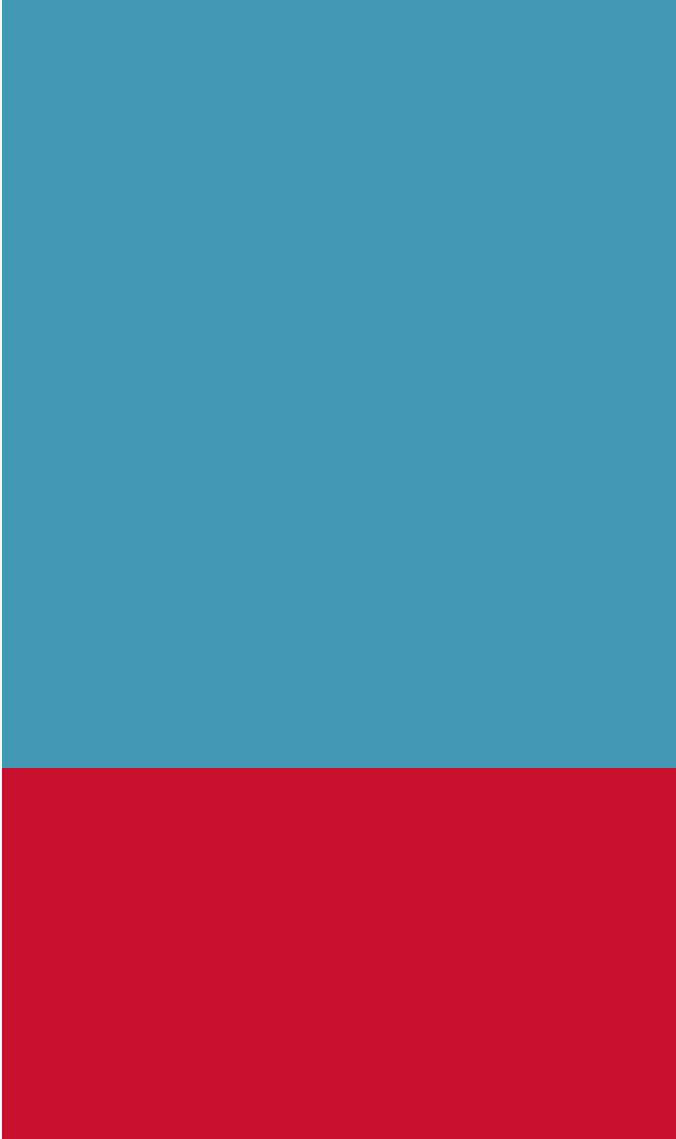




Appendix A

Navigation Impact Report and Associated Agency Coordination



Cape Fear Memorial Bridge Replacement Navigation Impact Report

NCDOT STIP Project HB-0039

Navigation Impact Report

New Hanover and Brunswick Counties

June 2024



Navigation Impact Report

The North Carolina Department of Transportation (NCDOT) proposes to construct State Transportation Improvement Project (STIP) HB-0039, which involves replacing and widening Bridge No. 640013 (Cape Fear Memorial Bridge) over the Cape Fear River on US 17/76/421 in Brunswick and New Hanover Counties. The Cape Fear River crossing is located 0.35 miles east of the NC 133 intersection with US 17/US 76/US 421 and is 23.5 miles above the entrance to the river at the bar. The existing bridge structure (#640013) is a truss lift span with reinforced concrete deck on steel and prestressed concrete girders. There are 35 spans along its length with the movable bridge portion spanning the Cape Fear River main channel.

The Cape Fear River has a channel 44 feet deep, over the entrance bar to a point just south of Southport, then 42 feet to the Lower Anchorage Basin at Wilmington, then 38 feet in the Upper Anchorage Basin, then 32 feet to Hilton Bridge, and finally 25 feet to the upstream limit of the federal project. The channel width is 400 feet with a 600-foot passing segment below the bridge. The average tidal range is less than 5 feet. Tides are mostly semi-diurnal (2 highs and 2 lows daily).

In the Cape Fear River, the set of the current is generally in the direction of the channel. The relative velocities of flood and ebb are related to the stage of the river. During some periods the flood at times can be overcome by the river current and the ebb is greatly increased. At low-river stages, a strong flood is experienced for a considerable distance above Wilmington, where it can run between 5 and 7 hours of ebb. Average current velocity ranges from 1.5 knots to up to 4 knots at the ebb, nearly equal downriver from Wilmington. The weather is mild with occurrences of fog not considered unusual nor are extreme winds. There were 12 weather restrictions with bridge closures in 2023. The area is subject to the passage of hurricanes and significant tropical storms over the years.

Pilotage is compulsory from the bar to the limit of navigation on the Cape Fear River, above Wilmington, for all foreign vessels and U.S. vessels under register in the foreign trade. Pilotage is optional for U.S. coastwise vessels that have on board a pilot licensed by the US Coast Guard. There are no formal harbor regulations for the Port of Wilmington. This includes vessels subject to pilotage that would pass under the existing or replacement bridge. There are several tugs available in the Port for vessel assistance. Last year (2023) there were an estimated 69 vessel bridge calls. Passage from the Port to the bar is approximately 3 hours. Vessels below the bridge calling on the Port can reach 1,200 feet in length with drafts of 42 feet.

An aerial photograph of the Port of Everett, Washington. The city of Everett is visible on the right side of the image, with its residential and commercial areas. The city is situated along the waterfront of the Skagit Bay. In the foreground, there are several large white storage tanks, likely for oil or other industrial liquids. A large bridge, the Everett-Ninth Avenue Bridge, spans the waterway. The water is a deep blue color. The surrounding area includes some industrial facilities and parking lots. The overall scene depicts a busy port city with a mix of urban and industrial development.



1.0 Purpose

The purpose of this report is to:

1. Provide a project overview.
2. Summarize the characteristics of the waterways upstream, downstream and within the project area.
3. Identify the users of the waterway.
4. Discuss potential impacts and improvements to navigation at the proposed bridge site.

2.0 Project Overview

2.1 Purpose and Need

The purpose of the proposed project is to replace the functionally-obsolete US 17/74/421 bridge over the Cape Fear River (Cape Fear Memorial Bridge) and to address the forecasted capacity needs of the bridge corridor in the design year. The project 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 part of the Strategic Highway Network (STRAHNET) for military transportation, is a NCDOT Identified Coastal Evacuation Route, and is on the Federal Highway Administration (FHWA) Primary Highway Freight System (PHFS). Annual repair and maintenance costs related to the bridge deck and lift mechanics are expected to increase as the bridge ages and traffic increases. Traffic delays due to repair and maintenance activities and the operation of the bridge lift cause congestion and make travel times unreliable. The current structure lacks bicycle and pedestrian facilities to support alternative modes of transportation.

2.2 Description of Existing Bridge

The existing bridge carries four lanes, two lanes in each direction. The bridge crosses over the Cape Fear River at 34°13'41" N, 77°57'8" W, approximately a third of a mile south from where the Northeast Cape Fear River empties into the Cape Fear River (34°14'27"N, 77°57'20"W). The bridge serves the City of Wilmington and is one of only two roadways into Downtown Wilmington from the west. The subject bridge is located at the southern end of Downtown Wilmington. The other bridge (US 74 / NC 133 Isabel Holmes Bridge) servicing Downtown Wilmington is located at the northern end. The Bridge is part of the Strategic Highway Network (STRAHNET) for military transportation, and is a NCDOT Identified Coastal Evacuation Route.

The navigable channel under the bridge is perpendicular to the bridge piers. The channel spanned by the bridge has documented clearances of 408 feet horizontally and 65 feet vertically (closed). The vertical clearance is approximately 135 feet vertically above mean high water when the bridge is in the open position. Refer to **Table 1** for more existing dimensions and clearances.

Cape Fear Memorial Bridge is currently a movable bridge with on-demand opening to allow larger vessels to navigate along the channel between 6:00 PM and 6:00 AM with additional lift times at approximately 10:00 AM and 2:00 PM. The bridge monitors VHF radio frequencies for lift requests.

Table 1: Existing Bridge Dimensions and Clearances

Bridge Location	34.2280°N 77.9521°W
Vertical Clearance (open)	135 feet
Vertical Clearance (closed)	65 feet
Horizontal Clearance	408 feet
Length of Bridge	3,033 feet
Width of Bridge	54 feet

2.3 Project Description

NCDOT performed a preliminary alternatives analysis from 2023 through 2024. The process evaluated several design alternatives based on a combination of traffic analysis results and due to constructability constraints in the study area. Three detailed study alternatives are being carried forward and are discussed further as part of this report. The three alternatives are as follows:

- Alternative A – This includes a movable span 65-foot vertical clearance closed / 135-foot when raised (open)
- Alternative B – This includes a fixed span 135-foot vertical clearance with US 74 trumpet interchange improvements
- Alternative C – This includes a fixed span 100-foot (+/- 35 feet to be determined by the USACE 408 Section and USCG) vertical clearance with US 74 trumpet interchange improvements

Each alternative includes the following typical section: three 12-foot lanes in each direction separated by a 22-foot median (including two 10-foot inside shoulders and a two-foot median barrier), 15-foot multi-use path on the north side of the bridge, and 12-foot outside paved shoulders. This amounts to an overall bridge width of approximately 133 feet. Refer to **Appendix A** for each of the alternative concepts. Based on the current project schedule, it is anticipated that the approved preferred alternative will be selected in Q4 (Fall/Winter) of 2024.

2.4 Environmental Summary

The lead federal agency for the National Environmental Policy Act (NEPA) compliance phase of the project is the Federal Highway Administration (FHWA). The proposed bridge project will be reviewed with an expected Environmental Assessment (EA)/Finding of No Significant Impact (FONSI). The proposed bridge does not violate the provisions of the Marine Mammal Protection Act. A Hydraulic Planning Report was completed in March of 2024. These documents will be finalized during the final design phase of the project. Other federal agencies with jurisdiction over this project are the United States Army Corp of Engineers (USACE), National Oceanic and Atmospheric Administration (NOAA), U.S. Environmental Protection Agency, and the U.S. Fish and Wildlife Service. The necessary permits and approvals will be completed during the final design phase of the project.

3.0 Data Collection

The primary source of waterway user data was from North Carolina State Ports Authority (NCSPA) and NCDOT. Data was also gathered via outreach with Cape Fear Pilots, Tribute Companies, Moran Towing Company, USS Battleship North Carolina, and local repair shops and marinas (Wilmington Boat Slips, Port City Marina, Off The Hook Yacht Services, Marine Mechanix, Cape Fear Boat Works, and Sawmill Point Marina), as well as using public online

databases (sources included in each section, as relevant). See **Appendix B** for direct outreach information. Additional information was obtained through US Coast Pilot Number 4 published by NOAA.

4.0 Present Governing Bridges or Aerial Structures on the Waterway

4.1 Identify all bridges upstream and downstream of the proposed bridge site and their existing horizontal and vertical clearances to determine the existing minimum horizontal and vertical clearances (including overhead transmission line clearances). Provide in table format.

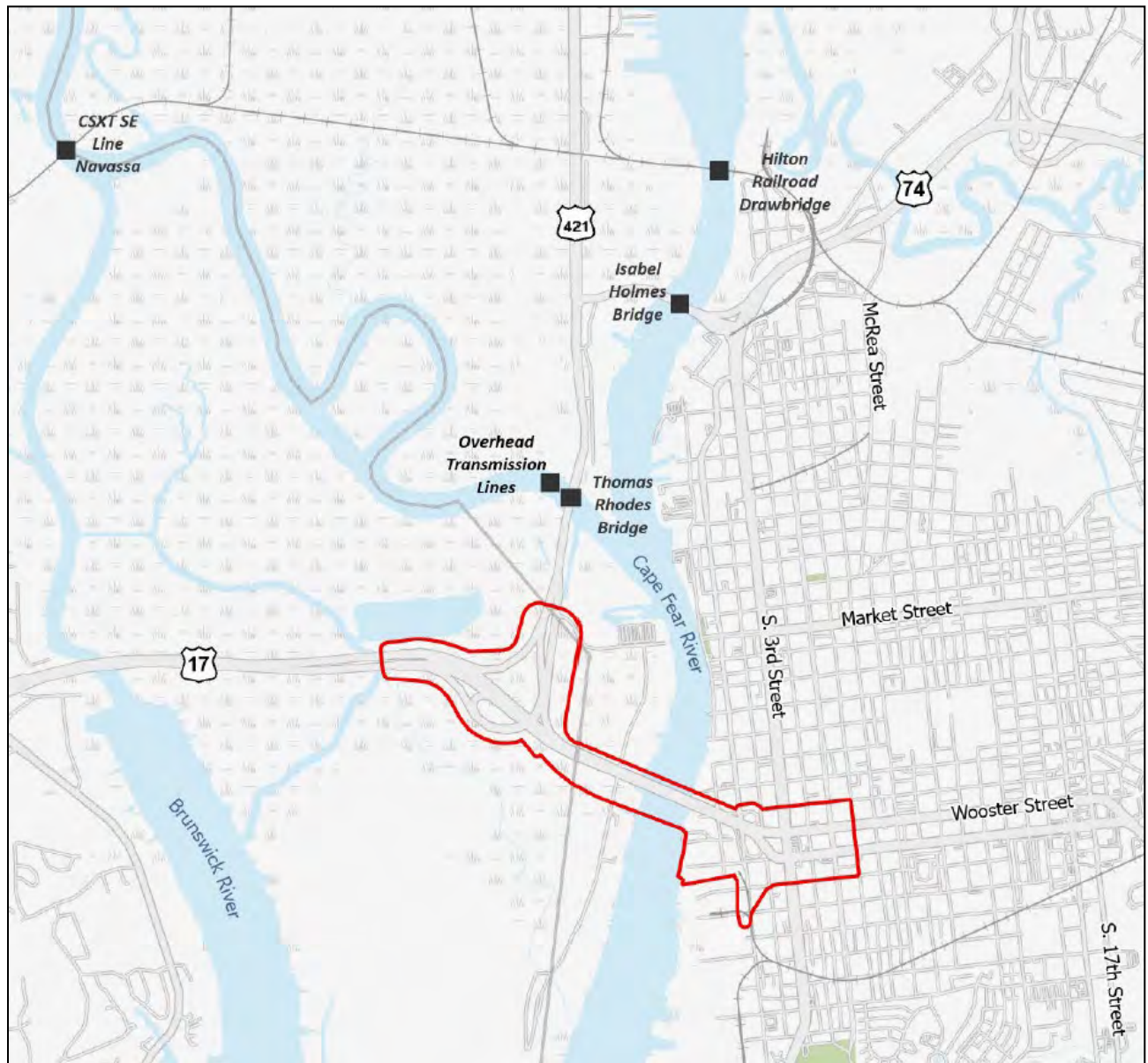
Refer to **Table 2** and **Figure 2** for a description of each existing structure. The confluence with the Atlantic Ocean is located approximately 25 miles downstream of the existing bridge location.

It should be noted that the City, in coordination with the Federal Railroad Administration (FRA), is proposing a Rail Realignment Project which is studying the realignment of the existing CSX freight rail line between Navassa (Davis Yard) and the Port of Wilmington. Two alternatives are being considered. Alternative 2A includes a parallel movable (vertical lift) span railroad bridge with a fixed span highway bridge and Alternative 2B includes a combined highway/railroad bridge structure with a movable (vertical lift) span railroad bridge underneath a fixed span highway bridge. According to the City's project webpage, a NEPA study is currently underway for the project. NCDOT is conducting ongoing coordination with the City on the project, and preliminary conversations indicate a proposed horizontal clearance of 250 feet through the main navigation span of the bridge would be sufficient. Because this bridge is not present at the preparation of this navigational study, it was not listed in the below table.

Table 2: Present Governing Bridges or Aerial Structures

Facility Carried	Feature Intersected	Approximate Waterway Mile Point	Channel Depth (MHW)	Vertical Clearance (MHW)	Horizontal Clearance
US 421 / 74 / NC 133 (S Thomas Rhodes Bridge)	Cape Fear Above Wilmington	30	25'	55'	120'
US 74 / NC 133 (Isabel Holmes Bridge)	Northeast Cape Fear River	1	43'	40' closed Unlimited open	200'
CSXT SE Line Navassa	Cape Fear Above Wilmington	34	12'	9' closed Unlimited open	102'
CSXT Hilton Railroad Bridge	Northeast Cape Fear River	1.5	38'	4' closed Unlimited open	200'
Overhead Transmission Line	Cape Fear Above Wilmington	30.3	25'	125'	Full Channel

Figure 2: Present Governing Bridges or Aerial Structures



4.2 Does the proposed bridge(s) match (or is greater than) the navigational clearance of the existing structures on the waterway?

There are currently three (3) detailed study alternatives being considered for the proposed bridge, as follows:

- Alternative A – This includes a movable span 65-foot vertical clearance closed / 135-foot when raised (open)
- Alternative B – This includes a fixed span 135-foot vertical clearance with trumpet interchange improvements
- Alternative C – This includes a fixed span 100-foot (+/- 35 feet to be determined by the USACE 408 Section and USCG) vertical clearance with trumpet interchange improvements

Vertical Clearance: Listed above (varies per alternative)

Horizontal Clearance: Approximately 450 feet

Refer to **Appendix A** for each of the respective bridge designs.

The existing Cape Fear Memorial Bridge by comparison has a vertical lift span with a horizontal navigation clearance of 408 feet and vertical clearance of 65 feet at rest or 135 feet with the lift span raised.

4.3 What is the most restrictive horizontal clearance on the waterway? (This may be a fixed bridge downstream/upstream of the proposed structure, a low hanging powerline downstream/upstream of the bridge(s), or it may be some other structure that limits horizontal clearance. Sometimes the existing to-be-replaced bridge(s) is the most restrictive structure.

Two channels feed into the Cape Fear River at the location of the proposed bridge (the Cape Fear River and the Northeast Cape Fear River). The limiting structure along the Cape Fear River is the CSXT SE Line Navassa and the limiting structure along the Northeast Cape Fear River is the Isabel Holmes Bridge. Overall, the CSXT SE Line Navassa has the more restrictive horizontal clearance; however, vessels may approach the Cape Fear Memorial Bridge via the Northeast Cape Fear River, so both structures are listed below.

Upstream of the proposed bridge location, via the Cape Fear River northwest channel, the structure which creates the most restrictive horizontal clearance is the CSXT SE Line Navassa.

a. Mile point: 34

b. Horizontal clearance: 120 feet

Upstream of the proposed bridge location, via the Northeast Cape Fear River channel, the structure which creates the most restrictive horizontal clearance is the Isabel Holmes Bridge.

- a. Mile point: 1
- b. Horizontal clearance: 200 feet

There is not a downstream structure from the proposed bridge location that would impact horizontal clearance.

4.4 What is the most restrictive vertical clearance on the waterway? (This may be a fixed bridge downstream/upstream of the proposed structure, a low hanging power line downstream/upstream of the bridge(s), or it may be some other structure that limits vertical clearance. Sometimes the existing to-be-replaced bridge(s) is the most restrictive structure.

Two channels feed into the Cape Fear River at the location of the proposed bridge (the Cape Fear River and the Northeast Cape Fear River). The limiting structure is the CSXT Line for both the Cape Fear River and the Northeast Cape Fear River channels. Vessels may approach the Cape Fear Memorial Bridge via the Northeast Cape Fear River, so both structures are listed below. Since these bridges are bascule span (drawbridge), with an unlimited vertical clearance when open, other structures were considered along the waterway; however, it was noted that large vessels may not reach these other structures based on the narrow horizontal clearances.

Cape Fear River:

- a. Mile point: 34
- b. Vertical clearance (bridge in closed position): 9 feet
- c. Vertical clearance (bridge in open position): Unlimited

Northeast Cape Fear River:

- a. Mile point: 1.5
- b. Vertical clearance (bridge in closed position): 4 feet
- c. Vertical clearance (bridge in open position): Unlimited

The downstream structure that would impact vertical clearance is an overhead transmission line.

- a. Mile point: 21.2 (Cape Fear River)
- b. Vertical clearance (bridge in closed position): 216 feet

4.5 Will the proposed bridge(s) become the most restrictive/obstructive structure across the waterway?

No, the proposed bridge will not become the most restrictive structure on the waterway. It should be noted that it will however be the most restrictive structure on the waterway as it relates to

downstream structures. There is not a downstream structure from the proposed bridge location that would impact horizontal clearance. There is an overhead power cable with a clearance of 216 feet over the main channel that crosses the Cape Fear River about 18.8 miles above the mouth. The most restrictive upstream structure is the CSXT SE Line Navassa across the Cape Fear River northwest channel or Isabel Holmes Bridge across the Northeast Cape Fear River channel.

5.0 Waterway Characteristics

(All domestic bridge navigational clearances should be stated in linear feet in decimal form vs. feet and inches. All international bridge navigational clearances should be state in linear unit of measure as well as the metric equivalent).

5.1 Various water stages: (Datum that is used).

The various waterway stages are listed in **Table 3**. All data values are relative to North American Datum of 1988 (NAVD88). Elevations are from National Oceanic and Atmospheric Administration (NOAA) station 8658120 in Wilmington, NC near the existing Cape Fear Memorial Bridge, in the vicinity of the US Corps of Engineers, Eagle Island maintenance yard and docks.

Table 3: Waterway Characteristics

Waterway Stage		Elevation (NAVD88)
MHHW	Mean Higher – High Water	2.08 feet
MHW	Mean High Water	1.83 feet
MTL	Mean Tide Level	-0.31 feet
MSL	Mean Sea Level	-0.16 feet
DTL	Mean Diurnal Tide Level	-0.26 feet
MLW	Mean Low Water	-2.44 feet
MLLW	Mean Lower-Low Water	-2.60 feet
NAVD88	North American Vertical Datum of 1988	0.00

5.2 Natural flow of the waterway including currents, waterway velocity, water direction, and velocity fluctuations (seasonal, daily, hourly, etc.), that might affect navigation.

The water has been at its highest during the weeks following Hurricanes Matthew and Florence when the river would swell during the tide cycles. Water travels north-south along this section of the Cape Fear River with an overall pattern generally traveling east-west. Tides are typically semi-diurnal and micro-tidal. The water has both ebb and flood tidal flows.

NOAA performed a Cape Fear River, NC survey in 2016 with results published in June 2019. The report made use of numerous observation stations for data collection, one of which was CFR1605 located just north of the proposed bridge location. Speed and timing relative to the tidal day of mean maximum ebb current (MEC) and mean maximum flood current (MFC) at the near surface were:

MFC = 81.3 cm/s (1.58 knots)
MEC = 106.6 cm/s (2.07 knots)

Source:

https://tidesandcurrents.noaa.gov/publications/Techrpt_089_Cape_Fear_Tech_Report_Final.pdf

5.3 Width of the waterway at bridge site.

The width of the waterway at the considered bridge site is approximately 1,000 feet bank to bank. The width of the navigational channel is approximately 450 feet wide at the bridge site. Per USACE GIS, for the Anchorage Basin reach, the minimum width is 448 feet, and the maximum width is 548 feet for the Anchorage Basin.

5.4 Depth of the waterway and elevation fluctuations at bridge site: [List the depth at each waterway bridge stage (ex. Range of tides, average high water elevation, etc.)].

The channel is surveyed by USACE. The latest hydrographic survey from February of 2024 is attached in **Appendix C**. Generally, the depths range from 38 feet to 42 feet, within the proposed bridge site area. According to hydrographic surveys from 2023, the upstream depth of the channel at the existing Cape Fear Memorial Bridge is 32 feet and downstream is 38 feet. Waterway elevations vary 4.43 feet from MLW to MHW.

5.5 Waterway layout and geometry: (For example, is there a dam or lock, does the elevation of the approach impact the required bridge(s) clearance?)

There are no dams, locks, elevation changes or other considerations which would materially impact the required bridge clearances. The confluence of the Cape Fear River and the Northeast Cape Fear River is approximately 4,500 feet to the north. The Cape Fear River meets Brunswick River approximately 4 miles to the south. The Atlantic Ocean is approximately 26 miles to the south along the waterway.

The NCSPA in coordination with the USACE is currently studying alternatives to improve navigation of the Wilmington Harbor, as part of the Wilmington Harbor Navigation Improvement Project. The project proposes enhancing the navigational channel to allow deep-draft vessels to navigate to the Port and could potentially affect navigation horizontal and vertical clearances associated with Cape Fear Memorial Bridge.

5.6 Channel and waterway alignment: Location of the channel(s).

The proposed bridge would cross a federal channel maintained by the USACE, the Cape Fear River. The Cape Fear channel has a typical width of approximately 400 feet within the vicinity of the bridge based on conversations with the Cape Fear Pilots Association. Also based on these

conversations, it is noted that there are 6 miles of passing lanes to the south of the bridge with a channel width of approximately 600 feet. There is a turning basin channel width of approximately 1,500 feet to the south of the bridge. Refer to the attached notes based on the coordination with the Cape Fear Pilots Association. **Appendix A** includes current preliminary bridge designs with approximate locations.

5.7 Other limiting factors: (For example, bends in the waterway within one-half mile of the project site, hindrances to free navigation, fog, hydraulics, etc.).

There are not any bends in the waterway within one-half mile of the project site to the south. There is a northwest bend that begins approximately a third of a mile north of the proposed bridge locations. Refer to **Appendix A** for a visual representation of the bend. The bend is not expected to limit navigation along the waterway at any of the proposed bridge locations. Additionally, there are no other anticipated limitations or hindrances to free navigation within the vicinity of the proposed bridge.

6.0 Do vessels that engage in emergency operations (i.e., law enforcement, fire, rescue, emergency dam repair, etc.), national defense activities (i.e. cruisers, fuel barges, munitions ships, etc.) or channel maintenance (i.e., dredges, dam and levee repair, etc.) operate on the waterway? If yes, describe the vessels and provide the following information:

6.1 Does levee maintenance, bridge work (other bridges), channel maintenance and emergency operations upstream of bridge require certain vessels to transit the waterway?

No, per coordination with the NCDOT, USACE, USCG and other agencies.

6.2 Does the proposed bridge(s) impact USCG and/or other government vessels' ability to transit the bridge(s) to conduct mission essential functions (icebreakers, patrols, etc.)?

No, per coordination with USCG.

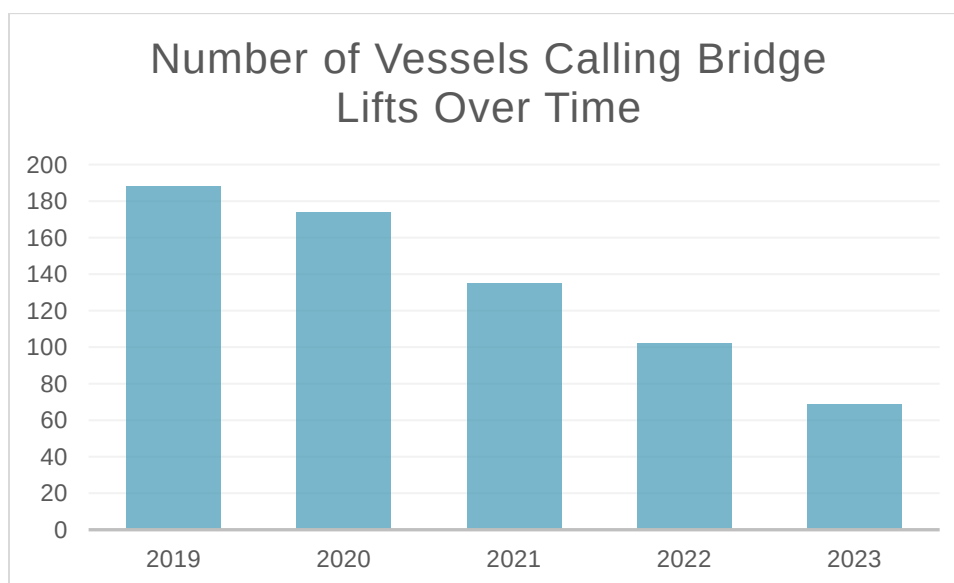
6.3 Vessels using the waterway during the proposed bridge(s) lifespan:

Based on the vessel logs provided by NCDOT, there has been a steady decline in bridge lifts from 2019 to 2023 (**Appendix D**). Refer to **Figure 3** below for a graphic representation of vessels calling bridge lifts over time. During 2019, there were 381 openings accommodating 188 vessels

(many of the openings were for maintenance or training); whereas, during 2023, there were only 168 openings serving 69 vessels. The Kinder Morgan site was sold in June of 2023, which may have contributed to the sharp decline in vessels taller than 65-feet (a 63% decrease since 2019 or a 32% decline between 2022 and 2023 alone). If the old Kinder Morgan site were to accommodate a similar use as Kinder Morgan in the future, it is expected that the number of vessels calling bridge lifts would increase. A deeper channel could also encourage more activity, as well as larger ships; however, while there are plans to deepen the channel to the south of the bridge, these channel modifications are not expected to extend as far north as Cape Fear Memorial Bridge.

Based on a call with Port City Marina on May 3, 2024, they currently have 111 wet slips and do accommodate some sailboats. While they were unsure if they have had any sailboats with masts greater than 100 feet in height, they did mention that they recently had a sailboat with an 80-foot mast. Cape Fear Marina has 75 slips and can accommodate sailboats up to 100 feet. Cape Fear Marina is serviced by Off The Hook Yachts. Sawmill Point has 37 slips and is also serviced by Off The Hook Yachts. Based on conversations with Off The Hook Yachts, the boats and sailboats that they have serviced and/or stored range from 50-150 feet long, and the heights vary greatly, but it is not believed that any exceed 100 feet in height. See **Appendix B** for direct outreach information.

Figure 3: Vessel Calls per Year



USCG 26160:

- i. Vessel name: Trailerable aids to navigation boat, CG 26160
- ii. Registration/documentation numbers: CG 26160
- iii. Vessel type: Outboard
- iv. Vessel owner contact information: USCG ANT Oak Island

- v. Primary vessel mooring location (include waterway milepoint, if known): 300A Caswell Beach Rd., Oak Island, NC 28465
- vi. Vessel overall length: 29' 7"
- vii. Vessel beam: 8' 4"
- viii. Vessel draft (depth of hull below waterline at full load): 2' 9"
- ix. Vessel air draft (height of the highest fixed point of the vessel above the waterline, when empty): 9'

USCG CGC SMILAX Vessel:

- i. Vessel name: SMILAX
- ii. Registration/documentation numbers: Call sign NRYN
- iii. Vessel type: Inland Construction Tender
- iv. Vessel owner contact information: Coast Guard District Five
- v. Primary vessel mooring location (include waterway milepoint, if known): SFO Fort Macon: 2301 E Fort Macon Rd, Atlantic Beach, NC
- vi. Vessel overall length: 170'
- vii. Vessel beam: 30'
- viii. Vessel draft (depth of hull below waterline at full load): 6'
- ix. Vessel air draft (height of the highest fixed point of the vessel above the waterline, when empty): 36' fixed, 54' unfixed at mast

USCG Oak Island Vessel:

- x. Vessel name: 29' RBS-II
- xi. Registration/documentation numbers: CG 29216, CG29217
- xii. Vessel type: Enclosed Cabin, outboards
- xiii. Vessel owner contact information: USCG Station Oak Island
- xiv. Primary vessel mooring location (include waterway milepoint, if known): 300A Caswell Beach Rd., Oak Island, NC 28465
- xv. Vessel overall length: 31' 7"
- xvi. Vessel beam: 8' 5"
- xvii. Vessel draft (depth of hull below waterline at full load): 2' 9" trimmed down, 1' 10" trimmed up
- xviii. Vessel air draft (height of the highest fixed point of the vessel above the waterline, when empty): 7' 10"

US Army's Sunny Point, NC firefighting and rescue vessel:

- i. Vessel name: Sunny Point
- ii. Registration/documentation numbers: Vessel # CG 1167165, Galdding-Hearn Shipbuilding Hull Number 387
- iii. Vessel type: Unclassified vessel, Aluminum, Jet Propulsion
- iv. Vessel owner contact information: US Army, Military Ocean Terminal Sunny Point (MOTSU), Fire & Emergency Services Division /Chief Michael Scott / 6280 Sunny Point Rd. Southport, NC 28461 / 910-457-8218

- v. Primary vessel mooring location (include waterway milepoint, if known): MOTSU Boat Basin / Buoy # 33 Cape Fear River
- vi. Vessel overall length: 82' 6"
- vii. Vessel beam: 20' 6"
- viii. Vessel draft: 4' 2"
- ix. Vessel air draft: 37' 3"
- x. Does the vessel have limited maneuverability due to inherit design or mode of operation? To operate one fire pump the vessel requires 6' of draft, 10' of draft to operate two pumps

6.4 Will the proposed bridge(s) provide the horizontal and vertical clearances for the safe, efficient passage of the largest of these vessels? Why?

The bridge Alternative A (movable), Alternative B (fixed at 135 feet vertical), and Alternative C (fixed at 100 feet [+/- 35 feet to be determined by the USACE 408 Section and USCG]) would all be expected to provide the horizontal and vertical clearance for the safe, efficient passage of these vessels, as they accommodate each of the vessels shown in the above table. Alternative A and Alternative B also exceed the dimensions of the limiting structures to the north along each the Cape Fear River and the Northeast Cape Fear River. Refer to **Appendix A** for each of the respective bridge designs.

It should be noted that the previous Kinder Morgan site, located at 2005 N 6th St, was sold to Tribute Companies Inc in June of 2023. This industrial site was previously used to store petroleum and specialty chemicals and was accessible for loading and unloading services via vessel, barge, tank truck and tank car. The site was previously owned by ChemServ Inc prior to Kinder Morgan purchasing the site in 2008. Within the vicinity of the site, the Cape Fear River has a depth of 31 feet. The dock at the site accommodates up to a 600-foot vessel. The future user of the site is currently unknown. Based on discussions with Tribute Companies Inc, the site may serve a similar use to Kinder Morgan, and it is assumed that it will have the same clearance needs as the Kinder Morgan site previously had if it includes a similar use. See **Appendix B** for direct outreach information.

Additionally, based on conversations with adjacent repair shops, it was noted that the existing movable bridge does provide constraints in the navigation of vessels to/from shops based on the two daily opening times from 6:00 AM to 6:00 PM (outside of the on-demand period between 6:00 PM and 6:00 AM).

Alternative B would be expected to provide the least limitation to the navigation along this waterway, because Alternative A would still need to be lifted and closed, similar to current operations. Alternative C, while anticipated to accommodate existing vessels, may not necessarily accommodate future vessels depending on future uses to the north of Cape Fear Memorial Bridge (i.e. the old Kinder Morgan site).

6.5 If no, estimate the number of vessels in each of the above categories unable to pass through the proposed bridge(s). Give the name, length overall (LOA), beam, draft and height of highest fixed point above the waterline for vessels affected by the bridge(s).

N/A

6.6 Can these vessels be modified (i.e., folding mast, relocation or equipment, etc.) without decreasing their respective response times? If so, name the vessels.

N/A

6.7 If modifications are feasible, state the name of the vessel(s), their trip frequency, the necessary modifications, the cost of the modification(s) and who will pay for them (i.e., vessel owner, applicant, other).

N/A

6.8 Provide any additional information concerning the potentially impacted or burdened users of the waterway as well as the future use of the waterway.

Please refer to the sections above. In addition, a discussion with the Operations Manager of the USS NORTH CAROLINA regarding any potential for moving the vessel in the future for drydocking or repair indicated the vessel would most likely never be moved and any repairs would take place at its current location.

7.0 Has the United States Corps of Engineers (USACE) completed or does it plan to complete a federal navigation project on the waterway?

If yes, provide the following information:

Yes, USACE has completed a federal navigation project on the waterway.

7.1 Project name, downstream/upstream milepoints, depth, type of project, scope, status of project and other limiting factors.

Project Name: Wilmington Harbor

Channels: (UPPER) ANCHORAGE BASIN [38 FOOT MLLW]

32 FOOT PROJECT SOUTH HWY 74-76 BRIDGE TO BATTLESHIP
Reach 1, 2, 3, 4 & 5

32 FOOT PROJECT NORTH HWY 133 BRIDGE TO HILTON BRIDGE
Reach 1, 2, 3, & 4

25 FOOT PROJECT
Reach 4

Milepoints: See above
Depth: See **Appendix C**
Type: Federal Navigation Channel
Status: Complete

7.2 Whether there is/was a “design vessel” used in planning the channel? What is/was the design vessel? Was the design vessel reviewed by the Coast Guard?

No “design vessel” was identified for the navigation project.

7.3 The following specification of the vessel for which the navigation project is or will be designed: LOA, beam, draft and height of the highest fixed point above waterline.

N/A

7.4 Will the proposed bridge(s) provide the horizontal and vertical clearances necessary for the safe, efficient passage of the vessel for which the navigation project was designed?

N/A

7.5 If so, can the vessel be modified to clear the proposed bridge(s) without substantially increasing operating costs?

N/A

7.6 If modifications are feasible, state the necessary modifications, costs of any modifications(s), who will pay for the modifications.

N/A

7.7 Are the projected changes in the waterway usage based upon anticipated waterway improvement projects?

There are no projected changes for waterway usage based upon any waterway improvement projects.

7.8 Does the proposed bridge impact USACE ability to transit the bridge in a Federal project channel?

No, the proposed bridge will not impact USACE ability to transit waterway.

8.0 Describe the present and prospective recreational navigation:

8.1 Will the proposed bridge(s) affect the safe, efficient movement of any segment of the present or prospective recreational fleet operation on the waterway? If yes, provide the following information:

Based on direct outreach to stakeholders along the waterway (see **Appendix B**), Alternative A, Alternative B, and Alternative C are not expected to affect the safe, efficient movement of any segment of present or prospective recreational operations on the waterway. Consideration for lift times should be given under the moveable design (Alternative A) to allow efficient navigation for larger vessels.

Sailboats accounted for a large proportion of recreational vessel types in the most recent 5-year period, which is relevant to this study since they typically require greater vertical navigational clearances. Of the 69 total lifts required for recreational vessels at the CFMB in 2023, 67 (97%) were for sailboats. See **Appendix D** for a copy of the bridge lift data.

Analysis of AIS data revealed that there are no regular recreational users of the waterway which are equipped with AIS technology.

9.0 Describe the present and prospective commercial navigation and the cargoes moved on the waterway:

9.1 Will the proposed bridge(s) affect the safe, efficient movement of any segment of the present or prospective commercial fleet operating on the waterway? If yes, provide the following information:

Based on direct outreach to stakeholders (see **Appendix B**) along the waterway, the proposed bridge will not affect the safe, efficient movement of any segment of present commercial fleet operations on the waterway; however, it may impact prospective commercial operations (i.e. the old Kinder Morgan site). There are also a number of passenger vessels and recreational vessels that make use of the subject portion of the waterway; however, these vessels are not expected to be limited by any of the proposed alternative bridge designs. See **Appendix E** for the registered ships in Wilmington.

10.0 Identify the name and contact information for marine facilities located within a 3-mile radius of the proposed project (public boat ramps, marinas or major docking facilities, boat repair facilities, etc.):

Marinas:

Port City Marina
10 Harnett St
Wilmington, NC 28401
(910) 251-6151
taylor@portcitymarina.com
<https://portcitymarina.com/>

Sawmill Point Marina
1015 Nutt St
Wilmington, NC 28401
(910) 772-9277
<https://sawmillpoint.com/>

Cape Fear Marina
1701 Jel Wade Dr
Wilmington, NC 28401
(910) 762-1256
capefearmarina@gmail.com
<https://www.capefearmarinanc.com/>

Wilmington Boat Slips
10 Grace St
Wilmington, NC 28401
(910) 620-9904
will@wilmingtonboatslips.com
<https://www.wilmingtonboatslips.com/>

Wilmington City Docks
Downtown Riverwalk
Wilmington, NC 28401
(910) 341-4520
douglas.lewis@wilmingtonnc.gov
<https://www.wilmingtonnc.gov/>

Smith Creek Boatyard
805 Cornelius Harnett Dr
Wilmington, NC 28401
(910) 343-8403
harborlinesllc@aol.com
<http://www.smithcreekboatyard.com/>

Public Boat Ramp:

Dram Tree Park Boat Ramp
602 Surry St
Wilmington, NC 28401
(910) 341-7852
april.ramsey@wilmingtonnc.gov
<https://www.wilmingtonnc.gov/departments/parks-recreation/parks>

Boat Repair:

Off the Hook Yacht Services
1701 Jel Wade Dr STE 16
Wilmington, NC 28401
(910) 772-9277
info@offthehookys.com
<https://www.offthehookyachts.com/>

Carolina Coastal Marine
405 Cornelius Harnett Dr STE 1
Wilmington, NC 28401
(910) 809-2628
info@carolinacoastalmarine.com
<https://www.carolinacoastalmarine.com/>

Marine Mechanix
1917 Hwy 421 North
Wilmington, NC 28401
(910) 251-0030
dinksparts@aol.com
<https://www.marinemechanix.com/>

Specialty Boatworks (*Currently Temporarily Closed*)
262 Battleship Rd NE
Wilmington, NC 28401
(910) 251-5219
a.rusher@icloud.com

Army Corps of Engineers Wilmington District Repair Yard
232 Battleship Rd NE
Leland, NC 28451
(910) 251-4979
<https://www.saw.usace.army.mil/>

11.0 Will the proposed bridge(s) block access of any vessel presently using local service facilities (i.e., repair shops, parts distributors, fuel stations)? If yes, provide the following information:

Alternative A and Alternative B are not expected to be any more restrictive to vessels presently using the waterway to access the sole marine service facility. Based on the current users of the waterway all of the alternatives would be expected to accommodate existing vessels; however, it should be noted that Alternative C (100-foot [$\pm$ 35 feet to be determined by the USACE 408 Section and USCG] fixed vertical clearance) may block future vessels contingent upon development to the north of the bridge. Regarding the limitations of Alternative A (movable) and Alternative C (100-foot [$\pm$ 35 feet to be determined by the USACE 408 Section and USCG] fixed), Giovana Cline from Off The Hook Yachts said, "The only constraints we (currently) have are certain times that it will open and close. Before construction, it would open at 10am and 2pm or 6pm-6am on demand. We currently serve a wide variety of large motor yachts and sailboats... Our large boats/sailboats range from 50ft-150ft long. The heights vary greatly on these vessels". It was further mentioned that they did not think they have accommodated vessels greater than 100 feet in height. See **Appendix B** for direct outreach information.

12.0 Are alternate routes bypassing the proposed bridge(s) available for use by vessels unable to pass the proposed bridge(s)? If yes, provide the following information:

No.

13.0 Will the bridge(s) prohibit the entry of any vessels to the local harbor of refuge? If yes, describe the harbor and provide the following information:

No, the bridge is not expected to prohibit the entry of vessels to the local harbor of refuge under Alternative A and Alternative B. Alternative C would restrict any vessels exceeding the 100-foot ($\pm$ 35 feet to be determined by the USACE 408 Section and USCG) vertical clearance to access harbors of refuge on the opposing side of the bridge; however, based on data collected, vessels are not currently navigating this waterway that exceed 100-feet in height.

14.0 Will the proposed bridge(s) be located within one-half mile of a bend in the waterway? If yes, describe the bend and provide the following information:

Yes, the proposed bridge is located near a bend of the waterway (approximately a third of a mile to the north of the proposed bridge).

14.1 Is there sufficient distance between the bridge(s) and the bend to allow proper vessel alignment for the safe, efficient passage of vessels through the proposed bridge(s)?

Yes, the proposed designs offer a similar or longer distance from the bend in the waterway; therefore, there is expected to be sufficient distance to the bend to allow proper vessel alignment for safe and efficient passage. It should be noted that there are varying designs as part of each of the proposed alternatives that may provide a difference in alignment and distance to align.

Alternative C limits the vertical clearance (100-foot [+/- 35 feet to be determined by the USACE 408 Section and USCG]) that may cause congestion prior to the bridge if modifications to vessels are needed. This may impact the time vessels have to correctly align for safe, efficient passage.

14.2 If no, what factors make construction of the bridge(s) at an alternate location impractical?

N/A

15.0 Are there other factors (i.e., dockages, lightering areas, existing bridges, etc.) located within one-half mile of the proposed bridge(s), which would create hazardous passage through the proposed structure? If yes, provide the following information:

15.1 Describe the factors. (For example, construction impacts to navigation and waterway users, etc.)

N/A

15.2 What mitigative measures are being recommended? (For example, navigation safety during construction, etc.) Why?

N/A

16.0 Do local hydraulic conditions (i.e., wave chop, cross currents, tides, shoals, etc.) increase the hazard of passage through the proposed bridge(s)? If yes, provide the following information:

No, hydraulic conditions are not expected to increase the hazard of passage through the proposed bridge. The directional flow of the current is not averse to vessel passage.

17.0 Do local atmospheric conditions (i.e., strong, prevailing winds, fog, rapidly developing storms, etc.) increase the hazard of passage through the proposed bridge(s)? If yes, provide the following information:

No, it is not expected that the proposed bridge would increase the hazard of passage due to local atmospheric conditions. In cases of extreme weather conditions, harbor operations would most likely be restricted. There were 12 weather restrictions (bridge closures) in 2023. The area has been subject to the passage of hurricanes and tropical storms over the years. As note previously, the bridge is a NCDOT Identified Coastal Evacuation Route.

17.1 Describe the conditions:

N/A

17.2 What mitigative measures are being recommended? Why?

N/A

18.0 Have guide clearances been established for the waterway? If yes, provide the following information:

Yes, guide clearances have been established for the waterway. The proposed bridge site is located at or near waterway milepoint 26.8.

Waterway	Marker	Bridge Type	Horizontal Clearance (feet)	Vertical Clearance (feet)	Reference Plane
Cape Fear River	Wilmington mile 30 to mile 39	Fixed or vertical lift	120	135	Maximum HW
		Swing or bascule	120	10 (closed)	
	Mile 39 to Fayetteville	Fixed or vertical lift	100	70	Maximum HW
		Swing or bascule	100	5 (closed)	
Northeast Cape Fear River	Mouth to mile 2.75	Fixed or vertical lift	200	135 / 5 (closed)	Maximum HW
		Swing or bascule	200	40 (closed)	

Source: <https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Marine-Transportation-Systems-CG-5PW/Office-of-Bridge-Programs/Bridge-Guide-Clearances/>

Do the proposed bridge(s) clearances differ from these guide clearances?

The proposed bridge clearance is met under Alternative A and Alternative B; however, the vertical clearance is not met under Alternative C.

If yes, what factors justify deviating from these guide clearances?

N/A for Alternative A and Alternative B. Under Alternative C, the proposed vertical navigational clearances for the proposed bridge would accommodate heights of existing vessels along the waterway, thus reasonably accommodating current navigational needs. It should be noted that if uses along the waterway change in the future (i.e. additional industrial or commercial uses are developed), the vertical clearance included in Alternative C may limit the navigational ability for these future uses.

19.0 Are there other natural or man-made conditions that affect navigation (atmospherics, exclusion zones, etc.)?

There are no natural or man-made conditions that are known which affect navigation

Describe the conditions:

No conditions were identified. The channel is maintained by USACE.

What mitigative measures are being recommended? Why?

None.

20.0 State any other factors considered necessary for the safe, efficient passage of vessels through the proposed bridge? Are clearance gauges needed? Why?

Fixed navigational lighting is recommended on the bridge to indicate channel perimeters. Clearance gauges will be used as a safety precaution. Information on the final bridge would be

provided for inclusion in the US Coast Pilot Number 4 and during construction through Notices to Mariners and other standard maritime information methods.

Regarding the efficient passage of vessels through the proposed bridge, consideration should be given to the operating rules of the proposed moveable span bridge (Alternative A). Currently the bridge is opened on-demand between 6:00 PM to 6:00 AM and opens at 10:00 AM, as well as 2:00 PM. Further analysis could be provided to determine the most appropriate operating times and rules for the bridge once the alternative is chosen.

Bridge structure protections are also recommended with a goal to absorb potential vessel impact or to deflect vessels before they could contact the bridge structure. Dolphins and fender systems are recommended, as appropriate, at the bridge piers, as well as other protective absorbing structures shown to be effective in other bridge installations. Currently, the proposed design alternatives indicate the horizontal span width is not expected to substantially change; therefore, existing vessels and those under pilotage are expected to be familiar with the current navigation structure. As part of the design of both the bridge itself and the bridge structure protection elements, a vessel collision study will be conducted. The study will follow the provisions of the AASHTO *LRFD Bridge Design Specifications*, Article 3.14 (Vessel Collision), as appropriate. The “operational classification” assigned to the bridge would be “critical or essential,” which will trigger a lower maximum annual frequency of collapse, AF, as defined in the AASHTO specifications (i.e., the bridge will be designed to be more resistant to collapse from vessel collision than a bridge with an operational classification of “typical”).

21.0 Include a description of the impacts to navigation caused or which could be reasonably caused by the proposed bridge including but not limited to: proposed construction methodology, proposed or prospective changes to the existing bridge operating schedule (for movable bridges), and any proposed mitigation to all unavoidable impacts to navigation.

Information on the final bridge would be provided for inclusion in the US Coast Pilot Number 4 and during construction through Notices to Mariners and other standard maritime information methods such as VHF radio broadcasts. More information will be proposed based on the selected bridge design alternative.

Once the bridge alternative is selected, an operations plan for the period related to modification, demolition, construction and other pre and post periods will be submitted to the US Coast Guard for review and approval.

Conduct a navigational impact report and include a review of all bridges upstream and downstream of the proposed site to determine the minimum vertical and horizontal clearances available on the waterway.

See the Present Governing Bridges section of this report.

If the proposed bridge is fixed and is replacing an existing drawbridge with unlimited vertical clearance, the applicant must determine whether the proposed bridge will accommodate existing and prospective navigation.

N/A for Alternative A and Alternative B (providing the same vertical clearance as the existing bridge). Under Alternative C, the proposed horizontal and vertical navigational clearances for the proposed bridge will be more restrictive than the existing bridge but is not expected to impact vessels currently using the waterway, thus reasonably accommodating navigational needs. It should be noted that Alternative C could restrict larger vessels contingent upon future commercial/industrial uses to the north of the bridge based on the vertical clearance restrictions under this alternative.

22.0 Is there any proposed or completed mitigation for the impacted waterway users? Are there any impacts that cannot be mitigated?

There are not expected to be any impacts to current and prior waterway users under Alternative A and Alternative B. Alternative C is not expected to be any more restrictive than other structures upstream and is expected to accommodate current waterway users. No mitigation efforts are recommended.

APPENDIX INSERTS:

Appendix A. Alternative Bridge Design Plans

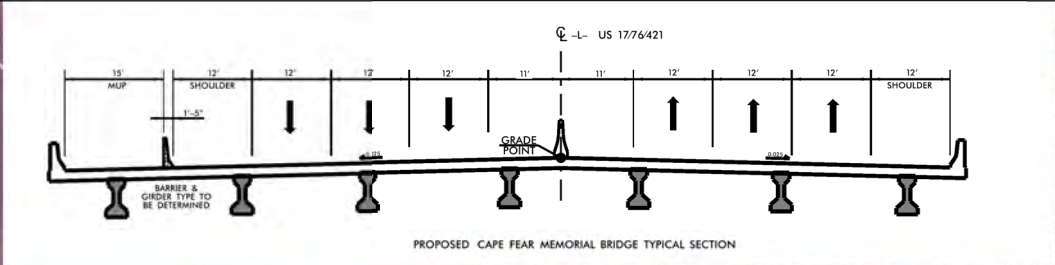
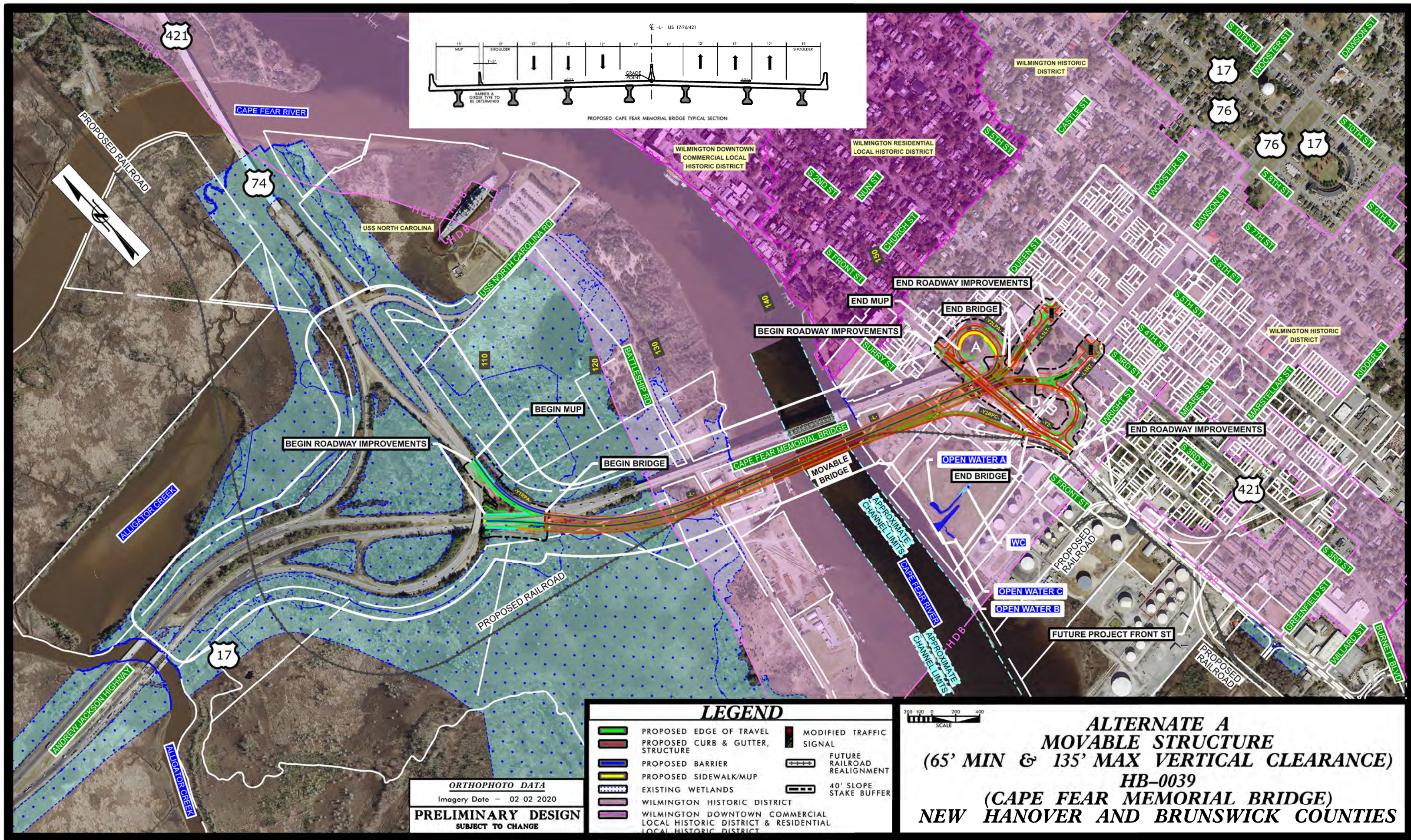
Appendix B. Summaries of Direct Outreach

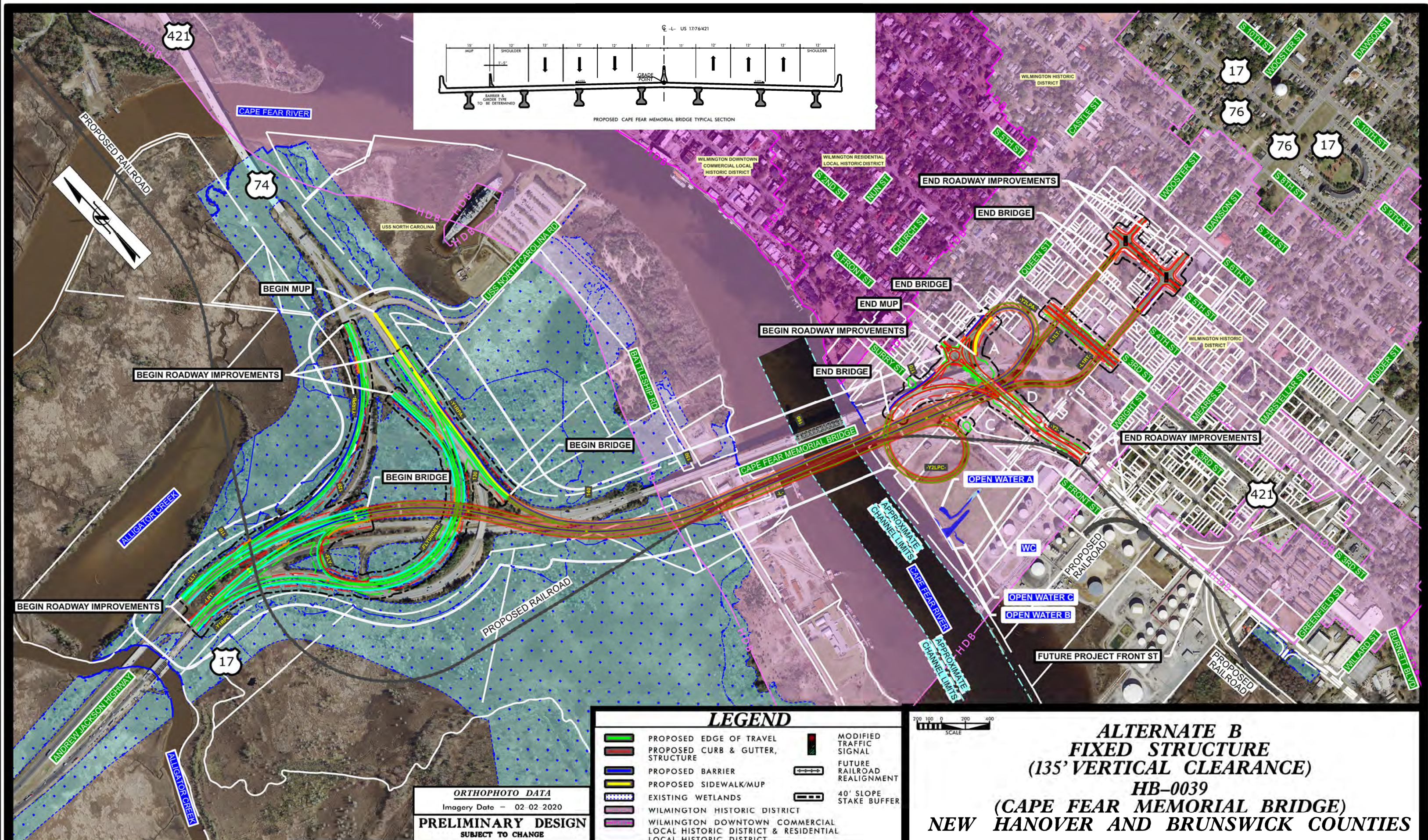
Appendix C. Hydrographic Survey

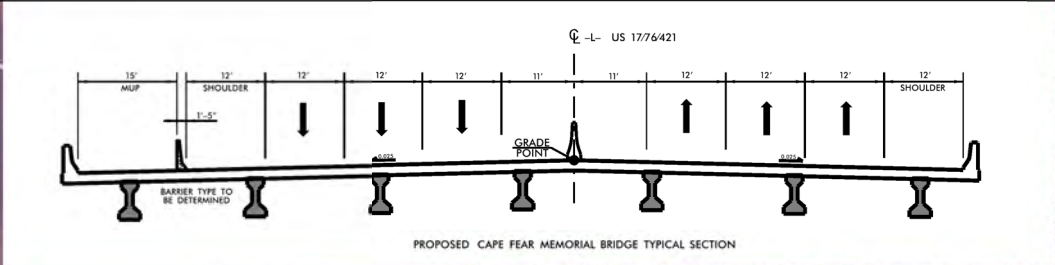
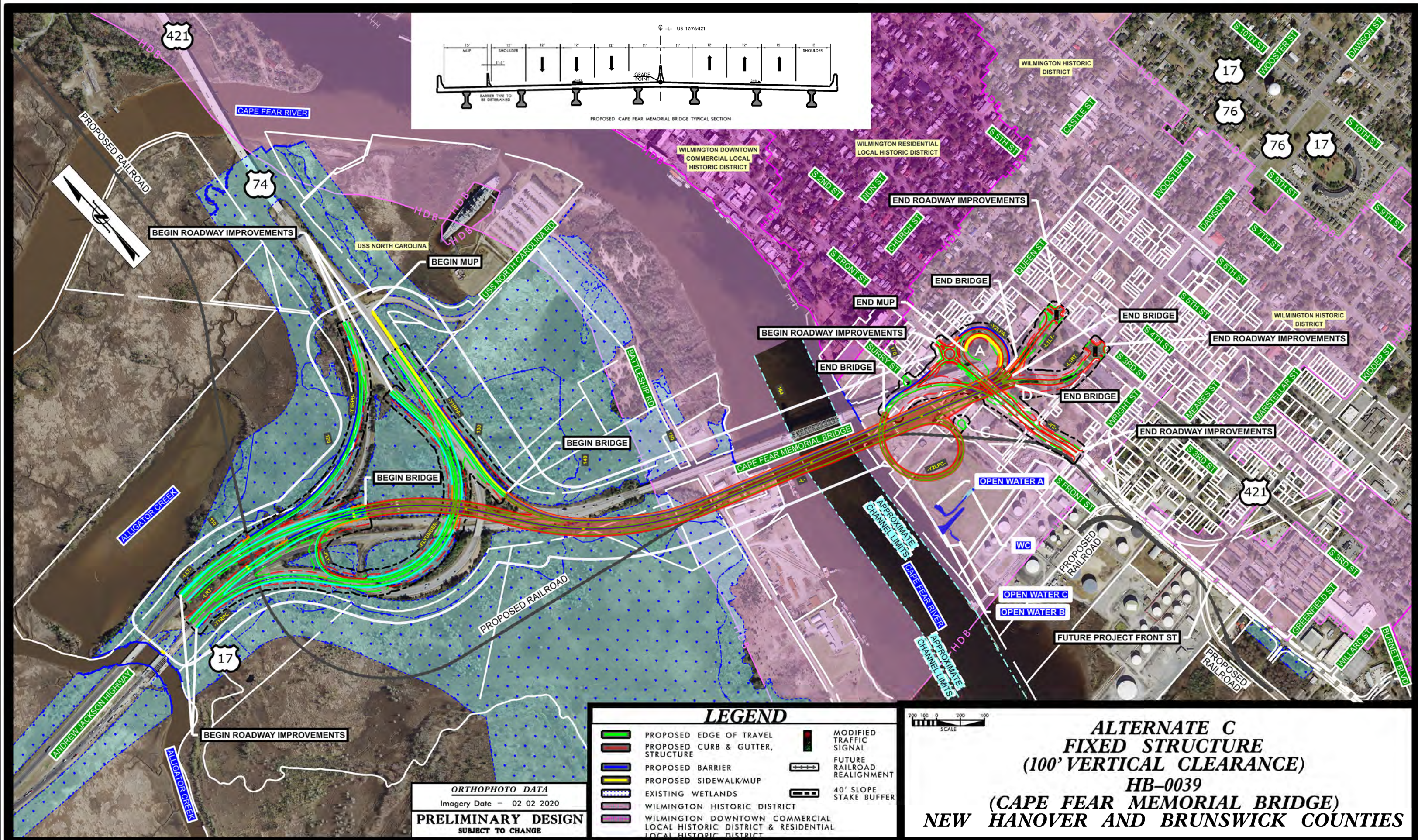
Appendix D. Bridge Lift Data

Appendix E. Registered Ships in Wilmington

Appendix A: Design Plans







ORTHOPHOTO DATA
Imagery Date - 02-02-2020
PRELIMINARY DESIGN
SUBJECT TO CHANGE

LEGEND

PROPOSED EDGE OF TRAVEL	MODIFIED TRAFFIC SIGNAL
PROPOSED CURB & GUTTER, STRUCTURE	FUTURE RAILROAD REALIGNMENT
PROPOSED BARRIER	40' SLOPE STAKE BUFFER
PROPOSED SIDEWALK/MUP	
EXISTING WETLANDS	
WILMINGTON HISTORIC DISTRICT	
WILMINGTON DOWNTOWN COMMERCIAL LOCAL HISTORIC DISTRICT & RESIDENTIAL LOCAL HISTORIC DISTRICT	

**ALTERNATE C
FIXED STRUCTURE
(100' VERTICAL CLEARANCE)
HB-0039
(CAPE FEAR MEMORIAL BRIDGE)
NEW HANOVER AND BRUNSWICK COUNTIES**

SCALE: 1" = 100'

Exhibit B: Direct Outreach

Date of Summary: 4/15/2024

US Coast Guard Navigation Impact Report Battleship North Carolina Meeting Summary

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over the Cape Fear River
New Hanover and Brunswick Counties
STIP No. HB-0039
Monday April 8, 2024 / 1:00 PM

Meeting Attendees

Name	Organization	E-mail Address
Christopher Vargo	USS Battleship North Carolina	Christopher.Vargo@dncr.nc.gov
Captain Jeffrey Monroe	HDR	jeffrey.monroe@hdrinc.com
Emily Poole	HDR	emily.poole@hdrinc.com

On April 8, 2024, a meeting was held between the USS Battleship North Carolina (Battleship NC) represented by Christopher Vargo and HDR regarding STIP Project HB-0039, replacement of Bridge Number 640013 (Cape Fear Memorial Bridge [CFMB]) over the Cape Fear River (River).

HDR began the meeting with a brief summary of the project's background and introducing the HDR team. Following the project background and introduction, HDR prompted Battleship NC for information regarding the battleship and any potential plans for moving. The following summarizes the topics discussed.

- HDR noted most museum ships from the 1940's around the country have recently been dry docked for repairs, and wanted to discuss potential concerns if the CFMB replacement is not configured properly the battleship would not be able to be moved for dry dock repairs.
- Battleship NC inquired what impacts HDR was quantifying.
 - HDR noted they were preparing a US Coast Guard (USCG) Navigation Impact Report (NIR) for the CFMB replacement which will address whether the proposed bridge would restrict any navigation on the River.
- Battleship NC noted the battleship came to Wilmington in 1961 and was an enterprise of the State of NC but revenue was earned through ticket sales and donations.
- Battleship NC noted in 2009 they raised \$11 million in donations through the Generations Campaign to construct a sheet pile coffer dam which serves as the Battleship's dry dock. In 2020, approximately \$5 million was spent on hull repair.
- Battleship NC stated there are no plans for leaving its current location, and a marine surveyor would likely not determine the battleship as seaworthy. The battleship is in 25 feet of mud and would need to be dredged out.
 - Battleship NC prepared an economic study on moving to a dry dock 10 years and it was determined moving the battleship would take approximately \$40 million, however, determined unfeasible.
- Battleship NC noted the battleship is 158 feet tall. The CFMB was built after battleship was moved to its current location, and the battleship does not fit underneath the bridge. The mast was removed approximately 2 years ago to be repaired shore side. Technically the mast could be removed again, the coffer dam removed, and battleship could be dredged out to be moved, however this was noted to be very unlikely.
- Battleship NC noted they have one entrance for visitors and would have concerns about the project obstructing their entrance or viewshed as a National Register Historic Landmark.
- HDR inquired the Length Overall (LOA) of the battleship.

- o Battleship NC noted 129.
 - HDR inquired whether the air draft was 158 feet.
 - o Battleship NC confirmed.
 - HDR inquired the beam of the battleship.
 - o Battleship NC stated 108 feet.
 - HDR inquired what the regular draft of the battleship would be if she was floating.
 - o Battleship NC stated 26 feet.
 - HDR inquired the displacement tonnage of the battleship.
 - o Battleship NC stated anywhere between 36,000 and 44,000 tons.
 - HDR inquired when the battleship was built.
 - o Battleship NC stated the battleship was commissioned April 1941.
 - Battleship NC noted they would have concerns if there was an attempt to realign the channel. The harbor line is approximately 5 feet off of the battleship park, and if the channel was realigned they would lose some of their park due to the steep drop off in the River depth.
 - Battleship NC noted there are no utilities on Eagles Island other than the battleship, via two pipes that run on the River's bottom. Both pipes were ripped out during Hurricane Florence due to severe currents.
 - HDR inquired whether there were any plans to acquire additional historic ships/submarines.
 - o Battleship NC stated no, the battleship takes 3-4 hours to tour and it was unlikely tourists would spend longer touring an additional ship in the same place.
 - Meeting adjourned.
-

Please direct any comments or questions to Consultant Project Manager Jeff Dayton at jeffrey.dayton@hdrinc.com.

Date of Summary: 4/9/2024

US Coast Guard Navigation Impact Report

Moran Meeting Summary

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over the Cape Fear River
New Hanover and Brunswick Counties
STIP No. HB-0039
Thursday, April 4, 2024 / 4:00 PM

Meeting Attendees

Name	Organization	E-mail Address
Erica J. Custis	Moran Towing Company	EricaC@morantug.com
Captain Jeffrey Monroe	HDR	jeffrey.monroe@hdrinc.com
Emily Poole	HDR	emily.poole@hdrinc.com
Mary Lynn Smith	HDR	marylynn.smith@hdrinc.com

On April 4, 2024, a meeting was held between Moran represented by Erica Custis and HDR regarding STIP Project HB-0039, replacement of Bridge Number 640013 (Cape Fear Memorial Bridge [CFMB]) over the Cape Fear River ('River').

HDR began the meeting with a brief summary of the project's background and introducing the HDR team. Following the project background and introduction, HDR prompted Moran for information regarding their operations and tug boats. The following summarizes the topics discussed.

- HDR noted other stakeholders had mentioned there has been a drop off in utilization since Kinder Morgan sold, and that the use of that property in the future may still be industrial.
 - Moran noted they believed part of the sale was future use of the property was to remain commercial/industrial.
- HDR asked the size of Moran's fleet.
 - Moran stated they have two tug boats, and don't anticipate having more. They have a horsepower rating of 3900 and 3000.
- HDR inquired whether the two tug boats have been adequate for docking of ships and turning.
 - Moran noted they occasionally need additional power and will reach out to McAllister to hire their tractor tug.
- HDR asked if they have tethered alongside and through the CFMB.
 - Moran stated they do not tether alongside, but instead cross the CFMB in front.
 - Moran mentioned their senior pilot, Cliff Nelson, may be able to provide more detail.
- HDR asked if docking masters dock vessels.
 - Moran said they retain the services of Hanover Docking Pilots, in addition to McAllister who uses Wilmington Docking Pilots.
- HDR inquired whether they had run into any constraints on the waterway or moving vessels/docking.
 - Moran mentioned there is a current as they've gotten bigger ships in postpanamax berthed at NC State Ports.
 - Moran said as far as maneuvering around, they don't experience a lot of tight corridors.
- HDR asked if there are any problems with the turning basin.
 - Moran said they have not heard of any problems.
- HDR asked if there is a fairly even share of work between Moran and McAllister.
 - Moran confirmed, noting they'd experienced a slow down since they lost a major line (Elerman) from 2023.

- HDR asked about Moran's exact location along the River.
 - Moran noted they are on south side of CFMB, just south of the US Army Corps of Engineers (USACE) and McAllister's boatyard. They stated there is not a lot of real estate available for their tug boats, so it would be concerning should the CFMB project impact their property.
- HDR asked about Moran's boats.
 - Moran said their two boats are Cape Charles and Cape Cod.
- HDR inquired what the water depth was at berth.
 - Moran stated they were unsure but could provide this information to HDR following the meeting.
- HDR asked if there are shoaling issues.
 - Moran noted the turning basin needs to be dredged regularly and potentially around Battery Island.
- HDR asked where Moran sends boats for repair.
 - Moran said mostly Colonna or Lyon in Norfolk. They have also sent a boat recently to Stevens Shipyard at Yorges Island, but it depends on the scope of work and who has availability.
- HDR asked if Moran has had any other issues (i.e. congestion, conflict with recreational vehicles, etc.).
 - Moran said no, and the US Coast Guard was typically on top of resolving any issues such as last year there was a derelict sailboat. They noted there was not heavy traffic in Wilmington like other ports.

Please direct any comments or questions to Consultant Project Manager Jeff Dayton at jeffrey.dayton@hdrinc.com.

