there is the possibility that the Pea Island inlet will seek to move southward.*

6. Permanent Bridge Over the Rodanthe Breach:

   - A new bridge would be too disruptive. It would ruin the waterfront experience, including recreation and scenic views. It would impact community cohesion and quality of life. Do not disturb the community; "everything" is disappearing; more commercial development is undesirable.
   - A new bridge will create negative impacts to recreational opportunities such as surfing and the economy unless beach access and parking are maintained/ provided, especially at the "S" curves.
   - The bridge alternative will devastate Rodanthe.

Response: *These comments will be addressed in future NEPA documentation for the Rodanthe breach.*

7. Relocating NC 12 as a Road:

   – What has changed to make shifting the right-of-way/NC 12 alignment to the west so difficult? It seems that health, welfare and safety issues, as well as old deeds that gave the state the right to do whatever it needed, would allow NCDOT to shift the alignment west as it desired.
   – NCDOT should pressure the US Fish and Wildlife Service to allow NCDOT to place roadway in an NCDOT-preferred location.

   Response: *Within the Refuge, NCDOT has a fixed easement that can only be relocated with the authorization of the US Fish and Wildlife Service (USFWS), so NCDOT cannot relocate NC 12 outside of the existing easement without permission from USFWS. Extensive research has been completed on historic deeds and terms of sale. This information is presented in Appendix B of the 2010 EA beginning on page B-9. Shifting the NC 12 easement also is subject to provisions of the National Wildlife Refuge System Improvement Act of 1997 that state that any use of the Refuge must be compatible with the mission and purpose of the Refuge. The primary purpose of the Refuge is to be a refuge and breeding ground for migratory birds and other wildlife.*

8. Beach Nourishment:

   – Reduce erosion; protection of homes, businesses, and property values.
   – Nourishment is the most economical choice.
   – The entrance to Rodanthe could benefit from beach re-nourishment; if nourishment is tried, then direct ingress to historical Rodanthe is desirable.
   – Beach nourishment has very low visual impacts and very low impacts to businesses and residences.
   – Beach nourishment has lower opportunity costs because it requires lower upfront costs compared to the other alternatives.
   – Beach renourishment is a waste of money.
   – Beach nourishment should be more extensive than shown in the handout. Access to Hatteras Island should be maintained, but do not support beach nourishment until concerns are addressed (e.g., sediment source and size, sediment toxicology, effect on beach profile, funding source, etc.).

   Response: *The positions of commenters (for or against beach nourishment) are noted. Beach nourishment is not being pursued as the Phase IIa Preferred Alternative for the following reasons: uncertainties related to the availability of suitable sand to regularly re-nourish the shoreline over the project's 50-year life; necessity of closing the Pea Island inlet; nourishment would not adequately protect NC 12 from potential future inlets in this area; it would not allow natural island processes to occur (which is an objective of the*

Refuge); and it is not likely to be found compatible with the Refuge's mission and purpose (based on previous US Department of Interior [USDOI] comments).

9. Other Actions to Minimize Shoreline Change

   - The State should change the current law to allow for the beaches to be built up through the use of sunken ships, barges or rocks to build a breakwater, jetty, groin, etc.
   - The issue of disappearing sand should be abated by re-examining the jetty situation.

   Response: *The commenters' positions are noted. Changing current laws related to hardened structures on the coast is not within the purview of NCDOT.*

10. Utilities and Emergency Services:

   - Any solution should carefully consider utility rate increases resulting from shifting utility lines.
   - Consideration should be given to how proposed fiber optic cables would be accommodated on a replacement bridge.
   - Please advise Hyde County emergency service providers in advance of any changes that could affect the transport of the sick off of the island or in the event additional resources need to be requested for Ocracoke.

   Response: *The relocation of utilities was addressed in Section 4.12.4.7 of the 2008 FEIS on page 4-164. Here it was stated: "As the shoreline erodes west on Hatteras Island with all alternatives under consideration except when nourishment is a component, telephone and electrical lines will have to be moved west. These lines roughly parallel NC 12, on poles and on Bonner Bridge. Like NC 12, these utility lines also are placed in jeopardy by shoreline erosion. Thus, it is reasonably foreseeable that these lines would need to be moved one or more times between now and the design year of this analysis, 2060." It is presumed that on Hatteras Island utility providers will work with USFWS to allow for the relocation of their infrastructure. NCDOT is working with utilities to relocate them from Bonner Bridge to the new Oregon Inlet bridge.*

   During construction of Phase II, emergency service officials will be kept informed of temporary road closures or other construction activities that could affect emergency services.

11. Other Comments:

   - No bridge will be needed if the National Park Service keeps closing beach access.
   - The long bridge alternative should be lined with windmills and have recreational platforms.

– Concerns about inadequate dredging of Rollison Channel and Hatteras Inlet are relevant to this project. If the Corps of Engineers has no federal funding, the State of NC must step in.

Response: *The positions expressed in these comments are noted. However, none of the items addressed are factors in the Phase II decision.*

C.2 Southern Environmental Law Center Comments

1. **Comment:** None of the proposed alternatives will provide a viable long-term solution for the ongoing transportation crisis on Hatteras Island. The options will not satisfy Governor Perdue's request for a permanent solution to transport people to the southern Outer Banks. Moreover, they will run afoul of federal law. After two decades of study, it should be clear that the only viable long-term solution is to re-route the transportation corridor off the island onto a bridge that bypasses the most unstable portion of the island and/or onto ferries.

   As discussed in more detail below, the Phase II plan is flawed in the following respects:

   1. The selected alternative for the Project constitutes illegal segmentation in violation of the National Environmental Policy Act ("NEPA").
   2. Outdated, skewed cost estimates can no longer justify construction of a replacement bridge over Oregon Inlet in Phase I and elimination of the Pamlico Sound Bridge alternative as the solution for the entire Project.
   3. The problems with each of the individual alternatives being considered for Phase II that have been previously identified still remain and prevent their implementation.

   Response: *To clarify, Governor Perdue asked NCDOT to pursue long-term solutions to the impact on NC 12 from Hurricane Irene. The Governor was not referring to all NC 12 improvement needs. The Governor's September 1, 2011 on-line newsletter says "Gov. Perdue has ordered the N.C. Department of Transportation to develop both short- and long-term solutions for the devastation to NC 12 caused by Hurricane Irene." The purpose of this EA is to present a long-term solution for Phase IIa. Section 2.2 of the 2010 EA explains why NCDOT concluded that the Pamlico Sound Bridge Corridor is not a reasonable or practicable alternative. The reasons why ferries are not a viable alternative were addressed in Section 2.2.6 of the 2008 FEIS, as well as in the response to comments by this organization (comment 13) in the 2010 ROD beginning on page C-51. The reasons why the Selected Alternative identified in the 2010 ROD does not constitute illegal segmentation were explained in Section 2.3.5 of the 2010 EA, and also were presented in the responses to comments by this organization (comments 8 to 10) in the 2010 ROD (beginning on page C-47). The response to this organization's comment 3*

below further discusses the reasons why the Selected Alternative in the 2010 ROD does not constitute illegal segmentation. This organization's comments related to project cost estimates and the ability to implement the alternatives discussed at the Citizens Informational Workshops in December 2011 and January 2012 are addressed below in the responses to the more specific comments related to these topics. The updated 2012 cost estimates for the Pamlico Sound Bridge Corridor are discussed in detail in Section 2.6.1 of this EA. The full updated cost report for the Pamlico Sound Bridge Corridor is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects /bonnerbridgephase2/.

I. General Comments

A. Background

2. **Comment:** In the Environmental Assessment ("EA") issued May 7, 2010, and the Record of Decision ("ROD") issued on December 10, 2010, NCDOT and FHWA approved and selected an alternative called the "Parallel Bridge Corridor with NC 12 Transportation Management Plan" (the "Selected Alternative"). The Selected Alternative segments the Project into several parts: "Phase I" (an initial replacement bridge over Oregon Inlet) and "Later Phases" (monitoring Highway NC 12 through Pea Island National Wildlife Refuge (the "Refuge") and maintaining it in place while the island on which it is located, Hatteras Island, erodes and moves westward). The EA and ROD also refer to the Later Phases as "Future Phases" and "Phases II-IV," and state they will "mix and match" methods of maintaining the highway from methods previously identified in the NEPA process as well as other, yet-to-be-identified methods.

   NCDOT and FHWA selected this alternative and rejected the less environmentally damaging Pamlico Sound Bridge alternative on the theory that the latter was not practical because all of its costs would be borne up front, while the Selected Alternative could proceed in phases, with fewer up-front costs and much of the cost being spread out over decades. Hurricane Irene in August 2011 (along with Tropical Storm Ida in November 2010, and numerous other storms over the years) proved the fallacy of that theory. Hurricane Irene created two new inlets and disrupted NC 12 for seven weeks. One new inlet is located near the mid-point of the Refuge (the "Refuge Inlet") and has been temporarily bridged. A second new inlet is located at the southern end of the Refuge near the village of Rodanthe (the "Rodanthe Breach"), and it has been temporarily filled and shored up with sandbags.[1]

[1] We understand that the banks of the Refuge Inlet are already eroding to the point that emergency measures are already being taken to prevent another breach of NC 12. Lauren King, "Lane Closures on N.C. 12 Bridge at Pea Island to Begin Wed.," The Virginian-Pilot (Jan. 17,

Governor Perdue has asked NCDOT to develop a long-term solution to the problem of maintaining NC 12 through the Refuge. In a series of public meetings beginning December 5, 2011, NCDOT presented alternatives for long-term solutions to the recurring problems caused by breaches of NC 12 in the southern two-thirds of the Refuge, leaving the recurring problems in the northernmost portion of the Refuge to be addressed later. The materials handed out by NCDOT at the public workshops are hereinafter referred to as the "NCDOT Handout." These comments address those alternatives.

Response: *The 2008 FEIS (in Section 4.6.8.6 beginning on page 4-68) acknowledges that short-term actions will be required to maintain NC 12 until the full project is completed. The 2010 EA in Section 2.3.2.2 (beginning on page 2-17) describes as a part of the PBC/TMP Alternative a process for identifying the need for and implementing future long-term phases in such a manner that future short-term maintenance activities can be minimized. In response to Governor Perdue's request to pursue long-term solutions to the impact on NC 12 from Hurricane Irene, NCDOT completed the following scoping activities for Phase II of the Bonner Bridge Replacement Project (B-2500): an October 18, 2011 Merger Team meeting; the October 2011 Peer Exchange meeting, and three Citizens Informational Workshops in December 2011 and January 2012. These scoping activities are described in detail in Section 2.2 of this EA. Additional phases will be addressed in the future in the manner described in Section 3.3.2 of the 2010 ROD. The temporary bridge is being monitored and corrective action is being taken as the Pea Island inlet evolves. The proposed permanent bridge would span the entire area that is geologically susceptible to a storm-created breach in the Pea Island inlet area (2.1 miles). Cost estimates (2012) and financing information for Phase IIa are provided in Section 2.5 of this EA.*

B. <u>Segmentation</u>

3. **Comment:** According to the EA and ROD, NCDOT and FHWA plan to select the methods for accomplishing the Later Phases from the list of options that were explored in previous NEPA documents but were rejected by federal agencies in the merger process. They may also turn to additional, undisclosed methods that were not revealed or explored in any NEPA document. NCDOT and FHWA plan to delay the decision on which of these methods – each impermissible for various reasons – until the Phase I bridge is already built and renders the maintenance of NC 12 in the Refuge necessary.

   However, the damage caused by Hurricane Irene has forced NCDOT and FHWA to confront the unsustainable NC 12 situation sooner than they expected. The Refuge Inlet and the Rodanthe Breach destroyed sections of NC 12 in two of the four

2012). We also understand that the fill material and sandbags supporting NC 12 at the Rodanthe Breach are also endangered by ongoing erosion.

locations where government scientists have long predicted new inlets would form. NCDOT and FHWA are now tasked with developing a long-term plan to restore or bridge those two sections of NC 12 as "Phase II," before even beginning construction of Phase I. According to news reports, NCDOT plans to award contracts for the northern-most portion of Phase II by August 2012 and for the Rodanthe area by December 2012. Construction on the Bonner Bridge replacement is not slated to begin until 2013 and is expected to last three years. The fact that Phase I and Phase II will now effectively proceed simultaneously demonstrates that the two phases are one project, the effects of which must be considered together.

Despite the fact that the Merger Team could not fully support any of the alternatives now proposed for Phase II at the time they were originally considered, NCDOT has proffered them again to the public, having failed to develop any different, workable options to keep the highway stable. Yet the problems that prevented the Merger Team from supporting each of these options still remain: they cannot receive necessary permits from various federal and state agencies, they depend upon easements that the State does not own, and/or they cannot be found compatible with the Refuge as required by the National Wildlife Refuge System Improvement Act of 1997 (the "Refuge Act").

