Alternatives Development and Selection

NCDOT examined a broad range of alternatives for the US 64 Improvements Project. The included the No-Build Alternative, the No-Action Alternative, Traffic Management Alternatives, and a variety of US 64 widening or Build Alternatives. The Build Alternatives assessed in detail in the Draft Environmental Impact Statement (DEIS) include multiple widening alternatives and the No-Build Alternative. The paragraphs below describe the alternatives considered and if applicable, why they were not selected as a detailed study alternative. Chapter 2 of the DEIS provides more detail on the alternatives and the selection process. Figure 2-6 from the DEIS illustrates the range of widening alternatives considered.

No-Build Alternative

The No-Build Alternative is considered in every NEPA document. Under the No-Build Alternative for the US 64 Improvements Project, no improvements would be made to US 64 in the project area. US 64 would remain a two-lane road and the Lindsay C. Warren Bride over the Alligator River would not be replaced.

No-Action Alternative

"No-Action" refers to NCDOT building a US 64 improvements project for which the US Army Corps of Engineers needs to take no action. The Corps' expected action on the US 64 project is to issue a Section 404 permit under the federal Clean Water Act (CWA) allowing NCDOT to place fill in wetlands and streams. Because the majority of the project area is wetlands, and all of the US 64 detailed study alternatives require some amount of filling in wetlands. The No-Action Alternative was developed to consider the merits of bridging the wetlands that would otherwise be filled. A Section 404 permit is not required for bridging wetlands. Constructing the No-Action Alternative would have cost over $1.5 billion dollars, which is roughly 3.4 times the amount of constructing the highest cost alternative being studied in detail in the US 64 DEIS. Because of the high costs associated with this alternative, it was not considered practicable, and, therefore is not assessed in detail in the US 64 DEIS.

Traffic Management Alternatives

Traffic management alternatives shown in the table that follows were considered to see if the project's purpose and need could be met without a notable investment in state transportation improvement funds. Traffic management alternatives seek to maximize the efficiency and usefulness of an existing road or bridge so it can better serve traffic.

Alternative	Attributes	Considerations	Outcome
Transportation Systems Management (TSM)	Transportation Systems Management (TSM) generally consists of small-scale improvements to intersections, signal timing, signage, and access management to help urban area traffic move more efficiently during the daily peak travel period.	• The project corridor is rural, with few intersections, no signals, low traffic volumes most of the year, and high through-traffic volumes during the summer vacation season. • Project traffic forecasts indicate that US 64 will operate at an acceptable peak period level of service in 2030. • Physical or operational improvement for daily travel is not a project purpose or need. • With respect to hurricane evacuation, the current unacceptably-long clearance times are not the result of a large number of evacuating vehicles generated from the project area itself, but rather the high evacuation demand from the Outer Banks to the east of the project limits, combined with the low capacity of the single outbound lane on US 64 through the project area.	Because TSM measures do not provide a measureable improvement to the primary corridor's existing deficiencies, and do not contribute to meeting the project's purpose and need, a TSM alternative was not given further consideration as a potential detailed study alternative.
Travel Demand Management (TDM)	Travel Demand Management (TDM) strategies are designed to reduce peak period travel demand, thereby reducing travel time. They are traditionally applied in metropolitan settings and may include: workplace flex-time; compressed work weeks; carpool/vanpool incentives; parking fees; peak period surcharges on parking, tolls, and transit; and congestion pricing (variable tolls based on traffic levels).	• TDM presumes clearance times can be reduced by shifting trips to other routes and/or other times of day. However, there is only one other evacuation route in the area and its clearance also exceeds 18 hours. • Encouraging some people not to evacuate in order to reduce demand is contrary to the safety objectives of an evacuation. • No mechanisms exist to force or provide incentives for evacuees to alter the time they choose to leave, other than the severity of the storm itself, and storm severity is already considered in the project's clearance time modeling.	Because hurricane evacuation clearance time through the project area is substantial and cannot be mitigated using only TDM strategies, a TDM alternative was not given further consideration as a potential detailed study alternative.
Bus Transit	The objective of bus transit is to reduce the number of vehicles traveling through an area. Like TSM strategies, bus transit is focused on reducing peak travel period congestion.	• The project area's peak travel period occurs on summer weekends when peak-hour traffic consists of vacationers traveling to and from multiple locations outside the project area, not within the project area itself. • With respect to hurricane clearance time, it is unlikely that vacationers would leave their personal cars, luggage and possessions behind in order to evacuate the Outer Banks on a bus. • Federal Highway Administration (FHWA) guidance indicates that bus transit is customarily considered as a potential alternative on major urban highway projects in areas with populations over 200,000, which the project area is not.	Because bus transit would likely not be used by peak period travelers, would likely not work in hurricane evacuation events, and is not typically used in areas with populations less than 200,000, a bus transit alternative was not given further consideration as a potential detailed study alternative.

