US 64 Improvements Project

From 0.9 mile east of Columbia to US 264
near Manns Harbor
Tyrrell and Dare Counties, North Carolina

State Project No. 6.049002T
TIP No. R-2544 & R-2545

Draft Environmental Impact Statement

Department of the Army, US Army Corps of Engineers (Lead Federal Agency)
North Carolina Department of Transportation (Joint Lead Agency)

Submitted Pursuant to the North Carolina Environmental Policy Act (NCGS 113A-1)
and the National Environmental Policy Act (NEPA)(42 USC 4321 et seq.)

APPROVED:

1/11/12 _____
Date Colonel Steven Baker, PE, District Commander
US Army Corp of Engineers Wilmington District

12/14/11 _____
Date: For Gregory J. Thorpe, Ph.D, Director, Project Development and Environmental Analysis
Branch North Carolina Department of Transportation

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The proposed project is the widening of a 27.3-mile section of US 64 in Tyrrell and Dare counties from 0.9 mile east of Columbia to US 264 near Manns Harbor. The project proposes to widen this section of two-lane road to a four-lane highway and replace the Lindsay C. Warren Bridge across the Alligator River with a new bridge. Fifteen study corridors and three bridge alternatives are evaluated, as well as the No-Build Alternative.. Every alternative includes a four-lane, median divided highway. This DEIS documents the project purpose and need, examines the alternatives, describes the studies that led to the selection of the Detailed Study Alternatives, and describes each alternative's design features. The characteristics of the existing environment are described. The direct, secondary, and cumulative impacts of the proposed project are assessed, including community, visual, cultural resource, natural resource, and environmental quality considerations.

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Documentation prepared by:
Parsons Brinckerhoff, Inc.

in association with:
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PBS&J, Inc.
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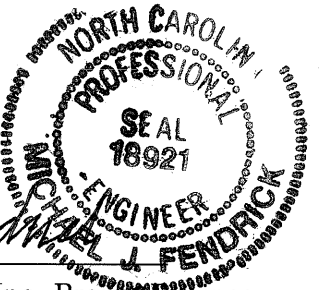

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Summary

S.1 Contacts

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S.2 Type of Action

This State Draft Environmental Impact Statement (DEIS) has been prepared for the North Carolina Department of Transportation (NCDOT) in accordance with the requirements of the North Carolina State Environmental Policy Act (SEPA G.S. 113A, Article 1), for the purpose of evaluating the potential impacts of a proposed transportation improvement project. This is an informational document intended for use by both decision-makers and the public. As such, it represents a disclosure of relevant environmental information concerning the proposed action.

This document conforms to the Council on Environmental Quality (CEQ) guidelines that provide direction regarding implementation of the procedural provisions of SEPA/ National Environmental Policy Act (NEPA). The United States Army Corps of Engineers is serving in the role of Lead Federal Agency on this project.

S.3 Brief Description of the Project

The action proposed in this state-funded Draft Environmental Impact Statement (DEIS) is located in northeastern North Carolina along a rural 27.3-mile corridor of US 64 from east of Columbia in Tyrrell County to US 264 in Dare County (Chapter 1, Figure 1-1 and Figure 1-2). The project is located as shown on Figure S-1. The NCDOT proposes to widen the existing road from a two-lane highway to a four-lane expressway and build a new four-lane bridge over the Alligator River. The posted speed limit along the improved roadway and new bridge will remain at the current 55 miles per hour (mph). In the draft NCDOT 2012-2018 State Transportation Improvement Program, the bridge portion of the proposed project, including reconnections to existing US 64, is currently funded for right-of-way in FY 2012 and for construction in FY 2014. Other portions are funded only for right-of-way in FY 2012 and FY 2016. Mitigation in Dare County, from east of the Alligator River to US 264, is funded in FY 2014. Construction of all other sections of the new roadway is currently unfunded.

The Project Study Area (PSA), shown on Figure S-2 begins east of the Town of Columbia, continues across the northern part of Tyrrell County, across the Alligator

River, and into the Dare County mainland. The PSA is divided into five major study sections. Sections 1 and 2 are in Tyrrell County, Section 3 is the actual bridge over the Alligator River (including bridge extensions over wetlands), and Sections 4 and 5 are in Dare County.

The Atlantic Intracoastal Waterway (AIWW) bisects the PSA along the Alligator River. Development along the project corridor includes the town of Columbia, just west of the project and outside the PSA. Within the PSA, development consists primarily of a neighborhood just east of Columbia, a small community at the eastern intersection of US 64 and Old US 64 in Tyrrell County, a marina/convenience store complex on the Alligator River, and the community of East Lake in Dare County. Wetlands and canals are present on both sides of US 64 for most of the project length. The ground is generally wet and low-lying. Roadside utilities consist mainly of underground fiber optic lines, cell towers, and aerial power. The project corridor is characterized by protected and managed natural resources, as shown on Figure S-3. Three known structures of historical or architectural importance lie within the PSA: the Lindsay C. Warren Bridge across the Alligator River, East Lake Methodist Church and cemetery, and East Lake Fire Tower.

S.4 Purpose of Proposed Project

The primary purposes of the proposed action are:

- Consistency with North Carolina's Strategic Highway Corridor Plan (which seeks long-term interconnectivity of consistent transportation corridors in North Carolina) and the Intrastate Highway System (Chapter 1, Figure 1-2).
- Reducing the US 64 hurricane evacuation times to better meet state clearance goals in the project study area.
- Maintaining a bridge across the Alligator River that meets the needs of highway users.

The secondary benefits of the proposed action are:

- Potential for reduction in total crash rates from the conversion of a two-lane rural roadway to a four-lane divided section.
- A new Alligator River bridge will provide the opportunity for safety improvements related to the absence of a swing-span and signalized approaches, as well as improved shoulders, wider lanes, and bicycle-safe rails.
- Potential for improved regional bicycle trail connectivity and pathways from the Town of Columbia to the Outer Banks.

US 64 Improvements Project
Environmental Impact Statement

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

County:	TYRRELL / DARE COUNTIES
NCDOT Div:	1
TIP Nos.:	R2544 & R2545
WBS:	35487

Vicinity Map
US 64 Improvements - Tyrrell/Dare Counties

Figure S-1

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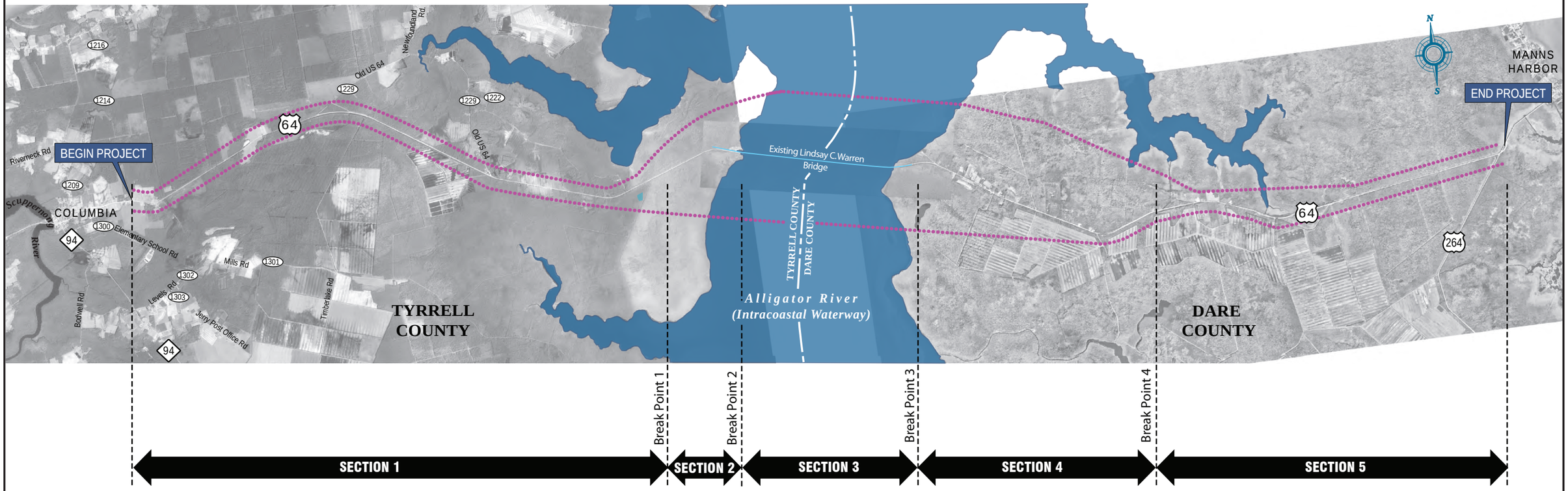

Legend

Project Study Area

0 5,000 10,000

US 64 Improvements Project
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Project Study Area

