



PROJECT INITIATION FORM

SPOT ID: H185357		STIP DESCRIPTION: Cape Fear Memorial Bridge Replacement	
DIVISION: 3	COUNTY: NEW HANOVER & BRUNSWICK	ROW DATE: N/A	LET DATE: N/A

	EXISTING FACILITY CHARACTERISTICS: Functional Classification: Freeway Existing No. of Lanes: 2 in each direction Existing Median: Yes Existing control of access: Full Control Posted Speed: 45 mph (Brunswick Co), 45 mph (New Hanover Co) AADT: 2019 - 60,900 vehicles per day (vpd) Right-of-Way Width: Bridge has a 54-foot width Structures: <input type="checkbox"/> Culvert(s) Number, Size(s) <input checked="" type="checkbox"/> Bridge(s) 54' width, approx. 3,033' length	PROPOSED FACILITY CHARACTERISTICS: Proposed Functional Classification: Freeway Proposed Typical Section: 6H – 6 Lane Divided (23' Raised Median) with Curb & Gutter, Sidewalk, and Sidepath, 35-45 mph Proposed No. of Lanes: 6 Addition of Median(s): Yes Proposed control of access: Full Control Design Speed: 40 mph/50 mph AADT: 2045 - 81,900 vpd Right-of-Way Width: 135-foot bridge width Structures: <input type="checkbox"/> Culvert(s) Number, Size(s) <input checked="" type="checkbox"/> Bridge(s) 1, approx. 135' width
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PROJECT DESCRIPTION: *Include project scope and location, including municipality and county.*

SPOT H185357 proposes to replace the Cape Fear Memorial Bridge, built in 1969. The bridge carries US 17/US 76/US 421 across the Cape Fear River between New Hanover and Brunswick Counties with terminations in the City of Wilmington on the east and Eagle Island (New Hanover and Brunswick counties) on the west. The existing bridge is a 4-lane steel center-span vertical-lift bridge. The proposed bridge would consist of a 6-lane median divided facility with a barrier-separated multi-use path. The project is needed to accommodate local population increases and truck traffic for the Port of Wilmington. A new bridge will improve traffic flow and provide bicycle/pedestrian connectivity across the river. Four design options were considered: two fixed spans with vertical clearances of 65 feet (Option 1) and 135 feet (Option 2), a movable span with a 65-foot vertical clearance (Option 3), and a movable span with a 65-foot vertical clearance and a railroad track component (Option 4). The Option 2 design and cost estimate also includes reconstruction of the US 17/US 74/US 421 interchange on Eagle Island. See Figure 1 for a Vicinity Map.



COST ESTIMATES:

Option Number	Construction Costs	Utility Relocation Costs	Right-of-Way Costs	Total Costs
Option 1 Fixed Span 65' Vertical Clearance	\$185.1 M	\$3.3 M	\$9.5 M*	\$197.9 M
Option 2 Total Costs	\$286.3 M	\$6.1 M	\$30.1 M	\$322.5 M
Option 2 Fixed Span 135' Vertical Clearance Bridge	\$213.6 M			
Option 2 Reconstruction of US 17/ US 74/ US 421 Interchange	\$44.0 M			
Option 2 Temporary Alignment	\$28.7 M			
Option 3 Movable Span 65' Vertical Clearance	\$475.7 M	\$3.3 M	\$9.5 M	\$488.5 M
Option 4 Movable Span 65' Vertical Clearance With Railroad Track Component	\$596.7 M	\$3.3 M	\$9.5 M	\$609.5 M

*A right of way estimate to determine property impacts to the Kinder Morgan terminal located north of the bridge has not been prepared. Ships access this terminal and would be unable to navigate under the fixed 65' vertical clearance in Option 1. This would necessitate the relocation of the business. Relocation costs for this business are expected to be extensive. If this option is selected a cost estimate will be requested.