Date of Summary: 3/27/2024

US Coast Guard Navigation Impact Report

Cape Fear Pilots Meeting Summary

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over the Cape Fear River
New Hanover and Brunswick Counties
STIP No. HB-0039
Tuesday, March 26, 2024 / 3:00 PM

Meeting Attendees

Name	Organization	E-mail Address
Captain Scott Aldridge	Wilmington Cape Fear Pilots Association	capefearpilots@eastnc.twcbc.com
Captain Jeffrey Monroe	HDR	jeffrey.monroe@hdrinc.com
Jeffrey Dayton	HDR	jeffrey.dayton@hdrinc.com
Emily Poole	HDR	emily.poole@hdrinc.com
Mary Lynn Smith	HDR	marylynn.smith@hdrinc.com

On March 26, 2024, a meeting was held between the Wilmington Cape Fear Pilots Association (Cape Fear Pilots) represented by Captain Scott Aldridge and HDR regarding STIP Project HB-0039, replacement of Bridge Number 640013 (Cape Fear Memorial Bridge [CFMB]) over the Cape Fear River ('River').

HDR began the meeting with a brief summary of the project's background and introducing the HDR team. Following the project background and introduction, HDR prompted Cape Fear Pilots for information regarding current vessels, any limitations of the current network and bridge, the existing waterway and currents, and environmental patterns/concerns. The following summarizes the topics discussed.

- HDR inquired how many vessels are handled annually on the Cape Fear River.
 - Cape Fear Pilots noted they do not have an annual number. With the closing of Kinder Morgan, there is no commercial traffic heading north above the CFMB. They noted the former Kinder Morgan site may be converted into condominiums in the future.
 - Cape Fear Pilots noted there is very sporadic traffic due to the closure of both terminals, mainly large recreational vessels, public vessels, and yacht traffic.
 - Cape Fear Pilots noted there are ~800 arrivals annually to Port of Wilmington. This includes the Port and the chemical and bulk piers north and south of the Port.
- HDR inquired what the largest vessel the pilots are comfortable with handling safely.
 - Cape Fear Pilots noted the largest vessel they have handled is 1270' in length, but the biggest vessels they are comfortable handling are 1200' in length, 170' beam, 42' arrivals and 41' sailings.
 - Cape Fear Pilots noted that there have been vessels very close or at the height of the existing CFMB's vertical clearance (135').
- HDR inquired what channel restrictions are present.
 - Cape Fear Pilots noted that the biggest limiting factor on vessels is the turning basin south of CFMB which restricts length. They noted the Association can't work with postpanamax or neopanamax vessels over 315' combined beam.
 - Cape Fear noted that draft is also limiting factor, along with the approximately 4.3' tide in Wilmington and approximately 4.1' tide in Southport.
- HDR inquired if there are any other unusual traffic conditions.

- Cape Fear Pilots noted powerlines south of CFMB used to pose issues for bringing in gantry cranes for the Port, but they were raised 5-6 years ago and are no longer a problem.
- HDR inquired if there are any recreational traffic issues.
 - Cape Fear Pilots noted that the River is periodically congested but does not typically tend to be recreationally congested. There are occasionally inexperienced and uneducated drivers on the River, but it is not a repetitive problem.
- HDR inquired the width of the current channel near the CFMB.
 - Cape Fear Pilots noted that the width of the channel near the bridge is generally 400'. There are 6 miles of passing lanes where the width of the channel is approximately 600', which tapers down to a width of ~350' at CFMB.
- HDR inquired about travel time and distance to nearby ports.
 - Cape Fear Pilots noted that it is an approximate 3-hour, 27-mile trip to North Carolina State Port Authority.
- HDR inquired about the towing capacity and fleet size.
 - Cape Fear Pilots noted that there is one efficient tug in the harbor, with a 60-ton tugging capability and there are others with decent power.
 - Cape Fear Pilots noted that McAllister and Moran are tug operators and that Cape Fear Towing used to exist before Moran bought them.
- HDR inquired about unusual weather conditions and/or currents.
 - Cape Fear Pilots noted that currents upstream are not strong and are fairly consistent at 1.5 knots. Currents downstream tend to be stronger and average 3-4 knots but can reach 5 knots in weather events (e.g., king tide, new moon).
 - Cape Fear Pilots noted that there are more fog events now than in the past, and weather has gotten noticeably worse over the past 30 years. There used to be a maximum of 3 shut down days per year due to weather but that number has risen to 10-12 days in recent years.
 - Cape Fear Pilots noted that there is a 3-mile visibility limit, but operators will not begin voyages in white-out rain or zero visibility.
- HDR inquired about the number of pilots that are working.
 - Cape Fear Pilots noted that there are 7 full pilots and 2 in training (1 of which will be licensed next month). They require 8 pilots for the amount of traffic that they get.
 - Cape Fear Pilots noted that the pilot station is in Southport.
- HDR inquired about the geometry of the Cape Fear River.
 - Cape Fear Pilots noted that the river has a slightly skewed jog and crossing that is not completely perpendicular at the existing bridge. They have had some issues in the past with the height of vessels at the 135' vertical clearance limit of the existing CFMB, and vessels having to come at low water to cross.
 - Cape Fear Pilots noted that they are hoping the future bridge will widen the channel at the CFMB closer to 400' to meet downstream bridges. From a navigational standpoint, 350' is the minimum operative channel width.
- HDR inquired how a fixed bridge would impact the Association or industrial activities.
 - Cape Fear Pilots noted that from a mariner's perspective, a fixed bridge would be a better option as it eliminates the potential of a movable bridge having a mechanical issue or inability to lift and therefore restricting crossings.
 - Cape Fear Pilots noted that there is a potential for a wind farm and laydown/import yard north of CFMB, but it is not come to fruition.
 - HDR noted they met with NC Ports in October who mentioned future development in the area.

- HDR inquired about the potential to move Battleship North Carolina to dry dock, what the air draft was. HDR noted it would fit under the existing bridge except for a few antennas.
 - Cape Fear Pilots noted they were not sure what the air draft was in its current state, but it would likely need to be loaded, have cut stacks and antennas taken down to fit under existing bridge.
 - HDR noted recently other boats of its age (built in the 1940s) had been dry docked and the steel was not holding up.
 - Cape Fear Pilots noted that area of Eagle Island floods routinely.
- HDR inquired whether the Cape Fear Pilots ran into issues with debris in the River.
 - Cape Fear Pilots noted that there is an upriver dam which is released occasionally and causes periodically debris build-ups. This can be exacerbated by king tides but not a routine problem.
- Cape Fear Pilots inquired into what kind of bridge NCDOT was planning to replace the existing CFMB with.
 - HDR noted that NCDOT is studying multiple alternatives that include both a fixed and movable bridge.
 - Cape Fear Pilots inquired if there are any rail crossings in the plans.
 - HDR noted that these are two separate projects, but they are still preliminary and subject to change.
- Cape Fear Pilots inquired about the future bridge location.
 - HDR noted that all bridge alternatives are in close proximity to the existing CFMB, just to the south.
 - HDR noted that there will be public meetings later this year, likely in the summer, and that HDR will pass along that information to Cape Fear Pilots once scheduled for any additional input.
- Meeting adjourned.

Next Steps/Action Items Related to Cape Fear Pilots:

- HDR to inform Cape Fear Pilots of public meeting(s) once scheduled.

Please direct any comments or questions to Consultant Project Manager Jeff Dayton at jeffrey.dayton@hdrinc.com.

Date of Summary: 4/9/2024

US Coast Guard Navigation Impact Report

Tribute Companies Meeting Summary

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over the Cape Fear River
New Hanover and Brunswick Counties
STIP No. HB-0039
Wednesday, April 3, 2024 / 1:00 PM

Meeting Attendees

Name	Organization	E-mail Address
Matt Maynard	Tribute Companies	michael@tributecompanies.com
Captain Jeffrey Monroe	HDR	jeffrey.monroe@hdrinc.com
Jeffrey Dayton	HDR	jeffrey.dayton@hdrinc.com
Emily Poole	HDR	emily.poole@hdrinc.com
Mary Lynn Smith	HDR	marylynn.smith@hdrinc.com

On April 3, 2024, a meeting was held between the Tribute Companies represented by Matt Maynard and HDR regarding STIP Project HB-0039, replacement of Bridge Number 640013 (Cape Fear Memorial Bridge [CFMB]) over the Cape Fear River ('River').

HDR began the meeting with a brief summary of the project's background. Following the project background and introduction, HDR prompted Tribute Companies for information regarding the previous Kinder Morgan site. The following summarizes the topics discussed.

- Tribute Companies noted they purchased the site without a plan for development, but as an investment. They are not currently marketing the site; however, it was noted there has been interest in purchasing the site and in redeveloping the site as more "typical" development (i.e. commercial or residential).
 - Tribute Companies noted some buyers are interested due to access to the River (which is part of the value of the site), deep water dock, and rail at the site.
 - HDR inquired whether the site was served by pipeline.
 - Tribute Companies stated it was not.
- HDR inquired whether there was a possibility to keep the site's use industrial, similar to the former owner Kinder Morgan.
 - Tribute Companies said it was a possibility.
- HDR asked if an environmental study been done to determine the level of mitigation necessary, particularly for more traditional development.
 - Tribute Companies stated the level of mitigation would be determined by the property's future use, which is unknown at this time.
- HDR inquired whether the dock was still workable and whether it was set up for liquid bulk handling.
 - Tribute Companies confirmed both.
- HDR asked the current depth on site.
 - Tribute Companies mentioned it is approximately 28-31 feet deep by the dock.
 - HDR inquired whether Tribute Companies had the berth length and width available.
 - Tribute Companies noted they did not but would send to HDR following the meeting.
- HDR asked if there was still tank storage on-site.

- Tribute Companies, confirmed, nothing there are approximately 30 tanks with varying size (some up to 100' in diameter and 40' tall).
- HDR inquired what the total size of property is.
 - Tribute Companies stated the site is approximately 72.3 acres with approximately 20 acres upland (the remainder is primarily wetlands).
- HDR asked why Tribute Companies was not currently marketing the site.
 - Tribute Companies noted there has been a lot of interest without marketing and for now it could be handled internally, without a traditional broker.
- HDR asked when Tribute closed on the property.
 - Tribute Companies stated Fall 2023.
- Tribute Companies asked if the bridge would be located as far north as their site
 - HDR answered that the new bridge will likely be in the vicinity of the existing bridge
 - HDR mentioned that bridge design alternatives are currently being explored
- Tribute Companies asked about the timeline of the project.
 - HDR noted public meetings would be held this summer. Bridge replacement alternatives are currently being studied, and the current schedule shows finishing up environmental and alternative work in Spring of 2026 with construction after that once funding is in place.
- Tribute Companies asked about the design of the future bridge and mentioned the prior Skyway design that tied to Independence Boulevard.
 - HDR mentioned that the Skyway design is not being pursued currently and that the focus is more towards replacing the existing bridge tying to Dawson Street and Wooster Street.

Next Steps/Action Items Related to Kinder Morgan:

- Tribute Companies to provide HDR with additional site survey information (including berth length and width) following the meeting.

Please direct any comments or questions to Consultant Project Manager Jeff Dayton at jeffrey.dayton@hdrinc.com.

Smith, Mary Lynn

From: Giovana Cline <gia@offthehookys.com>
Sent: Monday, May 6, 2024 12:08 PM
To: Smith, Mary Lynn
Cc: Dayton, Jeffrey
Subject: Re: Cape Fear Memorial Bridge

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I don't believe so.



Giovana Cline

Customer Service Manager, Service Administrator

 [910.772.9277](tel:910.772.9277) |  gia@offthehookys.com
 offthehookyachts.com
 1701 Jel Wade Dr, Wilmington, NC 28401



On Mon, May 6, 2024 at 8:56 AM Smith, Mary Lynn <MaryLynn.Smith@hdrinc.com> wrote:

Hi Gia!

Thanks, again, for all the help. Last question for you: Do you know if you have had any sailboats with masts over 100-feet high (either serviced or at the marina)?

Mary Lynn Smith, PE

D 919.985.8976 **M** 704.648.9081

hdrinc.com/follow-us

From: Giovana Cline <gia@offthehookys.com>
Sent: Monday, April 29, 2024 3:20 PM
To: Smith, Mary Lynn <MaryLynn.Smith@hdrinc.com>
Cc: Dayton, Jeffrey <jeffrey.dayton@hdrinc.com>
Subject: Re: Cape Fear Memorial Bridge

You don't often get email from gia@offthehookys.com. [Learn why this is important](#)

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

No problem! Our large boats/sailboats range from 50ft-150ft long. The heights vary greatly on these vessels.



Giovana Cline

Customer Service Manager, Service Administrator

| gia@offthehookys.com

| [910.772.9277](tel:910.772.9277)

| offthehookyachts.com

| [1701 Jel Wade Dr, Wilmington, NC 28401](#)



On Mon, Apr 29, 2024 at 3:10 PM Smith, Mary Lynn <MaryLynn.Smith@hdrinc.com> wrote:

Gia,

Thank you so much for the quick response and the information below! Do you have a rough range in sizes of your largest yachts and sailboats? We are particularly interested in vertical clearance needs for the new bridge design.

Thank you, again!

Mary Lynn Smith, PE

D 919.985.8976 **M** 704.648.9081

hdrinc.com/follow-us

From: Giovana Cline <gia@offthehookys.com>
Sent: Monday, April 29, 2024 2:50 PM
To: Smith, Mary Lynn <MaryLynn.Smith@hdrinc.com>
Cc: Dayton, Jeffrey <jeffrey.dayton@hdrinc.com>
Subject: Cape Fear Memorial Bridge

You don't often get email from gia@offthehookys.com. [Learn why this is important](#)

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon,

I received your email with questions regarding the Cape Fear Memorial Bridge. The existing bridge opens and closes so we can have large vessels dock at the Cape Fear Marina and get service work completed at Off The Hook Yachts. The only constraints we have are certain times that it will open and close. Before construction, it would open at 10am and 2pm or 6pm-6am on demand. We currently serve a wide variety of large motor yachts and sailboats.

Thanks,

Gia

Smith, Mary Lynn

From: Jeffrey Monroe <jeffrey.monroe@iampe.org>
Sent: Tuesday, April 16, 2024 8:33 PM
To: Dayton, Jeffrey; Smith, Mary Lynn; Poole, Emily
Cc: Capt. Jeffrey Monroe
Subject: Wilmington Meeting

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Justin Moore, NCPA, Global Terminal Manager, Port of Wilmington.

4/16/24

1. Dock limitations to Global Terminal 42 feet max draft
2. Bridge replacement has no impact on operations at terminal
3. A replacement bridge should not be placed south of the port facilities
4. Current bridge in bad shape
5. Bridge roadway is a key issue, numerous traffic delays to port facilities
6. Port gate times changed from 0500-2000 to 0500 to 1700.
7. Refer a second bridge as opposed to a replacement
8. With new bridge, no port disruptions should happen
9. A new bridge should be convenient port traffic and convenience for commercial traffic to the port
10. Interstate 74 needs to be completed. Currently 1 hour 40 minutes to Interstate 95.
11. NCPA is an operating port at the Global Terminal. Terminal is set up for neo-bulk cargos.
12. Channel widening and deepening is essential to the port
13. Terminal handles 20-30 ships per month
14. Ultrabulk handles lumber, Toca steel, also project cargos at terminal
15. All activities east of the bridge-Memorial bridge does not impact Global operations.

CAPT Jeffrey W. Monroe, MM, AMPE

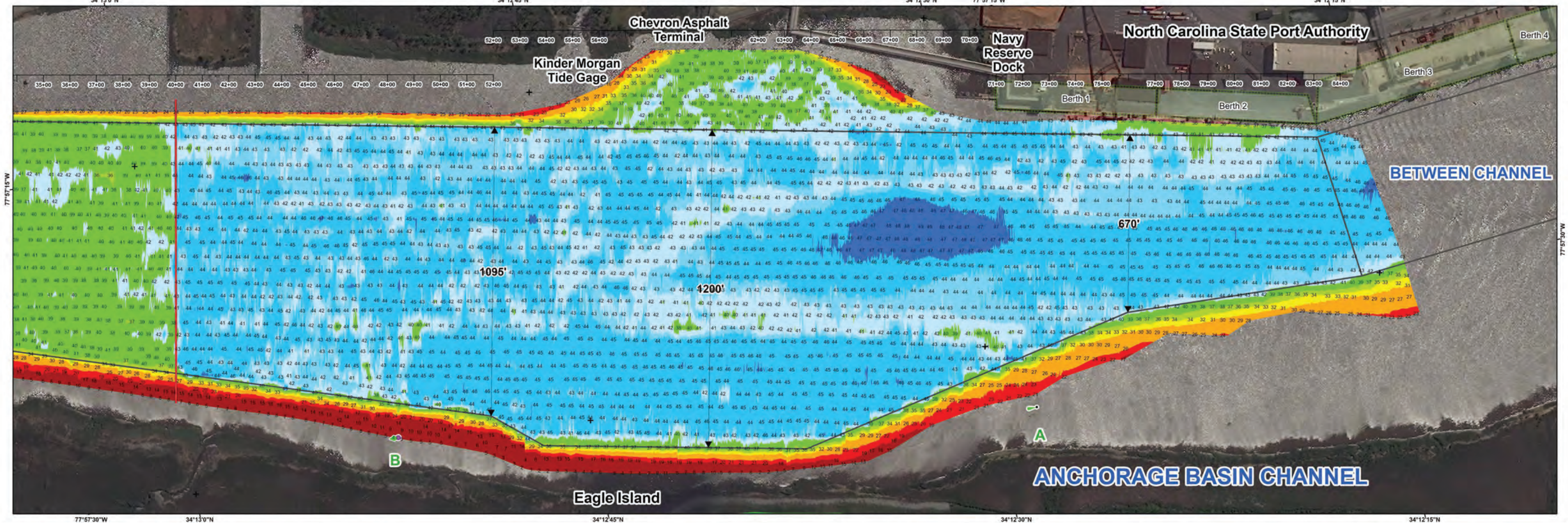
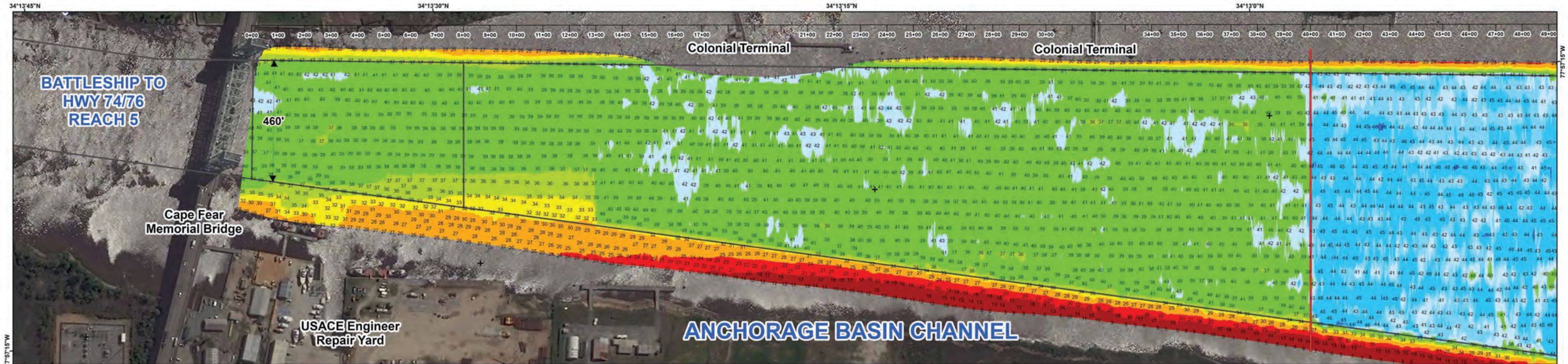
Senior Port Management Advisor

HDR Inc.

11 Katahdin Road, Cape Elizabeth, ME 04107-2828 USA

Office: 207.741.7000 Cell: 207.615.7989

Exhibit C: Hydrographic Survey



HYDROGRAPHIC SURVEY

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA
Wilmington Harbor

Anchorage Basin

Survey Date: 09 April 2024
Map Date: 10 April 2024
Imagery Date: 05 April 2024
© 2024 Maxar Technologies
Scale: 1:2,000
File Name: WH_25_ANC_20240409_CS
Surveyed by: SRV,JCC
Mapped by: k7opnkms
Processed by: k7opnkms

1. ELEVATIONS ARE IN FEET AND REFER TO NOAA'S REPORTED MEAN LOWER LOW WATER (MLLW) RELATIVE TO THE 1983-2001 TIDAL EPOCH.
2. PROJECT SURVEYED WITH DISTRICT SURVEY VESSEL "SWART" USING RTK GPS HORIZONTAL POSITIONING EQUIPMENT AND 28 KHZ SOUNDING EQUIPMENT.
3. HORIZONTAL DATUM NAD 83. VERTICAL DATUM M.L.L.W.
4. TIDE GAUGE LOCATED AT ENGINEER REPAIR YARD. USE OF TIDE VALUES FOR THIS GAUGE ARE RESTRICTED TO QUALITY ASSURANCE PURPOSES FOR VERIFICATION OF RTK TIDES. THE WILMINGTON DISTRICT VIAL ONLY USE STAFF GAUGE TIDE VALUES FOR FINAL MAPPING AND QUANTITY CALCULATIONS IF RTK GPS IS UNAVAILABLE AT THE TIME OF SURVEY.
5. THIS PROJECT WAS DESIGNED BY THE WILMINGTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ERTI-1812.
6. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHALING EVENTS. A MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HEREIN. REQUIRED BY 33 CFR 209.329.
7. NAVIGATION AIDS LOCATED WITH DISTRICT SURVEY VESSEL. ACCURACY +/- 3 METERS.
8. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT WWW.SAW.USACE.ARMY.MIL

TYPICAL SECTION

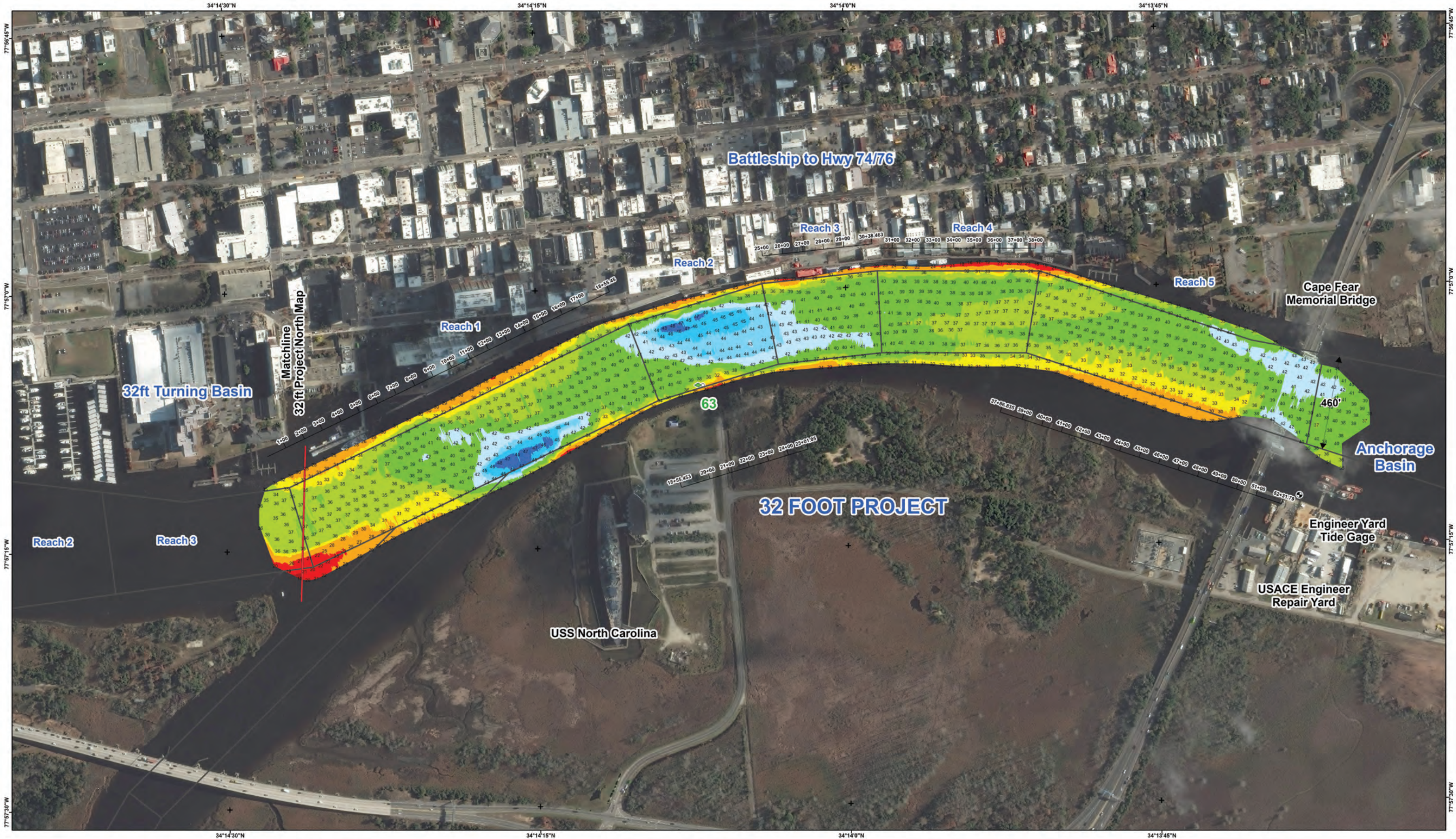
MLLW
-38' & -42'
Varies
NOT TO SCALE

Aids to Navigation

- Can
- Nun
- Green Lighted Buoy
- Red Lighted Buoy
- Junction Marker
- Green Light
- Red Light
- Green Daybeacon
- Red Daybeacon
- Danger Sign
- Mileboard
- Tide Gage

Depth In Feet

20 and Shallower
20-25
25-32
32-35
35-38
38-42
42-44
44-45
45-47
47 and Deeper



HYDROGRAPHIC SURVEY

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA
Wilmington Harbor
32ft Project South

NORTH CAROLINA

Survey Date: 20 February 2024
Map Date: 23 February 2024
Imagery Date: 6 December 2023
© 2023 Maxar Technologies
Scale: 1:2,400
File Name: WH_26_32F_20240220_CS
Surveyed by: LMT,SRV,KMS
Mapped by: k7opnagf
Processed by: k7opnagf

200 100 0 200 400 600 Feet

1. ELEVATIONS ARE IN FEET AND REFER TO NOAA'S REPORTED MEAN LOWER LOW WATER (MLLW) RELATIVE TO THE 1983-2001 TIDAL EPOCH.

2. PROJECT SURVEYED WITH DISTRICT SURVEY VESSEL "SWART" EQUIPMENT AND 28 KHZ SOUNDING EQUIPMENT.

3. HORIZONTAL DATUM NAD 1983. VERTICAL DATUM M.L.L.W.

4. TIDE GAGE LOCATED AT: ENGINEER REPAIR YARD. USE OF TIDE VALUES FOR THIS GAGE ARE RESTRICTED TO QUALITY ASSURANCE PURPOSES FOR VERIFICATION OF RTK TIDES. THE WILMINGTON DISTRICT WILL ONLY USE STAFF GAGE TIDE VALUES FOR FINAL MAPPING AND QUANTITY CALCULATIONS IF RTK GPS IS UNAVAILABLE AT THE TIME OF SURVEY.

5. THIS PROJECT WAS DESIGNED BY THE WILMINGTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

6. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325

7. NAVIGATION AIDS LOCATED WITH DISTRICT SURVEY VESSEL. ACCURACY +/- 3 METERS.

8. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: WWW.SAW.USACE.ARMY.MIL

TYPICAL SECTION

Aids to Navigation

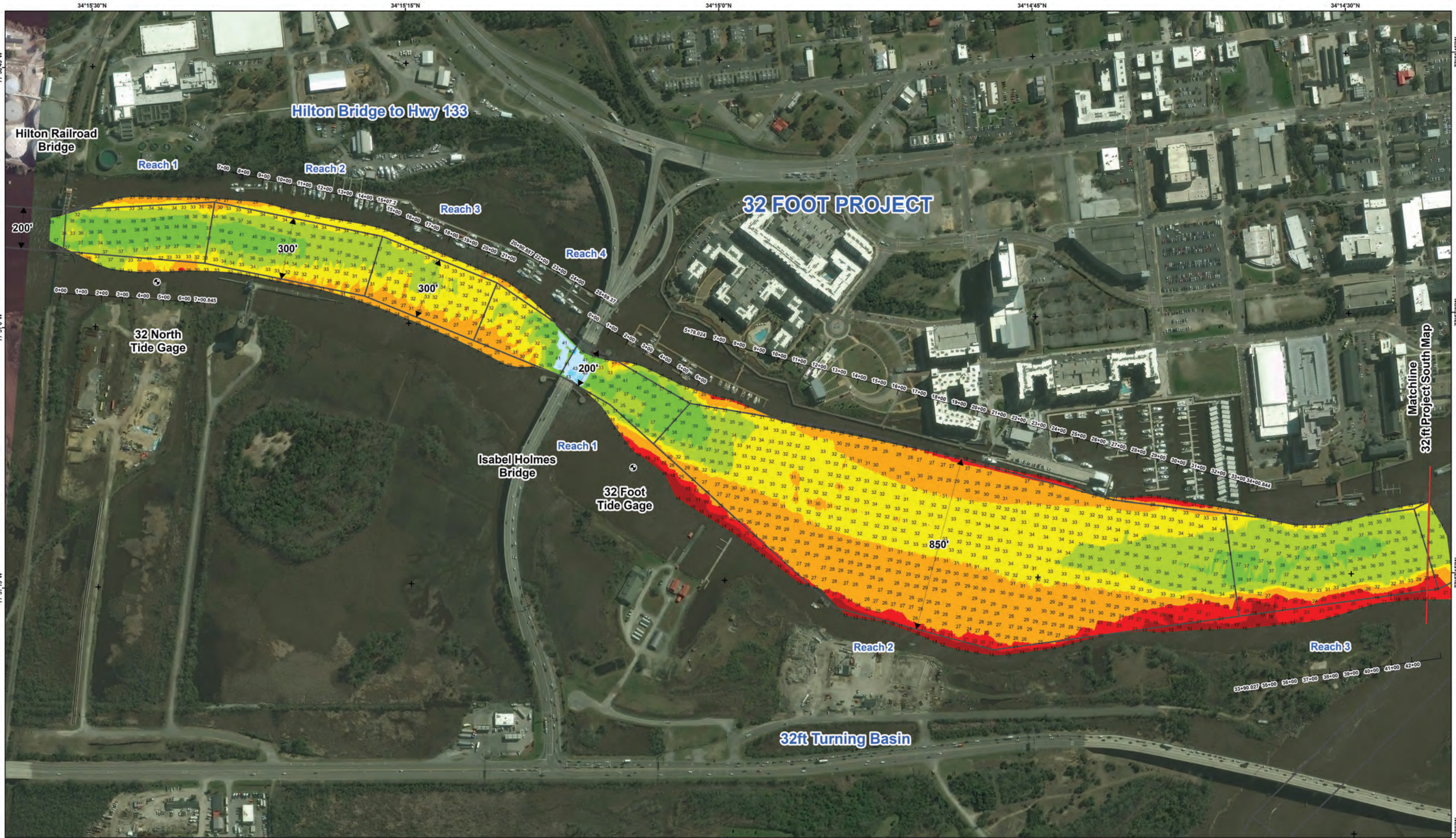
- Can
- Nun
- Green Lighted Buoy
- Red Lighted Buoy
- Junction Marker
- Green Light
- Red Light
- Green Daybeacon
- Red Daybeacon
- Danger Sign
- Mileboard
- Tide Gage

Depth In Feet

20 25 32 35 38 42 44 45 47

20 and Shallower 47 and Deeper

Matchlines
Navigation Channel



HYDROGRAPHIC SURVEY

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA

32ft Project North

NORTH CAROLINA

Survey Date: 12-13 March 2024
Map Date: 14 March 2024
Imagery Date: 11 March 2024
© 2024 Maxar Technologies
Scale: 1:2,400
File Name: WH_26_32F_20240312_CS
Surveyed by: JCC,SRV
Mapped by: k7pdpdgd
Processed by: k7pdpdgd

200 100 0 200 400 600 Feet

1. ELEVATIONS ARE IN FEET AND REFER TO NOAA'S REPORTED MEAN LOWER LOW WATER (MLLW) RELATIVE TO THE 1983-2001 TIDAL EPOCH.

2. PROJECT SURVEYED WITH DISTRICT SURVEY VESSEL "SWART" USING RTK GPS HORIZONTAL POSITIONING EQUIPMENT AND 28 KHZ SOUNDING EQUIPMENT.

3. HORIZONTAL DATUM NAD 83. VERTICAL DATUM MLLW.

4. TIDE GAUGE LOCATED AT: ENGINEER REPAIR YARD. USE OF TIDE VALUES FOR THIS GAUGE ARE RESTRICTED TO QUALITY ASSURANCE PURPOSES FOR VERIFICATION OF RTK TIDES. THE WILMINGTON DISTRICT WILL ONLY USE STAFF GAUGE TIDE VALUES FOR FINAL MAPPING AND QUANTITY CALCULATIONS IF RTK GPS IS UNAVAILABLE AT THE TIME OF SURVEY.

5. THIS PROJECT WAS DESIGNED BY THE WILMINGTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER1110-1-8152.

6. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.325.

7. NAVIGATION AIDS LOCATED WITH DISTRICT SURVEY VESSEL. ACCURACY +/- 3 METERS.

8. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT: WWW.SAW.USACE.ARMY.MIL

TYPICAL SECTION

Aids to Navigation

- Can
- Nun
- Green Lighted Buoy
- Red Lighted Buoy
- Junction Marker
- Green Light
- Red Light
- Green Daybeacon
- Red Daybeacon
- Danger Sign
- Mileboard
- Tide Gauge

Depth In Feet

20 and Shallower

47 and Deeper

Matchlines

Navigation Channel



HYDROGRAPHIC SURVEY

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA

25 Foot Project

NORTH CAROLINA

Survey Date: 02 May 2024
Map Date: 03 May 2024
Imagery Date: 05 April 2024
© 2024 Maxar Technologies
Scale: 1:2,400
File Name: WH_27_25F_20240502_CS
Surveyed by: JCC/SRV
Mapped by: k7pdpd
Processed by: k7pdpd

200 100 0 200 400 600 Feet

1. ELEVATIONS ARE IN FEET AND REFER TO NOAA'S REPORTED MEAN LOWER LOW WATER (MLLW) RELATIVE TO THE 1983-2001 TIDAL EPOCH.

2. PROJECT SURVEYED WITH DISTRICT SURVEY VESSEL "SWART", USING RTK GPS HORIZONTAL POSITIONING EQUIPMENT AND 28 KHZ SOUNDING EQUIPMENT.

3. HORIZONTAL DATUM NAD 1983. VERTICAL DATUM M.L.L.W..

4. TIDE GAGE LOCATED AT: 25FT
USE OF TIDE VALUES FOR THIS GAGE ARE RESTRICTED TO QUALITY ASSURANCE PURPOSES FOR VERIFICATION OF RTK TIDES. THE WILMINGTON DISTRICT WILL ONLY USE STAFF GAGE TIDE VALUES FOR FINAL MAPPING AND QUANTITY CALCULATIONS IF RTK GPS IS UNAVAILABLE AT THE TIME OF SURVEY.

5. THIS PROJECT WAS DESIGNED BY THE WILMINGTON DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS AND SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY 33 CFR 209.329.

6. THE INFORMATION DEPICTED ON THIS SURVEY MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME. THESE CONDITIONS ARE SUBJECT TO RAPID CHANGE DUE TO SHOALING EVENTS. A PRUDENT MARINER SHOULD NOT RELY EXCLUSIVELY ON THE INFORMATION PROVIDED HERE. REQUIRED BY 33 CFR 209.329.

7. NAVIGATION AIDS LOCATED WITH DISTRICT SURVEY VESSEL. ACCURACY +/- 3 METERS.

8. FOR THE MOST UP TO DATE INFORMATION PLEASE CHECK OUR WEBSITE AT WWW.SAIV.USACE.ARMY.MIL.

TYPICAL SECTION

NOT TO SCALE

Aids to Navigation

- Can
- Nun
- Green Lighted Buoy
- Red Lighted Buoy
- Junction Marker
- Green Light
- Red Light
- Green Daybeacon
- Red Daybeacon
- Danger Sign
- Mileboard
- Tide Gage

Depth In Feet

20 and Shallower

Navigation Channel

Exhibit D: Bridge Log

Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jan20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-01-20	9:42 AM	10:01 AM	0:19	Ship	Patalya		Clear	S	Blaha
01-08-20	8:58 AM	9:09 AM	0:11	Tug / Barge	seahawk		Clear	N	Walker
01-08-20	10:31 AM	10:39 AM	0:08	Sailboat	lanscape		Clear	S	Walker
01-09-20	9:51 AM	9:57 AM	0:06	Tug / Barge	seahawk		Clear	S	Walker
01-15-20	12:10 PM	12:18 PM	0:08	Sailboat	Lorraine		Clear	N	Steed
01-23-20	21:27 PM	21:36 PM	0:08	Maintenance	pcm		Clear		Walker
01-24-20	3:14 AM	3:19 AM	0:05			PCL	Clear		Barrett
01-27-20	11:21 AM	11:30 AM	0:08	Sailboat	chairity		Clear	S	Walker
02-01-20	10:59 AM	11:12 AM	0:13	Coast Guard	Diligence		Rainy	S	Steed
02-08-20	21:51 PM	22:06 PM	0:15	Ship	ChemLeon		Partly Cloudy	N	Steed
02-09-20	23:00 PM	23:13 PM	0:12	Ship	Chem Leon		Partly Cloudy	S	Steed
02-10-20	4:27 AM	4:38 AM	0:10	Maintenance		PCI..raised brigde 45'	Partly Cloudy		Steed
02-10-20	4:45 AM	4:59 AM	0:13	Maintenance		PCI..raised bridge 45'	Partly Cloudy		Steed
02-10-20	16:50 PM	17:08 PM	0:17	Tug / Barge	royal engineer		Partly Cloudy	N	Walker
02-11-20	1:19 AM	1:30 AM	0:10	Tug / Barge	barge with the crane		Partly Cloudy	S	Steed
02-11-20	15:11 PM	15:23 PM	0:11	Tug / Barge	royal engineer		Partly Cloudy	N	Walker
02-11-20	20:53 PM	21:06 PM	0:13	Tug / Barge	royal engineer		Partly Cloudy	S	Walker
02-13-20	12:39 AM	12:46 AM	0:07	Tug / Barge	Island Fox		Partly Cloudy	N	Blaha
02-13-20	10:33 AM	10:45 AM	0:12	Tug / Barge	Island Fox		Windy	S	Steed
02-14-20	14:55 PM	15:07 PM	0:12	Tug / Barge	Royal Engineer		Clear	N	Steed
02-15-20	9:22 AM	9:33 AM	0:11	Tug / Barge	Royal Engineer		Clear	S	Barrett
02-17-20	11:17 AM	11:17 AM	0:00	Maintenance		Released Torque NE-2.5", SE-1.5", SW-1.25", NW-	Clear		Walker
02-24-20	22:00 PM	22:08 PM	0:08	Training			Clear		Robbins
02-24-20	23:01 PM	23:10 PM	0:08	Training			Clear		Robbins
02-25-20	12:02 AM	12:11 AM	0:08	Training			Clear		Robbins

NOTE: All draw bridges are to be opened at least once a week. The machinery, gates and bearings are to be inspected at least once a week and are to be kept thoroughly lubricated. Reports are to be sent immediately after the last day of each month to the Maintenance Supervisor. An accident or serious damage to the fender system or the bridge machinery is to be reported at once by telephone to the Maintenance Supervisor. A

report of an accident or damage is to be made on regular form and forwarded immediately. Particular attention is to be paid to all navigation and warning lights which are to be kept in first class condition at all times.

Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Feb 20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
02-25-20	12:29 AM	12:39 AM	0:09	Training			Clear		Robbins
02-25-20	1:01 AM	1:09 AM	0:08	Training			Clear		Robbins
02-25-20	1:31 AM	1:39 AM	0:08	Training			Clear		Robbins
02-25-20	2:01 AM	2:09 AM	0:08	Training			Clear		Robbins
02-25-20	2:30 AM	2:38 AM	0:08	Training			Clear		Robbins
02-25-20	3:00 AM	3:08 AM	0:08	Training			Clear		Robbins
02-25-20	3:30 AM	3:38 AM	0:08	Training			Clear		Robbins
02-25-20	3:59 AM	4:07 AM	0:08	Training			Clear		Robbins
02-25-20	21:59 PM	22:08 PM	0:08	Training			Clear		Robbins
02-25-20	22:58 PM	23:07 PM	0:09	Training			Clear		Robbins
02-25-20	23:59 PM	12:08 AM	0:08	Training			Clear		Robbins
02-26-20	12:30 AM	12:38 AM	0:08	Training			Clear		Robbins
02-26-20	1:00 AM	1:09 AM	0:08	Training			Clear		Robbins
02-26-20	1:30 AM	1:38 AM	0:08	Training			Clear		Robbins
02-26-20	2:00 AM	2:08 AM	0:08	Training			Clear		Robbins
02-26-20	2:30 AM	2:38 AM	0:08	Training			Clear		Robbins
02-26-20	3:00 AM	3:08 AM	0:08	Training			Clear		Robbins
02-26-20	3:30 AM	3:37 AM	0:07	Training			Clear		Robbins
02-26-20	4:00 AM	4:08 AM	0:08	Training			Clear		Robbins
02-26-20	22:00 PM	22:08 PM	0:08	Training			Clear		Robbins
02-26-20	23:00 PM	23:08 PM	0:08	Training			Clear		Robbins
02-27-20	12:11 AM	12:23 AM	0:12	Ship	Chem Singapore		Clear	N	Robbins
02-27-20	1:00 AM	1:08 AM	0:08	Training			Clear		Robbins
02-27-20	1:30 AM	1:38 AM	0:08	Training			Clear		Robbins
02-27-20	2:00 AM	2:08 AM	0:08	Training			Clear		Robbins

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Feb 20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
02-27-20	2:30 AM	2:38 AM	0:08	Training			Clear		Robbins
02-27-20	3:01 AM	3:09 AM	0:08	Training			Clear		Robbins
02-27-20	3:30 AM	3:38 AM	0:08	Training			Clear		Robbins
02-27-20	4:00 AM	4:08 AM	0:07	Training			Clear		Robbins
02-27-20	20:39 PM	20:54 PM	0:14	Ship	ChemSingapore		Clear	S	Barrett
02-27-20	23:01 PM	23:09 PM	0:07	Training			Clear		Robbins
02-28-20	12:00 AM	12:08 AM	0:08	Training			Clear		Robbins
02-28-20	12:31 AM	12:38 AM	0:07	Training			Clear		Robbins
02-28-20	1:03 AM	1:11 AM	0:07	Training			Clear		Robbins
02-28-20	1:30 AM	1:39 AM	0:08	Training			Clear		Robbins
02-28-20	2:00 AM	2:08 AM	0:08	Training			Clear		Robbins
02-28-20	2:30 AM	2:38 AM	0:08	Training			Clear		Robbins
02-28-20	3:00 AM	3:08 AM	0:07	Training			Clear		Robbins
02-28-20	3:31 AM	3:39 AM	0:08	Training			Clear		Robbins
02-28-20	4:00 AM	4:08 AM	0:07	Training			Clear		Robbins
02-28-20	6:56 AM	7:08 AM	0:12	Tug / Barge	Scott Turecamo/Ne		Clear	N	Blaha
02-28-20	16:32 PM	16:44 PM	0:12	Sailboat	Sky Fall		Clear	N	Barrett
02-29-20	9:31 AM	9:44 AM	0:12	Tug / Barge	Scott Turecamo/Ne		Clear	S	Blaha
03-01-20	22:01 PM	22:09 PM	0:08	Training			Clear		Robbins
03-01-20	23:01 PM	23:08 PM	0:07	Training			Clear		Robbins
03-02-20	12:01 AM	12:09 AM	0:07	Training			Clear		Robbins
03-02-20	1:01 AM	1:09 AM	0:08	Training			Clear		Robbins
03-02-20	1:31 AM	1:38 AM	0:07	Training			Clear		Robbins
03-02-20	2:01 AM	2:08 AM	0:07	Training			Clear		Robbins
03-02-20	2:31 AM	2:39 AM	0:08	Training			Clear		Robbins

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Mar20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
03-02-20	3:01 AM	3:08 AM	0:07	Training			Clear		Robbins
03-02-20	4:00 AM	4:08 AM	0:08	Training			Clear		Robbins
03-02-20	22:01 PM	22:08 PM	0:07	Training			Clear		Robbins
03-02-20	23:01 PM	23:08 PM	0:07	Training			Clear		Robbins
03-03-20	12:01 AM	12:08 AM	0:07	Training			Clear		Robbins
03-03-20	1:01 AM	1:10 AM	0:09	Training			Clear		Robbins
03-03-20	2:01 AM	2:09 AM	0:07	Training			Clear		Robbins
03-03-20	2:47 AM	2:48 AM	0:00	Maintenance		Released Torque-NE-3"	Clear		Robbins
03-03-20	3:01 AM	3:08 AM	0:07	Training			Clear		Robbins
03-03-20	4:01 AM	4:09 AM	0:07	Training			Clear		Robbins
03-03-20	22:01 PM	22:08 PM	0:07	Training			Clear		Robbins
03-03-20	23:01 PM	23:09 PM	0:07	Training			Clear		Robbins
03-04-20	12:01 AM	12:09 AM	0:07	Training			Clear		Robbins
03-04-20	1:01 AM	1:09 AM	0:07	Training			Clear		Robbins
03-04-20	2:01 AM	2:09 AM	0:08	Training			Clear		Robbins
03-04-20	3:01 AM	3:12 AM	0:11	Training			Clear		Robbins
03-04-20	4:01 AM	4:09 AM	0:08	Training			Clear		Robbins
03-04-20	10:14 AM	10:22 AM	0:07	Sailboat	Gradlel		Clear	S	Barrett
03-04-20	23:01 PM	23:08 PM	0:07	Training			Clear		Robbins
03-05-20	9:40 AM	9:52 AM	0:12	Tug / Barge	Barbara Carol Ann	Had to use cheat button	Clear	N	Barrett
03-05-20	12:01 AM	12:08 AM	0:07	Training			Clear		Robbins
03-05-20	1:01 AM	1:08 AM	0:07	Training			Clear		Robbins
03-05-20	2:01 AM	2:08 AM	0:07	Training			Clear		Robbins
03-05-20	3:01 AM	3:09 AM	0:07	Training			Clear		Robbins
03-05-20	4:01 AM	4:09 AM	0:08	Training			Clear		Robbins

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Mar20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
03-05-20	13:21 PM	13:33 PM	0:12	Sailboat	Vixon 2		Clear	N	Barrett
03-05-20	15:05 PM	15:05 PM	0:00	Maintenance		tourque coupling ne 2" nw 1" 1/2	Clear		Barrett
03-05-20	22:01 PM	22:08 PM	0:07	Training			Clear		Robbins
03-06-20	7:53 AM	8:02 AM	0:09	Tug / Barge	Barbara Carol Ann		Clear	S	Barrett
03-07-20	8:23 AM	8:33 AM	0:10	Sailboat	Gradle		Clear	N	Robbins
03-10-20	12:24 PM	12:35 PM	0:11	Coast Guard	Diligence		Clear	N	Robbins
03-12-20	13:23 PM	13:23 PM	0:00	Maintenance		Released Torque: SW-2.5", NW - .25" NE-.75", SE-	Clear		Steed
03-21-20	20:31 PM	20:39 PM	0:08	Training			Clear		Wiant
03-28-20	12:07 PM	12:19 PM	0:11	Sailboat	C1		Clear	N	Robbins
03-28-20	19:30 PM	19:38 PM	0:08	Sailboat	Firefly		Clear	N	Steed
04-07-20	23:10 PM	23:22 PM	0:11	Ship	Chem New York		Clear	N	Steed
04-09-20	12:38 AM	12:52 AM	0:14	Ship	Chem New York		Clear	S	Steed
04-12-20	18:30 PM	18:42 PM	0:12	Tug / Barge	Barbara CarolAnne		Clear	N	Robbins
04-13-20	18:47 PM	18:58 PM	0:11	Tug / Barge	Barbara Carol Anne		Clear	S	Robbins
04-18-20	9:14 AM	9:25 AM	0:10	Tug / Barge	Mako		Clear	N	Robbins
04-19-20	5:49 AM	5:59 AM	0:10	Tug / Barge	Mako		Clear	S	Robbins
04-21-20	10:37 AM	10:50 AM	0:12	Ship	Chem Sirius		Clear	N	Steed
04-22-20	11:36 AM	11:55 AM	0:18	Ship	Chem Sirius And Sc	for ship and N for barge	Clear	S	Steed
04-23-20	10:09 AM	10:19 AM	0:09	Sailboat	Seeker		Partly Cloudy	N	Steed
04-23-20	10:55 AM	11:04 AM	0:09	Sailboat	Seeker		Rainy	S	Steed
04-24-20	18:17 PM	18:30 PM	0:12	Ship	Atlantik Miracle		Sunny	N	Barrett
04-24-20	13:08 PM	13:20 PM	0:11	Tug / Barge	Scott Turecamo		Partly Cloudy	S	Steed
04-25-20	20:03 PM	20:16 PM	0:12	Ship	Atlantik Miracle		Clear	S	Barrett
04-27-20	5:56 AM	6:04 AM	0:08	Ship	Palanka Rio		Clear	N	Blaha
04-27-20	10:15 AM	10:22 AM	0:06	Sailboat	Seaborne		Clear	S	Blaha

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Apr20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
04-28-20	9:55 AM	10:03 AM	0:08	Ship	Amparo Paola	had to cheat northeast corner	Clear	N	Blaha
04-28-20	11:30 AM	11:40 AM	0:10	Ship	Palanka Rio		Clear	S	Blaha
04-30-20	12:27 PM	12:38 PM	0:11	Ship	Paola		Clear	S	Blaha
05-01-20	13:36 PM	13:45 PM	0:08	Sailboat	Signia		Clear	N	Barrett
05-02-20	12:20 PM	12:35 PM	0:15	Tug / Barge	Barbara Carol Ann I		Clear	N	Barrett
05-03-20	8:44 AM	8:54 AM	0:10	Tug / Barge	Barbara Carol Ann I		Clear	S	Barrett
05-04-20	11:21 AM	11:21 AM	0:00	Maintenance		Released Torque	Clear		Barrett
05-04-20	17:00 PM	17:08 PM	0:08	Sailboat	TRIBUTE		Clear	N	Wiant
05-06-20	10:03 AM	10:09 AM	0:05	Sailboat	Tribute		Clear	S	Robbins
05-07-20	13:51 PM	13:58 PM	0:07	Sailboat	Margrieta		Clear	N	Steed
05-09-20	9:50 AM	9:59 AM	0:09	Sailboat	Sea Change	Used Cheat Button	Clear	N	Robbins
05-12-20	12:48 PM	12:48 PM	0:00	Maintenance		released torque: NE 1.25", SE 1.5", SW 2", NW 0"	Clear		Steed
05-13-20	16:49 PM	17:02 PM	0:12	Ship	BW Leopard		Clear	N	Blaha
05-15-20	11:20 AM	11:28 AM	0:08	Sailboat	Counting Stars		Clear	N	Steed
05-15-20	14:01 PM	14:15 PM	0:13	Ship	BW Leopard		Clear	S	Barrett
05-15-20	18:18 PM	18:29 PM	0:10	Tug / Barge	Sea Hawk		Clear	N	Barrett
05-16-20	19:53 PM	20:02 PM	0:09	Tug / Barge	Sea Hawk		Clear	S	Barrett
05-16-20	21:35 PM	21:49 PM	0:13	Tug / Barge	Scott Turcamo		Clear	N	Barrett
05-17-20	8:28 AM	8:38 AM	0:10	Tug / Barge	Scott Turecamo		Clear	S	Blaha
05-21-20	16:58 PM	17:06 PM	0:08	Sailboat	Asteria		Rainy	N	Robbins
05-24-20	12:45 PM	12:59 PM	0:13	Ship	STI Wembley		Partly Cloudy	N	Wiant
05-25-20	9:16 AM	9:27 AM	0:10	Ship	STI Wembley		Partly Cloudy	S	Barrett
05-25-20	12:24 PM	12:37 PM	0:12	Coast Guard	Dilagance		Partly Cloudy	S	Barrett
05-27-20	10:55 AM	11:09 AM	0:13	Coast Guard	(Cutter)Maple	Rain	Partly Cloudy	N	Robbins
05-28-20	9:02 AM	9:13 AM	0:10	Coast Guard	(Cutter) Maple		Partly Cloudy	S	Robbins

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF May20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
05-29-20	15:04 PM	15:15 PM	0:10	Sailboat	Landscape		Partly Cloudy	N	Blaha
05-29-20	22:20 PM	22:33 PM	0:12	Sailboat	Purple Pelican		Partly Cloudy	N	Barrett
06-04-20	6:32 AM	6:32 AM	0:00				Partly Cloudy		Walker
06-05-20	12:51 PM	12:56 PM	0:05	Sailboat	OLILUKI		Partly Cloudy	N	Walker
06-06-20	12:02 PM	12:10 PM	0:07	Sailboat	Starfish Enterprise		Partly Cloudy	S	Wiant
06-10-20	11:20 AM	11:30 AM	0:10	Sailboat	Silverbird		Partly Cloudy	N	Barrett
06-11-20	10:57 AM	11:04 AM	0:07	Sailboat	Silver Bird		Partly Cloudy	S	Barrett
06-11-20	12:17 PM	12:25 PM	0:07	Sailboat	Sublime		Partly Cloudy	S	Barrett
06-12-20	8:43 AM	8:53 AM	0:09	Sailboat	360		Rainy	N	Barrett
06-17-20	15:26 PM	15:36 PM	0:09	Maintenance		test opening	Partly Cloudy		Steed
06-18-20	16:30 PM	16:39 PM	0:08	Sailboat	MARGHARETTA		Partly Cloudy	S	Blaha
06-18-20	17:55 PM	18:02 PM	0:07	Sailboat	Margharetta		Partly Cloudy	N	Blaha
06-19-20	15:19 PM	15:24 PM	0:04	Sailboat	Margharetta		Partly Cloudy	S	Blaha
06-20-20	18:14 PM	18:22 PM	0:07	Sailboat	Margharetta		Partly Cloudy	N	Blaha
06-22-20	11:20 AM	11:29 AM	0:09	Sailboat	Firefly	had to use cheat button	Partly Cloudy	S	Steed
06-22-20	15:03 PM	15:13 PM	0:10	Sailboat	Firefly		Partly Cloudy	N	Blaha
06-23-20	6:54 AM	7:03 AM	0:08	Tug / Barge	scott turecamo		Partly Cloudy	N	Walker
06-24-20	12:39 PM	12:39 PM	0:00	Maintenance		release torque NE 1", SE 2.5"	Partly Cloudy		Steed
06-24-20	14:06 PM	14:23 PM	0:17	Tug / Barge	Scott Turecamo		Clear	S	Barrett
06-26-20	6:30 AM	6:44 AM	0:13	Tug / Barge	Barbara Carol Ann		Clear	N	Blaha
06-26-20	15:20 PM	15:28 PM	0:08	Sailboat	Malilia		Clear	N	Barrett
06-26-20	16:07 PM	16:19 PM	0:11	Tug / Barge	Barbara Carol Ann		Clear	S	Barrett
07-02-20	7:38 AM	7:51 AM	0:13	Sailboat	Bonhomme		Clear	N	Barrett
07-02-20	8:42 AM	8:54 AM	0:12	Ship	Alicudi		Clear	N	Barrett
07-02-20	10:06 AM	10:16 AM	0:09	Sailboat	Free Range Chick		Clear	S	Barrett

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jul20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
07-04-20	6:23 AM	6:37 AM	0:13	Sailboat	Grendel		Clear	S	Barrett
07-04-20	6:23 AM	6:37 AM	0:13	Ship	Alicudi		Clear	S	Barrett
07-05-20	13:02 PM	13:13 PM	0:11	Sailboat	Wander		Clear	N	Robbins
07-05-20	13:42 PM	13:52 PM	0:09	Sailboat	Gradle		Clear	N	Robbins
07-06-20	19:05 PM	19:14 PM	0:08	Sailboat	Wander		Clear	S	Steed
07-10-20	6:11 AM	6:21 AM	0:09	Sailboat	? dark blue and white		Clear	S	Steed
07-12-20	11:01 AM	11:10 AM	0:08	Sailboat	Sea Change	had to cheat	Clear	S	Steed
07-12-20	14:16 PM	14:25 PM	0:08	Sailboat	Gradie		Clear	S	Blaha
07-17-20	13:16 PM	13:26 PM	0:10	Sailboat	Gradle		Clear	N	Blaha
07-18-20	18:21 PM	18:25 PM	0:04	Sailboat	Oli Luki		Clear	S	Wiant
07-21-20	7:55 AM	8:05 AM	0:09	Sailboat	360		Clear	S	Barrett
07-22-20	14:22 PM	14:30 PM	0:07	Sailboat	Windflower		Clear	S	Robbins
07-23-20	14:26 PM	14:35 PM	0:09	Sailboat	lanscape		Clear	S	Walker
07-26-20	14:47 PM	14:59 PM	0:11	Sailboat	margarita		Clear	S	Walker
07-27-20	10:16 AM	10:25 AM	0:08	Sailboat	Gradle	Had to Cheat	Clear	S	Robbins
07-27-20	13:51 PM	13:55 PM	0:03	Malfunction			Clear		Robbins
07-28-20	8:47 AM	8:47 AM	0:00	Maintenance		Release Torque NE-1" SE-1"	Clear		Robbins
07-29-20	11:53 AM	11:54 AM	0:01	Maintenance		Elevator Inspection	Partly Cloudy		Wiant
07-31-20	17:58 PM	18:06 PM	0:08	Sailboat	Free Range Chick		Partly Cloudy	N	Blaha
08-01-20	9:06 AM	9:14 AM	0:08	Sailboat	Margerita		Clear	N	Steed
08-01-20	14:23 PM	14:31 PM	0:08	Sailboat	Loadstar		Partly Cloudy	N	Wiant
08-01-20	18:22 PM	18:30 PM	0:07	Sailboat	Gradle		Partly Cloudy	N	Wiant
08-04-20	9:50 AM	9:58 AM	0:08	Maintenance		Maintenance Test	+		Wiant
08-08-20	21:14 PM	21:24 PM	0:09	Sailboat	US Tow		Clear	N	Robbins
08-11-20	17:31 PM	17:39 PM	0:08	Sailboat	Sublime		Clear	N	Robbins

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
08-11-20	23:00 PM	23:09 PM	0:09	Training			Clear		McGee
08-12-20	22:06 PM	22:15 PM	0:08	Training			Clear		McGee
08-12-20	12:00 AM	12:08 AM	0:08	Training			Clear		McGee
08-12-20	1:00 AM	1:08 AM	0:08	Training			Clear		McGee
08-12-20	1:30 AM	1:39 AM	0:08	Training			Clear		McGee
08-12-20	2:00 AM	2:09 AM	0:09	Training			Clear		McGee
08-12-20	2:30 AM	2:38 AM	0:08	Training			Clear		McGee
08-12-20	3:30 AM	3:39 AM	0:08	Training			Clear		McGee
08-12-20	4:00 AM	4:09 AM	0:08	Training			Clear		McGee
08-12-20	4:30 AM	4:38 AM	0:08	Training			Clear		McGee
08-12-20	23:04 PM	23:13 PM	0:09	Training			Clear		McGee
08-13-20	12:00 AM	12:08 AM	0:08	Training			Clear		McGee
08-13-20	1:01 AM	1:48 AM	0:46	Training		Vehicle crashed through westbound gate	Clear		McGee
08-13-20	4:00 AM	4:08 AM	0:08	Training			Clear		McGee
08-19-20	17:09 PM	17:18 PM	0:08	Coast Guard	Maple		Clear	N	Blaha
08-20-20	11:18 AM	11:32 AM	0:13	Coast Guard	Maple		Partly Cloudy	S	Steed
08-20-20	18:34 PM	18:47 PM	0:12	Coast Guard	Maple		Partly Cloudy	N	Blaha
08-21-20	16:49 PM	16:57 PM	0:07	Coast Guard	Maple		Partly Cloudy	S	Blaha
08-23-20	11:41 AM	11:50 AM	0:08	Sailboat	Windflower		Partly Cloudy	N	Steed
08-29-20	13:53 PM	14:02 PM	0:09	Sailboat	Moonlight Lady		Partly Cloudy	N	Robbins
08-30-20	22:02 PM	22:13 PM	0:10	Ship	CHEM HOUSTON		Partly Cloudy	N	Robbins
08-31-20	13:14 PM	13:26 PM	0:11	Ship	Amparo Paola		Clear	N	Barrett
08-31-20	23:01 PM	23:14 PM	0:13	Ship	Chem Houston		Clear	S	Blaha
09-01-20	18:18 PM	18:30 PM	0:12	Ship	Amparo Paola		Clear	S	Steed
09-04-20	17:03 PM	17:12 PM	0:08	Sailboat	Purple Pelican		Clear	N	Steed

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Sep20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
09-04-20	10:51 AM	10:59 AM	0:07	Sailboat	Angel's Wing		Clear	S	Robbins
09-04-20	13:19 PM	13:27 PM	0:08	Sailboat	Purple Pelican		Clear	S	Robbins
09-05-20	10:14 AM	10:22 AM	0:07	Sailboat	Purple Pelican		Clear	S	Robbins
09-05-20	12:32 PM	12:39 PM	0:07	Sailboat	Angel's Wing		Clear	N	Robbins
09-05-20	15:42 PM	15:50 PM	0:08	Sailboat	Purple Pelican		Clear	N	Steed
09-06-20	10:12 AM	10:20 AM	0:07	Sailboat	Fiz Gig		Clear	S	Robbins
09-07-20	10:27 AM	10:37 AM	0:10	Sailboat	fizz gig	had to cheat	Clear	N	McGee
09-08-20	13:27 PM	13:27 PM	0:00	Maintenance		NE 2.5 SE 1.5 / SW 2 NW 0	Clear		McGee
09-09-20	13:48 PM	13:58 PM	0:09	Sailboat	Vermida		Clear	N	Blaha
09-09-20	16:22 PM	16:32 PM	0:09	Sailboat	Salika	90 ft mast	Clear	N	Blaha
09-11-20	14:30 PM	14:41 PM	0:10	Sailboat	Salika		Clear	S	Barrett
09-15-20	2:24 AM	2:37 AM	0:12	Maintenance		PCL Remove material from Elevator Shaft	Partly Cloudy		Wiant
09-15-20	3:32 AM	3:46 AM	0:13	Tug / Barge	Scott Turacoma		Partly Cloudy	N	Wiant
09-16-20	5:55 AM	6:14 AM	0:18	Tug / Barge	Scott Turacoma		Partly Cloudy	S	Blaha
09-21-20	2:11 AM	2:27 AM	0:16	Ship	Ardmore Dauntless		Partly Cloudy	N	Blaha
09-21-20	22:02 PM	22:12 PM	0:10	Training			Partly Cloudy		Merrick
09-21-20	23:02 PM	23:11 PM	0:09	Training			Partly Cloudy		Merrick
09-22-20	12:01 AM	12:10 AM	0:09	Training			Partly Cloudy		Merrick
09-22-20	1:01 AM	1:11 AM	0:09	Training			Partly Cloudy		Merrick
09-22-20	1:32 AM	1:42 AM	0:10	Training			Partly Cloudy		Merrick
09-22-20	2:01 AM	2:11 AM	0:09	Training			Partly Cloudy		Merrick
09-22-20	2:35 AM	2:39 AM	0:04	Training			Partly Cloudy		Merrick
09-22-20	3:00 AM	3:09 AM	0:08	Training			Partly Cloudy		Merrick
09-22-20	3:30 AM	3:40 AM	0:09	Training			Partly Cloudy		Merrick
09-22-20	22:04 PM	22:14 PM	0:09	Maintenance		Grease Aux Sheeves	Partly Cloudy		Steed

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Sep20 20

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
09-22-20	23:42 PM	23:57 PM	0:14	Tug / Barge	ardmore dauntless		Partly Cloudy	S	Steed
09-23-20	12:31 AM	12:40 AM	0:08	Training			Partly Cloudy		Steed
09-23-20	4:18 AM	4:26 AM	0:07	Ship	Chem Rotterdam		Partly Cloudy	N	Steed
09-24-20	12:34 AM	12:45 AM	0:11	Ship	Chem Rotterdam		Clear	S	Barrett
09-28-20	10:05 AM	10:18 AM	0:12	Tug / Barge	PENN NO. 81		Clear	N	Merrick
09-29-20	5:52 AM	6:04 AM	0:11	Tug / Barge	mako		Clear	S	Robbins
10-05-20	14:57 PM	15:05 PM	0:08	Sailboat	Moonlight Lady		Clear	S	Barrett
10-06-20	11:29 AM	11:37 AM	0:08	Sailboat	Sublime		Clear	S	Blaha
10-12-20	13:45 PM	14:00 PM	0:14	Sailboat	Sublime		Clear	N	Barrett
10-12-20	13:45 PM	14:00 PM	0:14	Sailboat	Bon Homme		Clear	N	Barrett
10-16-20	18:36 PM	18:45 PM	0:08	Sailboat	Patience	74 Ft Mast	Clear	N	Blaha
10-17-20	11:21 AM	11:32 AM	0:10	Tug / Barge	Mako		Clear	N	Robbins
10-17-20	19:59 PM	20:07 PM	0:07	Maintenance		Testing drive fault	Clear		Blaha
10-18-20	7:46 AM	7:58 AM	0:11	Tug / Barge	Matco		Clear	S	Steed
10-21-20	23:34 PM	23:43 PM	0:09	Sailboat	Dare Dancer		Clear	N	Robbins
10-23-20	17:07 PM	17:19 PM	0:12	Tug / Barge	Sea Hawk		Clear	N	Barrett
10-24-20	13:27 PM	13:43 PM	0:15	Tug / Barge	Sea Hawk	NE Corner did not seat	Clear	S	Blaha
10-26-20	13:39 PM	13:39 PM	0:00	Maintenance	Release Torque	NE 2", SE 1.5", SW 2", NW 0"	Clear		Blaha
10-27-20	10:02 AM	10:14 AM	0:12	Ship	Davide B		Clear	N	Wiant
10-28-20	5:31 AM	6:00 AM	0:28	Ship	David B	west motor failed	Clear	S	Steed
11-04-20	6:34 AM	6:42 AM	0:08	Sailboat	Counting Stars		Clear	S	Robbins
11-05-20	11:49 AM	11:57 AM	0:08	Sailboat	Renegade		Clear	N	Robbins
11-09-20	14:02 PM	14:11 PM	0:08	Sailboat	LaMariner	70 ft mast	Clear	N	Steed
11-10-20	8:26 AM	8:31 AM	0:05	Ship	selike		Clear	S	Merrick
11-10-20	13:43 PM	13:51 PM	0:08	Sailboat	KARMA		Clear	N	Merrick

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
11-13-20	10:21 AM	10:28 AM	0:07	Sailboat	Renegade	75 ft Mast	Clear	S	Blaha
11-14-20	10:18 AM	10:27 AM	0:09	Sailboat	DeerDancer		Clear	S	Blaha
11-15-20	10:31 AM	10:44 AM	0:12	Ship	Amparo Paola		Clear	N	Blaha
11-17-20	7:08 AM	7:19 AM	0:10	Ship	Amparo Paola		Clear	S	Barrett
11-20-20	6:59 AM	7:07 AM	0:08	Sailboat	karma		Clear	S	Barrett
11-23-20	11:19 AM	11:32 AM	0:12	Tug / Barge	Mako		Clear	N	Robbins
11-24-20	14:09 PM	14:23 PM	0:13	Tug / Barge	Mako	had to use cheat button	Clear	S	Steed
12-01-20	12:36 PM	12:36 PM	0:00	Sailboat	PATIENCE		Clear	S	Merrick
12-02-20	10:24 AM	10:33 AM	0:08	Malfunction	Wind Flower	69 ft Mast	Clear	S	Blaha
12-03-20	10:20 AM	10:30 AM	0:09	Sailboat	Leopard 43		Clear	S	Blaha
12-09-20	11:03 AM	11:12 AM	0:08	Sailboat	Wind Flower		Clear	S	Barrett
12-10-20	14:21 PM	14:35 PM	0:13	Sailboat	indego	had to cheat	Clear	S	McGee
12-11-20	10:57 AM	11:05 AM	0:08	Sailboat	Firefly		Clear	S	Barrett
12-11-20	15:56 PM	16:12 PM	0:15	Sailboat	frog's leap		Clear	S	McGee
12-14-20	16:47 PM	16:47 PM	0:00	Maintenance		Released Torque NE-.5", SE-2", SW-1.5",NW-0"	Clear		Merrick
12-20-20	2:48 AM	3:00 AM	0:12	Ship	Chem Mercury		Clear	N	Robbins
12-21-20	11:05 AM	11:17 AM	0:12	Ship	Chem Mercery		Clear	S	Steed
12-27-20	9:05 AM	9:14 AM	0:09	Sailboat	Fizig		Clear	S	Barrett
12-31-20	13:37 PM	13:45 PM	0:08	Sailboat	Bonhomm		Clear	S	Blaha

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Averages

No.Of Vessels	174
No.Of Openings	292
Avg. Vessels / Opening	0.6
Avg. Openings / Day	0.80
Avg. Vessels / Day	0.48
Avg. Opening Time	9 Min

Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jan20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-01-21	15:43 PM	15:53 PM	0:10	Sailboat	? couldn't see name		Clear	S	Steed
01-01-21	16:06 PM	16:15 PM	0:09	Sailboat	Fizgig		Rainy	N	Steed
01-02-21	13:56 PM	14:06 PM	0:09	Sailboat	Serenity		Partly Cloudy	S	Steed
01-03-21	6:49 AM	6:54 AM	0:04	Sailboat	N/A		Partly Cloudy	S	Merrick
01-03-21	9:49 AM	9:49 AM	0:00	Sailboat	Transquioo		Partly Cloudy	N	Merrick
01-03-21	22:03 PM	22:10 PM	0:07	Training		Training	Partly Cloudy		Cooper
01-03-21	23:01 PM	23:11 PM	0:09	Training		training	Partly Cloudy		Cooper
01-04-21	12:01 AM	12:11 AM	0:10	Training		Training	Partly Cloudy		Cooper
01-04-21	1:02 AM	1:13 AM	0:11	Training		Training	Partly Cloudy		Cooper
01-04-21	1:31 AM	1:41 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-04-21	2:01 AM	2:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-04-21	2:31 AM	2:40 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-04-21	3:01 AM	3:10 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-04-21	3:31 AM	3:40 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-04-21	4:01 AM	4:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-04-21	22:01 PM	22:10 PM	0:09	Training		tRAINING	Partly Cloudy		Cooper
01-04-21	23:01 PM	23:11 PM	0:09	Training		tRAINING	Partly Cloudy		Cooper
01-05-21	12:02 AM	12:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-05-21	12:31 AM	12:40 AM	0:09	Training		Trainig	Partly Cloudy		Cooper
01-05-21	1:01 AM	1:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-05-21	1:31 AM	1:40 AM	0:08	Training		TTraining	Partly Cloudy		Cooper
01-05-21	2:01 AM	2:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-05-21	2:31 AM	2:40 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-05-21	3:01 AM	3:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-05-21	3:31 AM	3:40 AM	0:08	Training		Training	Partly Cloudy		Cooper