Figure S-2

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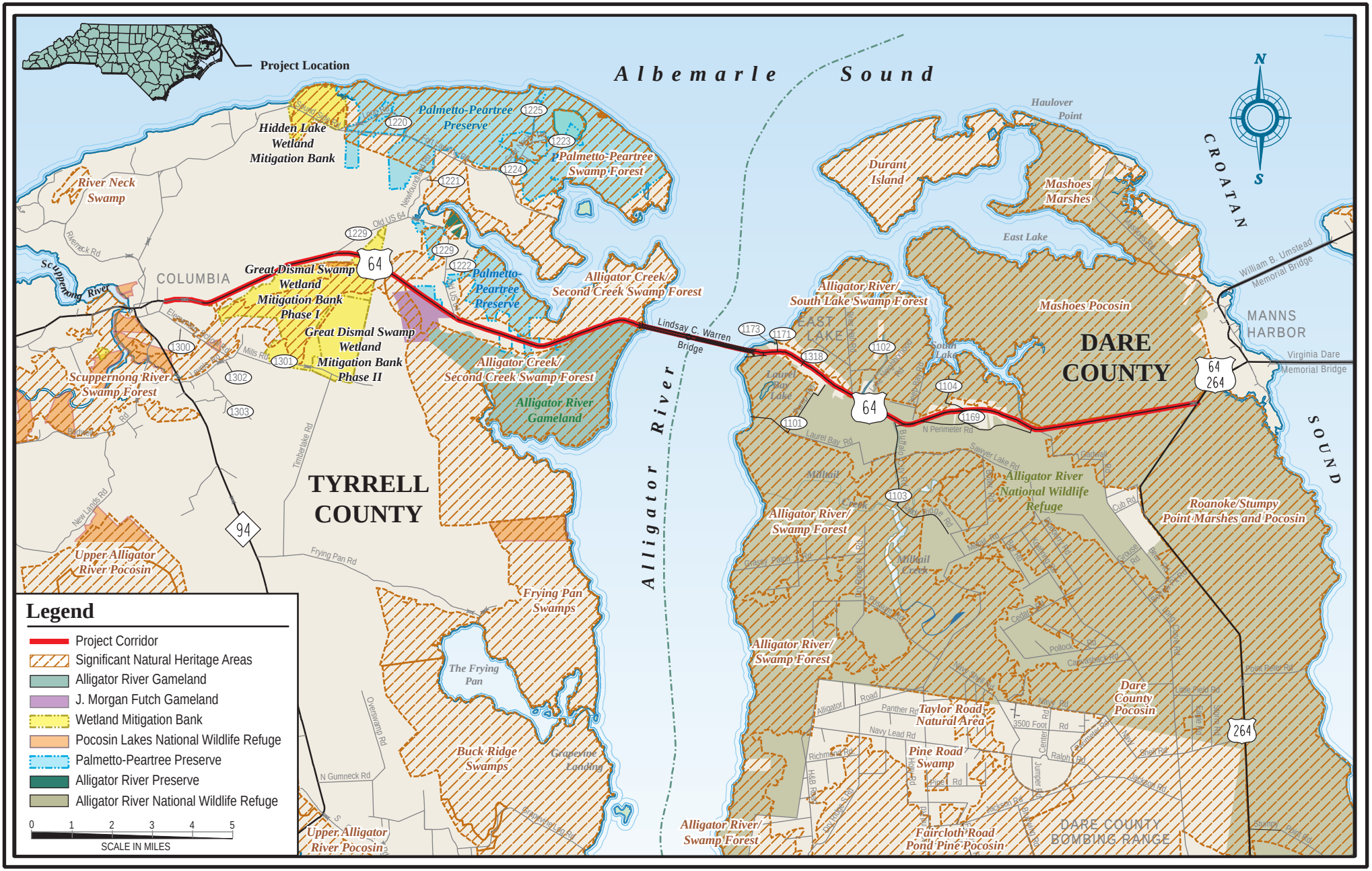

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Project Location Map

Figure S-3

S.5 Project Characteristics

S.5.1 Roadway Characteristics

Every project alternative involves a four-lane, median-divided highway. Within Tyrrell County, designs for both a 23-foot-wide raised median and 46-foot-wide depressed median are under evaluation. Within Dare County, only a 23-foot-wide median is under evaluation. Typical cross-sections of the widened or new roadway and replacement bridge are shown in Chapter 2, on Figure 2-2, Figure 2-3, and Figure 2-5.

The proposed general roadway characteristics include:

- Design speed of 60 miles per hour (posted speed of 55 miles per hour);
- Maintenance of partial control of access (one driveway connection per parcel);
- Modified access from driveways and side streets: configured to right-turn-in/right-turn-out design, with periodic breaks in the median (with bulb-outs) to accommodate U-turns;
- U-turn bulb-outs will have full control of access;
- All existing intersections with US 64 remain at grade; and
- Highway cross-sections consist of:
  - 12-foot lane width and 10-foot outside shoulder width (6 feet paved) and 6-foot inside shoulders (2 feet paved).
  - 46-foot depressed median or 23-foot raised median (Tyrrell County).
  - 23-foot raised median (Dare County).

S.5.2 Characteristics of Proposed New Bridge

The replacement bridge across the Alligator River is a four-lane highway with two 12-foot-wide travel lanes in each direction, separated by a 2-foot-wide concrete Jersey-shaped median barrier. The design accommodates 10-foot-wide outside shoulders and 4-foot-wide inside shoulders. The overall structure is a single 78-foot-wide bridge, excluding the width of the bridge rails. The 10-foot-wide outside shoulders provide accommodation for cyclists and pedestrians, but no separated sidewalks are proposed. For the safety of cyclists and pedestrians, the NCDOT-standard 2-bar metal railing on top of a concrete parapet will be used for the railing/barrier system. Other dimensions and design features will be determined during final design. Based on preliminary design, the replacement bridge is a low-level structure when adjacent to the river banks and for most of the bridge length. As the bridge nears the main channel of the AIWW, its elevation gradually rises to create a high-level crossing that provides 65 feet of vertical navigational clearance over the channel. The horizontal navigational clearance at the center navigation span is currently planned to be 180 feet wide; however, these navigational clearances are preliminary, based on navigation clearances provided at

nearby existing bridges. Ultimately, the United States Coast Guard (USCG) will need to approve these clearances.

S.5.3 Detailed Study Alternatives

As discussed in Chapter 2, the Detailed Study Alternatives include widening sections of US 64 in Dare and Tyrrell counties, a replacement bridge over the Alligator River and the resulting highway approaches (on new location) to the replacement bridge location. The No-Build Alternative also is evaluated.

As shown on Figure S-2, the 27.3-mile project corridor is not considered as one alternative, but is separated into five distinct sections, each comprised of one or more subsections, which can be variously combined to provide the Preferred Alternative. As a result, many permutations are possible, with the final result of improving the entire 27.3 miles of US 64 with the least impacts to the built and natural environment. Details of the five project sections and associated subsections are shown on Figure S-4 (Tyrrell County) and Figure S-5 (Dare County) and are described below:

- In Section 1, the project widens existing US 64 from two lanes to four lanes, either to the north side or south side (or some combination of north-side widening and south-side widening), with a 23-foot-wide or 46-foot-wide median.
- In Section 2, the project widens US 64 to the north and then builds a four-lane road (with a 23-foot-wide or 46-foot-wide median) on new location north of existing US 64 and the marina complex that will join with the western end of a replacement bridge.
- Section 3 is the entire distance of a new four-lane bridge over the Alligator River, which includes distance over water and any bridge extensions over wetlands on either shoreline.
- In Section 4, the project builds a four-lane highway with a 23-foot median on new location – to reconnect the eastern end of one three remaining bridge corridors back to existing US 64.
- Section 5 completes the project length, widening US 64 to four lanes, either to the north or south side, with a 23-foot-wide median. This section stretches from just east of the East Lake community to the project terminus, which lies just east of the US 264 intersection.

Note: As detailed in Chapter 2 and shown on Figure 2-18, this document later "combines" Sections 2, 3, and 4 into a series of East Lake Alternatives that present all possible corridor/alignment combinations in these sections. In Chapter 4, for each East Lake combination of alternatives, the team lists the impacts of each corridor that is a component of the successive combination, and then adds all corridor impacts to arrive at a start-to-end impact summation. Thus, impact tables will sum the impacts of each possible alternative combination, from the beginning of Section 2 (Tyrrell County bridge approach) to the end of Section 4 (multiple Dare County bridge approaches and

alternatives passing through or around the East Lake community) as ONE comparative distance.

Existing intersections will be modified to right-turn-in/right-turn-out configurations. Direct left turns will generally not be possible. In most locations, motorists wishing to turn left from US 64 onto a road or driveway will continue to the nearest break in the median (with bulb-out), make a U-turn, then continue to their desired turn location. Motorists wishing to turn left onto US 64 from a driveway or side road will instead turn right, travel to the nearest break in the median (with bulb-out to accommodate larger trucks), make a U-turn, and then continue in the desired direction. In some locations, proposed designs allow protected left-turns from US 64 to side roads. Median breaks with bulb-outs will be located approximately 800 feet to either side of intersections with state maintained roads (SR), and about 1 mile apart at other locations.

Connectivity along existing canals will be maintained. Some alternatives require adjacent canals to be relocated parallel to their existing axis.

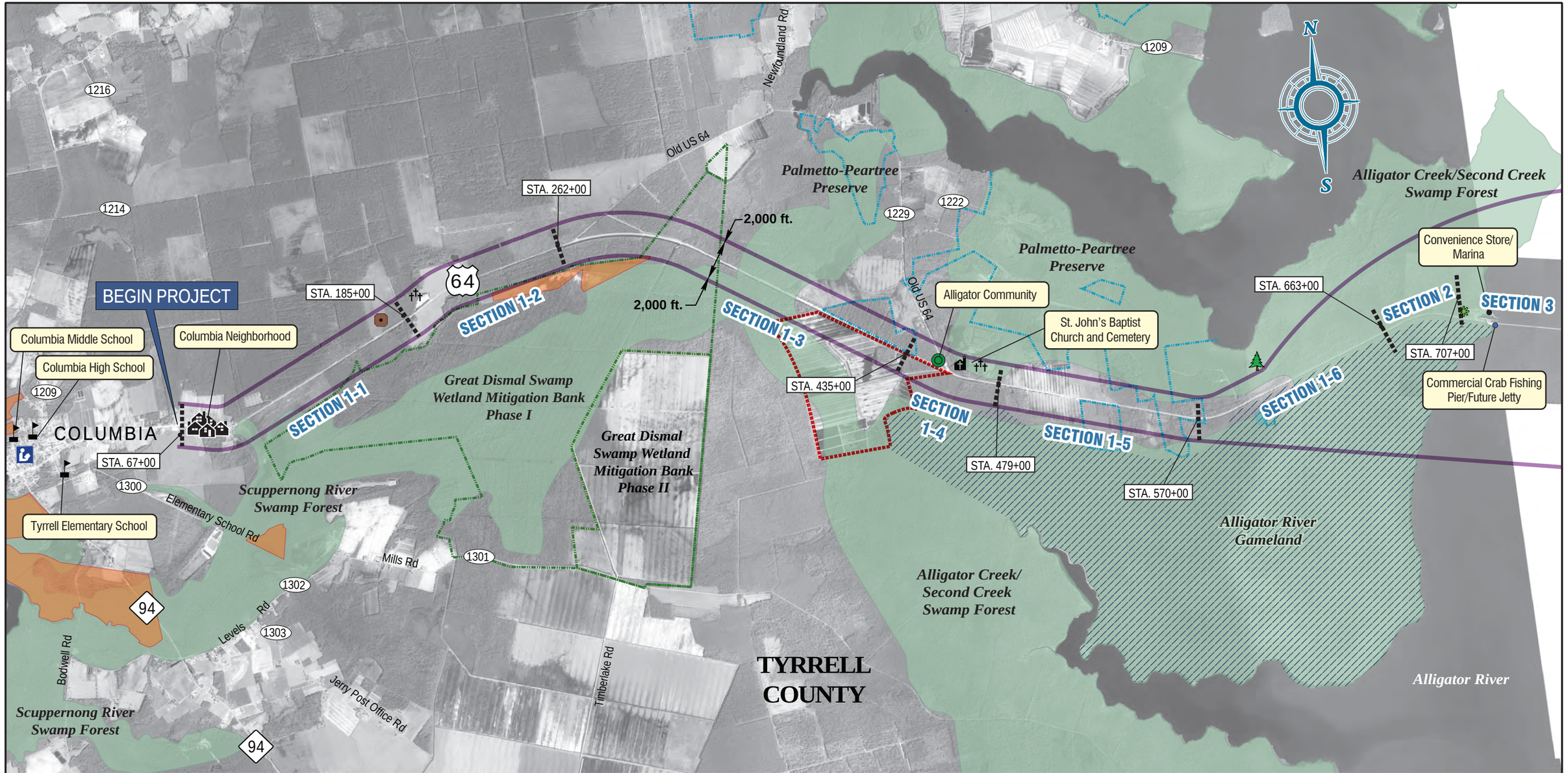
For the purpose of identifying the location of specific features, text and graphics may refer to "station" numbers, which are used to indicate roadway length in hundreds of feet. For example, 100 feet is 1+00 stations, and 285 feet is 2+85 stations. For example, the distance between Stations 640+00 and 645+53 is 5+53 stations, or 553 feet. Project "stationing" begins at Station 67+00 just east of Columbia, progresses eastward toward US 264, and ends at Station 1486+77.