FINDINGS AND RECOMMENDATIONS:

The Cape Fear Memorial Bridge Replacement Project is a high-profile project in a sensitive environmental and historic portion of North Carolina. The eastern portion of the project is located in downtown Wilmington with the possibility of business and residential relocations in a potential Environmental Justice (EJ) and low-income community. The project will impact the natural environment within the Cape Fear River, shoreline, and Eagle Island wetlands in Brunswick County. The Wilmington Local Historic District and the downtown business district of the City of Wilmington are not anticipated to have impacts. Archaeological resources in the Cape Fear River are not anticipated to have direct impacts. A southern extent of the National Register of Historic Places (NRHP) district is between Wright Street and Meares Street. Resources within the National Register (NR) boundary area that are also in areas under consideration for the project are designated as Surveyed Only. Based on the current express designs, Listed or Determined Eligible NR resources are not anticipated to be impacted.

A robust community outreach and public involvement process is recommended to address the effects of the project on minority and low-income communities and bicycle/pedestrian improvements. The Wilmington area has an extensive bicycle presence with many advocates for bicycling. During the public comment period for the *Cape Fear Moving Forward 2045* Metropolitan Transportation Plan 18 comments were received specifically requesting bike/pedestrian accommodations to cross the river between New Hanover and Brunswick counties.

DOCUMENT TYPE:	MERGER:	PROJECT TYPE:	FUNDING:	CONTRACT TYPE:
<input type="checkbox"/> CE/MCDC <input checked="" type="checkbox"/> EA/FONSI <input type="checkbox"/> EIS	<input checked="" type="checkbox"/> MERGER <input type="checkbox"/> NON-MERGER SCREENING DATE:	<input checked="" type="checkbox"/> DIVISION <input type="checkbox"/> CENTRAL	<input checked="" type="checkbox"/> Federal <input checked="" type="checkbox"/> State Funding source(s) to be determined	<input type="checkbox"/> Design Bid Build <input checked="" type="checkbox"/> Design Build <input type="checkbox"/> Construction Manager <input type="checkbox"/> Progressive Design Build

PROJECT HISTORY	Planning Studies: N/A
	SPOT Descriptions: N/A



	<p>Feasibility Studies:</p> <p>The 2017 <i>Wilmington Rail Realignment and Right of Way Use Alternatives Feasibility Study</i> identified three proposed alignments that would cross the Cape Fear River south of the existing Cape Fear Memorial Bridge.</p> <p>NCDOT’s 2019 <i>Cape Fear Crossing</i> Draft Environmental Impact Statement (DEIS) identified multiple alternatives to cross the Cape Fear River and alleviate congestion on the Memorial Bridge. One build alternative in this study considered upgrading US 17 which included the construction of a fixed-span bridge with additional capacity .</p>
	<p>Problem Statement:</p> <p>The bridge is functionally obsolete. Structure Safety Reports compiled for NCDOT indicate the bridge condition was rated Fair in February 17, 2016. February 23, 2018 the Deck, Superstructure and Substructure Condition Ratings were all described as Satisfactory. These elements were awarded a grade of 6¹ on a 0-9 point scale under the National Bridge Inventory Condition Ratings. Repair and maintenance costs are expected to increase as the bridge ages and traffic increases.</p>
PURPOSE AND NEED	<p>Purpose:</p> <p>The Wilmington Urban Area Metropolitan Planning Organization’s (<i>WMPO</i>) <i>Cape Fear Moving Forward 2045</i> Metropolitan Transportation Plan (2020) states “The purpose of this project is to improve congestion, mobility, connectivity, and required replacement of the Cape Fear Memorial Bridge.”</p>
	<p>Need(s):</p> <p>The Cape Fear Memorial Bridge replacement is needed to accommodate the high growth areas of New Hanover and Brunswick Counties and truck traffic increases that support the growing population, military preparedness, and port activities in southeastern North Carolina. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation.</p>
	<p>Supporting Data:</p> <p>According to The NC Office of State Budget Management (NCOSBM), the City of Wilmington’s estimated April 2010 population was 106,476 individuals. The July 2019 estimated population was 122,891 individuals, an increase of 16,415 or 15.4 percent.</p> <p>New Hanover County’s July 2020 projected population is 235,231 with 267,340 projected in July 2030, and 300,389 in July 2040². Between 2020 and 2040 the county is projected to grow by 65,158 individuals or 27.7 percent.</p> <p>NCOSBM estimated Brunswick County’s July 2020 population is 147,644 individuals. By July 2030 the population is projected to be 180,776 and 213,371 individuals by July 2040³. Between 2020 and 2040 the county is projected to grow by 65,727 individuals or 44.5 percent.</p> <p>The WMPO’s <i>Cape Fear Moving Forward 2045</i> Metropolitan Transportation Plan was adopted November 18, 2020. The Plan identified the subject project as “US76/421/17/17 BUS/Cape Fear Memorial Bridge Replacement”. The project is ranked 58th out of 79 projects in the Fiscally-Constrained Roadway Project</p>