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DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-05-21	4:01 AM	4:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-05-21	23:01 PM	23:11 PM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	12:01 AM	12:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	1:01 AM	1:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	1:31 AM	1:41 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	2:01 AM	2:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	2:31 AM	2:40 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	3:31 AM	3:40 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	4:01 AM	4:10 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	22:02 PM	22:11 PM	0:09	Training		Training	Partly Cloudy		Cooper
01-06-21	23:01 PM	23:11 PM	0:09	Training		Training	Partly Cloudy		Cooper
01-07-21	12:01 AM	12:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-07-21	1:01 AM	1:10 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-07-21	1:31 AM	1:40 AM	0:09	Ship		Training	Partly Cloudy		Cooper
01-07-21	2:01 AM	2:10 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-07-21	2:31 AM	2:40 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-07-21	3:01 AM	3:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-07-21	3:31 AM	3:40 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-07-21	4:01 AM	4:10 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-07-21	13:28 PM	13:28 PM	0:00			mistake	Partly Cloudy		Steed
01-07-21	22:02 PM	22:10 PM	0:08	Training		Training	Partly Cloudy		Cooper
01-07-21	23:01 PM	23:10 PM	0:09	Training		Training	Partly Cloudy		Cooper
01-08-21	12:01 AM	12:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-08-21	1:02 AM	1:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-08-21	1:31 AM	1:41 AM	0:09	Training		Training	Partly Cloudy		Cooper

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DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-08-21	2:01 AM	2:10 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-08-21	2:31 AM	2:41 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-08-21	3:02 AM	3:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-08-21	3:33 AM	3:33 AM	0:00	Maintenance		Released torque NE-2.5"	Partly Cloudy		Cooper
01-08-21	3:34 AM	3:43 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-08-21	4:02 AM	4:12 AM	0:10	Training		Training	Partly Cloudy		Cooper
01-11-21	15:48 PM	15:48 PM	0:00	Maintenance		SW 1 3/4 SE 1/4 NW 1 NE 2	Partly Cloudy		McGee
01-11-21	22:06 PM	22:15 PM	0:08	Training		tRAINING	Partly Cloudy		Cooper
01-11-21	23:02 PM	23:11 PM	0:09	Training		tRAINING	Partly Cloudy		Cooper
01-12-21	12:02 AM	12:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-12-21	1:01 AM	1:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-12-21	1:31 AM	1:40 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-12-21	2:01 AM	2:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-12-21	2:31 AM	2:40 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-12-21	3:02 AM	3:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-12-21	4:01 AM	4:10 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-12-21	22:02 PM	22:11 PM	0:09	Training		Training	Partly Cloudy		Cooper
01-12-21	23:02 PM	23:11 PM	0:09	Training		Training	Partly Cloudy		Cooper
01-13-21	12:02 AM	12:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-13-21	1:02 AM	1:11 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-13-21	1:32 AM	1:41 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-13-21	2:02 AM	2:11 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-13-21	2:32 AM	2:40 AM	0:08	Training		Training	Partly Cloudy		Cooper
01-13-21	3:01 AM	3:10 AM	0:08	Training	Training		Partly Cloudy		Cooper
01-13-21	3:31 AM	3:40 AM	0:08	Training		Training	Partly Cloudy		Cooper

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DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-13-21	4:01 AM	4:10 AM	0:09	Training		Training	Partly Cloudy		Cooper
01-13-21	22:00 PM	22:12 PM	0:12	Training		Training	Clear		Cooper
01-13-21	23:00 PM	23:09 PM	0:09	Training		Training	Clear		Cooper
01-14-21	2:01 AM	2:11 AM	0:09	Training			Rainy		Cooper
01-14-21	12:03 AM	12:13 AM	0:10	Maintenance		Aux counter weight top slide	Rainy		Steed
01-14-21	1:32 AM	1:41 AM	0:09	Training		Training	Rainy		Cooper
01-14-21	3:01 AM	3:10 AM	0:09	Training		Training	Rainy		Cooper
01-14-21	4:01 AM	4:10 AM	0:08	Training		Training	Rainy		Cooper
01-14-21	22:02 PM	22:14 PM	0:11	Training		Training	Rainy		Cooper
01-14-21	23:02 PM	23:11 PM	0:08	Training		Training	Rainy		Cooper
01-15-21	12:02 AM	12:11 AM	0:08	Training		Training	Rainy		Cooper
01-15-21	1:02 AM	1:10 AM	0:08	Training		Training	Rainy		Cooper
01-15-21	2:02 AM	2:11 AM	0:08	Training		Training	Rainy		Cooper
01-15-21	3:02 AM	3:11 AM	0:08	Training		Training	Rainy		Cooper
01-15-21	4:02 AM	4:11 AM	0:09	Training		Training	Rainy		Cooper
01-15-21	22:32 PM	22:42 PM	0:10	Training		Training	Rainy		Cooper
01-17-21	12:12 PM	12:21 PM	0:09	Sailboat	Tranquilo		Rainy	S	Barrett
01-22-21	11:37 AM	11:37 AM	0:00	Ship	Sten Moster	Tanker	Rainy		Cooper
01-23-21	6:51 AM	7:04 AM	0:13	Ship	Sten Moster	Tanker	Rainy		Cooper
01-27-21	22:09 PM	22:09 PM	0:00	Ship	NA CC Alsucudi	Tanker	Rainy		Cooper
02-02-21	22:22 PM	22:34 PM	0:12	Ship	NA CC Alsucudi		Clear	S	Steed
02-11-21	11:31 AM	11:31 AM	0:00	Ship	Ocean Princess 1	Tanker	Clear		Cooper
02-12-21	19:02 PM	19:14 PM	0:12	Ship	Ocean Princess 1		Rainy	S	Steed
02-28-21	9:43 AM	9:53 AM	0:09	Sailboat	Pau Hana		Clear	S	Barrett
03-03-21	11:55 AM	12:03 PM	0:08	Maintenance		Inspection	Clear		Cooper

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Mar20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
03-06-21	1:03 AM	1:12 AM	0:09	Sailboat	Firefly		Clear	N	Blaha
03-07-21	18:24 PM	18:37 PM	0:12	Tug / Barge	Weddell Sea		Clear	N	Blaha
03-08-21	14:54 PM	15:09 PM	0:15	Tug / Barge	weddell Sea	cheat	Clear	S	McGee
03-09-21	12:53 PM	12:53 PM	0:00	Maintenance	Release torque	NE-2.75", SE-2" SW-2", NW-0"	Clear		Steed
03-13-21	10:26 AM	10:34 AM	0:07	Sailboat	Grace		Clear	N	Blaha
03-15-21	10:18 AM	10:28 AM	0:10	Sailboat	zambeasy		Clear	N	McGee
03-15-21	11:33 AM	11:39 AM	0:06	Maintenance		Test opening NEW DRIVE	Clear		McGee
03-16-21	13:59 PM	14:18 PM	0:19	Ship	Chem Neon	Tanker	Clear		Cooper
03-17-21	14:50 PM	15:02 PM	0:12	Ship	Chem Neon	Tanker	Clear		Cooper
03-22-21	7:44 AM	7:53 AM	0:09	Sailboat	Zambesi	Sailboat	Clear		Cooper
03-23-21	20:59 PM	21:13 PM	0:13	Tug / Barge	Freeport		Rainy	N	Steed
03-25-21	17:12 PM	17:26 PM	0:13	Tug / Barge	Freeport		Rainy	S	Blaha
03-29-21	16:20 PM	16:32 PM	0:11	Ship	Chem Gallium	NW and SW did not seat	Rainy	N	Blaha
03-30-21	13:12 PM	13:23 PM	0:00	Ship	Chem Gallium		Clear	S	Steed
03-30-21	10:17 AM	10:24 AM	0:07	Maintenance		Checking seating issues	Rainy		Steed
03-31-21	10:03 AM	10:09 AM	0:06	Maintenance		Skew test	Clear		Steed
03-31-21	11:02 AM	11:08 AM	0:06	Maintenance		Skew test	Clear		Steed
03-31-21	12:04 PM	12:11 PM	0:06	Maintenance		Skew test	Clear		Steed
04-02-21	15:47 PM	15:57 PM	0:09	Ship	Ampard Paolo	clear	Clear		McGee
04-03-21	15:57 PM	16:09 PM	0:11	Sailboat	Windflower		Clear	N	Barrett
04-04-21	12:51 PM	13:02 PM	0:11	Ship	Amparo Paolo		Clear	S	Blaha
04-05-21	7:36 AM	7:44 AM	0:07	Sailboat	Grace		Clear	S	Blaha
04-05-21	9:48 AM	10:00 AM	0:12	Tug / Barge	Barbara Carol Ann		Clear	N	Blaha
04-06-21	14:59 PM	15:10 PM	0:10	Tug / Barge	Barbara Carol Ann	Tug Barge	Clear		Blaha
04-10-21	11:01 AM	11:01 AM	0:00	Sailboat	Once Again	Sailboat	Rainy	N	Cooper

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Apr20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
04-11-21	19:06 PM	19:18 PM	0:11	Ship	maple		Rainy	N	Merrick
04-12-21	7:51 AM	8:02 AM	0:11	Coast Guard	Maple	Buoy Tender	Rainy	S	Cooper
04-12-21	19:18 PM	19:27 PM	0:09	Sailboat	pau hana		Rainy	N	Merrick
04-13-21	6:43 AM	6:54 AM	0:10	Tug / Barge	Barry Silverton		Rainy	N	Cooper
04-14-21	13:13 PM	13:25 PM	0:11	Tug / Barge	Barry Singleton		Rainy	S	Cooper
04-19-21	5:57 AM	6:09 AM	0:11	Ship	Navig8 Amber		Clear	N	Steed
04-20-21	13:04 PM	13:17 PM	0:12	Ship	Navig8 Amber		Clear	S	Steed
04-21-21	10:14 AM	10:27 AM	0:13	Ship	Harbour Pioneer		Clear	N	Blaha
04-22-21	14:50 PM	15:05 PM	0:15	Ship	Harbor Pioneer		Clear	S	Barrett
04-22-21	19:43 PM	19:53 PM	0:09	Ship	Suhar		Clear	N	Barrett
04-26-21	10:30 AM	10:41 AM	0:10	Ship	Suhar		Clear	S	Barrett
04-29-21	11:39 AM	11:49 AM	0:10	Sailboat	Once Again		Clear	S	Barrett
05-09-21	13:32 PM	13:41 PM	0:09	Sailboat	frogs leap	clear	Clear	N	Steed
05-11-21	11:43 AM	11:54 AM	0:11	Tug / Barge	Barbara Carol Ann I		Clear	N	Blaha
05-12-21	1:53 AM	2:06 AM	0:12	Tug / Barge	Barbara Carol Ann I		Clear	S	Steed
05-14-21	10:21 AM	10:33 AM	0:11	Sailboat	Free Range Chick	had to use cheat button	Clear	S	Steed
05-15-21	9:23 AM	9:30 AM	0:07	Sailboat	Frogs Leap	Had to use the Over Ride Button	Clear	S	Steed
05-17-21	15:03 PM	15:11 PM	0:08	Sailboat	As You Wish		Clear	N	Cooper
05-20-21	8:38 AM	8:53 AM	0:14	Sailboat	Labmariner	Had to use cheat button	Clear	N	Barrett
05-20-21	12:14 PM	12:14 PM	0:00	Maintenance	Release Torque Co	NE-2.5" SE-1.5" SW-2" NW-0"	Clear		Barrett
05-21-21	10:17 AM	10:34 AM	0:16	Maintenance		fault alarm swithed motors from NW & NE to SW & SE.	Clear		McGee
05-25-21	9:45 AM	9:57 AM	0:11	Sailboat	Counting Stars		Clear	N	Cooper
05-25-21	9:45 AM	9:57 AM	0:11	Sailboat	As You Wish		Clear	S	Cooper
05-28-21	9:44 AM	9:54 AM	0:09	Sailboat	WindCrest		Clear	N	Steed
05-31-21	10:47 AM	10:56 AM	0:08	Sailboat	Windquest	127 ft Mast	Clear	S	Blaha

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jun20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
06-02-21	10:18 AM	13:58 PM	3:39	Sailboat	Soul Mate		Clear	S	Blaha
06-07-21	11:39 AM	11:47 AM	0:08	Sailboat	Fizzgig		Clear	S	Barrett
06-09-21	11:25 AM	11:37 AM	0:12	Ship	Santa Maria		Clear	N	Barrett
06-15-21	15:22 PM	15:31 PM	0:09	Sailboat	Fair Wind	70 Ft Mast	Clear	N	Blaha
06-16-21	16:34 PM	16:44 PM	0:09	Ship	Nao Santa Maria		Clear	S	Blaha
06-17-21	3:58 AM	4:10 AM	0:11	Tug / Barge	Blue Fin		Clear	N	Cooper
06-18-21	17:40 PM	17:51 PM	0:10	Tug / Barge	Blue Fin		Clear	S	Steed
06-18-21	20:32 PM	20:41 PM	0:08	Maintenance		test opening	Clear		Steed
06-21-21	14:20 PM	14:28 PM	0:07	Sailboat	Gradle		Clear	S	Barrett
06-21-21	16:30 PM	16:40 PM	0:10	Sailboat	Gradle		Clear	N	Barrett
06-23-21	8:32 AM	8:39 AM	0:06	Sailboat	Jetstream	73 ft mast	Clear	N	Blaha
06-27-21	10:10 AM	10:20 AM	0:10	Sailboat	tragmilo	had to cheat	Clear	N	McGee
06-28-21	13:28 PM	13:28 PM	0:00	Maintenance		tourque coupling NE-1" SE-1" SW 1.25" NW 0	Clear		McGee
06-30-21	15:25 PM	15:35 PM	0:09	Maintenance		PCL wanted counterweight measurements	Clear		Steed
07-03-21	16:11 PM	16:20 PM	0:08	Sailboat	Sweet Tea		Clear	N	Steed
07-04-21	11:42 AM	11:52 AM	0:09	Sailboat	Vista Vita		Clear	N	Cooper
07-13-21	12:59 AM	1:09 AM	0:10	Ship	Sunra		Clear	N	Steed
07-15-21	6:26 AM	6:35 AM	0:08	Sailboat	Vista Vita		Clear	S	Barrett
07-15-21	10:52 AM	11:05 AM	0:12	Ship	Suhar		Clear	S	Barrett
07-16-21	18:01 PM	18:10 PM	0:08	Sailboat	Go Shiki		Clear	N	Cooper
07-19-21	16:37 PM	16:45 PM	0:07	Sailboat	no name		Clear	N	McGee
07-21-21	10:33 AM	10:41 AM	0:08	Sailboat	Latin Marina		Clear	S	Cooper
07-21-21	16:14 PM	16:22 PM	0:08	Sailboat	Catana		Clear	N	Merrick
07-22-21	18:42 PM	18:51 PM	0:08	Sailboat	soul mate		Clear	N	Merrick
07-23-21	22:06 PM	22:14 PM	0:07	Training	None	Kurt Training	Clear		Blaha

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jul20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
07-24-21	14:33 PM	14:40 PM	0:07	Sailboat	Flying Loon		Clear	N	Blaha
07-26-21	22:03 PM	22:12 PM	0:09	Maintenance		training	Clear		Garrett
07-26-21	23:04 PM	23:13 PM	0:08	Maintenance		training	Clear		Garrett
07-27-21	22:00 PM	22:08 PM	0:08	Maintenance		training	Clear		Garrett
07-27-21	22:59 PM	23:07 PM	0:08	Maintenance		training	Clear		Garrett
07-27-21	12:04 AM	12:13 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	12:35 AM	12:43 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	1:00 AM	1:08 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	1:30 AM	1:38 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	2:00 AM	2:08 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	2:32 AM	2:40 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	3:00 AM	3:08 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	3:31 AM	3:40 AM	0:08	Maintenance		training	Clear		Garrett
07-27-21	4:00 AM	4:08 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	3:00 AM	3:08 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	3:59 AM	4:08 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	12:30 AM	12:40 AM	0:10	Maintenance		training	Clear		Garrett
07-28-21	1:01 AM	1:10 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	1:31 AM	1:39 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	2:32 AM	2:40 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	2:00 AM	2:08 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	12:00 AM	12:09 AM	0:09	Maintenance		training	Clear		Garrett
07-28-21	3:30 AM	3:38 AM	0:08	Maintenance		training	Clear		Garrett
07-28-21	5:59 AM	5:59 AM	0:00				Clear		Merrick
07-28-21	11:41 AM	11:50 AM	0:09	Sailboat	flying loon		Clear	S	Merrick

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
07-28-21	23:00 PM	23:08 PM	0:08	Maintenance		training	Clear		Garrett
07-29-21	12:00 AM	12:08 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	1:00 AM	1:08 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	1:31 AM	1:39 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	2:00 AM	2:08 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	2:29 AM	2:37 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	2:59 AM	3:07 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	3:29 AM	3:37 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	3:59 AM	4:07 AM	0:08	Maintenance		training	Clear		Garrett
07-29-21	22:00 PM	22:09 PM	0:09	Maintenance		training	Clear		Garrett
07-29-21	23:00 PM	23:08 PM	0:08	Maintenance		training	Clear		Garrett
07-29-21	23:59 PM	12:07 AM	0:08	Maintenance		training	Clear		Garrett
07-30-21	12:59 AM	1:08 AM	0:08	Maintenance		training	Clear		Garrett
07-30-21	1:29 AM	1:37 AM	0:08	Maintenance		training	Clear		Garrett
07-30-21	1:59 AM	2:07 AM	0:08	Maintenance		training	Clear		Garrett
07-30-21	2:59 AM	3:07 AM	0:08	Maintenance		training	Clear		Garrett
07-30-21	3:29 AM	3:37 AM	0:08	Maintenance		training	Clear		Garrett
07-30-21	3:59 AM	4:07 AM	0:08	Maintenance		training	Clear		Garrett
07-30-21	4:35 AM	4:35 AM	0:00	Maintenance		release torque cuppling NE-1.5"	Clear		Garrett
08-01-21	21:59 PM	22:08 PM	0:08	Maintenance		training	Clear		Garrett
08-01-21	22:59 PM	23:07 PM	0:08	Maintenance		training	Clear		Garrett
08-02-21	12:00 AM	12:08 AM	0:08	Maintenance		training	Clear		Garrett
08-02-21	1:00 AM	1:08 AM	0:08	Maintenance		training	Clear		Garrett
08-02-21	1:59 AM	2:07 AM	0:08	Maintenance		training	Clear		Garrett
08-02-21	2:59 AM	3:08 AM	0:08	Maintenance		training	Clear		Garrett

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
08-02-21	4:00 AM	4:08 AM	0:08	Maintenance		training	Clear		Garrett
08-02-21	14:15 PM	14:16 PM	0:00	Maintenance	Release Torque Co	NE 0.5 SE 2.5 SW 2.0 NW 0	Clear		Cooper
08-02-21	22:00 PM	22:08 PM	0:08	Maintenance		training	Clear		Garrett
08-02-21	22:30 PM	22:38 PM	0:08	Maintenance		training	Clear		Garrett
08-02-21	23:29 PM	23:38 PM	0:08	Maintenance		training	Clear		Garrett
08-02-21	23:59 PM	12:08 AM	0:08	Maintenance		training	Clear		Garrett
08-03-21	1:00 AM	1:08 AM	0:08	Maintenance		training	Clear		Garrett
08-03-21	1:59 AM	2:07 AM	0:08	Maintenance		training	Clear		Garrett
08-03-21	2:59 AM	3:08 AM	0:08	Maintenance		training	Clear		Garrett
08-03-21	3:59 AM	4:07 AM	0:07	Maintenance		training	Clear		Garrett
08-03-21	22:01 PM	22:09 PM	0:08	Maintenance		training	Clear		Garrett
08-03-21	23:00 PM	23:08 PM	0:08	Maintenance		training	Clear		Garrett
08-03-21	23:59 PM	12:07 AM	0:08	Maintenance		training	Clear		Garrett
08-04-21	1:00 AM	1:09 AM	0:08	Maintenance		training	Clear		Garrett
08-04-21	2:00 AM	2:09 AM	0:08	Maintenance		training	Rainy		Garrett
08-04-21	2:59 AM	3:08 AM	0:08	Maintenance		training	Rainy		Garrett
08-04-21	3:59 AM	4:06 AM	0:07	Maintenance		training	Rainy		Garrett
08-04-21	22:00 PM	22:08 PM	0:08	Maintenance		training	Rainy		Garrett
08-04-21	22:59 PM	23:07 PM	0:08	Maintenance		training	Rainy		Garrett
08-05-21	12:00 AM	12:08 AM	0:08	Maintenance		training	Rainy		Garrett
08-05-21	1:00 AM	1:08 AM	0:08	Maintenance		training	Rainy		Garrett
08-05-21	1:59 AM	2:08 AM	0:08	Maintenance		training	Rainy		Garrett
08-05-21	2:59 AM	3:08 AM	0:08	Maintenance		training	Rainy		Garrett
08-05-21	22:59 PM	23:08 PM	0:08	Maintenance		training	Rainy		Garrett
08-06-21	12:00 AM	12:08 AM	0:08	Maintenance		training	Rainy		Garrett

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
08-06-21	1:00 AM	1:08 AM	0:08	Maintenance		training	Rainy		Garrett
08-06-21	2:00 AM	2:08 AM	0:08	Maintenance		training	Rainy		Garrett
08-06-21	3:02 AM	3:10 AM	0:08	Maintenance		training	Rainy		Garrett
08-08-21	10:21 AM	10:31 AM	0:09	Sailboat	Bon A Mi		Rainy	S	Cooper
08-15-21	8:17 AM	8:27 AM	0:10	Maintenance		West Gate Malfunction	Rainy		Cooper
08-27-21	3:02 AM	3:08 AM	0:06	Ship	Suhar	Tanker	Clear	N	Cooper
08-29-21	16:26 PM	16:36 PM	0:10	Ship	Suhar		Clear	S	Steed
08-30-21	6:01 AM	6:09 AM	0:07	Sailboat	Sparkle Fish		Clear	S	Barrett
09-07-21	11:43 AM	11:43 AM	0:00	Sailboat	Sealacious Star		Clear	S	Cooper
09-09-21	11:11 AM	11:18 AM	0:07	Sailboat	Salacious Star		Clear	N	Blaha
09-13-21	18:39 PM	18:47 PM	0:08	Sailboat	Tranquilo		Clear	S	Garrett
09-19-21	11:23 AM	11:31 AM	0:08	Sailboat	Salacia Star		Clear	S	Garrett
09-22-21	11:26 AM	11:35 AM	0:08	Sailboat	Salacious Star		Clear	N	Cooper
09-22-21	11:35 AM	11:35 AM	0:00				Clear		Cooper
09-27-21	7:23 AM	7:32 AM	0:08	Sailboat	Sealacious Star		Clear	S	Cooper
09-28-21	12:06 PM	12:14 PM	0:07	Sailboat	Counting Stars	70 Ft Mast	Clear	S	Blaha
10-01-21	14:49 PM	14:57 PM	0:08	Sailboat	Counting Stars		Clear	N	Garrett
10-02-21	14:01 PM	14:10 PM	0:09	Sailboat	Firefly		Clear	N	Garrett
10-02-21	10:19 AM	10:28 AM	0:09	Sailboat	Firefly		Clear	S	Barrett
10-03-21	9:37 AM	9:49 AM	0:12	Sailboat	Born To Run		Clear	N	Barrett
10-14-21	14:12 PM	14:23 PM	0:11	Sailboat	Salacious Star	Mast Height 67'	Clear	N	Blaha
10-15-21	19:49 PM	20:01 PM	0:11	Ship	Navigate Rinaldo		Clear	N	Blaha
10-17-21	8:25 AM	8:38 AM	0:12	Ship	Navig8 Aronaldo		Clear	S	Cooper
10-18-21	1:09 AM	1:21 AM	0:12	Sailboat	Deerdancer		Clear	N	Garrett
10-18-21	10:52 AM	10:59 AM	0:07	Sailboat	Born to Run	Mast 82'	Clear	S	Blaha

NOTE: All draw bridges are to be opened at least once a week. The machinery, gates and bearings are to be inspected at least once a week and are to be kept thoroughly lubricated. Reports are to be sent immediately after the last day of each month to the Maintenance Supervisor. An accident or serious damage to the fender system or the bridge machinery is to be reported at once by telephone to the Maintenance Supervisor. A

report of an accident or damage is to be made on regular form and forwarded immediately. Particular attention is to be paid to all navigation and warning lights which are to be kept in first class condition at all times.

Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Oct20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
10-22-21	12:02 PM	12:11 PM	0:09	Sailboat	Salacious Star	67 ft mast	Clear	S	Blaha
10-22-21	13:31 PM	13:38 PM	0:07	Sailboat	Catamaran Miss Ka	78 ft mast	Clear	N	Blaha
10-22-21	15:57 PM	16:07 PM	0:10	Sailboat	Salacia Star		Clear	N	Garrett
10-23-21	10:49 AM	10:57 AM	0:08	Sailboat	Salacia Star		Clear	S	Garrett
10-23-21	10:49 AM	10:57 AM	0:08	Sailboat	Salacia Star		Clear	S	Garrett
10-23-21	12:47 PM	12:59 PM	0:11	Sailboat	Firefly		Clear	S	Garrett
10-23-21	13:22 PM	13:31 PM	0:09	Sailboat	Salacia Star		Clear	N	Garrett
10-24-21	9:27 AM	9:36 AM	0:09	Sailboat	Trenquilo		Clear	N	Cooper
10-24-21	19:36 PM	19:44 PM	0:08	Sailboat	Frogs Leap	Had to use cheat	Clear	N	Garrett
10-25-21	11:08 AM	11:08 AM	0:00			Torque coupling ne-2.5", SE-2", SW-21"	Clear		McGee
10-25-21	11:12 AM	11:23 AM	0:11	Sailboat	Time to go	overcast	Clear	N	McGee
10-27-21	14:39 PM	14:48 PM	0:08	Sailboat	Frogs Leap		Clear	N	Steed
10-27-21	10:40 AM	10:48 AM	0:07	Sailboat	Frogs Leap		Clear	S	Cooper
11-01-21	8:27 AM	8:35 AM	0:08	Sailboat	Counting Stars		Clear	S	Cooper
11-01-21	12:29 PM	12:37 PM	0:08	Sailboat	Tranquilo		Clear	S	Cooper
11-04-21	11:01 AM	11:10 AM	0:08	Sailboat	florence clara		Clear	S	McGee
11-04-21	11:01 AM	11:10 AM	0:08	Sailboat	rising star		Clear	S	McGee
11-05-21	18:18 PM	18:29 PM	0:11	Sailboat	Blue Diamond		Clear	N	Cooper
11-11-21	14:22 PM	14:30 PM	0:07	Sailboat	Labmariner	catamaran 72 ft mast	Clear	N	Garrett
11-12-21	4:45 AM	4:57 AM	0:12	Tug / Barge	Delsy		Rainy	N	Steed
11-13-21	10:44 AM	10:54 AM	0:09	Sailboat	Deerdancer		Rainy	S	Cooper
11-13-21	13:28 PM	13:39 PM	0:11	Tug / Barge	Weddell Sea/PENN		Rainy	S	Cooper
11-13-21	18:09 PM	18:19 PM	0:10	Tug / Barge	Coho - Penn No.92		Clear	N	Garrett
11-14-21	10:48 AM	10:56 AM	0:08	Sailboat	Blue Diamond		Clear	S	Cooper
11-14-21	14:19 PM	14:31 PM	0:12	Tug / Barge	Coho-Penn 92	Had to use cheat	Clear	S	Garrett

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Nov20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
11-15-21	13:03 PM	13:03 PM	0:00	Maintenance		Torque Coupling SE 2° NE 1° SW.75° NW 0°	Clear		Cooper
11-23-21	10:16 AM	10:26 AM	0:10	Sailboat	Soulmates		Clear	S	Garrett
11-23-21	18:54 PM	19:06 PM	0:11	Ship	Suhar		Clear	N	Blaha
11-26-21	9:40 AM	9:54 AM	0:13	Malfunction		issue with the wilmington gate, won't go down	Clear		Steed
11-26-21	10:26 AM	10:37 AM	0:11	Ship	Suhar		Clear	S	Steed
11-27-21	9:12 AM	9:26 AM	0:14	Tug / Barge	Barbara Carol Ann		Clear	N	Blaha
11-28-21	12:24 AM	12:37 AM	0:13	Tug / Barge	Barbara Carol Ann		Clear	S	Steed
11-28-21	4:45 AM	4:56 AM	0:10	Ship	Navig8 Amythest		Clear	N	Steed
11-29-21	13:41 PM	13:54 PM	0:12	Ship	Navig8 Amethyst		Clear	S	Blaha
11-29-21	22:03 PM	22:13 PM	0:10	Training			Clear		Goulding
11-29-21	23:00 PM	23:10 PM	0:10	Training			Clear		Goulding
11-30-21	12:00 AM	12:10 AM	0:10	Training			Clear		Goulding
11-30-21	1:00 AM	1:10 AM	0:10	Training			Clear		Goulding
11-30-21	2:00 AM	2:11 AM	0:10	Training			Clear		Goulding
11-30-21	3:00 AM	3:10 AM	0:10	Training			Clear		Goulding
11-30-21	4:01 AM	4:11 AM	0:09	Training			Clear		Goulding
11-30-21	22:00 PM	22:10 PM	0:10	Training			Clear		Goulding
11-30-21	23:06 PM	23:17 PM	0:10	Training			Clear		Goulding
12-01-21	12:00 AM	12:09 AM	0:09	Training			Clear		Goulding
12-01-21	1:00 AM	1:10 AM	0:10	Training			Clear		Goulding
12-01-21	1:30 AM	1:39 AM	0:09	Training			Clear		Goulding
12-01-21	2:00 AM	2:09 AM	0:09	Training			Clear		Goulding
12-01-21	3:00 AM	3:09 AM	0:09	Training			Clear		Goulding
12-01-21	4:00 AM	4:09 AM	0:09	Training			Clear		Goulding
12-01-21	4:30 AM	4:39 AM	0:09	Training			Clear		Goulding

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Dec20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
12-01-21	22:01 PM	22:10 PM	0:09	Training			Clear		Goulding
12-01-21	23:00 PM	23:10 PM	0:09	Training			Clear		Goulding
12-02-21	12:00 AM	12:08 AM	0:08	Training			Clear		Goulding
12-02-21	1:00 AM	1:10 AM	0:10	Training			Clear		Goulding
12-02-21	2:01 AM	2:10 AM	0:09	Training			Clear		Goulding
12-02-21	3:00 AM	3:09 AM	0:09	Training			Clear		Goulding
12-02-21	4:00 AM	4:09 AM	0:08	Training			Clear		Goulding
12-02-21	22:00 PM	22:09 PM	0:09	Training			Clear		Goulding
12-02-21	23:04 PM	23:05 PM	0:01	Training			Clear		Goulding
12-03-21	12:01 AM	12:10 AM	0:09	Training			Clear		Goulding
12-03-21	1:00 AM	1:08 AM	0:08	Training			Clear		Goulding
12-03-21	2:00 AM	2:09 AM	0:09	Training			Clear		Goulding
12-03-21	3:00 AM	3:09 AM	0:08	Training			Clear		Goulding
12-03-21	23:00 PM	23:09 PM	0:08	Training			Clear		Goulding
12-04-21	12:00 AM	12:09 AM	0:08	Training			Clear		Goulding
12-04-21	1:00 AM	1:08 AM	0:08	Training			Clear		Goulding
12-04-21	2:00 AM	2:09 AM	0:08	Training			Clear		Goulding
12-04-21	3:00 AM	3:08 AM	0:08	Training			Clear		Goulding
12-06-21	8:59 AM	8:59 AM	0:00	Maintenance		NE 1 3/4 NW 2 SE 1 1/4 SW 000	Clear		Goulding
12-06-21	22:00 PM	22:10 PM	0:10	Training			Clear		Goulding
12-06-21	23:00 PM	23:09 PM	0:09	Training			Clear		Goulding
12-07-21	12:00 AM	12:08 AM	0:08	Training			Clear		Goulding
12-07-21	1:00 AM	1:10 AM	0:09	Training			Clear		Goulding
12-07-21	1:30 AM	1:38 AM	0:08	Training			Clear		Goulding
12-07-21	2:00 AM	2:08 AM	0:08	Training			Clear		Goulding

NOTE: All draw bridges are to be opened at least once a week. The machinery, gates and bearings are to be inspected at least once a week and are to be kept thoroughly lubricated. Reports are to be sent immediately after the last day of each month to the Maintenance Supervisor. An accident or serious damage to the fender system or the bridge machinery is to be reported at once by telephone to the Maintenance Supervisor. A

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Dec 20 21

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
12-07-21	2:30 AM	2:38 AM	0:08	Training			Clear		Goulding
12-07-21	3:00 AM	3:08 AM	0:08	Training			Clear		Goulding
12-07-21	4:00 AM	4:08 AM	0:08	Training			Clear		Goulding
12-07-21	22:00 PM	22:08 PM	0:08	Training			Clear		Goulding
12-07-21	23:00 PM	23:08 PM	0:08	Training			Clear		Goulding
12-08-21	12:00 AM	12:08 AM	0:08	Training			Clear		Goulding
12-08-21	1:00 AM	1:08 AM	0:08	Training			Clear		Goulding
12-08-21	2:00 AM	2:08 AM	0:08	Training			Clear		Goulding
12-08-21	3:00 AM	3:08 AM	0:08	Training			Clear		Goulding
12-08-21	4:00 AM	4:08 AM	0:08	Training			Clear		Goulding
12-08-21	22:00 PM	22:08 PM	0:08	Training			Clear		Goulding
12-08-21	23:00 PM	23:08 PM	0:08	Training			Clear		Goulding
12-09-21	12:00 AM	12:08 AM	0:08	Training			Clear		Goulding
12-09-21	1:00 AM	1:08 AM	0:08	Training			Clear		Goulding
12-09-21	2:00 AM	2:09 AM	0:08	Training			Clear		Goulding
12-09-21	3:00 AM	3:08 AM	0:08	Training			Clear		Goulding
12-09-21	4:00 AM	4:08 AM	0:08	Training			Clear		Goulding
12-09-21	22:00 PM	22:08 PM	0:08	Training			Clear		Goulding
12-09-21	23:00 PM	23:08 PM	0:08	Training			Clear		Goulding
12-10-21	12:02 AM	12:10 AM	0:08	Training			Clear		Goulding
12-10-21	1:00 AM	1:08 AM	0:08	Training			Clear		Goulding
12-10-21	2:00 AM	2:09 AM	0:08	Training			Clear		Goulding
12-10-21	3:00 AM	3:09 AM	0:09	Training			Clear		Goulding
12-10-21	4:00 AM	4:08 AM	0:08	Training			Clear		Goulding
12-10-21	22:00 PM	22:08 PM	0:08	Training			Clear		Goulding

NOTE: All draw bridges are to be opened at least once a week. The machinery, gates and bearings are to be inspected at least once a week and are to be kept thoroughly lubricated. Reports are to be sent immediately after the last day of each month to the Maintenance Supervisor. An accident or serious damage to the fender system or the bridge machinery is to be reported at once by telephone to the Maintenance Supervisor. A

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Cape Fear Memorial

BRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Dec

20 21

[illegible]

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Averages

No.Of Vessels	135
No.Of Openings	384
Avg. Vessels / Opening	0.35
Avg. Openings / Day	1.05
Avg. Vessels / Day	0.37
Avg. Opening Time	9 Min

Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jan20 22

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-01-22	14:04 PM	14:14 PM	0:10	Sailboat	Miss Kitty		Clear	N	Goulding
01-05-22	14:26 PM	14:34 PM	0:07	Sailboat	Miss Kitty		Rainy	S	Barrett
01-18-22	14:43 PM	15:00 PM	0:17	Ship	Suhar	had to use cheat button	Clear	N	Steed
01-22-22	14:29 PM	14:38 PM	0:09	Training		Training	Clear		Cooper
01-23-22	10:21 AM	10:35 AM	0:13	Ship	SUHAR		Clear	S	Steed
01-31-22	16:51 PM	16:59 PM	0:08	Sailboat	Gradle		Clear	S	Garrett
02-06-22	10:24 AM	10:32 AM	0:08	Sailboat	Encore		Clear	S	Garrett
02-09-22	8:17 AM	8:25 AM	0:07	Sailboat	Harmony		Clear	S	Garrett
03-03-22	12:17 PM	12:28 PM	0:10	Tug / Barge	Chesapeake Coast		Clear	N	Steed
03-04-22	11:15 AM	11:28 AM	0:13	Tug / Barge	Chesapeake Coast		Clear	S	Steed
03-09-22	10:00 AM	10:09 AM	0:09	Training			Clear		Goulding
03-12-22	11:26 AM	11:41 AM	0:14	Maintenance		loose cable	Windy		Barrett
03-13-22	12:00 PM	12:08 PM	0:08	Sailboat	Goshity		Clear	N	Barrett
03-16-22	22:51 PM	23:04 PM	0:13	Tug / Barge	Cape Cod		Clear	N	Garrett
03-16-22	22:51 PM	23:04 PM	0:13	Tug / Barge	Cape Charles		Clear	N	Goulding
03-16-22	22:51 PM	23:04 PM	0:13	Ship	Stream Baltic		Clear	N	Goulding
03-18-22	12:11 AM	12:25 AM	0:13	Ship	Stream Baltic		Clear	S	Barrett
03-22-22	18:00 PM	18:12 PM	0:11	Ship	Suhar		Clear	N	Goulding
03-22-22	18:00 PM	18:12 PM	0:11	Tug / Barge	Erin McAllister		Clear	N	Goulding
03-22-22	18:00 PM	18:12 PM	0:11	Tug / Barge	Dorothy McAllister		Clear	N	Goulding
03-27-22	15:11 PM	15:23 PM	0:12	Ship	Suhar		Clear	S	Barrett
04-05-22	2:34 AM	2:50 AM	0:15	Tug / Barge	Cape Charles		Clear	N	Goulding
04-05-22	2:34 AM	2:50 AM	0:15	Tug / Barge	Cape Cod		Clear	N	Goulding
04-05-22	2:34 AM	2:50 AM	0:15	Ship	Overseas Martinez		Clear	N	Goulding
04-05-22	15:44 PM	15:58 PM	0:14	Commercial	Overseas Martinez		Clear	S	Garrett

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Apr20 22

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
04-13-22	19:18 PM	19:27 PM	0:08	Sailboat	Counting Stars		Clear	N	Goulding
04-14-22	7:52 AM	8:03 AM	0:11	Sailboat	Raggin Dragon		Clear	S	Steed
04-18-22	18:57 PM	19:07 PM	0:10	Tug / Barge	Blue Fin		Clear	N	Steed
04-19-22	13:09 PM	13:20 PM	0:10	Tug / Barge	Blue FIN		Clear	S	Goulding
04-19-22	13:09 PM	13:20 PM	0:10	Tug / Barge	Cape Charles		Clear	S	Goulding
04-19-22	19:57 PM	20:07 PM	0:10	Sailboat	Raggid Dragon		Clear	N	Garrett
04-20-22	17:15 PM	17:28 PM	0:12	Tug / Barge	Moran/Texas		Clear	N	Garrett
04-22-22	4:36 AM	4:52 AM	0:16	Tug / Barge	Mariya Moran		Clear	S	Goulding
04-22-22	4:36 AM	4:52 AM	0:16	Tug / Barge	Cape Charles		Clear	S	Goulding
04-24-22	12:48 PM	13:01 PM	0:13	Sailboat	Geranimo		Clear	N	Barrett
05-03-22	9:47 AM	10:06 AM	0:18	Sailboat	talaria	cheat	Clear	N	McGee
05-03-22	15:52 PM	15:52 PM	0:00	Maintenance		nw 0 ne1/2 sw1/4 se 5	Clear		Goulding
05-06-22	7:27 AM	7:37 AM	0:09	Sailboat	Ragon Dragon		Clear	S	Goulding
05-07-22	19:52 PM	20:11 PM	0:18	Tug / Barge	Paula Lee		Clear	N	Barrett
05-07-22	8:24 AM	8:37 AM	0:12	Tug / Barge	Colonel		Clear	N	Goulding
05-07-22	10:34 AM	10:44 AM	0:09	Tug / Barge	Colonel		Clear	S	Goulding
05-08-22	15:26 PM	15:41 PM	0:15	Tug / Barge	Colonel		Clear	S	Barrett
05-09-22	14:17 PM	14:25 PM	0:08	Tug / Barge	Colonel		Clear	N	Garrett
05-09-22	14:32 PM	14:40 PM	0:08	Sailboat	Ragged Dragon		Clear	N	Garrett
05-09-22	15:43 PM	15:43 PM	0:00	Tug / Barge	Colonel		Clear	S	Garrett
05-09-22	16:08 PM	16:18 PM	0:10	Tug / Barge	Colonel		Clear	N	Garrett
05-10-22	2:14 AM	2:23 AM	0:09	Tug / Barge	Colonel		Clear	S	Steed
05-10-22	4:25 AM	4:39 AM	0:13	Tug / Barge	Colonel		Clear	N	Steed
05-10-22	9:53 AM	10:09 AM	0:16	Tug / Barge	Colonel		Clear	S	Goulding
05-10-22	10:30 AM	10:40 AM	0:09	Tug / Barge	Colonel		Clear	N	Goulding

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF May20 22

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
05-10-22	19:34 PM	19:45 PM	0:11	Tug / Barge	Colonel		Clear	S	Garrett
05-11-22	20:42 PM	20:55 PM	0:13	Tug / Barge	Colonel		Clear	N	Garrett
05-12-22	1:14 AM	1:26 AM	0:12	Tug / Barge	Colonel		Clear	S	Goulding
05-15-22	16:21 PM	16:30 PM	0:09	Sailboat	Tularia		Clear	S	Steed
05-16-22	23:02 PM	23:12 PM	0:10	Training		Training	Clear		Keck
05-17-22	12:01 AM	12:10 AM	0:09	Training		training	Clear		Keck
05-17-22	12:59 AM	1:09 AM	0:09	Training		training	Clear		Keck
05-17-22	2:00 AM	2:09 AM	0:09	Training		training	Clear		Keck
05-17-22	3:00 AM	3:09 AM	0:09	Training		training	Clear		Keck
05-17-22	3:59 AM	4:10 AM	0:11	Training		training	Rainy		Keck
05-17-22	22:00 PM	22:09 PM	0:08	Training		training	Clear		Keck
05-17-22	23:00 PM	23:09 PM	0:09	Training		training	Clear		Keck
05-17-22	23:59 PM	12:09 AM	0:09	Training		training	Clear		Keck
05-18-22	1:00 AM	1:09 AM	0:09	Training		training	Clear		Keck
05-18-22	1:30 AM	1:39 AM	0:08	Training		Training	Clear		Keck
05-18-22	1:59 AM	2:09 AM	0:09	Training		training	Clear		Keck
05-18-22	2:32 AM	2:42 AM	0:09	Training		training	Clear		Keck
05-18-22	3:00 AM	3:09 AM	0:09	Training		training	Clear		Keck
05-18-22	4:00 AM	4:09 AM	0:09	Training		training	Clear		Keck
05-18-22	22:00 PM	22:09 PM	0:09	Training		training	Clear		Keck
05-18-22	23:02 PM	23:13 PM	0:11	Training		training	Clear		Keck
05-19-22	12:02 AM	12:11 AM	0:09	Training		training	Clear		Keck
05-19-22	12:59 AM	1:09 AM	0:09	Training		Training	Clear		Keck
05-19-22	2:00 AM	2:09 AM	0:09	Training		Training	Clear		Keck
05-19-22	3:00 AM	3:09 AM	0:09	Training		Training	Clear		Keck

NOTE: All draw bridges are to be opened at least once a week. The machinery, gates and bearings are to be inspected at least once a week and are to be kept thoroughly lubricated. Reports are to be sent immediately after the last day of each month to the Maintenance Supervisor. An accident or serious damage to the fender system or the bridge machinery is to be reported at once by telephone to the Maintenance Supervisor. A

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF May20 22

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
05-19-22	4:00 AM	4:10 AM	0:10	Training		training	Clear		Keck
05-19-22	22:00 PM	22:09 PM	0:08	Training		training	Clear		Keck
05-19-22	23:00 PM	23:09 PM	0:09	Training		training	Clear		Keck
05-20-22	12:00 AM	12:09 AM	0:09	Training		Training	Clear		Keck
05-20-22	1:00 AM	1:09 AM	0:09	Training		training	Clear		Keck
05-20-22	10:32 AM	10:32 AM	0:00	Maintenance		Released Torque-NE-.25"	Clear		Steed
05-22-22	23:00 PM	23:09 PM	0:09	Training		TRAINING	Rainy		Keck
05-23-22	16:30 PM	16:30 PM	0:00	Maintenance		ne 2 nw1/2 se 9 1/2 sw 1/2	Rainy		Goulding
05-23-22	12:00 AM	12:09 AM	0:09	Training		Training	Rainy		Keck
05-23-22	12:30 AM	12:39 AM	0:09	Training		Training	Rainy		Keck
05-23-22	1:00 AM	1:08 AM	0:08	Training		Training	Rainy		Keck
05-23-22	1:29 AM	1:38 AM	0:08	Training		Training	Rainy		Keck
05-23-22	2:00 AM	2:09 AM	0:09	Training		Training	Rainy		Keck
05-23-22	2:30 AM	2:39 AM	0:08	Training		Training	Rainy		Keck
05-23-22	2:59 AM	3:09 AM	0:09	Training		training	Rainy		Keck
05-23-22	4:00 AM	4:09 AM	0:09	Training		Training	Rainy		Keck
05-23-22	23:00 PM	23:09 PM	0:09	Training		Training	Rainy		Keck
05-23-22	23:59 PM	12:09 AM	0:09	Training		Training	Rainy		Keck
05-24-22	12:30 AM	12:39 AM	0:09	Training		Training	Rainy		Keck
05-24-22	1:00 AM	1:10 AM	0:10	Training		Training	Rainy		Keck
05-24-22	1:30 AM	1:39 AM	0:08	Training		Training	Rainy		Keck
05-24-22	2:00 AM	2:09 AM	0:09	Training		Training	Rainy		Keck
05-24-22	2:30 AM	2:42 AM	0:11	Training		Training	Rainy		Keck
05-24-22	3:00 AM	3:09 AM	0:09	Training		Training	Rainy		Keck
05-24-22	3:30 AM	3:39 AM	0:09	Training		Training	Rainy		Keck

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF May20 22

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
05-24-22	4:00 AM	4:09 AM	0:09	Training		Training	Rainy		Keck
05-24-22	23:00 PM	23:09 PM	0:09	Training		Training	Rainy		Keck
05-25-22	12:00 AM	12:11 AM	0:11	Maintenance		Grease AUX Sheave	Rainy		Keck
05-25-22	1:00 AM	1:09 AM	0:09	Training		Training	Rainy		Keck
05-25-22	1:30 AM	1:39 AM	0:08	Training		Training	Rainy		Keck
05-25-22	2:00 AM	2:10 AM	0:10	Training		Training	Rainy		Keck
05-25-22	2:30 AM	2:39 AM	0:08	Training		Training	Rainy		Keck
05-25-22	3:00 AM	3:08 AM	0:08	Training		Training	Rainy		Keck
05-25-22	3:30 AM	3:39 AM	0:08	Training		Training	Rainy		Keck
05-25-22	4:00 AM	4:09 AM	0:08	Training		Training	Rainy		Keck
05-25-22	6:09 AM	6:20 AM	0:10	Sailboat	Geronimo		Rainy	S	Steed
05-25-22	23:00 PM	23:09 PM	0:08	Training		Training	Rainy		Keck
05-26-22	12:00 AM	12:08 AM	0:08	Training		Training	Rainy		Keck
05-26-22	1:05 AM	1:14 AM	0:09	Training		Training	Rainy		Keck
05-26-22	2:00 AM	2:08 AM	0:08	Training		Training	Rainy		Keck
05-26-22	3:00 AM	3:10 AM	0:09	Training		Training	Rainy		Keck
05-26-22	4:00 AM	4:09 AM	0:09	Training		Training	Rainy		Keck
05-26-22	22:00 PM	22:09 PM	0:08	Training		Training	Rainy		Keck
05-26-22	22:30 PM	22:41 PM	0:10	Training		Training	Rainy		Keck
05-26-22	23:30 PM	23:39 PM	0:08	Training		Training	Rainy		Keck
05-27-22	12:30 AM	12:39 AM	0:09	Training		Training	Rainy		Keck
05-27-22	1:00 AM	1:09 AM	0:08	Training		Training	Rainy		Keck
05-27-22	1:59 AM	2:08 AM	0:08	Training		Training	Rainy		Keck
05-27-22	3:00 AM	3:08 AM	0:08	Training		Training	Rainy		Keck
05-27-22	4:00 AM	4:08 AM	0:08	Training		Training	Rainy		Keck

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
05-27-22	18:16 PM	18:27 PM	0:11	Sailboat	Miss Kitty		Clear	S	Barrett
05-31-22	15:25 PM	15:39 PM	0:13	Tug / Barge	Blue Fin/Penn No 8		Clear	N	Garrett
06-01-22	20:50 PM	21:02 PM	0:12	Tug / Barge	Blue Fin/Penn No80		Clear	S	Garrett
06-02-22	2:08 AM	2:20 AM	0:11	Tug / Barge	Coho		Clear	N	Keck
06-03-22	12:05 AM	12:17 AM	0:12	Tug / Barge	Coho		Clear	S	Keck
06-03-22	1:14 AM	1:29 AM	0:14	Sailboat	Labmariner		Clear	N	Keck
06-08-22	12:01 PM	12:10 PM	0:08	Sailboat	Orion		Clear	N	Garrett
06-14-22	19:51 PM	20:01 PM	0:09	Sailboat	Tranquilo		Clear	N	Barrett
06-14-22	22:33 PM	22:43 PM	0:09	Sailboat	Bristol Star		Clear	N	Garrett
06-16-22	13:08 PM	13:17 PM	0:08	Sailboat	Tranquilo		Clear	S	Keck
06-16-22	18:15 PM	18:29 PM	0:14	Sailboat	tranguilo	clear	Clear	N	McGee
06-18-22	11:13 AM	11:24 AM	0:10	Sailboat	Bristol Star	CHEATED	Clear	S	Keck
06-19-22	9:42 AM	9:51 AM	0:09	Sailboat	Dreamer	CHEATED	Clear	N	Keck
06-21-22	11:05 AM	11:05 AM	0:00	Maintenance		release all 4 tourque couplings	Clear		McGee
06-22-22	19:06 PM	19:18 PM	0:11	Tug / Barge	Moran		Clear	N	Garrett
06-23-22	20:25 PM	20:36 PM	0:11	Tug / Barge	Maria Moran		Clear	S	Steed
06-30-22	22:06 PM	22:16 PM	0:09	Sailboat	O Brian		Clear	S	Steed
07-03-22	12:17 PM	12:27 PM	0:10	Sailboat	Chasing Summer		Clear	S	Steed
07-04-22	12:55 AM	1:03 AM	0:07	Sailboat	Orion		Clear	N	Garrett
07-05-22	1:39 AM	1:50 AM	0:11	Tug / Barge	McCormack Boys		Clear	N	Garrett
07-09-22	14:50 PM	15:00 PM	0:10	Sailboat	Loca Lola II		Clear	N	Garrett
07-10-22	17:18 PM	17:26 PM	0:07	Ship	Calliope		Clear	N	Garrett
07-11-22	17:11 PM	17:22 PM	0:10	Sailboat	Loca Lola II	S	Partly Cloudy		Garrett
07-12-22	10:48 AM	10:57 AM	0:08	Sailboat	Calliope		Partly Cloudy	S	Barrett
07-14-22	3:26 AM	3:38 AM	0:11	Tug / Barge	Coho		Partly Cloudy	N	Keck

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Cape Fear Memorial

BRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jul20 22

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
07-14-22	23:02 PM	23:15 PM	0:13	Tug / Barge	Coho		Partly Cloudy	S	Keck
07-17-22	6:02 AM	6:10 AM	0:08	Sailboat	Goshiti		Partly Cloudy	S	Garrett
07-19-22	4:19 AM	4:30 AM	0:11	Tug / Barge	Skip Jack		Clear	N	Barrett
07-20-22	1:48 AM	1:59 AM	0:11	Tug / Barge	Skip Jack		Clear	S	Barrett
08-13-22	18:59 PM	19:08 PM	0:08	Sailboat	Goshiki		Clear		Barrett
08-19-22	14:34 PM	14:44 PM	0:10	Sailboat	Lorraine		Rainy	S	Steed
08-20-22	19:35 PM	19:46 PM	0:10	Sailboat	Salacia Star	return in 2-3 days	Partly Cloudy	N	Keck
08-20-22	7:10 AM	7:19 AM	0:08	Sailboat	Ragged Dragon		Rainy	S	Barrett
08-23-22	12:39 PM	12:47 PM	0:08	Sailboat	Sanora		Clear	N	Barrett
08-25-22	10:59 AM	10:59 AM	0:00	Maintenance		NW drive communication failure due to tripped brea	Clear		Garrett
08-27-22	12:43 PM	12:52 PM	0:08	Sailboat	Salacia Star		Clear	S	Garrett
09-04-22	13:13 PM	13:22 PM	0:08	Sailboat	Salacia Star		Clear	N	Garrett
09-17-22	14:19 PM	14:32 PM	0:12	Sailboat	Catalina		Clear	S	Barrett
09-21-22	17:32 PM	17:41 PM	0:09	Sailboat	Relentless	being towed by ustowboats	Clear	S	Garrett
09-22-22	8:24 AM	8:35 AM	0:11	Sailboat	Selicia Star		Clear	S	Steed
10-02-22	10:15 AM	10:23 AM	0:08	Sailboat	Senora		Clear	S	Barrett
10-13-22	13:22 PM	13:30 PM	0:08	Tug / Barge	Tow Boat 6	Tow Boat W/ Sail Boat	Partly Cloudy	N	Keck
10-14-22	9:08 AM	9:16 AM	0:08	Sailboat	Sea Life		Clear	S	Barrett
10-18-22	19:19 PM	19:35 PM	0:16	Ship	Eldia		Clear	N	Steed
10-19-22	14:05 PM	14:28 PM	0:23	Ship	Eldia		Clear	S	Keck
10-23-22	14:00 PM	14:10 PM	0:09	Sailboat	Ragged Dragon		Clear	N	Keck
10-30-22	5:45 AM	5:56 AM	0:10	Sailboat	labmariner		Clear	S	Keck
11-08-22	23:30 PM	23:40 PM	0:09	Maintenance			Clear		Merrick
11-09-22	3:21 AM	3:29 AM	0:07	Maintenance			Clear		Garrett
11-10-22	1:00 AM	1:09 AM	0:08	Maintenance			Clear		McGee

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Cape Fear Memorial

BRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Nov

20 22

[illegible]

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Averages

No.Of Vessels	102
No.Of Openings	177
Avg. Vessels / Opening	0.58
Avg. Openings / Day	0.48
Avg. Vessels / Day	0.28
Avg. Opening Time	10 Min

Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jan20 23

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-01-23	8:59 AM	9:09 AM	0:09	Sailboat	Counting Stars		Clear	S	Keck
01-03-23	16:11 PM	16:19 PM	0:07	Sailboat	Counting Stars		Clear	N	Steed
01-17-23	13:36 PM	13:44 PM	0:08	Sailboat	dragon fire		Clear	N	McGee
01-30-23	8:40 AM	8:49 AM	0:09	Sailboat	Senora		Rainy	S	Barrett
02-02-23	10:26 AM	10:34 AM	0:07	Maintenance			Rainy		Garrett
02-13-23	14:34 PM	14:40 PM	0:05	Maintenance		Greasing	Rainy		Steed
02-16-23	14:51 PM	15:04 PM	0:12	Tug / Barge	Dredge Brunswick		Windy	N	Barrett
02-20-23	14:00 PM	14:10 PM	0:09	Training		training	Windy		Robbins
03-08-23	12:42 PM	12:51 PM	0:00	Maintenance			Clear	<	Barrett
03-13-23	10:22 AM	10:27 AM	0:05	Maintenance			Partly Cloudy		Garrett
03-22-23	12:18 PM	12:33 PM	0:15	Commercial	Brunswick Dredge		Partly Cloudy	S	Robbins
03-23-23	16:12 PM	16:21 PM	0:08	Sailboat	Sea Tow..towing wh		Partly Cloudy	N	Steed
03-29-23	8:28 AM	8:29 AM	0:00	Sailboat	counting stars		Partly Cloudy	S	Merrick
04-05-23	14:04 PM	14:08 PM	0:03	Maintenance		Test aux drive shaft bearing	Partly Cloudy		Garrett
05-01-23	16:36 PM	16:45 PM	0:08	Sailboat	Stenno (blue)		Partly Cloudy	N	Garrett
05-03-23	10:40 AM	10:50 AM	0:09	Sailboat	Stenno	had to cheat	Partly Cloudy	S	Robbins
05-03-23	19:57 PM	19:57 PM	0:00	Maintenance		did torque cupplings on all 4 corners	Partly Cloudy		Steed
05-05-23	11:39 AM	11:47 AM	0:08	Sailboat	Senora		Partly Cloudy	N	Robbins
05-06-23	17:51 PM	17:59 PM	0:08	Sailboat	Ragin Dragon		Partly Cloudy	N	Steed
05-07-23	9:27 AM	9:36 AM	0:08	Sailboat	Second Fiddle		Clear	N	Barrett
05-09-23	11:29 AM	11:38 AM	0:09	Sailboat	Second Fiddle		Clear	S	Robbins
05-20-23	19:29 PM	19:37 PM	0:08	Sailboat	Dragon Fire		Clear	S	Garrett
05-22-23	10:28 AM	10:37 AM	0:08	Sailboat	Goshiki		Clear	S	Robbins
05-22-23	11:19 AM	11:28 AM	0:08	Sailboat	Sophie Amalie		Clear	N	Robbins
05-25-23	1:01 AM	1:10 AM	0:09	Sailboat	Dragon Fire		Clear	N	Garrett

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
05-28-23	6:28 AM	6:37 AM	0:09	Sailboat	Sophie Amalie		Rainy	S	Barrett
05-29-23	11:28 AM	11:40 AM	0:12	Sailboat	Papo DiMato		Clear	N	Barrett
05-30-23	13:40 PM	13:50 PM	0:09	Sailboat	Arabelle		Clear	N	Barrett
05-30-23	21:42 PM	21:50 PM	0:07	Sailboat	Allora		Clear	N	Steed
06-02-23	8:45 AM	8:58 AM	0:13	Sailboat	Nao Trinidad		Clear	N	Garrett
06-05-23	12:48 PM	13:01 PM	0:12	Sailboat	Allora		Clear	S	Steed
06-07-23	13:57 PM	14:07 PM	0:09	Sailboat	Papo DiMato		Clear	S	Garrett
06-10-23	15:27 PM	15:36 PM	0:09	Sailboat	Wild Rumpus		Clear	N	Garrett
06-12-23	6:14 AM	6:22 AM	0:07	Sailboat	Nao Trinidad		Clear	S	Robbins
06-12-23	15:14 PM	15:23 PM	0:08	Sailboat	counting stars		Clear	N	Steed
06-13-23	18:57 PM	19:07 PM	0:09	Sailboat	Dragon Fire		Clear	S	Steed
06-14-23	5:32 AM	5:42 AM	0:09	Sailboat	Renegade		Clear	N	Garrett
06-14-23	17:00 PM	17:11 PM	0:10	Sailboat	Tranquilo		Clear	N	Steed
06-16-23	11:00 AM	11:16 AM	0:15	Sailboat	Renegade		Clear	S	Barrett
06-20-23	19:01 PM	19:10 PM	0:08	Sailboat	Yonder	Vessel could not hear my radio transmission, but	Clear	N	Robbins
06-24-23	5:48 AM	5:57 AM	0:08	Sailboat	Yonder		Clear	S	Robbins
06-24-23	11:29 AM	11:38 AM	0:09	Sailboat	Tranquilo		Clear	S	Garrett
06-24-23	12:57 PM	13:07 PM	0:09	Sailboat	Tranquilo		Clear	N	Garrett
07-05-23	12:25 PM	12:32 PM	0:07	Sailboat	Senora		Clear	S	Robbins
07-11-23	10:31 AM	10:37 AM	0:05	Maintenance		Had to use cheat	Clear		Garrett
07-11-23	6:58 AM	7:06 AM	0:08	Sailboat	Counting Stars		Clear	S	Garrett
07-15-23	15:14 PM	15:23 PM	0:08	Sailboat	Orion		Clear	N	Barrett
07-15-23	13:50 PM	13:58 PM	0:07	Sailboat	Orion		Clear	S	Barrett
07-16-23	16:52 PM	17:03 PM	0:11	Sailboat	Esprit de Solei		Clear	N	Goulding
07-18-23	19:52 PM	20:00 PM	0:08	Sailboat	Counting Stars		Clear	N	Garrett

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
07-22-23	8:33 AM	8:45 AM	0:11	Sailboat	Dreamer		Clear	S	Barrett
07-22-23	12:34 PM	12:44 PM	0:10	Sailboat	Dreamer		Clear	N	Barrett
08-03-23	10:53 AM	11:00 AM	0:07	Maintenance			Clear		Garrett
08-18-23	15:20 PM	15:28 PM	0:08	Sailboat	pau hana		Clear	S	Robbins
08-19-23	13:57 PM	14:05 PM	0:07	Sailboat	Sri Lanka		Clear	S	Garrett
08-20-23	18:16 PM	18:26 PM	0:09	Sailboat	Hamifa		Clear	N	Barrett
08-22-23	12:00 PM	12:09 PM	0:09	Sailboat	Pau Hana		Clear	N	Garrett
09-01-23	11:37 AM	11:46 AM	0:08	Sailboat	Hamisha		Clear	S	Robbins
09-10-23	17:32 PM	17:40 PM	0:07	Sailboat	Gosaiki		Clear	N	Barrett
09-11-23	17:36 PM	17:42 PM	0:06			Malfunction	Clear		Barrett
09-11-23	19:01 PM	19:09 PM	0:07	Sailboat	Sunday		Clear	N	Barrett
09-11-23	19:01 PM	19:09 PM	0:07	Sailboat	Salacious Star		Clear	N	Barrett
09-14-23	11:35 AM	11:43 AM	0:08	Sailboat	Salacious Star and		Clear	S	Steed
09-20-23	14:17 PM	14:26 PM	0:08	Sailboat	Wild Rumpus		Clear	S	Steed
09-24-23	10:16 AM	10:25 AM	0:09	Sailboat	Gesheki		Clear	S	Goulding
09-25-23	22:00 PM	22:09 PM	0:09	Training		training Released 4 couplings	Clear		Dale
09-25-23	23:00 PM	23:10 PM	0:10	Training		training	Clear		Dale
09-26-23	12:00 AM	12:11 AM	0:11	Training		training	Clear		Dale
09-26-23	23:30 PM	23:39 PM	0:09	Training		training	Clear		Dale
09-26-23	22:30 PM	22:40 PM	0:10	Training		training	Clear		Dale
09-26-23	2:30 AM	2:39 AM	0:09	Training		training	Clear		Dale
09-26-23	2:00 AM	2:09 AM	0:09	Training		training	Clear		Dale
09-26-23	1:00 AM	1:09 AM	0:09	Training		training	Clear		Dale
09-26-23	1:30 AM	1:39 AM	0:09	Training		training	Clear		Dale
09-26-23	3:00 AM	3:09 AM	0:09	Training		training	Clear		Dale

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Sep20 23

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
09-26-23	14:23 PM	14:32 PM	0:08	Sailboat	Wild Rhompus		Clear	N	Robbins
09-27-23	22:30 PM	22:39 PM	0:09	Training		training/ welding on grate	Clear		Dale
09-27-23	23:30 PM	23:39 PM	0:09	Training		training/ welding on grate	Clear		Dale
09-27-23	12:30 AM	12:39 AM	0:08	Training		training	Clear		Dale
09-27-23	1:00 AM	1:08 AM	0:08	Training		training	Clear		Dale
09-27-23	1:30 AM	1:39 AM	0:09	Training		training	Clear		Dale
09-27-23	2:00 AM	2:10 AM	0:10	Training		training	Clear		Dale
09-27-23	2:30 AM	2:38 AM	0:08	Training		training	Clear		Dale
09-27-23	3:00 AM	3:08 AM	0:08	Training		training	Clear		Dale
09-27-23	3:30 AM	3:38 AM	0:08	Training		training	Clear		Dale
09-27-23	4:00 AM	4:08 AM	0:08	Training		training	Clear		Dale
09-28-23	1:29 AM	1:47 AM	0:18	Training		training/ welding on grate	Clear		Dale
09-28-23	2:59 AM	3:15 AM	0:15	Training		training/ welding on grate	Clear		Dale
09-28-23	2:00 AM	2:16 AM	0:16	Training		training/ welding on grate	Clear		Dale
09-28-23	12:00 AM	12:09 AM	0:09	Training		training/ welding on grate	Clear		Dale
09-28-23	1:00 AM	1:10 AM	0:10	Training		training/ welding on grate	Clear		Dale
09-28-23	3:30 AM	3:40 AM	0:10	Training		training/ welding on grate	Clear		Dale
09-28-23	12:30 AM	12:40 AM	0:10	Training		training/ welding on grate	Clear		Dale
09-28-23	2:30 AM	2:45 AM	0:15	Training		training/ welding on grate	Clear		Dale
09-28-23	4:01 AM	4:09 AM	0:08	Training		training	Clear		Dale
09-28-23	20:44 PM	20:44 PM	0:00	Maintenance			Clear		Dale
09-28-23	20:44 PM	20:44 PM	0:00	Maintenance		released torque couplings	Clear		Dale
09-28-23	21:07 PM	21:07 PM	0:00	Training			Clear		Dale
09-28-23	22:30 PM	22:38 PM	0:08	Training		training	Clear		Dale
09-28-23	23:30 PM	23:38 PM	0:08	Training		training	Clear		Dale

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
09-29-23	12:00 AM	12:08 AM	0:08	Training		training	Clear		Dale
09-29-23	12:40 AM	12:40 AM	0:00	Training		training	Clear		Dale
09-29-23	1:00 AM	1:08 AM	0:08	Training		training	Clear		Dale
09-29-23	1:30 AM	1:38 AM	0:08	Training		training	Clear		Dale
09-29-23	2:00 AM	2:09 AM	0:08	Training		training	Clear		Dale
09-29-23	2:30 AM	2:38 AM	0:08	Training		training	Clear		Dale
09-29-23	3:00 AM	3:08 AM	0:08	Training		training	Clear		Dale
09-29-23	3:30 AM	3:38 AM	0:08	Training		training	Clear		Dale
09-29-23	4:00 AM	4:08 AM	0:08	Training			Clear		Dale
10-01-23	22:30 PM	22:39 PM	0:09	Training		training	Clear		Dale
10-01-23	23:32 PM	23:40 PM	0:08	Training		training	Clear		Dale
10-02-23	12:39 AM	12:39 AM	0:00	Training		training	Clear		Dale
10-02-23	12:39 AM	12:39 AM	0:00	Training			Clear		Dale
10-02-23	1:00 AM	1:08 AM	0:07	Training		training	Clear		Dale
10-02-23	1:30 AM	1:38 AM	0:08	Training		training	Clear		Dale
10-02-23	2:08 AM	2:08 AM	0:00	Training		training	Clear		Dale
10-02-23	2:31 AM	2:39 AM	0:08	Training		training	Clear		Dale
10-02-23	3:00 AM	3:08 AM	0:08	Training		training	Clear		Dale
10-02-23	3:38 AM	3:38 AM	0:00	Training		training	Clear		Dale
10-02-23	4:00 AM	4:07 AM	0:07	Training		training	Clear		Dale
10-02-23	23:05 PM	23:13 PM	0:07	Training		training	Clear		Dale
10-03-23	12:00 AM	12:08 AM	0:08	Training		training	Clear		Dale
10-03-23	1:07 AM	1:15 AM	0:07	Training		training	Clear		Dale
10-03-23	1:30 AM	1:38 AM	0:08	Training		training	Clear		Dale
10-03-23	2:01 AM	2:01 AM	0:00	Training		training	Clear		Dale

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Oct20 23

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
10-03-23	2:30 AM	2:38 AM	0:08	Training		training	Clear		Dale
10-03-23	2:30 AM	2:38 AM	0:08	Training			Clear		Dale
10-03-23	3:00 AM	3:08 AM	0:07	Training		training	Clear		Dale
10-03-23	3:30 AM	3:38 AM	0:07	Training		training	Clear		Dale
10-03-23	22:32 PM	22:40 PM	0:08	Training		training	Clear		Dale
10-03-23	23:00 PM	23:08 PM	0:08	Training		training	Clear		Dale
10-04-23	12:00 AM	12:08 AM	0:08	Training		training	Clear		Dale
10-04-23	1:06 AM	1:14 AM	0:08	Training		training	Clear		Dale
10-04-23	1:30 AM	1:38 AM	0:08	Training		training	Clear		Dale
10-04-23	2:00 AM	2:08 AM	0:07	Training		training	Clear		Dale
10-04-23	2:30 AM	2:38 AM	0:08	Training		training	Clear		Dale
10-04-23	3:00 AM	3:08 AM	0:08	Training		training	Clear		Dale
10-04-23	3:30 AM	3:37 AM	0:07	Training		training	Clear		Dale
10-04-23	22:30 PM	22:42 PM	0:12	Training		training	Clear		Dale
10-04-23	23:00 PM	23:09 PM	0:08	Training		training	Clear		Dale
10-05-23	15:20 PM	15:20 PM	0:00	Maintenance		release touque coupling all 4	Clear		Goulding
10-05-23	12:00 AM	12:08 AM	0:07	Training		training	Clear		Dale
10-05-23	1:00 AM	1:08 AM	0:07	Training		training	Clear		Dale
10-05-23	2:00 AM	2:08 AM	0:08	Training		training	Clear		Dale
10-05-23	3:04 AM	3:13 AM	0:09	Training		training	Clear		Dale
10-05-23	15:23 PM	15:23 PM	0:00	Maintenance		release all 4 tourque couplings	Clear		Goulding
10-05-23	22:33 PM	22:42 PM	0:09	Maintenance		maintance	Clear		Dale
10-05-23	23:30 PM	23:38 PM	0:08	Training		training	Clear		Dale
10-06-23	12:30 AM	12:38 AM	0:08	Training		training	Clear		Dale
10-06-23	1:01 AM	1:09 AM	0:07	Training		training	Clear		Dale

NOTE: All draw bridges are to be opened at least once a week. The machinery, gates and bearings are to be inspected at least once a week and are to be kept thoroughly lubricated. Reports are to be sent immediately after the last day of each month to the Maintenance Supervisor. An accident or serious damage to the fender system or the bridge machinery is to be reported at once by telephone to the Maintenance Supervisor. A

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Oct20 23

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
10-06-23	2:00 AM	2:08 AM	0:08	Training		training	Clear		Dale
10-06-23	3:00 AM	3:08 AM	0:08	Training		training	Clear		Dale
10-06-23	4:00 AM	4:08 AM	0:07	Training		trainin g	Clear		Dale
10-15-23	3:38 AM	3:46 AM	0:07	Maintenance	Maintenance		Clear		Garrett
10-15-23	12:22 PM	12:30 PM	0:08	Sailboat	Ragged Dragon		Clear	S	Robbins
10-20-23	9:56 AM	10:05 AM	0:09	Sailboat	Deer Dancer		Clear	N	Garrett
10-23-23	7:18 AM	7:26 AM	0:08	Sailboat	counting Stars		Clear	S	Steed
10-23-23	12:59 PM	13:08 PM	0:09	Maintenance		Installing bolts	Clear		Steed
10-23-23	13:59 PM	14:05 PM	0:06	Maintenance		Grease Aux Cntwght 25' TOS	Clear		Barrett
10-24-23	16:04 PM	16:12 PM	0:07	Sailboat	Counting Stars		Clear	N	Garrett
10-28-23	9:12 AM	9:20 AM	0:07	Sailboat	Counting Stars		Clear	S	Goulding
11-04-23	5:56 AM	6:05 AM	0:08	Sailboat	Wild Rumpus		Clear	S	Barrett
11-14-23	14:13 PM	14:22 PM	0:09	Sailboat	Maureen		Clear	S	Goulding
11-22-23	13:39 PM	13:48 PM	0:08	Sailboat	Orion		Rainy	S	Barrett
11-25-23	16:10 PM	16:18 PM	0:07	Sailboat	Obrien		Rainy	N	Robbins
12-01-23	12:54 PM	13:03 PM	0:09	Sailboat	Lorraine		Rainy	N	Garrett
12-05-23	14:49 PM	14:58 PM	0:09	Sailboat	Eagle 2		Sunny	N	Garrett
12-13-23	14:30 PM	14:39 PM	0:09	Training		training	Sunny		Barrett
12-16-23	10:02 AM	10:10 AM	0:08	Sailboat	Lady Equittaine & S	2 Sailboats/1 Opening	Sunny	N	Robbins
12-18-23	9:28 AM	9:28 AM	0:00	maintance		tourqe couplingNS ne1/2"se1 1/4" nw 1/2" sw 1 1/4	Sunny		McGee
12-20-23	10:27 AM	10:45 AM	0:17	Maintenance		Strain gauge test	Sunny		Garrett
12-31-23	11:04 AM	11:14 AM	0:09	Sailboat	Pau Hana		Sunny	S	Robbins