NCDOT and FHWA cannot legally ignore the impediments and impacts of the Phase II alternatives by segmenting the difficult, environmentally damaging portions of the Project until there is no other choice but to construct them. Under CEQ's NEPA guidelines, when an agency is considering "connected actions" that "are related to each other closely enough to be, in effect, a single course of action," their impacts must be considered together. 40 C.F.R. §§ 1502.4(a), 1508.25(a). Here, the bridge over Oregon Inlet and the alternatives for addressing the damage inflicted by Hurricane Irene constitute such "connected actions," and they must be considered a single transportation project, for which the impacts must be considered altogether.

The new breaches/inlets and NCDOT's newly accelerated timetable clarify that NCDOT cannot divide the Project into separate phases and consider only the environmental effects of Phase I at this time without violating NEPA. As we explained in previous comments,[2] NCDOT and FHWA's phased plan constitutes illegal segmentation by evaluating the environmental impacts of the Project piecemeal, and allowing the selection for Phase I to force choices for Phase II. The Project in this case encompasses the entire transportation corridor from Bodie Island to Rodanthe, so evaluating each "phase" of the Project separately violates NEPA. With multiple phases of this Project now underway simultaneously, it is even more apparent that NEPA documentation must evaluate the entire Project as a whole in

[2] Comments dated June 21, 2010, on the EA (pp. 6-9); Comments dated October 27, 2008, on the 2008 Final Environmental Impact Statement ("FEIS") (pp. 25-27)

order to analyze its environmental impacts adequately. A complete evaluation of the Project as a whole must include re-evaluating the choices made concerning Phase I.

To do otherwise – to treat Phase I's replacement bridge as a *fait accompli* when planning Phase II – impermissibly forces the decision on the Later Phases. It irretrievably commits resources to the Phase I replacement bridge in such a way that it forces the Later Phases to go forward without regard to their environmental consequences. If the environmental consequences and costs of the alternatives for the Later Phases had been considered thoroughly and realistically, the agencies would likely have selected a different alternative altogether in the ROD.

Segmentation is also inappropriate because it leaves users of NC 12 and Hatteras Island residents and visitors vulnerable to a foreseeable breach outside the two current Phase II sites. The proposed options do nothing to address the ongoing problems at the Canal Zone hot spot, for example, and another breach may open in or near the S-curves area in the very near future. NCDOT's approach suggests that, as with the Hurricane Irene breaches, it will wait until the next crisis arises before attempting to patch it and then retrospectively attempt to develop a stable solution for that particular site. This piecemeal approach falls far short of the comprehensive, long-term solution for the NC 12 corridor required by NEPA and, furthermore, requested by Governor Perdue.

Response:

*<u>Methods for Future Phases and Hurricane Irene</u>**.** All phases of the PBC/TMP Alternative, selected for implementation in the 2010 ROD, are part of one project. Phase II is underway. The options for future phases contemplated by the PBC/TMP Alternative are an integral part of that alternative. Moreover, the impacts as evaluated and disclosed in the 2008 FEIS and the 2010 EA are representative of the range and degree of impacts that could be expected through the implementation of future project phases. The objective of the PBC/TMP Alternative (as stated in Section 3.3.2 of the 2010 ROD) is to take into account "the inherent uncertainty in predicting future conditions with the dynamic coastal barrier island environment." Thus, NCDOT expects in the future to potentially consider variations of the options for future phases incorporated into the PBC/TMP Alternative (e.g., different roadway relocation and/or bridge alignments, etc.) that reflect specific future coastal conditions that cannot be anticipated today. The impacts of the options for future phases will be thoroughly evaluated through the NEPA process. The NEPA/Section 404 Merger Process will be used to study, select, and finalize options for future phases as called for with the PBC/TMP Alternative (see Section 1.2 of this EA and Section 2.3.2.2 of the 2010 EA). The outcome of Hurricane Irene has dictated the focus and timing of Phase II in two portions of the project area, but*

has not created a need to implement changes on other parts of NC 12 within the project area.

<u>Merger Team Findings and Compatibility</u>. In January 2010, the NEPA/Section 404 Merger Dispute Resolution Board (including representatives of NCDOT, the Federal Highway Administration [FHWA], the US Army Corps of Engineers [USACE], and the North Carolina Department of Environment and Natural Resources [NCDENR]) concurred with the PBC/TMP Alternative as the Preferred Alternative for the Bonner Bridge Replacement Project (B-2500) (the concurrence form is included in Appendix A [page A-9] of the 2010 EA). In addition, the issuance of the 2010 ROD demonstrates that all issues related to the identification of the PBC/TMP Alternative as the Selected Alternative for the Bonner Bridge Replacement Project (B-2500) were resolved. The Least Environmentally Damaging Practicable Alternative (LEDPA) agreement stipulates that any option considered for future phases of the project beyond Phase I "will be evaluated and selected with multi-agency input and concurrence as part of the Merger Process." Remaining objections to the LEDPA agreement were resolved through continued coordination and an agreed upon approach, as documented in a December 17, 2010 letter between USDOI and FHWA. With the exception of the Pamlico Sound Bridge Corridor alternatives, the other detailed study alternatives evaluated in the 2008 FEIS and the 2010 EA were not rejected during the Merger Process; they were not selected as the LEDPA. As discussed in Section 2.2 of the 2010 EA, the Pamlico Sound Bridge Corridor alternatives were eliminated as detailed study alternatives. All alternatives require permits and easements.

The alternatives presented to the public for comment were the Parallel Bridge Corridor alternatives assessed in the 2008 FEIS and the 2010 EA. Since that is where the previous studies ended, a presentation of these alternatives and their potential impacts is an appropriate starting point for Phase II. Discussion of these alternatives has led to concurrence or abstention (which by definition allows the NEPA/404 Merger Process to move forward) by the environmental resource and regulatory agencies on the Merger Team on the detailed study alternative and the LEDPA for Phase IIa (see Section 6.2.6 of this EA). The Refuge has indicated that a compatibility determination is not required for work within the existing NC 12 easement; therefore, it is not anticipated that a compatibility determination by USFWS would be required for the Phase IIa LEDPA.

<u>Segmentation and the Selected Alternative</u>. The reasons why the Selected Alternative identified in the 2010 ROD does not constitute illegal segmentation were presented in the following locations: Section 2.3.5 of the 2010 EA; the response to this organization's comment 9 on the Revised 4(f) Evaluation (see Appendix F of the 2010 EA, page F-36); and the responses to this organization's comments 8 to 10 in the 2010 ROD (beginning on page C-47). The reasons apply to the implementation of Phase I, Phase II, and future phases of the Bonner Bridge Replacement Project (B-2500). The last paragraph of Section 2.3.5 of the 2010 EA on page 2-32 summarizes the reasons why the Selected Alternative

identified in the 2010 ROD does not constitute illegal segmentation as follows: "In summary, although the new Preferred Alternative does not immediately prescribe preferred activities beyond Phase I, FHWA and NCDOT have evaluated and assessed environmental issues to maintain transportation along the Parallel Bridge Corridor for the entire project corridor. The impacts presented for the other Parallel Bridge Corridor alternatives reflect the reasonably foreseeable range of impacts for the NC 12 Transportation Management Plan Alternative (Preferred). In addition, based on the projected shoreline conditions for Hatteras Island, the Bonner Bridge Replacement Project (B-2500) has logical termini, as the project encompasses both the bridge replacement over Oregon Inlet and the entire section of NC 12 roadway projected to be threatened in the future between Oregon Inlet and Rodanthe. As stated above, the proposed project also does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements, as improvements are proposed south of the southern limits of this project. After reviewing the limits of the study area, the limits of the Preferred Alternative, and the projected shoreline conditions, and after assessing whether the proposed project restricts future foreseeable projects, FHWA has determined that the Preferred Alternative is not segmented in its scope or in its environmental impact assessment, consistent with the 23 CFR 771.111(f) regulations."

C. <u>Inaccurate Cost Estimates</u>

4. **Comment:** The alternatives for Phase II cannot be considered without updated and accurate cost estimates, for all alternatives, including a Pamlico Sound Bridge and modern ferries, as requested by the Corps of Engineers in its letter to NCDOT of January 5, 2012. The Pamlico Sound Bridge alternative cost estimates should include estimates for a version of that bridge that does not travel as far away from Hatteras Island into the sound, but rather incorporates new bridge-building technologies that allow construction closer to the Refuge without harming submerged aquatic vegetation. Such a bridge would be shorter and presumably less expensive than the 17.5-mile version previously priced.

   Although the Merger Team selected the Pamlico Sound Bridge alternative for detailed study in 2003 and generally acknowledged it to be the least environmentally damaging alternative, NCDOT and FHWA rejected it in favor of the current approach, arguing that the up-front costs of the long bridge would be too expensive while the phased approach or transportation management plan (TMP) alternatives would supposedly have fewer up-front costs with the majority of costs being spread over decades. This argument no longer justifies rejection of the Pamlico Sound alternative.

   As explained above, after Hurricane Irene, Phases I and II will now overlap significantly and progress virtually simultaneously. We have attached a map showing the location of the three portions of the Project that are currently planned,

created using data obtained from NCDOT. As is evident from the map, the currently planned Project portions account for at least seven to 10 miles of bridge and two-thirds of the length of the entire Project, leaving little to be accomplished in the Later Phases. In addition, in light of the current rate of erosion of the banks of the Refuge Inlet, we understand that the bridge over that portion of the Refuge might need to be much longer to last more than a few years. Accordingly, the combined up-front costs of the currently planned portions will surely begin to approach the up-front costs of the Pamlico Sound alternative. The fact that NCDOT is proposing to fund three large-scale construction projects simultaneously, even though the total cost of these projects is likely to be comparable to the less environmentally damaging Pamlico Sound Bridge, should compel reconsideration of the prior rejection of the Pamlico Sound Bridge solely on the basis of funding.

The cost estimates provided in the NCDOT Handout (p. 11) date from 2006. Even at that time, federal agencies – including the National Marine Fisheries Service ("NMFS"), Department of the Interior ("DOI"), and the Army Corps of Engineers – questioned the accuracy of those estimates. In 2006, when cost estimates of various alternatives were updated from the 2005 Supplemental Draft Environmental Impact Statement, the cost of the Pamlico Sound Bridge alternative rose inexplicably disproportionately as compared to the other alternatives. Then, in 2011, the Phase I Oregon Inlet replacement bridge contract was awarded for a mere 59% of its previously estimated price. The Pamlico Sound Bridge would likely see similar savings, and might even realize greater savings to the extent that its 2006 estimated price appears to have been inflated relative to the estimates for other alternatives.[3] In addition to the passage of time, much has changed since the 2006 estimates were generated, including construction costs, recession and inflation, the creation of new inlets in the Refuge, and other changes to the island's geography.

The chart below shows the progression of cost estimates and contracts. NCDOT states that it will develop more accurate cost information once the proposed options have been narrowed down through the public comment process and Merger Team meetings. However, this sequence of events deprives the public of vital information it needs before it can accurately evaluate these options. Updated cost information should have been provided to the public at the outset to inform the comments. Moreover, NCDOT and the Merger Team need accurate cost information in order to select or eliminate options reasonably.

[3] See, *e.g.*, U.S. Army Corps Comments on Supplement to SDEIS (Apr. 18, 2007), at p. 1 (questioning the 123% increase for the Pamlico Sound Bridge as compared with the 36% increase for the Oregon Inlet bridge).

	Short / Parallel Bridge Alternative	Long / Pamlico Sound Bridge Alternatives
NCDOT's 2005 Estimates (from NCDOT's Supplemental Draft Environmental Impact Statement, Sept. 12, 2005, p. 2-110)	"All Bridge Alternative" **$493 million** (incl. $191 million for Phase I Oregon Inlet bridge, plus remainder for route to Rodanthe)	**$420 million to $425 million**
NCDOT's 2006 Estimates (from NCDOT's Revised Final Section 4(f) Evaluation, Oct. 9, 2009, pp. 26, 27, Apx. G-3)	Parallel Bridge Alternatives: **$602 million to $1.524 billion** (incl. up to $368 million for Phase I Oregon Inlet bridge, plus remainder for route to Rodanthe)	**$943 million to $1.441 billion**
NCDOT's 2006 Estimates for Phase II only (from NCDOT Handout, p. 11)	**$331 million to $1.136 billion** (for Phase II only)	**N/A**
NCDOT's 2011 Estimates (from NCDOT Handout, p. 7, and article by Bruce Siceloff, News & Observer, 12/15/11, quoting NCDOT)	**$216 million** – contract for Phase I Oregon Inlet bridge **$211 million to $387 million** – NCDOT estimates for Phase II alternatives over new Hurricane Irene breaches Total: **$427 million to $603 million**	**$553 million to $846 million ??** (if actual contract came in at the same 59% discount from 2006 estimate as the Phase I Oregon Inlet bridge)

Waiting until an alternative has been selected to develop accurate cost information prevents sound agency decision-making and risks impermissible reverse-engineering of cost estimates to support predetermined outcomes.