This DEIS presents a summary of the Preliminary Alternatives studied, discusses why certain alternatives were eliminated, and then presents discussion for the remaining Detailed Study Alternatives. Descriptions of the Detailed Study Alternatives are presented in Chapter 2, Section 2.4.

Section 1, Tyrrell County (Alternatives 1A and 1B)

In Section 1, the project proposes to widen existing US 64 from two to four lanes, - either to the north or south-side. A single 1,000-foot corridor is established, which accommodates all widening alternatives. Section 1 is divided into six subsections (1-1 through 1-6), shown on Figure S-4. The begin/end points for the subsections are interchangeable such that the final highway could cross from a south-side widening to a north-side widening, and then back again. However, to accommodate good highway alignment and simplify construction phasing, NCDOT will seek to minimize such crossovers to the extent practicable.

Alternative 1A represents a south-side widening and is termed "Tyrrell South-Side Widening." Conversely, Alternative 1B is a north-side widening and is thus termed "Tyrrell North-Side Widening. Both alternatives evaluate widening for two different cross sections: either a 23-foot-wide raised median or 46-foot-wide depressed median. These alternatives begin at Station 67+00 where the five-lane curb-and-gutter section of



Legend

- Project Study Area

MANAGED RESOURCES

- Natural Heritage Swamp Forests
- J. Morgan Futch Gameland
- Great Dismal Swamp Wetland Mitigation Bank
- Pocosin Lakes National Wildlife Refuge
- Palmetto-Peartree Preserve
- Alligator River National Wildlife Refuge
- Mashoes Pocosin
- Roanoke/Stumpy Point Marshes and Pocosin

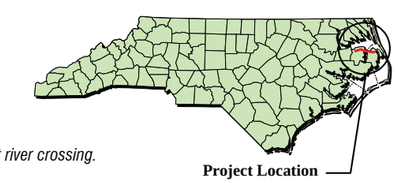
COMMUNITY FACILITIES

- Cell Tower
- Radio Tower
- Dare County Landfill (Closed)
- Borrow Pit (Private)
- Wildlife Resources Commission Public Boat Ramp
- Crab/Fishing Pier/Future Jetty
- Creef Cut Wildlife Trail/Charles Kuralt Trail
- Twiddy Cover Tree Farm
- Cemetery
- Church
- Public School
- Tyrrell County Public Library
- Affected Alligator Community

0 5,000 10,000 ft
SCALE IN FEET

NOTES

Entire corridor is located in floodplain.
Corridor width along US 64 - 1,000 ft. north and south of existing centerline, or as shown at river crossing.
Natural and built features and corridor location are portrayed for information purposes only.



US 64 Improvements Project
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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Tyrrell County
Built Environment and Managed Resources

Figure S-4

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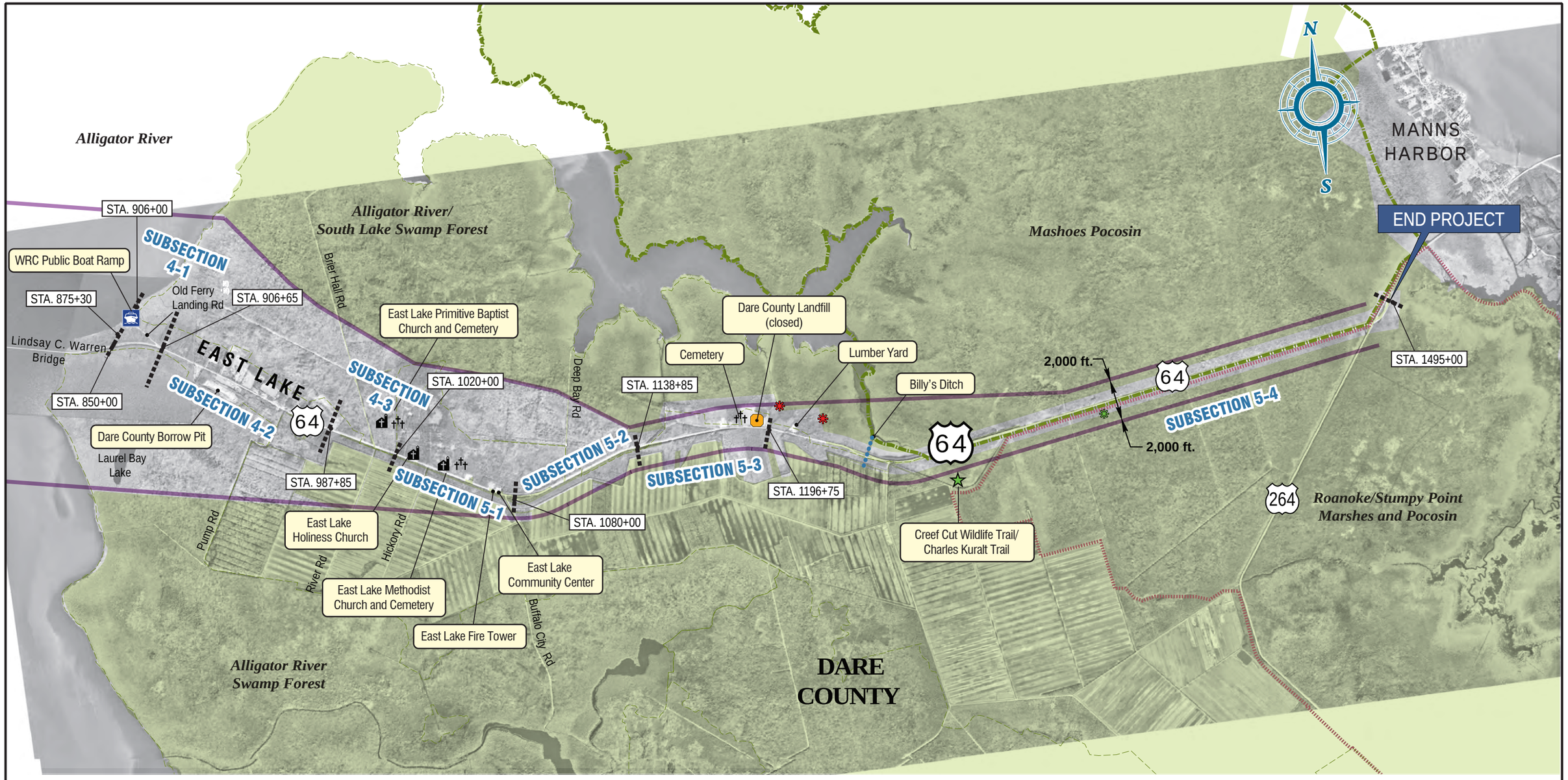

Legend

- Project Study Area

MANAGED RESOURCES

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- Palmetto-Peartree Preserve
- Alligator River National Wildlife Refuge
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- Radio Tower
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- Borrow Pit (Private)
- Wildlife Resources Commission Public Boat Ramp
- Crab/Fishing Pier/Future Jetty
- Creef Cut Wildlife Trail/Charles Kuralt Trail
- Twiddy Cover Tree Farm
- Cemetery
- Church
- Public School
- Tyrrell County Public Library
- Affected Alligator Community

0 5,000 10,000 ft
SCALE IN FEET

NOTES

Entire corridor is located in floodplain.
Corridor width along US 64 - 1,000 ft. north and south of existing centerline, or as shown at river crossing.
Natural and built features and corridor location are portrayed for information purposes only.

Project Location

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Dare County
Built Environment and Managed Resources

Figure S-5

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US 64 ends, which is approximately 0.9 mile east of the town of Columbia. Section 1 then extends eastward along US 64 for a distance of approximately 11.3 miles. Proposed right-of-way varies from 200 to 250 feet wide, depending on topography and the design cross-section (23-foot-wide median or 46-foot-wide median).

Section 5, Dare County (Alternatives 5A and 5B)

Section 5 crosses lengthy, undeveloped portions of the Alligator River National Wildlife Refuge (ARNWR). Within one 1,000-foot wide study corridor, South-Side Widening (Alternative 5A) and North-Side Widening (Alternative 5B) traverse the remaining project distance of approximately 8.8 miles. These alternatives represent widening from two to four lanes using a 23-foot-wide raised median.

Section 5, shown on Figure S-5, is divided into four subsections. Section 5 begins just east of SR 1102 (Lake Neighborhood Road) at Station 1020+00 and ends at Station 1486+77, which is a short distance beyond US 264. This project also proposes northbound US 264 and westbound US 64 approach improvements to the US 64/US 264 intersection. The begin/end points for the four subsections in Section 5 are interchangeable with adjacent subsections; that is, the final highway could cross from south-side widening to north-side widening, and then back again. However, to accommodate good highway alignment and simplify construction phasing, NCDOT will seek to minimize highway crossovers to the extent practicable.

Proposed right-of-way widths average between 200 and 250 feet wide, depending on canal relocation. This section of the project has large and sometimes deep canals that will require additional width to accommodate canal relocation.

Sections 2, 3, and 4, Tyrrell and Dare Counties – Bridge Replacement Corridors

Chapter 2 (and Figure 2-6 through Figure 2-11) presents Preliminary Alternative Corridors that were studied in early project stages. During a process of elimination, several corridors in Sections 2, 3, and 4 were removed.