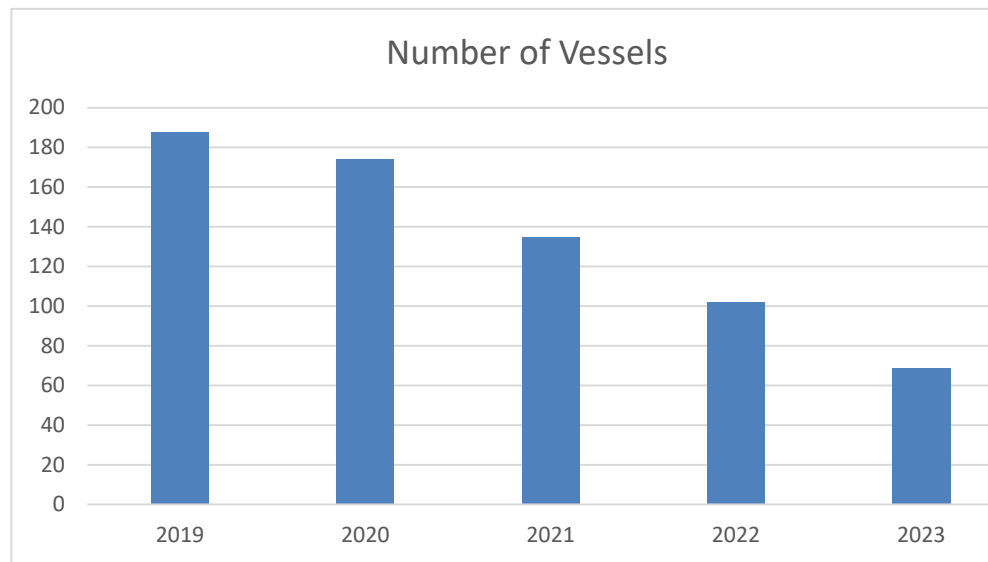
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Averages

No.Of Vessels	69
No.Of Openings	168
Avg. Vessels / Opening	0.41
Avg. Openings / Day	0.46
Avg. Vessels / Day	0.19
Avg. Opening Time	8 Min

	2019	2020	2021	2022	2023
Number of	188	174	135	102	69



Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Jan20 24

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-02-24	12:46 PM	12:54 PM	0:08	Sailboat	Pau Hana		Sunny	N	Barrett
01-05-24	9:32 AM	9:45 AM	0:12	Maintenance			Sunny	<	Barrett
01-07-24	9:34 AM	9:43 AM	0:08	Sailboat	Lady Aquitaine & Su		Sunny	S	Garrett
01-14-24	23:33 PM	23:45 PM	0:11	Maintenance		Wok done on bridge	Clear		Barrett
01-15-24	20:52 PM	21:07 PM	0:15	Maintenance	open for contractors		Clear		Garrett
01-15-24	21:54 PM	22:15 PM	0:21	Maintenance	Work on span		Clear		Barrett
01-15-24	22:38 PM	22:55 PM	0:16	Maintenance			Clear		Barrett
01-15-24	23:19 PM	23:36 PM	0:16	Maintenance			Clear		Barrett
01-16-24	12:21 AM	12:32 AM	0:11	Maintenance		Work on span	Clear		Barrett
01-16-24	12:45 AM	12:58 AM	0:13	Work on span			Clear		Barrett
01-16-24	1:14 AM	1:25 AM	0:11	Maintenance		Work on span	Clear		Barrett
01-16-24	1:45 AM	2:02 AM	0:17	Maintenance		Work on span	Clear		Barrett
01-20-24	19:40 PM	19:52 PM	0:12	Maintenance			Clear		Steed
01-20-24	19:56 PM	20:07 PM	0:10	Maintenance			Clear		Steed
01-20-24	20:21 PM	20:35 PM	0:14	Maintenance			Clear		Steed
01-20-24	20:55 PM	21:06 PM	0:10	Maintenance			Clear		Steed
01-20-24	21:23 PM	21:33 PM	0:10	Maintenance			Clear		Steed
01-20-24	21:37 PM	21:49 PM	0:12	Maintenance			Clear		Steed
01-20-24	22:05 PM	22:18 PM	0:13	Maintenance		Work on span	Clear		Barrett
01-21-24	22:04 PM	22:14 PM	0:00	Maintenance			Clear		Steed
01-21-24	19:45 PM	20:03 PM	0:18	Maintenance			Clear	N	Steed
01-21-24	21:30 PM	21:41 PM	0:00	Maintenance			Clear		Steed
01-21-24	20:12 PM	20:26 PM	0:14	Maintenance			Clear		Steed
01-21-24	20:32 PM	20:52 PM	0:19	Maintenance			Clear		Steed
01-21-24	21:10 PM	21:22 PM	0:12	Maintenance			Clear		Steed

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	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
01-21-24	21:45 PM	21:57 PM	0:12	Maintenance			Clear		Steed
01-25-24	10:00 AM	10:09 AM	0:09	Ship	cape hatteras	cloudy	Clear	S	McGee
02-10-24	20:41 PM	21:05 PM	0:23	Maintenance		Contractor Maintenance	Clear		Robbins
02-10-24	23:23 PM	23:39 PM	0:16	Maintenance	Contractors		Clear		Garrett
02-10-24	23:51 PM	12:03 AM	0:12	Maintenance		Contractors	Clear		Garrett
02-11-24	12:07 AM	12:24 AM	0:16	Maintenance		Contractors	Clear		Garrett
02-13-24	6:25 AM	6:25 AM	0:00		mistake		Clear		Berg
02-22-24	17:23 PM	17:31 PM	0:08	Sailboat	Star Tracer		Clear	N	Dale
02-24-24	20:21 PM	20:42 PM	0:21	Maintenance		maintenance	Clear		Dale
02-24-24	20:53 PM	21:13 PM	0:20	Maintenance		maintenance	Clear		Dale
02-24-24	21:34 PM	21:51 PM	0:17	Maintenance		maintenance	Clear		Dale
02-24-24	22:06 PM	22:16 PM	0:09	Maintenance		maintenance	Clear		Dale
02-29-24	19:53 PM	20:13 PM	0:19	Maintenance		Setting Counter Weights-extended opening time due	Clear		Robbins
02-29-24	19:22 PM	19:40 PM	0:17	Maintenance		Setting Counter Weights	Clear		Robbins
03-08-24	19:07 PM	19:27 PM	0:19	Maintenance		Contractors	Clear		Garrett
03-08-24	19:45 PM	20:04 PM	0:19	Maintenance		Contractors	Clear		Garrett
03-13-24	19:37 PM	19:52 PM	0:14	Maintenance		maintenance	Clear		Dale
03-13-24	20:00 PM	20:16 PM	0:16	Maintenance		maintenance	Clear	N	Dale
03-13-24	20:40 PM	21:01 PM	0:20	Maintenance		maintenance	Clear	N	Dale
03-21-24	20:24 PM	20:24 PM	0:00	Maintenance	Maintenance	Released Torque Couplings all 4 corners	Clear		Robbins
03-21-24	19:35 PM	19:44 PM	0:09	Maintenance		Contractors / had to use cheat	Clear		Garrett
03-22-24	11:38 AM	11:47 AM	0:09	Commercial	cape fear hatteras		Clear	N	Dale
03-24-24	11:41 AM	11:50 AM	0:09	Sailboat	carolina hobie		Clear	S	Dale
03-24-24	13:17 PM	13:26 PM	0:08	Sailboat	carolina hobie		Clear	N	Dale
03-26-24	20:02 PM	20:16 PM	0:13	Maintenance		Contractors	Clear		Garrett

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DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
03-26-24	20:21 PM	20:34 PM	0:12	Maintenance		Contractors	Clear		Garrett
03-26-24	20:47 PM	20:59 PM	0:12	Maintenance		Contractors	Clear		Garrett
03-26-24	21:30 PM	21:39 PM	0:09	Maintenance		Contractors	Clear		Garrett
03-26-24	23:05 PM	23:13 PM	0:07	Maintenance		Contractors	Clear		Garrett
03-27-24	12:15 AM	12:22 AM	0:07	Maintenance		Contractors	Clear		Garrett
03-27-24	12:37 AM	12:49 AM	0:11	Maintenance		Contractors	Clear		Garrett
03-27-24	1:01 AM	1:13 AM	0:12	Maintenance		Contractors	Clear		Garrett
03-27-24	1:23 AM	1:36 AM	0:12	Maintenance		Contractors	Clear		Garrett
03-27-24	1:44 AM	1:58 AM	0:13	Maintenance		Contractors	Clear		Garrett
03-27-24	2:05 AM	2:19 AM	0:13	Maintenance		Contractors	Clear		Garrett
03-27-24	2:26 AM	2:42 AM	0:15	Maintenance		Contractors	Clear		Garrett
03-27-24	2:58 AM	3:13 AM	0:14	Maintenance		Contractors	Clear		Garrett
03-27-24	3:22 AM	3:37 AM	0:14	Maintenance		Contractors	Clear		Garrett
03-27-24	3:48 AM	4:04 AM	0:15	Maintenance		Contractors	Clear		Garrett
03-27-24	4:16 AM	4:31 AM	0:14	Maintenance		Contractors	Clear		Garrett
03-27-24	4:44 AM	4:52 AM	0:08	Maintenance		Contractors	Clear		Garrett
03-27-24	9:48 AM	9:48 AM	0:00	Maintenance		Released Torque Couplings NE,SE,SW,NW	Clear		Hutto
03-27-24	9:57 AM	10:06 AM	0:09	Ship	Cape Hatteras		Clear	S	Hutto
03-27-24	19:40 PM	19:47 PM	0:06	Maintenance		Contractors	Clear		Garrett
03-27-24	19:59 PM	20:13 PM	0:13	Maintenance		Contractors	Clear		Garrett
03-27-24	20:32 PM	20:45 PM	0:13	Maintenance		Contractors	Clear		Garrett
03-27-24	21:13 PM	21:28 PM	0:14	Maintenance		Contractors	Clear		Garrett
03-27-24	21:42 PM	21:58 PM	0:15	Maintenance		Contractors	Clear		Garrett
03-27-24	22:09 PM	22:18 PM	0:08	Maintenance		Contractors	Clear		Garrett
03-28-24	18:17 PM	18:25 PM	0:08	Commercial	Cape Hatteras		Clear	N	Garrett

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Mar20 24

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
03-28-24	19:27 PM	19:37 PM	0:09	Maintenance		Contractors	Clear		Garrett
04-01-24	19:36 PM	19:36 PM	0:00	Maintenance	Contractor lift	Computer glitched; lift was approx. 15 minutes in	Clear		Robbins
04-01-24	10:21 AM	10:21 AM	0:00	Commercial	cape hatteras		Clear	S	Dale
04-01-24	20:24 PM	20:24 PM	0:00	Maintenance	Contractor lift	Computer is glitching; lift occurred approx 2000hr	Clear		Robbins
04-02-24	2:09 AM	2:22 AM	0:12	Maintenance	Contractor Opening	Counter Weights	Clear		Robbins
04-02-24	2:45 AM	2:54 AM	0:09	Maintenance	Contractor Opening	Had to use Cheat Button	Clear		Robbins
04-02-24	16:58 PM	17:12 PM	0:13	Sailboat	Freebird		Clear	N	Garrett
04-02-24	18:44 PM	18:44 PM	0:00	Maintenance		released NW NE SW SE torque couplings	Clear		Garrett
04-02-24	18:45 PM	18:53 PM	0:07	Maintenance			Clear		Garrett
04-03-24	8:38 AM	8:47 AM	0:09	Ship	cape hatteras		Clear	N	Merrick
04-03-24	15:16 PM	15:25 PM	0:09	Sailboat	Molly D		Clear	N	Hutto
04-04-24	8:33 AM	8:41 AM	0:08	Sailboat	Molly D		Clear	S	Hutto
04-05-24	1:22 AM	1:31 AM	0:08	Maintenance			Clear		Dale
04-05-24	1:22 AM	1:31 AM	0:08	Maintenance		contractors-	Clear		Dale
04-05-24	3:11 AM	3:22 AM	0:11	Maintenance		contractors	Clear		Dale
04-08-24	10:32 AM	10:40 AM	0:08	Ship	Cape Hatteras		Clear	S	Robbins
04-11-24	1:56 AM	2:00 AM	0:04	Maintenance		Contractors	Clear		Garrett
04-11-24	2:04 AM	2:16 AM	0:11	Maintenance		Contractors	Clear		Garrett
04-12-24	19:50 PM	20:35 PM	0:45	Maintenance		contractors	Clear		Dale
04-12-24	21:32 PM	21:42 PM	0:10	Maintenance		Open for contractor	Clear		Dale
04-14-24	8:37 AM	8:44 AM	0:07	Commercial	Cape Hatteras		Clear	N	Robbins
04-14-24	15:19 PM	15:26 PM	0:07	Sailboat	Sea Escape		Clear	N	Robbins
04-15-24	17:32 PM	17:46 PM	0:13	Maintenance		Had to use Cheat button	Clear		Barrett
04-17-24	9:56 AM	10:07 AM	0:11	Commercial	Cape Hatteras		Clear	S	Barrett
04-17-24	16:29 PM	16:41 PM	0:11	Sailboat	Joule		Clear	N	Garrett

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Cape Fear MemorialBRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76REPORT OF DRAW OPENINGS FOR THE MONTH OF Apr20 24

	TIME GATES	TIME GATES	DELAY DUE TO	TYPE	NAME OR NUMBER		WEATHER WHEN BOAT	DIRECTION OF	NAME OF
DATE	CLOSED	ARE OPENED	BRIDGE OPENING	OF VESSEL	OF VESSEL	REMARKS	WAS PASSING THROUGH	TRAVEL	OPERATOR
04-18-24	9:30 AM	9:30 AM	0:00	Maintenance		Released Torque NE, SE, SW, NW	Clear		Barrett
04-18-24	16:18 PM	16:25 PM	0:07	Commercial	Cape Hatteras		Clear	N	Garrett
04-18-24	19:03 PM	19:14 PM	0:10	Sailboat	Ikigai		Clear	N	Garrett
04-22-24	10:38 AM	10:46 AM	0:08	Commercial	Cape Hatteras		Clear		Barrett
04-25-24	12:41 PM	12:52 PM	0:10	Sailboat	Lamisting		Clear	N	Hutto
04-25-24	19:32 PM	19:40 PM	0:08	Maintenance		Contractors	Clear		Garrett
04-25-24	19:58 PM	20:10 PM	0:12	Maintenance		Contractors	Clear		Garrett
04-25-24	20:27 PM	20:42 PM	0:15	Maintenance		Contractors	Clear		Garrett
04-25-24	20:59 PM	21:17 PM	0:17	Maintenance		Contractors	Clear		Garrett
04-25-24	21:40 PM	21:55 PM	0:15	Maintenance		Contractors	Clear		Garrett
04-25-24	22:10 PM	22:25 PM	0:14	Maintenance		Contractors	Clear		Garrett
04-25-24	22:38 PM	22:54 PM	0:16	Maintenance		Contractors	Clear		Garrett
04-27-24	23:43 PM	23:51 PM	0:08	Maintenance		Contractor	Clear		Robbins
04-27-24	20:20 PM	20:20 PM	0:00	Maintenance		Contractor approx 15 mins	Clear		Robbins
04-27-24	19:49 PM	19:59 PM	0:10	Maintenance	Contractor	Contractor Maintenance	Clear		Robbins
04-27-24	21:19 PM	21:19 PM	0:00	Maintenance		Contractor approx 15 mins	Clear		Robbins
04-27-24	21:47 PM	22:02 PM	0:14	Maintenance		Contractor	Clear		Robbins
04-27-24	22:19 PM	22:19 PM	0:00	Maintenance		Contractor approx 15 mins	Clear		Robbins
04-27-24	23:04 PM	23:04 PM	0:00	Maintenance		Contractor approx 15 mins	Clear		Robbins
04-28-24	9:20 AM	9:29 AM	0:09	Sailboat	Ikiagi		Clear	S	Barrett
04-28-24	8:04 AM	8:14 AM	0:10	Commercial	Cape Hatteras		Clear	<	Barrett
04-28-24	12:01 AM	12:01 AM	0:00	Maintenance		Contractor approx 15 mins	Clear		Robbins
04-28-24	6:51 AM	7:02 AM	0:10	Sailboat	Joule		Clear	S	Barrett
04-29-24	20:18 PM	20:36 PM	0:18	Maintenance		Contractor	Clear		Robbins
04-29-24	21:07 PM	21:19 PM	0:12	Maintenance		Contractor	Clear		Robbins

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Cape Fear Memorial

BRIDGE OVER Cape Fear RIVER AT Wilmington, NCROUTE US 17/74/76

REPORT OF DRAW OPENINGS FOR THE MONTH OF Apr

20 24

[illegible]

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Averages

No.Of Vessels	26
No.Of Openings	126
Avg. Vessels / Opening	0.21
Avg. Openings / Day	1.04
Avg. Vessels / Day	0.22
Avg. Opening Time	11 Min

NCSPA

Vessel Statistics

	<u>FY23</u>		<u>FY22</u>		<u>FY21</u>		<u>FY20</u>		<u>FY19</u>	
	<u>Barges</u>	<u>Ships</u>	<u>Barges</u>	<u>Ships</u>	<u>Barges</u>	<u>Ships</u>	<u>Barges</u>	<u>Ships</u>	<u>Barges</u>	<u>Ships</u>
WILMINGTON										
Container	0	367	0	357	2	320	0	292	0	332
Breakbulk	0	81	1	66	0	48	0	50	0	29
Bulk	9	108	16	122	10	95	8	110	7	115
Combinator	0	19	0	26	0	24	0	30	0	25
Total	9	575	17	571	12	487	8	482	7	501

Exhibit E: Registered Ships

Boat Name	Ship Builder	Build Year	Vessely Type	Gross Tons	Length (feet)
7	CABO YACHTS A DIVISION OF BRUNSWICK CORP	2006	RECREATIONAL	37	47.5
"CURRENT AFFAIR"	S2 YACHTS INC	1998	Recreational	31	41.2
10 ACIOUS	TARTAN MARINE COMPANY	1978	Recreational	9	33.1
5 O'CLOCK SOMEWHERE	HUNTER MARINE CORPORATION	2005	RECREATIONAL	21	37
7 SEAS	S2 YACHTS INC.	1997	Unclassified	8	28
A PROPER PERSPECTIVE	CRUISERS YACHTS DIVISION OF KCS INTERNATIONAL INC	2004	Recreational	8	27.1999
ABBAY	CHANTIERS BENETEAU S.A.	2007	RECREATIONAL	11	38.4
ABOUT FACE	CHAPARRAL BOATS INC	2005	Recreational	15	32
ADONAI	NOVA MARINE CO. LTD	2002	Recreational	37	47
ADVENTURES	GULFSTAR INC	1975	Recreational	20	36.2
AFRAYED KNOT	CATALINA YACHTS INC	2004	Recreational	14	35.2999
AGNES LEE	PEARSON YACHTS	1981	Recreational	12	32.2999
ALL GONE NOW	AMF HATTERAS YACHTS	1984	Recreational	24	36.2999
ALLAGASH	RANGER YACHTS	1974	Recreational	13	37
ALOAN AGAIN	CARVER BOAT CORPORATION	1996	Recreational	21	39
AMAZING GRACE	CS YACHTS LIMITED	1990	Recreational	11	33.5
AMAZING GRACE	SYMBOL YACHT CO LTD	2004	Recreational	66	59.5
ANAGNORISIS	ALLMAND BOATS INC	1980	Recreational	16	30.8999
ANCON	CAPE ISLAND YACHT LIMITED	2003	Recreational	21	36
APRIL'S FOOLS	TIDEWATER BOATS LLC	2014	Recreational	9	28.3
AQUAHOLIC	MAXUM MARINE	2000	Recreational	8	25.3
AQUATIC SAFARIS I	ISLAND HOPPER INT'L BOAT WORKS INC	2005	Passenger (Inspected)	32	43
AQUATIC SAFARIS II	ISLAND HOPPER INTL BOAT	2001	Passenger (Inspected)	12	29
AQUATIC SAFARIS II	SEA HAWK INDUSTRIES INC	2014	Passenger (Inspected)	18	34
AT EASE II	SEA RAY DIVISION OF BRUNSWICK CORP	2006	Recreational	15	32.2999
AT LAST	ALBIN MANUFACTURING INC	2000	Recreational	22	36
ATLANTIC V	BARBOUR BOAT WORKS	1961	Unclassified	52	61.1
AVA GRACE	QUEST KIT BOATS DIV SILVE	1982	Recreational	12	35.7
AVALON	BLUEWATER YACHT BUILDERS	1988	Recreational	33	40.6
BABY FACE	SABRE CORPORATION	1995	Recreational	18	36
BACO	WILLARD BOAT WORKS	1965	Recreational	20	33.2
BAD HABITS	FREEMAN BOATWORKS LLC	2016	Recreational	18	37.2
BAM BAM	CAISON YACHTS INC	2010	Recreational	25	38.7999
BARNEY	J M FURR LANDSCAPING CORP	1989	Towing Vessel	10	31.5
BAR-NICOLE *	BERTRAM YACHT INC	1981	Recreational	10	28.3
BAYOU BRAVE	HOUMA SHIPBUILDING INC	1973	Towing Vessel	76	59.2999
BEAGLE	YOUNG SUN YACHT CORP	1980	Recreational	11	34.5
BECAUSE	ALUMINUM CRUISERS, INC.	1986	Recreational	21	39
BEECHWOOD DAYS	AMF HATTERAS YACHTS	1984	Recreational	66	61.2999
BEERACUDA	FABBRO MARINE GROUP INC	2013	Recreational	9	26.8
BEERACUDA	ONSLow BAY MARINE GROUP LLC	2016	Recreational	10	32.7999
BELLE	DICKERSON BOATBUILDERS	1986	Recreational	15	37
BELLE MER	COLUMBIA YACHT	1977	Recreational	13	31.5
BERGERS IN PARADISE	BOSTON WHALER INC	2014	Recreational	8	27.3
BERMUDA HIGH	EGG HARBOR YACHT COMPANY	1988	Recreational	18	35
BETSEAS BLUIS	S2 YACHTS INC	2007	Recreational	16	30.5
BEYOND REASON IV	ACTIVA MARINE CO., LTD.	2003	Recreational	34	55
BIG BAD WOLF	CONTENDER BOATS INC	2006	Commercial Fishing Vessel	11	34.4
BIG BLUE	REGAL MARINE INDUSTRIES	1998	Recreational	8	24.9
BIG FOOT	CHARLES M. HANCOCK	1983	Commercial Fishing Vessel	21	41
BILL COLLECTOR	BERTRAM YACHTS	1979	Recreational	21	36
BIRD DOG	LUHRS CORPORATION	1993	Recreational	15	29.3
BITE ME	GRADY-WHITE BOATS INC	2006	Recreational	8	28
BITE THIS TOO	CAROLINA CLASSIS BOATS	1996	Recreational	6	25.1999
BITTER SWEET SYMPHONY	GIBSON FRP PRODUCTS INC	2001	Recreational	33	41
BIZZY BEE	NAVIGATOR BOATS	1995	Passenger (Inspected)	14	34.5
BLOWIN' TIME	TUP CORPORATION	1978	Recreational	11	35.6
BLUE DOG	AMF HATTERAS YACHTS	1985	Recreational	33	45.1
BLUE DOG II	JUPITER MARINE INTERNATIONAL INC	2015	Recreational	9	29.5
BLUE EYES	GRADY-WHITE BOATS INC	2006	Recreational	14	33.5
BLUE MOON	BRUCKMAN MANUFACTURING	2000	Recreational	6	29.8999
BOLERO	CATALINA YACHTS	1993	Recreational	11	36.2999
BOUNTY HUNTER	S2 YACHTS INC	1988	Recreational	20	36.7
'BOUT TIME II	CHRIS CRAFT CORPORATION	1969	Recreational	21	42
BRAVE TURTLE	KONG & HALVORSEN MARINE	1988	Recreational	36	44
BRIAR PATCH	UNIFLITE INC	1980	Recreational	17	32
BRIGADOON	WESTERN PACIFIC YACHT	1976	Recreational	19	36.7
B-SEA-N-YA	WELLCRAFT MARINE	1987	Recreational	13	31.8
BUCKEY	n/a	2000	Recreational	31	37.7999
BUDGET BREAKER	SEA RAY DIVISION OF BRUNSWICK CORP	2007	Recreational	15	33.1
BULL MARKET	BAYLINER MARINE CORP	1996	Recreational	13	30.5
BVI - VII	BRUNSWICK FAMILY BOAT CO INC	2011	Recreational	32	47
C BREEZE	S2 YACHTS INC	2002	Recreational	19	35.5
C SHACK	TOLLYCRAFT YACHTS CORP	1990	Recreational	31	44.2
CABERNET	CATALINA YACHTS, INC.	1989	Recreational	8	29.8999
CAMLEY	AMF HATTERAS YACHTS	1973	Recreational	43	58.2999
CANKLES AWEIGH	n/a	2007	Recreational	21	40.2
CAPE FEAR	GREENVILLE BARGE CONST	1959	Towing Vessel	87	55.1
CAPE FEAR	PANHANDLE CUSTOM MARINE	1988	Research Vessel	77	63
CAPT. BRANDON	MILLIS & LEE INC	1984	Commercial Fishing Vessel	35	47

CAPT. J. N. MAFFITT	NORFOLK NAVAL SHIPYARD	1944	Passenger (Inspected)	19	49
CAPTAIN RUSSELL	SEABOARD STRUCTURAL STEEL	1957	Towing Vessel	45	54.7
CAPTIVATION	OCEAN YACHTS INC	1988	Recreational	36	48
CAROLINA BREEZE	MAXUM MARINE	1999	Recreational	24	39.2
CAROLINA CAN	SEA RAY BOATS INC	2004	Recreational	28	41.5
CAROLINA GIRL	SEA RAY DIVISION OF BRUNSWICK CORP	2004	Recreational	12	30.3
CAROLINA GOLD	JC BOAT SALES LTD	1990	Commercial Fishing Vessel	19	34.8999
CAROLINA LADY	BRUNSWICK CORP	2001	Recreational	9	28.3
CAROLINE FAYE	SHEARLINE BOATWORKS LLC	2002	Recreational	12	30.1999
CEILI	SEA RAY BOATS INC	1997	Recreational	9	27.3999
CEILI	BAYLINER MARINE CORPORATION	1998	Recreational	30	47.2999
CELTIC KNOTS	ALBIN MANUFACTURING CORP	2004	Recreational	10	29.8
CERITH	HUNTER MARINE CORP	1992	Recreational	19	42.1
CEST LHEURE	TRADITIONAL WATERCRAFT	1994	Recreational	17	35.2
CHALLENGER	FT MYERS YACHT & SHIPBLDG	1981	Recreational	24	42
CHAMPAGNE DREAMS	SEA RAY BOATS	2015	Recreational	15	33.2
CHANCE	MORGAN YACHT INC	1983	Recreational	13	31.8
CHANGE ORDER 1	SILVERTON MARINE CORPORATION	2002	Recreational	31	43.5
CHEROKEE	HULLS UNLIMITED EAST INC	1981	Commercial Fishing Vessel	8	31.1999
CHERYL ANN	MARINE TRADING INTERNATL	1984	Recreational	19	35.6
CHILLIN' THE COAST	SEA RAY BOATS	2012	Recreational	9	28.5
CHLOE	S2 YACHT INCORPORATD	1976	Recreational	7	30
CHRISTINA JEANE	CATALINA YACHTS	1985	Recreational	8	29.9
CHRISTINE S	GULF COAST STEEL INC	2016	Towing Vessel	193	76.5
CIAO BELLA	SEA RAY DIVISION OF BRUNSWICK CORP	2006	Recreational	14	32.2999
CITATION2	CONTENDER BOATS INC	2014	Recreational	14	39.1
CLOUD NINE	BERTRAM YACHTS	1978	Recreational	18	34.8999
COMFORTABLY NUMB II	BAYLINER MARINE	1985	Recreational	8	32
COMMODORE	LUHRS CORPORATION	1999	Recreational	25	36.3
COMPROMISE	SEA RAY DIVISION OF BRUNSWICK CORP	2005	RECREATIONAL	8	29.3
CONTRAIL	TROJAN YACHT	1978	UNSPECIFIED	20	35.8999
COOL'N OUT	SEA RAY BOATS, INC.	1995	Recreational	7	27.3
COPY CAT	SEA RAY BOATS INC	2000	Recreational	41	47.7
CORALINE	SILVERTON MARINE CORP	2000	Recreational	34	46.2
COUNTING STARS	FOUNTAIN PAJOT SA	2016	Recreational	58	48.2999
CRANKEY PLUMBER	BRUNSWICK FAMILY BOAT CO INC	2003	Recreational	7	25.1
CUBAN CONNECTION	REGULATOR MARINE INC	2015	Recreational	8	25.1999
CURLZ	MAINSHIP CORPORATION	2004	Recreational	10	30.3999
CUT-N-DRY	ROB SEIDELMANN BOATBLDRS	1998	Commercial Fishing Vessel	25	36
D FISH N SEA	S2 YACHTS INC	1988	Recreational	20	36.7
DADDY'S MONEY	HENRY C. GREBE & CO., INC	1965	Recreational	46	53
DAWN MARIE	PHILLIP NILES FRP HULLS,I	1978	Commercial Fishing Vessel	22	45.3
DECOY	n/a	1978	Passenger (Uninspected)	32	45.8999
DELIVERED	NAVIGATOR YACHT INC	2001	Recreational	44	56
DELTA 10	CONSOLIDATED STEEL CORP.	1941	Tank Barge	616	196
DEPOSIT SLIP	CARVER BOAT CORP	1991	Recreational	17	33.2999
DESPERADO	DON EDWARD DOSHER	1988	Commercial Fishing Vessel	24	40
DETAILS	S2 YACHTS INC.	1990	Recreational	8	26.4
DETENTE	ENDEAVOUR YACHT CORP.	1982	Recreational	18	37.8999
DIAMOND GIRL	POST MARINE COMPANY INC	1988	Recreational	31	46
DIAMOND RING	BOSTON WHALER INC	1992	Recreational	9	29.1
DIGGS IT	SEA RAY BOATS INC	1997	Recreational	14	31.6
DISABELLA	AZIMUT BENETTI SPA	2015	Recreational	41	53.7999
DISABELLA	AZIMUT BENETTI SPA	2015	Recreational	50	62.6
DIVA	TA YANG YACHT BUILDING	1988	Recreational	18	36.7
DIVERSION	BLACKFIN YACHT CORP	1993	Recreational	14	32.8999
DOCKS KNOTT INN	SEA RAY BOATS	2014	Recreational	9	28.3
DOCTORS ORDERS	HUNTER MARINE CORPORATION	1997	Recreational	9	33.7
DONNCHAIDH	MARINE TRADING INTERNATIO	1977	Recreational	27	39.7
DOUBLE J	POST MARINE COMPANY INC	2006	Recreational	44	52.7999
DOUBLE TROUBLE	SEA RAY DIVISION OF BRUNSWICK CORP	2005	Recreational	12	30.3
DOWN TIME	FOUR WINNS BOATS, LLC	2005	Recreational	14	32.8999
DOWNEASTER	OCEAN YACHTS INC.	1989	Recreational	36	48
DRAGON LADY	CHRIS CRAFT CORP	1968	Recreational	38	52
DREAMS DO COME TRUE	FOUNTAIN PAJOT SA	2012	Recreational	29	39.2
DREDGE DEBORAH ANNE	DREDGING SUPPLY CO INC	1999	Industrial Vessel	11	35
DUE SOUTH	NORDIC TUGS INC	2000	Recreational	25	39.2
EARLY RISER	BERTRAM YACHT INC	1974	Passenger (Uninspected)	22	37.3999
EASY PEACE	BERTRAM YACHT DIVISION OF WHITTAKER CORPORATION	1970	Commercial Fishing Vessel	10	30.3
EIRA	BENETEAU USA INC	2002	Recreational	15	39.3
EL PATRON	FOUNTAIN POWERBOATS INC	2006	Recreational	15	37.8999
ELIZABETH II	EGG HARBOR BOAT CO., INC.	1959	Recreational	14	34
ELIZABETH S	B & B BOATBUILDERS INC	2004	Towing Vessel	99	78.5
ELLIS ISLAND	BRUNSWICK FAMILY BOAT CO INC	2007	Recreational	20	35.8
ELYSIUM	TA YANG YACHT BUILDING CO	1976	Recreational	16	34.5
EMILY	CSY YACHT CORP	1980	Recreational	11	33.4
ENDEAVOR	SILVERTON MARINE CORPORAT	1985	Recreational	25	37
ENDEAVOR	UNIFLITE INC	1981	Recreational	40	48.7
ENDLESS SUMMER	SEA RAY BOATS	2013	Recreational	9	28.3
ESSENCE	ISLANDER YACHTS	1981	Recreational	6	30
ESTELLE	MALO YACHTS AB	2007	Recreational	12	37.8999

EYRA	LAGOON LIMITED	2003	Recreational	31	37.7999
FAMILY AFFAIR V	HATTERAS YACHTS	1986	Recreational	65	54.2
FANCY FREE	THE WILLARD CO., INC.	1977	Recreational	10	30
FAST COMPANY	S2 YACHTS INC	1988	Recreational	13	31
FAST EDDIE III	THE TALARIA COMPANY LLC	2002	Recreational	11	36.3999
FAST FORWARD	BENETEAU MFG., INC.	1991	Unclassified	11	35.3999
FASTRAC	AMF-HATTERAS YACHTS	1975	Recreational	39	50.7999
FAT CAT	TRADITIONAL WATERCRAFT	1992	Recreational	18	35.2
FEELING FREE	SILVERTON MARINE CORP	1987	Recreational	21	39.7999
FIFTY B	ROBALO BOATS LLC	2006	Recreational	11	29.2
FINALLY	GUNTHER RIECKMANN	1995	Recreational	12	45
FINE LINES	DAVIS YACHTS INC	1989	Recreational	40	47
FINS UP	CONTENDER BOATS INC	2012	Recreational	14	39.1
FINS UP JR	CONTENDER BOATS INC	2014	Recreational	10	32.7
FISHIN' FEVER	DAVIS BOATWORKS INC	1997	Recreational	44	52
FISHTAIL II	AQUASPORT INC	1984	Recreational	10	26.3999
FLASH	BERTRAM YACHT INC	1995	Recreational	32	43
FLATLINED	SEA HUNT BOAT MFG CO INC	2016	Recreational	10	29.8
FLIP FLIP	AMF HATTERAS	1979	Recreational	43	48.7999
FLYING SQUIRREL	SEA RAY DIVISION OF BRUNSWICK CORP	2006	Recreational	18	37.3
FOOTE LOOSE	S2 YACHTS, INC.	1988	Recreational	20	36.7
FOREVER DREAMIN'	REGAL MARINE INDUSTRIES INC	2006	Recreational	21	36.6
FORTUNE HUNTER	BERTRAM YACHT INC	1984	Passenger (Uninspected)	18	34.8999
FREDA BEA	GRANDBANKS YACHTS PTE LTD	2001	Recreational	35	47.1
FRIENDSHIP	CHUNG HWA BOAT BLDG COLTD	1987	Recreational	24	41.8
G FORCE	CAISON YACHTS INC	2005	Passenger (Uninspected)	73	64.2999
G.S. LOLLIPOP III	BENETEAU-SPBI SA	2011	Recreational	18	39.8999
GABRIEL	EGG HARBOR BOAT CO	1963	PASSENGER (INSPECTED)	17	36.1
GAME KEEPER	CORE SOUND MARINE SRV INC	2000	Passenger (Uninspected)	47	55.2
GAVIOTA	CARVER BOAT CORP	1988	Recreational	11	30.7
GENERAL QUARTERS	BERTRAM YACHT	1987	Recreational	10	28.3
GET OFF ME	BOSTON WHALER	2007	UNSPECIFIED	11	30
GET REEL II	LUHRS CORPORATION	2000	Recreational	15	29.3
GIGGLIN MARLIN	GRADY-WHITE BOATS INC	2002	Recreational	13	30.5
GILTY	S2 YACHTS INC	2000	Recreational	9	30.8
GINA	CRUISERS YACHTS	1997	Recreational	15	32.7999
GOLDEN LEAF	SEA RAY BOATS INC	2010	Recreational	55	56.6
GORDITA	HINTERHOELLER YACHTS LTD	1979	Recreational	10	30.3999
GRACE	HANSA YACHT UND SCHIFFBAU	1982	Recreational	10	32.7
GRACE	EVANS BOAT REPAIR INC	2008	Recreational	19	38
GRAND SLAM	C&C INDUSTRIES LIMITED	1990	Recreational	10	35.5
GYPSY ANGLER	JARRETT BAY BOATWORKS INC	1996	Recreational	52	58
HAELIFE III	VIKING YACHT COMPANY	2002	Recreational	47	48.7999
HANALEI	ST AUGUSTINE BOAT WORKS	1986	Recreational	47	46.7999
HARMONY	GRADY-WHITE BOASTS, INC	1987	Recreational	6	23.4
HARMONY	MAINSHIP CORPORATION	2008	Recreational	21	36.6
HEJIRA	CAPE DORY YACHTS INC	1984	Recreational	16	36.2
HIGH MAINTENANCE	VIKING YACHT COMPANY	1983	Recreational	24	41.2
HIGH STEPPER	HUNTER MARINE CORPORATION	2005	Recreational	29	41.7999
HOOKEE	BERTRAM YACHT INC	1976	Recreational	22	36
HOOK-UP	ATLANTIC BOATS INC	1990	Commercial Fishing Vessel	8	27.8
HORSE	CAP-N-SQUID BOATWORKS	2003	Passenger (Uninspected)	55	58
HOT TICKET	HARRIS BOAT WORKS, INC.	1986	Passenger (Uninspected)	18	38
HOWDY K	CHRIS-CRAFT CORPORATION	1963	Recreational	20	38
HT-207	NASHVILLE BRIDGE COMPANY	1971	Tank Barge	1379	264
HUB'S WAY	LUHRS CORPORATION	2004	Passenger (Uninspected)	35	42.2999
HUMMINGBIRD	EGG HARBOR BOAT COMPANY	1979	Recreational	21	35.7
I	n/a	1979	Recreational	32	47.2999
III SONS	GRADY-WHITE BOATS INC	2004	Recreational	6	24.8
IMPETUOUS	CALIBER YACHT CORP.	1989	Recreational	14	32.4
IMPULSE	SEA RAY BOATS, INC	1999	Recreational	25	40.7
INDIAN SUMMER	BLUEWATER MARINE CORPORATION	1992	Recreational	26	49.5
INDIGO 2	LAGOON	2005	Recreational	31	37.7999
INNISFREE	n/a	1986	Recreational	13	32
INSPIRATION	BOSTON WHALER INC	2014	Recreational	17	37.2999
INSPIRATION	FOUNTAIN POWERBOATS INC	2007	Recreational	11	42
INSPIRATION	AZIMUT SPA VIAREGGIO	1999	Recreational	85	70
IRIE CAT	FONTAINE PAJOT SA	2007	Recreational	24	36.2
ISIS	BRISTOL YACHT CORP.	1966	Recreational	7	32.1
ISLE & BUOY	CATALINA YACHTS INC	2000	Recreational	15	40.5
IT IS WHAT IT IS	SEA RAY BOATS INC	2004	Recreational	30	44.7999
JACATASH	HATTERAS YACHT DIVISION	1972	Recreational	24	38.2999
JACOB'S RUN	UNIFLITE INC	1979	Passenger (Inspected)	25	50.2
JADE	JEFFREY L COXWELL	1978	Recreational	16	40.8999
JAWS	SEA RAY BOATS INC	2007	Recreational	33	45.2999
JEANNEAU IT	JEANNEAU NEWCO LESHERRIERS	1999	Recreational	33	49.2
JET LAG II	TORRES BOAT MFG INC	1987	Commercial Fishing Vessel	19	41
JIM DANDY	NORTH AMERICAN ROCKWELL	1971	Commercial Fishing Vessel	27	45.8999
JIMCRACKCORN	SEA RAY BOATS INC	1999	Recreational	19	37.8
JIMCRACKCORN	CRUISERS YACHTS DIVISION OF KCS INTERNATIONAL INC	2005	Recreational	32	43.5
JOHN KNOX	WILLARD MARINE INC	1985	Passenger (Inspected)	16	40.2

JUST KNOT TODAY	CRUISERS YACHTS DIVISION OF KCS INTERNATIONAL INC	2002	Recreational	14	33
KAREN	ED WILLIS	1943	Recreational	9	37.7
KAREN MARIE	UNION YACHT CO LTD	1984	Recreational	11	36.2
KATERINA	SEA RAY DIVISION OF BRUNSWICK CORP	2002	Recreational	9	28.3
KAZAKOS	BERTRAM YACHT	1986	Recreational	18	32.7999
KELLIE	C.S. YACHTS LIMITED	1989	Recreational	12	39.2
KEYS4US	HYDRA-SPORTS BOATS	2011	Recreational	10	29.6999
KIKI	BENETEAU USA INC	2006	Recreational	9	32.7999
KISMET	POST MARINE COMPANY INC.	1987	Recreational	30	45
KNEAD MORE DOUGH	JUPITER MARINE INTERNATL	1999	Recreational	10	30.7
KNOT IN THE OFFICE	FOUR WINNS BOATS LLC	2002	Recreational	11	27.8
KNOT WORRIED	n/a	1979	Recreational	43	58.2999
KNOTWORK	LUHRS CORPORATION	1993	Recreational	24	35
KUDU	TILLOTSON-PEARSON INC	1990	Recreational	12	40.6
LA TE DA II	CRUISERS YACHTS	1999	Recreational	8	27.1999
LADY D	LUHRS CORPORATION	1999	Recreational	29	37.8
LADY LOVE	C & C YACHTS LIMITED	1983	Recreational	7	28.6
LADY SUN DREAM	CALIBER YACHTS INC	2011	Recreational	21	48.6
LASEAS	SOUTHPORT BOAT WORKS LLC	2006	Recreational	14	28.5
LAST DANCE	AMERICAN MARINE	1975	Recreational	22	42
LAST ONE	CABO YACHTS INC	2002	Recreational	20	34.5
LAURALEI	n/a	1956	Commercial Fishing Vessel	37	49.3999
LEEDERSHIP	GRADY-WHITE BOATS INC	2002	Recreational	14	33.5
LESLIE ANN TOO	BOSTON WHALER	2005	Recreational	11	31.8999
LESLIE ANNE TOO	JARRETT BAY BOATWORKS,INC	1998	Recreational	7	27
LIALTA	HATTERAS YACHTS DIVISION OF BRUNSWICK CORPORATION	2006	Recreational	70	66.5
LIBERTY	WATKINS YACHTS, INC.	1985	Recreational	12	33
LIGHT SEEKER	HUNTER MARINE CORPORATION	2004	Recreational	20	38.7
LIL' ALEXANDRA	CRUISERS YACHTS, DIVISION OF KCS INTERNATIONAL INC	2006	Recreational	8	27.2
LINE DANCER	RAMPAGE DIVISION OF KCS INTERNATIONAL INC	2003	Recreational	13	28.8
LITTLE SKIPPY WINNER	HOYLE D VARNUM	1964	Passenger (Inspected)	22	36.7
LITTLE WING	SEIDELMANN YACHTS	1979	Recreational	14	29.6999
LORELEI	HATTERAS YACHT DIVISION	1968	Recreational	35	43
LORI ROBIN	TROJAN YACHT	1979	Commercial Fishing Vessel	11	30
LOUISA	ERIC JAMES RYDZEWSKI	2006	Recreational	14	37.6
LOW ROLLER	BRUNO AND STILLMAN INC	1977	Recreational	11	31.8999
LUCKY DOGS	S2 YACHTS INC	2005	Recreational	31	40.2
LUCKY SEVEN	n/a	1984	Recreational	8	27.5
LUCKY STAR	TRADITIONAL WATERCRAFT	2000	Recreational	10	31
LUCY	CATALINA YACHTS INC	1994	Recreational	8	29.8999
M/V BOFUS	WELLCRAFTMARINE	1987	Recreational	27	39.5
M/V HT	REGULATOR MARINE INC	2005	Recreational	10	32
MACFISHIN	BLACK FIN YACHT CORP	1979	Recreational	13	32.5
MAD HATTER	SEA RAY BOATS, INC	1998	Recreational	8	26.1
MADAM QUEEN	ROBERTSON & CAINE	2000	Recreational	52	45
MAGIC	TILLOTSON-PEARSON INC	1985	RECREATIONAL	12	32.9
MAGIC BUS	GRADY WHITE BOATS INC	2000	Recreational	9	27.7
MAGIC TOUCH	LUHRS CORPORATION	1998	Commercial Fishing Vessel	17	32
MAI DONA	JOHN BOKSMAN/ANDREE PERRO	1986	Recreational	13	38
MAINE IDEA	NORTH END COMPOSITES	2003	Recreational	10	29
MAINE IDEA	BROOKLYN BOAT YARD	1982	Recreational	36	50
MANATEE	OFFSHORE MARINE INC	1987	Recreational	38	43.7999
MARA III	BERTRAM YACHT	1986	Commercial Fishing Vessel	22	37.3999
MARGARET	STATEN ISLAND SHIPBUILD	1915	Towing Vessel	160	95.0999
MARIANNE	BENETEAU USA INC	2000	Recreational	12	33.8999
MARIONETTE	HUNTER MARINE CORP.	1993	Unclassified	9	33.3999
MARTECH I	MARINETTE MARINE CORP	1981	Recreational	34	53
MARVELLOUS LIGHT	COOPER ENTERPRISES INC	1980	Recreational	10	37
MARY ELIZABETH	n/a	1919	Recreational	34	59.5
MAUR'RAY	SEA RAY DIVISION OF BRUNSWICK CORP	2003	Recreational	15	32.2999
MEERCAT TWO	HEAVENLY CRUISING YACHTS	1996	Recreational	7	28
MEMORY II	MORRIS YACHTS INC	2010	Recreational	7	29.1999
MEMORY IV	ABLE MARINE, INC	1987	Recreational	21	50
MEMORY MAKER II	CRUISERS YACHTS DIVISION OF KCS INTERNATIONAL INC	2004	Recreational	8	27.2
MEMORY V	ABERKING & RASMUSSEN	1952	Recreational	9	34
MID LIFE III	S2 YACHTS INC	2006	Recreational	6	30.5
MIDLIFE II	CARVER BOAT CORPORATION	1989	RECREATIONAL	9	30.8
MIGHTY FINE	PRINCESS YACHTS INTERNATIONAL PLC	2015	Recreational	86	69.2
MIGHTY GRAND	AMERICAN MARINE (S) PTE	1977	Recreational	10	32
MINDFUL	HUNTER MARINE CORPORATION	2003	Recreational	29	41.7999
MIO AMORE	CHRIS CRAFT CORP	1973	Recreational	26	55
MISS ANN	n/a	1956	Towing Vessel	51	42.7999
MISS ANNIE	TROJAN YACHT	1984	Recreational	20	35.8999
MISS BETTY	GENE A SPINKS	1986	Commercial Fishing Vessel	75	68
MISS CAROL	J LOWDA DAVIS	1960	Recreational	9	40.5
MISS CAROLINE	FOUNTAIN POWERBOATS INC	2003	Recreational	7	29
MISS FRANCES	BAYLINER MARINE CORP	1998	Recreational	30	47.2999
MISS GRACE	MAINSHIP CORPORATION	2004	Recreational	16	34.2
MISS KAYLA	WILLISTON BOAT WORKS	1954	Commercial Fishing Vessel	30	42.2
MISS LYNN	QUALITY WELDING & TANK CO	1973	Unknown	9	28.2
M-N-M'S WITH PEANUTS	BERTRAM YACHT	1988	Recreational	22	37.3999

MOON DANCE	n/a	1985	Recreational	11	31.3999
MOON DOGGIE	ONSLow BAY BOATWORKS & MARINE PRODUCTS INC	2016	Recreational	10	32.7999
MOON SHINE	PEARSON YACHTS DIV GRMMAN	1966	Recreational	10	32.6
MOPPIE 70	BERTRAM YACHT - DIV OF WHITTAKER CORP	1970	Recreational	10	30.3
MORAL COMPASS	VIKING YACHT COMPANY	1982	Recreational	40	44.5
MOTIVATION	ONSLow BAY MARINE GROUP LLC	2014	Recreational	13	32.7999
MOTIVATION II	YELLOW FIN YACHTS INC	2005	Recreational	9	36.7
MUIRGHEASA	HENRI WAUGUIEZ	1984	Recreational	17	43
MURDEN	CONRAD SHIPYARD LLC	2012	Industrial Vessel	551	147.9
MY TIME 2	REGULATOR MARINE INC	2013	Recreational	8	25.1999
MYRMIDON	CLARK BOAT COMPANY	1980	Recreational	7	28.8
MYSTIC LADY	BILLY G JOWERS	1990	Recreational	14	36.1
NARNIA	SEAFARER FIBERGLASS YACHT	1979	Recreational	11	30
NAUGHTY NAUGHTY	BERTRAM YACHT	1977	Recreational	68	58
NAUT ON CALL	RINKER BOAT CO INC	2001	Research Vessel	6	24.8
NAUTI NAUTI	SEA RAY BOATS, INC	1999	Recreational	33	45.2999
NAUTI NELL	JOHN TILIAKOS, BLDR	1955	Commercial Fishing Vessel	38	50.6
NAUTI NEWFS	SEA RAY DIVISION OF BRUNSWICK CORP	2006	Recreational	15	32.2999
NETTIE	NEW ENGLAND BOAT BUILDERS INC	1979	Recreational	10	37.1
NEVER SATISFIED II	TRITON BOAT CO LP	2006	Recreational	14	34.7999
NICE AFT	NOVA MARINE CO., LTD.	1988	Recreational	39	44
NIGHT MOVES III	KCS INTERNATIONAL INC	1996	Recreational	11	30
NO HURRY	CATALINA YACHTS INC	2011	Recreational	13	34.5
NO REGRETS	C&C YACHTS MFG LTD	1974	Recreational	7	30
NOBODY WALKS	BERTRAM YACHT	1989	Recreational	32	43
NON LINEAR	HUNTER MARINE CORPORATION	1993	Recreational	13	33.4
NOTHING IMPLIED	INTREPID POWERBOATS INC	1992	Commercial Fishing Vessel	9	32.1
OCEAN COMMOTION	JEANNEAU	1985	Recreational	11	33.2999
OCEAN REEL	FOUNTAIN POWERBOATS INC	1999	Recreational	7	31
OCEAN STINGER	LUHRS CORPORATION	1999	Commercial Fishing Vessel	26	36.2
ODYSSEY	MACGREGOR 65 CORPORATION	1989	Recreational	26	65
OFFLINE	WHITBY BOAT	1984	Recreational	14	37.1
OFFSHORE ACCOUNT	LUHRS CORP	1992	Commercial Fishing Vessel	15	29.3
ON THE WINGS OF THE WIND	BENETEAU USA, INC	1999	Recreational	15	41.7
ORIAWA	REGAL MARINE INDUSTRIES INC	2007	Recreational	10	27.4
OSCAR D	RPS BARGE COMPANY	2009	Freight Barge	13	40
OSCAR D	RPS BARGE COMPANY	2009	Freight Barge	13	40
OSPREY	n/a	1975	Recreational	15	34.2
OUT OF SYNCH	CHAPARRAL BOATS INC	2005	Recreational	8	28.8
PACKAGE DEAL	CONTENDER BOATS INC	2000	Recreational	10	30
PAID FOUR	THOMPSON TRAWLERS DIVISIO	1972	Commercial Fishing Vessel	8	26.8
PANACEA II	BRISTOL YACHT CO	1976	Recreational	13	34.7
PANORAMA	MAINE CAT	2008	Recreational	28	41.5
PARROT HEAD	PEARSON YACHTS CORP	1987	Recreational	6	26.8999
PARTY TIME	SEA RAY BOATS, INC	1998	Recreational	19	36.7999
PATIENCE	MARINE TRADING INTERNATIO	1985	Recreational	16	33.5
PATRICIA J	CAPE DORY YACHTS INC.	1987	Recreational	12	29.8999
PAU HANA	VOYAGE YACHTS LTD	1997	Passenger (Uninspected)	30	47
PAY TRIBUTE	HC COMPOSITES LLC	2015	Passenger (Uninspected)	10	32.2
PEGASUS	CARVER BOAT CORPORATION	1987	Recreational	14	32
PERFECT II	SEA RAY DIVISION OF BRUNSWICK CORP	2005	Recreational	18	37.2999
PHAT CAT	RAMPAGE DIVISION OF KCS INTERNATIONAL INC	2001	Recreational	23	36.8999
PHOENIX	BAYLINER MARINE CORP	1988	Recreational	11	28.6999
PHOENIX	BERTRAM YACHT DIVISION OF WHITTAKER CORP	1982	Recreational	18	32.7
PHOENIX	NEWTON BOATS INC	2011	Passenger (Inspected)	20	36
PIRATE'S PRIDE	DONALD H CAISON JR	2000	Recreational	25	36.2999
PLAN B	CAROLINA CLASSIC BOATS INC	2006	Recreational	9	28.4
PLAN B	GLASS BOAT WORKS INC	2001	Commercial Fishing Vessel	11	32.5
PLAN B	LINSSSEN YACHTS	1987	Recreational	14	40.5
PLAY HARDER	SEA RAY BOATS, INC.	1998	Recreational	25	40.7
PONY GIRL	EDEY & DUFF, INC	1974	Recreational	5	24
POPEYE	BERTRAM YACHT	1979	Recreational	18	32.7999
POPEYE	BANGO PUNTA MARINE	1971	Recreational	13	33.2
POR QUE NO	QUEEN LONG MARINE CO.,LTD	1982	Recreational	15	40.7
PORT ELIZABETH	CARVER BOAT CORPORATION	1986	Recreational	19	35.6
PRIMA DONNA	S2 YACHTS, INC.	1987	Unknown	8	27
PROVIDENCE	SABRE CORPORATION	1997	Recreational	18	36
PTEROSAUR	TARTAN MARINE COMPANY	1985	Recreational	9	34.2
PUDDLE JUMPER	SCOUT BOATS INC	2003	Recreational	7	28.2
PURA VIDA	AMF HATTERAS YACHTS	1974	Passenger (Uninspected)	25	42.7
PURE CHEMISTRY	ALBEMARLE BOATS INC	2001	Recreational	14	32.2
QUICK RELEASE	S2 YACHTS INC	1994	Recreational	13	31.1
R ROSE	WELLCRAFT MARINE	2002	Recreational	11	30.1999
R. HOLLAND	AMF HATTERAS YACHTS	1973	Recreational	39	53.1
R/V LEGACY	ISLAND HOPPER INTERNATIONAL BOAT WORKS INC	2004	Research Vessel	14	38
RAFALEO	CARVER BOAT CORPORATION	1988	Recreational	24	37.5
RAMESEAS	B C BOATWORKS	2000	Recreational	43	56
RANDOM ACTS	CRUISERS YACHTS DIVISION OF KCS INTERNATIONAL INC	2005	Recreational	32	43.5
RAUNCHIE CONCH	YELLOWFIN YACHTS	2016	Recreational	8	32.5
RAZ N CAIN	S2 YACHTS INC	1988	Recreational	20	36.7
REAL-EYES	CARVER BOAT CORPORATION	1992	Recreational	12	28.5

REALITY	SEA RAY BOATS, INC	2003	Recreational	33	45.2999
REEL FAST	n/a	1987	Recreational	9	27.6
REEL JOB II	COMMODORE BOATS	1970	Recreational	18	34
REEL MCKOY	BOSTON WHALER INC	2004	Recreational	10	28.2
REEL MCKOY	SILVERTON MARINE CORPORATION	2007	Recreational	20	35.7
REEL NAUTI	CONTENDER BOATS INC	2005	Recreational	7	30
REEL'N IN THE YEARS	HSING HANG MARINE INDUSTRIES CO LTD	2005	Recreational	37	44.7999
RELENTLESS II	GLOUCESTER MARINE, INC.	1989	Commercial Fishing Vessel	22	41.3999
REMEDY	n/a	1982	Recreational	25	37.7999
REVERIE II	FT. MEYERS YACHT & SHIPBL	1982	Recreational	9	32.7999
RILEY GIRL	TIDES BOAT WORKS	1992	Recreational	9	27.5
RIVER MAN	SEARAY BOATS INC	1998	Recreational	14	31.6
RO A TAN	GILLIKIN CRAFT INC	1981	Commercial Fishing Vessel	11	28.6
ROD HAWG	BERTRAM YACHT - DIV OF WHITTAKER CORP	1972	RECREATIONAL	10	28.2
ROUGHNECK	C&M SHIPBUILDING COMPANY	1978	Towing Vessel	64	45.7999
ROUNABOUT	CAPE DORY YACHTS, INC.	1986	Recreational	6	25.9
S O B	C&C YACHTS INC	1977	Recreational	6	26.4
SAILBAD THE SINNER	MORGAN YACHT CORP	1976	Recreational	25	41.2
SAINT N SINNER	SEA RAY BOATS INC	2003	Recreational	30	44.7999
SALTED	VIKING YACHT COMPANY	1987	Recreational	18	35
SARAH JANE	HILL DREDGING CORP	1949	Towing Vessel	9	31.5
SARAH JO	TRITON BOAT CO	2006	Recreational	14	34.8
SARATOGA	PACEMAKER CORPORATION	1967	Recreational	28	44
SAVANNAH	ALLSTATE ENVIROMENTAL DREDGING INC	1998	Towing Vessel	9	25.8
SAVANNAH IV	CRUISERS YACHTS DIVISION OF KCS INTERNATIONAL INC	2004	Recreational	28	39.2999
SEA BREEZE	SEA RAY BOATS, INC	1998	Recreational	13	30.9
SEA CREECHER	AMF HATTERAS YACHTS	1983	Recreational	27	43.1
SEA CREECHER	TOLLYCRAFT YACHTS	1994	Recreational	27	45.2
SEA DUCK TOO	SEA RAY BOATS INC	2008	Recreational	35	46.3999
SEA FEVER	IRWIN YACHT & MARINE CORP	1977	Passenger Barge (Uninspected)	22	42.5
SEA KER	BERTRAM YACHT	1983	Passenger (Uninspected)	32	42.2999
SEA LARK	C.P. LEEK & SONS INC	1963	Recreational	21	36.3999
SEA NUGGET	BOSTON WHALER INC	2016	Recreational	7	28
SEA SPA	CRUISERS YACHTS DIVISION OF KCS INTERNATIONAL INC	2002	Recreational	26	36
SEA TREK	HATTERAS YACHT DIV/N.A.RO	1970	Recreational	27	45.1
SEA VENTURE	ALBEMARLE BOATS INC	1991	Recreational	9	27.3
SEABISCUIT	CATALINA YACHTS INC	2005	Recreational	21	44.3
SEACOWBOY	MARINE TRADING INTERNATL	1979	Recreational	27	39.7
SEAMILEY	104 MIDWAY LLC	2014	Recreational	20	35.3
SEAS THE MOMENT	S2 YACHTS, INC.	1989	Recreational	21	36.7
SEAS THE MOMENT	CATALINA YACHTS	2003	Recreational	19	41.7
SEASCAPE	BAYLINER MARINE CORP	1987	Recreational	10	27.3999
SEASCAPE	AMERICAN MARINE LTD	1969	Recreational	11	31.8999
SEASCAPE	TARTAN MARINE COMPANY	1973	Recreational	11	34.2999
SECUMPTUAL III	JENSEN MARINE CORP	1964	Recreational	12	39.2999
SEQUEL	CAPE DORY YACHTS INC	1977	Recreational	8	28.1999
SEQUEL	SABRE CORPORATION	1997	Recreational	40	47.5
SHADOW	BERTRAM YACHT INC	1997	Recreational	19	35.6
SHAMROCK	BEACHCAT BOATS INC	2004	Passenger (Inspected)	5	26.5
SHARON LEIGH	CONTENDER BOATS INC	2003	Recreational	10	30
SHAWNCRY'S REVENGE	NEWTON BOATS INC	2013	Passenger (Inspected)	15	32
SHELBY KAY	SILVERTON MARINE CORP	1979	Recreational	16	34
SHINE	OCEAN YACHTS INC	1985	Passenger (Uninspected)	48	55.7
SILVERADO	FOUNTAIN POWERBOATS INC.	1990	Recreational	6	31
SINGLEHEADED	TILLOTSON-PEARSON INC	1987	Recreational	12	36.3999
SKAGGERAK XI	n/a	1956	Recreational	8	30.1
SKIMMER	CORSAIR MARINE INC	2002	Recreational	9	28.3999
SKIPPERS CREW II	BRUNSWICK FAMILY BOAT CO INC	2006	Recreational	20	35.8
SKIPPY'S WRECK ROGUES	NORFOLK NAVAL SHIPYARD	1951	UNSPECIFIED	43	53.2
SKYS THE LIMIT	SEMINOLE MARINE INC	2009	Recreational	7	28.5
SLAINTE	TRADITIONAL WATERCRAFT	1985	Recreational	7	26.5
SLOW BY SLOW	TRADITIONAL WATERCRAFT	1996	Recreational	12	34.7999
SMILEN 6	GRADY-WHITE BOATS INC	2013	Recreational	11	30.5
SNAKE OIL	REGULATOR MARINE INC	2007	Recreational	10	29
SNOW WHITE	n/a	1968	Commercial Fishing Vessel	54	57.2
SOUTHERN CROSS	n/a	1981	Passenger (Uninspected)	15	31.6999
SOUTHERN GRACE	MACHINE & SUPPLY COL, INC	1971	Recreational	59	57.8999
SOUTHERN LADY	SAN SEBASTIAN MARINE INC	1980	Commercial Fishing Vessel	101	63.6
SPLASH DOWN	TOLLYCRAFT YACHTS CORP.	1987	Recreational	31	44.2
SPOONDRIFT	BAYLINER MARINE CORP	1994	Recreational	13	32.1
SPORTSMAN	REGULATOR MARINE INC	1999	Recreational	10	32
SPORTSMAN	SLEEPY CREEK BOAT WORKS	1995	Recreational	19	39.5
STARDUST	HENRY R HINCKLEY & CO	1996	Recreational	11	36.3999
STEEL AWAY	SEA RAY BOATS INC	2005	Recreational	45	52
STEEL HEEL	BRUNSWICK FAMILY BOAT CO INC	2007	Recreational	33	47.7999
STEEL SPOILED	SEA RAY DIV OF BRUNSWICK CORP	2000	Recreational	20	33.5
STEPHANIE S	M F MARTIN JR	1986	Towing Vessel	126	69.0999
STILL STANDING	HULLS UNLIMITED EAST INC	1987	Commercial Fishing Vessel	20	42.7
STOKED	SCOUT BOATS INC	2009	Recreational	21	35.7999
STREAM WEAVER	SPENDER YACHTS INC	2011	Passenger (Uninspected)	69	60.2999
STRIDER	S2 YACHTS, INC	1996	Recreational	11	28.6999

SUGARFOOT	CAPE ISLAND YACHT LIMITED	2000	Recreational	21	36
SUMMER PLACE	n/a	1977	Recreational	18	32.7
SUNNYSIDE	CABO YACHTS INC	1998	Recreational	34	44.7
SUNSEEKER	TEXAS MARINE INTERNATIONAL	1980	Recreational	11	30
SUNSHINE	CAPE DORY YACHTS INC	1985	Recreational	11	36.1
SUSPENSE	CHANTTTERS BENETEAU	1989	Recreational	7	32
SUSPENSE	EGG HARBOR BOAT COMPANY	1978	Recreational	20	48
SUTURE SELF	WEST BAY SONSHIP YACHTS	1996	Recreational	56	55
SUTURE SELF II	CARVER BOAT CORPORATION	1993	Recreational	9	27.7
SWEET JAYNE	MATT WINCHELL	2015	Recreational	23	37.2999
TAKE FIVE	GRADY-WHITE BOATS, INC.	1992	Recreational	11	29.8999
TALL TAIL	S2 YACHTS INC	1988	Recreational	15	32.7
TANKER	ALBIN MANUFACTURING INC	2001	Recreational	14	31.3
TAR HEEL	CATALINA YACHTS INC	1994	Recreational	29	45.3
TAR HEELS 3	REGULATOR MARINE INC	2007	Recreational	11	32
TERESA MARIE	NORTH END COMPOSITES	2015	Recreational	12	30.5
TERN	MARINETTE MARINE CORP	1969	Towing Vessel	13	36
THAT'S MY GIRL	MERIDIAN YACHTS	2014	Recreational	32	47
THE ANCHOR'S AWAY	HUNTER MARINE CORPORATION	2003	Recreational	11	34.5
THE FRENCH GIRL	n/a	2011	Recreational	6	29
THE G'S SPOT	FOUNTAIN POWERBOATS INC	2004	Recreational	9	35
THE OTHER BAR	MURRAY CHRIS CRAFT CRUIS	1982	Recreational	10	28.8999
THE PACIFIER	BAYLINER MARINE CORPORATION	1987	Passenger (Uninspected)	14	31.5
THUNDER	EAST BAY BOAT WORKS INC	2000	Recreational	35	56
TIDE RUNNER	TARTAN MARINE COMPANY	1980	Recreational	11	33.6
TIME OUT	SEA RAY BOATS	1993	Recreational	11	30.5
TIS TIME	MILLER YACHT SALES	1976	Recreational	19	35.5
TOP CAT	OFFSHORE 30, INC.	1977	Commercial Fishing Vessel	11	31.6999
TORTUGA	CHEOY LEE SHIPYARDS LTD	1983	Recreational	41	66
TOSCA B	DROLSEA LIMITED	1977	RECREATIONAL	7	31.2
TOTAL FREEDOM	HUNTER MARINE CORP	1994	Recreational	12	29.5
TRADEWINDS	MORGAN YACHT	1979	Recreational	22	41.2
TRAVELLER	C.J. PEARSON CO.	1988	Recreational	20	47.3
TREEMENDOUS	HATTERAS YACHTS INC	1994	Recreational	68	54.7999
TRIPPIN	CHANTIERS AMEL SA	2008	Recreational	23	53.7999
TRUE LUFF	CATALINA YACHTS	1997	Recreational	7	28.5
TRUE NORTH	AMERICAN MARINE LTD	1968	Recreational	12	32
TRUMAN	SHANON BOAT COMPANY INC	1983	Recreational	13	28.1
TWO FOOLS	SILVERTON MARINE CORP	1996	Recreational	18	36.1
UNFINISHED BUSINESS	S2 YACHTS INC	2002	Recreational	9	30.8
UNTIE ME	CARVER BOAT CORPORATION	1988	Recreational	44	48
VIATOR	CAPITAL YACHTS INC	1982	Recreational	30	41
VIOLET ANN	SHANNON YACHTS LLC	2001	Recreational	11	32
VIRGINIAN	n/a	1977	Recreational	9	29.8
VIVID	BRISTOL YACHT COMPANY	1975	Recreational	8	30
VIXEN	n/a	1978	Recreational	19	43.8999
VON BREMEN	SILTALA YACHTS OY	1995	Recreational	8	37.5
WANDERLUST	HUNTER MARINE CORPORATION	1989	Recreational	12	37.5
WASTED TIME	FOUR WINNS BOATS LLC	2006	Recreational	7	25.8999
WAXY	CATALINA YACHTS	1999	Recreational	19	41.7999
WAYNE'S WORLD II	SEA RAY BOATS INC	1998	Recreational	19	37.7999
WET MARTINI	SEA RAY BOATS INC	2006	Recreational	30	44.7999
WHATA HOOT	ALGAS CORPORATION	1968	Recreational	15	33
WHATEVER YOU SAY	SEA RAY BOATS INC	1999	Recreational	7	25.1999
WHIPSAW	WILL'S BOAT WORKS	1974	Passenger (Uninspected)	23	39
WIDE OPEN	OUT ISLAND SPORT YACHTS INC	2005	Recreational	25	37.7999
WILDU II	n/a	1972	Unclassified	12	33.7
WILMINGTON	EVANS BOAT REPAIR INC	2010	Passenger (Inspected)	14	46
WINCHESTER	SAFTICRAFT CORP	1964	Towing Vessel	111	66.4
WIND DANCER	PACIFIC SEACRAFT CORP	1987	Recreational	9	30.5
WINDFLOWER	HERMAN J HERMANSON	1972	Recreational	21	48
WINDSTAR	CAPE DORY YACHTS INC	1986	Recreational	6	25.8999
WWW.SEAYA.GON	n/a	1970	Recreational	15	36.2999
XICA	C&C YACHTS MFDG LTD	1977	Recreational	12	30.1
YANKEE DOODLE	ERICSON YACHTS, INC.	1979	Recreational	12	31
YARRA YARRA	TOPAZ MARINE CORP	1984	Recreational	9	29
YARRA YARRA	PARKER MARINE ENTERPRS INC	2004	Recreational	9	33.2
YELL-A-TALE	REGULATOR MARINE INC	2003	Recreational	10	32
YO MUDDER	UNITED BOATBUILDERS INC	1967	Unclassified	14	36
ZIP A DEE DO DA	HUNTER MARINE CORPORATION	1993	Recreational	13	30.1
ZOE	EISTA WERF NV	1971	Recreational	17	36.5
ZUBENUBI	TIARA DIV S2 YACHTS, INC	1986	Recreational	10	27.8999
ZULU CHIEF	WILLIAM E MUNSON CO., INC.	2006	Research Vessel	15	38
ZULU WITCH	SILVER SHIPS INC	2014	Industrial Vessel	10	36



DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

May 15, 2025

Mr. Trevor Carroll
North Carolina Department of
Transportation – Division 3
5501 Barbados Boulevard
Castle Hayne, North Carolina 28429

Section 408 Request Number: 408-SAW-2024-00030

Dear Mr. Carroll:

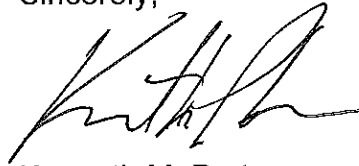
The Wilmington District of the U.S. Army Corps of Engineers (USACE) is currently reviewing your request to replace the existing Cape Fear Memorial Bridge with a fixed bridge within and over the Wilmington Harbor Federal Project, pursuant to Section 14 of the Rivers and Harbors Act of 1899, 33 U.S.C. 408 (Section 408). This evaluation is being performed consistent with Engineer Circular (EC) 1165-2-220.

Section 12, a. (1) of EC 1165-2-220 states, *"If at any time it is concluded that the usefulness of the authorized project will be negatively impacted, any further evaluation should be terminated and the requester notified."* We have completed the technical analyses for this review and have determined that the construction of a bridge with a vertical clearance less than 135' feet above the current MHHW elevation would be injurious to the purpose of the federal project and the usefulness of the federal project would be negatively impacted. Please see the attached Memorandum for Record for our technical analysis and more information about the federal project.

We will therefore terminate any further analysis of the construction of a bridge with a vertical clearance less than 135' feet above the current MHHW elevation. However, we will continue the analysis for the request otherwise, as contemplated in EC 1165-2-220. Specifically, the USCG bridge permit decision will be informed by USACE's determination under Section 408 whether the bridge will impact the usefulness of the navigation project. See EC 1165-2-220, Appendix G-5. a. Additionally, we will coordinate with the lead federal agency, the Federal Highway Administration, as to whether USACE should assume a cooperating agency role in the National Environmental Protection Act review. See EC 1165-2-220, Appendix G-5. c.