Moreover, the cost estimates for Phase II provided by NCDOT fail to include key components of the Project. First, all cost estimates should include the cost of replacing the Bonner Bridge (Phase I) since they are part of the same Project. They also should include the costs of foreseeable direct and indirect impacts of these options, including mitigation costs, emergency repairs of storm damage throughout the construction of the phased approach, the permanent ongoing maintenance of an elevated roadway located in the Atlantic Ocean that will result from the phased approach, etc. For instance, NCDOT has incurred costs to restore NC 12 over the two Hurricane Irene breaches and is currently incurring additional costs to shore up the bridge over the Refuge Inlet; these costs should be considered part of Phase II. Finally, despite frequent mentions of a monitoring program in previous NEPA documents, there are no cost estimates provided to reflect the costs of such a program for each of the proposed alternatives. Providing all of this information to reflect the true cost of each alternative would help the agencies and the public fairly compare these alternatives with other alternatives such as a Pamlico Sound Bridge or modern ferry system.

In sum, many factors – including the fact that Phases I and II will proceed nearly simultaneously, the likelihood that the Pamlico Sound Bridge alternative would cost far less than previously estimated, the likelihood that the true cost of Phases I and II

will approach that of a Pamlico Sound Bridge, and the possibility that any sources that could fund Phase II might also be available to fund a Pamlico Sound Bridge – all mandate a reexamination and revision of the cost estimates previously provided to the public and the Merger Team.

Response: *The updated 2012 cost estimates, including the methodology used to develop these estimates, and funding source analysis for the Pamlico Sound Bridge Corridor are discussed in Section 2.6.1 of this EA. The full updated cost report for the Pamlico Sound Bridge Corridor is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www .ncdot.gov/projects/bonnerbridgephase2/. Cost estimates (2012) and financing information for Phase IIa are provided in Section 2.5 of this EA.*

II. Specific Problems with Each of DOT's Proposals for Pea Island and Rodanthe

5. **Comment:** Each of the alternatives currently proposed by NCDOT for Phase II is taken from options first proposed in 2005 and analyzed extensively since then. None of these options was eventually selected as the preferred alternative due to the serious legal and/or engineering problems inherent in each of them, and the fact that the same problems remain militates in favor of re-evaluating the plan for the entire Project.

   According to the NCDOT Handout, p. 4, the current Phase II "Beach Nourishment" alternative equates to the 2008 FEIS's Nourishment alternative. The current Phase II "Bridge Within Existing NC 12 Easement" alternative equates to the 2008 FEIS's "Phased Approach." The current Phase II "Bridge/Road on New Location" alternatives described in the NCDOT Handout equate to the 2008 FEIS's "Road North/Bridge South" and "All Bridge" alternatives.

   Because all of these options are virtually identical to past alternatives rejected by the Merger Team, our specific comments on the current proposed options are similar to (and incorporate by reference) our comments on the 2005 Supplemental Draft Environmental Impact Statement (SDEIS), the 2007 Supplement to the SDEIS, the 2008 FEIS and Section 4(f) Evaluation, the 2009 Revised Final Section 4(f) Evaluation ("Revised 4(f) Evaluation"), and the 2010 EA.

   Finally, it is striking that NCDOT essentially concedes it has no viable plan for a long-term solution to transportation problems for the Rodanthe area. NCDOT Chief Operating Officer Jim Trogdon has stated that even after six years of studying the current proposed options for Rodanthe, "there's no alternative that stands out yet."[4]

[4] Catherine Kozak, NCDOT Presents Options for Long-Term Highway 12 Repair to the Public, Island Free Press (Dec. 7, 2011).

Moreover, even the NCDOT Handout, Table 2 (p. 10), lists "Potential Constraints" that will be fatal to each of the Rodanthe options:

- The Beach Nourishment option is "[n]ot likely to be found compatible with Refuge's mission and purpose; sand quality and sand availability . . . is [sic] a concern," as is the "extensive dredging" that will be required to obtain the sand and the frequency with which nourishment would have to be repeated.

- The Bridge on New Location option is "[n]ot likely to be found compatible with Refuge's mission and purpose."

- The Bridge within Existing NC 12 Easement is subject to a "[r]apid erosion rate" that will result in parts of the elevated structure being "in the surf zone or offshore in the future," a result that was rejected in 1991 as creating serious maintenance problems and an unreliable storm evacuation route that would bear the brunt of an incoming nor'easter or hurricane.

- The Bridge within Existing NC 12 Easement and Beach Nourishment option raises the "[s]ame concerns as with beach nourishment option [i.e., compatibility and sustainability]; in addition, rapid erosion rate in this area may cause portions of the structure to be in the surf zone or offshore in the future."

The significant problems that NCDOT concedes with regard to each of these options demonstrate that none of them presents the viable long-term solution to the NC 12 maintenance problem requested by Governor Perdue. Any long-term solution must include moving the transportation corridor off this vulnerable stretch of Hatteras Island.

Response: *NCDOT agrees with this organization's assertion that the Phase II detailed study alternatives have been analyzed extensively since the Parallel Bridge Corridor was first proposed as a detailed study alternative in the 2005 Supplemental Draft Environmental Impact Statement. In January 2010, the NEPA/Section 404 Merger Dispute Resolution Board (including representatives of NCDOT, FHWA, USACE, and NCDENR) concurred with the PBC/TMP Alternative as the Preferred Alternative for the Bonner Bridge Replacement Project (B-2500) (the concurrence form is included in Appendix A [page A-9] of the 2010 EA). In addition, the issuance of the 2010 ROD demonstrates that all issues related to the identification of the PBC/TMP Alternative as the Selected Alternative for the Bonner Bridge Replacement Project (B-2500) were resolved. With the exception of the Pamlico Sound Bridge Corridor alternatives, the other detailed study alternatives evaluated in the 2008 FEIS and the 2010 EA were not rejected during the Merger Process; they were not selected as the LEDPA. As discussed in Section 2.2 of the 2010 EA, the Pamlico Sound Bridge Corridor alternatives were eliminated as detailed study alternatives. The alternatives presented to the public for comment were the Parallel Bridge Corridor alternatives assessed in the 2008 FEIS and*

the 2010 EA. Since that is where the previous studies ended, a presentation of these alternatives and their potential impacts is an appropriate starting point for Phase II. Discussion of these alternatives has led to concurrence or abstention (which by definition allows the NEPA/ 404 Merger Process to move forward) by the environmental resource and regulatory agencies on the Merger Team on the detailed study alternative and the LEDPA for Phase IIa (see Section 6.2.6 of this EA). With reference to Mr. Trogdon's remarks, to note that no alternative stands out and that all have potential constraints were remarks appropriate to the status of the Phase II study process at the time. The conclusion that there are no viable plans and that the constraints associated with the alternatives are fatal for all options is merely this organization's interpretation of Mr. Trogdon's remarks and not NCDOT's position.

The Bridge within Existing NC 12 Easement Alternative was not evaluated in 1991 as suggested in the third bullet point above. Based on this organization's comment 7 below, it appears it is referring to locating an Oregon Inlet bridge east of Bonner Bridge. This East Bridge Corridor was described in a 1991 feasibility study. It, however, was not dropped at that time, but was assessed in the 1993 Draft Environmental Impact Statement (DEIS) and discussed in Section 2.2.2 of the 2008 FEIS. As stated in both documents (page 2-8 of the 2008 FEIS): "… cost savings resulting from a shorter structure would be offset by costs related to risks introduced by construction in an area of greater wave activity, faster currents during storm surges, and less protected from storms." The factor addressed was construction cost and not storm evacuation.

A. <u>Problems with Beach Nourishment Alternative</u>

6. **Comment:** NCDOT proposes to use beach nourishment combined with dune enhancement "to maintain an adequate protective beach and dune system." NCDOT plans to nourish four locations at four-year intervals, though more frequent intervals will likely be required.

1. Practical Difficulties

There are numerous practical impediments to relying on beach nourishment to try to counteract the natural movement of Hatteras Island and the formation of new breaches and inlets. Chief among these is the fact that nourishment tends to accelerate erosion by steepening the beach. This and other problems are described in more detail below.

However, in addition to these general problems, nourishment simply is not a viable option in the area of the temporary bridge over the Refuge Inlet because the inlet there is moving southward and will cause the bridge to collapse. Nourishment will not stop this movement. One of the Fish and Wildlife Service ("FWS") buildings on the south side of the new inlet has already fallen into the inlet, and several more are currently close to collapse and may have already been condemned. Just a few

months after the temporary bridge was installed there, the inlet has already migrated so much that it has already become necessary to shore up the bridge. (See footnote 1.) Inlet movement is a natural part of barrier island dynamics, and the new Refuge Inlet may migrate as far south as the location of the former New Inlet. Much more intrusive structural maintenance would be required to try to stabilize the current bridge, which would be found to be incompatible with the Refuge.

Finally, the nourishment options for the Rodanthe Breach are described inconsistently in NCDOT's workshop handout. The Nourishment option's map shows nourishment stopping just south of the Refuge boundary. However, the "Bridge Within Existing NC 12 Easement and Beach Nourishment" option shows nourishment extending south of the Rodanthe Historic District. If nourishment further south will be required for the bridge option, it will be required for the nourishment-alone option as well. Thus, NCDOT appears to understate significantly the geographical extent of the nourishment required for this latter option.

2. Geological and Biological Impacts

The Nourishment and dune enhancement option would harm – both directly and indirectly – protected species with habitat in the Study Area. It would also alter the geological profile of the island in a manner harmful to the natural processes of the barrier islands. The geologic effects of nourishment will narrow the island and will cause further harm to federally protected plants and animals.

Nourishment and dune construction alter the geological profile of the target beach. "[A] steeper beach profile is created when sand is stacked on the beach during the nourishment process. This condition can lead to greater wave energy on the beach and greater beachside erosion." Atlantic States Marine Fisheries Commission, "Beach Nourishment: A Review of the Biological and Physical Impacts" 5 (November 2002). Because of this higher erosion rate with nourishment, the demand for sand increases over time. *Id*. at 6. The combined erosion on the ocean and sound sides of the island will lead to a narrowing of the island, potentially to the point that it can no longer support a highway, mush [sic] less the wildlife habitat that is the purpose of the Refuge.

In addition, nourishment and dune construction prevent ocean overwash, leading to further erosion on the sound side, including erosion of sound-side wetlands. Overwash moves sand to the sound side of barrier islands and is an essential part of barrier island dynamics. *See* S.R. Riggs, *et al.*, "North Carolina's Coasts in Crisis: A Vision for the Future" ("Coasts in Crisis"), which explains how nourishment and dune construction contribute to ocean-side erosion and prevent overwash, exacerbating sound-side erosion. This article is available at: http://www.coastal .geology.ecu.edu/NCCOHAZ/downloads/Coasts%20in%20Crisis%20 Booklet.pdf.

The impacts of nourishment also extend beyond the visible beach to the near-shore waters and to the offshore areas from which sand is mined. Mining sand offshore can disrupt long-shore sediment transport and the long-term sediment budget for the barrier islands and their adjacent inlets.

Beyond these negative effects on the physical structure of the island, the nourishment option will also negatively impact plant and animal species. Organisms can be harmed by nourishment either directly by sand placement or indirectly through alterations to the beach environment. For example, "birds may be displaced by dredges, pipelines, and other equipment along the beach, or may avoid foraging on the beach if they are aurally affected." Atlantic States Marine Fisheries Commission, "Beach Nourishment: A Review of the Biological and Physical Impacts" (November 2002). Other direct impacts include eggs, hatchlings, and adult birds being crushed by sand. *Id*. Indirect impacts to feeding birds are related to the sediment grain. "If the sediment is too coarse or high in shell content it can inhibit the bird's ability to extract food particles in the sand. Fine sediment that reduces water clarity can also decrease feeding efficiency of birds." *Id*. Other indirect impacts from beach nourishment can include diminished reproductive success, reduction in biomass of prey items, and long-term changes to substrate composition at dredging sites.

Long-term nourishment within the Project area would have additional adverse impacts on federally protected species, including the piping plover and North Carolina's endangered sea turtle species. By suppressing overwash, nourishment leads to loss of designated critical sound-side feeding habitat and nesting habitat for the federally threatened piping plover. In addition, the nourishment and artificial dune system prevents natural maintenance of existing habitat by increasing vegetative succession. Furthermore, nourishment may result in a narrower, steeper beach profile, reducing the available intertidal area. See National Park Service, Natural Resource Year in Review— 2004: Ecosystem Restoration in an Altered Coastal Environment, *available at* http://www.nature.nps.gov/yearinreview/yir2004/01_H.html ("A berm constructed to reduce the potential for island breaching has prevented natural overwash processes and has reduced habitat availability of piping plover.").