Alternative	Attributes	Considerations	Outcome
Rail Alternatives	Like bus transit, the objective of rail transit is to reduce the number of vehicles traveling through an area.	Rail service is not available within or through the project area.	Because the rail infrastructure does not exist in the project area, a rail alternative was not given further consideration as a potential detailed study alternative.
Three-Lane Alternatives	Three different three-lane alternatives were considered. These included: • Third Lane painted as a Center, Two-Way Left Turn Lane in both directions. • Third Lane painted as a Center, Passing Lane that alternates between directions of travel. • Third Lane as a Center, Passing Lane that alternates between directions of travel, using a Concrete Median Barrier to separate opposing traffic.	• Safety concerns associated with three lane alternatives included: increased head-on collision potential; reduced recovery time for vehicles drifting outside of the lines; insufficient separation of oncoming headlights. • Operational issues associated with three lane alternatives included: constrained and disrupted passing lanes that can cause dangerous driver decisions; reduced travel lane widths in areas of dedicated left turn lanes; no ability for left turns where concrete barriers are used; insufficient median width necessary for queuing left turning vehicles. • Constructability would be greatly reduced because no detour routes are available for the project area, and the horizontal setback for constructing new lanes would be very minimal, thereby causing unsafe vehicular and construction worker conditions during construction.	Because of the plentitude of safety, operational and constructability concerns and issues, a three-lane alternative was not given further consideration as a potential detailed study alternative.
Express Lane Alternative	An express lane facilitates a faster flow of traffic by being separate from the other lanes that may have more turning options or slower vehicles (i.e. wide load vehicles).	Current and projected corridor traffic volumes will not support an express lane alternative.	Because the current and projected traffic volumes will not support the Express Lane Alternative, and therefore will not support the project purpose and need, the Express Lane Alternative was not given further consideration as a potential detailed study alternative.

Rehabilitation of the Lindsay C. Warren Bridge Alternative

This alternative was developed to consider the feasibility of having the roadway alternative alignments connect to an altered version of the existing Lindsay C. Warren Bridge. The Lindsay C. Warren Bridge was constructed in 1960, and is deficient in several ways: its deck, swing span and approach spans are in poor condition; its concrete beams and piles are spalling or splitting; its design is functionally obsolete because it does not meet the current lane, shoulder width, and railing crash standards; and FHWA and NCDOT have given the bridge a sufficiency rating of 36, in a range where 0 is critical and 100 is good. Bridges with sufficiency ratings of 50 are eligible for replacement.

Fixing the above inadequacies would equal a one-time fix that would likely last only ten years. Widening the bridge would cause the bridge to carry more weight than it was designed for, and would be an additional stress on its already poor support structure. Because of the current structural and functional inadequacies, and poor potential to widen the bridge deck, the Rehabilitation of the Lindsay

C. Warren Bridge Alternative was not given further consideration as a potential detailed study alternative.

Preliminary Build Alternatives

In addition to Build Alternatives assessed in detail in the DEIS, which are described in the next section, two additional alternatives also were evaluated and not selected for detailed study. They are shown in Figure 2-9 from the DEIS and are:

Tyrrell South and Dare South 1

This alternative would have placed a new four-lane, concrete center divided bridge over the Alligator River south of the existing bridge. This alternative was not selected for detailed assessment because it would cause substantial impact to coastal wetlands, take and fragment Alligator River National Wildlife Refuge lands, and pass across Outstanding Resource Waters. It would have avoided impacts to the East Lake community. As described in the section on alternatives assessed in detail, this opportunity was instead captured by the Dare Southern Bypass Alternative, which was suggested by the East Lake community.

Dare Northern Bypass Extension

This alternative would have extended the Dare Northern Bypass, which was selected for detailed evaluation, much farther east, completely bypassing the East Lake community. Although it would avoid the relocation of properties in East Lake, it would have substantial natural resource impacts, have the greatest wetland impacts, take substantial Alligator River National Wildlife Refuge lands, and cause substantial habitat fragmentation.