For any further questions regarding the analysis of your request for a Section 408 permission, please contact Mr. Ronnie Smith via email at ronnie.d.smith@usace.army.mil, or by phone at 910-251-4489.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Porter', with a stylized flourish at the end.

Kenneth M. Porter
Lieutenant Colonel, U.S. Army
Acting Commander

Enclosure:
Section 408 Technical Analysis

U.S. Department of
Homeland Security

United States
Coast Guard



Commander
United States Coast Guard
Fifth Coast Guard District

431 Crawford Street
Portsmouth, VA 23704-5004
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Phone: (757) 398-6277
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Email: Jack.H.Williams2@uscg.mil
CGDFiveBridges@uscg.mil

16591
28 MAY 2025

Mr. Trace Howell
Division 3 Project Manager
North Carolina Department of Transportation
5501 Barbado Blvd.
Castle Hayne, NC 28429

Dear Mr. Howell:

The Coast Guard has reviewed the Section-408 permission letter from the U.S. Army Corps of Engineers (USACE) Wilmington District dated May 15, 2025, email from Mr. Ronnie Smith, USACE Wilmington District, dated May 22, 2025, and the Navigation Impact Report (NIR) for the Cape Fear River in Wilmington, NC dated June 2024. Based on a preliminary review of this documentation and the information available as of the date of this letter, the Coast Guard does not foresee anything that would prevent a bridge permit from being issued. The Preliminary Navigation Clearance Determination (PNCD) and information below are provided to assist the North Carolina Department of Transportation (NCDOT) in preparing and submitting a bridge permit application.

The Coast Guard has made a PNCD that a drawbridge or fixed bridge that carries U.S. 17/76/421 over the Cape Fear River, at mile 26.8, will provide for the current and prospective reasonable needs of navigation. The proposed drawbridge or fixed bridge would replace the existing drawbridge on a new alignment approximately 150 feet south of the existing bridge. The existing drawbridge has a vertical clearance of 135 feet above mean high water in the open position, a vertical clearance of 65 feet above mean high water in the closed position, and 350 feet of horizontal clearance. The proposed bridge should provide at least 135 feet of vertical clearance above mean high water and at least 400 feet of horizontal clearance through the main navigation span of the bridge. If a drawbridge is proposed, the drawbridge should provide at least 65 feet of vertical clearance above mean high water in the closed position.

Please note that this PNCD is not binding, does not constitute an approval or final agency action, and **expires three (3) years from the date of this correspondence**. A final determination can only be made in accordance with regulation and after NCDOT submits a complete bridge permit application to the Coast Guard. If a complete bridge permit application is not submitted within three (3) years from the date of this correspondence, an updated Navigation Impact Report as described in appendix A of the Coast Guard's Bridge Permit Application Guide, COMDTPUB P16591.3E, should be prepared and submitted in order to obtain a new PNCD.

16591
28 MAY 2025

Mr. Jack Williams, at the above listed address or telephone number, has been assigned as the Coast Guard's Bridge Permit project officer. Please maintain frequent and regular contact with the project officer to ensure efficient and effective project administration.

Sincerely,

PITTS.HAL.R.
1121267272

Digitally signed by
PITTS.HAL.R.11212672
72
Date: 2025.05.28
12:09:51 -04'00'

HAL R. PITTS
Bridge Program Manager
By direction

Encl: Bridge Permit Application Guide, COMDTPUB P16195.3D and BPAG Applicant
Template located at (<https://go.usa.gov/xRFk2>)

Copy: Coast Guard Sector North Carolina, Waterways Management
Federal Highways Administration, NC Division Office
U. S. Army Corps of Engineers, Wilmington District Office



Appendix B

Traffic Capacity Analysis



Cape Fear Memorial Bridge Improvements Study

NCDOT Project HB-0039

Capacity Analysis Report

New Hanover and Brunswick County
February 2024



PREPARED FOR:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



CAPE FEAR MEMORIAL BRIDGE IMPROVEMENTS STUDY
CAPACITY ANALYSIS

STATE TRANSPORTATION IMPROVEMENT PROJECT HB-0039
NEW HANOVER AND BRUNSWICK COUNTY

PREPARED BY:

HDR ENGINEERING, INC. OF THE CAROLINAS
555 FAYETTEVILLE STREET, SUITE 900
RALEIGH, NC 27601
NC LICENSE NO. F-0116



Executive Summary

The North Carolina Department of Transportation (NCDOT) proposes to construct STIP HB-0039, which involves replacing and widening Bridge No. 640013 (Cape Fear Memorial Bridge) over the Cape Fear River on US 17/76/421 in Brunswick and New Hanover County. These improvements may include widening and interchange improvements within the study area. To alleviate traffic congestion, the current roadway and intersection geometries are under consideration for improvements. The primary objective of this capacity analysis is to assess traffic conditions in the base year (2023) and future year (2050) of the project study area with and without improvements using the TransModeler traffic simulation software (Version 6.1, Build 8655) to determine the anticipated impact of the proposed improvements within the study area. The two potential alternatives analyzed in this report are:

- **Alternative A** – Widen US 17/76/421 to 6 lanes from US 17/74/NC 133 to Front Street utilizing a new movable bridge with 65' clearance. This alternative also includes improvements to S Front Street including widening to 4 lanes from the U-5734 project limits to Front Street at US 17/76/421 WB On Ramp and a new signal at Front Street at US 17/76/421 WB On Ramp.
- **Alternative B** – Widen US 17/76/421 to 6 lanes from US 17/74/NC 133 to Front Street and removing access at 3rd Street and 4th Street. The removal of access to 3rd Street and 4th Street was due to limitations in the roadway geometry as the bridge is anticipated to be constructed with a clearance of 135 feet versus the 65-foot clearance in Alternative A. Due to the reduced access, turn lane improvements were proposed along S 5th Avenue to accommodate future traffic volumes. As part of this alternative, the S Front Street ramp intersections were reconfigured to allow the on and off ramps via one roundabout intersection to be located at the existing S Front Street and US 17/76 On Ramp. In addition, the Front Street was proposed to be widened to 4 lanes from U-5734 project limits to US 17/76/421 WB On Ramp.

2023 No-Build Scenario

The analysis of the 2023 conditions along the corridor showed 2 freeway sections out of the 12 operate at Level of Service (LOS_s) E or LOS_s F during each the AM and the PM peak hours (the failing segments were in the eastbound direction for the AM and westbound direction for the PM). The model had an average vehicle speed of 40.7 mph and 39.5 mph during the AM and PM peak hours, respectively. All intersections analyzed operated at an overall LOS_s D or better, indicating acceptable overall operations. During the AM peak hour, all of the lane groups at signalized intersections operated acceptably at a LOS_s D or better, except at the intersection of Wooster Street and 3rd Street, which had one lane group operating at LOS_s E. During the PM peak hour, all signalized intersections had at least one lane group operating at a LOS_s E or LOS_s F with the exception of Dawson Street at 3rd Street. At times, this resulted in longer queuing that spilled beyond the storage capacity of the lane but was not significant enough to affect operations at adjacent intersections.

2050 No-Build Scenario

The 2050 No-Build analysis was performed to show the impacts on traffic operations of the projected traffic volumes in the study area if no improvements are made to the roadway network. During the AM and PM peak hours, respectively, 7 of the 12 and 10 of the 12 freeway segments experienced LOS_s E or worse. The model had an average vehicle speed of 30.7 mph and 30.1 mph during the AM and PM peak hours, respectively. Based on a review of the intersection analysis, all intersections had at least one lane group that was found to operate at LOS_s E or LOS_s F during either the AM and PM peak hours. A review of the queuing data and model animation found that queuing is expected to impact the freeway and surrounding arterials with queues along Front Street, 3rd Street, Wooster Street, and US 17/76 anticipated to extend outside of the study network during the AM and PM peak hours.

2050 Build Alternative A Scenario

The 2050 Build Alternative A analysis was performed to show the impacts on traffic operations of the projected traffic volumes in the study area with Alternative A improvements made to the roadway network. During the AM and PM peak hours, 6 of the 11 freeway segments experienced LOS_s E or worse. The model had an average vehicle speed of 36.3 mph and 35.1 mph during the AM and PM peak hours, respectively. The overall LOS_s for the signalized intersections in the 2050 Future Year Build Alternative A analysis shows that 1 of the 5 signalized intersections operate unacceptably at a LOS_s E or worse in the AM peak hour and 3 of the 5 intersections operate unacceptably in the PM peak hour. A review of the queuing data and model animation found that queuing is expected to impact the freeway and surrounding arterials as minimal improvements were able to be made along 3rd Street and 5th Street. It showed that multiple turn bay storage lengths were not sufficient to contain all turning movement queues during the AM and PM peak hours. Based on the heavy volumes and heavy queues along 3rd Street, queueing was noted to extend beyond the study network in both the northbound and southbound directions. This queuing on 3rd Street was shown to impact queuing and delays along Wooster Street as well as along the eastbound US 17/76, causing queues to spillback along the freeway.

2050 Build Alternative B Scenario

The 2050 Build Alternative B analysis was performed to show the impacts on traffic operations of the projected traffic volumes in the study area with Alternative B improvements made to the roadway network. During the AM and PM peak hours, respectively, 3 of the 11 and 2 of the 11 freeway segments experienced LOS_s E or worse. The model had an average vehicle speed of 39.0 mph and 35.6 mph during the AM and PM peak hours, respectively. The overall LOS_s for the signalized intersections in the 2050 Future Year Build Alt 2 Analysis shows that both signalized intersections operate unacceptably at a LOS_s E or worse in each the AM and PM peak hour, except the intersection of US 17/76 (Wooster Street) and S 5th Avenue during the AM peak hour. It should be noted that 2 signalized intersections were removed as part of this alternative, which is expected to overall reduce delays experienced along the corridor but may show slightly higher delays at the remaining signalized intersections due to the increased turning movement traffic expected at these intersections. A review of the queuing data and model animation found that queuing is expected to impact the freeway and surrounding arterials. It showed that the

southbound left-turn bay storage length at the intersection of US 17/76 (Dawson Street) and S 5th Avenue was not sufficient to contain all turning movement queues during the AM and PM peak hours. Queuing was not shown to extend to the S Front Street ramps along US 17/76. During the PM peak hour, heavy queuing is expected on the westbound approach at the intersection of US 17/76 (Wooster Street) and S 5th Avenue, as well as on the northbound approach at the intersection of US 17/76 Ramps and S Front Street.

Conclusions

Based on the results of the analysis, operations along the Cape Fear Memorial Bridge corridor and at adjacent study area intersections are expected to deteriorate by the year 2050 without any proposed improvements. As discussed in **Section 8.8**, freeway densities as well as queues at intersections within the study area would experience large increases between the 2023 year and 2050 year analyses. These increases would cause higher densities along the freeway which creates stop and go conditions through most of the model.

Alternative A and Alternative B are expected to provide relief to the roadway network based on analysis findings. Alternative A results indicate a reduction in VHT of 411.3 hours and an increase in network travel speed of 5.3 mph on average, as compared to 2050 No-Build conditions. Alternative B results indicate a reduction in VHT of 592.1 hours and an increase in network travel speed of 6.9 mph on average, as compared to 2050 No-Build conditions. Queuing was also shown to improve between 2050 No-Build and 2050 Build (Alternative A and Alternative B) conditions throughout the study area.

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Appendix A: Traffic Volume Forecast

Appendix B: IAU Spreadsheets

Appendix C: Model Volume Validation

Appendix D: Proposed Concepts

1. Project Background

HDR Engineering, Inc. of the Carolinas (HDR) has been retained by the State of North Carolina Department of Transportation (NCDOT) to develop and evaluate traffic operations for NCDOT Project Number HB-0039 in New Hanover County and Brunswick County. The HB-0039 project proposes replacing and widening Bridge No. 640013 (Cape Fear Memorial Bridge) over the Cape Fear River on US 17/76/421. As part of this study, improvements were considered along the Front Street, 3rd Street, and 5th Avenue corridors in Wilmington. This study also encompasses the analysis for the trumpet interchange with US 74/421 ramps along US 17/76/421 west of the Cape Fear River.

1.1 Purpose of Technical Memorandum

The purpose of this technical memorandum is to quantify existing and future traffic conditions with and without the proposed project to provide a comparison of level of service (LOS) with the future-year build alternatives. LOS is determined using data from *TransModeler* traffic simulation software (Version 6.1, Build 8655) and then compared to Highway Capacity Manual (HCM) 6 thresholds. *TransModeler* tracks individual vehicle movements and interactions and quantifies overall intersection delays more realistically than typical HCM methods, but for the purposes of this analysis the LOS criteria are based on HCM 6 metrics. This report is limited to traffic engineering measures of effectiveness (MOE's) and does not account for any financial metrics, including cost of ROW acquisition, structures, inflation adjustment, etc.

1.2 Study Area Description

US 17/76, a four-lane median-divided facility, is the primary east-west route that traverses to/from Wilmington. US 17 is a major regional route as it runs north-south along the eastern coast of South Carolina and North Carolina, passing through a number of major cities along the route, such as Charleston, Myrtle Beach, Wilmington, Jacksonville, and New Bern. US 421 is a major regional route, running in a north-south direction going to/from Greensboro.

The study area includes two interchanges along the corridor with one entirely free flow in nature. Forecasted volumes along US 17/76/421 over the Cape Fear Memorial Bridge indicate up to 65,200 vehicles per day within the study area in the year 2023, a number that is forecasted to increase to 94,900 by the year 2050. The project study area includes the following intersections and can be seen in **Figure 1**:

- US 17/76 On-Ramp and S Front Street
- US 17/76 Off-Ramp and S Front Street
- US 17/76 (Wooster Street) and US 17 BUS (S 3rd Street)
- US 17/76 (Dawson Street) and US 421 (S 3rd Street)
- US 17/76 (Dawson Street) and S 4th Street
- US 17/76 (Wooster Street) and S 5th Avenue
- US 17/76 (Dawson Street) and S 5th Avenue

2. Description of Scenarios Analyzed

The scenarios evaluated as part of this study include the following:

- 2023 No-Build
- 2050 No-Build
- 2050 Build Alternative A
- 2050 Build Alternative B

2.1 2023 Base Year No-Build Scenario

The 2023 No-Build scenario reflects the base year traffic volumes and roadway network configuration within the study area and will serve as a “baseline” with which to compare with the future-year scenarios. No calibration was performed on this model but a check of the volumes produced within the model was performed to verify the requisite volumes were produced. The 2023 No-Build volumes were based on the traffic forecast provided by NCDOT.

2.2 2050 Future Year No-Build Scenario

The 2050 No-Build scenario reflects the same roadway network configuration as in the 2023 No-Build Scenario with the inclusion of the improvements made to Front Street as part of the U-5734 project which is assumed to be completed by 2050. The projected future year traffic volumes based on traffic forecasts provided by NCDOT.

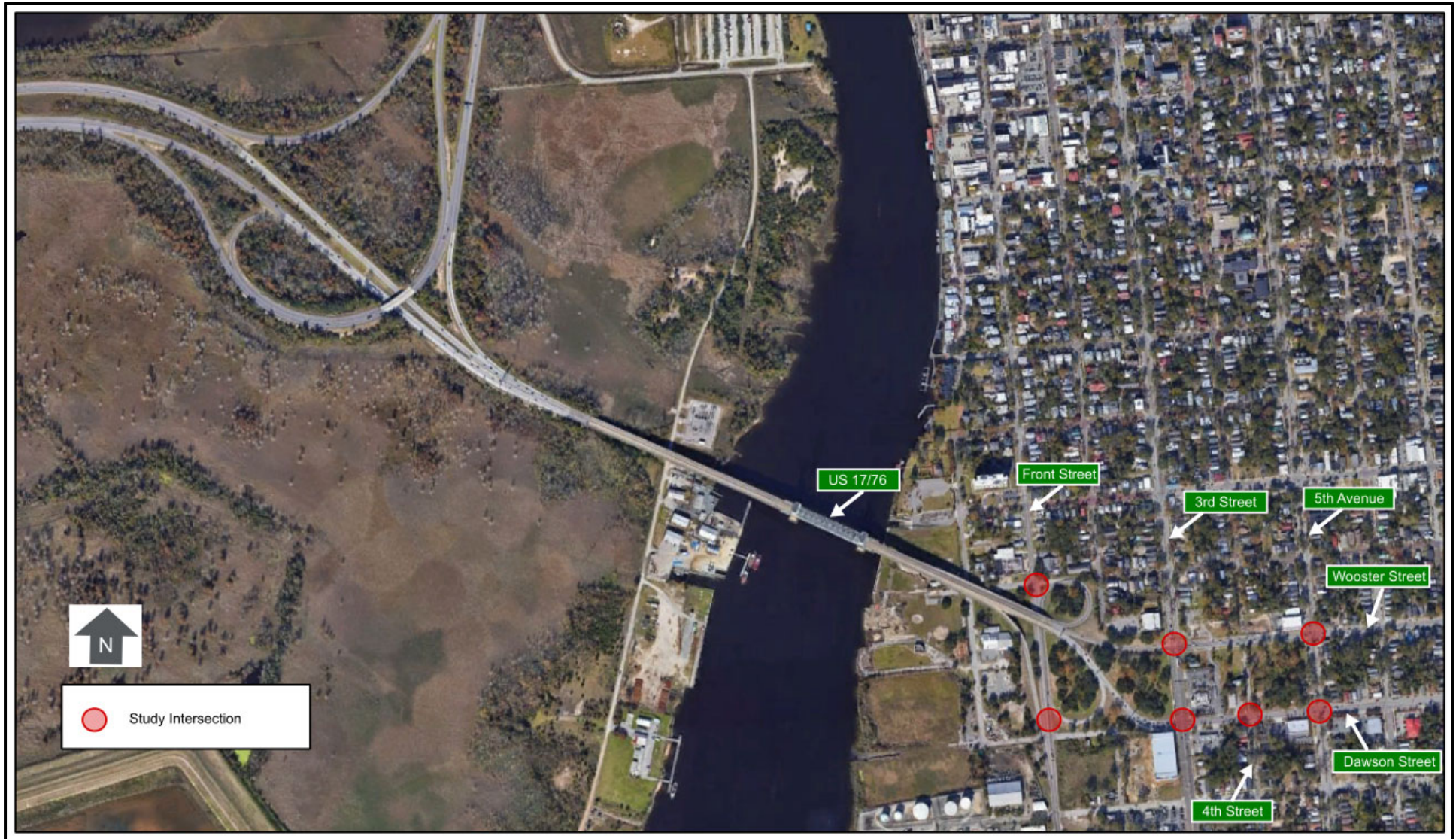
2.3 2050 Future Year Build Alternative A Scenario

The 2050 Build Alternative A scenario includes widening Cape Fear Memorial Bridge to 6 lanes. The new Cape Fear Memorial Bridge is anticipated to be constructed to the south of its current location. This alternative also includes improvements to S Front Street including widening S Front Street to four lanes within the interchange of the interchange and improvements to the ramp terminals. Additional improvements were considered along 3rd Street and 5th Avenue but were eliminated due to the impacts to the historic district. Traffic volumes for the 2050 Build Alternative A utilized the same volumes as the 2050 Future Year No-Build. Refer to **Section 9** of the report for further details on the proposed design.

2.4 2050 Future Year Build Alternative B Scenario

The 2050 Build Alternative B scenario includes widening Cape Fear Memorial Bridge to 6 lanes and removing access at 3rd Street and 4th Street. The removal of access to 3rd Street and 4th Street was due to limitations in the roadway geometry as the bridge is anticipated to be constructed with a clearance of 135 feet versus the 65-foot clearance in Alternative A. The new Cape Fear Memorial Bridge is anticipated to be constructed to the south of its current location. Due to the reduced access, turn lane improvements are proposed along S 5th Avenue to accommodate future traffic volumes. As part of this alternative, the S Front Street ramp intersections were reconfigured to allow the on and off ramps via one roundabout intersection to be located at the existing S Front Street and US 17/76 On Ramp. Future year Alternative B traffic volumes based the forecast provided by NCDOT that was developed assuming reduced connectivity to 3rd Street and 4th Street. Refer to **Section 9** of the report for further details on the proposed design.

Figure 1: Project Study Area



3. Methodology

The analysis of the US 17/76/421 corridor was performed using *TransModeler*. *TransModeler* is a microscopic, behavior based multi-purpose traffic simulation program that was selected for this project due to the complexity of the project and the need to be able to analyze the interaction of signals and interchanges along the corridor. The microscopic model was developed for the 2023 and 2050 scenarios and was developed from data collected for the transportation network. The model was then visually validated against observations of the study corridor made in the field on September 20, 2023, during peak hour conditions. This microscopic simulation model was developed in accordance with the NCDOT Congestion Management Simulation Guidelines.

4. Measures of Effectiveness

Measures of Effectiveness (MOE) are system performance statistics produced by the simulation to show the improvement that a particular alternative would have over the base network conditions. As the analysis in this report only includes the no-build scenarios, the MOE's will be used to determine the need for further study of this corridor.

Traffic conditions in each scenario were quantified using the MOE's as specified by *NCDOT Congestion Management Simulation Guidelines*.

- Arterial MOE's
 - Average control delay (in seconds per vehicle) and LOS, for each lane group approaching an intersection in addition to the whole intersection (weighted according to flow rate)
 - Average queue length (in feet), for each lane group approaching an intersection
 - Spillback rate (time of spillback as a percentage of the total analysis time), for each lane group approaching an intersection
 - Maximum queue length (in feet), for each approach to an intersection
- Freeway MOE's
 - Average Density (in vehicles per lane per mile) for each freeway segment.
- Network MOE's
 - Vehicle Hours Traveled (VHT)
 - Vehicle Miles Traveled (VMT)
 - Average Speed (in miles per hour)
 - Average Delay (in hours)
- Corridor MOE's
 - Travel Time (in minutes)
 - Travel Speeds (in miles per hour)

MOE's are reported for all lane groups at signalized intersections, and only those lane groups with conflicting movements at two-way stop control (TWSC) intersections. LOS and the associated thresholds of average control delay for both types of intersections are summarized in **Table 1**.

Table 1: LOS for Interrupted Flow Facilities*

LOS	Signalized Intersections (s)	TWSC Intersections (s)
A	≤ 10	≤ 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80, and/or v/c > 1.00	> 80, and/or v/c > 1.00

*Based on *Highway Capacity Manual (HCM) 6th Edition* Exhibits 19-8 and 20-2

Average control delay in the Highway Capacity Manual (HCM) is derived differently from that of the reported MOE's from microsimulation. Thus, as an indication that level of service in the context of this report is not explicitly HCM-compliant, it is denoted as LOS_S.

Freeways have multiple sets of thresholds for LOS and depend on the type of freeway segment being considered. The first set of thresholds for LOS are for basic freeway segments and are shown in **Table 2**. The second set of thresholds for LOS are for merge or diverge segments and are shown in **Table 3**. The type of freeway segment is determined by *TransModeler* in the Freeway LOS output.

Table 2: LOS for Uninterrupted Flow Freeway Facilities*

LOS	Freeway Segment Density (veh/ln/mi)
A	≤ 11
B	> 11-18
C	> 18-26
D	> 26-35
E	> 35-45
F	> 45, and/or v/c > 1.00

*Based on *Highway Capacity Manual (HCM) 6th Edition* Exhibit 12-15

Table 3: LOS for Freeway Merge/Diverge Facilities*

LOS	Freeway Segment Density (veh/ln/mi)
A	≤ 10
B	> 10-20
C	> 20-28
D	> 28-35
E	> 35
F	v/c > 1.00

*Based on *Highway Capacity Manual (HCM) 6th Edition* Exhibit 14-3

For this report, an acceptable LOS is defined as LOS D or better while unacceptable or failing LOS is defined as LOS E or LOS F for both freeway and intersection LOS.

For this report, the Corridor MOE's were developed for the eastbound and westbound movements along US 17/76 from the western edge of the study area to the eastern edge of the study area.

5. Traffic Volume Development

Traffic volume forecasts for the scenarios (2023 No-Build, 2050 Build Alternative 1, and 2050 Build Alternative 2) used in this analysis were provided by NCDOT (**Appendix A**). For this report, 2050 Future Year No-Build and Build Alternative A utilize the 2050 Build Alternative 1 Forecast while Build Alternative B utilizes the 2050 Build Alternative 2 Forecast. The traffic volume forecasts were then inserted into NCDOT's *Intersection Analysis Utility* (IAU) spreadsheet tool to determine the peak hour turning movement volumes (**Appendix B**). Several existing low-volume intersections were not included in the forecast report, and the K-factors and D-factors (which together convert the daily volumes to the peak hour volumes) vary along segments within the study area.

All the volume scenarios utilized an O-D Matrix developed from the forecasted IAU traffic volumes. Volumes for the interchanges were developed by balancing the volumes against the nearest intersections with imbalances being pushed off network where possible. The volumes used in the network can be seen in **Appendix B**.

An O-D Matrix was necessary for these scenarios due to the complexity of the roadways being analyzed. To develop the O-D Matrix, the IAU traffic volumes were input into a model with optimized signal timings. The model was then run for ten runs to allow all traffic to proceed through the network by the end of the model. The Trip Statistics O-D Matrix output report and the outputs were averaged across all ten runs. The O-D Matrix from the model was then adjusted to eliminate mid-block volume imbalances by pushing the imbalance to a boundary node utilizing engineering judgement to select the appropriate boundary node. Any volumes maintaining the same origin and destination node were rerouted through engineering judgement to exit the model through an appropriate new destination node. To balance out the rerouted volume, other O-D pairs were adjusted to maintain the proper turning movements throughout the network. This adjusted O-D Matrix was then input into their respective models for use as the traffic volume input.

6. Deviation from Default Values

No adjustments were made to the default values provided by NCDOT as a part of this study.

7. 2023 Base Year No-Build Analysis

7.1 Model Geometry

Aerial photographs from NC OneMap (New Hanover County and Brunswick County, 2023 imagery; <http://nconemap.org/>) were used as a background to develop the model network and were verified with newer aerial photographs from Google Earth. The limits of the model include US 17/76 from US 74 / 421 to S 5th Avenue. The existing lane configurations used in the model can be seen in **Figure 2**.

Figure 2: Existing Lane Configurations

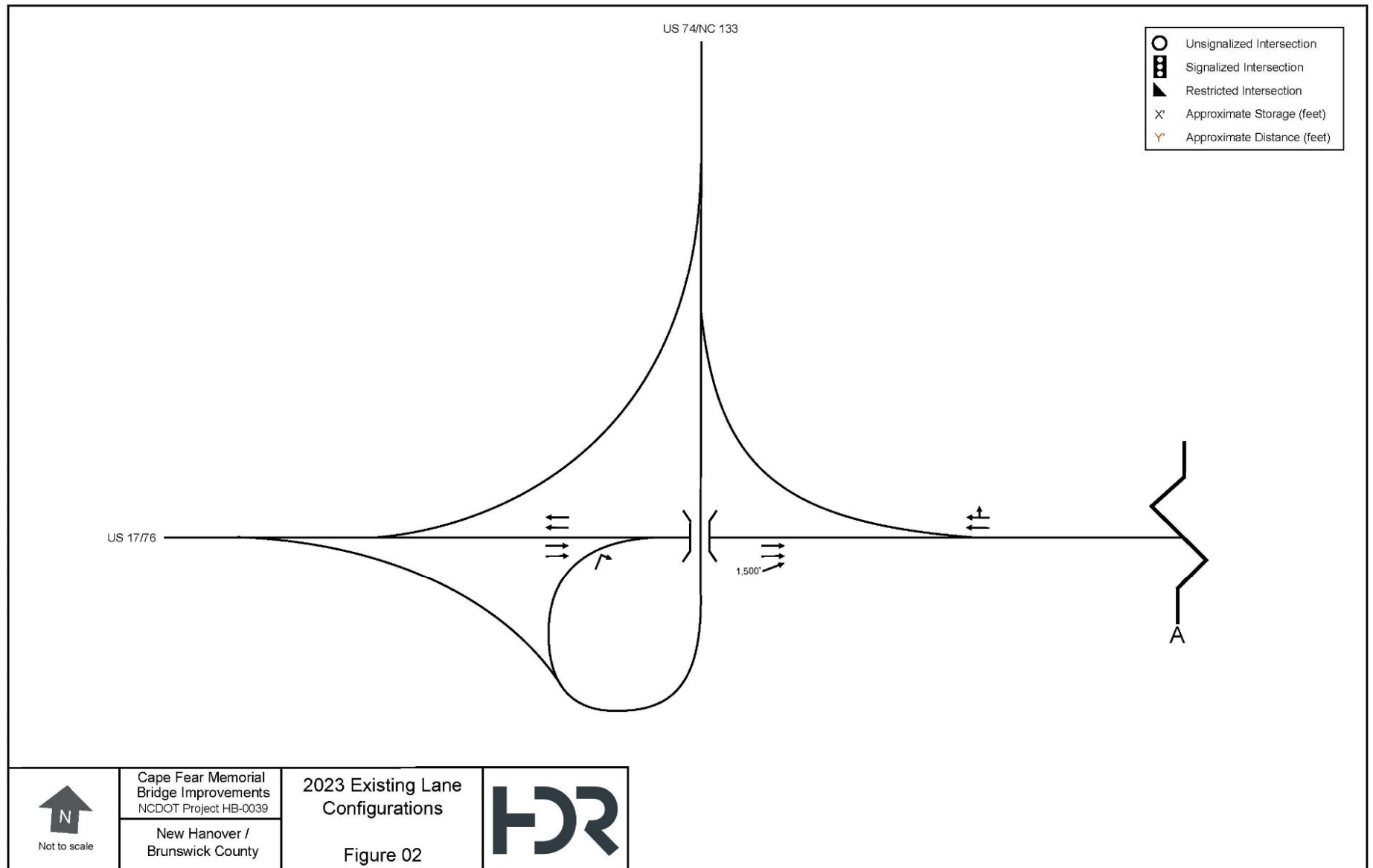
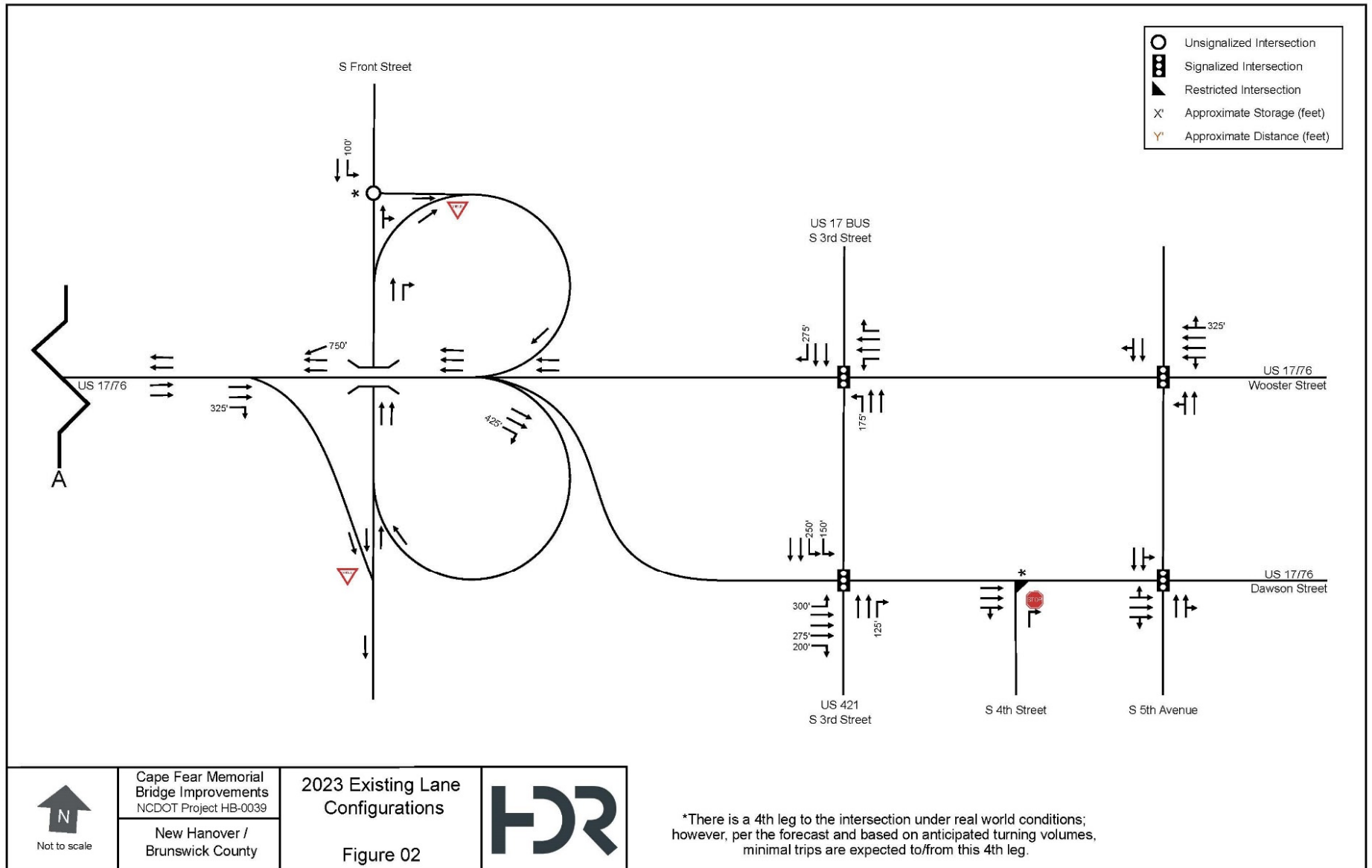


Figure 2: Existing Lane Configurations (cont'd)



7.2 Model Parameters

The base year no-build model uses the Level NCDOT default parameters file for *TransModeler*. Additionally, the model was set to be a one hour model with a 15 minute warm-up (seeding) period for each of the two peak hour time periods. This was done to ensure the model was properly seeded at the start of the runs while also ensuring that the model captured the entirety of the congestion period.

7.3 Intersections

The geometric layout for the intersections was coded based on the aerial photographs of the area. The base timings were coded based on the default guidelines presented in NCDOT Congestion Management Simulation Guidelines. The signal detectors were coded according to the Simulation Guidelines. For all signals in the study area, the minimum green, yellow, and all red timings from the signal control plan were entered into *TransModeler* and then the corridor optimization tool in *TransModeler* was used to replicate the coordinated condition.

As HCM 6 does not include methodology for determining the control delay of yield movements, it was decided in conjunction with NCDOT guidelines that these movements would be included in the signal and modeled with right turn on red allowed at the intersection of Wooster Street and 3rd Street. By modeling the movement in this manner, the control delay can be collected for these movements which will allow for better comparison of scenarios throughout the study.

7.3.1 Signal Optimization

As noted above, the intersections were optimized as coordinated signals where each arterial corridor was optimized separately. Once the signal timings were optimized for the model network, the signal timings were reviewed by the analyst to verify they were operating as expected.

7.4 Volume Data and Vehicle Routing

Traffic demand and vehicle inputs for the model were described in **Section 5**. The turning movement volumes for the 2023 base year analysis can be found in the IAU spreadsheets located in **Appendix B**. The output volumes from the model were compared against the input turning movement volumes to verify that the model is producing the necessary volumes. These checks can be found in **Appendix C**.

7.5 Outputs and Measures of Effectiveness

After running the simulation, the output statistics from the model runs were used to analyze the traffic conditions of the roadway network. Nodes for the delay and queue analysis as well as the links for the spillback queue analysis were defined into selection sets to create the analysis outputs needed. The MOE's used in the analysis are detailed in **Section 4** and are summarized in **Section 7.7**.

7.6 Simulation and Run Controls

The simulation software requires run control parameters be input into the model to help deliver a customized model for the local area which includes the random seed sequence. The random seed sequence varies each run in a multi-run simulation that is usually close to the average of all the runs but is completely different than the rest. After review of a ten-run scenario, it was determined that the default parameters and ten simulation runs recommended by NCDOT's *TransModeler* Guidelines would be sufficient for this project.

7.7 2023 Base Year No-Build Model Results

The output data was collected for the model via the Output Data manager and the Delay, Queue, Queue Spillback, and Freeway LOS reports. The outputs were collected to develop the MOE's described in **Section 4** and are summarized in the following pages.

7.7.1 Network Results

The results for the Network MOE's are summarized in **Table 4**. As described in **Section 4**, the network results were pulled from the Network Delay reports. The total vehicle hours traveled (VHT) was 502.2 hours and 558.8 hours during the AM and PM peak hours, respectively, with an average speed of 40.7 mph and 39.5 mph. The total vehicle miles traveled (VMT) was 19,213.8 miles and 20,418.9 miles during the AM and PM peak hours, respectively.

7.7.2 Corridor Results

The results for the Corridor MOE's are summarized in **Table 5**. In the eastbound direction, the corridor was found to operate with an average travel time of 3.77 minutes and 3.65 minutes in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 40 mph and 41 mph in the AM and PM Peak hours, respectively. In the westbound direction, the corridor was found to operate with an average travel time of 3.52 minutes and 3.76 minutes in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 42 mph and 39 mph in the AM and PM Peak hours, respectively.

7.7.3 Freeway Results

The results for the Freeway MOE's are summarized in **Table 6**. As described in **Section 4**, the freeway results were pulled from the Freeway LOS reports. During the AM peak hour, 2 of the 12 freeway segments experienced LOS_S E with the failing segments being in the eastbound direction along US 17/76/421. During the PM peak hour, 2 of the 12 segments experienced LOS_S E with the failing segments being in the westbound direction along US 17/76/421.

7.7.4 Arterial/Intersection Results

The results for the intersection analysis for intersections within the study area are summarized in **Table 7**. The overall LOS_S for the 4 total signalized intersections in the 2023 Base Year No-Build Analysis shows that all intersections in the AM and PM peak hours operate acceptably overall at a LOS_S D or better.

During the AM peak hour, all of the lane groups at signalized intersections operated acceptably at a LOS_s D or better, except at the intersection of Wooster Street at 3rd Street, which had one lane group operating at LOS_s E. During the PM peak hour, all signalized intersections had at least one lane group operating at a LOS_s E or worse with the exception of Dawson Street at 3rd Street.

Analysis was also done on the one unsignalized intersection along the corridor [Dawson Street and S 4th Street]. After a review of the analysis, it was found that the intersection was anticipated to operate acceptably during both time periods.

A review of the queuing data and model animation found that queuing along the arterials did not substantially affect traffic. It did show that some turn bay storage lengths were not sufficient to contain all turning movement queues during the AM and PM peak hours. This consisted of the following movements:

- Northbound left-turn lane at 3rd Street and Wooster Street
- Southbound left-turn lane at 3rd Street and Dawson Street

Table 4: 2023 No-Build Network Statistics

Time	Vehicle Hours Traveled (VHT)	Vehicle Miles Traveled (VMT)	Average Speed (mph)	Total Delay (hrs)
AM	502.2	19,213.8	40.7	132.2
PM	558.8	20,418.9	39.5	163.6

Table 5: 2023 No-Build Corridor Summary

O D	Description	TRAVEL TIMES (min)		TRAVEL SPEEDS (mph)	
		8:00 9:00	17:00 18:00	8:00 9:00	17:00 18:00
100-106	US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133 to US 17 / 76 (Dawson Street) east of 5th Avenue	3.77	3.65	39.77	41.12
105-100	US 17 / 76 (Wooster Street) east of 5th Avenue to US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133	3.52	3.76	42.06	39.32

Table 6: 2023 No-Build Freeway Segment LOS_s Summary

Order	Street Name	Analysis Type	Location	DENSITY (vplpm)		LOS _s	
				AM	PM	AM	PM
1	US 17 / 74 / 76 / NC 133 EB	Basic	West of US 74 / 421 / NC 133 Off Ramp	19.5	15.4	C	B
2	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp	27.4	21.9	D	C
3	US 17 / 76 / 421 EB	Basic	US 74 / 421 / NC 133 On Ramp	23.0	18.2	C	C
4	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 On Ramp and SB Front Street Off Ramp	41.1	32.3	E	D
5	US 17 / 76 / 421 EB	Diverge	SB Front Street Off Ramp	38.3	30.2	E	D
6	US 17 / 76 EB	Basic	Between SB Front Street Off Ramp and NB Front Street Off Ramp	25.3	21.4	C	C
7	US 17 / 76 EB	Basic	NB Front Street Off Ramp	18.1	16.0	C	B
8	US 17 / 76 / 421 WB	Basic	Front Street On Ramp	18.6	30.3	C	D
9	US 17 / 76 / 421 WB	Basic	Between Front Street On Ramp and US 74 / 421 / NC 133 Off Ramp	26.6	40.4	D	E
10	US 17 / 76 / 421 WB	Diverge	US 74 / 421 / NC 133 Off Ramp	25.8	37.7	C	E
11	US 17 / 76 / 421 WB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp	17.3	27.7	B	D
12	US 17 / 74 / 76 / NC 133 WB	Basic	West of US 74 / 421 / NC 133 On Ramp	18.8	28.1	C	D

**Table 7: 2023 No-Build Intersection LOS_s Summary**

Signalized Intersections													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
				AM	PM	AM	PM	AM		PM		AM	PM
30	US 17 BUS (S 3rd Street), US 421 (S 3rd & US 17 / 76 EB	Overall		23.4	25.7	C	C						
		US 17 BUS (S 3rd Street) SB	L	45.6	50.3	D	D	31.2	0%	53.0	0%	164.0	215.9
		US 17 BUS (S 3rd Street) SB	T	18.5	15.9	B	B	10.5	0%	42.4	0%	164.0	215.9
		US 421 (S 3rd Street) NB	T	24.8	41.1	C	D	96.7	0%	89.2	0%	277.6	354.3
		US 421 (S 3rd Street) NB	R	23.9	26.5	C	C	41.5	0%	31.5	0%	277.6	354.3
		US 17 / 76 EB EB	L	20.9	34.3	C	C	35.5	0%	40.8	0%	360.3	298.6
		US 17 / 76 EB EB	T	22.1	19.5	C	B	79.4	0%	45.4	0%	360.3	298.6
		US 17 / 76 EB EB	R	20.4	19.0	C	B	29.3	0%	28.8	0%	360.3	298.6
40	US 17 / 76 (Wooster Street), US 17 BUS (& US 76 WB-421 NB-17 BUS SB	Overall		23.3	29.2	C	C						
		US 17 BUS (S 3rd Street) SB	T	39.6	41.5	D	D	69.9	0%	117.0	0%	257.9	346.1
		US 17 BUS (S 3rd Street) SB	R	17.7	31.9	B	C	13.8	0%	60.6	0%	257.9	346.1
		US 17 / 76 (Wooster Street) WB	L	13.6	17.8	B	B	14.6	0%	28.8	0%	360.4	426.6
		US 17 / 76 (Wooster Street) WB	T	17.3	24.2	B	C	44.8	0%	92.7	0%	360.4	426.6
		US 17 / 76 (Wooster Street) WB	R	15.4	17.2	B	B	26.0	0%	31.9	0%	360.4	426.6
		US 17 BUS (S 3rd Street) NB	L	63.7	67.4	E	E	144.1	3%	148.1	12%	357.2	608.2
		US 17 BUS (S 3rd Street) NB	T	14.2	19.4	B	B	18.2	0%	39.4	0%	357.2	608.2
60	US 17 / 76 (Dawson Street) & S 5th Avenue	Overall		4.6	8.1	A	A						
		S 5th Avenue SB	LT	37.2	56.7	D	E	12.9	0%	33.1	0%	84.9	119.3
		S 5th Avenue SB	T	34.2	38.5	C	D	5.6	0%	11.8	0%	84.9	119.3
		S 5th Avenue NB	T	38.8	42.2	D	D	8.4	0%	10.9	0%	83.2	84.0
		S 5th Avenue NB	TR	37.6	39.1	D	D	10.2	0%	12.6	0%	83.2	84.0
		US 17 / 76 (Dawson Street) EB	LT	2.1	3.0	A	A	3.3	0%	1.5	0%	0.0	234.3
		US 17 / 76 (Dawson Street) EB	T	1.7	2.4	A	A	2.9	0%	1.2	0%	0.0	234.3
		US 17 / 76 (Dawson Street) EB	TR	1.5	2.3	A	A	2.4	0%	1.2	0%	0.0	234.3
70	US 17 / 76 (Wooster Street) & S 5th Avenue	Overall		7.5	9.8	A	A						
		S 5th Avenue SB	T	38.7	42.5	D	D	14.0	0%	28.2	0%	85.4	115.5
		S 5th Avenue SB	TR	37.7	44.5	D	D	15.0	0%	27.1	0%	85.4	115.5
		US 17 / 76 (Wooster Street) WB	LT	3.7	4.7	A	A	0.3	0%	7.3	0%	119.7	186.9
		US 17 / 76 (Wooster Street) WB	T	5.1	5.3	A	A	2.4	0%	18.3	0%	119.7	186.9
		US 17 / 76 (Wooster Street) WB	TR	3.2	4.3	A	A	0.8	0%	6.9	0%	119.7	186.9
		S 5th Avenue NB	LT	39.1	57.3	D	E	10.7	0%	20.0	0%	79.2	121.3
		S 5th Avenue NB	T	30.6	44.5	C	D	6.5	0%	13.8	0%	79.2	121.3
Unsignalized Intersections ³													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
				AM	PM	AM	PM	AM		PM		AM	PM
50	US 17 / 76 (Dawson Street) & S 4th Street	S 4th Street NB	R	13.2	13.5	B	B	0.4	0%	0.3	0%	14.4	8.3
		US 17 / 76 (Dawson Street) EB	T	1.0	0.7	A	A	0.0	0%	0.0	0%	0.0	0.0
		US 17 / 76 (Dawson Street) EB	TR	0.6	0.4	A	A	0.0	0%	0.0	0%	0.0	0.0

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay

8. 2050 Future-Year No-Build Analysis

8.1 Model Parameters

All driver behaviors and parameters used in the 2023 Existing Year No-Build analysis were utilized in the future year analysis.

8.2 Design Assumptions and Model Network

The model network was revised along Front Street to the south of the interchange with US 17/76/421 to match the proposed conditions for U-5734. U-5734 proposes to improve Front Street to a 4-lane roadway from US 421 (Burnett Boulevard) to the interchange with US 17/76/421. No additional design assumptions beyond those assumed in the base year analysis were used in the future year analysis. The 2050 Future-Year No-Build lane configurations used in the model can be seen in **Figure 3**.

8.3 Volume Data

The volume data development was described in **Section 5** and is based on the turning movement volumes shown in the IAU spreadsheets located in **Appendix B**. Vehicle loading utilized an O-D Matrix based routing and were loaded onto the network based on NCDOT Congestion Management Simulation Guidelines.

8.4 Signal Timings and Operations

No changes to base signal timing inputs were made from the base year analysis. The signals were re-optimized in accordance with the methodology used in the base year analysis and described in **Section 7.3.1**.

8.5 Measures of Effectiveness

The MOE's pulled for the 2050 Future Year No-Build model were the same MOE's extracted from the 2023 Base Year No-Build Model. The MOE's used are described in **Section 4**.

8.6 Simulation Run Control

The simulation run controls were identical to those used in the 2023 Base Year No-Build Model. The simulation run controls for the base year model can be found in **Section 7.6**.

Figure 3: 2050 No-Build Lane Configurations

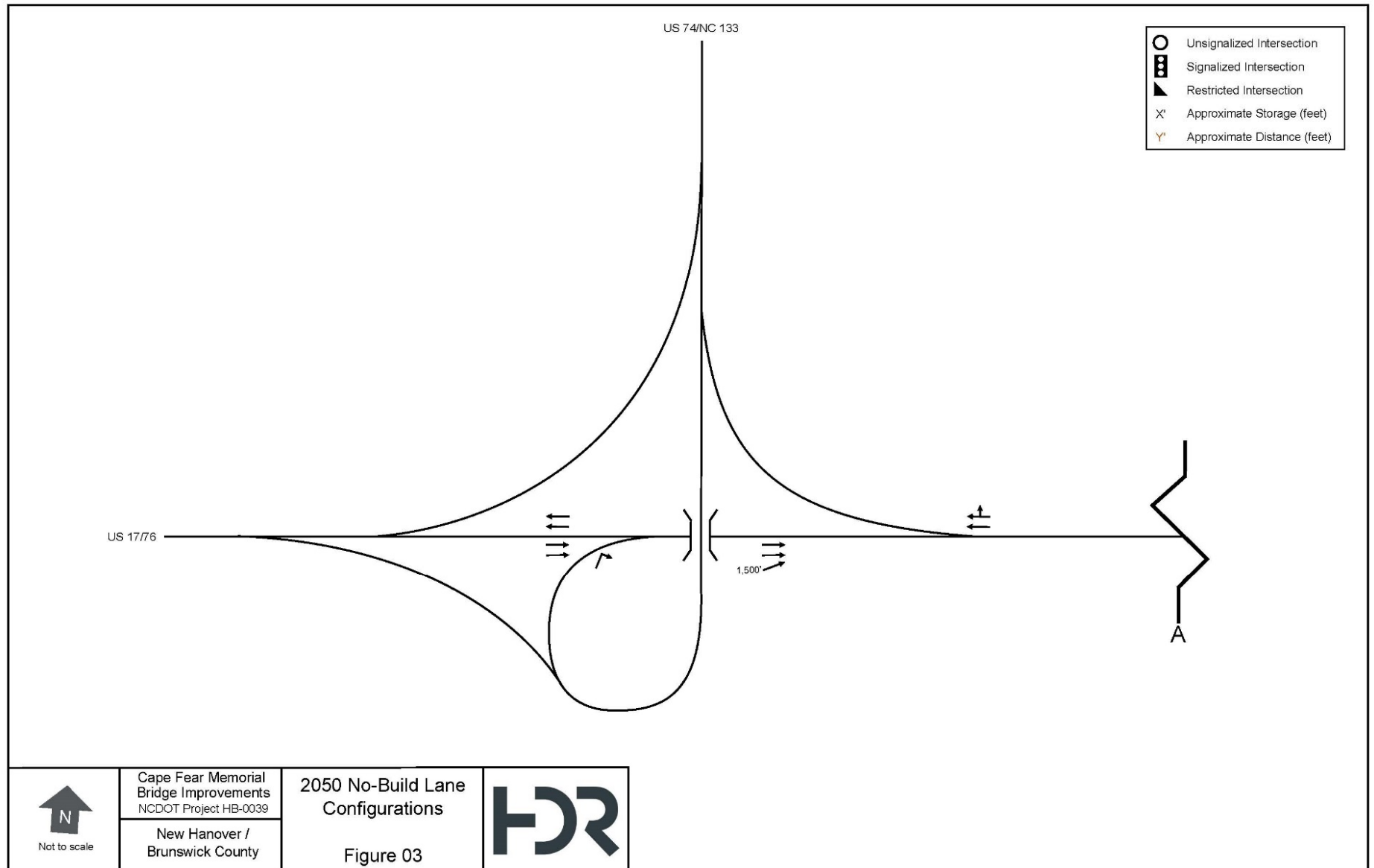
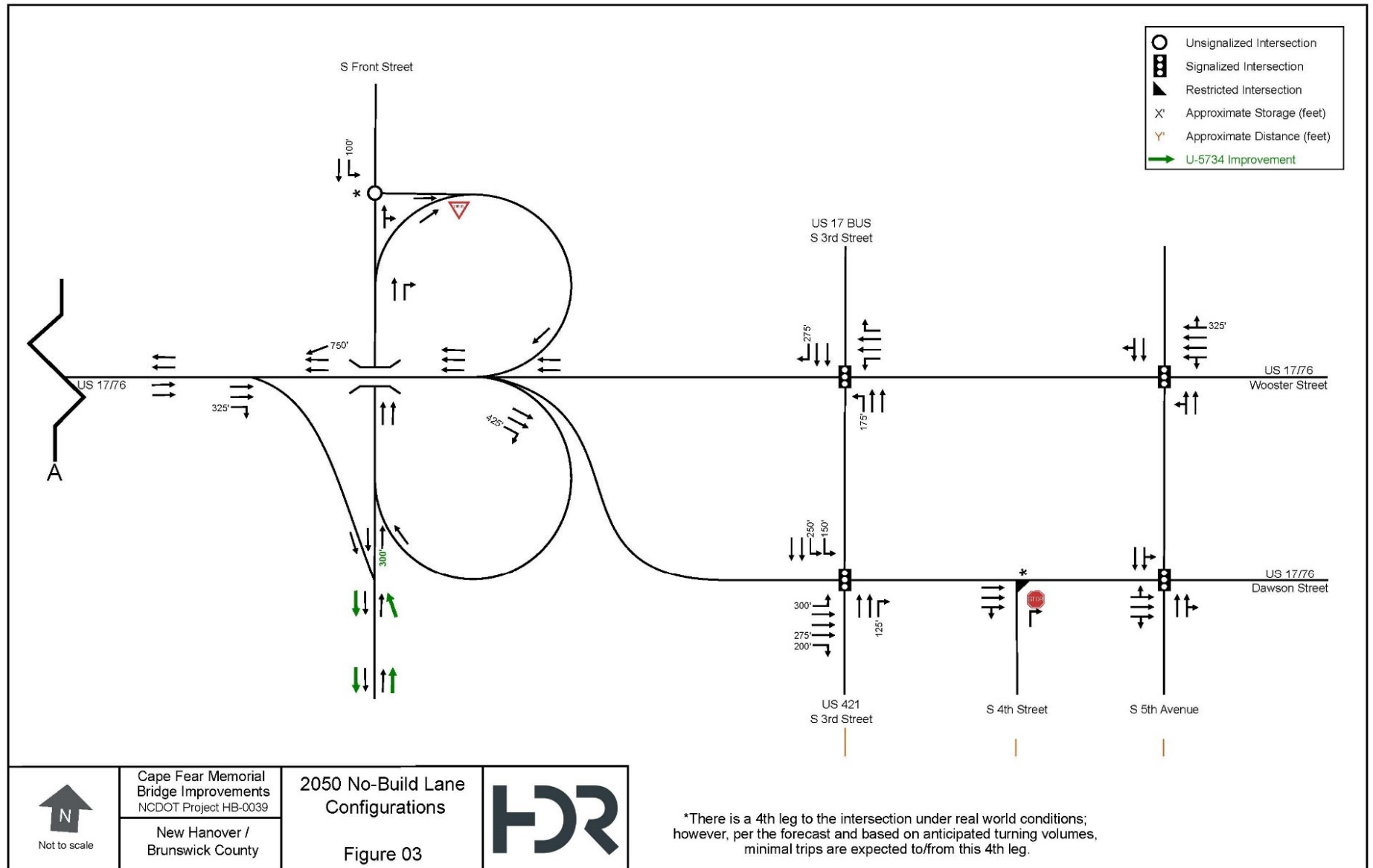


Figure 3: 2050 No-Build Lane Configurations (cont'd)



8.7 2050 Future-Year No-Build Model Results

The output data was collected for the model via the Output Data manager and the Delay, Queue, Queue Spillback, and Freeway LOS reports. The outputs were collected to develop the MOE's described in **Section 4** and are summarized in the following pages.

8.7.1 Network Results

The results for the Network MOE's are summarized in **Table 8**. As described in **Section 4**, the network results were pulled from the Network Delay reports. The VHT was 984.4 hours and 1291.0 hours during the AM and PM peak hours, respectively, with an average speed of 30.7 mph and 30.1 mph. The total vehicle miles traveled (VMT) was 24,288.2 miles and 25,984.7 miles during the AM and PM peak hours, respectively.

8.7.4 Corridor Results

The results for the Corridor MOE's are summarized in **Table 9**. In the eastbound direction, the corridor was found to operate with an average travel time of 7.98 minutes and 5.32 minutes in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 22 mph and 30 mph in the AM and PM peak hours, respectively. In the westbound direction, the corridor was found to operate with an average travel time of 4.19 minutes and 5.33 minutes in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 36 mph and 30 mph in the AM and PM peak hours, respectively.

8.7.2 Freeway Results

The results for the Freeway MOE's are summarized in **Table 10**. As described in **Section 4**, the freeway results were pulled from the Freeway LOS reports. During the AM peak hour, 7 of the 12 freeway segments experienced LOS_S E or worse. This consists of all eastbound sections along US 17/76/421 EB from the western edge to the Off Ramp to SB Front Street and along US 17/76/421 WB over the Cape Fear River. During the PM peak hour, 10 of the 12 segments operate at a failing condition, which consists of all segments along US 17/76/421 EB and the US 17/76/421 WB segments from the Front Street On Ramp to the US 74/421/NC 133 Off Ramp.

8.7.3 Arterial/Intersection Results

The results for the intersection analysis for intersections within the study area are summarized in **Table 11**. The overall LOS_S for the 4 total signalized intersections in the 2050 Base Year No-Build Analysis shows that only the intersection of Dawson Street at 5th Avenue is anticipated to operate acceptably at a LOS_S D or better in the AM and PM peak hours. All other intersections are expected to operate at an overall LOS_S E or LOS_S F during at least one of the peak hours. Based on a review of the intersection analysis, all intersections had at least one lane group that was found to operate at LOS_S E or LOS_S F during one of the peak hours.

Analysis was also completed on the one unsignalized intersection along the corridor [Dawson Street and S 4th Street]. After a review of the analysis, it was found that the intersection was anticipated to operate acceptably during the AM and PM peak hours.

A review of the queuing data and model animation found that queuing is expected to impact the freeway and surrounding arterials. Queuing along Front Street was observed to queue outside of the study network during the AM and PM peak hours due to the loop ramp being over capacity. It also showed that some turn bay storage lengths were not sufficient to contain all turning movement queues during the AM and PM peak hours. This consisted of the following movements:

- Northbound left-turn lane at US 17 BUS (S 3rd Street) and US 17/76 (Wooster Street)
- Northbound right-turn lane at US 17 BUS (S 3rd Street) and US 17/76 (Dawson Street)
- Southbound left-turn lane at US 17 BUS (S 3rd Street) and US 17/76 (Dawson Street)

Based on the heavy volumes and heavy queues along S 3rd Street, queueing was noted to extend beyond the study network in both the northbound and southbound directions. This queueing on S 3rd Street was shown to impact queuing and delays along Wooster Street and onto eastbound US 17/76/421, causing queues to spillback along the freeway.

Table 8: 2050 No-Build Network Statistics

Time	Vehicle Hours Traveled (VHT)	Vehicle Miles Traveled (VMT)	Average Speed (mph)	Total Delay (hrs)
AM	984.4	24,288.0	30.7	518.3
PM	1,291.0	25,984.7	30.1	796.6

Table 9: 2050 No-Build Corridor Summary

O D	Description	TRAVEL TIMES (min)		TRAVEL SPEEDS (mph)	
		8:00 9:00	17:00 18:00	8:00 9:00	17:00 18:00
100-106	US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133 to US 17 / 76 (Dawson Street) east of 5th Avenue	7.98	5.32	22.48	30.13
105-100	US 17 / 76 (Wooster Street) east of 5th Avenue to US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133	4.19	5.33	35.88	29.83

Table 10: 2050 No-Build Freeway Segment LOS_s Summary

Order	Street Name	Analysis Type	Location	DENSITY (vplpm)		LOS _s	
				AM	PM	AM	PM
1	US 17 / 74 / 76 / NC 133 EB	Basic	West of US 74 / 421 / NC 133 Off Ramp	60.9	38.9	F	E
2	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp	80.8	59.3	F	F
3	US 17 / 76 / 421 EB	Basic	US 74 / 421 / NC 133 On Ramp	75.3	56.8	F	F
4	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 On Ramp and SB Front Street Off Ramp	73.3	67.3	F	F
5	US 17 / 76 / 421 EB	Diverge	SB Front Street Off Ramp	58.2	58.9	F	F
6	US 17 / 76 EB	Basic	Between SB Front Street Off Ramp and NB Front Street Off Ramp	30.9	95.0	D	F
7	US 17 / 76 EB	Basic	NB Front Street Off Ramp	29.5	66.1	D	F
8	US 17 / 76 / 421 WB	Basic	Front Street On Ramp	26.8	42.9	D	E
9	US 17 / 76 / 421 WB	Basic	Between Front Street On Ramp and US 74 / 421 / NC 133 Off Ramp	40.0	47.8	E	F
10	US 17 / 76 / 421 WB	Diverge	US 74 / 421 / NC 133 Off Ramp	36.2	45.4	E	F
11	US 17 / 76 / 421 WB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp	24.7	32.8	C	D
12	US 17 / 74 / 76 / NC 133 WB	Basic	West of US 74 / 421 / NC 133 On Ramp	24.9	34.5	C	D

**Table 11: 2050 No-Build Intersection LOS_s Summary**

Signalized Intersections													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
			AM	PM	AM	PM	AM		PM		AM	PM	
30	US 17 BUS (S 3rd Street), US 421 (S 3rd & US 17 / 76 EB	Overall		58.5	105.7	E	F						
		US 17 BUS (S 3rd Street) SB	L	39.5	39.8	D	D	36.9	0%	27.0	0%	254.8	396.5
		US 17 BUS (S 3rd Street) SB	T	18.6	16.2	B	B	30.0	0%	28.6	0%	254.8	396.5
		US 421 (S 3rd Street) NB	T	143.4	319.2	F	F	539.1	6%	763.0	12%	1610.6	1648.8
		US 421 (S 3rd Street) NB	R	113.0	228.5	F	F	170.5	1%	316.3	6%	1610.6	1648.8
		US 17 / 76 EB EB	L	45.9	88.9	D	F	131.7	0%	111.1	0%	549.1	1131.9
		US 17 / 76 EB EB	T	29.1	73.2	C	E	120.6	0%	172.0	0%	549.1	1131.9
		US 17 / 76 EB EB	R	27.0	70.9	C	E	51.8	0%	119.3	0%	549.1	1131.9
40	US 17 / 76 (Wooster Street), US 17 BUS (& US 76 WB-421 NB-17 BUS SB	Overall		55.1	98.5	E	F						
		US 17 BUS (S 3rd Street) SB	T	171.8	356.0	F	F	512.8	0%	1097.7	17%	1057.1	1700.9
		US 17 BUS (S 3rd Street) SB	R	108.6	364.2	F	F	250.0	0%	838.8	30%	1057.1	1700.9
		US 17 / 76 (Wooster Street) WB	L	21.9	25.2	C	C	26.5	0%	57.4	0%	1030.2	2271.5
		US 17 / 76 (Wooster Street) WB	T	52.6	48.1	D	D	126.9	0%	219.8	6%	1030.2	2271.5
		US 17 / 76 (Wooster Street) WB	R	24.8	21.4	C	C	40.2	0%	54.4	0%	1030.2	2271.5
		US 17 BUS (S 3rd Street) NB	L	52.9	45.8	D	D	182.6	9%	114.9	12%	673.3	898.3
		US 17 BUS (S 3rd Street) NB	T	16.8	16.1	B	B	102.0	1%	44.2	1%	673.3	898.3
60	US 17 / 76 (Dawson Street) & S 5th Avenue	Overall		7.3	12.9	A	B						
		S 5th Avenue SB	LT	51.7	67.7	D	E	27.0	0%	57.3	0%	93.4	338.4
		S 5th Avenue SB	T	34.7	29.2	C	C	10.3	0%	26.7	0%	93.4	338.4
		S 5th Avenue NB	T	36.4	43.8	D	D	12.6	0%	28.3	0%	127.6	180.1
		S 5th Avenue NB	TR	36.0	41.3	D	D	21.7	0%	38.5	0%	127.6	180.1
		US 17 / 76 (Dawson Street) EB	LT	1.8	4.7	A	A	3.8	0%	9.7	0%	134.3	27.3
		US 17 / 76 (Dawson Street) EB	T	2.0	4.6	A	A	4.0	0%	8.4	0%	134.3	27.3
		US 17 / 76 (Dawson Street) EB	TR	2.1	4.6	A	A	4.7	0%	9.6	0%	134.3	27.3
70	US 17 / 76 (Wooster Street) & S 5th Avenue	Overall		15.9	73.6	B	E						
		S 5th Avenue SB	T	35.1	40.9	D	D	23.0	0%	46.2	0%	150.0	165.2
		S 5th Avenue SB	TR	35.0	41.5	D	D	28.3	0%	53.1	0%	150.0	165.2
		US 17 / 76 (Wooster Street) WB	LT	5.8	81.4	A	F	22.5	0%	164.6	1%	296.2	1682.2
		US 17 / 76 (Wooster Street) WB	T	16.5	85.8	B	F	73.6	0%	434.8	6%	296.2	1682.2
		US 17 / 76 (Wooster Street) WB	TR	5.9	59.1	A	E	25.4	0%	31.1	0%	296.2	1682.2
		S 5th Avenue NB	LT	68.6	141.6	E	F	35.8	0%	67.5	0%	143.1	178.4
		S 5th Avenue NB	T	40.4	62.3	D	E	23.2	0%	40.0	0%	143.1	178.4

Unsignalized Intersections ³													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
			AM	PM	AM	PM	AM		PM		AM	PM	
50	US 17 / 76 (Dawson Street) & S 4th Street	S 4th Street NB	R	24.6	20.2	C	C	0.4	0%	0.5	0%	13.6	13.6
		US 17 / 76 (Dawson Street) EB	T	0.3	1.9	A	A	0.0	0%	0.3	0%	0.0	0.0
		US 17 / 76 (Dawson Street) EB	TR	0.2	2.6	A	A	0.0	0%	0.0	0%	0.0	0.0

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay

9. 2050 Future-Year Build Alternative A / Alternative B Analysis

9.1 Model Parameters

All driver behaviors and parameters used in the 2050 Future Year No-Build analysis were utilized in the future year analysis.

9.2 Alternative Designs

The 2050 Build Alternative A scenario includes the following improvements from the 2050 Future Year No-Build network:

- Widening US 17/76/421 to 6 lanes from US 74/421/NC 133 to Front Street. The new Cape Fear Memorial Bridge is anticipated to be constructed to the south of its current location with a 65-foot clearance.
- Widening of Front Street to 4 lanes from US 17/76/421 to the connection with U-5734.
- The loop ramp from US 17/76/421 EB to NB Front Street was realigned to become a stop-controlled intersection. This realignment eliminated the existing weave condition while maintaining access to the north.
- Widen the US 17/76/421 WB On Ramp from Front Street from one lane to two lanes with one of the lanes being used as an add lane condition for US 17/76/421 WB.
- Upgrade Front Street at US 17/76/421 WB On Ramp to a traffic signal with the removal of access to Queen Street.
- Improve the northbound approach to Front Street at US 17/76/421 WB On Ramp to one thru lane with dual right turn lanes.

The 2050 Build Alternative B scenario the following improvements from the 2050 Future Year No-Build network:

- Widening US 17/76/421 to 6 lanes from US 74/421/NC 133 to Front Street and removing access at 3rd Street and 4th Street. The removal of access to 3rd Street and 4th Street was due to limitations in the roadway geometry as the bridge is anticipated to be constructed with a clearance of 135 feet versus the 65-foot clearance in Alternative A.
- Widen the US 17/76/421 WB On Ramp from Front Street from one lane to two lanes with one of the lanes being used as an add lane condition for US 17/76/421 WB.
- Remove the loop ramp from US 17/76/421 EB to Front Street NB due to geometric constraints.
- Realign the US 17/76/421 EB Off Ramp to Front Street into a loop configuration that follows the alignment of Queen Street and tie into Front Street at the existing intersection of Front Street at US 17/76/421 WB On Ramp.
- Improve the intersection of Front Street at US 17/76/421 WB On Ramp to a roundabout with a single northbound right turn bypass lane and dual bypass right turn lanes for the eastbound right turn.

- Reduce southbound Front Street to a single lane approach at the intersection of Front Street and US 17/76/421.
- Improve Front Street from the intersection of Front Street at US 17/76/421 WB On ramp to the U-5734 project limits to 4 lanes with a southbound acceleration lane exiting the roundabout for approximately 775 before merging.
- Add a 150' turn lane for the northbound left turn from 5th Avenue onto westbound Wooster Street.
- Add A 150' turn lane for the southbound left turn lane from 5th Avenue onto eastbound Dawson Street.

Proposed concepts can be found in **Appendix D**. The 2050 Build Alternative A lane configurations used in the model can be seen in **Figure 4** and the 2050 Build Alternative B lane configurations used in the model can be seen in **Figure 5**.