Beach nourishment can directly impact endangered sea turtles by burying nests and disturbing nesting turtles. Nourishment also impacts turtles indirectly. Beach nourishment may result in increased sand compaction and hardness and changes in moisture content and beach slope. Furthermore, as discussed above, nourished barrier islands may erode more quickly than natural beaches. This rapid erosion creates escarpments, which hamper access to nesting sites. In a vicious cycle, the rapid erosion may necessitate re-nourishment at more frequent intervals, thereby increasing the likelihood of interference with sea turtle nesting. See Fish and

Wildlife Service, Recovery Plan for the U.S. Population of Atlantic Green Turtle, 3, 1991, *available at* http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_atlantic.pdf.

The nourishment option is also unsustainable. Narrowing the island renders it more fragile and makes maintenance of NC 12 even more difficult in the long-term. Not only does erosion accelerate as a result of nourishment, but the costs of nourishment increase greatly over time and the amount of usable sand is limited. NMFS commented that the need for nourishment appeared to be significantly understated and the availability of suitable sand appears to be significantly overstated, which "could affect conclusions about the suitability of the alternatives that have beach nourishment as a component." (FEIS at 8-49 to 8-50). DOI noted in its comments on the nourishment option that "over 500,000 cubic yards of Oregon Inlet sand have been placed along and adjacent to the 'Canal Zone Hot Spot' [alone] *annually* for the past four years, and it has not been sufficient to protect the highway from overwash and sand deposition impacts." FEIS 8-58 (emphasis added). And NCDOT admitted in its response to NMFS and DOI's concerns that it has not adequately studied the sand supply issue to determine whether available and suitable sand sources exist for a project of this magnitude. (Response to Comment, FEIS at 8-59).

3. Inaccurate Cost Estimates

The cost estimates provided for the nourishment option are misleading for several reasons. First, like all the cost estimates provided in the handout, they are now five years out of date. Second, as discussed above, nourishment tends to accelerate beach and sound-side erosion. That means that not only will the need for more sand increase over time, but the island will become more vulnerable to breaches as it narrows, necessitating expensive emergency repairs. NCDOT has also admitted that nourishment has increased flooding problems in the Canal Zone hot spot area. FEIS at 4-70. Cost estimates should reflect these problems. Due to the massive volume of sand (500,000 cubic yards annually) that has been required even to partially stabilize the Canal Zone hot spot area in recent years, the Department of the Interior noted that "it appears that the estimated beach stabilization and associated costs are understated." FEIS at 8-58.

Finally, the long Pamlico Sound Bridge agreed upon by the Merger Team in 2003 was designed to last 100 years. Providing only a 50-year cost estimate for nourishment disguises the true cost of this option in comparison with a 100-year option like the Pamlico Sound bridge. The equivalent 100-year cost of nourishment would be at least double the current 50-year estimate, or $815,490,000 to $1,314,520,000, and it will likely be much higher when updated cost information is developed and erosion acceleration and other geologic impacts of nourishment are taken into account. When these costs are added to the cost of the Oregon Inlet

bridge currently under contract, the nourishment option is significantly more expensive than the Pamlico Sound Bridge alternative.

4. Permitting and Compatibility Problems

It is unlikely that NCDOT will be able to secure necessary permits from the Army Corps of Engineers for the Nourishment alternative. Section 404(a) of the Clean Water Act, 33 U.S.C. § 1344(a), authorizes the Secretary of the Army, acting through the Corps of Engineers, to issue permits for the discharge of dredged or fill materials into navigable waters. Section 404(b)(1) directs the Environmental Protection Agency to issue guidelines ("404(b)(1) Guidelines") defining the circumstances in which dredged or fill material may be discharged into wetlands or other waters. The Corps must deny applications for section 404 permits if the discharge that would be authorized by the permit would not comply with EPA's 404(b)(1) Guidelines. 33 C.F.R. § 320.4(a).

The 404(b)(1) Guidelines prohibit issuance of a permit where:

> (i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or
>
> (ii) The proposed discharge will result in significant degradation of the aquatic ecosystem . . . ; or
>
> (iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or
>
> (iv) There does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.

40 C.F.R. §230.12(a)(3). An alternative to discharge to navigable waters "is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of *overall* project purpose." 40 C.F.R. § 230.10(a)(2) (emphasis added). Where a discharge "is proposed for a special aquatic site" and is not "water dependent," all practicable alternatives to the proposed discharge which do not involve a discharge to a special aquatic site "are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise." 40 C.F.R. § 230.10(a)(3). As a federal wildlife refuge, the area at issue in this case is a special aquatic site, and the use is not "water dependent" since the transportation route could be placed elsewhere, including over Pamlico Sound. 40 C.F.R. §§ 230.2(q-1); 230.40. "If such an alternative exists . . . the [Clean Water Act] compels that the alternative be considered and selected unless *proven* impracticable."

Utahns for Better Transp. v. U.S. Dep't of Transp., 305 F.3d 1152, 1188-89 (10th Cir. 2002) (emphasis added).

The fact that NCDOT has a contract for construction of an Oregon Inlet bridge replacement does not preclude this required alternatives analysis, because practicable alternatives must be evaluated relative to the *overall* project purpose. The Pamlico Sound Bridge and the development of a ferry network are two examples of practicable alternatives that fulfill the project purpose with far less impact on the island's ecosystems. The decision to proceed simultaneously with three costly projects in the transportation corridor demonstrates that the funding concerns raised by FHWA in no way proved the Pamlico Sound Bridge impracticable as required by the Clean Water Act. As the Corps of Engineers explained in its letter to NCDOT dated January 5, 2012, "the primary reason [it] believed that the Pamlico Sound Bridge was not a practicable alternative was based on cost estimates and the assertion that the project could not reasonably be funded." If this underlying rationale is proven false and the Pamlico Sound Bridge re-emerges as the least environmentally damaging practicable alternative, the Corps will not be able to issue a § 404 permit for the Selected Alternative or any of its component parts, including the Nourishment option for Phase II.

In addition to these § 404 permitting concerns, the Nourishment option within the Refuge requires depositing sand outside the State's NC 12 easement, and therefore constitutes a use of the refuge under § 4(f) of the Department of Transportation Act of 1966. Use of publicly owned land is prohibited unless "(1) there is no prudent and feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use." 49 U.S.C. § 303(c). Depositing sand on the Refuge beaches is without question a use of the Refuge property. Thus, it is prohibited where there are prudent and feasible alternatives. For the reasons discussed above, NCDOT's plan to construct three components of the transportation corridor project simultaneously reveals that the up-front funding concerns used to justify the rejection of the Pamlico Sound Bridge as not prudent were in fact arbitrary and capricious, and should be rejected in light of the current situation. Because feasible and prudent alternatives to this use of the Refuge land exist, this option cannot be approved under § 4(f). Even if no feasible and prudent alternatives exist, § 4(f)'s implementing regulations require that "the Administration may approve *only* the alternative that . . . [c]auses the least overall harm." 23 C.F.R. § 774.3(c)(1) (emphasis added). The Nourishment option does not cause the least overall harm, even among NCDOT's current Phase II options.

Moreover, the Nourishment option's use of the Refuge property also triggers a required compatibility determination: "[T]he Secretary shall not initiate or permit a new use of a refuge or expand, renew, or extend an existing use of a refuge, unless

the Secretary has determined that the use is a compatible use and that the use is not inconsistent with public safety." 16 U.S.C. § 668dd(d)(3)(A)(i). "Compatible use" "means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge." 16 U.S.C. § 668ee.

> Inherent in fulfilling the System mission is not degrading the ecological integrity of the refuge . . . . The Refuge Manager must consider not only the direct impacts of a use but also the indirect impacts associated with the use and the cumulative impacts of the use when conducted in conjunction with other existing or planned uses of the refuge, and uses of adjacent lands or waters that may exacerbate the effects of a refuge use.
>
> 65 Fed. Reg. 62484, 62490 (Oct. 18, 2000).

Here, the direct and indirect impacts of nourishment and dune construction are incompatible with the purpose of the Refuge because would they harm plants and animals in the Refuge as well as the species' ecosystems and designated critical habitat, and they would negatively alter the geological condition of the Refuge land by contributing to increased erosion and island narrowing. NCDOT acknowledges that the Nourishment option is "[n]ot likely to be found compatible with Refuge's mission and purpose." (Handout p. 10).

Finally, the Cape Hatteras National Seashore extends 150 feet offshore of the Refuge, so NCDOT would also need a Special Use Permit from the National Parks Service ("NPS") in order to pursue the Nourishment option. The harmful impacts of nourishment, which result in narrowing the island, are not compatible with the NPS's goal of supporting the natural processes of barrier island dynamics.

> ***Response:*** *The Nourishment Alternative was assessed in the 2008 FEIS. The assessment was not revised in the 2010 EA. Many of the issues raised by this organization were recognized and discussed (including that such an alternative would not be compatible with NPS and USFWS goals of supporting natural processes), although it is noted that FHWA and NCDOT do not agree with all of the commenter's assertions. For reasons including some of those raised by this commenter, the Nourishment Alternative was not selected as the Phase IIa Preferred Alternative by the Merger Team (see Table S-1 of the 2008 FEIS for a summary of the major environmental impacts and costs of the Nourishment Alternative). However, it was appropriate to give the public the opportunity to discuss again the merits and issues associated with the Nourishment Alternative when initiating the Phase IIa study process because it was assessed in the 2008 FEIS as a long-term option in the Parallel Bridge Corridor and because it proved to be an alternative of interest to the public, thus warranting consideration to be included in the range of alternatives for Phase II.*

Had an alternative involving nourishment been proposed for further evaluation based on 2008 FEIS findings and the current setting in which it would be placed, then its design would have been re-assessed, off-shore drilling would have been conducted to determine if an adequate and appropriate sand source existed, additional Section 7 consultation under the Endangered Species Act would have been conducted, and costs would have been revised prior to any decision to select nourishment for implementation. Available information, however, was considered adequate to reject nourishment as the Phase IIa Preferred Alternative, which also appears to be the position of this organization.

For several of the comments above, the following additional clarifications are offered:

- *There is no discussion of flooding on the road because of nourishment in Section 4.6.8.6 (see page 4-70) of the 2008 FEIS. It is noted that, in the Canal Zone Hot Spot, windblown sand can create high shoulders and swales filled with sand. NC 12 becomes a low spot and water pools on the road until, during maintenance activities, the sand is moved to restore normal drainage patterns.*

- *Regarding the 500,000 cubic yards of sand placed annually at the Canal Zone Hot Spot. As indicated on page 8-51 of the 2008 FEIS: "Past deposition of sand from Oregon Inlet was not done as a part of a systematic program to maintain the shoreline. The sand quantities presented for the alternatives involving nourishment reflect such a program." The sand referenced by this organization in its comment was placed as a part of the disposal of Oregon Inlet dredging material to keep the sand within the natural shore/off-shore sand movement system.*

- *This organization mentions inadequate cost estimates for the alternatives in the Pamlico Sound Bridge Corridor. Costs were calculated consistently for all detailed study alternatives through 2060. This included 50 years of bridge maintenance cost for the Pamlico Sound Bridge Corridor.*

USACE agreed that the Pamlico Sound Bridge Corridor is not practicable based on a 2012 cost estimate and funding analysis. The updated 2012 cost estimates, including the methodology used to develop these estimates, and funding source analysis for the Pamlico Sound Bridge Corridor are discussed in detail in Section 2.6.1 of this EA. The full updated cost report for the Pamlico Sound Bridge Corridor is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.

Based on USEPA's and this organization's additional comments and requests regarding the Ferry Alternative (see Sections 2.3.2 and 6.2.2 of this EA), new 2012 cost estimates for this alternative were generated by NCDOT's Ferry Division, and additional research was conducted by FHWA on the potential use of quadrimaran ferries (high-speed ferries). Section 2.3.2 of this EA discusses the new cost estimates and research related to the Ferry Alternative, as well as the reasons why it was subsequently re-affirmed that the Ferry

Alternative is not a reasonable alternative. The full report documenting reconsideration of the Ferry Alternative is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects /bonnerbridgephase2/.

B. <u>Problems with Bridge Within Existing Easement Alternative</u>

7. **Comment:** This "Bridge Within Existing Easement" alternative involves elevating NC 12 onto bridges within the State's current easement and is part of the "Phased Approach" that was effectively rejected by not being designated the preferred alternative in the EA or the selected alternative in the ROD. This option has two components in the current Phase II proposal: a longer, permanent bridge over the Refuge Inlet, along with two bridge options for the Rodanthe Breach site. Though NCDOT's workshop materials do not disclose this, the Phased Approach option may also involve nourishment and the construction of artificial dunes.

   NCDOT claims that elevating NC 12 in the Refuge will not use the Refuge so long as the Project stays within its existing easement. As a result, NCDOT claims there are no potential constraints on this option (Handout p. 8). However, this option is highly unlikely to stay within its easement, and even if it does, it will constitute a use of the Refuge that is subject to a compatibility determination.