The remaining bridge replacement corridors are now Detailed Study Alternatives in Sections 2, 3, and 4. Corridor centerlines selected for detailed study are described in Chapter 2 (and in Figure 2-12 through Figure 2-17) and listed below:

- Tyrrell North (Section 2 only) - Widening and New Location
- Dare North 1 (Section 3 and Subsection 4-1) – New Location
- Dare North 2 (Section 3 and Subsection 4-1) – New Location
- Dare Northern Bypass (Sections 3 and 4) – New Location
- Dare Southern Bypass (Subsection 4-2 only) – New Location
- Dare South-Side Widening (Subsections 4-2 and 4-3) – Widening
- Dare North-Side Widening (Subsections 4-2 and 4-3) – Widening

Section 2

The Section 2 bridge approach corridor, Tyrrell North, connects US 64 to any of the three remaining bridge replacement alternatives, which are located on the north side of the existing bridge. Given the elimination of other Section 2 corridors, Tyrrell North is the only remaining corridor alternative in Section 2. It is preliminarily established that the project will utilize the Tyrrell North corridor. Also, given that the three alignment possibilities within the preliminary Tyrrell North corridor have been narrowed down to one alignment, the corridor centerline is also established. Although both a 23- and 46-foot-wide median are studied in Tyrrell North, the impacts of each are similar. The overall distance is approximately 0.83 mile. With this alternative, the existing section of US 64 south of the Alligator River marina is retained as an access road to provide continued southerly access to the marina and access to the commercial fishing dock on the western shore of the Alligator River.

Section 3 Bridge Replacement Corridors

Preliminary agreements with natural resource agencies identified that at the end of the Tyrrell North corridor, a new bridge will begin 295 feet inland from the Tyrrell County shoreline with the Alligator River (to bridge wetlands). This point marks the beginning of Section 3, the bridge itself.

From the Tyrrell North Alternative, three possible bridge replacement corridors extend eastward across the Alligator River and connect to one of the three bridge landings on the east side of the Alligator River in Dare County. The three bridge corridors are, from south to north, Dare North 1, Dare North 2 and Dare Northern Bypass.

Each bridge replacement corridor presents a different bridge length over water and also over wetlands on the Dare County shoreline. The actual bridge end in Dare County marks the terminus of Section 3 for each corridor; however, it should be noted that all three of these corridors also extend partially or fully through Section 4

Dare North 1 – New Location (Section 3 and Subsection 4-1)

Section 3. The bridge itself spans a distance of approximately 16,547 feet (3.13 miles) from Station 707+00 in Tyrrell County to Station 850+00 in Dare County. This is the shortest of the three bridge alignments. In Tyrrell County, the west end of the bridge extends inland over wetlands for a distance of 295 feet from the shoreline. In Dare County, the east end of the bridge extends inland over wetlands for a distance of 1,360 feet from the shoreline.

Subsection 4-1 Highway on Fill. Once the end of bridging is reached for Dare North 1, the corridor offers three possibilities to connect with corridors that begin in Subsection 4-2 and extend through or around the East Lake community. The three

resulting "connector alignments" propose 23-foot raised medians, and (shown in Chapter 2, Figure 2-17) are described below:

- Dare North 1 Connector to Dare Southern Bypass. The alignment extends approximately 3,400 feet east of the bridge end (Station 850+00) to Station 906+00+00. Approximately 1,100 feet east of the bridge, the alignment crosses existing US 64 and continues east, where it connects to a southern bypass of East Lake.
- Dare North 1 Connector to Dare South-Side Widening. This alignment extends approximately 3,400 feet from the bridge end (Station 850+00) to Station 906+00. This new location connector shares the same alignment as Dare North-Side Widening for about 1,000 feet, at which point the alignment curves southward to cross existing US 64 and connect to a south-side widening through East Lake.
- Dare North 1 Connector to Dare North-Side Widening. This alignment extends approximately 3,400 feet from the bridge end (Station 850+00) to Station 906+00. The alignment is on new location for about 1,000 feet, then joins existing US 64 for a north-side widening, from just east of the intersection of US 64 and SR 1153 (Old Ferry Landing Road) through the remainder of Subsection 4-1.

Dare North 2 – New Location (Section 3 and Subsection 4-1)

Section 3. The bridge structure spans a distance of approximately 16,830 feet (3.19 miles) from Station 707+00 in Tyrrell County to Station 875+30 in Dare County. In Tyrrell County, the west end of the bridge extends inland over wetlands for a distance of 295 feet from the shoreline. In Dare County, the east end of the bridge extends inland over wetlands for a distance of 455 feet from the shoreline.

Subsection 4-1 Highway on Fill. Once the end of bridging is reached for Dare North 2, the corridor offers three possibilities in Subsection 4-1 to connect with corridors that begin in Subsection 4-2 and extend through or around the East Lake community. While the descriptions of the three "connector alignments" below (shown in Chapter 2, Figure 2-17) are quite similar to the connectors from Dare North 1; the alignments are markedly different. All propose 23-foot raised medians:

- Dare North 2 Connector to Dare Southern Bypass. From the end of the bridge (Station 875+00), this alignment extends southeast across US 64 and passes over a canal on the south side of the highway to connect with a southern bypass of East Lake at Station at Station 906+00. Where the alignment crosses US 64, large pipes or a culvert will be provided to maintain hydraulic connectivity. Navigable connectivity (canoe/kayak) will not be maintained.
- Dare North 2 Connector to Dare South-Side Widening. From the end of the bridge at Station 875+00, this alignment is on new location until it crosses existing US 64 at Old Ferry Landing Road. From here the alignment functions as a south-side widening to Station 906+00. Where this alternative passes over a canal on the south side of US 64, large pipes or a culvert will be provided to maintain hydraulic connectivity. Navigable connectivity (canoe/kayak) will not be maintained.

- Dare North 2 Connector to Dare North-Side Widening. From the end of the bridge (Station 875+00), this alignment is on new location until it joins existing US 64 west of Old Ferry Landing Road as a north-side widening and continues to Station 906+00.

Dare Northern Bypass – New Location (Section 3 and Section 4)

Section 3. This bridge is the longest of the three bridge alignments. It covers a distance of approximately 19,900 feet (3.77 miles) from Station 707+00 in Tyrrell County to Station 906+00 in Dare County. In Tyrrell County, the west end of the bridge extends inland over wetlands for a distance of 295 feet from the shoreline. In Dare County, the east end of the bridge extends inland over wetlands for a distance of 1,780 feet from the shoreline. The corridor then continues as Section 4 around the north side of East Lake until connection is made to existing US 64.

Section 4 Highway on Fill. Dare Northern Bypass (shown in Chapter 2, Figure 2-16) is so-named because it extends north of and around the East Lake community. This stand-alone alignment consists of a four-lane, divided highway with a 23-foot raised median, on new location for an estimated distance of 2.3 miles, beginning at the eastern end of the bridge for Dare Northern Bypass (Station 906+00) and ultimately reconnecting to US 64 as a north-side widening between Brier Hall Road and Lake Neighborhood Road, continuing to the end of Section 4 at Station 1020+00.

Section 4 Corridors

In Dare County, all Section 4 alternatives provide 23-foot-wide raised medians. Right-of-way widths for alternatives that widen existing US 64 average 200 feet. Right-of-way widths for alternatives on new location average 210 feet. At elevated bridge ends where the highway footprint flares out to accommodate wider fill, the right-of-way for the Dare North 1, Dare North 2 and Dare Northern Bypass bridges tapers outward to a maximum width of approximately 310 feet. Only one, 1,000-foot wide corridor is established in Subsections 4-2 and 4-3 to accommodate north or south-side widening alternatives through East Lake. A separate 1,000 foot-wide corridor is established in Subsection 4-2 (only) for an East Lake Southern Bypass.

Dare South-Side Widening is accommodated within the single 1,000-foot widening corridor.

Subsection 4-2. In subsection 4-2, this alignment extends a distance of approximately 1.5 miles and continues south-side widening through the community of East Lake to Station 987+85.

Subsection 4-3. In Subsection 4-3, this alignment widens US 64 to the south side for 0.61 mile to Station 1020+00.

Dare North-Side Widening is also accommodated within the single 1,000-foot widening corridor.

Subsection 4-2. In Subsection 4-2 this alignment extends a distance of approximately 1.5 miles and continues a north-side widening through the community of East Lake to Station 987+85. More relocations are anticipated than with a south-side widening.

Subsection 4-3. In Subsection 4-3, this alignment widens US 64 to the north side for 0.61mile to Station 1020+00.

Dare Southern Bypass - New Location

Subsection 4-2 only. The Dare Southern Bypass corridor is 1.5 miles long (from Station 906+00 to Station 987+85) and exists only in Subsection 4-2. Either Dare North 1 or Dare North 2 corridors will precede this alternative with connector alignments that tie-in to a fixed starting point for the bypass. The alignment crosses the infrequently-used Dare County borrow pit and, at SR 1101 (Pump Road), turns to the northeast to reconnect to existing US 64 at the end of Subsection 4-3, approximately 1,200 feet east of Pump Road.

"East Lake" Alternatives

As explained in Chapter 2 and shown on Figure 2-18, the above corridors in Sections 2, 3, and 4 may be combined such that numerous "mix and match" alignment possibilities are available for selection, resulting in a total of 13 possible permutations that move from west to east. Because these combinations include bridge replacement corridors that also pass through or around the community of East Lake, they are termed "East Lake Alternatives." The project team identified clear beginning and end points for comparison of the above combinations. Beginning at the start of Section 2, all East Lake Alternative combinations run from west to east until the end of Section 4. In text and tables, East Lake Alternatives are designated as "EL" followed by the appropriate alternative number. For example, East Lake Alternative 6 will be designated as "EL 6."

Detailed descriptions of the bridge replacement corridors are presented below in terms of individual corridor components, broken down by Sections 2, 3 and 4, and by subsections (as appropriate). Table S-1 provides a definitive description and shows the linkages of the various East Lake Alternative combinations.