Figure 4: 2050 Build Alternative A Lane Configurations

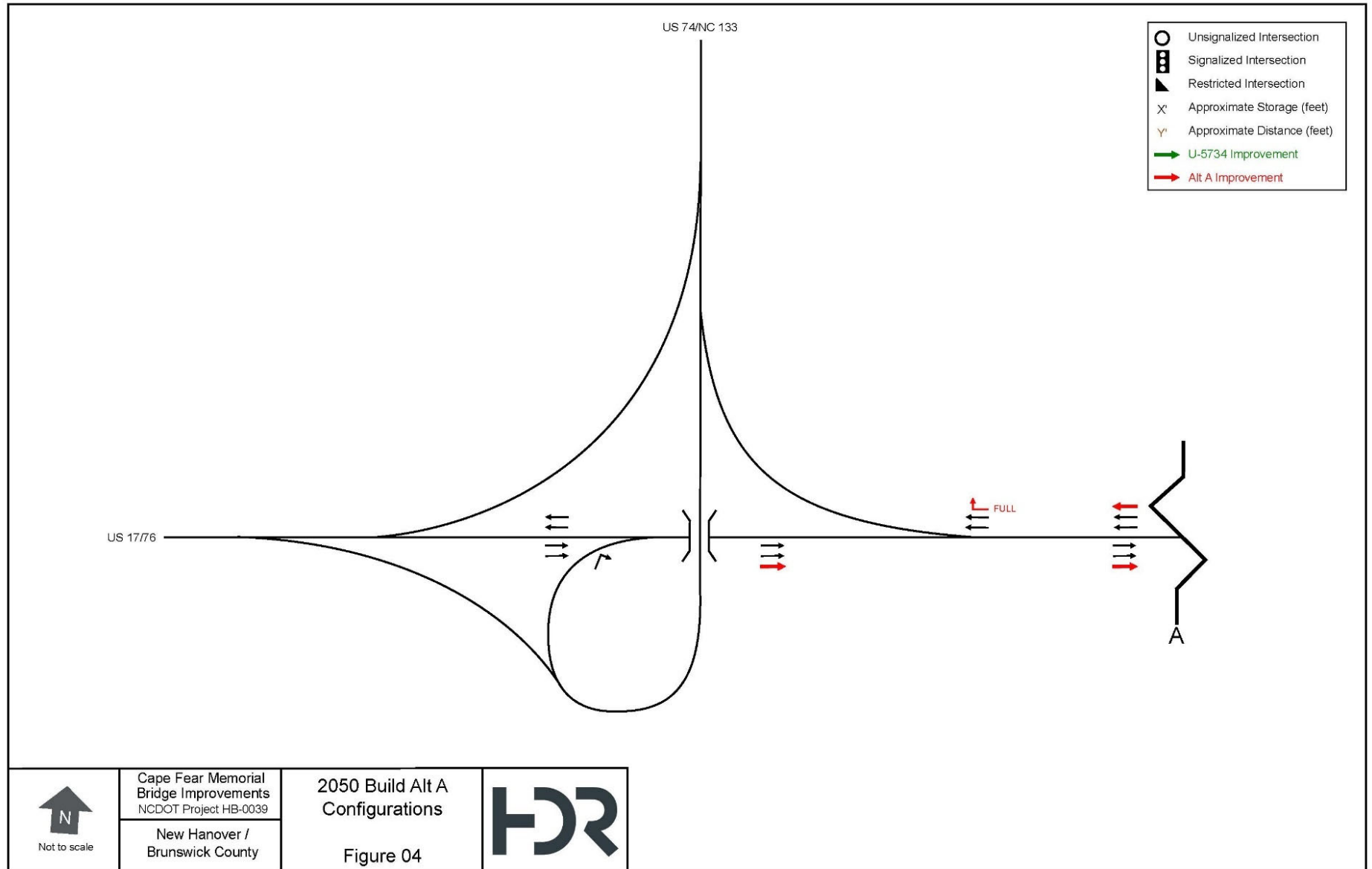


Figure 4: 2050 Build Alternative A Lane Configurations

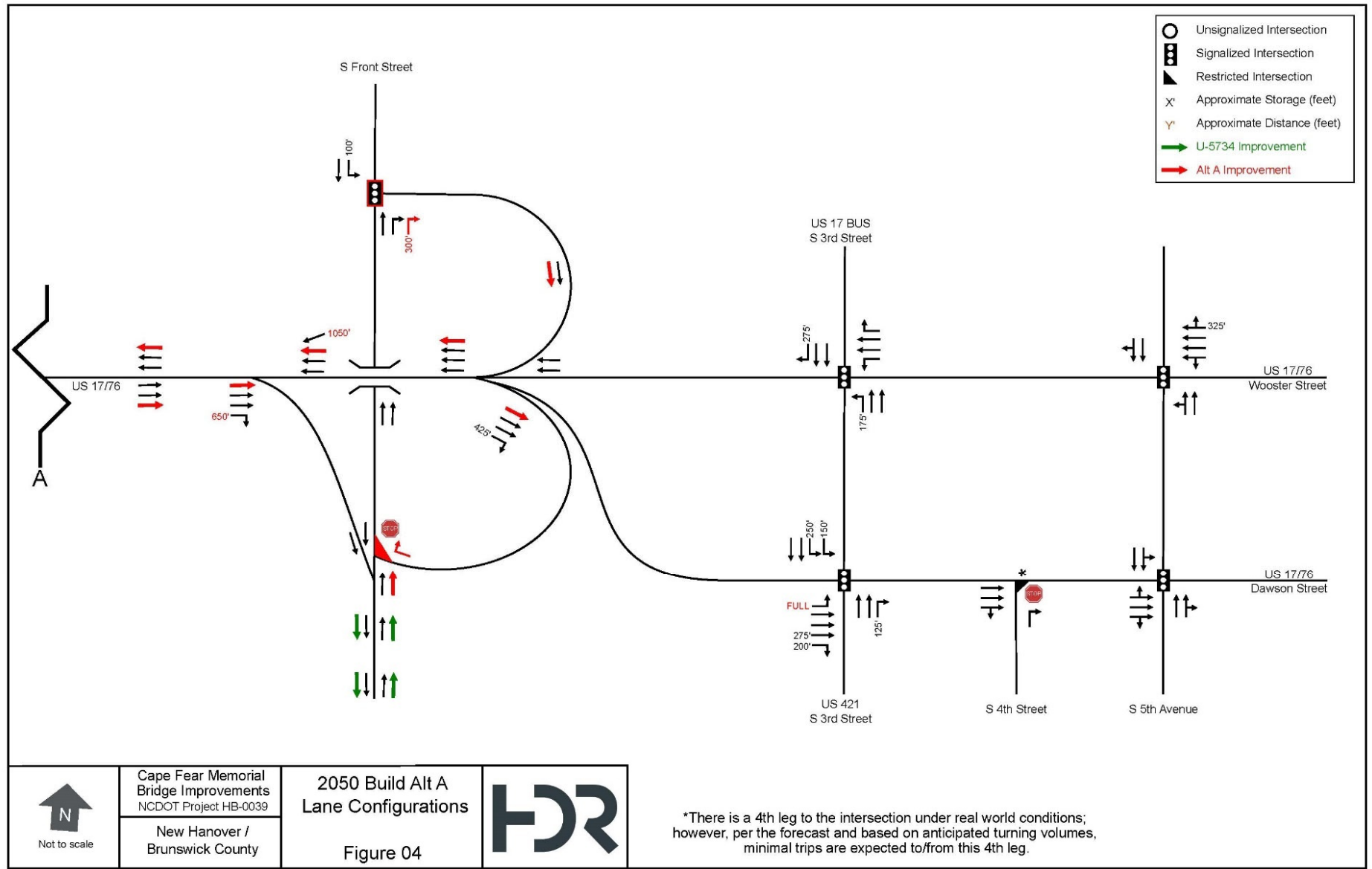


Figure 5: 2050 Build Alternative B Lane Configurations

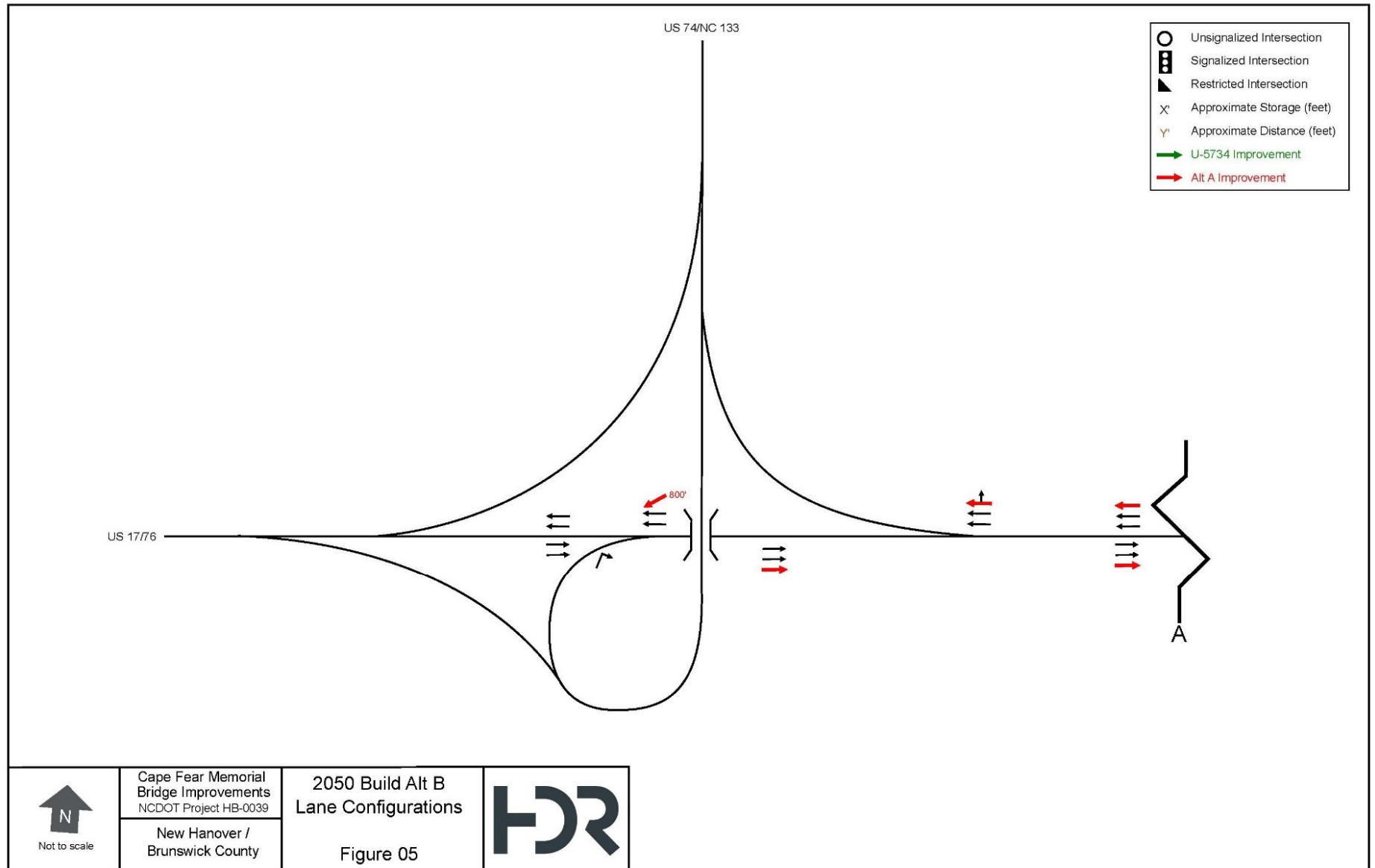
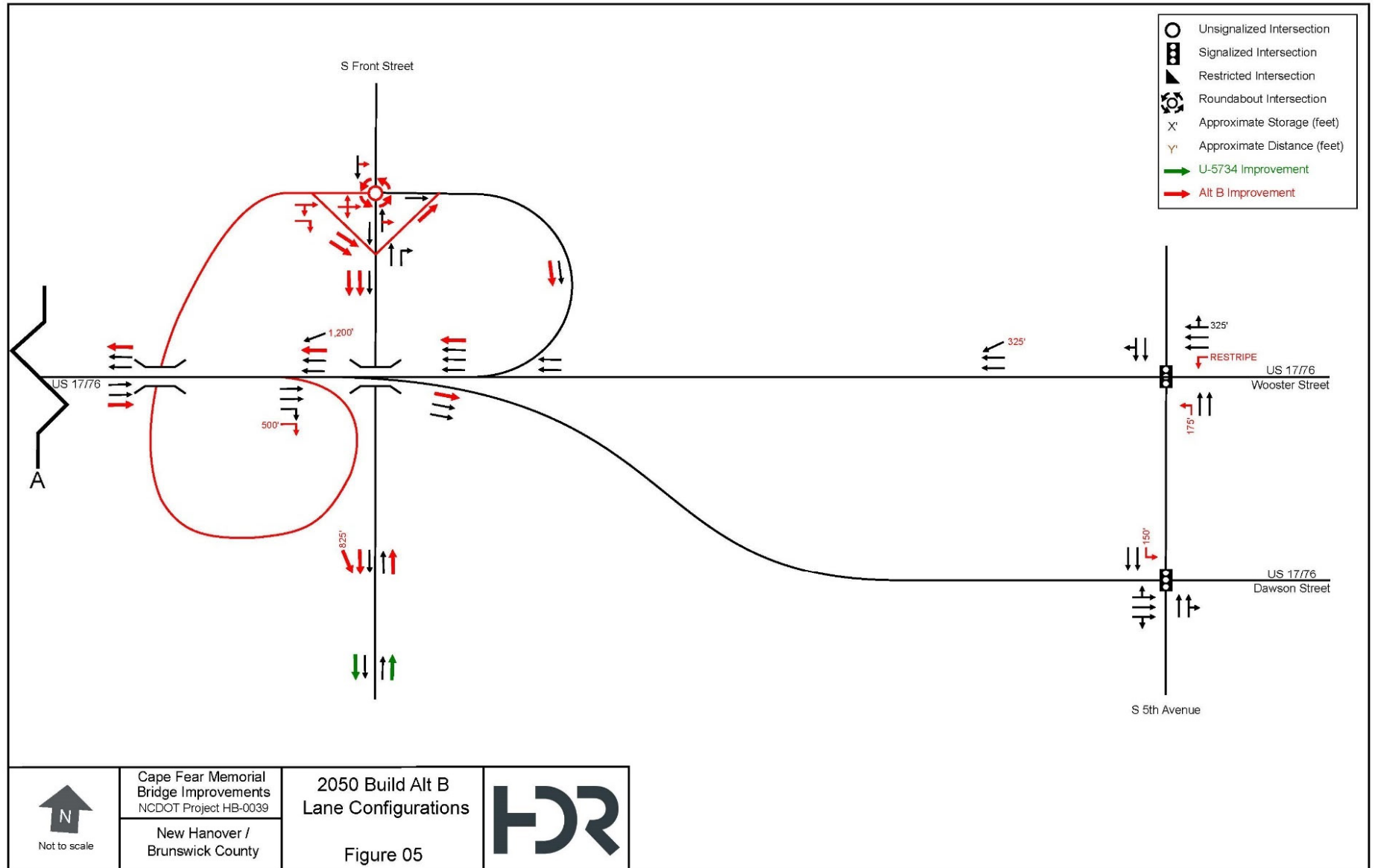


Figure 5: 2050 Build Alternative B Lane Configurations (cont'd)



9.3 Volume Data

The volume data development was described in **Section 5** and is based on the turning movement volumes can be found in the IAU spreadsheets located in **Appendix B**. The O-D Matrix for Alternative A utilized the O-D Matrix from the 2050 Future Year No-Build. The O-D Matrix for Alternative B was developed utilizing the methodology described in **Section 5** as the proposed condition resulted in differing vehicle routing as was proposed in Alternative A. Vehicles were loaded onto the network based on NCDOT Congestion Management Simulation Guidelines.

9.4 Signal Timings and Operations

The base signal timing inputs from the 2023 No-Build Analysis were utilized in the Build Alternative A model. The signals were re-optimized in accordance with the methodology used in the base year and future year analysis and described in **Section 7.3.1**. Alternative A included a new proposed signalized intersection at Front Street and US 17/76/421 WB On Ramp. This location was optimized as an isolated intersection in accordance with NCDOT Congestion Management Simulation Guidelines. It should also be noted that Build Alternative B includes the removal of 3rd Street from the model as the location is now anticipated to be an overpass which removes the signalized intersections of 3rd Street at Dawson Street and 3rd Street at Wooster Street.

In Alternative B, the westbound right turn from US 17/76/421 EB Off Ramp to NB Front Street was restricted to the right lane only as the model produced unrealistic delays and queues due to merging that was occurring along NB Front Street. In reviewing the simulation, vehicles were able to utilize the right lane and merge over to complete the through move that was desired without impacts to Front Street operations.

9.5 Measures of Effectiveness

The MOE's pulled for the 2050 Future Year No-Build model were the same MOE's extracted from the 2050 Future Year No-Build Model. The MOE's used are described in **Section 4**.

9.6 Simulation Run Control

The simulation run controls were identical to those used in the 2050 Future Year No-Build Model. The simulation run controls for the base year model can be found in **Section 7.6**.

9.7 2050 Future-Year Build Alternative A Model Results

The output data was collected for the model via the Output Data manager and the Trip Statistics, Delay, Queue, Queue Spillback, and Freeway LOS reports. The outputs were collected to develop the MOE's described in **Section 4** and are summarized in the following pages.

9.7.1 Network Results

The results for the Network MOE's are summarized in **Table 12**. As described in **Section 4**, the network results were pulled from the Network Delay reports. The total VHT was 813.5 hours and 1,050.6 hours during the AM and PM peak hours, respectively, with an average speed of 36.3 mph and 35.1 mph. The total vehicle miles traveled (VMT) was 26,060.6 miles and 27,796.0 miles during the AM and PM peak hours, respectively. Each of these metrics indicate an improvement over the 2050 Future Year No-Build and show that the proposed alternative is processing vehicles more efficiently throughout the network.

9.7.2 Corridor Results

The results for the Corridor MOE's are summarized in **Table 13**. In the eastbound direction, the corridor was found to operate with an average travel time of 4.98 minutes and 4.52 minutes in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 32 mph and 34 mph in the AM and PM peak hours, respectively. In the westbound direction, the corridor was found to operate with an average travel time of 4.16 minutes and 5.50 minutes in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 36 mph and 29 mph in the AM and PM peak hours, respectively. In general, travel time and speeds in both directions saw an improvement along the corridor. The PM peak hour remained relatively consistent in the westbound direction for this alternative as there were minimal changes proposed in this project that allow for improvement to occur as most of the delays were found to be at the signals.

9.7.3 Freeway Results

The results for the Freeway MOE's are summarized in **Table 14**. During the AM peak, 6 of the 11 freeway segments experienced LOS_s E or worse. This consists of all eastbound sections along US 17/76/421 EB with the exception of the westernmost segment. During the PM peak hour, 6 of the 11 segments operating at a failing condition. US 17/76/421 EB was found to experience failing PM conditions from the SB Front Street off Ramp to the NB Front Street Off Ramp while US 17/76/421 WB had LOS_s E operations from west of the Front Street On Ramp to the western edge of the model. When compared to the No-Build, traffic densities along the corridor were found to be reduced which indicates that traffic is experiencing less congestion due to the proposed improvements. The failing segments included in the analysis were found to be due to capacity restrictions located outside of the intended scope of the project including at the intersections with 3rd Street and the interchange with US 74/421/NC 133.

9.7.4 Arterial/Intersection Results

The results for the intersection analysis for intersections within the study area are summarized in **Table 15**. The overall LOS_s for the 5 total signalized intersections in the 2050 Future Year Build Alternative A analysis shows that 2 intersections operate unacceptably at a LOS_s E or worse in the AM peak hour and 3 intersections operate unacceptably in the PM peak hour. The new signalized intersection of US 17/76/421 WB On Ramp and Front Street was found to operate at acceptably at LOS_s A in the AM Peak hour and LOS_s B in the PM peak hour. The following intersections were found to operate at LOS_s E or LOS_s F in at least one peak hour:

- US 17 BUS (S 3rd Street) and US 17/76 EB
- US 17/76 (Wooster Street) and US 17 BUS (S 3rd Street)
- US 17/76 (Wooster Street) and S 5th Avenue

Analysis was also completed on the two unsignalized intersection along the corridor [Dawson Street at S 4th Street and US 17/76/421 EB Off Ramp at NB Front Street]. After a review of the analysis, it was found that the northbound right turn at 4th Street was anticipated to reach LOS_E during the AM peak hour. All other movements at both intersections were found to operate acceptably during the AM and PM peak hours. As the scope of the project is a bridge replacement project, capacity improvements to reduce delays along US 17/76 (Dawson Street) and US 17/76 (Wooster Street) were limited to minimize impacts within the study area.

A review of the queuing data and model animation found that queuing is expected to impact the freeway and surrounding arterials. It showed that some turn bay storage lengths were not sufficient to contain all turning movement queues during the AM and PM peak hours. This consisted of the following movements:

- Northbound left-turn lane at 3rd Street and Wooster Street
- Northbound right-turn lane at 3rd Street and Dawson Street
- Southbound left-turn lane at 3rd Street and Dawson Street

Based on the heavy volumes and heavy queues along 3rd Street, queueing was noted to extend beyond the study network in both the northbound and southbound directions. This queueing on 3rd Street was shown to impact queueing and delays along Wooster Street as well as along the eastbound US 17/76/421 causing queues to spillback along the freeway.

9.8 2050 Future-Year Build Alternative B Model Results

The output data was collected for the model via the Output Data manager and the Delay, Queue, Queue Spillback, and Multilane Highway LOS reports. The outputs were collected to develop the MOE's described in Section 4 and are summarized in the following pages.

9.8.1 Network Results

The results for the Network MOE's are summarized in **Table 16**. As described in **Section 4**, the network results were pulled from the Network Delay reports. The total VHT was 737.9 hours and 945.3 hours during the AM and PM peak hours, respectively, with an average speed of 39.0 mph and 35.6 mph. The total vehicle miles traveled (VMT) was 26,688.3 miles and 28,309.7 miles during the AM and PM peak hours, respectively. Each of these metrics indicate an improvement over the 2050 Future Year No-Build and show that the proposed alternative is processing vehicles more efficiently throughout the network.

9.8.2 Corridor Results

The results for the Corridor MOE's are summarized in **Table 17**. In the eastbound direction, the corridor was found to operate with an average travel time of 4.28 minutes and 4.16 minutes in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 36 mph and 37 mph in the AM and PM peak hours, respectively. In the westbound direction, the corridor was found to operate with an average travel time of 3.68 minutes and 5.77 minutes

in the AM and PM peak hours, respectively. In addition, the eastbound direction was found to operate at 41 mph and 28 mph in the AM and PM peak hours, respectively. In general, travel time and speeds in both directions saw an improvement along the corridor. The PM peak hour remained relatively consistent in the westbound direction for this alternative as there were minimal changes proposed in this project that allow for improvement to occur as most of the delays were found to be at the signals. Additionally, the increased traffic along 5th Street is anticipated to reduce operations at each of the signalized intersections which made for some of the reduced operations during the PM peak hour.

9.8.3 Freeway Results

The results for the Freeway MOE's are summarized in **Table 18**. As described in **Section 4**, the freeway results were pulled from the Freeway LOS reports. During the AM peak, 3 of the 11 freeway segments experienced LOS_s E or worse. This consists of the eastbound sections along US 17/76/421 EB from the Cape Fear River crossing to the US 74/41/NC 133 On Ramp. During the PM peak hour, 2 of the 11 segments operate at a failing condition with both segments occurring on WB US 17/76/421 from the US 74/421/NC 133 On Ramp to the west. When compared to the No-Build, traffic densities and LOS along the corridor were found to be reduced which indicates that traffic is experiencing less congestion due to the proposed improvements. The failing segments included in the analysis were found to be due to capacity restrictions located outside of the intended scope of the project including at the intersections with 3rd Street and the interchange with US 74/421/NC 133

9.8.4 Arterial/Intersection Results

The results for the intersection analysis for intersections within the study area are summarized in **Table 19**. The overall LOS_s for the 2 total signalized intersections in the 2050 Future Year Build Alternative B Analysis shows that both signalized intersections operate unacceptably at an overall LOS_s E or worse in each the AM and PM peak hour, except the intersection of US 17/76 (Wooster Street) and S 5th Avenue during the AM peak hour. It should be noted that 2 signalized intersections were removed as part of this alternative, which is expected to overall reduce delays experienced along the corridor but may show slightly higher delays at the remaining signalized intersections, because more turning movement traffic is expected at these intersections because of the removal of the other 2 signals.

Analysis was also completed on the one roundabout intersection, added as a result of this alternative [S Front Street and US 17/76/421 Ramps]. After a review of the analysis, it was found that the northbound approach (S Front Street) was found to operate at LOS_s F during the PM Peak hour. On review of the data, the delay appeared to be caused by the high variability in the delays produced by each model run likely caused by the heavy free flow right turn movement. A review of the queues and model simulations showed minimal queueing along the approach is anticipated at the roundabout itself and is does not appear to operate as the delay data indicates. During the AM peak hour, all approaches are expected to operate at LOS_s A, and all other approaches are expected to operate acceptably during the PM peak hour. As the scope of the project is a bridge replacement project, capacity improvements to reduce delays along US 17/76 (Dawson Street) and US 17/76 (Wooster Street) were limited to minimize impacts within the study area.

A review of the queuing data and model animation found that queuing is expected to impact the freeway and surrounding arterials. It showed that the southbound left-turn bay storage length at the intersection of Dawson Street and S 5th Avenue was not sufficient to contain all turning movement queues during the AM and PM peak hours. Queuing was not shown to extend to the S Front Street ramps along US 17/76/421. During the PM peak hour, heavy queuing is expected on the westbound approach at the intersection of Wooster Street and S 5th Avenue, as well as on the northbound approach at the intersection of US 17/76 Ramps and S Front Street.

Table 12: 2050 Build Alternative A Network Statistics

Time	Vehicle Hours Traveled (VHT)	Vehicle Miles Traveled (VMT)	Average Speed (mph)	Total Delay (hrs)
AM	813.5	26,060.6	36.3	318.4
PM	1,050.6	27,796.0	35.1	519.1

Table 13: 2050 Build Alternative A Corridor Summary

O D	Description	TRAVEL TIMES (min)		TRAVEL SPEEDS (mph)	
		8:00 9:00	17:00 18:00	8:00 9:00	17:00 18:00
100-106	US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133 to US 17 / 76 (Dawson Street) east of 5th Avenue	4.98	4.52	32.03	34.31
105-100	US 17 / 76 (Wooster Street) east of 5th Avenue to US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133	4.16	5.50	36.19	29.22

Table 14: 2050 Build Alternative A Freeway Segment LOS_s Summary

Order	Street Name	Analysis Type	Location	DENSITY (vplpm)		LOS _s	
				AM	PM	AM	PM
1	US 17 / 74 / 76 / NC 133 EB	Basic	West of US 74 / 421 / NC 133 Off Ramp	30.3	21.9	D	C
2	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp	47.2	33.0	F	D
3	US 17 / 76 / 421 EB	Basic	US 74 / 421 / NC 133 On Ramp	48.9	25.9	F	C
4	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 On Ramp and SB Front Street Off Ramp	60.5	33.5	F	D
5	US 17 / 76 / 421 EB	Diverge	SB Front Street Off Ramp	56.5	47.8	F	F
6	US 17 / 76 EB	Basic	Between SB Front Street Off Ramp and NB Front Street Off Ramp	65.1	63.9	F	F
7	US 17 / 76 EB	Basic	NB Front Street Off Ramp	56.6	50.8	F	F
8	US 17 / 76 / 421 WB	Basic	Front Street On Ramp	18.0	30.8	B	D
9	US 17 / 76 / 421 WB	Basic	Between Front Street On Ramp and US 74 / 421 / NC 133 Off Ramp	23.9	35.9	C	E
10	US 17 / 76 / 421 WB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp	24.8	39.0	C	E
11	US 17 / 74 / 76 / NC 133 WB	Basic	West of US 74 / 421 / NC 133 On Ramp	25.3	38.4	C	E

Table 15: 2050 Build Alternative A Intersection LOS_s Summary

Signalized Intersections													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
			AM	PM	AM	PM	AM		PM		AM	PM	
20	S Front Street & US 17 / 76 WB On-Ramp	Overall		3.0	15.2	A	B						
		S Front Street SB	L	15.3	24.8	B	C	3.8	0%	47.2	0%	37.9	157.1
		S Front Street SB	T	0.0	1.4	A	A	0.0	0%	0.0	0%	37.9	157.1
		S Front Street NB	T	3.8	6.4	A	A	12.0	0%	38.3	0%	169.8	397.8
		S Front Street NB	R	2.6	21.1	A	C	8.8	0%	107.5	0%	169.8	397.8
30	US 17 BUS (S 3rd Street), US 421 (S 3rd & US 17 / 76 EB	Overall		75.4	102.0	E	F						
		US 17 BUS (S 3rd Street) SB	L	38.1	40.1	D	D	34.9	0%	30.0	0%	235.7	347.4
		US 17 BUS (S 3rd Street) SB	T	19.0	17.1	B	B	31.2	0%	29.5	0%	235.7	347.4
		US 421 (S 3rd Street) NB	T	144.2	316.4	F	F	567.8	7%	836.1	13%	1637.3	1695.6
		US 421 (S 3rd Street) NB	R	116.8	236.1	F	F	183.4	2%	306.9	5%	1637.3	1695.6
		US 17 / 76 EB EB	L	48.4	51.8	D	D	148.8	0%	109.0	0%	1673.1	1523.4
		US 17 / 76 EB EB	T	73.3	79.1	E	E	314.0	1%	195.4	0%	1673.1	1523.4
		US 17 / 76 EB EB	R	56.5	71.2	E	E	82.9	0%	135.0	0%	1673.1	1523.4
40	US 17 / 76 (Wooster Street), US 17 BUS (& US 76 WB-421 NB-17 BUS SB	Overall		53.2	98.6	D	F						
		US 17 BUS (S 3rd Street) SB	T	150.6	360.8	F	F	486.4	0%	1100.5	19%	983.3	1685.9
		US 17 BUS (S 3rd Street) SB	R	103.8	365.5	F	F	243.9	0%	811.7	25%	983.3	1685.9
		US 17 / 76 (Wooster Street) WB	L	20.5	24.8	C	C	27.4	0%	54.0	0%	1106.2	1975.0
		US 17 / 76 (Wooster Street) WB	T	53.7	48.0	D	D	126.6	0%	214.8	6%	1106.2	1975.0
		US 17 / 76 (Wooster Street) WB	R	35.6	22.4	D	C	57.5	0%	56.0	0%	1106.2	1975.0
		US 17 BUS (S 3rd Street) NB	L	54.1	45.5	D	D	189.9	11%	110.8	14%	933.5	1065.4
		US 17 BUS (S 3rd Street) NB	T	18.7	15.2	B	B	120.8	5%	47.7	1%	933.5	1065.4
60	US 17 / 76 (Dawson Street) & S 5th Avenue	Overall		8.9	14.5	A	B						
		S 5th Avenue SB	LT	127.2	110.0	F	F	79.6	0%	94.4	0%	163.1	521.1
		S 5th Avenue SB	T	33.1	27.6	C	C	11.2	0%	26.3	0%	163.1	521.1
		S 5th Avenue NB	T	36.4	42.5	D	D	13.1	0%	27.0	0%	111.0	157.6
		S 5th Avenue NB	TR	36.6	40.7	D	D	22.2	0%	38.2	0%	111.0	157.6
		US 17 / 76 (Dawson Street) EB	LT	1.6	4.7	A	A	3.6	0%	10.4	0%	136.3	35.2
		US 17 / 76 (Dawson Street) EB	T	1.9	4.8	A	A	4.0	0%	9.7	0%	136.3	35.2
		US 17 / 76 (Dawson Street) EB	TR	1.9	4.4	A	A	5.1	0%	8.9	0%	136.3	35.2
70	US 17 / 76 (Wooster Street) & S 5th Avenue	Overall		17.6	80.7	B	F						
		S 5th Avenue SB	T	38.0	42.0	D	D	21.6	0%	48.1	0%	152.4	164.9
		S 5th Avenue SB	TR	37.9	40.9	D	D	31.0	0%	52.9	0%	152.4	164.9
		US 17 / 76 (Wooster Street) WB	LT	6.6	92.8	A	F	27.2	0%	180.2	1%	337.7	1740.6
		US 17 / 76 (Wooster Street) WB	T	19.5	95.5	B	F	73.6	0%	441.4	5%	337.7	1740.6
		US 17 / 76 (Wooster Street) WB	TR	5.6	65.5	A	E	23.3	0%	29.2	0%	337.7	1740.6
		S 5th Avenue NB	LT	70.4	120.3	E	F	37.8	0%	63.4	0%	143.6	170.1
		S 5th Avenue NB	T	43.1	63.4	D	E	24.3	0%	39.4	0%	143.6	170.1
Unsignalized Intersections ³													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
			AM	PM	AM	PM	AM		PM		AM	PM	
22	S Front Street & US 17 / 76 EB Off-Ramp to NB Front	S Front Street SB	T	0.0	0.0	A	A	0.0	0%	0.0	0%	0.0	0.0
		US 17 / 76 EB Off-Ramp WB	R	8.1	31.6	A	D	3.4	0%	4.3	0%	43.4	38.9
		S Front Street NB	T	0.1	2.9	A	A	0.0	0%	11.8	2%	0.0	390.0
50	US 17 / 76 (Dawson Street) & S 4th Street	S 4th Street NB	R	37.1	23.6	E	C	0.8	0%	0.5	0%	15.5	13.3
		US 17 / 76 (Dawson Street) EB	T	0.2	1.5	A	A	0.0	0%	0.4	0%	0.0	0.0
		US 17 / 76 (Dawson Street) EB	TR	0.9	1.0	A	A	0.0	0%	0.0	0%	0.0	0.0

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay

Table 16: 2050 Build Alternative B Network Statistics

Time	Vehicle Hours Traveled (VHT)	Vehicle Miles Traveled (VMT)	Average Speed (mph)	Total Delay (hrs)
AM	737.9	26,688.3	39.0	209.8
PM	945.3	28,309.7	35.6	389.4

Table 17: 2050 Build Alternative B Corridor Summary

O D	Description	TRAVEL TIMES (min)		TRAVEL SPEEDS (mph)	
		8:00 9:00	17:00 18:00	8:00 9:00	17:00 18:00
100-106	US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133 to US 17 / 76 (Dawson Street) east of 5th Avenue	4.28	4.16	35.76	36.67
105-100	US 17 / 76 (Wooster Street) east of 5th Avenue to US 17 / 74 / 76 / NC 133 West of US 74 / 421 / NC 133	3.68	5.77	40.60	28.38

Table 18: 2050 Build Alternative B Freeway Segment LOS_s Summary

Order	Street Name	Analysis Type	Location	DENSITY (vplpm)		LOS _s	
				AM	PM	AM	PM
1	US 17 / 74 / 76 / NC 133 EB	Basic	West of US 74 / 421 / NC 133 Off Ramp	28.5	21.7	D	C
2	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp	41.9	32.5	E	D
3	US 17 / 76 / 421 EB	Basic	US 74 / 421 / NC 133 On Ramp	41.9	25.5	E	C
4	US 17 / 76 / 421 EB	Basic	Between US 74 / 421 / NC 133 On Ramp and Front Street Off Ramp	55.0	30.5	F	D
5	US 17 / 76 / 421 EB	Basic	Front Street Off Ramp	28.9	23.9	D	C
6	US 17 / 76 EB	Basic	East of Front Street Off Ramp	19.9	16.8	C	B
7	US 17 / 76 / 421 WB	Basic	Front Street On Ramp	19.4	26.6	C	D
8	US 17 / 76 / 421 WB	Diverge	Between Front Street On Ramp and US 74 / 421 / NC 133 Off Ramp	21.8	31.2	C	D
9	US 17 / 76 / 421 WB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp (3 Lane)	19.5	33.8	C	D
10	US 17 / 76 / 421 WB	Basic	Between US 74 / 421 / NC 133 Off Ramp and US 74 / 421 / NC 133 On Ramp (2 Lane)	27.1	42.5	D	E
11	US 17 / 74 / 76 / NC 133 WB	Basic	West of US 74 / 421 / NC 133 On Ramp	26.5	37.7	D	E

Table 19: 2050 Build Alternative B Intersection LOSs Summary

Signalized Intersections													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
			AM	PM	AM	PM	AM		PM		AM	PM	
60	US 17 / 76 (Dawson Street) & S 5th Avenue	Overall		57.1	65.8	E	E						
		S 5th Avenue SB	L	95.3	59.2	F	E	224.3	13%	160.7	8%	735.6	814.4
		S 5th Avenue SB	T	32.2	35.7	C	D	38.0	0%	41.8	0%	735.6	814.4
		S 5th Avenue NB	T	83.9	105.1	F	F	203.3	0%	210.0	0%	786.2	658.7
		S 5th Avenue NB	TR	136.8	122.2	F	F	296.1	0%	216.7	0%	786.2	658.7
		US 17 / 76 EB EB	LT	41.1	64.1	D	E	152.9	0%	236.2	0%	795.6	1132.2
		US 17 / 76 EB EB	T	36.5	63.7	D	E	134.5	0%	222.0	0%	795.6	1132.2
		US 17 / 76 EB EB	TR	46.1	86.9	D	F	136.2	0%	248.7	0%	795.6	1132.2
70	US 17 / 76 (Wooster Street) & S 5th Avenue	Overall		37.9	144.8	D	F						
		S 5th Avenue SB	T	106.5	364.5	F	F	231.5	0%	726.6	9%	625.2	1835.5
		S 5th Avenue SB	TR	61.2	262.4	E	F	120.2	0%	546.6	6%	625.2	1835.5
		US 17 / 76 (Wooster Street) WB	L	24.8	103.8	C	F	27.3	0%	150.3	0%	651.1	1682.2
		US 17 / 76 (Wooster Street) WB	T	27.6	124.0	C	F	117.9	0%	406.9	3%	651.1	1682.2
		US 17 / 76 (Wooster Street) WB	TR	30.4	116.9	C	F	90.6	0%	273.5	2%	651.1	1682.2
		S 5th Avenue NB	L	61.8	91.3	E	F	76.8	0%	142.3	1%	246.5	247.8
		S 5th Avenue NB	T	18.6	18.0	B	B	18.9	0%	26.1	0%	246.5	247.8

Roundabouts													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate				Maximum Queue Length (ft)	
				AM	PM	AM	PM	AM		PM		AM	PM
20	S Front Street & US 17 / 76 Ramps Roundabout	S Front Street SWB	T	2.5	5.5	A	A	0.0	0%	0.0	0%	0.0	21.6
		S Front Street NB	T	6.8	78.8	A	F	11.1	0%	22.1	0%	122.1	115.5
		US 17 / 76 EB Off-Ramp SEB	T	3.7	33.7	A	D	2.3	0%	60.4	0%	32.7	334.3

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay

10. Conclusions and Recommendations

Based on the results of the analysis, operations along the Cape Fear Memorial Bridge corridor and at adjacent study area intersections are expected to deteriorate by the year 2050 without any proposed improvements. As discussed in **Section 8.8**, freeway densities as well as queues at intersections within the study area would experience large increases between the 2023 year and 2050 year analyses. These increases would cause higher densities along the freeway which creates stop and go conditions through most of the model.

Alternative A and Alternative B are expected to provide relief to the roadway network based on analysis findings. Alternative A results indicate a reduction in VHT of 411.3 hours and an increase in network travel speed of 5.3 mph on average, as compared to 2050 No-Build conditions. Alternative B results indicate a reduction in VHT of 592.1 hours and an increase in network travel speed of 6.9 mph on average, as compared to 2050 No-Build conditions. Queuing was also shown to improve between 2050 No-Build and 2050 Build (Alternative A and Alternative B) conditions throughout the study area.

Appendix

Appendix A:

Traffic Volume Forecasts



MEMORANDUM

To: Trace Howell, North Carolina Department of Transportation

From: Craig R. Gresham, P.E.
Clearbox Forecast Group, PLLC

Date: September 27th, 2023

Subject: Traffic Forecast – Cape Fear Memorial Bridge Replacement (NCDOT Project HB-0039)

Please find attached an amended 2023/2050 traffic forecast for NCDOT Project HB-0039. This forecast was originally reviewed and approved by NCDOT Transportation Planning Division on May 15th, 2023. **This amended forecast updates intersection volumes at South 3rd Street/South 5th Avenue and Wooster/Dawson Street for Future Build 2 scenario only. No other forecast volumes have been updated as a part of this amendment.**

This forecast provides 2023 Base Year Build and 2050 Future Year Build for two six-lane build scenarios for the replacement of the existing bridge. Previously prepared Traffic Forecasts for NCDOT Projects U-4738 and U-5734 were consulted during the development of this forecast.

This forecast assumes all projects documented in the adopted 2045 “Cape Fear Moving Forward 2045” Metropolitan Transportation Plan (MTP) for the Wilmington area. This forecast was requested for use in the project development activities associated with the project. This traffic forecast includes Average Annual Daily Traffic (AADT) estimates for the three scenarios for the 2023 Base Year and 2050 Future Year listed in Table 1.

Table 1. Traffic Forecast Scenarios

Forecast Scenario		Year	Forecast Scenario
1	Base Year No-Build (BYNB)	2023	Existing Road Network
2	Future Year Build 1 (FYBD1)	2050	Existing Road Network plus 2045 Wilmington MPO MTP Fiscally-Constrained Projects and Subject Project (Widen Cape Fear Memorial Bridge to Six Lanes)
3	Future Year Build 2 (FYBD2)	2050	Existing Road Network plus 2045 Wilmington MPO MTP Fiscally-Constrained Projects and Subject Project (Widen Cape Fear Memorial Bridge to Six Lanes) with no access at S. 3 rd Street or S. 4 th Street



The following basic assumptions were made to complete this forecast.

Travel Demand Model: This forecast utilizes the Wilmington MPO 2045 Travel Demand Model (TransCAD 7) as a tool to determine Base Year and Future Year volumes.

Fiscally Constrained: The Wilmington MPO Model was run using the Wilmington 2045 MTP adopted on November 18th, 2020. 2045 MTP Projects in the vicinity of the study area were reviewed and considered as part of the traffic forecast development.

Forecast Methodology: The 2023 base year build and 2050 future year build volumes generally included the development of diversion rates between like model years with different scenarios. The compound annual growth rates or diversion rates were then applied to the AADT volumes from another scenario to develop initial volumes for each scenario. Engineering judgment adjustments were applied as needed to prepare balanced forecasts.

Interpolation: Straight-line interpolation may be used. AADT volumes may be extrapolated for up to two years immediately following 2050. If it is determined that any of these assumptions have become inconsistent with the project and surrounding area activity, please request updated projections for this project.

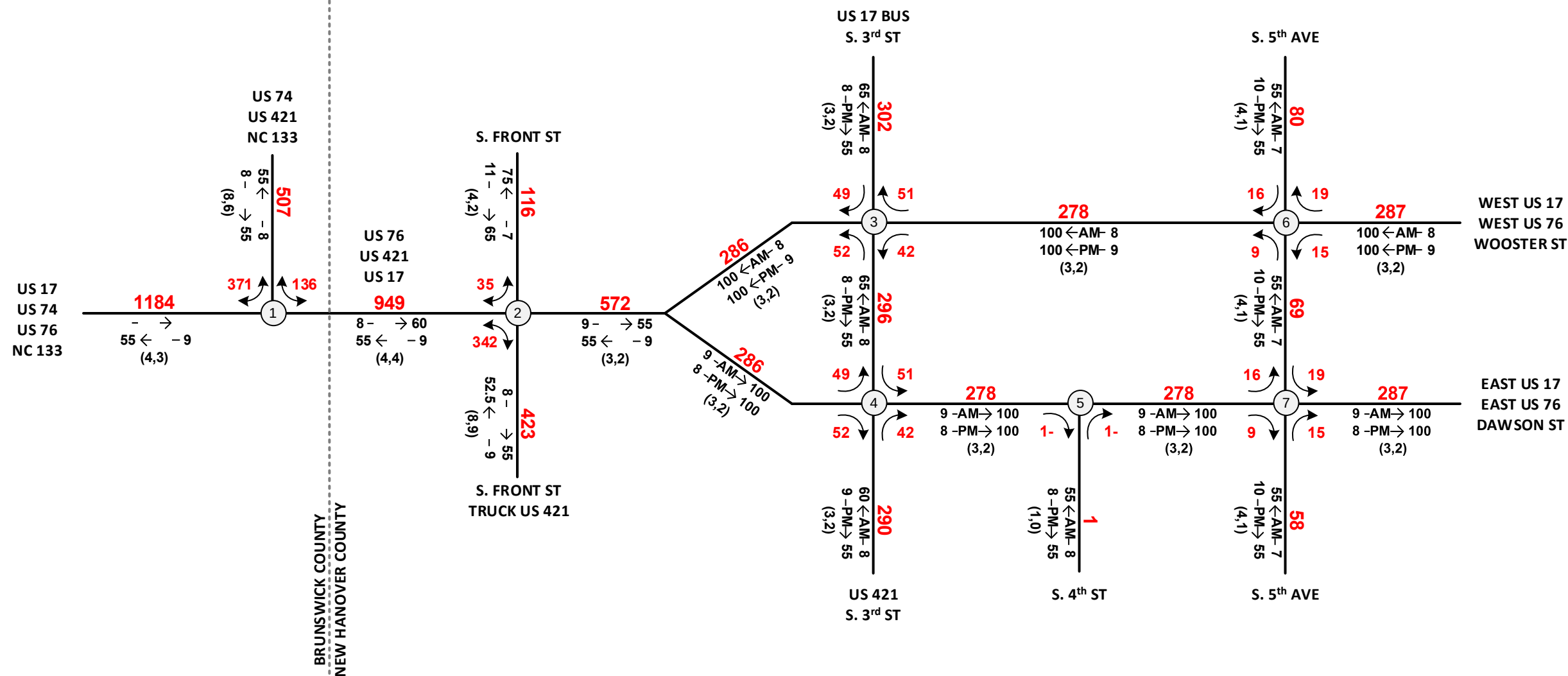
Please contact me for any further assistance at 919-651-8010 or craig@clearboxforecast.com

A handwritten signature in black ink, appearing to read "Craig Gresham", followed by a horizontal line.

Craig Gresham, P.E.

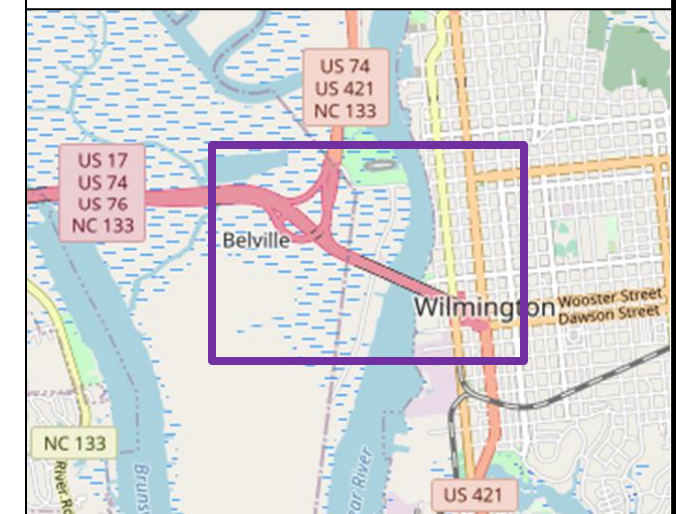
Clearbox Forecast Group, PLLC

cc: FILE (Brunswick County, NCDOT TIP Project HB-0039)
Keith Dixon, NCDOT Transportation Planning Branch



LEGEND

- ### No. of Vehicles Per Day in 100s
1- Less than 50 vpd
X Movement Prohibited
K-AM→D
D←PM- K
(d, t)
K Design Hour Factor (%)
PM PM Peak Period
AM AM Peak Period
D Peak Hour Directional Split (%)
→ Indicates Direction of D
(d, t) Duals, TT-STs (%)



2050 AVERAGE ANNUAL
DAILY TRAFFIC

FUTURE YEAR BUILD 1 SHEET 1 OF 1

NC TIP: HB-0039

COUNTY: New Hanover/
Brunswick

WBS: 50603.1.1

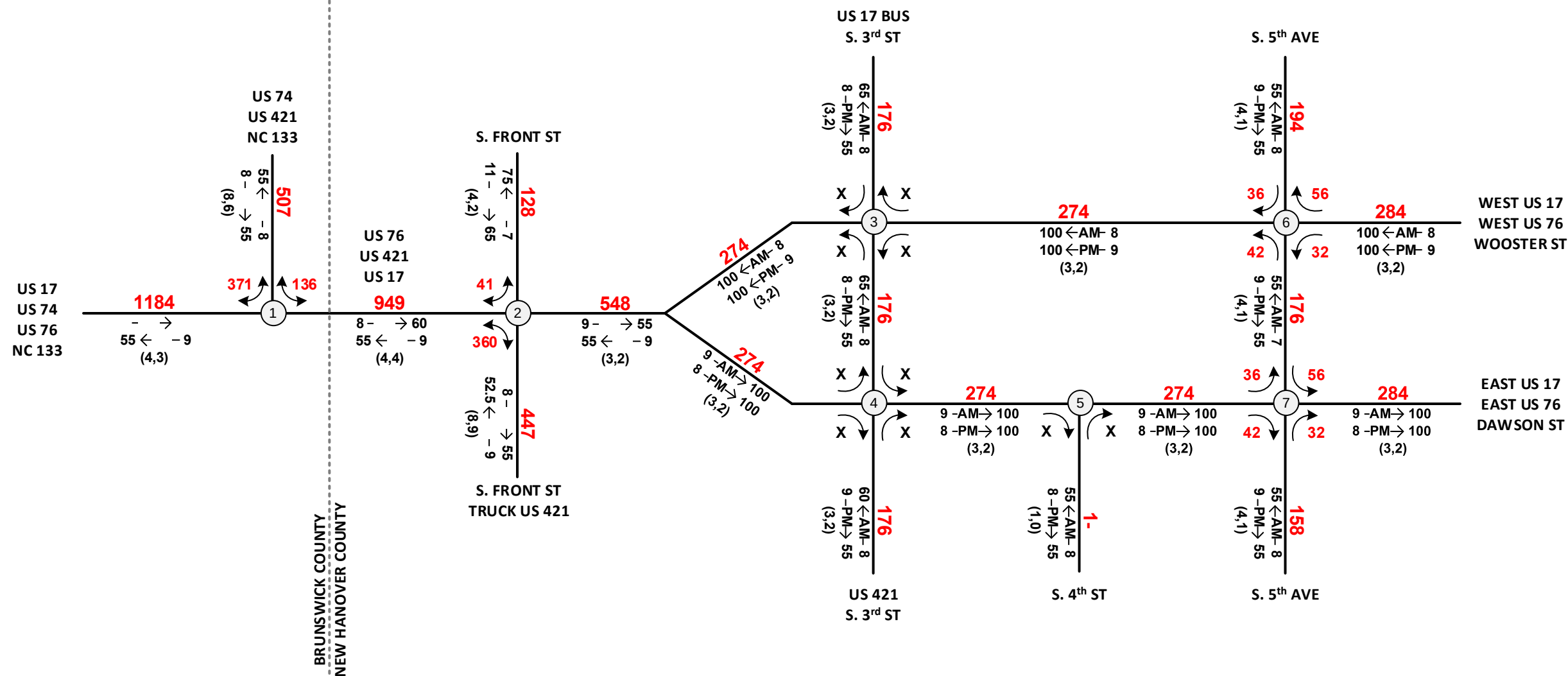
DATE: May 2023

DIVISION: 3

PREPARED BY: Clearbox Forecast Group

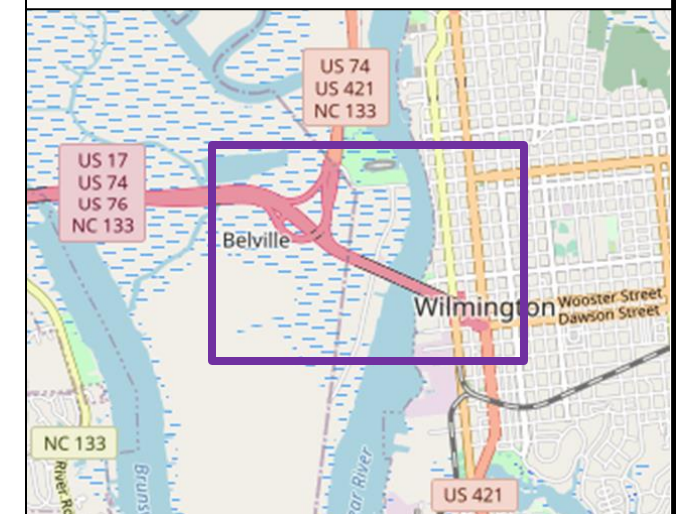
LOCATION: WILMINGTON, NC

PROJECT: REPLACE BRIDGE 640013 (CAPE FEAR
MEMORIAL BRIDGE) OVER CAPE FEAR RIVER IN
NEW HANOVER COUNTY



LEGEND

- ### No. of Vehicles Per Day in 100s
1- Less than 50 vpd
X Movement Prohibited
K-AM→D
D←PM- K
(d, t)
K Design Hour Factor (%)
PM PM Peak Period
AM AM Peak Period
D Peak Hour Directional Split (%)
→ Indicates Direction of D
(d, t) Duals, TT-STs (%)



2050 AVERAGE ANNUAL DAILY TRAFFIC

FUTURE YEAR BUILD 2
SHEET 1 OF 1

NC TIP: HB-0039

COUNTY: New Hanover/
Brunswick **WBS:** 50603.1.1

DATE:September 2023 **DIVISION:** 3

PREPARED BY: Clearbox Forecast Group

LOCATION: WILMINGTON, NC

PROJECT: REPLACE BRIDGE 640013 (CAPE FEAR MEMORIAL BRIDGE) OVER CAPE FEAR RIVER IN NEW HANOVER COUNTY

Appendix B:

IAU Spreadsheets

[illegible]

HB-0039 2023 NB

AMPEAK

↑ N

1025 0 402

right through left

← ↓ →

1427 1752

↓ ↑

US 74/US 421/NC 133

↑ right 349

← through 1727

↓ left 0

2752 ←

4130 →

US 17/US 74/US 76/NC 133

US 76/US 421/US 17

1403 left ↑

2727 through →

0 right ↓

↓ ↑

0 0

0%

← ↑ →

left through right

0 0 0

AM peak hour inflow is 7633 vehicles. AM peak hour outflow is 7633 vehicles.

PMPEAK

↑ N

US 74/US 421/NC 133

US 17/US 74/US 76/NC 133

US 76/US 421/US 17

0%

Vehicle counts and movements:

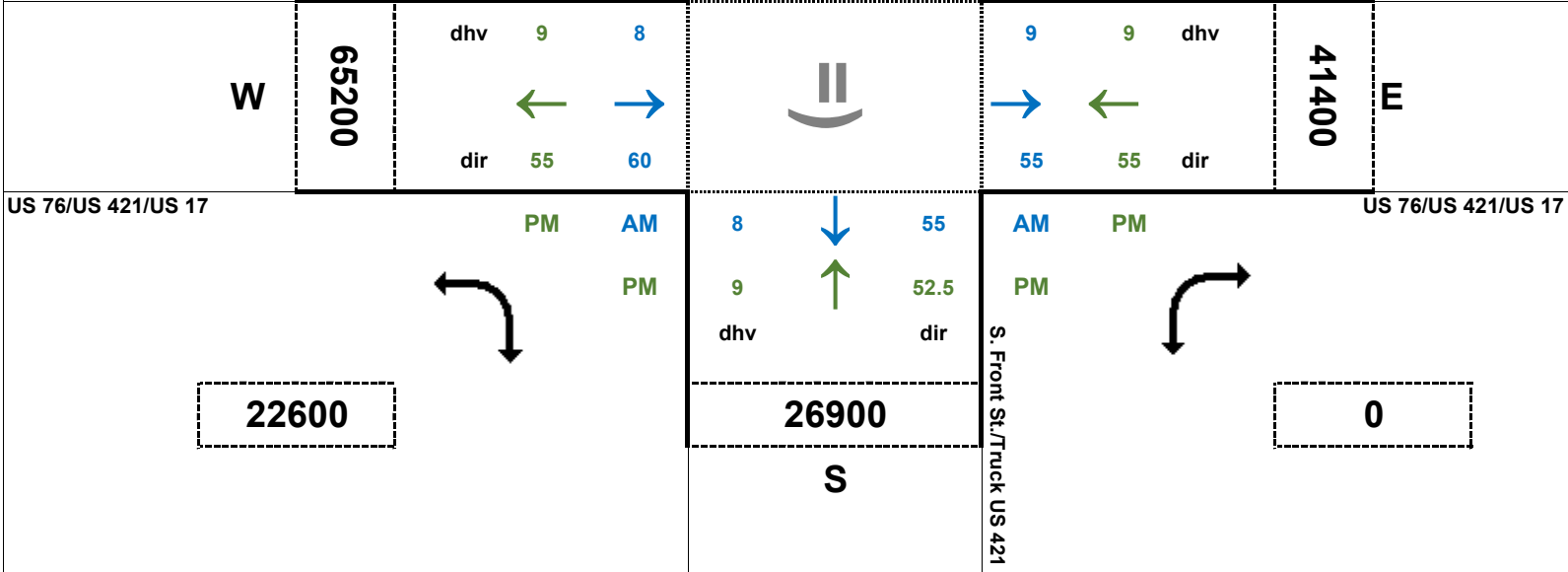
- Northbound (US 74/US 421/NC 133):
 - Right: 345
 - Through: 2877
 - Left: 0
- Southbound (US 74/US 421/NC 133):
 - Right: 0
 - Through: 1447
 - Left: 1745
- Eastbound (US 17/US 74/US 76/NC 133):
 - Right: 3420
 - Through: 4271
 - Left: 0
- Westbound (US 17/US 74/US 76/NC 133):
 - Right: 1102
 - Through: 2318
 - Left: 0

PM peak hour inflow is 8387 vehicles. PM peak hour outflow is 8387 vehicles.

24 HOUR

1200

PM AM



Project:
HB-0039 2023 NB

AMPEAK

↑ N

16 81 0

right through left

← ↓ →

97 305

↓ ↑

S. Front St.

↑ right 0

← through 1544

↓ left 0

2228 ←

3201 →

US 76/US 421/US 17

← 1544

→ 2032

US 76/US 421/US 17

76 left ↑

2032 through →

1093 right ↓

1174 897

↓ ↑

S. Front St./Truck US 421

← ↑ →

left through right

668 229 0

AM peak hour inflow is 5739 vehicles. AM peak hour outflow is 5739 vehicles.

The diagram illustrates a four-way intersection with the following traffic flow and volume data:

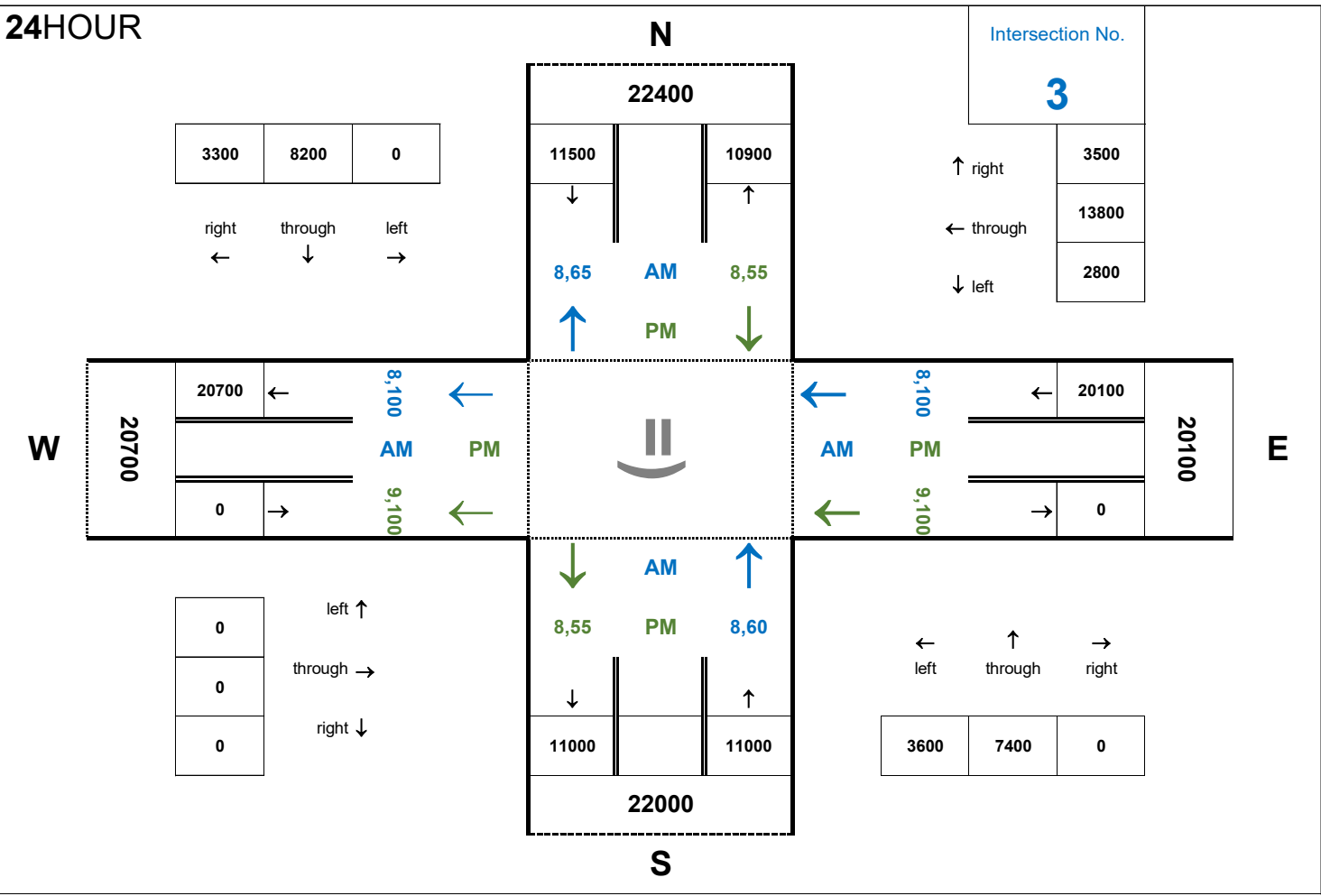
- Northbound (Top):**
 - Left turn: 92 vehicles
 - Through traffic: 297 vehicles
 - Right turn: 0 vehicles
- Southbound (Bottom):**
 - Left turn: 42 vehicles
 - Through traffic: 1696 vehicles
 - Right turn: 865 vehicles
- Eastbound (Right):**
 - Left turn: 0 vehicles
 - Through traffic: 2048 vehicles
 - Right turn: 0 vehicles
- Westbound (Left):**
 - Left turn: 3239 vehicles
 - Through traffic: 2603 vehicles
 - Right turn: 0 vehicles

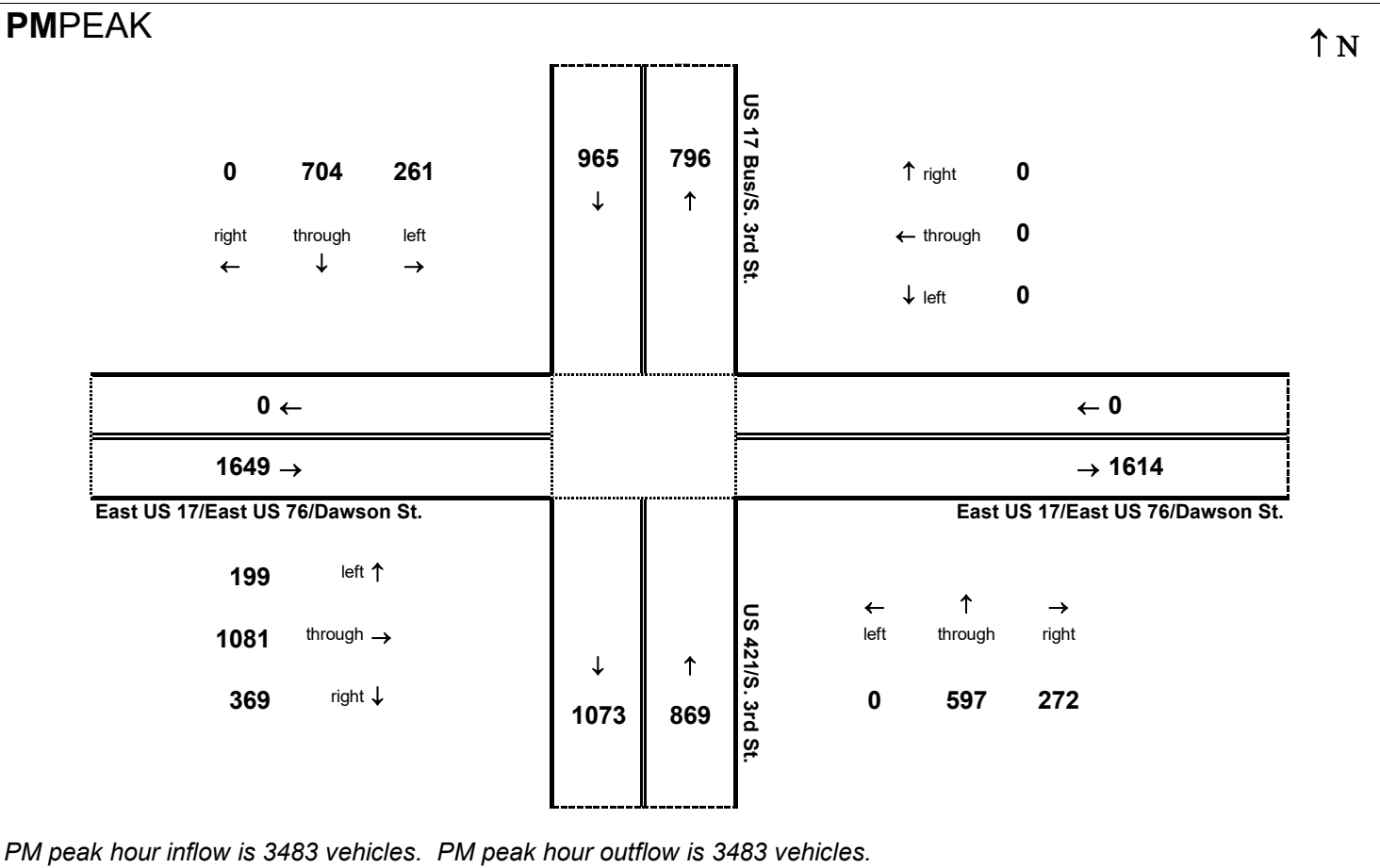
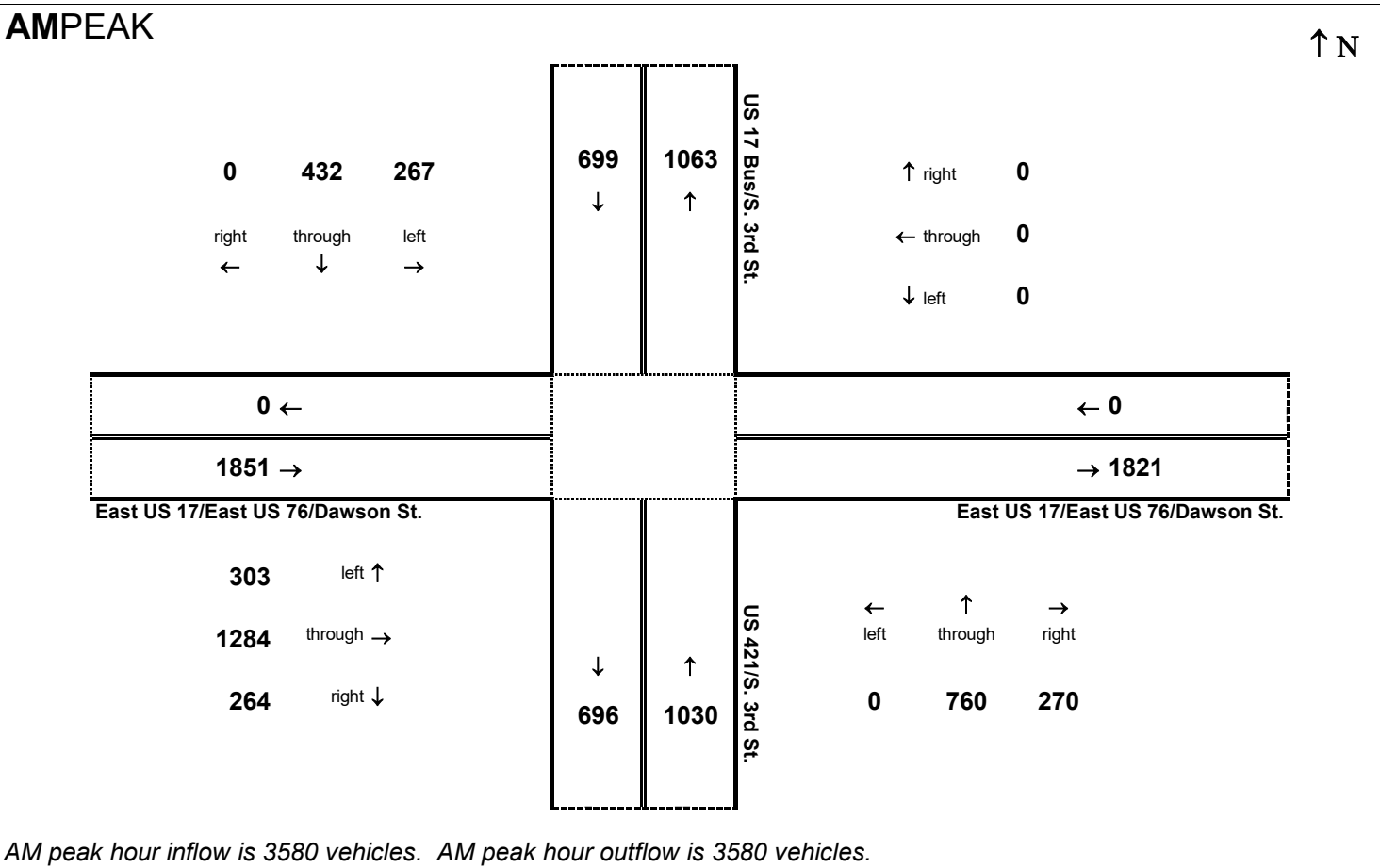
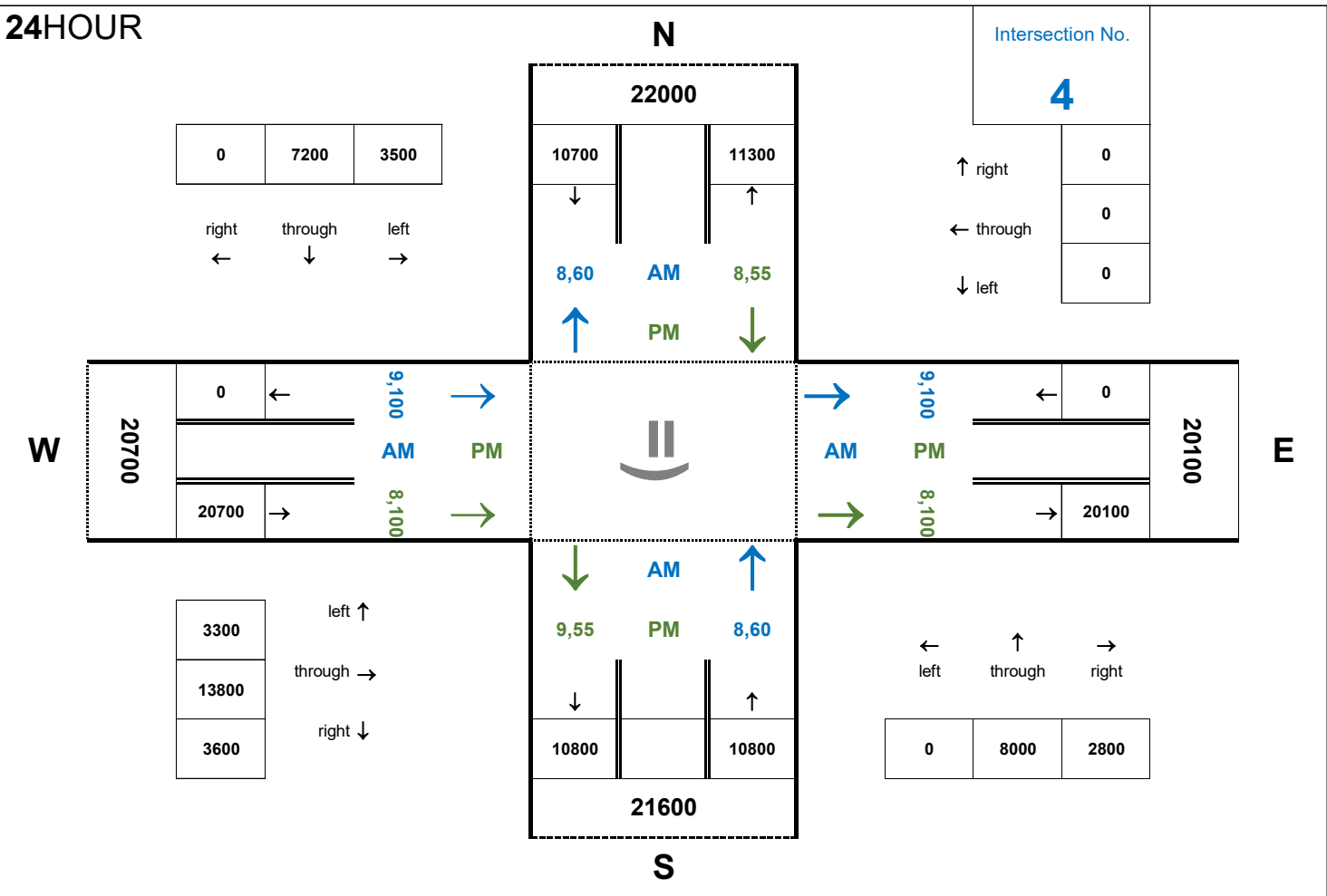
The intersection is labeled with the following street names:

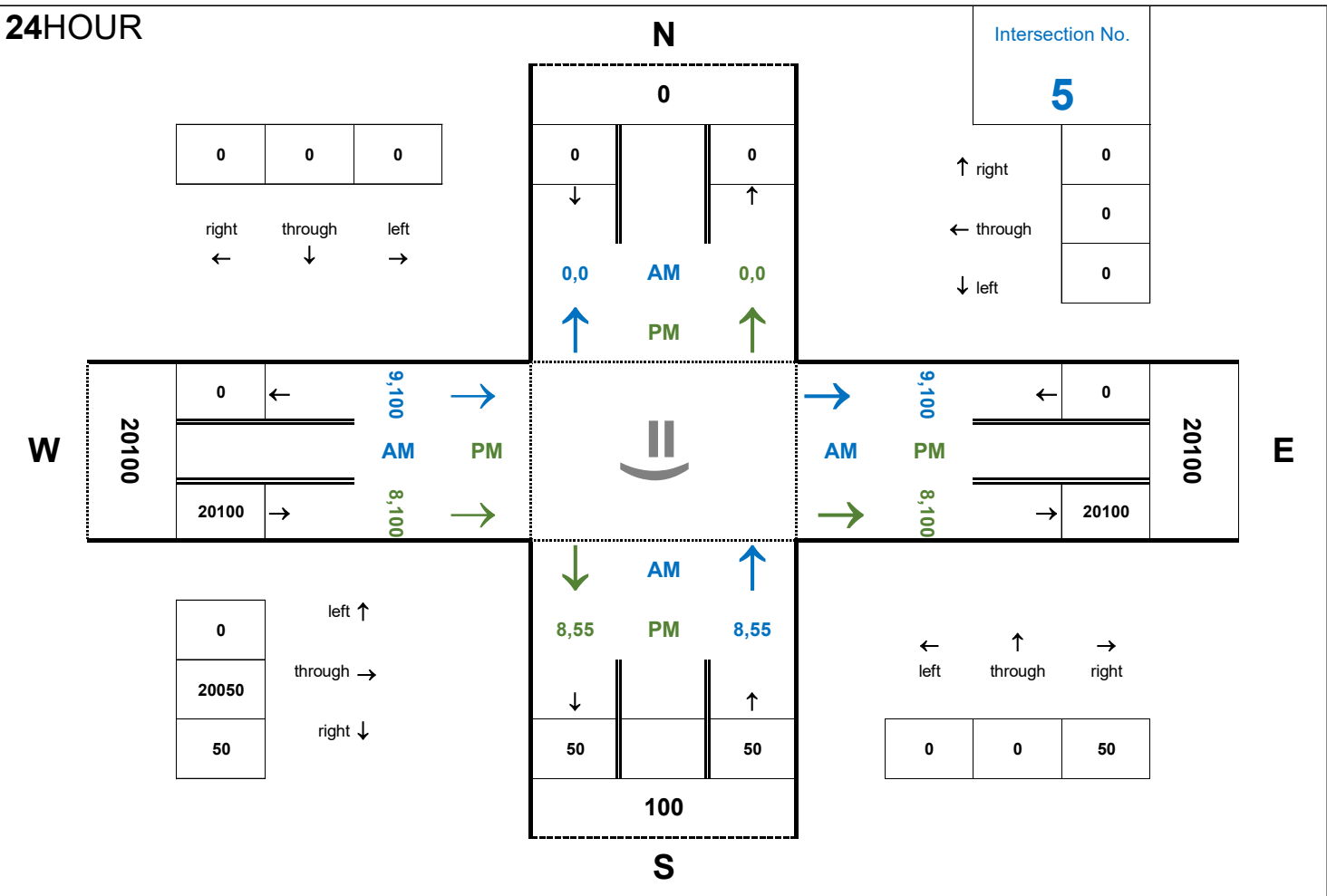
- Top: S. Front St.
- Bottom: S. Front St./Truck US 421
- Left: US 76/US 421/US 17
- Right: US 76/US 421/US 17

A north arrow is located in the top right corner, pointing upwards.