   In a 2007 letter to then-Governor Easley, DOI stated that the Phased Approach would require actual use of Refuge land and therefore was likely incompatible with the Refuge's purpose:

   > While the intent is to construct these new bridges within the existing road's right-of-way, we believe this alternative would require *continued maintenance outside of the existing road's right-of-way* through the Refuge until each subsequent phase of bridge construction along NC 12 is completed. Current information also indicates that all 4 phases would require at least 13 years of actual construction during a 28-year timeframe. Based on the information that the Service currently has, *it is unlikely that we could find this alternative to be compatible with the purposes for which the refuge was established*, as required under the Refuge Improvement Act.

   Letter from David Verhey, Acting Assistant Secretary for Fish and Wildlife and Parks, to Governor Easley, dated September 11, 2007 (emphasis added).

   The Phase II NCDOT Handout and other materials also fail to mention the projected dune-building and maintenance activities through 2030 that were integral to the Phased Approach as it was described in the FEIS (pages 4-70 to 4-72), much less explain how maintenance and any future dune-building will stay within the easement and cause no further encroachment onto the Refuge. Absent credible

information to the contrary, it is simply not realistic for NCDOT to claim it will be able to accomplish all of the activities it proposes – new dune construction and maintenance, a temporary road, and constructing a long bridge more than 40 feet wide while keeping the existing highway open – while staying entirely within its existing easement. It is virtually inevitable that these activities will "use" the Refuge within the meaning of Section 4(f). Moreover, the FEIS acknowledged that the Phased Approach "may require some beach nourishment," which would constitute a further use of Refuge land. (FEIS at 4-107). For all these reasons, it is foreseeable that the Phased Approach will result in actual use of Refuge land.

In addition to these actual uses of Refuge land, this option will constructively use Refuge property as well. The elevated roadway will soon be located on the beach, in the surf, and eventually in the Atlantic Ocean as the island migrates westward. NCDOT acknowledges that the end result of this option will be a long bridge located in the ocean. See FEIS at 4-172. This is an absurd result. The U.S. Army Corps reminded NCDOT in its 2007 comments on the Supplement to the SDEIS that an ocean bridge was rejected in 1991 (in the form of the "East Bridge" alternative) because wave and storm impacts would create unjustifiably high maintenance costs. Those same problems will plague an elevated NC 12 that winds up in the ocean under the Phased Approach as well. Large sections of the proposed bridge will sit in highly dynamic breaker zones, where they will be subject to waves, scour, and severe storms, including nor'easters and hurricanes. Beyond the severe maintenance problems this would create, the route would also fail utterly to provide a safe, reliable storm evacuation route. For this reason alone, this option must be rejected.

Moreover, beyond these problems, the bridge's eventual location in the surf also constitutes a constructive use of the Refuge: "A constructive use occurs when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired." 23 C.F.R. § 774.15(a). An ocean-side bridge will negatively affect Refuge geology, including erosion rates, inlet formation, ocean overwash, etc. Indeed, NCDOT has admitted that the presence of bridge piles on the beach or in the ocean and the accompanying scour effects would create erosion problems and "could accelerate the development of a breach" during storms. The scour area on the ocean floor anticipated by NCDOT to result from the elevated roadway is approximately 15.6 acres. (FEIS at 4-61.) As we discussed in our comments on the FEIS, scour effects from a long ocean-side bridge running parallel to the shore have not been adequately studied and may be much more significant than revealed in the FEIS. Moreover, dune construction and/or nourishment will increase ocean-side erosion, prevent overwash, and increase sound-side erosion, reducing valuable wetland habitat.

The Refuge Act specifically mandates that a compatibility determination consider the direct, indirect, and cumulative impacts on Refuge land and any adjacent land or waters that affect the Refuge use. It is clear that the elevated roadway option will have adverse impacts on the Refuge, and it is therefore subject to a compatibility determination. For the reasons already discussed, FWS is likely to find the proposed activity is incompatible with the mission and purpose of the Refuge.

This option also would be subject to a compatibility determination even if it did not constitute a physical use of Refuge land under § 4(f). First, this option would use the Refuge as a historic property due to the significant visual impact of an elevated bridge through the length of the Refuge. NCDOT acknowledges that a long bridge through the Refuge or on the beach will create a "sizeable visual intrusion in to the landscape of the Refuge," all the more so in light of new bridge height requirements developed after Hurricane Katrina.

Second, irrespective of § 4(f) use, maintenance of an existing right-of-way is subject to review and approval by the FWS and is restricted to minor actions such as minor expansions or minor realignments to meet safety standards. *See* Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. 62484, 62490 (Oct. 18, 2000). The impacts of a major project to elevate the length of NC 12 through the Refuge will include significant direct and indirect effects and therefore cannot be exempted from a compatibility determination.

Assuming that NCDOT plans to continue this option under a phased approach and thus will not elevate the entire roadway at once, this option will have significant indirect impacts on the Refuge and impermissibly interfere with the FWS's ability to manage the Refuge for the benefit of federally protected species. Because of the unpredictable nature of barrier island dynamics – including inlet/breach formation, shoreline erosion rates and locations, and sound-side erosion – NCDOT's plan to elevate sections of the highway as problems arise will likely occur suddenly and require "temporary" or "emergency" actions that will permanently and adversely affect the Refuge. As has been the case for maintaining NC 12 in the past, these temporary measures include sand bags, beach nourishment, dune rebuilding, dune sprigging, fencing, and road relocation. As NCDOT admitted in the FEIS, it has never conducted these emergency or maintenance measures within the existing right-of-way. Such an approach would also recreate the significant transportation problems and economic losses that Hatteras residents suffered as a result of recent NC 12 breaches, including the six to seven weeks they were cut off in the wake of Hurricane Irene.

In addition to the harmful impacts on Refuge land, an ocean bridge would harm essential fish habitat ("EFH"). NCDOT has stated that the ocean bridge that would result from this option

> could permanently affect diversity and density of some aquatic wildlife within these [ocean] communities . . . . Because of habitat alteration and diminished vegetative growth, shading could impact managed species by locally diminishing the primary producers on which the managed species rely for food and cover, thereby resulting in an overall reduction in local carrying capacity. Fish abundance and growth have been found to be lower beneath fishing piers compared to adjacent waters . . . . The high energy around the piles may reduce habitat quality for larval and adult fish, as well as reduce invertebrate species abundance and diversity.

(FEIS at 4-107.) The Magnuson-Stevens Act, 16 U.S.C. § 1801 *et seq.*, requires agencies to consult with the U.S. Secretary of Commerce before undertaking any action that might adversely affect EFH.

In addition, maintenance activities on this bridge in the surf zone "would . . . represent a long-term impact" to EFH and federally protected species. See FEIS at 4-108. Permanent, ongoing maintenance would be a necessity for bridge piles located in the high-energy surf zone, as the vast majority of the elevated roadway would be over the next 50 years, and this intrusive activity would be a major detriment to EFH. Permanent, on-going maintenance of an ocean bridge would also constitute another use of the Refuge, would require a Special Use Permit from the NPS, and likely a section 404 permit from the Army Corps as well.

The dune-building activities associated with this option will disrupt overwash and other barrier island dynamics, as described above in the discussion of the Nourishment option. Once these natural processes are interrupted, the bridge will adversely affect migratory bird and other wildlife habitat. For example, the eventual presence of bridge pilings in the surf or on the beach would impact the quality of nesting habitat for the federally protected piping plover and green and loggerhead sea turtles. Because this result is readily foreseeable, this option is incompatible with the purpose of the Refuge due to the significant negative impacts of a long bridge located on the beach or in the ocean.

Beyond these problems within the Refuge, there are serious legal and logistical problems with elevating the existing roadway in the Rodanthe area as well. By NCDOT's own calculations, a bridge in this area will be located in the breakers by 2020 – *in eight short years* – creating tremendous maintenance and erosion problems. By 2060, NCDOT calculates the bridge could be 930 feet offshore. FEIS at 4-30, 4-62. Cost estimates should reflect the certainty of this section of bridge being located in the Atlantic Ocean. Moreover, as discussed above, the bridge's eventual location in the breakers and offshore would render the bridge unusable as an emergency evacuation route.

A Rodanthe bridge will also create access problems and significant effects on the human environment for property owners and tourists. As one example, NCDOT noted in its 2010 EA that the bridge will have to terminate in a full-height stub so that it can be continued farther into Rodanthe when continuing erosion cuts off planned temporary access ramps. Furthermore, NCDOT concedes that the bridge being in the surf will impede views and beach access for residents and visitors and likely will accelerate the erosion problems that already threaten structures in Mirlo and Rodanthe, to the detriment of local property owners.

The Bridge with Nourishment option for Rodanthe is not feasible either. It would have the same erosion problems as the longer Rodanthe bridge, and would also require a compatibility determination in order to deposit sand and construct dunes in the Refuge. As NCDOT acknowledges—as well as for the reasons given above—this activity is likely to be found incompatible with the Refuge. (Handout p. 10).

Finally, the cost of this option was estimated by NCDOT to be higher than that of the Pamlico Sound Bridge when the most recent cost estimates were calculated in 2006. The Phased Approach was estimated to cost between $1.171 and $1.497 billion, or between $1.149 billion and $1.524 billion if nourishment was also used in the Rodanthe area. (Rev'd Final 4(f) Evaluation, FEIS at B-26). The Pamlico Sound Bridge, by contrast, was estimated to cost between $942.9 and $1.441 billion. Cost cannot therefore justify rejecting the Pamlico Sound Bridge in favor of this current proposal.

Response:

<u>Rejection of Phased Approach</u>. In January 2010, the NEPA/Section 404 Merger Dispute Resolution Board (including representatives of NCDOT, FHWA, USACE, and NCDENR) concurred with the PBC/TMP Alternative as the Preferred Alternative for the Bonner Bridge Replacement Project (B-2500) (the concurrence form is included in Appendix A [page A-9] of the 2010 EA). With the exception of the Pamlico Sound Bridge Corridor alternatives, the other detailed study alternatives evaluated in the 2008 FEIS and the 2010 EA were not rejected during the Merger Process; they were not selected as the LEDPA. In developing and assessing alternatives in previous studies and in Phase IIa studies, Merger Team concerns were considered and addressed. In a December 17, 2010 letter to NCDOT, USDOI withdrew its objections to the PBC/TMP Alternative. As discussed in Section 2.2 of the 2010 EA, the Pamlico Sound Bridge Corridor alternatives assessed in the 2008 FEIS were eliminated as detailed study alternatives. The alternatives presented to the public for comment were the Parallel Bridge Corridor alternatives assessed in the 2008 FEIS and the 2010 EA. Since that is where the previous studies ended, a presentation of these alternatives and their potential impacts is an appropriate starting point for Phase II. Discussion of these alternatives has led to concurrence or abstention (which by definition allows the NEPA/404 Merger

Process to move forward) by the environmental resource and regulatory agencies on the Merger Team on the detailed study alternative and the LEDPA for Phase IIa (see Section 6.2.6 of this EA).

<u>Compatibility Determination in the Existing NC 12 Easement</u>. The Refuge has indicated that a compatibility determination is not required for work within the existing NC 12 easement. However, in the Pea Island inlet area, a temporary construction easement outside of the existing easement is expected to be needed because the presence of the temporary bridge limits the area within the easement available to maintain traffic. An approximately 5-foot-wide easement will be needed along much of the alternative to provide room for construction workers to erect erosion control measures (fencing) along the edge of the existing NC 12 easement. Temporary construction easements also would be requested for staging areas at the existing paved boat ramp and paved parking area just south of the Pea Island inlet. Pile jetting pipes also would be placed between NC 12 and the Pamlico Sound at an additional location. These needs are being discussed and coordinated with USFWS-Refuge. Elsewhere, the bridge can be built and maintained within the existing easement. The statement referenced by the commenter on page 4-107 of the 2008 FEIS stating that the Phased Approach alternatives "may require some beach nourishment" reflects an incorrect use of terminology by the project biologist that was not corrected during final review of the document. To put the quote referenced by the commenter in proper context, the full sentence that this text was taken from is "NC 12 maintenance associated with other Parallel Bridge Corridor alternatives (including the Preferred Alternative) may require some beach nourishment (see Section 4.6.8.6)." Section 4.6.8.6 of the 2008 FEIS (beginning on page 4-68) describes the potential short-term NC 12 maintenance activities that would likely occur until Phases II through IV of the Phased Approach alternatives are implemented. As listed in Table 4-13 of the 2008 FEIS, these activities include road scraping, dune maintenance, dune rebuilding, sandbag-based dune and berm replenishment, and dune translation. A large beach nourishment program is not listed in this section as a maintenance strategy; however, the project biologist in completing the natural resource-related analyses of the detailed study alternatives incorrectly referred to beach nourishment as one of these maintenance strategies instead of berm replenishment.