Build Alternatives Assessed in Detail in the DEIS

The Build Alternatives described here are all being evaluated in detail in the DEIS and are eligible for selection as the Preferred Alternative. The Build Alternatives represent widening US 64 from its current two-lane, painted center line divided roadway, to a four-lane, median divided highway. The median widths may be 23 feet or 46 feet wide in Tyrrell County, and 23 feet wide in Dare County (see Figures 2-2 and 2-3 from the DEIS). A new bridge over the Alligator River would be four-lanes, with a concrete center barrier (see Figure 2-5 from the DEIS).

Build Alternatives in Tyrrell County

Alternative 1A

This alternative widens US 64 on the south side to a four-lane divided highway, with a 23- or 46-foot-wide center median, through Tyrrell County (see Figure 2-7 from the DEIS).

Alternative 1B

This alternative widens US 64 on the north side to a four-lane divided highway, with a 23- or 46- foot-wide center median, through Tyrrell County (see Figure 2-7 from the DEIS).

Tyrrell County Bridge Approach (Tyrrell North)

This alternative would extend from the terminus point of the 1A or 1B alternatives to the bank of the Alligator River, and would include widening US 64 to the north, with a 23- or 46-foot-wide center median that would converge to a concrete center barrier on its approach to the bridge over Alligator River (see the yellow corridor on Figure 2-10 from the FEIS). This is the only bridge approach

alternative in Tyrrell County. The two Tyrrell South corridors were eliminated from detailed consideration as indicated above.

Build Alternatives in Dare County

Alternatives Across the Alligator River and in East Lake

A range of alternatives for crossing the Alligator River and passing through or around the community of East Lake are under consideration. Various alternatives combine together to create 13 "East Lake" combinations of alternatives. The first table below describes the alternative corridors available and the second table describes how these corridors could be combined in 13 possible "East Lake" alternatives.

Alternatives		Description of Alternative
Bridge Alternatives	Dare Northern Bypass Alternative (bridge component)	This alternative would span Alligator River north of the existing bridge and would have a four-lane, concrete center divided bridge deck (see Figure 2-14 from the DEIS).
	Dare North 1 (bridge) Alternative plus connectors to improvements in East Lake	This alternative would span Alligator River north of the existing bridge and would have a four-lane, concrete center divided bridge deck (see Figure 2-14 from the DEIS).
	Dare North 2 (bridge) Alternative plus connectors to improvements in East Lake	This alternative would span Alligator River north of the existing bridge and would have a four-lane, concrete center divided bridge deck (see Figure 2-14 from the DEIS).
Alternatives Through East Lake	Dare Northern Bypass (road component)	This alternative would extend from the eastern bank of Alligator River, would avoid East Lake by traversing the lands north of the community, and would connect to the western terminus points of the 5A or 5B Alternatives east of East Lake (see Figure 2-16 from the DEIS).
	Dare Southern Bypass	This alternative would extend from the eastern terminus point of any one of the above bridge alternatives, with the exception of Dare Northern Bypass, would avoid East Lake by traversing the lands south of the community, and would connect to the western terminus points of the 5A or 5B Alternatives east of East Lake (see Figure 2-16 from the DEIS).
	Dare North-Side Widening	This alternative would widen US 64 to the north through East Lake (see Figure 2-16 from the DEIS).
	Dare South-Side Widening	This alternative would widen US 64 to the south through East Lake (see Figure 2-16 from the DEIS).

The East Lake Alternatives (i.e. EL 1 through EL 13) shown in the table below are comprised of 13 different combinations of the alternatives in the above table (see Figure 2-18 from the DEIS) plus the Tyrrell North approach to the Alligator River Bridge.

Alternatives	13 Combinations of the Above Alternatives
EL 1	A combination of the Tyrrell North, Dare North 1, Dare North 1 Connector, and Dare North-Side Widening alternatives.
EL 2	A combination of the Tyrrell North, Dare North 1, Dare North 1 Connector, Dare North-Side Widening, and Dare South-Side Widening alternatives.