¹ National Bridge Inventory Condition rating of 9 is Excellent Condition. A rating of zero indicates the bridge is beyond corrective action.

² Source: NC Office of State Budget Management https://files.nc.gov/ncosbm/demog/countygrowth_2040.html

³ Ibid



	<p>List. The project is identified as RW-127 with a planning year of 2040. The Plan describes the Cape Fear Memorial Bridge Replacement as a targeted infrastructure improvement. The Plan indicates the existing capacity of the bridge is 60,000 vehicles with a Daily Travel Volume (Vehicles Per Day) of 64,521. The crash rate is 217⁴. The Plan includes a proposed project cross section described as six 12-foot lanes, no median and a separated 10-foot multi-use path (MUP).</p>
<p>CONCEPTS BEING CONSIDERED</p>	<p>Four express concept bridge options were most recently proposed. All options have the same typical section which consists of a 15-foot multi-use path (MUP) on the north side of the bridge, 12-foot outside shoulders, three 12-foot travel lanes in each direction separated by a 22-foot median and inside shoulders. The existing eastern loop ramps at South Front Street would be slightly modified and tie into the current one-way pair of Wooster Street and Dawson Street in downtown Wilmington. The options differ by vertical clearance (65' or 135') and fixed or movable center span as described below:</p> <ul style="list-style-type: none"> • Option 1 – A fixed structure with a 65' vertical clearance. This option would have fewer impacts on downtown Environmental Justice (EJ) communities and businesses however, the clearance could limit the height of ships, cargo or equipment traveling under the bridge. Kinder Morgan, a petroleum products transporter, located north of the bridge could have a change in access due to restricting clearance to 65' fixed in Option 1. Currently, ships pass under the Cape Fear Memorial Bridge to access the Kinder Morgan terminal northeast of Downtown Wilmington. If a fixed bridge option is selected Kinder Morgan waterway access could be impacted. Additionally, right of way cost are expected to be extensive due to impacts of the Kinder Morgan terminal. • Option 2 – Similar to Option 1, but with a fixed structure having a 135-foot vertical clearance. Across the river, the bridging of Eagle Island wetlands would extend to a reconstructed US 17/US 74/US 421 interchange. A temporary alignment would be necessary for access during construction. Temporary pavement/structure would allow for construction activities within the existing interchange and would be removed at conclusion of the interchange reconstruction activities. • Option 3 – A movable structure with a 65' vertical clearance. This option would have more operational and maintenance costs than a fixed structure. Although the 65' vertical clearance will have fewer impacts on downtown EJ communities and businesses, the clearance could restrict ships, cargo or equipment traveling under the bridge. • Option 4 - A movable structure with a railroad component and 65' vertical clearance. Option 4 includes a separate bridge for single track rail extending on the south side of the vehicular bridge. A single substructure would accommodate both bridges. The bridges would have independent, movable center lifts. This option would have more operational and maintenance costs than a fixed structure. Although the 65' vertical clearance will have fewer impacts on downtown EJ communities and businesses, the clearance could restrict ships, cargo or equipment traveling under the bridge <p>The fixed span alternative would relieve congestion for both vehicular and marine traffic in addition to maintenance and operational savings. In recent years, NCDOT has replaced many movable bridges with fixed span bridges, particularly in the coastal areas such as Oak Island, Sunset Beach, and Surf City. See Figure 2 for Option 1-4 concepts.</p>

⁴ Crash Rate: Based on the number of crashes per 100,000 vehicles.