<u>A Bridge in the Ocean as a Safe and Reliable Evacuation Route</u>. A bridge in the existing easement that eventually ends up in the ocean as a result of shoreline erosion would provide a safe and reliable evacuation route. Once gale force winds arrive from an approaching storm, it is generally not safe for motorists to be travelling anywhere in the affected area, whether it be on a bridge, on a ferry, or on a road. Normal hurricane evacuation procedures call for the evacuation early enough for residents of coastal areas to have time to reach a point of safety (shelter) prior to the arrival of gale force winds and the storm surge.

<u>Bridge in the Surf as a Constructive Use of the Refuge</u>. An assessment of the Phased Approach on coastal processes is presented in Section 4.6.8 of the 2008 FEIS, including scour, wave climate, longshore sediment transport, beach erosion, and the potential for an island breach. Regarding scour, page 4-61 of the 2008 FEIS discusses the potential effect of Phased Approach bridge piles on scour. The results of that assessment begin on page 4-64. Scour holes around bridge piles offshore and outside of the Refuge would not substantially impair the protected features, activities, and attributes that make the Refuge eligible for the National Register of Historic Places (NRHP). Section 4.6.8.4 on page 4-67 indicates that the presence of bridge piers could create focused erosional hot spots and that it is possible that the presence of the piers could accelerate the development of a breach during a sound-side storm surge such as occurred with Hurricane Irene. These potential changes also would not substantially impair the protected features, activities, and attributes that make the Refuge eligible for the NRHP since they represent a potential variation in an on-going natural process. Key features of the Refuge that make it eligible for the NRHP are the man-made dikes (associated with Refuge ponds) and dunes. The dunes are already affected by shoreline erosion and breaches and it is the Refuge's preference that they not be restored since they substantially affect the natural geological evolution of the island. The Refuge ponds are already affected by sand overwash when storms breach the protecting dunes, as occurred with Hurricane Sandy in October 2012. The ponds are not in an area geologically susceptible to breaching, although during Hurricane Irene the sound-side dike of the southern pond was damaged and subsequently repaired.

The Revised 4(f) Evaluation presented in Appendix B of the 2010 EA, however, did conclude that the Phased Approach, and thus the Bridge within Existing NC 12 Easement, would have a constructive use of the Refuge as a historic resource because of its visual impacts.

<u>Visual Impact of Bridge</u>. As discussed in Section 4.2.1 of this EA, based on safety requirements developed by a FHWA and American Association of State Highway and Transportation Officials (AASHTO) joint committee after Hurricane Katrina related to wave and water forces on bridges, the 2008 FEIS indicated that the bridge deck for bridges in the existing NC 12 easement, including the Phase IIa project area, would be at an elevation of approximately 33.5 feet above mean sea level (approximately 30 feet above ground), allowing for the bottom of the superstructure to be a minimum of 25 feet above mean high water. However, as part of the design of the Phase IIa Preferred Alternative's bridge, additional site analysis was performed by NCDOT of the Phase IIa project area to determine the necessary bridge heights. This analysis was done in coordination with members of the committee who originally developed the Hurricane Katrina safety requirements. Based on the results of this analysis, it was determined that it would be sufficient for the bridge to have 15.8 feet of clearance between mean high water and the bottom of the superstructure (17 feet from zero elevation), instead of 25 feet. In addition, the deck would be approximately 23 feet above mean sea level instead of 33.5 feet.

However, the Phase IIa Preferred Alternative's bridge would be higher (deck height of approximately 32 feet) in the Pea Island inlet area to accommodate truck traffic on NC 12 passing under the Phase IIa Preferred Alternative's bridge during construction at two locations where the permanent bridge would be built on the sound side of the NC 12 easement to avoid the temporary bridge. The total length of this greater height would be about 900 feet. This has been taken into consideration in the Phase II study process. The visual impacts assumed in the 2008 FEIS would remain, but would be lessened because of the shorter bridge heights (i.e., the bridges would not be visible from as great a distance because of the shorter heights).

Temporary NC 12 Maintenance and Minimizing Impacts to the Refuge. The objective of the PBC/TMP Alternative (as stated in Section 3.3.2 of the 2010 ROD) is to take into account "the inherent uncertainty in predicting future conditions with the dynamic coastal barrier island environment." The outcome of Hurricane Irene has dictated the focus and timing of Phase II in two portions of the project area (i.e., the Pea Island inlet and Rodanthe breach areas). However, as indicated beginning on page 12 of the 2010 ROD, the PBC/TMP Alternative includes several measures to facilitate advance planning and implementation of future phases. These efforts are underway, including using the Merger Process to study, select, and finalize the Phase IIa and Phase IIb projects.

In Project Commitment 19 in Appendix A of the 2010 ROD (page A-4), NCDOT indicated that it recognized that storm-related NC 12 maintenance will occur before the completion of future phases, and also that it is committed to continuing to work with the Refuge to reduce the potential impacts to the Refuge and NC 12 resulting from NC 12 storm-related maintenance. Since making that commitment, NCDOT has minimized the impact of NC 12 maintenance activities on the Refuge by:

- *No longer repairing dunes that occur wholly outside the existing easement. In the past, this could typically involve several weeks of pushing and reestablishing the primary dune approximately 100 to 200 feet beyond the NC 12 easement.*
- *No longer placing sand fencing on dunes outside the existing easement.*
- *Leaving as storms change them washed-out dunes outside the existing easement, with a few minor dune repair exceptions, which were done in coordination with USFWS.*

This approach to NC 12 maintenance has increased the amount of work within the existing easement in terms of moving sand off the road. This is particularly the case at the Canal Zone Hot Spot where the dune is partially within the easement and dune sand regularly drifts onto NC 12 and has to be put back on the crest of the dune.

NCDOT has performed NC 12 maintenance activities outside of the existing easement in recent years, but these activities were the exception to the rule. In addition, these activities were approved by the Refuge and were primarily in response to major storm events. No NC 12 maintenance activities occur outside of the existing easement without the prior approval of the Refuge. These activities have included:

- *Following Hurricane Ida in 2009, NCDOT conducted sandbag placement and dune reconstruction at the 'S' Curves Hot Spot just north of Rodanthe in the easement. NCDOT was permitted to "plug" a couple of small dune breaches outside the NC 12 easement. These breaches were approximately 20 to 50 feet wide and occurred in a few spots along the island. In association with the sandbag replacement/addition effort, a beach habitat restoration (nourishment) project took place at the 'S' Curves Hot Spot in 2010. The beach habitat restoration was done at the request of USFWS, through a condition of the 2006 Special Use Permit authorizing the sand bag project. The entire effort was done in coordination with USFWS and NCDENR, Division of Coastal Management (DCM) and included the preparation of a Categorical Exclusion (CE) under NEPA, the issuance of Coastal Area Management Act (CAMA) major permit, a USACE individual permit, a NCDENR, Division of Water Quality (DWQ) Certification, and a USFWS Special Use Permit. Consultation occurred with USFWS under Section 7 of the Endangered Species Act.*

- *In 2009 and 2010, NCDOT went beyond the NC 12 easement to remove derelict sand fencing. Prior to the new policy, NCDOT typically placed sand fencing beyond the easement at the toe and crest of primary dunes each year. This sand fencing was removed primarily because it had deteriorated and no longer functioned.*

- *Following Hurricane Irene in 2011, a temporary bridge was built over the new Pea Island inlet opened by the hurricane. NCDOT acquired permits from USFWS, USACE, NCDENR-DCM, and NCDENR-DWQ and prepared a Categorical Exclusion (CE) for the temporary bridge, fulfilling the requirements of NEPA. The CE, approved in September 2011, demonstrated that the temporary bridge would have no significant environmental impact. In addition, NCDOT coordinated with FHWA to determine that the approved CE is sufficient to address the NEPA requirements for additional riprap and sandbags around the southern abutment of the temporary bridge. The work was confined to the existing NC 12 easement except for the excavation of fill material, which occurred in the Refuge in the area behind (i.e., immediately south of) the terminal groin—the majority of the 10,000 cubic yards of fill material came from this area. The removal of the material was done under the supervision of a representative from the Refuge and was conducted so as to enhance shore bird foraging habitat in that area. A USFWS Special Use Permit was obtained for this work. This work also was authorized under a CAMA major permit. However, because the alignment of the temporary bridge was placed along the eastern side of the NCDOT easement, overhangs from a couple of interior bridge support*

bents encroached approximately 1 to 3 feet outside of the NC 12 easement, which was allowed in the USFWS Special Use Permit.

- *Following Hurricane Irene in 2011, when restoring the sandbags (at the sandbag filled dune just north of Rodanthe) and NC 12 roadway, NCDOT maintenance staff and contractors encroached on areas beyond the easement in the Rodanthe 'S' Curves Hot Spot area. This was a temporary action allowed for the rebuilding process. The final alignment of the sandbags and roadway are within the NC 12 easement. A CAMA major permit and a USFWS Special Use Permit were obtained for this work. NCDOT also prepared a CE for this work to fulfill the requirements of NEPA. The CE, approved in September 2011, demonstrated that this work would have no significant environmental impact. Sand was obtained from a site in Avon and not the Refuge.*

- *In January 2012, a CAMA major permit and a USFWS Special Use Permit were obtained for a shoring project to increase stability around the southern end bent of the temporary bridge over the Pea Island inlet. The project included installing additional sheet pile, riprap, and sandbags around the southern end bent. The temporary riprap shoring on the southeast corner extends beyond the NCDOT easement by approximately 15 feet. This structure will be entirely removed following the construction of a permanent bridge at this location. The project also included dredging approximately 9,000 to 11,000 cubic yards of sand, which was placed around the southern end bent to reestablish the previous high ground shoreline. The dredging took place in a sand spit that had formed on the north side of the inlet and extended beyond the easement by approximately 75 to 100 feet, within the Pea Island inlet channel. NCDOT has also coordinated with USFWS, USACE, NCDENR-DCM, and NCDENR-DWQ and obtained the necessary permits from these agencies.*

- *In the context of placing sand back on the dune in the Canal Zone Hot Spot area, equipment operation may temporarily have minor encroachments beyond the easement; however, the base of the dune is not pushed back farther east into the Refuge. Some sand ends up being placed along and directly outside the existing easement when it is removed from the road and placed back on the dune crest. The constraint of dune height and slope adjacent to the edge of pavement are factors in these actions.*

- *Following Hurricane Sandy in 2012, almost all of the NC 12 repair work is being confined to the existing easement. In areas where dunes were lost or substantially lost in the northern part of the Refuge, dunes are being re-established in the NC 12 easement. NCDOT, however, is working with the Refuge to try and connect dune lines in the easement to existing dune lines just off the easement. NCDOT also established a 1,000- to 1,500-foot-long temporary four-wheel drive detour outside of*

the existing NC 12 easement at the north end of Rodanthe and south end of the Refuge.

As discussed above, these exceptions to working within the existing easement primarily involve responses to major storm events, not routine maintenance, and in each case efforts are made to minimize work outside the easement. Special Use Permits were obtained from the Refuge. In one case, work outside the easement (the gathering of fill material for post-Hurricane Irene repairs as a part of the associated Special Use Permit) was intended to benefit the mission of the Refuge by the creation of shallow ponds for shore bird foraging habitat. In another case, it involved removing sand fencing associated with previous NCDOT practices.

In the 2010 ROD's Appendix A (pages A-3 and A-4), NCDOT made three Project Commitments (16, 17, and 19) related to minimizing impacts to the Refuge until later phases could be built. In Project Commitment 16, NCDOT indicated that in phasing the construction of the project, it is NCDOT's intent to place a high priority on the monitoring and need for implementation of improvements in the three hot spot areas – Rodanthe 'S' Curves, Sandbag Area, and Canal Zone. Final phasing decisions will be developed through interagency collaboration and under the requirements of NEPA as project area conditions warrant. Given the continued NC 12 maintenance and construction activities needed in the Refuge (i.e., outside of the NC 12 easement) to address breaching at the Rodanthe 'S' Curves Hot Spot, NCDOT is proceeding with a long-term solution in that area now, using the promised NEPA/Section 404 Merger Process interagency collaboration. After the completion of Phases I and II, NCDOT will continue to place a high priority on addressing issues at the other two hot spots (Canal Zone and Sandbag Area).

In Project Commitment 17, NCDOT indicated that decisions related to the implementation of future phases and the specific location of future phases would likely need to evolve with actual geomorphological change relative to the NC 12 easement. With this in mind, NCDOT committed to funding and implementing an on-going coastal monitoring program on Hatteras Island within the project study area. The program was initiated in early 2011, and the updated 2011 coastal conditions data is published in the report titled Coastal Monitoring Program, NC 12 Transportation Management Plan, TIP Project B-2500, 2011 Update (Overton, 2013). NCDOT also committed to funding and implementing a periodic Refuge habitat/NC 12 vulnerability forecasting study in consultation with USFWS. This program is based on the outcome of the coastal monitoring program, so it will begin soon since the results of the monitoring program through 2011 have now been published. Further, the decision to move forward promptly with a long-term solution in the Pea Island inlet and Rodanthe breach areas was in response to actual geomorphological change relative to the NC 12 easement and that change has been considered in Phase II decision-making.