Note: Tables in this Summary and in Chapter 4 list the sum of the cumulative impacts of each Section 2, 3, and 4 corridor into a single combined impact – for each East Lake (EL) Alternative. Interested parties can study the calculation breakdown of each East Lake Alternative by reviewing tables in Appendix F. These tables definitively show the impacts of each corridor by section and subsection, and demonstrate how they are combined for each EL alternative. Furthermore, in an effort to minimize East Lake Alternatives to 13 permutations (rather than 26), Section 2 impacts presented in the EL tables reflect only the wider 46-foot-wide median, or worst-case scenario. When the

Table S-1
East Lake Alternatives

East Lake Alternative (EL)	Section 2	Section 3	Section 4		
			Subsection 4-1*	Subsection 4-2	Subsection 4-3
EL 1	Tyrrell North	Dare North 1	Dare North 1 connector to Dare North-Side Widening	Dare North-Side Widening	Dare North-Side Widening
EL 2	Tyrrell North	Dare North 1	Dare North 1 connector to Dare North-Side Widening	Dare North-Side Widening	Dare South-Side Widening
EL 3	Tyrrell North	Dare North 1	Dare North 1 connector to Dare South-Side Widening	Dare South-Side Widening	Dare South-Side Widening
EL 4	Tyrrell North	Dare North 1	Dare North 1 connector to Dare South-Side Widening	Dare South-Side Widening	Dare North-Side Widening
EL 5	Tyrrell North	Dare North 1	Dare North 1 connector to Dare Southern Bypass	Dare Southern Bypass	Dare South-Side Widening
EL 6	Tyrrell North	Dare North 1	Dare North 1 connector to Dare Southern Bypass	Dare Southern Bypass	Dare North-Side Widening
EL 7	Tyrrell North	Dare North 2	Dare North 2 connector to Dare Southern Bypass	Dare Southern Bypass	Dare South-Side Widening
EL 8	Tyrrell North	Dare North 2	Dare North 2 connector to Dare Southern Bypass	Dare Southern Bypass	Dare North-Side Widening
EL 9	Tyrrell North	Dare North 2	Dare North 2 connector to Dare South-Side Widening	Dare South-Side Widening	Dare South-Side Widening
EL 10	Tyrrell North	Dare North 2	Dare North 2 connector to Dare South-Side Widening	Dare South-Side Widening	Dare North-Side Widening
EL 11	Tyrrell North	Dare North 2	Dare North 2 connector to Dare North-Side Widening	Dare North-Side Widening	Dare North-Side Widening
EL 12	Tyrrell North	Dare North 2	Dare North 2 connector to Dare North-Side Widening	Dare North-Side Widening	Dare South-Side Widening
EL 13	Tyrrell North	Dare Northern Bypass			

*Subsection 4-1 represents the "connector alignments" from Dare North 1 and Dare North 2 corridors.

project team meets to deliberate between selection of a 23-foot or 46-foot median for the Tyrrell North corridor, impacts of the two cross-sections will be compared and a decision rendered. The Impacts Table in Appendix F presents this Section 2 impact comparison.

S.5.4 No-Build Alternative

The No-Build Alternative assumes US 64 will remain a two-lane road, with no improvements within the PSA. In addition, the Lindsay C. Warren Bridge over the Alligator River will not be replaced. This alternative does not meet the purpose and need of the project, as US 64 in the project area will remain out of compliance with the North Carolina Strategic Highway Corridors plan. The No-Build Alternative also will fail to meet the project purpose and need related to better meeting state hurricane clearance time goals, and for replacement of a bridge that is nearing the end of its service life. The No-Build Alternative assumes completion of other *2012-2018 State Transportation Improvement Program* (STIP) projects near the project area that are funded or partially funded for right-of-way acquisition and construction or are under construction, including the TIP projects described below.

S.5.5 No Action Alternative

A No-Action Alternative, defined as a project alternative that would not require a Section 404 permit from USACE, was considered for the project. To develop the No-Action Alternative, the various project alternative alignments were each reviewed for amount of wetlands impact. Those having least amount of wetland impact in each section (project Sections 1 through 5) were adjoined to the next section to make a combined project alignment with the least amount of wetland impacts. After the project alignment with the least amount of wetlands impact was identified, the costs were estimated for bridging the wetlands that they would cross. It was concluded that the No-Action Alternative would cost well over $1 billion dollars to construct. Because of this, it was concluded that the No-Action Alternative was not a feasible alternative, and it was dropped from further consideration.

S.6 Other Proposed Actions

The proposed project is listed as TIP numbers R-2544 and R-2545 in the NCDOT *2012 to 2018 State Transportation Improvement Program* for the period from Federal Fiscal Year (FFY) 2012 (October 2011) through FFY 2018 (September 2018). Regional transportation projects listed in the same STIP that are near the proposed project are listed below:

Project B-2500	NC 12 replacement of Herbert C. Bonner Bridge (Bridge No. 11) over Oregon Inlet. Planning and design in progress. The request for proposals for construction was published on February 7, 2011.
Project R-2414	US 158 from east of Pasquotank River in Elizabeth City to NC 34 in Belcross. Widen to multi-lanes. Planning and design are in progress, with the segment from Elizabeth City to SR 1257 under construction in 2011, and right of way in progress for remainder of highway in 2011.
Project R-2574	US 158 from east of NC 34 at Belcross to NC 168. Widen to multi-lanes (10.6 miles). Planning and design are in progress with right-

of-way funding starting in 2020 and construction funding beyond 2020.

Project R-2576 — US 158 from east of NC 34 at Belcross to NC 168. Widen to multi-lanes (10.6 miles). Planning and design are in progress with right-of-way funding starting in 2020 and construction funding beyond 2020.

Construction of the US 64 improvements project is not dependent on completion of any of the above projects.

S.7 Other Alternatives Considered

In addition to the Detailed Study Alternatives described above, other traffic management and bridge rehabilitation alternatives for the proposed project were considered for evaluation. As described below, none of these alternatives was carried forward for analysis in the DEIS.

Traffic management alternatives seek to maximize the efficiency and usefulness of an existing road or bridge without a major capital investment. Given that available transportation improvement funding has limits, it is always important to consider whether the purpose and need of a project can be met without a major capital investment. The following traffic management alternatives were considered:

- Transportation Systems Management (TSM) (modest physical and operational improvements).
- Travel Demand Management (TDM) (opportunities to alter the pattern of when people choose to travel US 64 to reduce congestion).
- Bus transit.
- Rail alternatives.
- Three lane alternatives.
- Express lane alternatives.

Due to the project's rural location, none of these alternatives was found to meet the project's purpose and need. They are best suited to address peak travel period congestion problems, which is neither a project need nor purpose. A fourth, potentially-lower capital investment alternative, was considered: rehabilitation of the Lindsay C. Warren Bridge. This alternative was evaluated but found not to be reasonable.

S.8 Major Environmental Impacts and Costs

A full description of the existing community, visual, cultural, natural, and other resources in the project area is provided in Chapter 3. A detailed presentation of the environmental impacts of the alternatives selected for detailed study is presented in

Chapter 4. The major environmental impacts associated with the detailed study alternatives are summarized below and shown on Table S-2 and Table S-3.

S.8.1 Neighborhoods and Communities

The proposed project widens or relocates an existing highway and replaces an existing historic bridge. No new access to previously isolated areas is provided, and access to existing roads and properties is maintained. No project-related impacts will occur to neighborhoods within the geographic limits of Columbia, as the western terminus of the project lies about 0.9 mile east of the Columbia town boundary. Alternative 1A widens US 64 to the south and will displace up to nine homes and two businesses. In Subsection 1-1, with a 46-foot median, this alternative displaces seven homes and two businesses in the neighborhood east of Columbia (Figure S-4), while the 23-foot median displaces six homes and two businesses. In Subsection 1-2, both options for Alternative 1A displace one home and one business with either median width. Access to US 64 will be maintained for the remaining homes, yet the quality, continuity, character and cohesiveness of the neighborhood as a whole will be impacted.

Alternative 1B widens US 64 to the north and displaces up to five homes and one business. In Subsection 1-1, either median-width alternative will displace one home and one business. In Subsection 1-2, only a cemetery is impacted by both alternatives. In Subsection 1-4, both options for Alternative 1B (23-foot-wide and 46-foot-wide median) affect the Alligator Community (Figure S-4) north of US 64 at the eastern intersection of US 64 and SR 1229 (Old US 64). This community includes St. John's Missionary Baptist Church and cemetery and about 20 homes (see Section 3.1.4.2), including those approximately 0.75-mile north of the intersection. Four of these homes will be displaced as a result of Alternative 1B, with likely impacts to neighborhood continuity, character, and cohesion through the loss of first tier homes and exposure of the remaining homes and St. John's Baptist Church to the four-lane expressway.

In the East Lake Community in Dare County (Figure S-5), in Subsection 4-2, a north-side widening under Alternatives EL 1, EL 2, EL 11 and EL 12 displaces 12 homes. South-side widening with EL 3, EL 4, EL 9 and EL 10 displaces seven homes. Alternatives EL 5, EL 6, EL 7 and EL 8 (all Dare Southern Bypass Alternatives) will displace 1 home. These alternatives introduce an access-controlled roadway into the East Lake neighborhood and could alter the existing neighborhood character, inhibit pedestrian crossings, and affect community continuity and cohesiveness.