PM peak hour inflow is 6310 vehicles. PM peak hour outflow is 6310 vehicles.





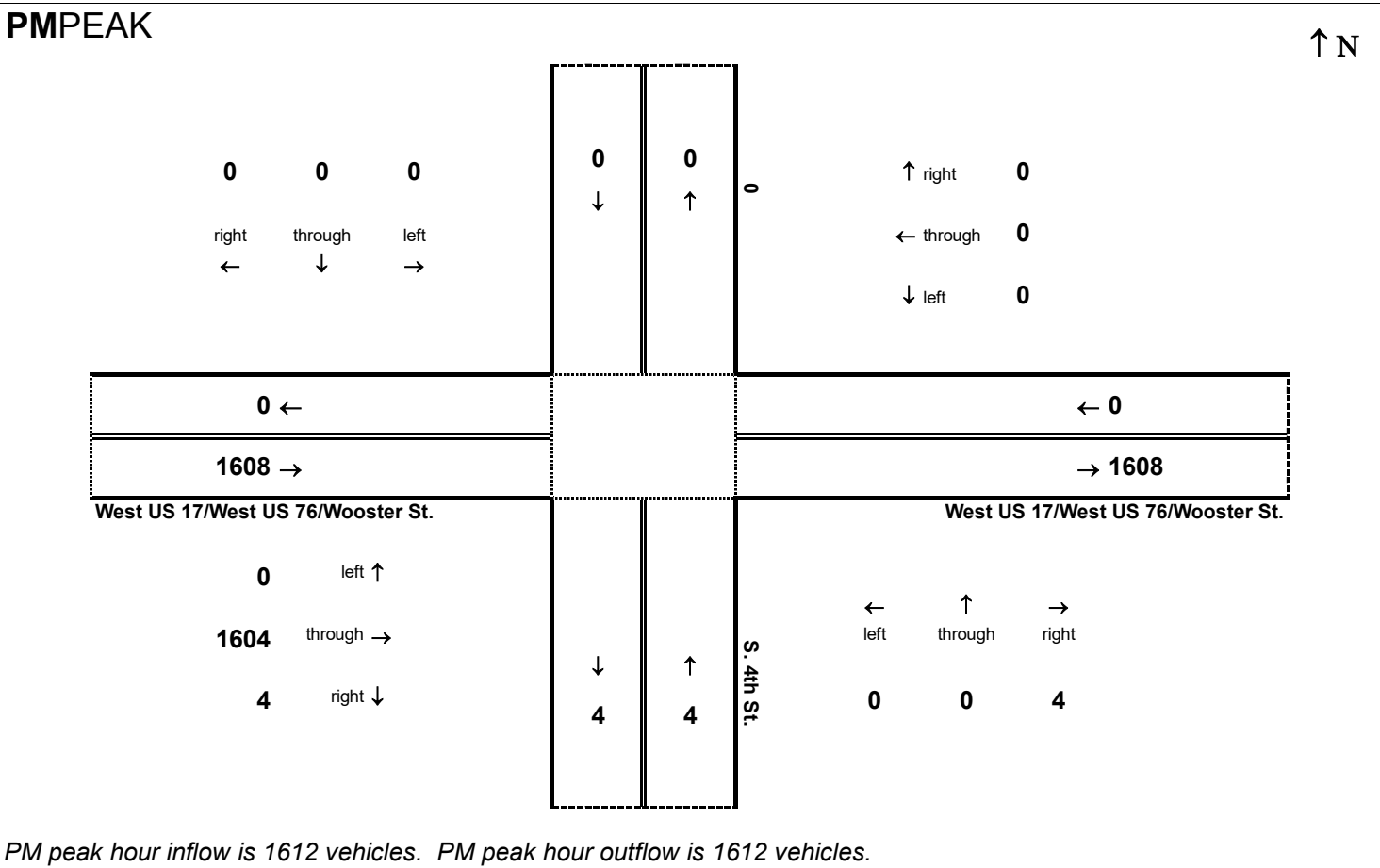
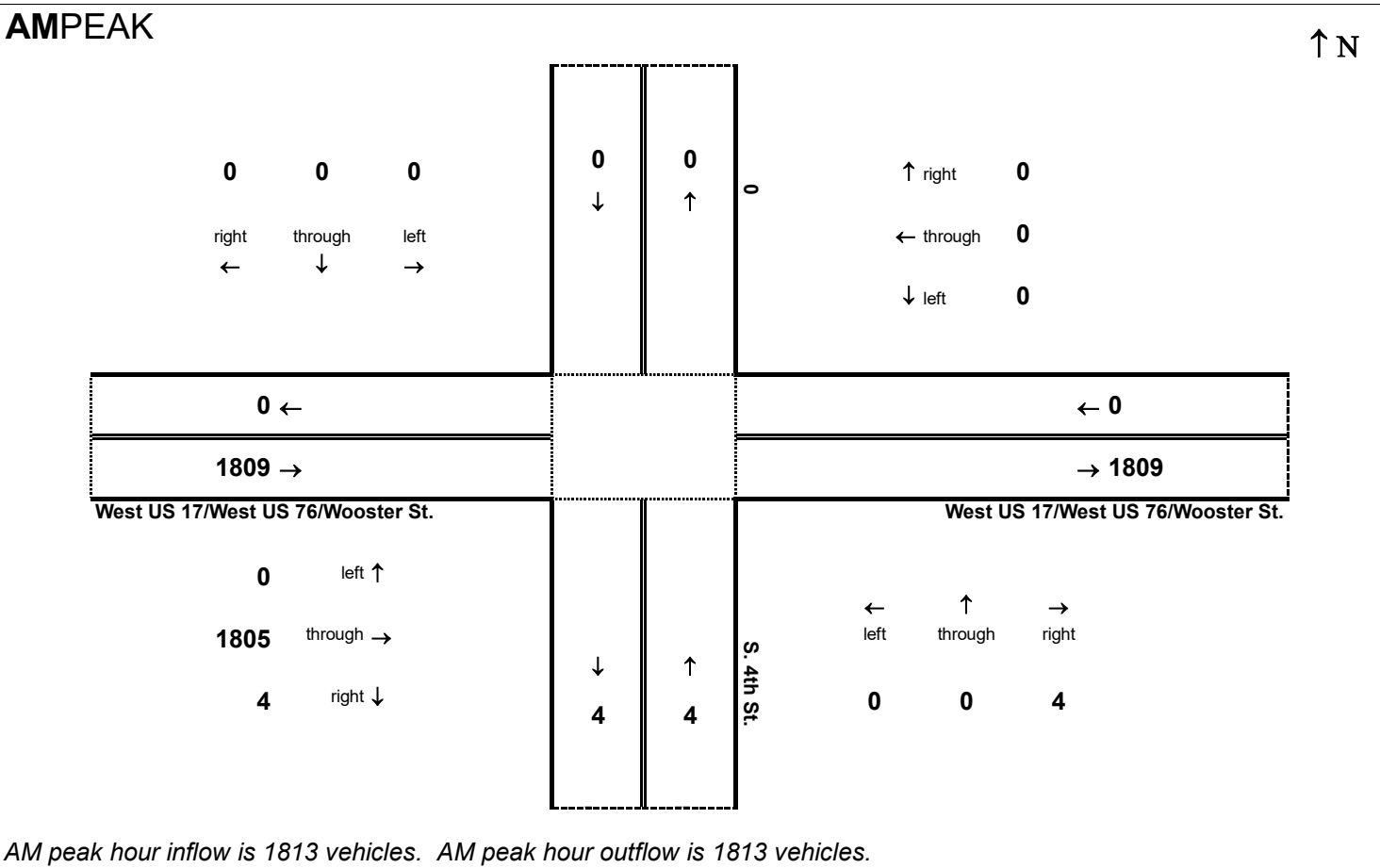


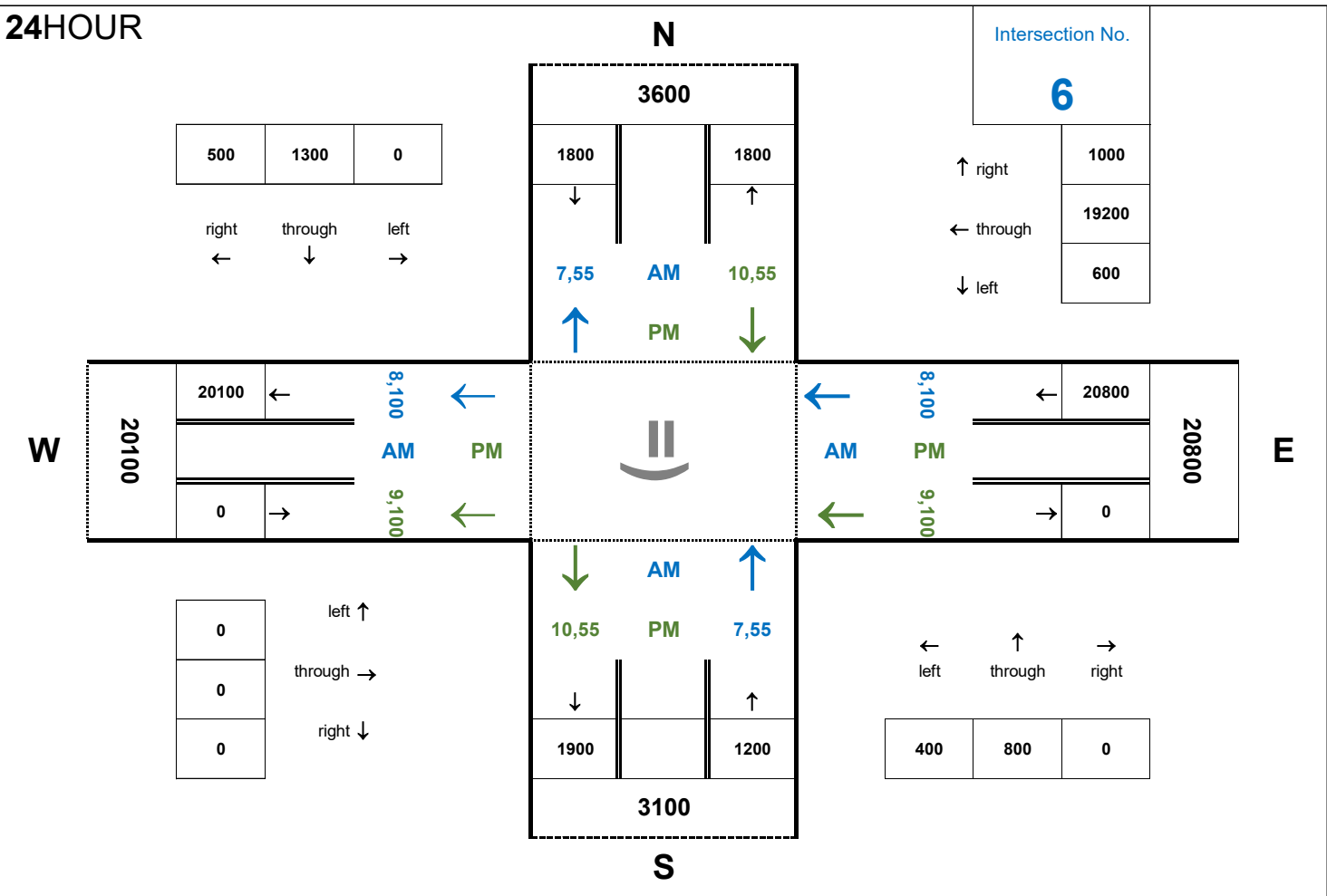
Peak Hour Volume Breakouts Report:
S. 4th St. at East US 17/East US 76/Dawson St.

Traffic Forecast Release Date:
May-23

Traffic Data Year:
1/1/2023

Project:
HB-0039 2023 NB



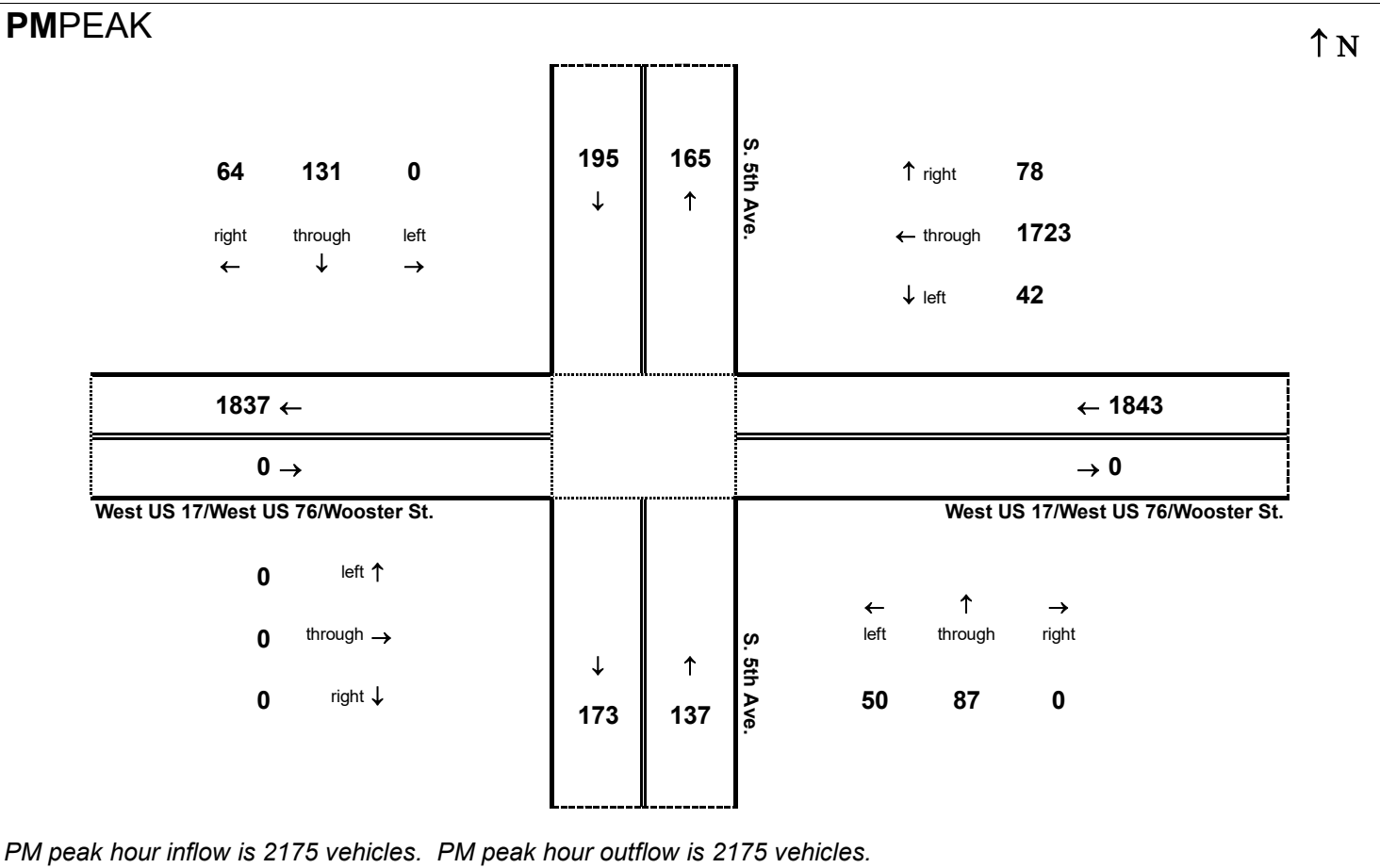
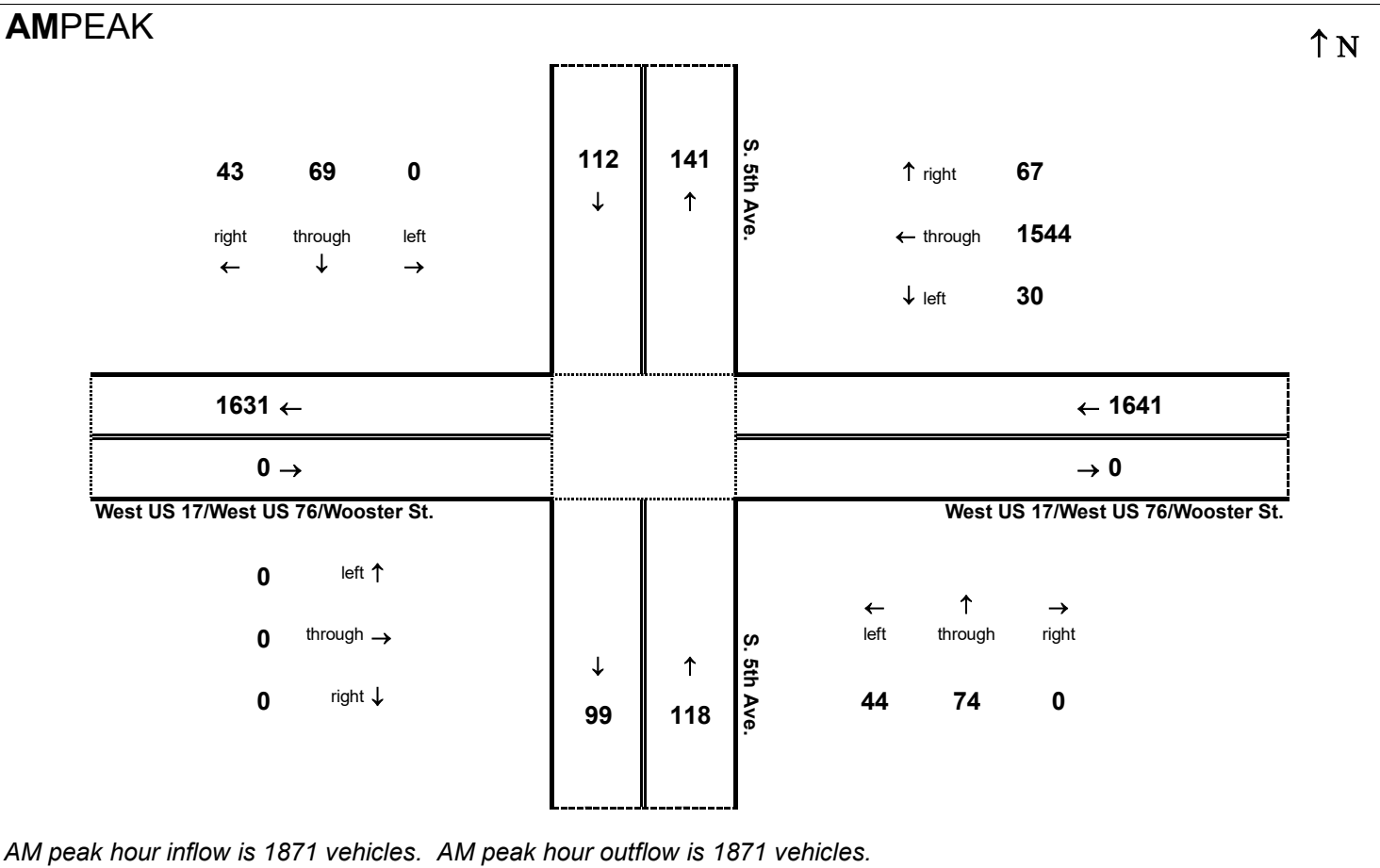


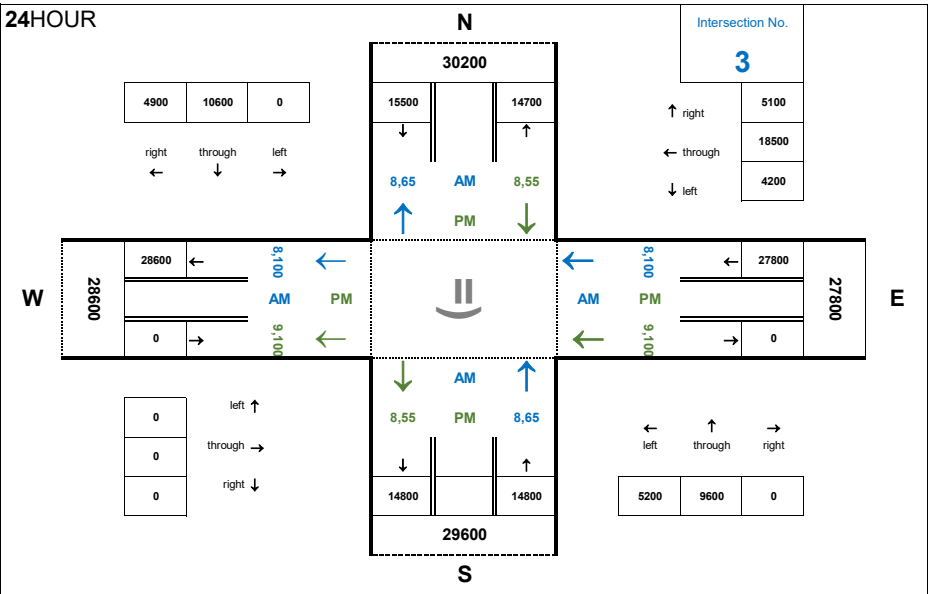
Peak Hour Volume Breakouts Report:
S. 5th Ave. at West US 17/West US 76/Wooster St.

Traffic Forecast Release Date:
May-23

Traffic Data Year:
1/1/2023

Project:
HB-0039 2023 NB



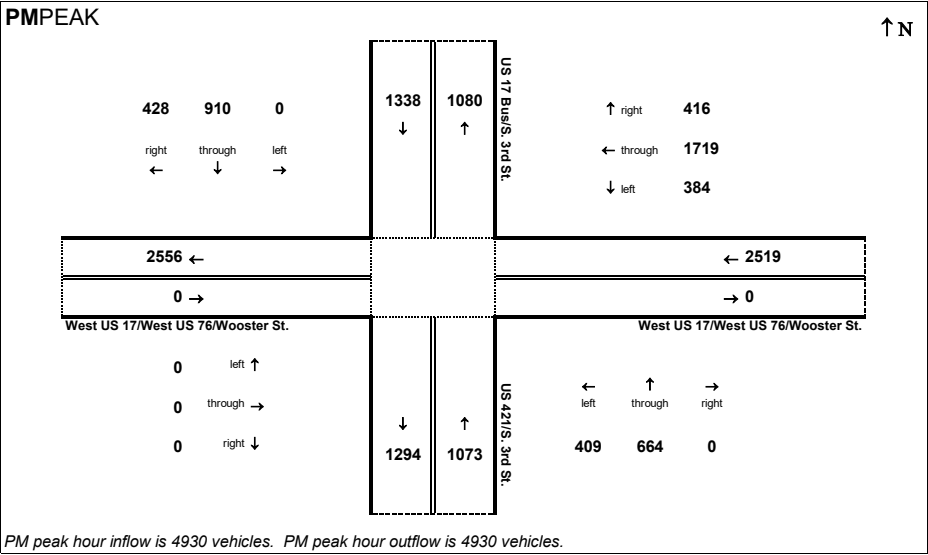
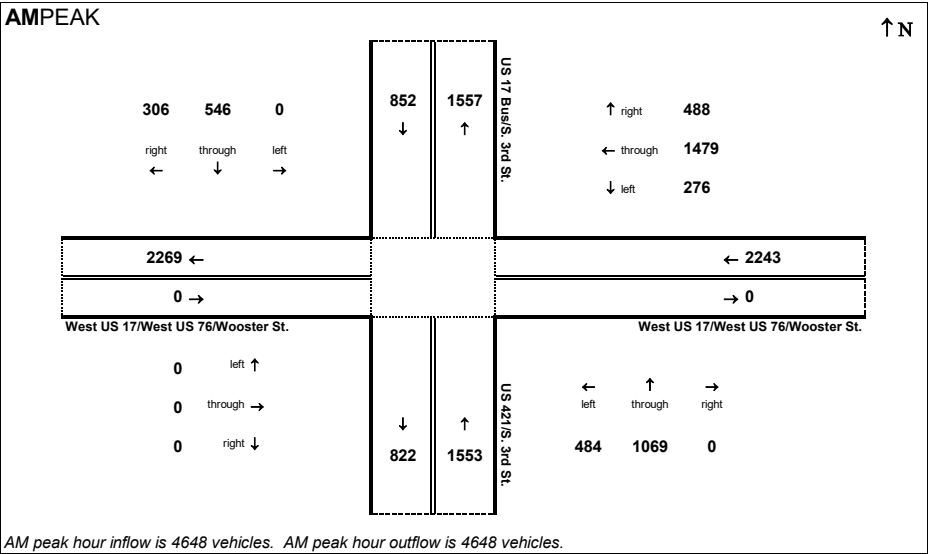


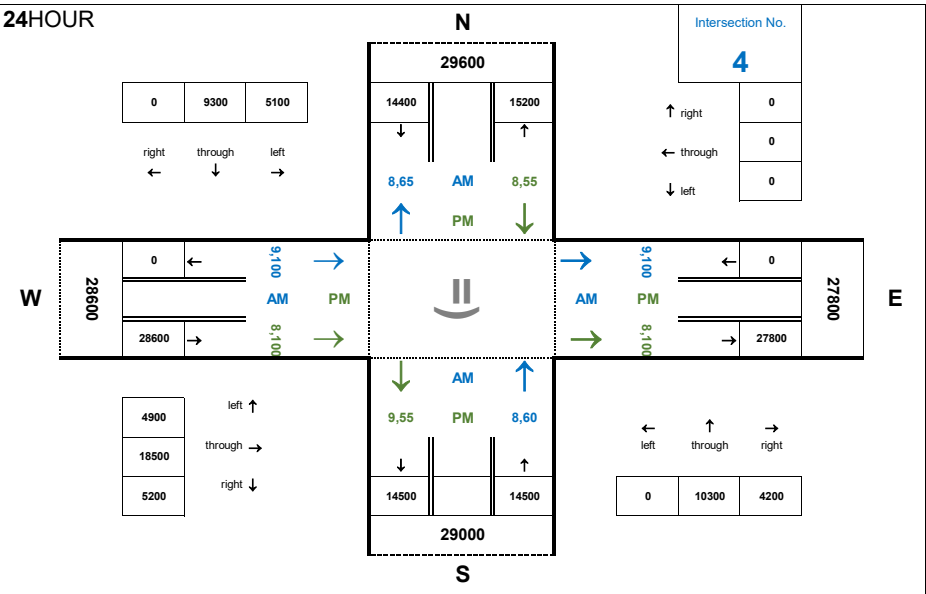
Peak Hour Volume Breakouts Report:
S. 3rd St. at West US 17/West US 76/Wooster St.

Traffic Forecast Release Date:
May-23

Traffic Data Year:
1/1/2050

Project:
HB-0039 2050 Build 1



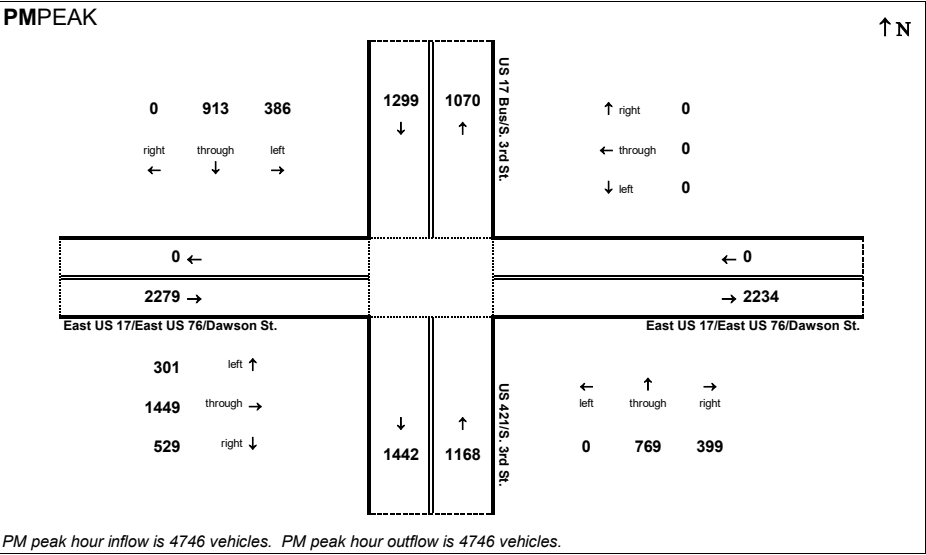
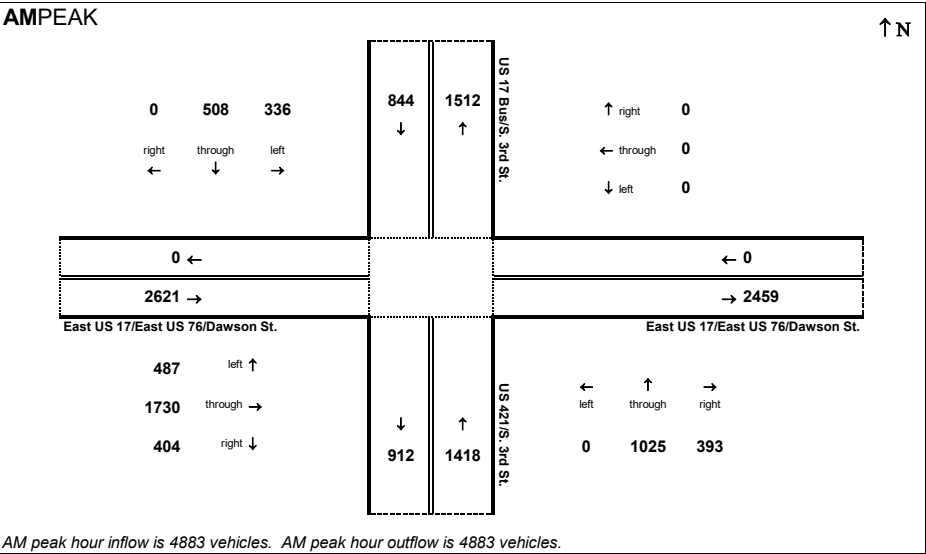


Peak Hour Volume Breakouts Report:
S. 3rd St. at East US 17/East US 76/Dawson St.

Traffic Forecast Release Date:
May-23

Traffic Data Year:
1/1/2050

Project:
HB-0039 2050 Build 1



The diagram illustrates a four-way intersection with the following details:

- North Approach (0):** Features a center turn lane. Left-turn lane (0) has a blue arrow pointing left. Through lane (0) has a blue arrow pointing forward. Right-turn lane (0) has a green arrow pointing right. Signal timing: 0.0 AM, 0.0 PM.
- South Approach (100):** Features a center turn lane. Left-turn lane (50) has a green arrow pointing left. Through lane (50) has a green arrow pointing forward. Right-turn lane (50) has a blue arrow pointing right. Signal timing: 8.55 AM, 8.55 PM.
- West Approach (27800):** Features a center turn lane. Left-turn lane (0) has a blue arrow pointing left. Through lane (27800) has a blue arrow pointing forward. Right-turn lane (27800) has a green arrow pointing right. Signal timing: 9.100 AM, 8.100 PM.
- East Approach (27800):** Features a center turn lane. Left-turn lane (0) has a green arrow pointing left. Through lane (27800) has a green arrow pointing forward. Right-turn lane (27800) has a blue arrow pointing right. Signal timing: 9.100 AM, 8.100 PM.
- Intersection Details:** The central intersection is marked with a blue 'H' symbol. The intersection number is 5.
- Signal Timing:** The signal timing is 24HOUR.

Project:
HB-0039 2050 Build 1

Diagram illustrating the intersection of West US 17/West US 76/Wooster St. and S 4th St. during the AM peak hour. The diagram shows the intersection layout, including the intersection box, approach lanes, and traffic flow directions. The vehicle counts for each approach are as follows:

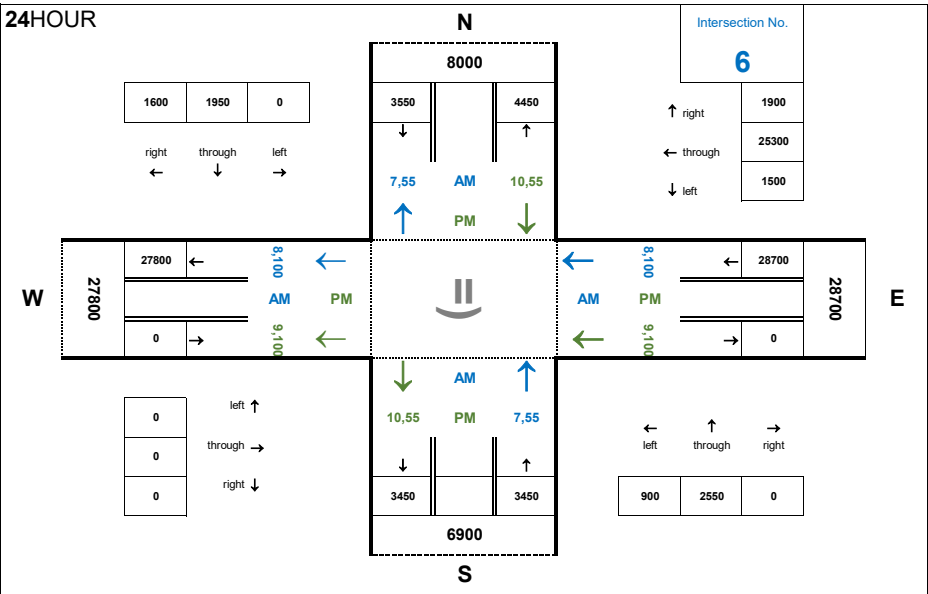
- West US 17/West US 76/Wooster St. (Northbound):**
 - Left turn: 0
 - Through: 2502
 - Right turn: 0
- West US 17/West US 76/Wooster St. (Southbound):**
 - Left turn: 0
 - Through: 2502
 - Right turn: 0
- S 4th St (Eastbound):**
 - Left turn: 0
 - Through: 4
 - Right turn: 4
- S 4th St (Westbound):**
 - Left turn: 0
 - Through: 4
 - Right turn: 4

AM peak hour inflow is 2506 vehicles. AM peak hour outflow is 2506 vehicles.

AM peak hour inflow is 2506 vehicles. AM peak hour outflow is 2506 vehicles.

[illegible]

PM peak hour inflow is 2228 vehicles. PM peak hour outflow is 2228 vehicles.

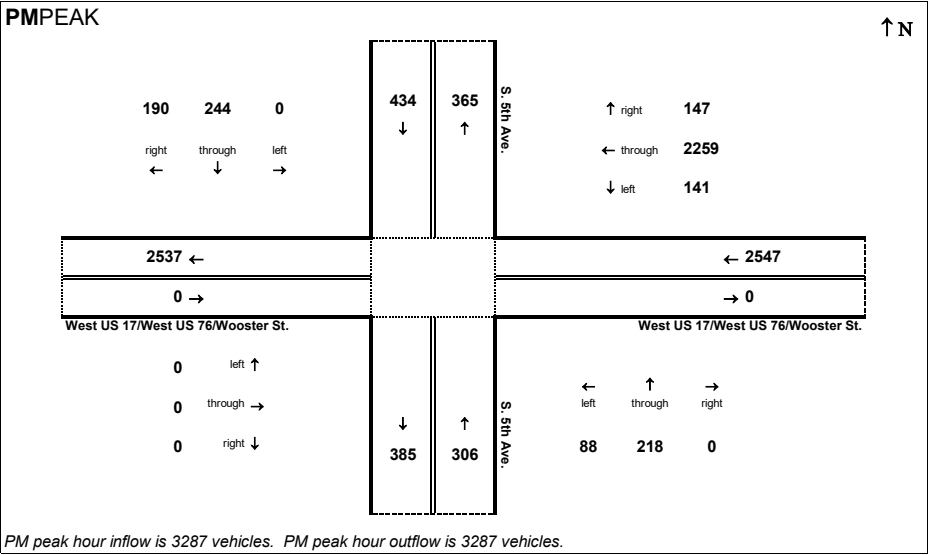
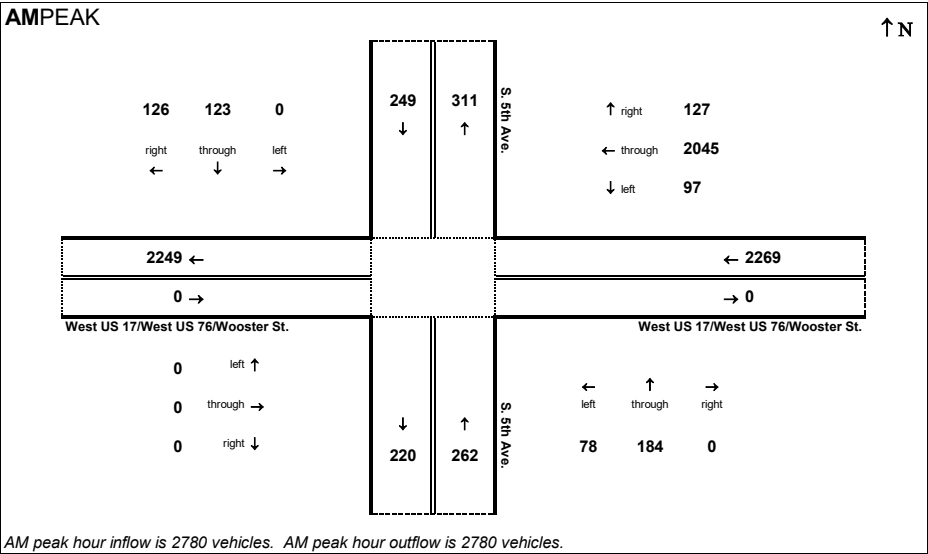


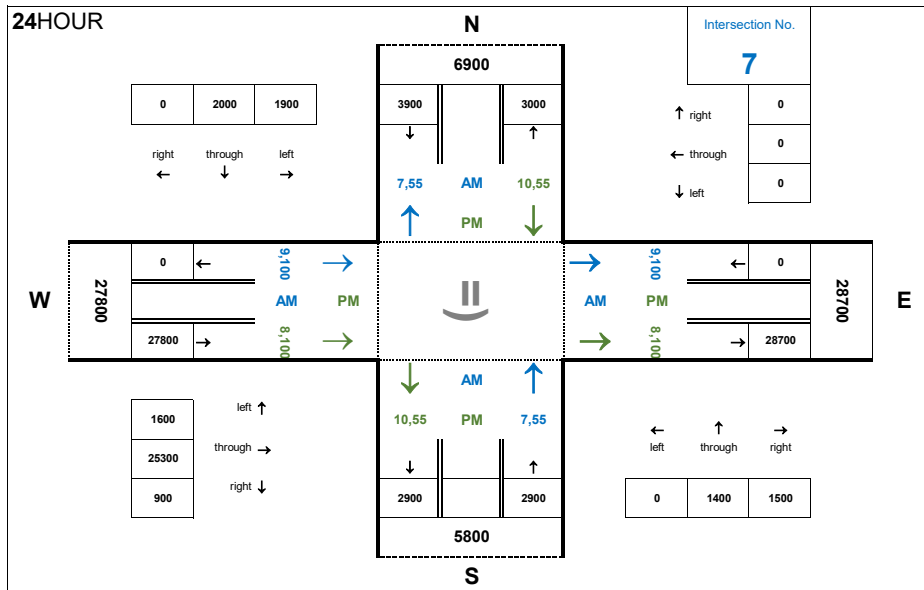
Peak Hour Volume Breakouts Report:
S. 5th Ave. at West US 17/West US 76/Wooster St.

Traffic Forecast Release Date:
May-23

Traffic Data Year:
1/1/2050

Project:
HB-0039 2050 Build 1



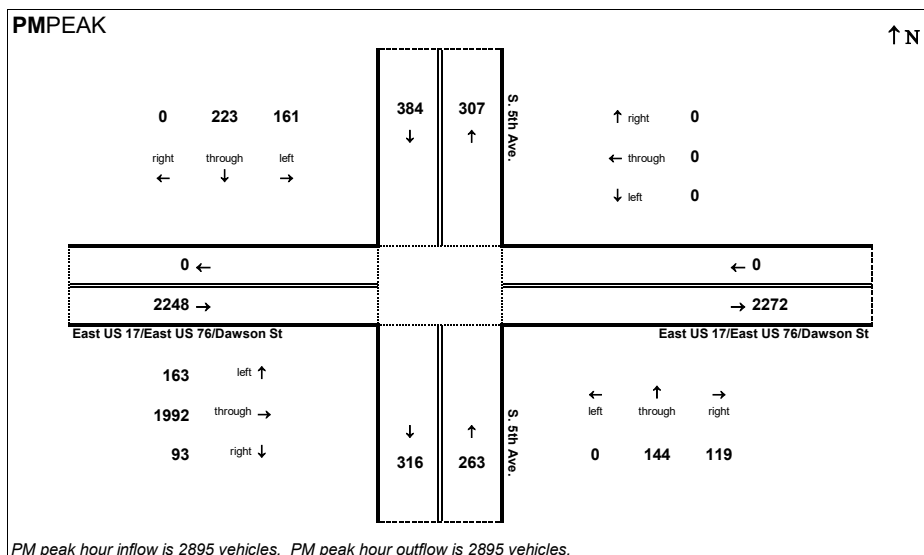
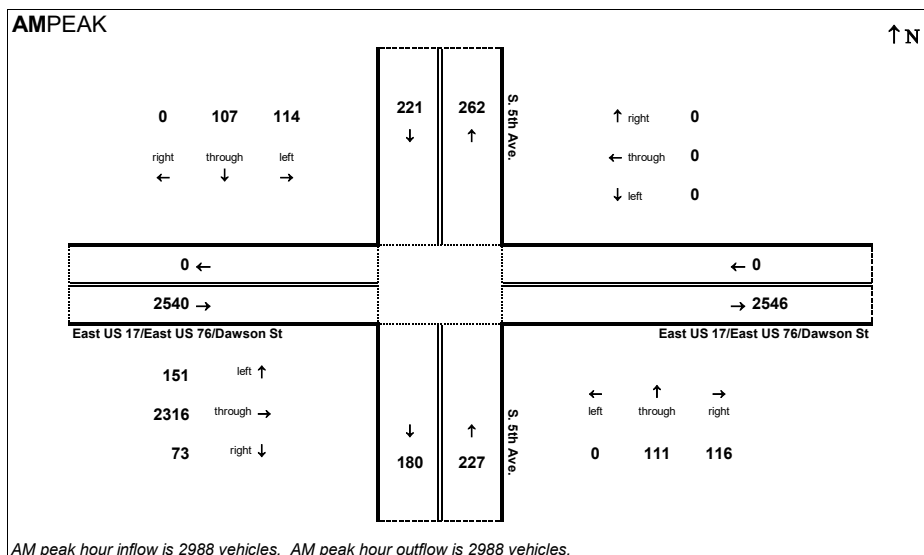


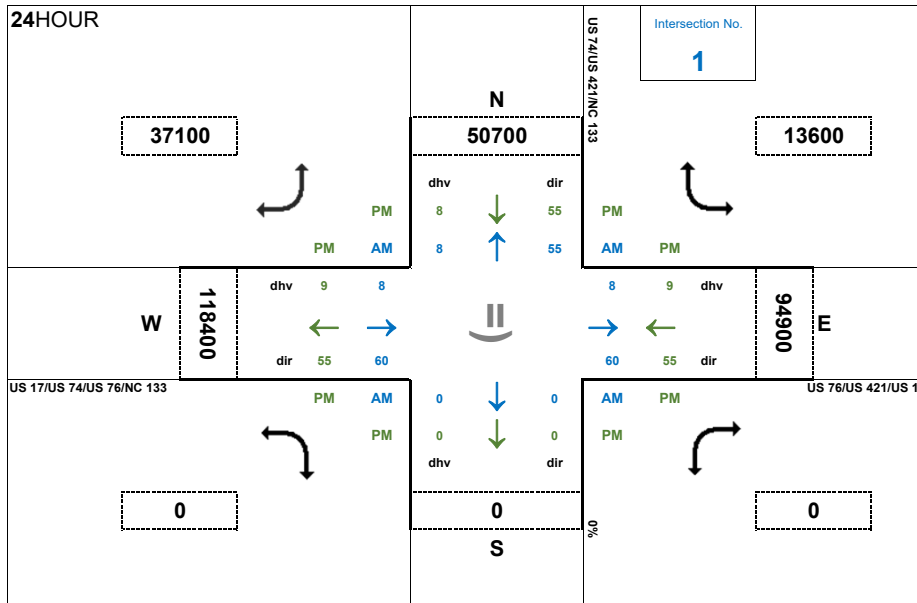
Peak Hour Volume Breakouts Report:
S. 5th Ave. at East US 17/East US 76/Dawson St.

Traffic Forecast Release Date:
May-23

Traffic Data Year:
1/1/2050

Project:
HB-0039 2050 Build 1





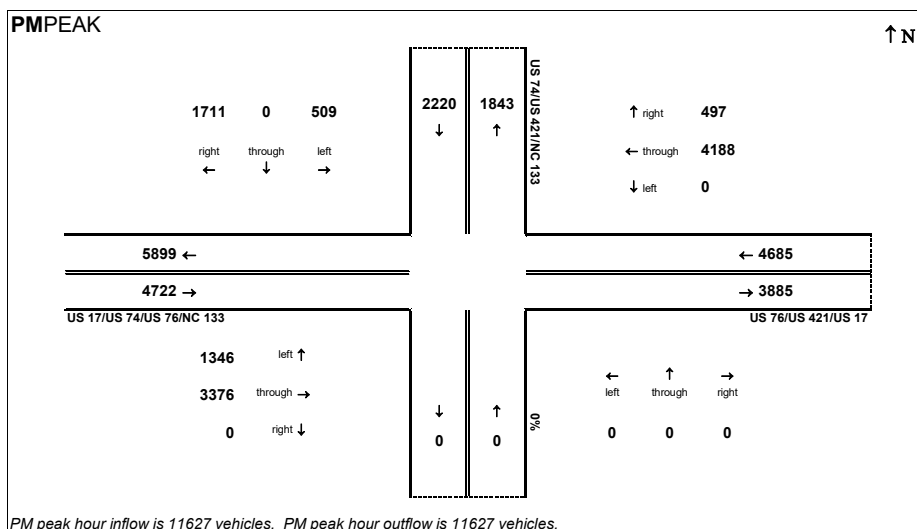
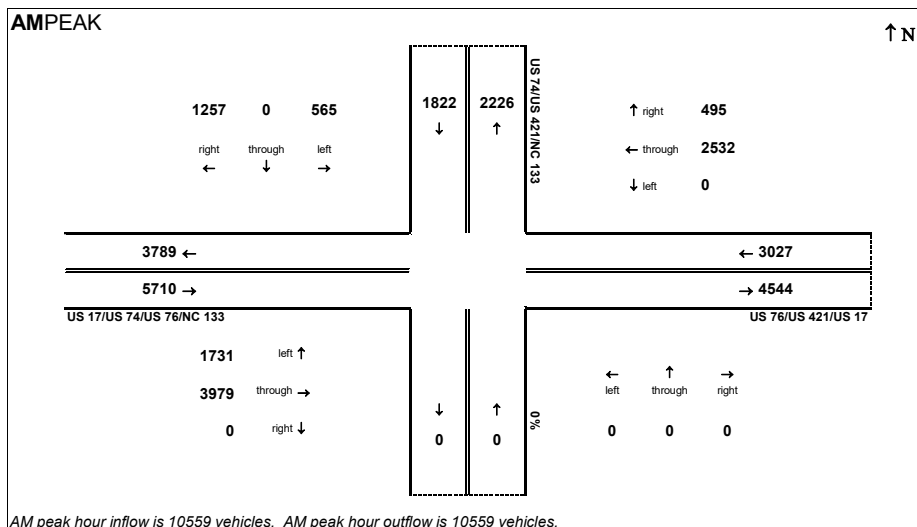
Peak Hour Volume Breakouts Report:
US 74/US 421/NC 133 at US 76/US 421/US 17

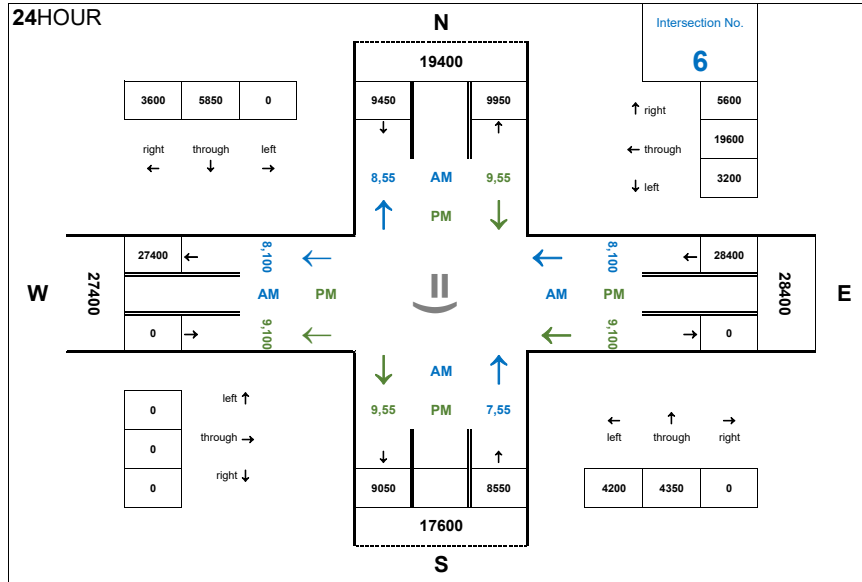
Traffic Forecast Release Date:

September-23

Traffic Data Year:
1/1/2050

Project:
HB-0039 2050 Build 2



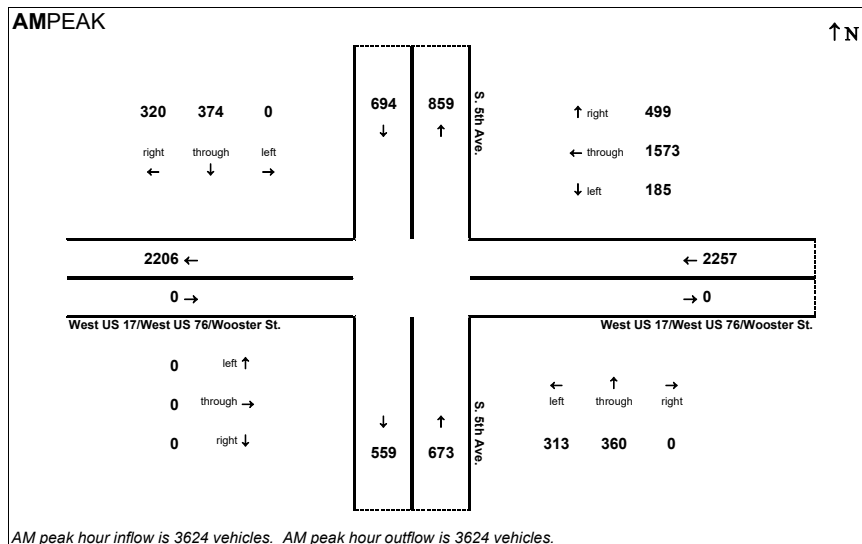


Peak Hour Volume Breakouts Report:
S. 5th Ave. at West US 17/West US 76/Wooster St.

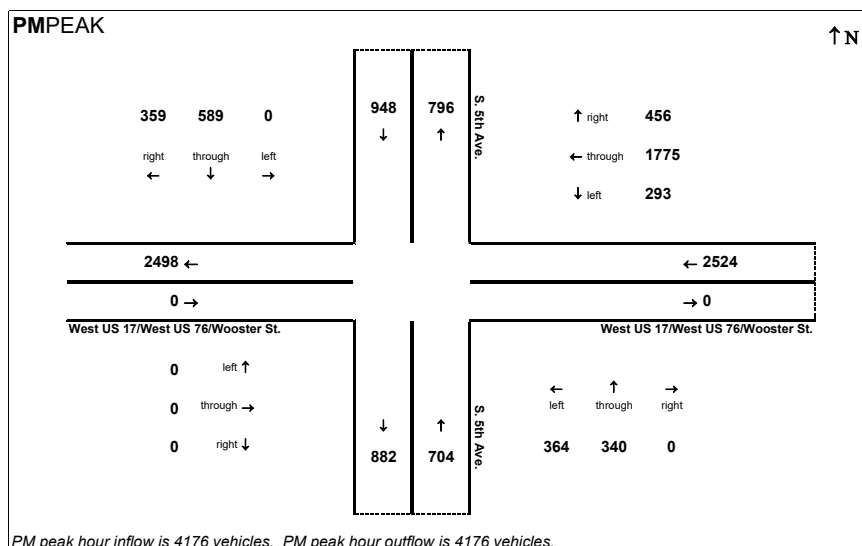
Traffic Forecast Release Date:
September-23

Traffic Data Year:
1/1/2050

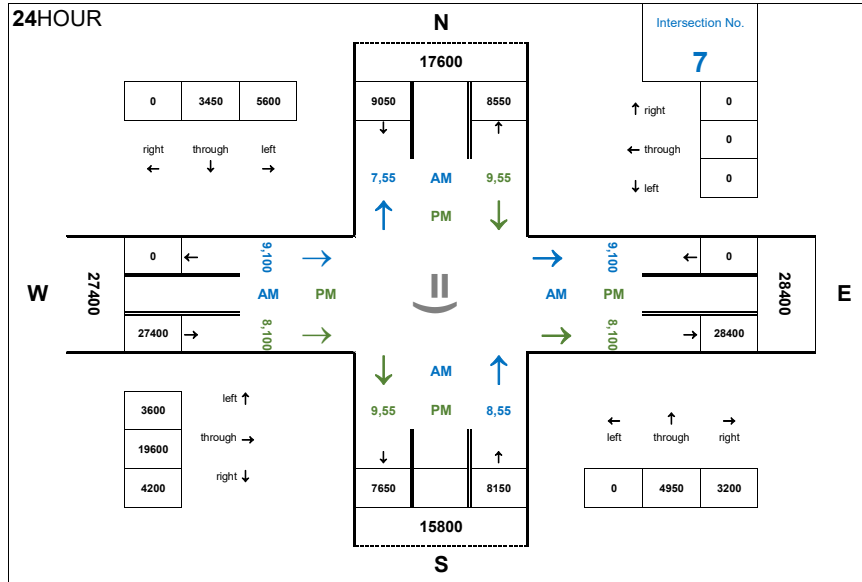
Project:
HB-0039 2050 Build 2



AM peak hour inflow is 3624 vehicles. AM peak hour outflow is 3624 vehicles.



PM peak hour inflow is 4176 vehicles. PM peak hour outflow is 4176 vehicles.

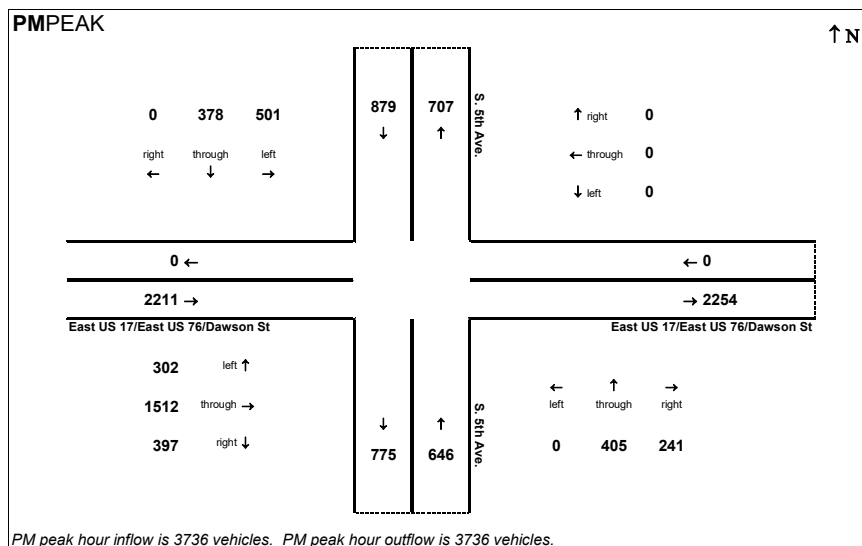
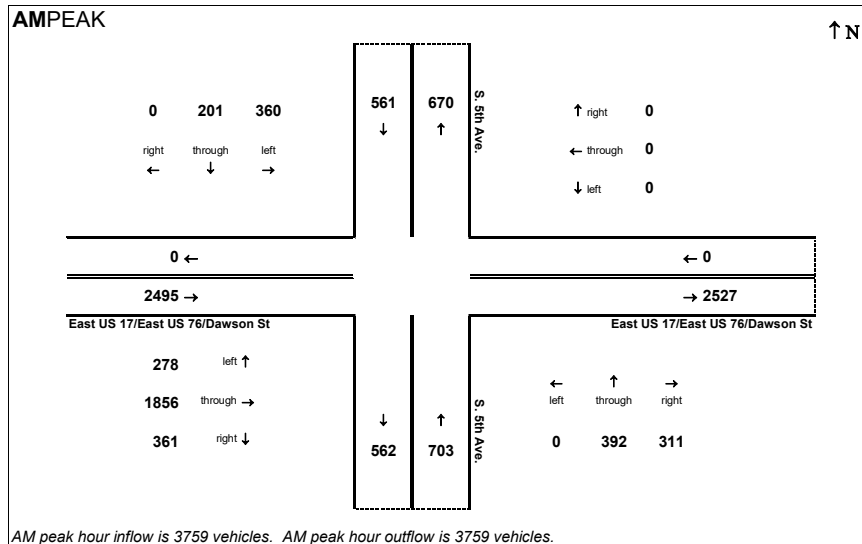


Peak Hour Volume Breakouts Report:
S. 5th Ave. at East US 17/East US 76/Dawson St.

Traffic Forecast Release Date:
September-23

Traffic Data Year:
1/1/2050

Project:
HB-0039 2050 Build 2



Appendix C:

Model Volume Validation

2023 No Build AM GEH Check

Movement	TMC Input	TransModeler Volume	Vol Diff	% Diff	GEH	Vol Threshold	Meet?	GEH Threshold	Meet?
11-WBT	1025	1014	-11	-1.0%	0.3	+/- 15%	Yes	< 5	Yes
11-WBT	1727	1806	79	4.6%	1.9	+/- 15%	Yes	< 5	Yes
12-EBT	2727	2831	104	3.8%	2.0	+/- 400 vph	Yes	< 5	Yes
12-EBT	1403	1400	-3	-0.2%	0.1	+/- 15%	Yes	< 5	Yes
13-SET	402	380	-22	-5.5%	1.1	+/- 100 vph	Yes	< 5	Yes
13-SET	2727	2831	104	3.8%	2.0	+/- 400 vph	Yes	< 5	Yes
14-SET	1403	1401	-2	-0.2%	0.1	+/- 15%	Yes	< 5	Yes
14-NWT	402	380	-22	-5.4%	1.1	+/- 100 vph	Yes	< 5	Yes
15-SBT	402	380	-22	-5.5%	1.1	+/- 100 vph	Yes	< 5	Yes
15-SBT	1025	1018	-7	-0.7%	0.2	+/- 15%	Yes	< 5	Yes
16-SBT	402	380	-22	-5.5%	1.1	+/- 100 vph	Yes	< 5	Yes
16-NBT	1403	1406	3	0.2%	0.1	+/- 15%	Yes	< 5	Yes
17-NBT	349	378	29	8.4%	1.5	+/- 100 vph	Yes	< 5	Yes
17-NBT	1403	1409	6	0.4%	0.2	+/- 15%	Yes	< 5	Yes
18-NWT	1727	1816	89	5.1%	2.1	+/- 15%	Yes	< 5	Yes
18-NWT	349	377	28	8.0%	1.5	+/- 100 vph	Yes	< 5	Yes
20-NBT	305	376	71	23.4%	3.9	+/- 100 vph	Yes	< 5	Yes
28-NBR	668	611	-57	-8.6%	2.3	+/- 100 vph	Yes	< 5	Yes
20-SBL	16	16	-1	-3.1%	0.1	+/- 100 vph	Yes	< 5	Yes
20-SBT	81	80	-1	-1.1%	0.1	+/- 100 vph	Yes	< 5	Yes
21-SBT	1093	1143	50	4.6%	1.5	+/- 15%	Yes	< 5	Yes
21-NBT	897	888	-9	-1.0%	0.3	+/- 15%	Yes	< 5	Yes
21-SBT	81	79	-2	-2.7%	0.2	+/- 100 vph	Yes	< 5	Yes
22-NBT	76	97	21	27.9%	2.3	+/- 100 vph	Yes	< 5	Yes
22-NBT	897	891	-6	-0.7%	0.2	+/- 15%	Yes	< 5	Yes
22-SBT	81	80	-1	-1.7%	0.2	+/- 100 vph	Yes	< 5	Yes
23-SET	1093	1155	62	5.6%	1.8	+/- 15%	Yes	< 5	Yes
23-SET	2108	2060	-49	-2.3%	1.1	+/- 15%	Yes	< 5	Yes
24-NWT	1544	1606	62	4.0%	1.6	+/- 15%	Yes	< 5	Yes
24-WBT	684	624	-60	-8.8%	2.3	+/- 100 vph	Yes	< 5	Yes
27-SET	2032	1958	-74	-3.6%	1.6	+/- 15%	Yes	< 5	Yes
27-SET	76	97	21	28.2%	2.3	+/- 100 vph	Yes	< 5	Yes
30-NBT	760	791	31	4.0%	1.1	+/- 15%	Yes	< 5	Yes
30-NBR	270	265	-5	-1.9%	0.3	+/- 100 vph	Yes	< 5	Yes
30-SBT	432	425	-7	-1.7%	0.4	+/- 100 vph	Yes	< 5	Yes
30-SBL	267	263	-4	-1.6%	0.3	+/- 100 vph	Yes	< 5	Yes
30-EBL	303	321	18	5.9%	1.0	+/- 100 vph	Yes	< 5	Yes
30-EBT	1284	1350	66	5.2%	1.8	+/- 15%	Yes	< 5	Yes
30-EBR	264	263	-1	-0.5%	0.1	+/- 100 vph	Yes	< 5	Yes
40-SBT	461	473	12	2.5%	0.5	+/- 100 vph	Yes	< 5	Yes
40-SBR	188	191	3	1.4%	0.2	+/- 100 vph	Yes	< 5	Yes
40-NBL	311	330	19	6.2%	1.1	+/- 100 vph	Yes	< 5	Yes
40-NBT	783	780	-3	-0.3%	0.1	+/- 15%	Yes	< 5	Yes
40-WBL	220	220	0	0.1%	0.0	+/- 100 vph	Yes	< 5	Yes
40-WBT	1102	1069	-33	-3.0%	1.0	+/- 15%	Yes	< 5	Yes
40-WBR	343	333	-10	-3.0%	0.6	+/- 100 vph	Yes	< 5	Yes
50-NBR	4	4	0	0.0%	0.0	+/- 100 vph	Yes	< 5	Yes
50-EBR	4	11	7	170.0%	2.5	+/- 100 vph	Yes	< 5	Yes
50-EBT	1809	1888	79	4.4%	1.8	+/- 15%	Yes	< 5	Yes
60-SBL	55	40	-15	-27.1%	2.2	+/- 100 vph	Yes	< 5	Yes
60-SBT	44	44	-1	-1.1%	0.1	+/- 100 vph	Yes	< 5	Yes
60-EBL	55	33	-22	-40.2%	3.3	+/- 100 vph	Yes	< 5	Yes
60-EBT	1748	1823	75	4.3%	1.8	+/- 15%	Yes	< 5	Yes
60-EBR	36	34	-2	-6.1%	0.4	+/- 100 vph	Yes	< 5	Yes
60-NBT	63	61	-2	-3.8%	0.3	+/- 100 vph	Yes	< 5	Yes
60-NBR	39	39	0	-0.3%	0.0	+/- 100 vph	Yes	< 5	Yes
70-WBL	30	15	-16	-51.7%	3.3	+/- 100 vph	Yes	< 5	Yes
70-WBT	1544	1557	13	0.8%	0.3	+/- 15%	Yes	< 5	Yes
70-WBR	67	67	0	-0.3%	0.0	+/- 100 vph	Yes	< 5	Yes
70-SBR	43	38	-5	-10.7%	0.7	+/- 100 vph	Yes	< 5	Yes
70-SBT	69	68	-1	-1.0%	0.1	+/- 100 vph	Yes	< 5	Yes
70-NBL	44	23	-21	-47.3%	3.6	+/- 100 vph	Yes	< 5	Yes
70-NBT	74	69	-5	-6.9%	0.6	+/- 100 vph	Yes	< 5	Yes

2023 No Build PM GEH Check

Movement	TMC Input	TransModeler Volume	Vol Diff	% Diff	GEH	Vol Threshold	Meet?	GEH Threshold	Meet?
11-WBT	1394	1374	-20	-1.5%	0.6	+/- 15%	Yes	< 5	Yes
11-WBT	2877	2796	-81	-2.8%	1.5	+/- 400 vph	Yes	< 5	Yes
12-EBT	2318	2295	-23	-1.0%	0.5	+/- 15%	Yes	< 5	Yes
12-EBT	1102	1094	-8	-0.7%	0.2	+/- 15%	Yes	< 5	Yes
13-SET	351	332	-19	-5.3%	1.0	+/- 100 vph	Yes	< 5	Yes
13-SET	2318	2297	-21	-0.9%	0.4	+/- 15%	Yes	< 5	Yes
14-SET	1102	1095	-7	-0.6%	0.2	+/- 15%	Yes	< 5	Yes
14-NWT	351	333	-18	-5.2%	1.0	+/- 100 vph	Yes	< 5	Yes
15-SBT	351	332	-19	-5.5%	1.1	+/- 100 vph	Yes	< 5	Yes
15-SBT	1394	1377	-17	-1.2%	0.5	+/- 15%	Yes	< 5	Yes
16-SBT	351	332	-19	-5.5%	1.1	+/- 100 vph	Yes	< 5	Yes
16-NBT	1102	1101	-1	-0.1%	0.0	+/- 15%	Yes	< 5	Yes
17-NBT	345	329	-16	-4.7%	0.9	+/- 100 vph	Yes	< 5	Yes
17-NBT	1102	1103	1	0.0%	0.0	+/- 15%	Yes	< 5	Yes
18-NWT	2877	2805	-72	-2.5%	1.3	+/- 400 vph	Yes	< 5	Yes
18-NWT	345	330	-16	-4.5%	0.8	+/- 100 vph	Yes	< 5	Yes
20-NBT	213	232	19	8.7%	1.2	+/- 100 vph	Yes	< 5	Yes
28-NBR	1099	1055	-44	-4.0%	1.4	+/- 15%	Yes	< 5	Yes
20-SBL	92	91	-1	-0.7%	0.1	+/- 100 vph	Yes	< 5	Yes
20-SBT	297	296	-1	-0.2%	0.0	+/- 100 vph	Yes	< 5	Yes
21-SBT	865	913	48	5.6%	1.6	+/- 15%	Yes	< 5	Yes
21-NBT	1270	1256	-14	-1.1%	0.4	+/- 15%	Yes	< 5	Yes
21-SBT	297	293	-5	-1.5%	0.3	+/- 100 vph	Yes	< 5	Yes
22-NBT	42	26	-16	-38.8%	2.8	+/- 100 vph	Yes	< 5	Yes
22-NBT	1270	1261	-9	-0.7%	0.3	+/- 15%	Yes	< 5	Yes
22-SBT	297	295	-2	-0.7%	0.1	+/- 100 vph	Yes	< 5	Yes
23-SET	865	922	57	6.5%	1.9	+/- 15%	Yes	< 5	Yes
23-SET	1738	1715	-23	-1.3%	0.6	+/- 15%	Yes	< 5	Yes
24-NWT	2048	2030	-18	-0.9%	0.4	+/- 15%	Yes	< 5	Yes
24-WBT	1191	1145	-46	-3.9%	1.4	+/- 15%	Yes	< 5	Yes
27-SET	1696	1687	-9	-0.5%	0.2	+/- 15%	Yes	< 5	Yes
27-SET	42	26	-16	-39.0%	2.8	+/- 100 vph	Yes	< 5	Yes
30-NBT	597	624	27	4.6%	1.1	+/- 100 vph	Yes	< 5	Yes
30-NBR	272	265	-7	-2.4%	0.4	+/- 100 vph	Yes	< 5	Yes
30-SBT	704	692	-12	-1.7%	0.5	+/- 100 vph	Yes	< 5	Yes
30-SBL	261	265	4	1.5%	0.2	+/- 100 vph	Yes	< 5	Yes
30-EBL	199	217	18	9.1%	1.3	+/- 100 vph	Yes	< 5	Yes
30-EBT	1081	1092	11	1.0%	0.3	+/- 15%	Yes	< 5	Yes
30-EBR	369	365	-4	-1.0%	0.2	+/- 100 vph	Yes	< 5	Yes
40-SBT	705	705	0	0.0%	0.0	+/- 15%	Yes	< 5	Yes
40-SBR	288	317	29	10.1%	1.7	+/- 100 vph	Yes	< 5	Yes
40-NBL	283	333	50	17.5%	2.8	+/- 100 vph	Yes	< 5	Yes
40-NBT	514	509	-6	-1.1%	0.2	+/- 100 vph	Yes	< 5	Yes
40-WBL	256	262	6	2.5%	0.4	+/- 100 vph	Yes	< 5	Yes
40-WBT	1279	1368	89	7.0%	2.4	+/- 15%	Yes	< 5	Yes
40-WBR	287	290	3	1.2%	0.2	+/- 100 vph	Yes	< 5	Yes
50-NBR	4	4	0	2.5%	0.0	+/- 100 vph	Yes	< 5	Yes
50-EBR	4	10	6	147.5%	2.2	+/- 100 vph	Yes	< 5	Yes
50-EBT	1604	1611	7	0.4%	0.2	+/- 15%	Yes	< 5	Yes
60-SBL	79	62	-17	-21.6%	2.0	+/- 100 vph	Yes	< 5	Yes
60-SBT	94	94	0	-0.1%	0.0	+/- 100 vph	Yes	< 5	Yes
60-EBL	59	38	-21	-35.9%	3.0	+/- 100 vph	Yes	< 5	Yes
60-EBT	1524	1539	15	1.0%	0.4	+/- 15%	Yes	< 5	Yes
60-EBR	47	44	-3	-6.4%	0.4	+/- 100 vph	Yes	< 5	Yes
60-NBT	79	76	-3	-3.9%	0.4	+/- 100 vph	Yes	< 5	Yes
60-NBR	40	40	0	1.0%	0.1	+/- 100 vph	Yes	< 5	Yes
70-WBL	42	24	-18	-42.4%	3.1	+/- 100 vph	Yes	< 5	Yes
70-WBT	1723	1838	115	6.7%	2.7	+/- 15%	Yes	< 5	Yes
70-WBR	78	79	1	1.3%	0.1	+/- 100 vph	Yes	< 5	Yes
70-SBR	64	57	-7	-10.6%	0.9	+/- 100 vph	Yes	< 5	Yes
70-SBT	131	133	2	1.2%	0.1	+/- 100 vph	Yes	< 5	Yes
70-NBL	50	28	-22	-43.8%	3.5	+/- 100 vph	Yes	< 5	Yes
70-NBT	87	84	-3	-3.8%	0.4	+/- 100 vph	Yes	< 5	Yes

Appendix D:

Proposed Concepts



Appendix C

Hydraulic Planning Report



NCDOT - HYDRAULIC PLANNING REPORT



TIP/PROJECT NO.