<u>Essential Fish Habitat</u>. The National Marine Fisheries Service (NMFS) (a part of the US Department of Commerce) is on the project's Merger Team and Essential Fish Habitat (EFH) consultation is a part of the Phase II environmental studies. Such consultation is needed for any alternative affecting the Atlantic Ocean, Pamlico Sound, and Oregon Inlet. It was done as a part of studies that ended with the release of the 2010 ROD, the temporary bridging of Pea Island inlet, and is being done as a part of Phase IIa.

<u>Maintenance of Bridge in the Surf Zone</u>. NCDOT agrees that, as with all bridges, typical bridge maintenance activities will be necessary for the bridge with the Phase IIa Preferred Alternative, whether or not it is eventually located in the ocean. However, the permanent, on-going maintenance referred to by the commenter would not be necessary for bridge piles in the high-energy surf zone because the Phase IIa Preferred Alternative's bridge will be designed to account for the potential future conditions that the bridge will be exposed to. For example, because of severe scour at the south end of Bonner Bridge, pile maintenance has occurred over its life in the form of installation and repair of pile jackets to protect bridge piles and driving new/longer piles at the south end of the bridge. Based on experience gained in maintaining Bonner Bridge, scour would be taken into consideration in determining pile lengths for the Phase IIa Preferred Alternative's bridge so that scour does not become a pile maintenance issue. For example, the pile tip elevations at the south end of the Phase I Oregon Inlet bridge are designed to be -93 to -100 feet versus the original -26.0 to -49.5 feet (retrofitted to -73.5 to -98.2 feet) for Bonner Bridge. Pile tip elevations are expected to be between approximately -95 and -120 feet with the Phase IIa Preferred Alternative's bridge. The potential for scour for a bridge in the surf zone is addressed in Section 4.6.8.1 of the 2008 FEIS (beginning on page 4-60).

The new Oregon Inlet bridge, as well as any other new coastal bridges, will have protective measures that were not a part of the Bonner Bridge and that will reduce the need for future major maintenance activities. For example, the new Oregon Inlet bridge will use high quality corrosion resistant concrete throughout the entire structure and stainless steel rebar when concrete containing rebar is within the saltwater splash zone, protecting it from corrosion from salt water seeping into the concrete.

Bridge maintenance activities for a bridge in the existing NC 12 easement would primarily involve an inspection of every component of the bridge at two-year intervals (as required by federal law), as well as the following: correction of any potential problems while they are still minor; pressure washing with water in the bridge bearing area where the girders rest on the pile cap; re-sealing the deck every five years to minimize salt intrusion; and sweeping the deck and collecting dirt and debris four times a year. The bridge inspection activities for much of the bridge will be from a platform lowered from the deck. Some inspection activities will be from a boat. Debris from any maintenance activities (minor or major) would be captured and transported off site. This was done during recent Bonner Bridge rehabilitation work.

Dune Building. Of the two Phased Approach alternatives assessed in the 2008 FEIS, only the Phased Approach/Rodanthe Nourishment Alternative (referred to as the Bridge within Existing NC 12 Easement and Beach Nourishment Alternative during Phase II scoping) would involve both nourishment and dune building. This alternative will be addressed in future NEPA documentation for the Rodanthe breach.

Effect on Natural Resources of Bridge Pilings in the Surf. The effect of bridges on migratory birds, other wildlife habitat, and protected species is addressed in the 2008 FEIS in Sections 4.7.6 and 4.7.9. The presence of bridge pilings in the surf or on the beach was addressed during Section 7 formal consultation with USFWS and NMFS (see Section 3.6 of the 2010 EA).

Cost Estimates and Uncertainties of Bridge Pilings in the Ocean. Cost estimates for the Bridge within Existing NC 12 Easement Alternative take into consideration the alternative's ultimate location offshore. The effect of the Phase IIa Preferred Alternative on coastal processes is discussed in Section 4.6.8 of the 2008 FEIS. The potential for bridge piles to affect beach erosion is discussed in Section 4.6.8.4 on page 4-67. This section concludes that focused erosional hot spots could occur that are not in the present system.

Termination of Bridge within Existing NC 12 Easement Alternative in Rodanthe. The question of the termination of the Bridge within Existing NC 12 Easement Alternative in Rodanthe will be addressed in future NEPA documentation for the Rodanthe breach.

Cost and Funding of the Pamlico Sound Bridge Corridor. Finally, the Selected Alternative in the 2010 ROD (PBC/TMP Alternative), which includes the detailed study alternatives in the two Phase II areas currently under study, can be phased and the cost spread out over time. A bridge in the Pamlico Sound Bridge Corridor would need to be built as one project, so its cost could not be spread out over time. Project funding availability was discussed in detail in Appendix G of the Revised 4(f) Evaluation. These findings were updated in an October 24, 2012 report prepared by NCDOT titled Bonner Bridge – NC 12 Transportation Management Plan Phase II—Pamlico Sound Bridge Corridor Cost Analysis. Over the four-year estimated construction period for a bridge in the Pamlico Sound Bridge Corridor, NCDOT would need between $896 million and $1.172 billion. This would require at least 94 percent of the projected NCDOT Division 1 budget for years 2014 to 2020. Therefore, a decision to build the Pamlico Sound Bridge is not reasonable in consideration of the projected bridge costs and the Division 1 projected budget. Based on the results of the updated 2012 cost estimates for the Pamlico Sound Bridge Corridor (see Section 2.6.1 of this EA), the construction of a Pamlico Sound bridge would still present a unique problem of extraordinary magnitude to NCDOT, reaffirming the conclusions in the 2009 Revised Final Section 4(f) Evaluation and the 2010 EA that the Pamlico Sound Bridge Corridor Alternative is neither a feasible and prudent nor practicable alternative. Transportation improvement plan funds are

allocated to complete Phase I and the two Phase II projects. In addition, as discussed in Section 2.5 of this EA, FHWA advised NCDOT that a portion of the cost of Phase II (including Phase IIa and Phase IIb) may be eligible for reimbursement under federal Emergency Relief (ER) funding. The estimated cost of Phase I is $216.0 million for the design-build contractor and an additional $57.4 million for other NCDOT costs, for a total of $273.4 million. The estimated cost of Phase IIa is $98 million and Phase IIb is $123 million (an average of the estimated low and high costs). Thus, the estimated total cost for all three phases is currently $494.4 million.

The updated 2012 cost estimates, including the methodology used to develop these estimates, and funding source analysis for the Pamlico Sound Bridge Corridor are discussed in detail in Section 2.6.1 of this EA. The full updated cost report for the Pamlico Sound Bridge Corridor is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/.

C. Problems with Road or Bridge on New Location West of Existing Easement in the Refuge

8. **Comment:** NCDOT has conceded that the two options to relocate NC 12 west of its existing easement are not viable because they could not obtain the necessary easements and compatibility determinations. Jim Trogdon has admitted that "[o]n Pea Island, any option that stays in the right of way is preferred, and in some cases, required."[5] Several agencies on the Merger Team rejected these options in 2009 due to their substantial wetlands impacts. Moreover, the NCDOT Handout (p. 8) acknowledges that neither relocation option would be likely to be found compatible with the Refuge. These admissions should have prevented NCDOT from presenting such unrealistic options to the public.

   The information provided to the public about these options is also unrealistic because it artificially understates the impacts to wetlands and other lands within the Refuge. The NCDOT Handout states that the wetlands impact for the "Bridge on New Location" option is 0.1 acre and that it is 3.0 acres for the "Road on New Location" option. However, the FEIS reveals that relocating the easement west as proposed by the current options will result in permanent wetlands impacts of 8.5 acres filled for an "All Bridge" option, and between 67.5 and 79.4 acres for a relocated roadway. SDEIS at 4-58, FEIS at 2-73. The workshop handout does not explain this discrepancy. It may stem from the fact that "Phase II" of this option entails temporarily linking the relocated corridor back to existing NC 12 just north of the new Refuge Inlet. However, given that this alignment is admitted to be temporary and will inevitably be replaced by a new corridor that extends through

[5] Kozak, "NCDOT Presents Options for Long-Term Highway 12 Repair to the Public," Island Free Press (Dec. 7, 2011).

the entire length of the Refuge, the true impacts of this option and their implications for the viability of this option must be disclosed to the public. To withhold those impacts until the remainder of the corridor is relocated is another instance of illegal segmentation.

In fact, neither of these options stands any chance of being constructed. Because of their massive impacts on jurisdictional wetlands and other Refuge wildlife habitat described above, these relocation options cannot be approved by FWS or the Army Corps. First, in order to be constructed, NCDOT would have to obtain a new easement for each of these options. FWS could not grant such an easement, however, because these options are manifestly incompatible with the mission and purpose of the Refuge. The huge footprint of a new road or bridge through the length of the Refuge, including cutting through vital waterfowl impoundments, would clearly degrade the ecological integrity of the Refuge as a wildlife habitat and therefore must be found to be an incompatible use.

In addition, there is no viable compensatory wetlands mitigation within the Refuge to offset these impacts. Even if FWS were willing to accept NCDOT's abandonment of its existing easement as partial mitigation – which is unlikely, especially since on information and belief NCDOT plans to undertake no pavement removal or restoration work in the Refuge – the new route would use more acres of the Refuge than the existing easement and thus would require additional mitigation that simply does not exist. *See* EA at 2-24. Mitigation would also be required for the degraded state of the abandoned easement. DOI has reminded NCDOT that "mitigation cannot be used to make an otherwise incompatible proposed use compatible with the mission and purpose directives." FEIS 8-70.

For similar reasons, the Army Corps could not issue a § 404 permit for the massive amount of wetlands fill that these options would necessitate. The existence of other proposed options that would be less harmful to jurisdictional wetlands, in addition to the even less intrusive long Pamlico Sound Bridge or ferry options, preclude the issuance of a § 404 permit for these options.

> ***Response:*** *The Road or Bridge on New Location alternatives were assessed in the 2008 FEIS. Many of the issues raised by this organization were recognized and discussed, although NCDOT does not agree with the commenter's assertion that this alternative is not viable or that there is a discrepancy in the impact numbers presented. These alternatives were not selected as the Phase IIa Preferred Alternative by the Merger Team. The reasons they were not selected for detailed study or as the Phase IIa Preferred Alternative reflect many of the concerns about these alternatives raised by this organization. It was important to give the public the opportunity to discuss again the merits and issues associated with these alternatives when initiating the Phase II study process because they were assessed in the 2008 FEIS as a long-term option in the Parallel*

Bridge Corridor. It also is a logical starting point. The issues associated with these alternatives were provided to and discussed with the public.

For several of the comments above, the following additional clarifications are offered:

- *Regarding the impact numbers, the handout provided to the public focused on the impacts associated with Phase II because that was the focus of the meetings. The PBC/TMP Alternative is assessed for its full length in the 2008 FEIS and the 2010 EA. Both of these documents and the 2005 and 2007 Supplemental Draft Environmental Impact Statements were presented to the public during their respective public reviews and hearings.*

- *NCDOT would remove the pavement and restore the old easement as a part of mitigation for this alternative and any other alternative in which the existing NC 12 easement is no longer needed.*

D. <u>Problems with Bridge in Pamlico Sound Near Rodanthe</u>

9. **Comment:** The proposed bridge from Rodanthe through the Pamlico Sound was originally proposed as part of the "Road North/Bridge South" and "All Bridge" alternatives. Because it now could also be combined with one of the other proposed options, we discuss it separately from the relocation options covered in the previous section.

   No matter which other option the proposed bridge would be linked to, a Rodanthe area bridge would require a new easement through two acres of estuarine emergent wetland areas in the Refuge in order to rejoin the existing NC 12 corridor; such a new easement would likely be denied as incompatible for the reasons given above. Here too, on-site compensatory mitigation would be impossible because there are no equivalent wetlands NCDOT could restore. For all these reasons, the NCDOT Handout concedes that this option is "[n]ot likely to be found compatible with the Refuge's mission and purpose" and thus it could not be constructed. (Handout at 10).

   In addition, the proposed bridge would travel through areas of known submerged aquatic vegetation (SAV), which are also classed as EFH because they provide refuge from predators and foraging areas for juvenile and adult fish. As discussed above, the Magnuson-Stevens Act requires consultation with the Secretary of Commerce before any action is taken that might adversely affect EFH. In this case, the proposed bridge would fill approximately 1.4 acres of SAV (see FEIS at 4-88) and shade 5.3 acres of SAV (Handout at 10).

   The bridge would also require a § 404 permit from the Army Corps of Engineers for discharge and fill in jurisdictional waters. Such discharges are not permitted if a

practicable alternative exists that would have a lesser adverse impact on the aquatic ecosystem. 40 C.F.R. § 230.10(a)(2). As discussed earlier, the in-corridor Rodanthe bridge, as well as a long Pamlico Sound Bridge or a ferry system, would offer practicable alternatives with lesser adverse impact.