Alternative 5A and 5B will each impact 3 residential dwelling units. Alternative 5A-Dare South Side Widening will displace three homes and a cemetery in Subsection 5-3. Alternative 5B-Dare North Side Widening will displace one home in Subsection 5-2 and two homes in Subsection 5-3. Alternative 5B-Dare North Side Widening in Subsection 5-1 will displace the historic East Lake Methodist Church and cemetery, East Lake Holiness Church, the East Lake Community Center, and the historic East Lake Fire Tower (Figure S-5). Because of their importance to the community, the displacement of

Table S-2
Section 1 and 5 Impacts

Impact Category		Tyrrell County				Dare County	
		Section 1				Section 5	
		Alt. 1A (South-Side Widening)		Alt. 1B (North-Side Widening)		Alt. 5A (South-Side Widening)	Alt. 5B (North-Side Widening)
		23' Median	46' Median	23' Median	46' Median	23' Median	23' Median
Length (miles)		11.28	11.28	11.28	11.28	8.84	8.84
UST/Hazards		--	--	--	--	--	Has potential to breach landfill toe slope.
Prime Farmland (acres)		5.60	6.80	6.40	9.90	--	--
Managed Lands and (acres)		82.83	94.96	39.88	49.59	170.03	236.72
Natural Heritage Areas (acres)							
Neighborhood Disturbance		Columbia Neighborhood & East of Columbia		Columbia Neighborhood; Alligator Community		--	East Lake
Noise[1]		No Impacts		3 sites in AM, 1 site in PM w/ or w/o project.		3 sites in AM w/ or w/o project.	1 site in AM and PM w/ or w/o project.
Historic Resources		--	--	--	--	--	East Lake Methodist Church / Cemetery; East Lake Fire Tower
Relocations	Residence	7	9	5	5	3	3
	Business	2	2	1	1	--	--
	Church	--	--	--	--	--	2
	Cemetery	1	1	1	1	1	2
Cowardin Wetlands (acres)		76.08	94.90	75.36	99.30	98.46	91.49
Coastal Wetlands (acres)		0.08	0.08	0	0	2.78	10.26
Canal Relocation (Linear Feet)							
Essential Fish Habitat (acres)		114.67	133.62	78.43	101.93	68.65	145.18
Protected Species Habitat (acres)		73.53	83.38	56.69	66.86	7.43	34.21
CAMA Resources (acres)[2]		22.21	24.80	16.44	19.37	27.14	74.57
Plant Communities (acres)		175.01	202.84	171.56	208.24	131.07	142.18
Cost (millions)[3]		$72.0	$73.4	$64.8	$65.8	$70.0	$73.4

[1]Noise Impacts w/ or w/o project – Considering future traffic volumes which will be the same with or without the project.
[2]CAMA Resources – Estuarine public trust waters, Estuarine public trust waters shorelines (75 feet), Outstanding resource waters shorelines (575 feet), Inland public trust waters, Inland public trust waters shorelines (30 feet), and Coastal wetlands.
[3]Detailed costs are shown in Tables S-4 through S-6.

Table S-3
East Lake Alternatives Impacts

Dare County						
Impact Category		**East Lake Alternatives**				
		EL 1	**EL 2**	**EL 3**	**EL 4**	**EL 5**
Length (miles)		6.76	6.76	6.74	6.74	6.76
UST/Hazards		--	--	--	--	--
Prime Farmland (acres)		--	--	--	--	--
Managed Lands (acres)		38.32	23.27	43.91	29.01	54.19
Natural Heritage Areas (acres)						
Neighborhood Disturbance		East Lake	East Lake	East Lake	East Lake	East Lake
Noise[1]		4 sites in AM and PM, 1 for AM conditions w/ or w/o project		8 sites in AM and PM, 4 w/ or w/o project		None
Historic Resource		Lindsay C. Warren Bridge				
Relocations	Residence	12	12	7	7	1
	Business	--	--	--	--	--
	Church	--	--	--	--	--
	Cemetery	--	--	--	--	--
	Other Impacts	7 Sheds	7 Sheds	5 Sheds; 4 Abandoned Structures	5 Sheds; 4 Abandoned Structures	--
Cowardin Wetlands (acres)		34.24	40.37	53.09	46.96	60.80
Coastal Wetlands (acres)		0.60	0.60	6.11	6.11	5.69
Canal Relocation (Linear Feet)		--	--	--	--	--
Essential Fish Habitat (acres)		66.13	72.71	88.49	81.91	83.34
Federal Species of Concern						
Protected Species Habitat		7.43	7.43	7.43	7.43	7.43
CAMA Resources (acres)[2]		44.78	44.78	45.46	45.46	41.58
Plant Communities (acres)		68.72	72.87	73.9	69.76	88.92
Cost (millions)[3]		$222.7	$222.9	$221.1	$220.9	$226.7

[1]Noise Impacts w/ or w/o project – Considering future traffic volumes which will be the same with or without the project.
[2]CAMA Resources – Estuarine public trust waters, Estuarine public trust waters shorelines (75 feet), Outstanding resource waters shorelines (575 feet), Inland public trust waters, Inland public trust waters shorelines (30 feet), and Coastal wetlands.
[3]Detailed costs are shown in Tables S-4 through S-6.

Table S-3 (continued)
East Lake Alternatives Impacts

Dare County						
Impact Category		East Lake Alternatives				
		EL 6	EL 7	EL 8	EL 9	EL 10
Length (miles)		6.76	6.76	6.76	6.75	6.75
UST/Hazards		--	--	--	--	--
Prime Farmland (acres)		--	--	--	--	--
Managed Lands (acres)		54.00	50.10	49.95	40.55	40.40
Natural Heritage Areas (acres)						
Neighborhood Disturbance		East Lake	East Lake	East Lake	East Lake	East Lake
Historic Resource		Lindsay C. Warren Bridge				
Noise[1]		None			8 sites in AM and PM, 4 with or without project	
Relocations	Residence	1	1	1	7	7
	Business	--	--	--	--	--
	Church	--	--	--	--	--
	Cemetery	--	--	--	--	--
	Other Impacts	--	--	--	5 Sheds; 4 Abandoned Structures	5 Sheds; 4 Abandoned Structures
Cowardin Wetlands (acres)		54.67	61.77	55.64	55.77	49.64
Coastal Wetlands (acres)		5.69	3.26	3.26	2.74	2.74
Canal Relocation (Linear Feet)						
Essential Fish Habitat (acres)		82.76	86.36	79.78	70.96	75.47
Protected Species Habitat		7.43	7.43	7.43	7.43	7.43
CAMA Resources (acres)[2]		41.58	38.04	38.05	27.77	38.86
Plant Communities (acres)		84.77	89.19	85.05	74.05	69.91
Cost (millions)[3]		$226.5	$229.4	$229.2	$221.2	$221.0

[1]Noise Impacts w/ or w/o project – Considering future traffic volumes which will be the same with or without the project.
[2]CAMA Resources – Estuarine public trust waters, Estuarine public trust waters shorelines (75 feet), Outstanding resource waters shorelines (575 feet), Inland public trust waters, Inland public trust waters shorelines (30 feet), and Coastal wetlands.
[3]Detailed costs are shown in Tables S-4 through S-6.

Table S-3 (concluded)
East Lake Alternatives Impacts

Dare County				
Impact Category		East Lake Alternatives		
		EL 11	EL 12	EL 13
Length (miles)		6.75	6.75	6.93
UST/Hazards		--	--	--
Prime Farmland (acres)		--	--	--
Managed Lands (acres)		37.34	37.49	72.36
Natural Heritage Areas (acres)				
Neighborhood Disturbance		East Lake	East Lake	--
Noise[1]		4 sites in AM and PM, 1 for AM conditions w/ or w/o project		None
Historic Resource		Lindsay C. Warren Bridge		
Relocations	Residence	12	12	--
	Business	--	--	--
	Church	--	--	--
	Cemetery	--	--	--
	Other Impacts	7 Sheds	7 Sheds	--
Cowardin Wetlands (acres)		39.28	45.41	66.07
Coastal Wetlands (acres)		0.34	0.34	0.23
Canal Relocation (Linear Feet)		--	--	--
Essential Fish Habitat (acres)		68.52	75.10	68.65
Protected Species Habitat		7.43	7.43	7.43
CAMA Resources (acres)[2]		43.14	43.14	22.53
Plant Communities (acres)		69.51	73.65	72.31
Cost (millions)[3]		$222.0	$222.1	$252.5

[1]Noise Impacts w/ or w/o project – Considering future traffic volumes which will be the same with or without the project.
[2]CAMA Resources – Estuarine public trust waters, Estuarine public trust waters shorelines (75 feet), Outstanding resource waters shorelines (575 feet), Inland public trust waters, Inland public trust waters shorelines (30 feet), and Coastal wetlands.
[3]Detailed costs are shown in Tables S-4 through S-6.

these structures will have substantial impacts to community continuity and cohesiveness.

No neighborhood impacts will occur with the No-Build Alternative.

S.8.2 Community Facilities

The project alternatives will not affect schools. Two churches in the East Lake Community, plus the East Lake Community Center (Figure S-5), will be displaced and require relocation with the Dare North-Side Widening Alternative in Subsection 5-1. Emergency service response times may improve with the improved roadway and new bridge. With all bridge alternatives, marine traffic that currently requires bridge opening will benefit from the unlimited passage associated with the new high-rise bridge.

With the No-Build Alternative, community facilities will experience no change.

S.8.3 Environmental Justice

The Alligator Community (Figure S-4) is verified to be a predominantly minority community. In accordance with Executive Order 12898 regarding environmental justice, implementation of Alternative 1B (north-side widening) with a 23-foot or 46-foot median will likely cause disproportionately high and adverse effects to the minority population in the Alligator community. The East Lake community (Figure S-5) meets the qualifications for a low-income community under Executive Order 12898. Implementation of any East Lake Alternative that widens existing US 64 through the community will cause the greatest community impact. In addition, an Alternative 5B (north-side widening) in Section 5-1 will also result in community impact. Either of these scenarios is likely to cause a disproportionately high and adverse impact on the community.

The No-Build Alternative will not affect environmental justice.

S.8.4 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966, as amended (16 United States Code [USC] 470f), protects properties that are listed on or eligible for listing on the National Register of Historic Places (NRHP).

In accordance with the requirements of Section 106 and NEPA, the NCDOT conducted a survey in October 2007 to identify cultural resources in the PSA.

Three properties were identified that are eligible for listing on the NRHP. The Lindsay C. Warren Bridge over the Alligator River was previously determined eligible for the NRHP during the 2005 NCDOT Historic Bridge Inventory. In addition, the 2007 survey determined that the East Lake Methodist Church/Cemetery and the East Lake fire tower both are eligible for listing on the NRHP.

Effects on cultural resources are expected as follows:

- Lindsay C. Warren Bridge – All three bridge alignments cause an Adverse Effect. Because the existing bridge cannot be widened, it must be replaced by a new bridge. The existing bridge will be demolished.
- East Lake Methodist Church and Cemetery – Alternative 5B in Subsection 5-1 has an Adverse Effect because widening to the north of existing US 64 displaces the church and cemetery. Alternative 5A in Subsection 5-1 has No Adverse Effect because widening to the south side of existing US 64 maintains the existing right-of-way, yet modifies driveway access to right-in, right-out with median U-turns nearby.
- East Lake Fire Tower –Alternative 5B in Subsection 5-1 has an Adverse Effect because widening to the north of existing US 64 will displace the fire tower. Alternative 5A in Subsection 5-1 has No Effect.

The terms "No Effect," "Adverse Effect," and "No Adverse Effect" refer to the Section 106 process. The concurrence forms for these conclusions are included in Appendix A.

No known archaeological resources are within the Area of Potential Effect, so no archaeological resources are affected by any of the project alternatives.