	<p>Concepts Dismissed and Why:</p> <ul style="list-style-type: none"> • Two parallel vehicular bridges - Maintenance would increase with two movable spans instead of one. • Bascule design – For the given design parameters, when the bridge is in the open position the bascule span counterweights could be under water. • Tunnel design - The cost of an immersed tunnel could potentially be almost double the cost of a bridge as a result of right of way requirements associated with the roadway profile that would be needed to locate the tunnel below the bottom of the required navigation channel; the approach tunnel and transition-to-grade depressed roadway sections would extend far to the east and west of the Cape Fear River. The resulting impacts to the human and natural environments would be extensive. Residential and business displacement could occur in Wilmington communities along with disturbances and potential loss of habitat. The Cape Fear River has archeological resources listed in the National Register that could be affected with dredging and excavation activities. A tunnel would be unable to safely accommodate bicycle and pedestrian users unless a special duct (or passage) is designed specifically for such use.⁵
<p>PUBLIC/ AGENCY COORDINATION</p>	<p>Anticipated Permits:</p> <p>US Army Corps of Engineers: Individual Section 404 Permit and Section 10 Permit. US Coast Guard Section 9 Permit. Bridge Permit Application to construct a new bridge. US Fish & Wildlife Section: Section 404 and Section 10 Permit Review and Section 7 Consultation NC Division of Water Resources: Section 401 Water Quality Certification NC Division of Coastal Management: CAMA Permit for both Brunswick and New Hanover Counties</p>
	<p>Federal Agency Involvement:</p> <ul style="list-style-type: none"> • Federal Emergency Management Agency (FEMA) • Federal Highway Administration (FHWA) • US Army Corps of Engineers (USACE) –co-lead federal agency • US Environmental Protection Agency (EPA) • US Fish and Wildlife Service (USFWS) • US Coast Guard (USCG) – co-lead federal agency
	<p>Public Involvement Strategy:</p> <p>Due to the sensitive nature of both the human and natural environment with this project the following actions will comprise a Public Involvement strategy:</p> <ul style="list-style-type: none"> • Early and continuing public involvement • Representation of downtown residents, business owners, Historic Wilmington Foundation, environmental advocacy groups, NC State Ports Authority, river pilots, bicycle advocates, and other stakeholders • Timely information using a variety of platforms • Reasonable public access to technical information • Adequate public notice of public involvement activities <p>See Figure 3 Resource Map for human and natural environment resources.</p>

⁵ US Department of Transportation Technical Manual for Design and Construction of Road Tunnels – Civil Elements, December 2009, https://www.fhwa.dot.gov/bridge/tunnel/pubs/nhi09010/tunnel_manual.pdf



Potential Merger Issues:

- Substantive new information that warrants a reevaluation of a milestone
- Temporary alignment construction on Eagle Island
- Bridge approach alignment
- New temporary alignment on Eagle Island
- Avoidance and minimization of impacts
- Compensatory mitigation

PRELIMINARY RESOURCE INVENTORY TABLE			
	Natural Environment	Human Environment	Physical Environment
	<input checked="" type="checkbox"/> Stream(s) <input checked="" type="checkbox"/> Wetland(s) <input type="checkbox"/> Water supply watersheds or critical area(s) <input checked="" type="checkbox"/> CAMA Area(s) of environmental concern <input checked="" type="checkbox"/> T/E species or potential habitat <input checked="" type="checkbox"/> Protected land(s) <input type="checkbox"/> FEMA resource(s) <input type="checkbox"/> Riparian buffer(s) Other	<input checked="" type="checkbox"/> Historic site(s)/district(s) <input checked="" type="checkbox"/> Cemetery(ies)/archaeological resource(s) <input checked="" type="checkbox"/> EJ community(ies) <input checked="" type="checkbox"/> Section 4(f) resource(s) <input checked="" type="checkbox"/> Section 6(f) resource(s) <input type="checkbox"/> Unusually large number of relocations Other	<input checked="" type="checkbox"/> Utilities <input checked="" type="checkbox"/> Hazardous material(s) <input type="checkbox"/> Active agriculture <input type="checkbox"/> Prime or important farmland soil <input type="checkbox"/> Air quality non-attainment or maintenance area <input checked="" type="checkbox"/> Type I noise project Other