Alternatives	13 Combinations of the Above Alternatives
EL3	A combination of the Tyrrell North, Dare North 1, Dare North 1 Connector, and Dare South-Side Widening alternatives.
EL 4	A combination of the Tyrrell North, Dare North 1, Dare North 1 Connector, Dare South-Side Widening, and Dare South-Side Widening alternatives.
EL 5	A combination of the Tyrrell North, Dare North 1, Dare North 1 Connector, Dare Southern Bypass, and Dare South-Side Widening alternatives.
EL 6	A combination of the Tyrrell North, Dare North 1, Dare North 1 Connector, Dare Southern Bypass, and Dare North-Side Widening alternatives.
EL 7	A combination of the Tyrrell North, Dare North 2, Dare North 2 Connector, Dare Southern Bypass, and Dare South-Side Widening alternatives.
EL 8	A combination of the Tyrrell North, Dare North 2, Dare North 2 Connector, Dare Southern Bypass, and Dare North-Side Widening alternatives.
EL 9	A combination of the Tyrrell North, Dare North 2, Dare North 2 Connector, and Dare South-Side Widening alternatives.
EL 10	A combination of the Tyrrell North, Dare North 2, Dare North 2 Connector, Dare South-Side Widening, and Dare North-Side Widening alternatives.
EL 11	A combination of the Tyrrell North, Dare North 2, Dare North 2 Connector, and Dare North-Side Widening alternatives.
EL 12	A combination of the Tyrrell North, Dare North 2, Dare North 2 Connector, Dare North-Side Widening, and Dare South-Side Widening alternatives.
EL 13	A combination of the Tyrrell North and Dare Northern Bypass alternatives.

Alternative 5A

This alternative widens US 64 on the south side to a four-lane divided highway, with a 23-foot-wide center median through Dare County, east of East Lake (see Figure 2-13 from the DEIS).

Alternative 5B

This alternative widens US 64 on the north side to a four-lane divided highway, with a 23-foot-wide center median through Dare County, east of East Lake (see Figure 2-13 from the DEIS).

NCDOT's Preferred Alternative

NCDOT selected a LEDPA in February 2013 which is discussed in detail in the sections below. At that time, the US Army Corps of Engineers (USACE) and other state and federal environmental resource and regulatory agencies agreed that NCDOT's Preferred Alternative is the Least Environmentally Damaging Alternative (LEDPA) under the requirements of the federal Clean Water Act. It is expected that USACE will either concur with or make changes to the current LEDPA, or determine their own LEDPA within the next four months.

NCDOT's Preferred Alternative in Tyrrell County consists of the a four lane, 46 foot, depressed center median divided highway that will include by section and subsection:

- Subsection 1-1: North-Side Widening
- Subsection 1-2: South-Side Widening
- Subsection 1-3: North-Side Widening
- Subsection 1-4: North-Side Widening
- Subsection 1-5: North-Side Widening
- Subsection 1-6: North-Side Widening
- Section 2: Tyrrell North (part of the EL8 East Lake area alternative)

NCDOT's Preferred Alternative for a new Alligator River bridge is a four lane, concrete barrier divided roadway. The new bridge will be constructed north of the existing Lindsay C. Warren Bridge, and the bridge landings will be approximately 800 feet north of the existing Tyrrell County landing and approximately 1,000 feet north of the existing Dare County landing. The bridge is project Section 3 and the Preferred Alternative is Dare North 2 (part of of the EL8 East Lake area alternative).

NCDOT's Preferred Alternative in Dare County will consist of a four lane, 23 foot, raised center median divided highway that will include by section and subsection:

- Subsection 4-1: Dare North 2 connector to Southern Bypass as refined since the public hearings in April 2012 to avoid Alligator River National Wildlife Refuge (ARNWR) lands (part of EL8)
- Subsection 4-2: Southern Bypass as refined since the public hearings in April 2012 to minimize the impact to ARNWR (part of EL8)
- Subsection 4-3: North-Side Widening as refined since the public hearings in April 2012 to minimize the impact to ARNWR (part of EL8)
- Subsection 5-1: South-Side Widening as refined since the public hearings in April 2012 to minimize the impact to ARNWR and wetlands
- Subsection 5-2: North-Side Widening as refined since the public hearings in April 2012 to minimize the impact to ARNWR
- Subsection 5-3: Best Fit (North-Side Widening west of former Dare County landfill; at former landfill using landfill property on the north without encroaching on areas that contain buried waste)
- Subsection 5-4: South-Side Widening