S.8.5 Protected Lands and Recreation Areas

Impacts to protected lands and recreation areas, as detailed in Chapter 4, Section 4.3, may consist of filling, vegetative clearing, dredging, exclusion from use, or other activities. These types of resources comprise most of the project area and existing US 64 right-of-way, so full avoidance is not possible. As discussed in Chapter 2 and Chapter 7, minimizing impacts to protected lands and recreation areas was considered in selecting the project alternatives.

Alternative 1A has the greatest impact to protected lands in Tyrrell County, ranging from 82.83 acres of managed lands and natural heritage areas for a 23-foot median to 94.96 acres of managed lands and natural heritage areas for a 46-foot median. Of the EL alternatives, EL 13 has the greatest impact to protected lands, affecting 72.36 acres, and EL 2 has the least impact, affecting 23.27 acres. Section 5 impacts in Dare County are associated with the ARNWR. Alternative 5A has direct effects to 170.03 acres of managed and protected lands; 116.34 of these acres are ARNWR land. Alternative 5B directly affects 236.72 acres of managed lands, with 133.79 acres being ARNWR land.

S.8.6 Natural Systems

Impacts to natural resources are detailed in Chapter 4, Section 4.6. Section 404 Jurisdictional Wetlands occupy major acreages within the proposed alternatives. Minimizing impacts to wetlands and surface waters is an imperative for all project

alternatives. Specifically, avoidance of Coastal Area Management Act (CAMA) wetlands has been a major factor in project decisions.

The Alligator River is approximately 2.6 miles wide at the existing Lindsay C. Warren Bridge and is a jurisdictional stream. In addition, the majority of the canals are jurisdictional open water, as is the canal system connected into the upper reaches of the Little Alligator River. Essential fish habitat (EFH) occurs within the right-of-way of all project alternatives. The EFH acreage impacts for the project alternatives are summarized in Table S-2 and Table S-3. The new bridge design proposes a higher span and precludes the need for a swing-span or drawbridge over the AIWW. With removal of the pilings for the old bridge, it is expected that no net increase in impacts to the river will occur.

The project does not result in significant floodplain encroachment as defined in 23 CFR 650, Subpart A (Location and Hydraulic Design of Encroachments on Floodplains). Possible disturbances to canals and drainage ditches may include relocation and temporary siltation. These impacts will be minimized by implementing erosion control measures such as silt fences and detention basins. In addition, NCDOT will implement Best Management Practices (BMP) to further minimize impacts. The proposed improvements should have little or no effect on groundwater and wells.

Much of the PSA consists of relatively undisturbed forest communities. Impacts to plant communities are expected to include fill and temporary or permanent clearing within limits of the proposed right-of-way.

Aquatic communities within the PSA consist primarily of man-made canals, ditches, ponds, open waters, and two named features (Alligator River and Billy's Ditch) (Figure S-5). Most of the PSA consists of some type of wetland or open water habitat, and extensive aquatic communities are found throughout. Impacts to aquatic resources consist of placing fill in wetlands, and installing culverts to connect open water ditches and canals. Designs for the project alternatives include measures to minimize these impacts, such as reducing project footprints, maintaining flow between inundated areas, and sizing culverts to maintain waterway connections for aquatic species. Short-term displacement of wildlife during construction is anticipated. Where a new location alternative is selected, a permanent decrease in habitat will occur.

The majority of the PSA, as well as the footprints of the proposed project alternatives, occur on wetlands designated by the Clean Water Act. These wetlands exhibit appropriate hydrology, soils, and vegetation and are under the jurisdiction of the US Army Corps of Engineers (USACE) and North Carolina Division of Water Quality (NCDWQ). Alternatives 1A and 1B have comparable impacts to Cowardin Wetlands in Tyrrell County. Alternative 1A affects 76.08 acres with a 23-foot median and 94.90 acres with a 46-foot median. Alternative 1B affects 75.36 acres of wetlands with a 23-foot median and 99.30 acres with a 46-foot median. Of the EL alternatives, EL 13 has the

greatest impact to wetlands, affecting 66.07 acres, and EL 1 has the least impact, affecting 34.24 acres. In Dare County, Alternative 5A has direct effects to 98.46 acres of Cowardin Wetlands, while Alternative 5B directly affects 91.49 acres.

Some of the Cowardin Wetlands are designated as CAMA Areas of Environmental Concern (AEC), with jurisdiction administered by the North Carolina Division of Coastal Management. The NCDENR-DCM manages AEC under the CAMA (see Section 3.6). CAMA AECs include designated coastal wetlands, waters, and shorelines. CAMA coastal wetlands are a subset of Clean Water Act wetlands. CAMA shorelines also often overlap areas of Clean Water Act wetlands.

Impacts to CAMA wetlands in the Tyrrell County PSA are very small, totaling 0.08 acre with either a 23-foot median or a 46-foot median.

For the East Lake Alternatives, the lowest CAMA wetland impacts are associated with EL 13 (0.23 acres), which avoids the large coastal resource areas (AECs) near the existing highway, and EL 11 and EL12 (0.34 acres each), which follow the existing roadway.

Within the Dare County portion of the PSA, the largest CAMA wetland impacts occur with Alternative 5B at 10.26 acres, versus 2.78 acres with Alternative 5A. Although both alternatives widen the existing roadway, coastal resources exist in the roadside canals, their buffers, and adjacent wetlands. This impact corridor is long, and impacts to these areas are unavoidable.

Of the 13 federally protected species listed for Dare County and the three listed for Tyrrell County, habitat for five species is present in the PSA (see Chapter 3, Table 3-17). Special studies were conducted to determine the presence of the red cockaded woodpecker (RCW), black bear and red wolf. In areas where RCW habitat was identified, none of the project widening alternatives directly impacts active or inactive RCW cavity trees. Section 1 (Tyrrell South-Side Widening and North-Side Widening Alternatives), EL 1 through EL 4, EL 9 through EL 12, and Section 5 (Dare South-Side Widening and North-Side Widening Alternatives) are on or adjacent to the existing highway alignment. Therefore, little loss or fragmentation of RCW foraging habitat is expected with these alternatives. ARNWR is believed to have one of the largest concentrations of black bear in the southeastern United States. Red wolves were reintroduced in ARNWR in 1987, and now can be found in ARNWR as well as four surrounding counties. Studies are currently underway for the black bear and red wolf to develop sufficient information for recommending design features into the project that will ensure their safe crossing of US 64 in the future.

Removal of the old bridge pilings in the Alligator River, an Estuarine Public Trust Water, may result in short-term siltation as well as permanent removal of established hard substrate for benthic flora and fauna. However, this loss is expected to be mitigated by the establishment of new bridge pilings, which will create new hard substrate. Bridge construction is expected to result in no net impact to Estuarine Public Trust Waters.

No occurrences of Submerged Aquatic Vegetation (SAV) were found in the PSA.

S.8.7 Air Quality

Tyrrell and Dare counties comply with the National Ambient Air Quality Standards (NAAQS) as an attainment area. The proposed project is not anticipated to create any adverse effects on the air quality of this attainment area. The project is predicted to have no effect on Mobile Source Air Toxics (MSAT) emissions, since the estimated 2030 vehicle miles traveled (VMT) for each of the detailed study alternatives is the same as for the No-Build Alternative.

Construction-related effects of the project will be limited to short-term increased fugitive dust and by mobile-source emissions during construction.

S.8.8 Noise

Predicted noise levels were evaluated at 91 noise-sensitive sites within the PSA, primarily isolated and scattered single-family residential properties. Impacts occur where there is a substantial increase in noise or where noise is predicted to approach or exceed FHWA Noise Abatement Criteria (NAC). Based on the noise analysis, impacts resulting from the proposed project alternatives are expected to occur as follows:

- Alternative 1A – No impact
- Alternative 1B – Noise is predicted to approach or exceed FHWA Noise Abatement Criteria (NAC) at three noise-sensitive sites during AM conditions and at one noise-sensitive site during PM conditions. However, with the exception of one of the sites for AM conditions, all of these impacted sites are already exposed to noise levels that approach or exceed the NAC under existing conditions. In addition, all of these impacted sites for both AM and PM conditions also are predicted to be exposed to noise levels that approach or exceed the NAC in 2030 with the No-Build Alternative.
- Alternatives EL 1 through EL 13 – Two noise-sensitive sites at the Alligator River Marina in the Tyrrell North corridor (Section 2), which is common to all East Lake Alternatives .
- Alternatives EL 3, EL 4, EL 9 and EL 10 – Eight noise-sensitive sites are predicted to be exposed to noise levels that approach or exceed the NAC for both the AM and PM conditions. However, two of these impacted receptors for PM conditions and one for AM conditions are already exposed to noise levels that approach or exceed the NAC under existing conditions.
- Alternatives EL 1, EL 2, EL 11 and EL 12 – Four receptors are predicted to be exposed to noise levels that approach or exceed the NAC for both the AM and PM conditions. However, one of these impacted receptors also is predicted to be exposed to noise levels that approach or exceed the NAC in 2030 for AM conditions with the No-Build Alternative.

- Alternative 5A – Noise is predicted to approach or exceed the NAC at three noise-sensitive sites during PM conditions and at two noise-sensitive sites during AM conditions. However, two of these impacted sites for both AM and PM conditions are already exposed to noise levels that approach or exceed the NAC under existing conditions and all of these impacted sites for both AM and PM conditions also are predicted to be exposed to noise levels that approach or exceed the NAC in 2030 with the No-Build Alternative.
- Alternative 5B – One noise-sensitive site located in Subsection 5-3.

Noise abatement measures were considered for the affected receptors in accordance with the NCDOT *Traffic Noise Abatement Policy*. Because all receptors are isolated structures, noise abatement measures and alignment modification are deemed not feasible and/or not reasonable.

S.8.9 Land Use and Transportation

The project alternatives are compatible with the land use and zoning requirements of Tyrrell County, Dare County, and the Coastal Area Management Act (CAMA). The USFWS will determine whether or not the project alternatives are consistent with the *Alligator River National Wildlife Refuge Comprehensive Conservation Plan (USFWS, 2008)* and provisions of the National Wildlife Refuge System Improvement Act of 1997.

S.8.10 Indirect and Cumulative Effects

The project has little to no potential for indirect effects to socioeconomic conditions, land use and transportation, protected lands and recreation areas, cultural, visual and natural resources, and public utilities and services. However, it was found that further assessment is warranted to determine effects on protected species as the result of: existing and future logging; the approximately 20.5 acres of changes to agricultural lands from the R-2544/R-2545 project; anticipated future zoning changes on the outskirts of Columbia; and the R-2544/R-2545 project itself. The project has little to no potential for cumulative effects.