The Rodanthe terminus of this bridge would apparently be in the same location as the Rodanthe Bridge Within Existing NC 12 Easement. As discussed above, NCDOT has acknowledged potential problems with the terminus of the latter option being located seaward of the projected 2060 shoreline. The same problem is likely to affect the Bridge on New Location option, raising its costs and increasing its environmental impact as a result.

Lastly, the proposed bridge would be quite expensive to construct due to the shallow water in the proposed bridge corridor. The water depth is less than six feet for virtually all of the bridge length. NCDOT is prohibited from dredging in SAV areas in order to use barges to construct the bridge, so instead a temporary work bridge would have to be constructed and the proposed bridge built off of that. (FEIS 4-90, 4-177). This is a much more expensive construction method than conventional barge-based bridge construction and likely means the estimates provided in the handout are artificially low.

Response: *This comment will be addressed in future NEPA documentation for the Rodanthe breach.*

E. <u>Seven-Mile Bridge in Pamlico Sound Bypassing Rodanthe Breach and Refuge Inlet</u>

10. **Comment:** Although it was not included in NCDOT Handout or other materials distributed at the public meetings, we understand that NCDOT is also considering a seven-or-more-mile long bridge to bypass the southern half or even two thirds of the Refuge in the Pamlico Sound as yet another alternative for Phase II. We have marked our understanding of the general path of such a bridge in magenta on the attached map. [The map is included in Appendix B of this re-evaluation with the original comment letter.]

Because this alternative has not been explained by NCDOT nor evaluated during the NEPA process, it is difficult to comment thoroughly on it. Generally, it represents a step in the right direction insofar as it would remove the transportation corridor from the most unstable portion of Hatteras Island and would eliminate the need for the much of the nourishment, construction, maintenance, and other activities that would constitute use of the Refuge under the Refuge Act. Once the details of this alternative are revealed, however, there may well be problems to be addressed, such as the use of the Refuge land where the northern end of the bridge makes landfall on the Refuge, the maintenance of the remaining miles of NC 12 (especially in the future

inlet locations identified by government scientists), impacts on submerged aquatic vegetation on the sound side of the Refuge, harm to EFH, and impacts to wetlands, among other things.

The consideration of this medium-length bridge alternative again raises the issue of cost: if NCDOT has the funding necessary to build both the 2.5-to 3.2-mile Phase I bridge over Oregon Inlet as well as a seven-or-more mile bridge to bypass both the Rodanthe Breach and the Refuge Inlet, why should that money not be spent to build the less environmentally damaging Pamlico Sound Bridge alternative? Such a bridge would bypass the entire Refuge, eliminate impacts to the Refuge, eliminate the need for the Later Phases of the current Selected Alternative, and result in a safe and reliable route predicted to last 100 years.

Response: *The "Seven-Mile Bridge Alternative" was suggested by a representative of the Refuge as a possibility during the October 2011 Peer Exchange meeting and the December 15, 2011 Merger Team meeting (see Section 6.2.3 of this EA). This alternative is described in Section 2.3.4 of this EA. The suggested alignment for this alternative would involve NC 12 leaving the Refuge at the southern end of the ponds, just north of the Pea Island inlet. The bridge would extend west outside of the Refuge and Seashore western boundary and continue south to Rodanthe for a distance of about 7 miles, before ending in Rodanthe at the same location as the Rodanthe – Bridge on New Location Alternative. In coordination with Refuge representatives, NCDOT developed a conceptual alignment for this alternative and assessed its merits. However, as discussed in detail in Section 2.3.4 of this EA, USFWS, FHWA, and NCDOT agreed that the Seven-Mile Bridge Alternative should be dropped from further consideration. Section 6.3.5 of this EA summarizes a February 9, 2012 meeting between FHWA, NCDOT, USACE, and USFWS to discuss the Seven-Mile Bridge Alternative. As summarized in Section 2.3.4, the reasons that it was mutually agreed between these agencies to not pursue this alternative included:*

- *Based upon NCDOT's current financial commitments, projected revenue availability, and the construction cost estimates for the Seven-Mile Bridge Alternative (ranging between $289 million [low cost] and $440 million [high cost]), the alternative is not affordable. While the combined costs of the Phase II detailed study alternatives at the Pea Island and Rodanthe sites also are high and impact NCDOT's funding ability for projects statewide, construction of the detailed study alternatives at these sites can be staggered based on funding availability.*

- *NCDOT's conceptual alignment for the Seven-Mile Bridge Alternative would cross the southern dike that borders the Refuge's southern-most pond. This would constitute an impact to a contributing element of the Refuge's historic landscape (because of the dike's association with the Civilian Conservation Corps), which would*

likely be prohibited under Section 4(f) of the Department of Transportation Act of 1966.

- *The Seven-Mile Bridge Alternative would result in potential SAV and EFH impacts in Pamlico Sound. These impacts also would occur with the Rodanthe – Bridge on New Location Alternative, but the area of potential impact would be greater with the Seven-Mile Bridge Alternative because of its longer distance through the Sound.*

III. <u>NCDOT Must Reconsider Off-Island Options</u>

11. **Comment:** As discussed above, the ostensible justification for rejecting a long Pamlico Sound Bridge – its cost – has been disproven. At Governor Perdue's request, NCDOT has accelerated its timetable to try to provide a long-term solution to the breaches caused by Hurricane Irene. As a result, NCDOT now proposes to construct Phase I and Phase II of the Bonner Bridge replacement at once, with three major components, incurring costs that will surely be comparable to the likely contract price of the Pamlico Sound Bridge. Accordingly, that option must now be reconsidered by the Merger Team as the least environmentally damaging alternative, or "LEDPA," and as a feasible and prudent avoidance alternative under § 4(f), because it would cause significantly less environmental harm and would provide a much more stable long-term solution to the current transportation crisis on Hatteras Island.

    In addition, however, it is time for NCDOT and the rest of the Merger Team to give serious consideration to a system of modern, high-speed ferries that would link the Hatteras communities to Bodie Island and the mainland. Ferry technology has come a long way since the ferry option was studied in 1991 and dismissed in the 1993 DEIS. For example, quadrimaran ferries already in use elsewhere appear to offer the combination of high speed, extremely shallow draft, and low wake that could meet the needs of transportation across Pamlico Sound. See, e.g., William A. Hockberger, "Quadrimaran Ferries: High Speed with Shallow Draft," 2033 Transportation Research Record: Journal of the Transportation Research Board at 1-7 (2007).

    Privatizing a ferry system for Hatteras Island would introduce competition and multiple route options while allowing the private sector to bear the costs of expensive new ferry technologies. Spreading the transportation burden among multiple routes (and possibly among multiple carriers) would help address the objection that a ferry system could not match the carrying capacity of the Bonner Bridge, since each route would only need to carry a fraction of the total demand by taking passengers directly to their final destination in Rodanthe, Cape Hatteras, Bodie Island, etc.

    Finally, ferry terminals located in currently isolated mainland towns like Stumpy Point could have a tremendous positive economic impact on these communities.

Ferries would create permanent jobs on the Outer Banks and the mainland while also supporting the creation of other local businesses to serve ferry passengers.

NCDOT's previous response to comments regarding ferries has indicated a resistance to meaningfully considering this option. For example, in its response to comments on the 2010 EA, NCDOT stated that other island communities served exclusively by ferries are "not in any way equivalent" in part because they have been "accessed by boat, ferry or plane for their entire modern histories." (ROD at C-53.) This is not a meaningful reason to refuse to study modern ferry options for Hatteras Island. NCDOT also argued that these other communities have lower permanent and seasonal populations than Hatteras Island, but again, dividing the transportation load currently carried by the Bonner Bridge among multiple ferry routes to key locations on Hatteras Island would alleviate any capacity issues.

One point made in our comments on the EA bears repeating in light of Hurricane Irene: ferry systems provide a much more reliable and resilient transportation option after a major storm. While the Hatteras communities were cut off for over six weeks after Hurricane Irene breached NC 12, ferry service to Ocracoke Island was up and running within days. Hatteras residents and businesses suffered a major economic loss as a result of NCDOT's dependence on the vulnerable stretch of NC 12 through the Refuge. In contrast, an updated ferry system would provide a much quicker recovery from hurricanes during tourist season.

In short, rather than finding reasons to reject ferries out of hand, NCDOT should study this option seriously, investigating other public and private ferry systems in the United States and internationally to determine whether such an option is practicable. NCDOT claimed in its response to comments on the EA that the FEIS provided an adequate discussion of the ferry option, but that discussion, like discussions in previous NEPA documents, appears merely to summarize and repeat assumptions made in a 1991 feasibility study. Given the lack of viable options among those it is currently proposing for Phase II, NCDOT can no longer afford to dismiss this alternative using out-of-date assumptions, data, and reasoning.

Response: *The updated 2012 cost estimates, including the methodology used to develop these estimates, and funding source analysis for the Pamlico Sound Bridge Corridor are discussed in detail in Section 2.6.1 of this EA. The full updated cost report for the Pamlico Sound Bridge Corridor is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects/bonnerbridgephase2/. The effects of the updated cost estimates on the reasonableness and practicability of a bridge in the Pamlico Sound Bridge Corridor also are discussed in Section 2.6.1 of this EA. For fundability reasons, the Pamlico Sound Bridge Corridor remains neither practicable nor feasible and prudent. In addition, contrary to the commenter's assertion, justification for rejecting a bridge in*

the Pamlico Sound Bridge Corridor – its cost – has not been disproven. Cost estimates (2012) and financing information for Phase IIa are provided in Section 2.5 of this EA.

Based on USEPA's and this organization's additional comments and requests regarding the Ferry Alternative (see Sections 2.3.2 and 6.2.2 of this EA), new 2012 cost estimates for this alternative were generated by NCDOT's Ferry Division, and additional research was conducted by FHWA on the potential use of quadrimaran ferries (high-speed ferries). Section 2.3.2 of this EA discusses the new cost estimates and research related to the Ferry Alternative, as well as the reasons why it was subsequently re-affirmed that the Ferry Alternative is not a reasonable alternative. The full report documenting reconsideration of the Ferry Alternative is available on the compact disc (CD) that accompanies this EA, at the public review locations listed in Section 6.7, and on the NCDOT web site at http://www.ncdot.gov/projects /bonnerbridgephase2/.

Conclusion

12. **Comment:** The Merger Team must revisit the entire Bonner Bridge replacement project. The Selected Alternative has proven inadequate because NCDOT has not developed any viable options for NC 12 and has instead been forced to rely upon old options already rejected by the Merger Team. Storm damage and erosion will only continue to reveal the shortcomings of this piecemeal approach. These realities have forced NCDOT to find funding to pursue three simultaneous components of its proposed transportation corridor, but the cumulative costs of these components are without question comparable to other alternatives, including the likely contract price of a long Pamlico Sound Bridge.

    A safe and secure Pamlico Sound Bridge, predicted to last 100 years, and/or an updated ferry system, are surely a better use of the money than a series of precarious bridges and roads predicted to last only 50 years and to be beset by erosion and storm damage throughout their useful life. Thus, the Merger Team must reconsider off-island alternatives -including a Pamlico Sound Bridge and ferries – in light of the immense challenges and true costs of maintaining a long-term NC 12 corridor through the Refuge. These options are practicable, feasible, and prudent alternatives that will be far more stable and less environmentally damaging than the options presented to the public in the current Phase II process.

    Response: *This organization's comments above are answered in responses to its comments 3, 4, 6, and 11.*

Appendix D

2060 High-Erosion Shoreline

Aerial date: April 13, 2012

COMPARISON OF FEIS AND UPDATED FORECAST 2060 HIGH-EROSION SHORELINE LOCATIONS

Figure D-1a

Aerial date: April 13, 2012

COMPARISON OF FEIS AND UPDATED FORECAST 2060 HIGH-EROSION SHORELINE LOCATIONS

Figure D-1b

Aerial date: April 13, 2012

COMPARISON OF FEIS AND UPDATED FORECAST 2060 HIGH-EROSION SHORELINE LOCATIONS

Figure D-1c

Aerial date: April 13, 2012

COMPARISON OF FEIS AND UPDATED FORECAST 2060 HIGH-EROSION SHORELINE LOCATIONS

Figure D-1d

Aerial date: April 13, 2012

COMPARISON OF FEIS AND UPDATED FORECAST 2060 HIGH-EROSION SHORELINE LOCATIONS

Figure D-1e

Aerial date: April 13, 2012

COMPARISON OF FEIS AND UPDATED FORECAST 2060 HIGH-EROSION SHORELINE LOCATIONS

Figure D-1f

Aerial date: April 13, 2012

COMPARISON OF FEIS AND UPDATED FORECAST 2060 HIGH-EROSION SHORELINE LOCATIONS

Figure D-1g