S.8.11 Costs

Multiple alternative combinations are available, and project partitioning into sections and subsections is designed to maximize the benefits of these combinations in regard to design and cost. All alternatives are interchangeable at begin/end points for each major section (Section 1, East Lake, Section 5), with limited combinations available among subsections (such as Subsections 1-1, 1-2, and 1-3). Costs include demolition of the Lindsay C. Warren Bridge. Costs are shown per alternative in the last row of Table S-2. Detailed costs are provided in Chapter 2, Section 2.7. Details of these costs are shown in Table S-4, Table S-5, and Table S-6.

Based on the information provided in the above tables, the least expensive combination of sections will involve Alternative 1B- Tyrrell North-Side Widening (23-foot-wide

median), EL 4, and Alternative 5A-Dare South-Side Widening, at a cost of $355.7 million. The most expensive option will involve Alternative 1A-Tyrrell South-Side Widening (46-foot median), EL 13, and Alternative 5B-Dare North-Side Widening, at a cost of $399.3 million.

S.9 Areas of Controversy

During the process of project scoping, interagency involvement, and citizen participation, the principal issues of concern expressed by those in attendance were:

- Preservation of managed and protected natural and human resources in the PSA. Wetland impacts are associated with all project alternatives.
- Historic resources.
- Neighborhood impacts in the Alligator community and East Lake community.
- Preservation of the convenience store/marina and the commercial fishing site on the western shore of the Alligator River in Tyrrell County.
- Preservation of the ARNWR purpose and mission.

S.10 Major Unresolved Issues with Other Agencies

- Compatibility Determination by the USFWS that the proposed project does not compromise the purpose and mission of the ARNWR.
- It was agreed at the Concurrence Point (CP) 2 Merger Management Team meeting that median reduction opportunities in Dare County will be discussed during CP 4A proceedings.
- Displacement of historic resources vs. impacts to ARNWR mineral soils and buffer issues in Dare County (Section 5). (These resources lie on opposite sides of US 64.)
- Endangered Species Act coordination.
- Impacts to the Alligator community vs. the J. Morgan Futch Gameland.
- Locations and type of wildlife crossings.

S.11 Other Federal Actions Required for the Proposed Project

- US Army Corps of Engineers Dredge and Fill Permit will be required for the project.
- US Coast Guard Permit will be required for the Alligator River bridge replacement.

Table S-4
Alternatives 1A and 1B - Construction, Right-of-Way, and Utilities Costs by Subsection

Criteria	Alternative 1A – 23-Foot Median					
	Subsection 1-1	Subsection 1-2	Subsection 1-3	Subsection 1-4	Subsection 1-5	Subsection 1-6
Length (miles)	2.24	1.45	3.27	0.84	1.72	1.76
Right-of-Way Cost	$2,223,500	$507,500	$364,500	$157,500	$328,500	$262,500
Utilities Cost	$986,560	$358,400	$870,400	$204,800	$460,800	$460,800
Construction Cost	$11,100,000	$7,100,000	$21,000,000	$5,700,000	$9,700,000	$10,200,000
Total Subsection Cost	$14,310,060	$7,965,900	$22,234,900	$6,062,300	$10,489,300	$10,923,300
	Total Cost Alternative 1A – 23-Foot Median: $71,985,760					

Criteria	Alternative 1A- 46-Foot Median					
	Subsection 1-1	Subsection 1-2	Subsection 1-3	Subsection 1-4	Subsection 1-5	Subsection 1-6
Length (miles)	2.24	1.45	3.27	0.83	1.72	1.77
Right-of-Way Cost	$2,638,000	$575,000	$417,000	$175,500	$369,000	$292,500
Utilities Cost	$986,560	$358,400	$870,400	$204,800	$460,800	$460,800
Construction Cost	$10,800,000	$6,900,000	$21,200,000	$6,000,000	$9,700,000	$11,000,000
Total Subsection Cost	$14,424,560	$7,833,400	$22,487,400	$6,380,300	$10,529,800	$11,753,300
	Total Cost Alternative 1A – 46-Foot Median: $73,408,760					

Criteria	Alternative 1B – 23-Foot Median					
	Subsection 1-1	Subsection 1-2	Subsection 1-3	Subsection 1-4	Subsection 1-5	Subsection 1-6
Length (miles)	2.23	1.46	3.28	0.83	1.72	1.76
Right-of-Way Cost	$1,022,000	$505,500	$372,000	$552,500	$322,500	$301,500
Utilities Cost	$894,400	$399,360	$921,600	$276,480	$460,800	$460,800
Construction Cost	$11,000,000	$8,400,000	$17,300,000	$4,300,000	$8,300,000	$9,000,000
Total Subsection Cost	$12,916,400	$9,304,860	$18,593,600	$5,128,980	$9,083,300	$9,762,300
	Total Cost Alternative 1B – 23-Foot Median: $64,789,440					

Criteria	Alternative 1B – 46-Foot Median					
	Subsection 1-1	Subsection 1-2	Subsection 1-3	Subsection 1-4	Subsection 1-5	Subsection 1-6
Length (miles)	2.23	1.46	3.28	0.83	1.72	1.76
Right-of-Way Cost	$1,155,500	$577,500	$424,500	$614,000	$361,500	$337,500
Utilities Cost	$894,400	$399,360	$921,600	$276,480	$460,800	$460,800
Construction Cost	$10,900,000	$8,400,000	$17,600,000	$4,100,000	$8,600,000	$9,300,000
Total Subsection Cost	$12,949,900	$9,376,860	$18,946,100	$4,990,480	$9,422,300	$10,098,300
	Total Cost Alternative 1B – 46-Foot Median: $65,783,940					

Table S-5
East Lake (EL) Alternatives (Sections 2, 3, and 4)
Construction, Right-of-Way, and Utilities Costs

East Lake Alternative	Length in Miles	Costs			
		Right of Way	Utilities	Construction	Total Costs
EL 1	6.76	$3,340,500	$845,192	$217,600,000	**$221,785,692**
EL.2	6.76	$3,348,000	$776,036	$217,900,000	**$222,024,036**
EL 3	6.74	$3,382,000	$499,412	$217,600,000	**$221,481,412**
EL 4	6.74	$2,988,000	$568,568	$217,300,000	**$220,856,568**
EL 5	6.76	$2,305,500	$284,255	$224,100,000	**$226,689,755**
EL 6	6.76	$2,298,000	$353,411	$223,800,000	**$226,451,411**
EL 7	6.76	$2,317,500	$230,472	$226,900,000	**$229,447,972**
EL 8	6.76	$2,310,000	$299,628	$226,600,000	**$229,209,628**
EL 9	6.75	$2,905,500	$484,039	$217,800,000	**$221,189,539**
EL 10	6.75	$2,898,000	$553,195	$217,500,000	**$220,951,195**
EL 11	6.75	$3,371,500	$591,615	$217,400,000	**$221,363,115**
EL 12	6.75	$3,379,000	$522,459	$217,700,000	**$221,601,459**
EL 13	6.93	$3,058,000	$253,524	$249,200,000	**$252,511,524**

Table S-6
Alternatives 5A and 5B - Construction, Right-of-Way, and Utilities Costs by Subsection and Alternative

Criteria	Alternative 5A – 23-Foot Median			
	Subsection 5-1	Subsection 5-2	Subsection 5-3	Subsection 5-4
Length (miles)	1.14	1.11	1.09	5.50
Right-of-Way Cost	$67,500	$108,000	$333,000	$571,500
Utilities Cost	$268,940	$268,940	$268,940	$1,191,020
Construction Cost	$6,600,000	$6,800,000	$7,400,000	$46,200,000
Total Subsection Cost	$6,936,440	$7,176,940	$8,001,940	$47,962,520
	Total Cost Alternative 5A – 23-Foot Median: $70,077,840			
Criteria	**Alternative 5B – 23-Foot Median**			
	Subsection 5-1	**Subsection 5-2**	**Subsection 5-3**	**Subsection 5-4**
Length (miles)	1.13	1.11	1.10	5.49
Right-of-Way Cost	$1,169,500	$174,500	$656,500	$355,000
Utilities Cost	$444,186	$268,940	$268,940	$1,075,760
Construction Cost	$6,800,000	$6,400,000	$6,100,000	$49,700,000
Total Subsection Cost	$8,413,686	$6,843,440	$7,025,440	$51,130,760
	Total Cost Alternative 5B – 23-Foot Median: $73,413,326			

Project Commitments

US 64 Improvements Project
From Columbia to US 264 near Manns Harbor
Tyrrell and Dare Counties, North Carolina
State Project No. 6.049002T
TIP Nos. R-2544 & R-2545

Project Development and Environmental Analysis Branch, Roadway Design Unit, Division 1

- As agreed during the Concurrence Point 2 Merger Management Team meeting, the NCDOT will review further median reduction opportunities in Dare County prior to CP 4A.
- NCDOT will continue coordinating with the residents of the Alligator Community to determine concerns and interests regarding the project. The results of the coordination activities will be documented in the Project FEIS.
- NCDOT will continue coordinating with the residents of the East Lake Community to determine concerns and interests regarding the project. The results of the coordination activities will be documented in the Project FEIS.
- For bicycle safety, the NCDOT-standard 54-inch-high, 2-bar metal bridge railing on top of a concrete parapet of the Alligator River bridge will be installed for the railing/barrier system. No sidewalks are proposed.
- Bridge construction may involve barges and other watercraft originating from other-than-local harbor waters. To ensure that these watercraft do not introduce exotic or invasive species, NCDOT will require its contractors to pre-inspect and certify that all vessels are clean and devoid of exotic or invasive species.
- The West Indian manatee is not expected to be in the PSA between November and May, and is unlikely to be in the PSA between June and October. However, any construction associated with the project will follow guidelines prepared by the USFWS to avoid impacts to the manatee. Additional project commitments with respect to the West Indian manatee include: 1) Construction managers will advise all construction personnel to be aware of the possibility of manatee appearance and the legal obligation to avoid harassment of the species; 2) Construction personnel will watch for manatees and be prepared to shut down equipment if a sighting is made; 3) Any sightings or contact with manatees will be reported to the appropriate natural resource agencies (USFWS or NCWRC); 4) A sign will be posted providing instructions to equipment operators in case a manatee is sighted; and 5) Special steps will be taken on site concerning operations during the no-blast moratorium period, such as guidelines for operating water craft and placement of siltation barriers.

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