HB-0039

WBS ELEMENT NO.

50603.1.1

PROJECT DESCRIPTION:

REPLACEMENT OF BRIDGE NUMBER 640013 (CAPE FEAR MEMORIAL BRIDGE) OVER THE CAPE FEAR RIVER.
A: Movable 65' Min Vertical Clearance and 135' Max Vertical Clearance.
B: Fixed 135' Vertical Clearance
C: Fixed 65' Vertical Clearance

PROPOSED RDWY TYPICAL:

EXISTING RDWY TYPICAL:

COUNTY:

DIVISION:

DESIGNER:

DATE:

SEAL:

PREPARED BY:

555 Fayetteville Street, Suite 900, Raleigh, NC 27601
(919) 232 6600
NC License No. F-0116

PROJECT MANAGER:

QA REVIEWED BY:



PROJECT NUMBER: HB-0039	DATE: 3/18/2024
WBS ELEMENT #: 50603.1.1	DESIGN FIRM: HDR
COUNTY: New Hanover	DESIGNED BY: JOSHUA MASSROCK, PE
DIVISION: 3	REVIEWED BY:

NCDOT - HPR

GENERAL INFORMATION

MISCELLANEOUS PROJECT INFORMATION ⓘ

The Cape Fear River is designated as a warm water stream for the purposes of stream mitigation. There are no existing stormwater treatment devices in the project vicinity.

The Cape Fear River has not been designated as an Outstanding Resource Water (ORW). There are no designated High Quality Waters (HQW) or water supply watersheds (WS-I or WS-II) within the study area, or within 1.0 mile downstream of the study area. The portion of the Cape Fear River (AU segments 18-(71)a2a and 18-(71)a2b) within the project study area was identified on the North Carolina 2022 Final 303(d) list. The Brunswick River (AU segments 18-77a, and 18-77b), and Alligator Creek (AU Segment 29-33-1-1) located within a mile of the project study area were identified on the Final 2022 303(d) list.

The Cape Fear River falls within AE with Base Flood Elevations (BFE) of 9 feet.

Division 3 has indicated that there are not any current or historical flooding issues in the project corridor. The highest the water has been was during the weeks following Hurricanes Matthew and Florence when the river would swell during the tide cycles.

GREEN SHEET COMMITMENTS

FEMA INVOLVEMENT?

☒ YES ☐ NO

Hydraulics Unit commitment: The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (FMP) to determine status of project with regard to applicability of NCDOT's Memorandum of Agreement, or approval of a Conditional Letter of Map Revision (CLOMR)* and subsequent final Letter of Map Revision (LOMR).

Highway Division commitment: This project involves construction activities on or adjacent to FEMA-regulated stream(s). Therefore, the Division shall submit sealed As-built construction plans to the Hydraulics Unit upon completion of structure construction, certifying that the drainage structure(s) and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

RISK IDENTIFICATION

There are historic properties within the study area for the bridge replacement.

There is a presence of the Northern long-eared bat which is on the endangered species list. This project is likely to adversely affect this species.

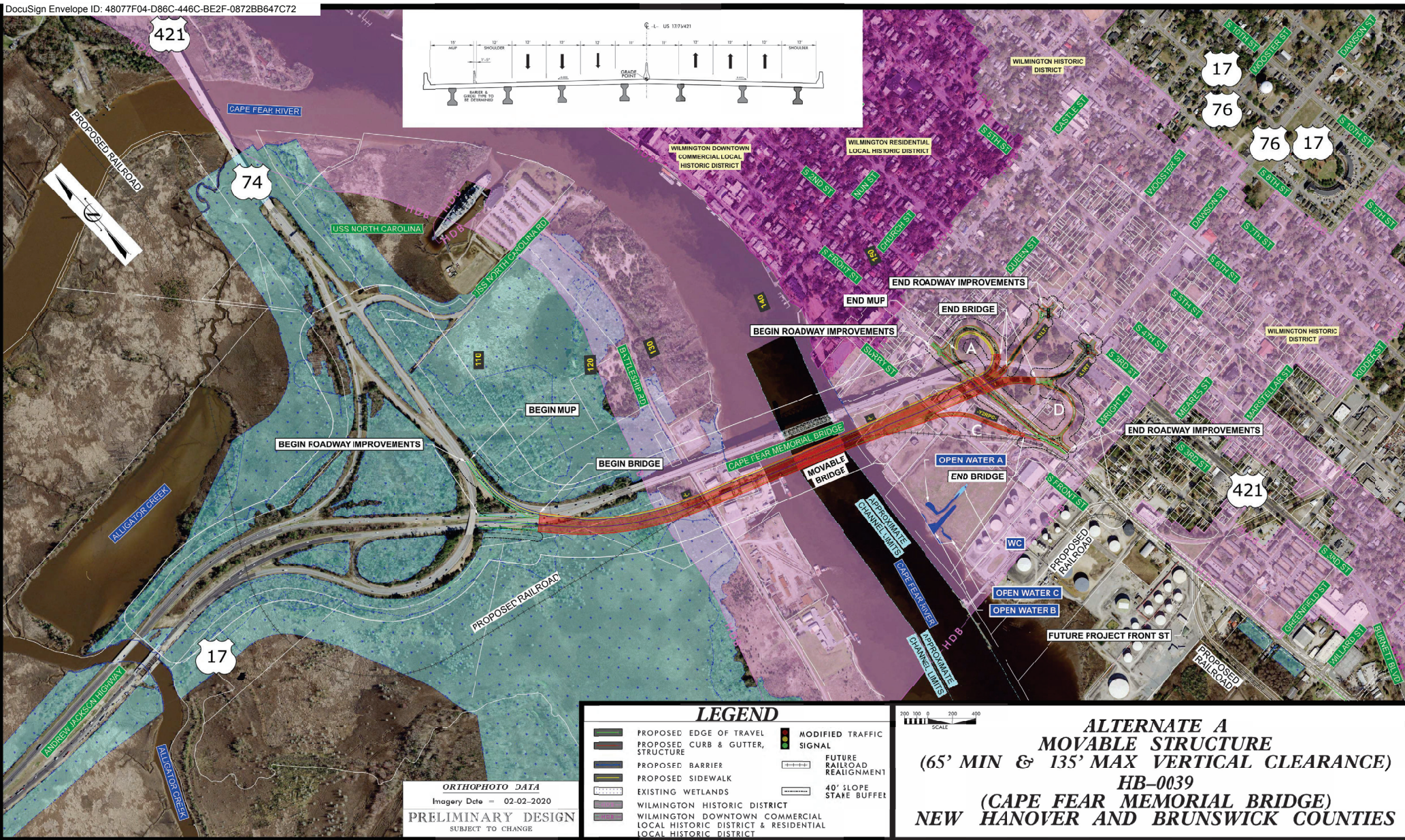
The NMFS has identified the Cape Fear River as an Essential Fish Habitat. The bridge replacement could include footings to be placed within designated EFH.

The Cape Fear River has been designated as an anadromous fish spawning area by the North Carolina Division of Marine Fisheries (NCDMF) and the North Carolina Wildlife Resource Commission (NCWRC). Also, the Cape Fear River is identified as a primary nursery area by NCDMF. The Cape Fear River is also identified as a sturgeon spawning water by NMFS. An in-water construction moratorium is in effect from February 1 through June 30 for these waters.

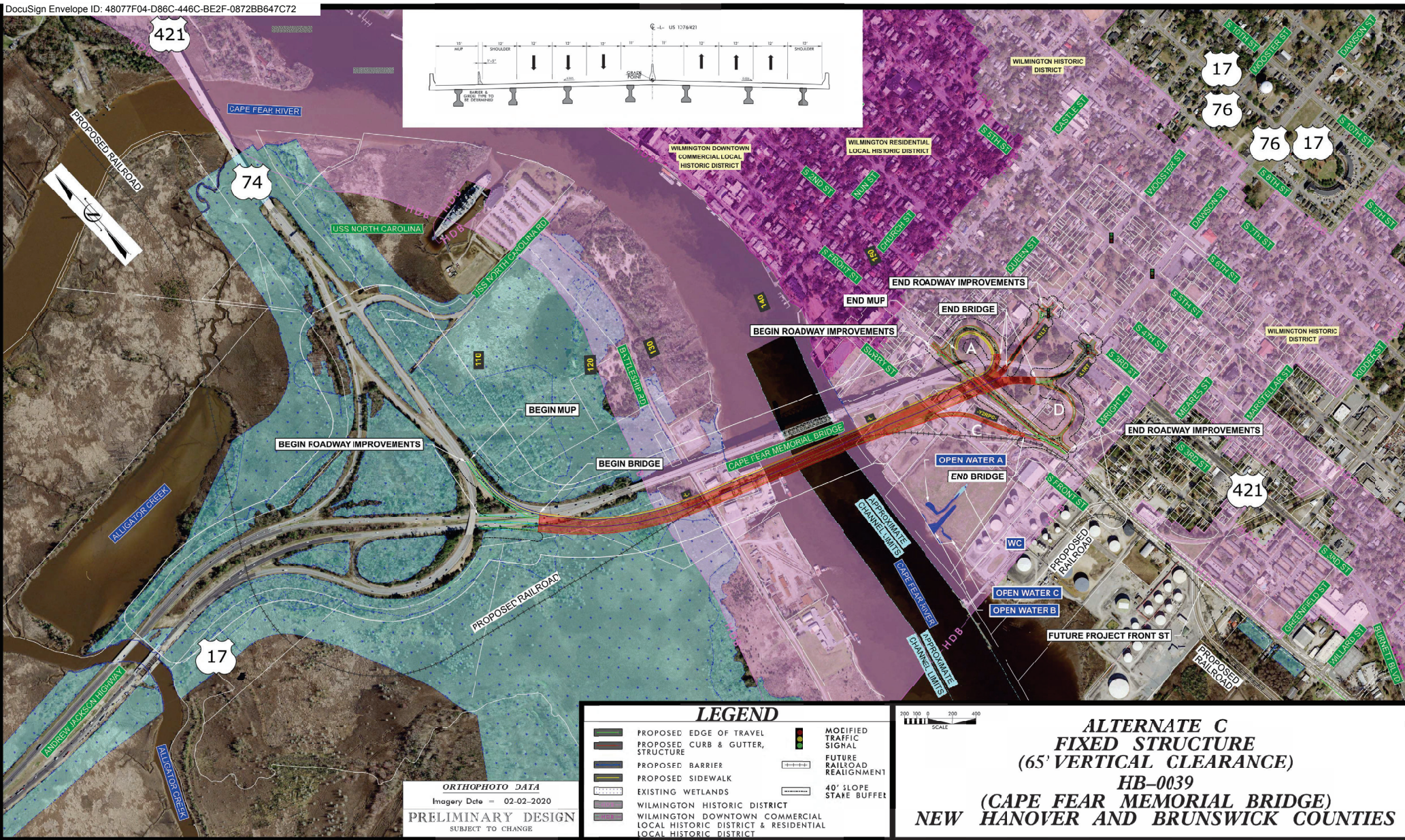
AVOIDANCE AND MINIMIZATION

Avoidance and minimization measures will be implemented throughout the project development process.

When feasible, steepened slopes will be utilized to minimize wetland and stream impacts on Eagle Island, grass-lined ditches will be implemented to provide treatment for stormwater discharges, and retaining walls will be utilized in locations to limit impacts to the adjacent historic properties.



ALTERNATE B
FIXED STRUCTURE
(135' VERTICAL CLEARANCE)
HB-0039
(CAPE FEAR MEMORIAL BRIDGE)
NEW HANOVER AND BRUNSWICK COUNTIES



PROJECT NUMBER: HB-0039

WBS ELEMENT #: 50603.1.1

COUNTY: New Hanover

DIVISION: 3



PRELIMINARY HYDRAULIC RECOMMENDATIONS FOR MAJOR CROSSINGS

DATE: 3/13/2024

DESIGN FIRM: HDR

DESIGNED BY: JOSHUA MASSROCK, PE

REVIEWED BY:

SITE NUMBER	ALTERNATIVE ID (2)	ROUTE	STATION	LAT	LONG	STREAM/ WETLAND ID	STREAM NAME	FEMA STUDY TYPE	DRAINAGE AREA (Mi^2)	EXISTING STRUCTURE	MINIMUM RECOMMENDED STRUCTURE	Notes
										Number, Size, Structure Type	Number, Size, Structure Type	
1	CAPE FEAR MEMORIAL BRIDGE	US17, US74, US421	-L- 161+40	34.2274	-77.9519	18-(71)	CAPE FEAR RIVER	DETAILED	8810	640013, 65' VERTICAL CLEARANCE, TRUSS LIFT SPAN AND RC DECK ON STL. GDRS.	640013 ALT. A - 500' MOVABLE SPAN 65' VERTICAL CLEARANCE, 6.5' SUPERSTRUCTURE DEPTH ALT. B - 500' FIXED SPAN 135' VERTICAL CLEARANCE W/ 300' FLANKING SPANS, 28' SUPERSTRUCTURE DEPTH ALT. C - 500' FIXED SPAN 65' VERTICAL CLEARANCE W/ 300' FLANKING SPANS, 28' SUPERSTRUCTURE DEPTH - TYPICAL 120' APPROACH SPANS FOR ALL OPTIONS	ALL ALTERNATIVES ARE HYDRAULICALLY ADEQUATE

NOTES:
(1) Major Crossings - conveyance greater than 30 square feet or more.
(2) Complete Table for all Roadway projects (Not necessary for Structure replacement projects)
(3) Provided in planning document
(4) Mark N/A for Site No. if no major drainage structures.



Site Data

1 Existing Structure

The Cape Fear River crossing is located 0.35 miles east of the NC 133 intersection with US 17/US 76/US 421. The existing bridge structure (#640013) is a truss lift span on steel deck with open grid. There are 35 spans along its length with the movable bridge portion spanning the Cape Fear River main channel. The bridge is hydraulically adequate as it was designed for ship passage and is well above any increased water surface elevations from large rainfall events. The construction of the existing bridge was completed in 1969 and is coming to the end of its functional lifespan. Scheduled maintenance and repairs have prolonged its life, but it needs replacement due to increased traffic and population growth that the existing structure cannot support.

Structure Safety Reports compiled for NCDOT indicate the bridge condition was rated fair to satisfactory in 2023. The deck and substructure Condition Ratings were both rated satisfactory, and the superstructure was rated fair. These elements were awarded a grade of six out of nine and five out of nine respectively under the National Bridge Inventory Condition Ratings. Repair and maintenance costs are expected to increase as the bridge ages and traffic increases. In 2019, approximately \$15 million was spent on a major rehabilitation for the bridge, and average annual maintenance costs were estimated at \$550,000.

Division 3 has indicated that there are not any current or historical flooding issues in the project corridor. The highest the water has been was during the weeks following Hurricanes Matthew and Florence when the river would swell during the tide cycles.

2 Existing Channel

The Wilmington Harbor originates offshore and extends approximately 38 miles from the Atlantic Ocean and up the Cape Fear River to the City of Wilmington. The harbor features a channel depth of 42 ft and width of 500 ft. The existing channel width at the Cape Fear Memorial Bridge is approximately 460 ft. The existing Cape Fear Memorial Bridge has a vertical lift span with a navigation clearance of 408 ft and vertical clearance of 65 ft at rest or 135 ft with the lift span raised. According to hydrographic surveys from 2023, the upstream depth of the channel is 32 ft and downstream is 38 ft.

3 Upstream and Downstream Structures

The upstream structure Bridge 640011 is approximately 1.8 miles upstream of the existing Cape Fear Memorial Bridge location. The structure is a draw bridge with 46' of vertical clearance at low tide. The confluence with the Atlantic Ocean is located approximately 25 miles downstream of the existing bridge location.



4 Site Hydrology

Water resources in the study area are part of the Cape Fear River basin. There is one major crossing within the study area. There are no riparian buffers and it is not located within a water supply critical area. The Cape Fear River is on the 2022 303d list for dissolved oxygen, hexavalent chromium fish tissue advisory, and arsenic fish tissue advisory. The river is listed as a class SC water which refers to all tidal salt waters protected for aquatic life propagation, survival, and maintenance of biological integrity (including fishing, fish (not to include shellfish for market purposes), and Primary Nursery Areas); wildlife; and secondary contact recreation. Secondary contact recreation activities can be summarized as wading, boating, other uses not involving human body contact with the water, and activities involving human body contact with the water where such activities take place on an infrequent, unorganized, or incidental basis.

The existing crossing receives flow from approximately 8810 sq. miles which is predominantly rural area at 2.7% impervious. The drainage basin currently has land uses of mostly forest and farmland with smaller areas of developed urban land use. There are many adjacent wetlands on Eagle Island within the project vicinity.

The Cape Fear River is under tidal influence at the project location due to the close proximity to the confluence with the Atlantic Ocean. According to NOAA, sea levels are expected to rise 3.5'-5' by the year 2100. This future rise is reflected in the profiles for the three alternative designs as well as in Table 3. Due to the tidally influenced location, the sea level rise prediction was used as a future condition analysis in place of increased impervious area assumptions within the drainage area.

Advanced coastal hydraulic modeling which incorporates sea level rise, tropical event storm surge, tropical event wave height, and tidal influence, is anticipated to aid in setting bridge and approach roadway elevations, as well as evaluating scour.

The drainage basin was mapped for the river crossing using USGS StreamStats Version 4.1.8: North Carolina. Table 1 contains the measured drainage basin area for the corridor river crossing.

Table 1: Stream crossing requiring conveyance larger than 30 Sq. Feet

Site	Relative Road Location	Stream Crossing	Drainage Area (Sq Mi) ¹	Est. Length (mi)	Land Usage Urban/Rural	IA% ²	Stream Class ³
1	0.35 miles east of the US 133 intersection with US 17/US 76/US 421	Cape Fear River	8810	312	Rural	2.7	SC

¹ Drainage Areas from USGS StreamStats for North Carolina

² Impervious Area Estimates from USGS StreamStats for North Carolina, 2011 National Land Use Data Set

³ Stream Classifications per NC Dept. of Environmental Quality, Division of Water Resources



Table 2: Cape Fear River Discharge (cfs)

	Q10	Q50	Q100	Q500
StreamStats- Existing (2.7%) Impervious Area	66,200	105,000	121,000	161,000

¹ Impervious Area Estimate from USGS StreamStats for North Carolina, 2011 National Land Use Data Set

² Magnitude and frequency of floods for rural streams in Georgia, South Carolina, and North Carolina, 2017—Results: U.S. Geological Survey Scientific Investigations Report 2023–5006, 75 p

Table 3: Water Surface Elevation (ft)

	BFE	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
Water Surface Elevation from FIRM	9	5.9	7.5	8.5	9	12
Water Surface Elevation w/ Anticipated Sea Level Rise of +5 ft	14	10.9	12.5	13.5	14	17

¹ Elevations from DFIRM dated 08/28/2018 Datum NAVD 1988

5 Floodplain and Permit Requirements

The proposed alignment stream crossing was evaluated against the NC Floodplain Mapping Program regulated floodplains and are listed in Table 4. The Cape Fear River falls within AE with Base Flood Elevations (BFE) of 9 feet. The current FEMA DFIRMs shows that there are many insurable structures in the upstream floodplain. The flood source is the Atlantic Ocean. The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (NCFMP), to determine status of the project with regard to applicability of NCDOT'S State Floodplain Compliance (SFC), or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR). An MOA (SFC) submittal is anticipated.

The project involves construction activities on or adjacent to FEMA-regulated stream(s). This requires the Division to submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structure(s) and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.



Table 4: Floodplain Designations in Study Area.

Site	Stream Name	County	Zone X (500-yr or future)	Zone A	Zone AE	Zone AEFW
1	Cape Fear River	New Hanover			■	

The proposed project is a linear transportation project, and as a result, a Nationwide Permit (NWP) 14 will likely be applicable. Section 404 jurisdictional areas (waters of the U.S.) within the project include the Cape Fear River. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a 404 permit is required, then a Section 401 Water Quality Certification (WQC) from the North Carolina Department of Water Resources (NCDWR) will be needed. As New Hanover and Brunswick counties are both within the Coastal Area Management Act (CAMA), a CAMA permit for both counties will be needed. An MOA (SFC) submittal is anticipated.

6 Detour

The location of the options for replacement structures is approximately 250 ft downstream of the existing bridge location. This will allow traffic to be maintained on the existing structure throughout the new bridge construction.

7 Design Concerns

The functional designs are not anticipated to impact the upstream floodplain and adjacent properties. The alternatives are not hydraulically constrained, and the majority of the adjacent wetlands will be spanned by the structures to minimize impacts. When feasible, steepened slopes will be utilized to minimize wetland and stream impacts on Eagle Island, grass-lined ditches will be implemented to provide treatment for stormwater discharges, and retaining walls will be utilized in locations to limit impacts to the adjacent historic properties.

The total area of the structure components in the floodplain are expected to be less than or equal to existing. There were no observed existing stormwater basins in the project vicinity. Preliminary hydroplaning analysis results indicate no areas of hydroplaning concern with the functional design.

8 Proposed Alternative Bridge and Roadway Designs

The complexity of the location and existing bridge condition have created the need for multiple alternatives to the proposed bridge design. Contributing factors for the selection of the three



designs are adjacent historic properties, public opinion, and the need for a minimum vertical clearance of 135 ft for large ship passage.

The proposed typical section for all bridge options is a 6-lane divided (22' median with concrete barrier) with curb and gutter, and multi-use path. The structure is anticipated to be approximately 135' bridge width.

8.1 Alternative A: Movable Bridge Structure

The Cape Fear Memorial Bridge has become a defining landmark in Wilmington. The silhouette has developed into an icon that is used in many promotional materials for the city. As such, the first alternative proposed for the replacement of the existing movable bridge is a new movable bridge with clearances that match those enabled in the existing structure. The movable crossing with 65' min to 135' max vertical clearance involves a 500' main span steel truss lift bridge and associated prestressed girder approach spans. The superstructure depth would be 6.5' for the 500' span over the channel with typical approach spans of 120'. Deck drains would be utilized on the bridge for drainage at approximately 12' increments. The alternative ties back to S. 3rd St. with realignments of the Y2 access loops and ramps.

This option maintains the existing structure design while adding width for additional traffic lanes and pedestrian paths. The mechanics of a moveable structure, however, require more maintenance than a fixed structure and has the potential to shut down traffic on the bridge when repairs are needed.

The functional design of the movable structure is not hydraulically constrained.

8.2 Alternative B: Segmental Box Girder Structure with 135' Vertical Clearance

Alternative B consists of a fixed segmental structure with 135' clearance. The main channel span is 500' with flanking spans of 300' each and typical approach spans of 120'. The superstructure depth is 28'. Deck drains would be utilized on the bridge for drainage at approximately 12' increments. This alternative Includes reconstruction of the US17/US74/US421 interchange on Eagle Island and ties back to S. 4th St. The loops for access to S. Front St. would be reconfigured and realigned into raised options with a need for extended bridge connections.

This option has a much higher impact to adjacent historic areas in Wilmington and wetland areas on Eagle Island as well as significantly longer bridge lengths compared to the first alternative.

The functional design of the fixed structure is not hydraulically constrained.

8.3 Alternative C: Segmental Box Girder Structure with 65' Vertical Clearance

Alternative C consists of a fixed segmental structure with 65' clearance. The main channel span is 500' with flanking spans of 300' each and typical approach spans of 120'. The superstructure



Project: HB-0039
WBS: 50603.1.1
County: New Hanover
Date: 04/08/2024

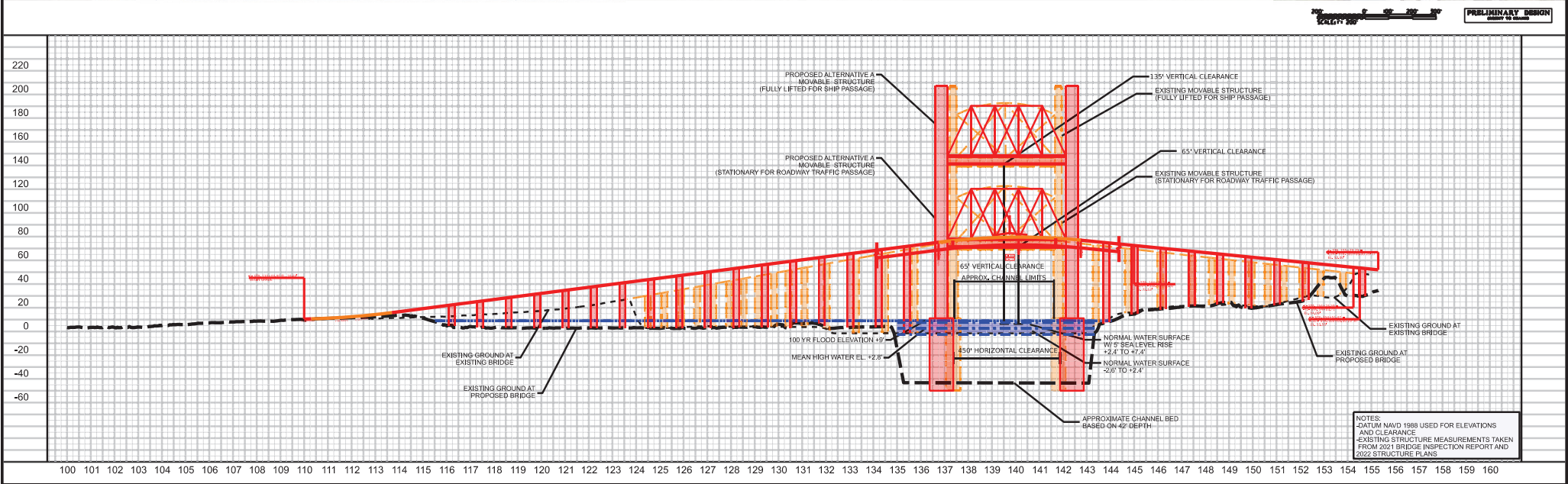
depth is 28'. Deck drains would be utilized on the bridge for drainage at approximately 12' increments. The alternative ties back to S. 3rd St. with realignments of the Y2 access loops and ramps.

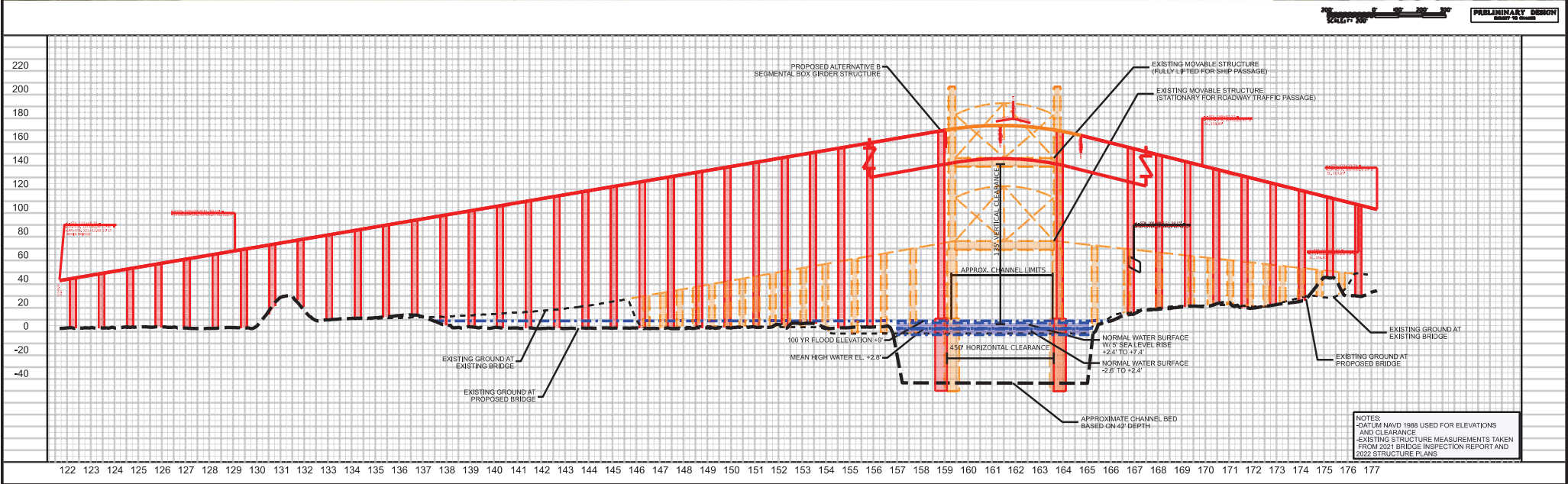
This option maintains the lower impact footprint of Alternative A but does not provide the vertical clearance for ship passage that alternatives A and B provide. This option also significantly reduces presumed maintenance costs associated with the moveable structure while adding width for additional traffic lanes and pedestrian paths.

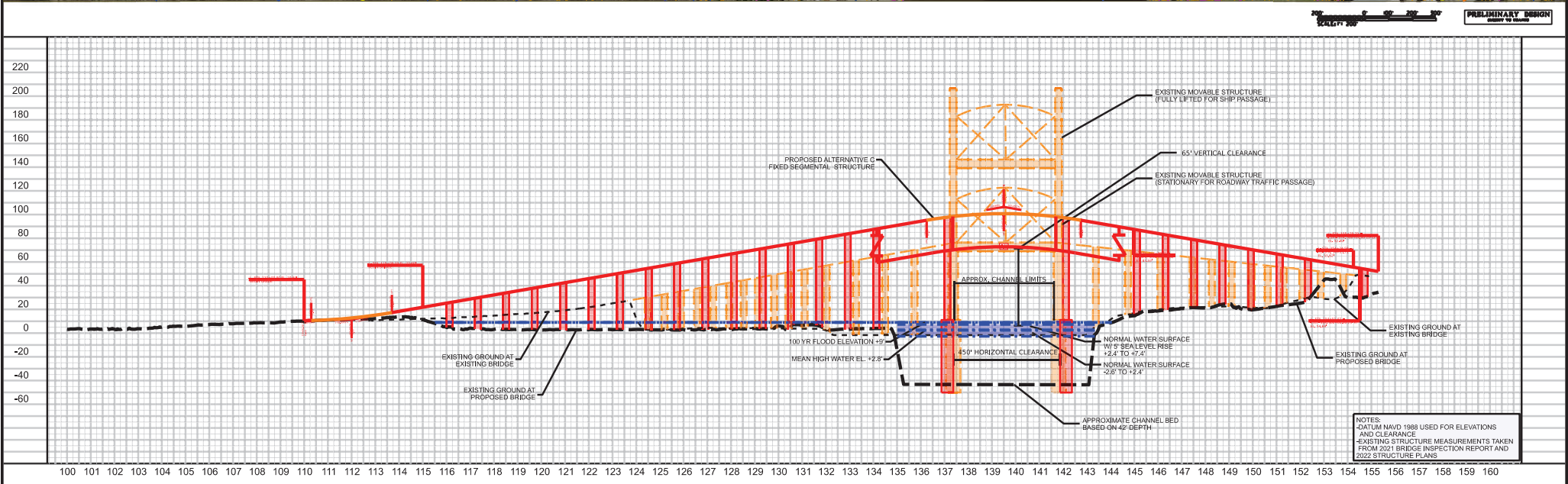
The functional design of the fixed structure is not hydraulically constrained.



PROJ. REFERENCE NO.		SHEET NO.	TOTAL SHEETS
HB-0039			
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
		ALT A	







National Flood Hazard Layer FIRMMette



77°57'25"W 34°13'54"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		8 Coastal Transect
		512 Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/25/2024 at 1:50 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

0 250 500 1,000 1,500 2,000 Feet

1:6,000

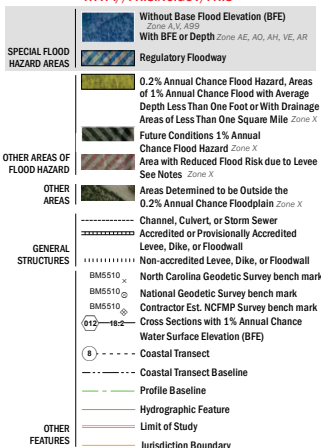
77°56'48"W 34°13'24"N

Basemap Imagery Source: USGS National Map 2023



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTP://FRIS.NC.GOV/FRIS](http://FRIS.NC.GOV/FRIS)



NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-368-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) (revising portions of this panel, and digital versions of this FIRM) may be available. Visit the North Carolina Floodplain Mapping Program website at <http://www.ncfloodmaps.com> or contact the FEMA Map Service Center.

Communities desiring land adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM panel. These may be ordered directly from the Map Service Center of the number listed above. For community and countywide map data refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-358-4800.

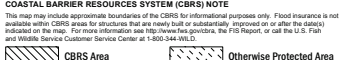
Flood Insurance Study (FIS) means an examination, evaluation, and determination of flood hazards, corresponding water surface elevations, flood hazard risk zones, and other flood data is a community issued by the North Carolina Floodplain Mapping Program (NCFMP). The Flood Insurance Study (FIS) is comprised of the following products used together: the Digital Flood Hazard Database, the Water Surface Elevation Station, the digitally derived, automated Flood Insurance Rate Map and the Flood Insurance Survey Report. A Flood Insurance Survey is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. This report contains detailed flood elevation data, data tables and FIRM indices. When a flood study is completed for the NCFMP, the digital information, reports and maps are assembled into an FIS. Information shown on this FIRM is provided in digital format by the NCFMP. Base map information shown on this FIRM is provided in digital format by the NCFMP. The source of the information can be determined from the metadata available in the digital FIRM database and in the Technical Support Data Notebook (TSDB).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk to residential risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA website at <http://www.fema.gov/business/floodinfo.cfm>.

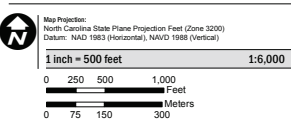
PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 requirements, FEMA will remove the flood insurance and floodproofing or other protective measures from the area. To mitigate flood risk to residential risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA website at <http://www.fema.gov/business/floodinfo.cfm>.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LMWA). The LMWA represents the approximate landward limit of the 1-5 foot breaking wave. The effects of wave heights between the VE Zone and the LMWA (if between the shoreline and the LMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

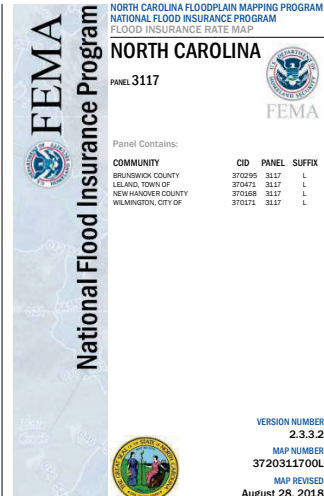
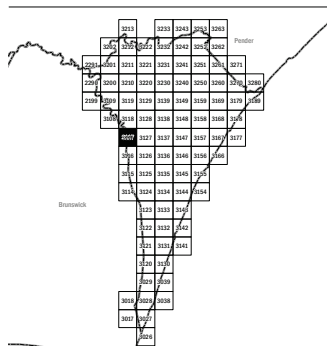
COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE
This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved or for the structures indicated on the map. For more information see <http://www.fema.gov/cbrs>, the FIS report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-6843.



SCALE



PANEL LOCATOR



Field Photos Taken 2/1/2024



Figure 1: Cape Fear Memorial Bridge Looking Downstream



Figure 2: Cape Fear Memorial Bridge Looking Downstream from Wilmington Downtown Riverwalk.



Figure 3: Cape Fear Memorial Bridge Looking Downstream Towards West Bank from Wilmington Downtown Riverwalk.



Figure 4: Cape Fear River Looking Upstream from Wilmington Downtown Riverwalk.



Figure 5: Cape Fear Memorial Bridge Looking Downstream



Figure 6: Downstream of Cape Fear Memorial Bridge Looking West.

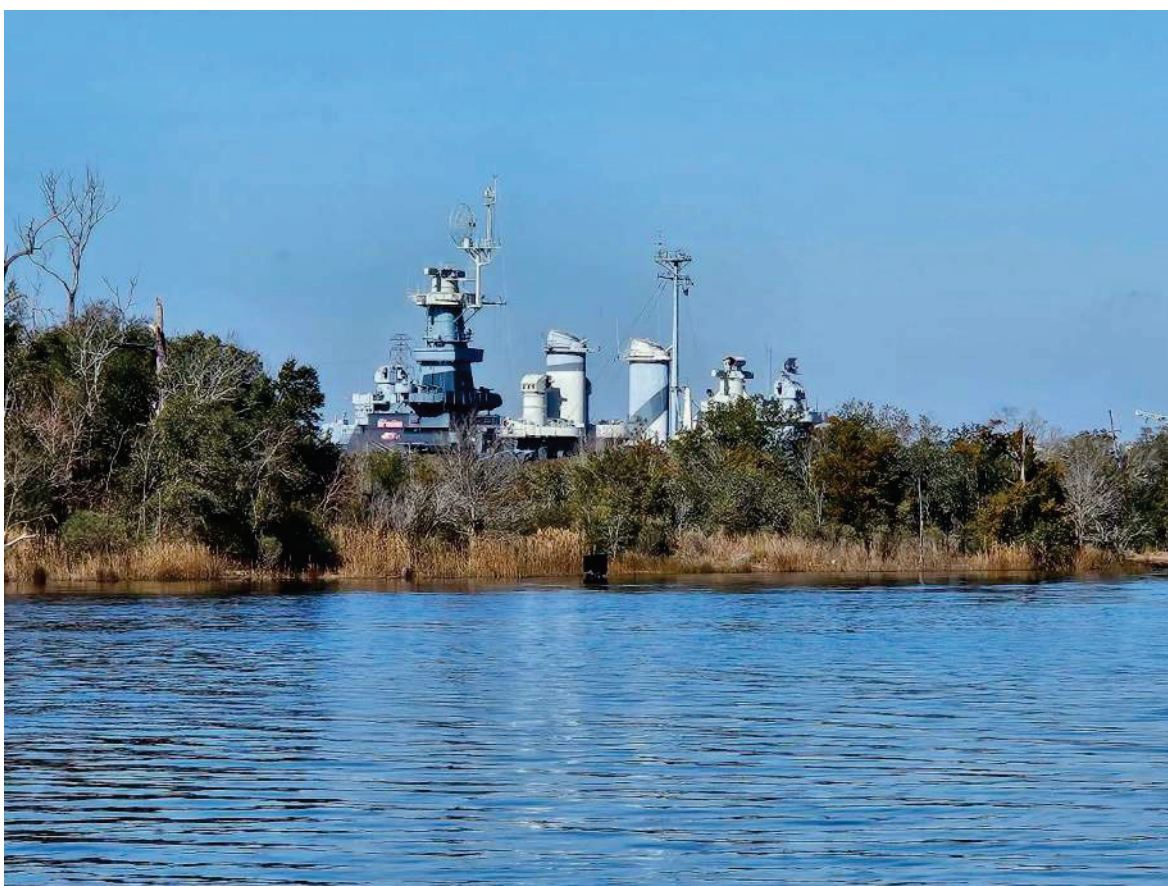


Figure 7: West Bank of Cape Fear River.



Figure 8: East Bank of Cape Fear River at Riverwalk.



Figure 9: Downstream Floodplain East of Cape Fear River.



Appendix D

Community Characteristics Report



STIP HB-0039 New Hanover and Brunswick Counties

COMMUNITY CHARACTERISTICS REPORT

EXECUTIVE SUMMARY

PLANNER, FIRM:		Emily Poole, AICP, HDR Cheryl Hannah, HDR	DIVISION: 3	Existing No. of Lanes: 4	Existing Median: Yes
NCDOT/LOCAL PROJECT MANAGER:		Trace Howell, PE	WBS: 50603.1.1	Proposed No. of Lanes: 6	Addition of Median(s): No
DOCUMENT TYPE: ☒ NEPA ☐ SEPA	PROJECT TYPE: ☒ DIVISION ☐ CENTRAL ☐ LOCALLY-ADMIN. PROGRAM PROJECT (LAPP)		Existing control of access: ☐ No Control ☐ Partial Control ☐ Limited Control ☒ Full Control		Proposed control of access: ☐ No Control ☐ Partial Control ☐ Limited Control ☒ Full Control
CS PROJECT REVIEWER : Herman Huang, PhD, AICP					

PROJECT DESCRIPTION FROM STIP: Replace Bridge 640013 (Cape Fear Memorial Bridge) over Cape Fear River.

Community Context

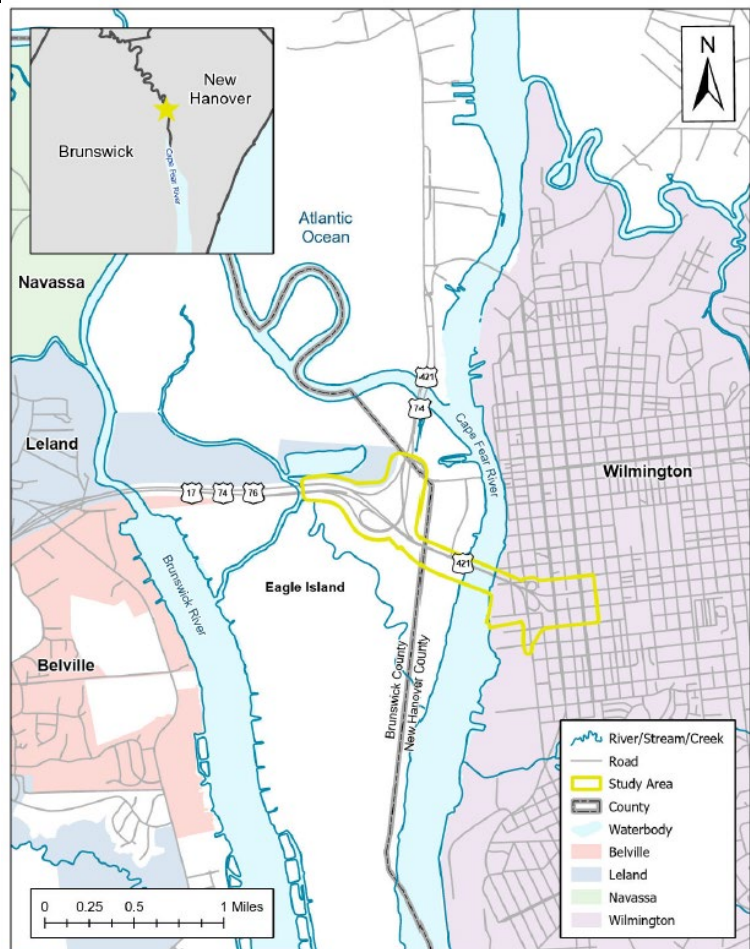
The North Carolina Department of Transportation (NCDOT) proposes to replace the Cape Fear Memorial Bridge (CFMB), constructed in 1969. The bridge carries US 17/US 76/US 421, across the Cape Fear River linking the City of Wilmington's urban core on the east with Brunswick County in the west. NCDOT identifies the bridge as being Functionally Obsolete with a Sufficiency Rating of 49.56 out of 100.

Based on the 2020 Feasibility Study, NCDOT identified two alternatives for consideration in project development as listed below. Each alternative includes the following typical section: three 12-foot lanes in each direction separated by a 22-foot median, 10-foot inside shoulders, 15-foot multi-use path on the north side of the bridge, and 12-foot outside paved shoulders.

- Alternative A: Movable span 65' vertical clearance
 - Alternative B: Fixed span 135' vertical clearance with trumpet interchange improvements
- It is anticipated the bridge will remain open during construction.

The Direct Community Impact Area (DCIA) is generally bounded by Queen Street, South 6th Street, and Wright Street in Wilmington and the Alligator Creek bridge and Battleship Road in Brunswick County. The DCIA includes the US 17/US 76/US 421 interchange.

The eastern portion of the DCIA, within downtown Wilmington, includes single-family residential and commercial uses between the river and South 6th Street. Eagles Island lies between the Cape Fear and Brunswick Rivers and consists of approximately 2,100 acres that are primarily wetlands and remain undeveloped. The Eagles Island portion of the DCIA extends slightly west of the US 17/US 76/US 421 interchange to Alligator Creek.



Notable Characteristics

- Dram Tree Park, a potential Section 4(f) resource and Section 6(f) resource, is located within the DCIA, adjacent to current bridge alignment to the north, though not accessed from the project corridor.
- There are several existing bicycle and pedestrian facilities within the DCIA. This includes the NC 5 – Cape Fear Run regional bicycle route, and sidewalks on both sides of Castle Street, portions of Queen Street, South 2nd Street, South 3rd Street, South 4th Street, and South 5th Avenue.
- Pedestrians were observed on 3rd Street and standing in the median at its intersection with Dawson Street during a field visit. A bicycle tour was also observed north of the study area within the DCIA.
- The Cape Fear Public Transportation Authority, operating as Wave Transit, operates fixed routes within the DCIA include the following, where bus or trolley stops are located on both sides of each street: Route 201, 202, 203, 205, and 210. Wave Transit also offers a point-to-point service (Microtransit) available to anyone traveling within the designated service network. Brunswick Transit System, a non-profit community transportation system, provides non-emergency on-demand transportation services to the general public and to various agency clients.
- Arterials within the Wilmington portion of the DCIA consist of the one-way pair of Wooster Street and Dawson Street (US 17/US 76), and South 3rd Street (US 421). Approaches to/ from the bridge in Wilmington include South Front Street, South 3rd Street, Queen Street, Wooster Street, and Dawson Street. US 17/US 76/US 421 provides access to the bridge from Brunswick County. Cross streets in Wilmington include Surry Street, South Front Street, South 2nd Street, South 3rd Street, South 4th Street, South 5th Street, South 6th Street, Queen Street, Wooster Street, Dawson Street, and Wright Street. Brunswick County cross streets include USS North Carolina Road. There are approximately 124 driveways within the Wilmington portion of the DCIA. The USS North Carolina Road provides access from US 74 to the Battleship North Carolina, an important tourist destination for the area.
- There are sixteen businesses are located within the DCIA, fourteen on the Wilmington side and two on the Brunswick County side. A heavy volume of traffic was observed using Wooster Street, Dawson Street, South Front Street and 3rd Street within the DCIA during a field visit on September 20, 2023. Additionally, the USS North Carolina battleship is located approximately 2,700 feet north of the Cape Fear Memorial Bridge on Eagles Island.
- EMS officials from Brunswick County and Leland noted roadways, including the CFMB, in the DCIA serve as main routes to access medical centers.
- One place of worship is located within the DCIA, Healing Waters Holy Temple Church. Grandma & Grandpa's Childcare is located at the intersection of South 3rd Street/ Queen Street. Davis Funeral Home is located at the intersection of Dawson Street and South 6th Street. The Dollar General, also located at Dawson Street/South 5th Avenue, is a shopping destination for the community which likely serves as a grocery store to the area. The Gullah Geechee Cultural Heritage Corridor, which spans from Florida to Wilmington including across the CFMB, is a National Heritage Area, with several sites located in downtown Wilmington.
- The New Hanover County average pedestrian and bicycle crash rates were both higher than the statewide crash rates, whereas Brunswick County was lower. Access to exercise opportunities is 78.2% in Brunswick County and 95.1% in New Hanover County, both higher than the statewide 74.5%. Additionally, physical inactivity for Brunswick County was 20% and 19.1% for New Hanover County, both lower than the statewide 25.0%.
- Census data indicates a notable presence of minority and low-income populations meeting the criteria for Environmental Justice and populations protected by Title VI and related statutes within the Demographic Study Area (DSA), and minority and low-income communities were observed within the DCIA during the field visit and were noted by a local planner.
- Census data does not indicate Limited English Proficiency (LEP) populations meeting the US Department of Justice LEP Safe Harbor threshold, but does indicate an Asian/Pacific language-speaking population exceeding 50 persons within the Demographic Study Area that may require language assistance. This population is within the Direct Community Impact Area, located in downtown Wilmington north of the bridge, just east of South 3rd Street.
- There are five STIP roadway or intersection projects within the DCIA that have the potential to affect or be affected by this project, including U-5734, HL-0109, HL-0110, HS-2003Q, and HS-2003Z.



Potential Project Impacts

- The project would have a positive effect on active transportation modes by providing additional bicycle and pedestrian facilities within the DCIA. The proposed typical section includes a 15-foot multi-use path on the north side of the bridge. The project will not preclude planned and proposed bicycle and pedestrian facilities.
- Construction activities may temporarily impact pedestrian and bicycle activities within the DCIA, particularly the NC 5 bike route along South Front Street. As Alternative B proposes a new on-ramp at South Front Street and Queen Street, it is anticipated construction activities may temporarily disrupt bicycle access on South Front Street. Bicyclists could utilize the parallel Surry Street or South 3rd Street in the meantime, connecting to South Front Street via the perpendicular roads Queen Street in the north and Dawson Street in the south.
- Construction activities may temporarily delay transit vehicles traveling within the DCIA. Wave Transit bus/trolley stops located on these roadways may need to be modified as a result of the project. Brunswick Transit System on-demand service may have temporary impacts for riders using the Cape Fear Memorial Bridge.
- Impacts to driveways have been analyzed from a high-level perspective. Detailed investigations into driveway tie-ins will be conducted during final design. The proposed project may alter access to South Front Street, and direct access to 3rd Street to and from the bridge as a result of tying into the existing elevation from the new bridge, particularly with Alternative B.
- Impacts to businesses, particularly along South Front Street and Surry Street are possible, and may occur in the form of additional right of way and/or altering parking or access. Permanent impacts, if any, are dependent on project design and have not been determined at this time. Construction activities may temporarily impact access and accessibility to surrounding businesses as well.
- Although construction activities have the potential to create temporary delays that could increase emergency response times, the proposed project would ultimately have a beneficial effect by increasing efficiency and improving access throughout the DCIA. Detour routes and construction methods have not yet been determined at this time. EMS officials primarily rated the potential impact of having roadways in the study area at reduced capacity for a year as severe to emergency response times.
- Construction activities may temporarily impact access and accessibility to the churches, childcare facility, funeral home, and/or Dollar General. Permanent impacts are dependent on project design and have not been determined at this time.
- As noted previously, the project would have a positive effect on community health by providing additional bicycle and pedestrian facilities within the DCIA, and therefore safer opportunities for bicyclists and pedestrians within the DCIA.
- Various NCDOT projects to connect New Hanover and Brunswick Counties across the Cape Fear River and to replace the CFMB have been studied and in the news for many years. There are known community concerns about the project. As the subject project is developed and designs refined, the project is anticipated to receive more attention and discussion locally, regionally, and statewide.
- It is anticipated there may be residential relocations associated with Alternative B, particularly along Dawson Street, Wooster Street, Queen Street, and South 2nd Street. While it is too early in the design process to identify exact relocations, as the DSA primarily contains block groups meeting the low-income and minority EJ thresholds, impacts to EJ populations are anticipated.
- While Alternative A is not anticipated to incur as many residential relocations, temporary EJ impacts associated with Alternative A could include disruptions to bus and trolley service within the DCIA.

Recommendations

- The NCDOT Project Manager should continue coordination with the NCDOT Integrated Mobility Division (IMD) and local municipalities to evaluate the necessary level of bicycle/pedestrian access accommodation during construction and to ensure designs incorporate features that best meet the needs of bicyclists and pedestrians.
- The NCDOT Project Manager should also coordinate with the Downtown Wilmington Visitor Center prior to construction so tour operators are aware of construction in the project study area.
- In order to minimize potential delays to transit services, NCDOT should coordinate with Wave Transit and Brunswick Transit System prior to construction to notify them of the schedule for potential lane closures during construction activities.



- The NCDOT Project Manager should coordinate with affected property owners and businesses regarding access needs and options for temporary and permanent solutions to maintain access during construction and once the project is complete.
- Coordination with EMS services is recommended during construction to ensure access and acceptable response times throughout the DCIA.
- The NCDOT Project Manager should coordinate with community resource business owners to ensure access is maintained during construction.
- A web-based and/or in person Citizens Informational Workshop (CIW) is recommended with information distribution recommended through direct mail, regular press releases updating the project, and a NCDOT project web page.
- The NCDOT Project Manager should coordinate with NCDOT Public Involvement, Community Studies and Visualization to ensure that all public involvement activities include outreach materials appropriately focused on EJ populations. Public involvement and outreach activities must ensure full and fair participation of all potentially affected communities in the transportation decision-making process.
- Because notable Asian/Pacific language-speaking populations are located within the DCIA, with Tagalog (including Filipino) being the most common and thus requiring language assistance, the NCDOT Project Manager should consult with NCDOT Public Involvement to determine appropriate measures assuring meaningful public involvement to satisfy the requirements of Executive Order 12898.

Indirect and Cumulative Effects Statement

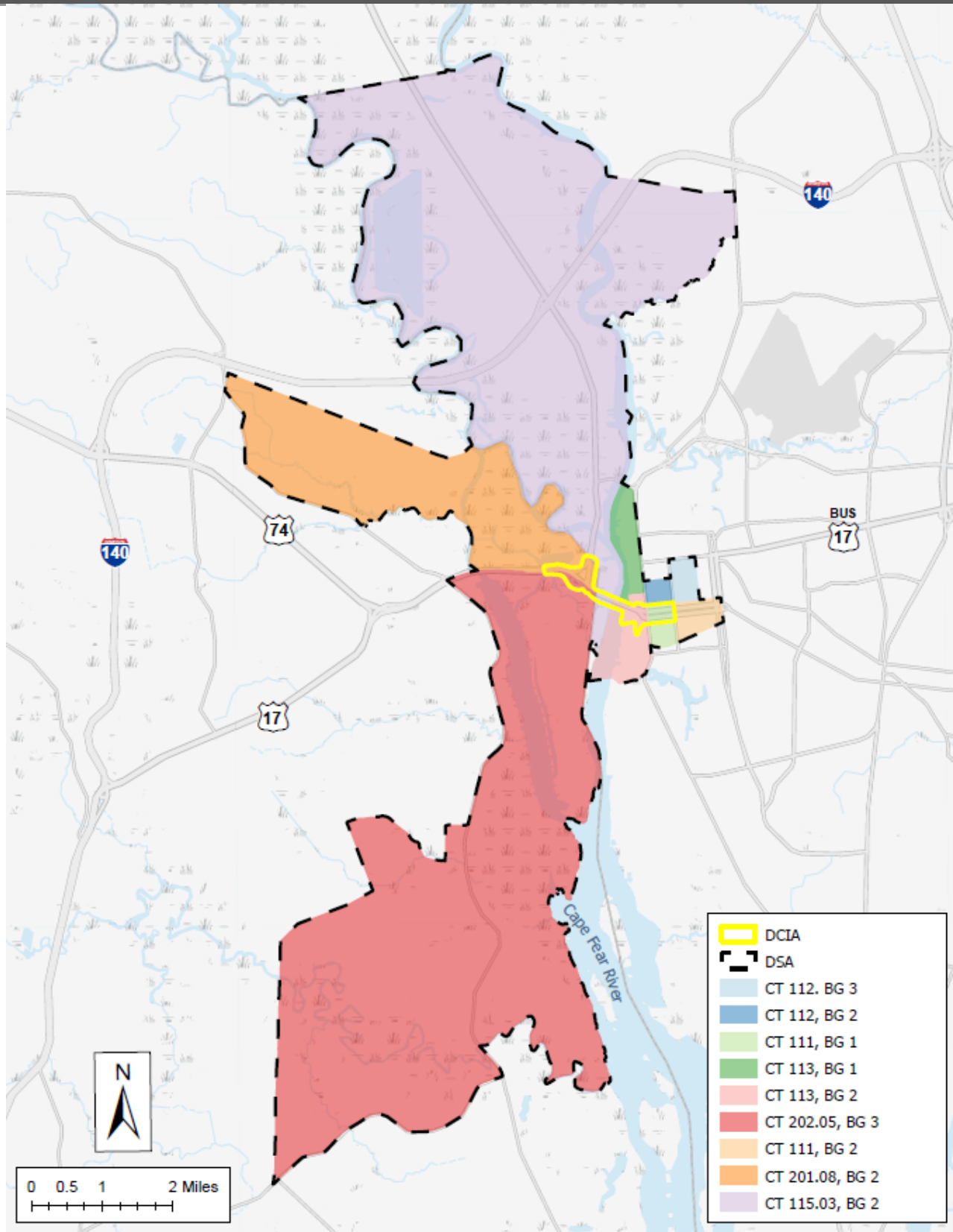
- The project will not alter travel patterns, reduce travel times, affect access to properties in the area, or open areas for development or redevelopment. Due to its minimal transportation impact-causing activities, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect and cumulative effects study will not be necessary.



COMMUNITY CONTEXT MAP



DEMOGRAPHIC STUDY AREA



COMMUNITY CHARACTERISTICS, IMPACTS & RECOMMENDATIONS

Community Resource	Presence	
RECREATIONAL RESOURCE(S) OR ACTIVITY <u>Presence</u> <i>Are there any recreational resources, areas, or observed activities in the Direct Community Impact Area? If Federally-funded, are these potential 4(f) resources?</i> Dram Tree Park, a potential Section 4(f) resource, is located within the DCIA, adjacent to the current bridge alignment on the north side of the Cape Fear River accessed from Surry Street. The park located on three acres and includes a parking area and boat ramp providing year-round access to the Cape Fear River.	☐ YES, SEPA Parks & Recreation ☐ YES, NEPA potential 4(f); adjacent to/accessed from the project corridor ☒ YES, NEPA potential 4(f); present in DCIA but not adjacent to or accessed from the project corridor ☐ NO	
<u>Impacts</u> While a potential Section 4(f) resource is located within the DCIA, impacts to this resource are not anticipated.	☐ YES, SEPA Impact ☐ YES, potential NEPA impact ☒ NO	
<u>Recommendation</u>		☐ YES ☒ NO
SECTION 6(F) LAND & WATER CONSERVATION FUND RESOURCES <u>Presence</u> <i>Are there any areas protected under Section 6(f) in the Direct Community Impact Area?</i> Dram Tree Park is a Section 6(f) resource. As noted above, the park is located within the DCIA and accessed from Surry Street.		☒ YES ☐ NO
<u>Impacts</u> <i>Is the project likely to impact identified Section 6(f) Land & Water Conservation Fund Resources?</i>	☐ YES ☒ NO	
<u>Recommendation</u>		☐ YES ☒ NO
VOLUNTARY & ENHANCED VOLUNTARY AGRICULTURAL DISTRICTS [VAD/EVAD] <u>Presence</u> <i>Is there a Voluntary Agricultural District or Enhanced Voluntary Agricultural District in the project footprint?</i>		☐ YES ☒ NO
<u>Impacts</u> <i>Is the project likely to impact designated Voluntary Agricultural Districts or Enhanced Voluntary Agricultural Districts?</i>	☐ YES ☒ NO	
<u>Recommendation</u>		☐ YES ☒ NO
AGRICULTURAL RESOURCES AND ACTIVITY <u>Presence</u> <i>Are there any active agricultural operations located in the Direct Community Impact Area? Is there any documented activity related to goods movement in the Direct Community Impact Area (e.g. farm or logging trucks, tractors, or other agricultural equipment)?</i>		☐ YES ☒ NO
<u>Impacts</u> <i>Is the project likely to impact identified agricultural operations?</i>	☐ YES ☒ NO	
<u>Recommendation</u>		☐ YES ☒ NO



BICYCLE, PEDESTRIAN, AND/OR GREENWAY FACILITIES AND ACTIVE TRANSPORTATION		☒ YES ☐ NO
Presence <i>Are there existing bicycle, pedestrian, greenway or other active transport facilities located in the Direct Community Impact Area? Are there future plans for bicycle, pedestrian, greenway or active transport facilities to be located in the Direct Community Impact Area?</i>		
All bicycle and pedestrian facilities are located within the City of Wilmington surrounding the project's eastern terminus. Based on the NCDOT Pedestrian and Bicycle Infrastructure Network (PBIN) online mapping the existing facilities within the DCIA include: ▪ NC 5 – Cape Fear Run is a state bike route that travels through the DCIA along South Front Street ▪ Sidewalks on both sides of: Castle Street, portions of Queen Street, South 2nd Street, South 3rd Street, South 4th Street, and South 5th Street ▪ Segments of sidewalks are missing on several streets within the Wilmington portion of the DCIA. There are local plans for pedestrian improvements as noted in the Local Area Plans section below. Proposed pedestrian improvements within the DCIA include: ○ Between the Cape Fear River and Surry Street on the south side of Castle Street ○ Both sides of Queen Street from the river to South Front Street ○ Both sides of South Front Street from the bridge southward to Burnett Boulevard ○ Both sides of Dawson Street from South Front Street to South 2nd Street ○ Both sides of South Front Street from Dawson Street to Wright Street ○ Wright Street from South 2nd Street to South 3rd Street ○ Both sides of Wooster Street from South 3rd Street to South 6th Street Shared lane markings are also proposed on South Front Street within the DCIA. A proposed shared-use path is proposed along the river from north of Church Street to South Front Street between Dawson Street and Wright Street. One project (HS-2003Q) is included in the 2024-2033 STIP for pedestrian facilities in the DCIA. This highway safety project is described as upgrading the traffic signal, pavement markings and adding pedestrian accommodations on US 17 (Dawson Street) at US 421 (3rd Street). Construction year is 2026. During the field visit conducted on September 20, 2023, sidewalks in the DCIA were observed to be in need of improvements and repair.		
Impacts <i>Is the project likely to result in impacts to bicycle, pedestrian, and/or greenway facilities?</i>	☒ YES ☐ NO	
The project would have a positive effect on active transportation modes by providing additional bicycle and pedestrian facilities within the DCIA. The proposed typical section includes a 15-foot multi-use path on the north side of the bridge. The project will not preclude planned and proposed bicycle and pedestrian facilities.		
Recommendation The NCDOT Project Manager should continue coordination with the NCDOT Integrated Mobility Division (IMD) and local municipalities to evaluate the necessary level of bicycle/pedestrian access accommodation during construction and to ensure designs incorporate features that best meet the needs of bicyclists and pedestrians.		☒ YES ☐ NO
BICYCLE/PEDESTRIAN ACTIVITY Presence <i>Were bicyclists, pedestrians or worn paths observed in the Direct Community Impact Area?</i>		☒ YES ☐ NO
Pedestrians were observed walking along 3rd Street and standing in the median at 3rd Street/Dawson Street during a field visit on September 20, 2023. A bicycle tour was also observed north of the study area within the DCIA.		



<u>Impacts</u> <i>Is the project likely to result in impacts to bicycle or pedestrian activity?</i> As noted previously, the project would have a positive effect on active transportation modes by providing additional bicycle and pedestrian facilities within the DCIA. Construction activities may temporarily impact pedestrian and bicycle activities within the DCIA, particularly the NC 5 bike route along South Front Street. As Alternative B proposes a new on-ramp at South Front Street and Queen Street, it is anticipated construction activities may temporarily disrupt bicycle access on South Front Street. Bicyclists could utilize the parallel Surry Street or South 3rd Street in the meantime, connecting to South Front Street via the perpendicular roads Queen Street in the north and Dawson Street in the south.	☒ YES ☐ NO		
<u>Recommendation</u> The NCDOT Project Manager should continue coordination with NCDOT IMD and local municipalities to evaluate the necessary level of bicycle/pedestrian access accommodation during construction and to ensure designs incorporate features that best meet the needs of bicyclists and pedestrians. The NCDOT Project Manager should also coordinate with the Downtown Wilmington Visitor Center prior to construction so tour operators are aware of construction in the project study area.	☒ YES ☐ NO		
TRANSIT ROUTES, FACILITIES, AND/OR ACTIVITY <u>Presence</u> <i>Are transit routes present in the Direct Community Impact Area? Were buses, transit stops or route signs observed on the site visit? Were any riders observed using or known to use these facilities? Were any of these riders special users?</i> The Cape Fear Public Transportation Authority, operating as Wave Transit, is the public transportation operator for the metro area of Wilmington, North Carolina. Fixed routes within the DCIA include the below, where bus or trolley stops are located on both sides of each street: ▪ Route 201 (Carolina Beach Road) which travels along South Front Street and South 3rd Street, ▪ Route 202 (Oleander West) which travels along South 3rd Street and Dawson Street, ▪ Route 203 (Port City Trolley) which travels along South Front Street and South 5th Street, ▪ Route 205 (Long Leaf Park) which travels along South 5th Street, and ▪ Route 210 (South 17th Street) which travels along Wooster Street, Dawson Street, and South 3rd Street. Wave Transit also offers a point-to-point service (Microtransit) available to anyone traveling within the designated service network. This rideshare service can be connected to Wave Transit's fixed-route service or riders brought to their destination. Wave Transit online mapping indicates Zone 1 (Northern Brunswick) Microtransit service crosses the CFMB between Wilmington and Brunswick County. Brunswick Transit System, a non-profit community transportation system, provides non-emergency on-demand transportation services to the general public and to various agency clients.		☒ YES ☐ NO	
<u>Impacts</u> <i>Is the project likely to result in impacts to transit routes, facilities, and/or activity?</i> Construction activities may temporarily delay transit vehicles traveling within the DCIA. Wave Transit bus/ trolley stops located on these roadways may need to be modified as a result of the project. Brunswick Transit System on-demand service may have temporary impacts for riders using the CFMB.	☒ YES ☐ NO		



<u>Recommendation</u> In order to minimize potential delays to transit services, NCDOT should coordinate with Wave Transit and Brunswick Transit System prior to construction to notify them of the schedule for potential lane closures during construction activities.	☒ YES ☐ NO
COMMUNITY SAFETY FOR BICYCLISTS, PEDESTRIANS, AND TRANSIT USERS <u>Presence</u> <i>Are there any existing or perceived security or safety issues in the Direct Community Impact Area, including unsafe bicycle or pedestrian facilities, inadequate lighting, and/or isolated or poorly connected areas?</i> According to NCDOT's Bicycle and Pedestrian Crash Map, there were two pedestrian crashes and one bicycle crash on the west side of the bridge between 2007 and 2022.¹ On the east side of the bridge, there were 18 pedestrian crashes and 15 bicycle crashes between 2007 and 2022. The current CFMB does not provide bicycle or pedestrian facilities for safe travel between New Hanover and Brunswick counties. The steel grate deck and heavy truck traffic on the bridge are not favorable for safe bicycle/pedestrian travel across the river. The Wilmington Associate Planner noted this area was identified as a Pedestrian High Injury Network and priority corridor in Walk Wilmington (additional details on the Plan are included in the Local Area Plans section below). The Leland Planning and Inspections Director and Brunswick County Planning Director also noted concerns over the lack of existing bicycle and pedestrian accommodations on the bridge.	☒ YES ☐ NO
<u>Impacts</u> <i>Is the project likely to change any existing or perceived security or safety issues?</i> As noted previously, the project would have a positive effect on active transportation modes by providing additional bicycle and pedestrian facilities within the DCIA.	☒ YES ☐ NO
<u>Recommendation</u>	☐ YES ☒ NO
LOCAL AREA PLANS, GOALS, AND DEVELOPMENT ACTIVITY <u>Presence</u> <i>Are there any local area plans, goals, or zoning initiatives specifically affecting the Direct Community Impact Area (e.g. comprehensive plan; corridor or thoroughfare plan; small area plan; long-range growth plan; health impact assessment; etc.)? Has recent development activity occurred in the Direct Community Impact Area and/or are there known plans for public or private development activity in the Direct Community Impact Area?</i> <u>Brunswick County</u> The <i>Brunswick County Coastal Area Management Act (CAMA) CORE Land Use Plan</i>² includes a future land use map, which primarily identifies the area surrounding the DCIA as conservation land. The <i>Blueprint Brunswick 2040 Plan</i> (Comprehensive Land Use Plan & Parks & Recreation Master Plan) recommends linking the county's regional trail system to the East Coast Greenway and Gullah Geechee Heritage Trail through bicycle and pedestrian connections.³ Additional information on the Gullah Geechee Heritage Trail is found in the community resources section. <u>Town of Leland</u> Within the DCIA, municipal limits for the Town of Leland extend along the north and west sides of the US 17 interchange in Brunswick County. The <i>Leland 2045 Comprehensive Land Use Plan</i>⁴ identifies Eagles Island as Ideal Conservation/Preservation Areas and Already Protected/Managed Areas (NC Natural Heritage Program).	☒ YES ☐ NO

¹ NCDOT. Bicyclists and Pedestrian Crash Map. Web. October 2023.

<https://www.arcgis.com/home/webmap/viewer.html?webmap=b4fcdc266d054a1ca075b60715f88aef>

² Brunswick County. *CAMA CORE Land Use Plan*. Web. November 2012. <https://www.brunswickcountync.gov/planning/ordinances-plans/lup/>

³ Brunswick County. *Blueprint Brunswick 2040 Plan*. Web. February 2023. <https://www.brunswickcountync.gov/blueprintbrunswick/plan-documents/>

⁴ Town of Leland. *Leland 2045*. Web. November 2021. <https://www.townofleland.com/planning-inspections/planning-zoning/leland-2045>



Based on the Town's Projects webpage, future projects are not currently planned within the DCIA area.⁵

The *Leland Comprehensive Bicycle Plan*⁶ proposes a bicycle connection from the Leland area along US 74/76 to Eagles Island. Projects in this plan have been in planning and implementation phases since adoption in 2008.

City of Wilmington

The *Create Wilmington Comprehensive Plan*⁷ identifies the eastern portion of the DCIA as an Urban Mixed-use Center. The goals of the Urban Mixed-use Center are to support transit, walking, and biking and be the focal points of vibrant city life and activity. These locations are strategic for accommodating a notable share of future population and employment growth.

The *Walk Wilmington Pedestrian Plan*⁸ has identified this area as a priority location for pedestrian safety. Additionally, 3rd Street, Wooster Street, and Dawson Street are identified as High Injury Network (HIN) Priority Corridors, and several recommendations are made to improve crossings at intersection along each roadway in the downtown area. The Plan also recommends a sidepath along 5th Street, which is also the designated route for the East Coast Greenway. This Plan is currently being updated but not yet available online for public review.

The Wilmington/New Hanover County *Comprehensive Greenway Plan*⁹ recommended within the DCIA intersection improvements for the on-road bicycle network at 5th Avenue/Dawson Street and 5th Avenue/Wooster Street.

The City of Wilmington, in coordination with the Federal Railroad Administration (FRA), is proposing a Rail Realignment Project¹⁰ which is studying the realignment of the existing CSX freight rail line between Navassa (Davis Yard) and the Port of Wilmington. The preferred alternative for the project crosses the Cape Fear River just south of the existing bridge.

Wilmington Urban Area Municipal Planning Organization

The Wilmington Urban Area Municipal Planning Organization's (WUAMPO) *Dawson and Wooster Corridor Plan*¹¹ provides recommendations to improve safety along Dawson Street and Wooster Street from South 3rd Street to 17th Street, and the neighborhood directly adjacent to and between this one-way pair. Recommendations include South 6th Street improvements (immediate); intersection spot safety improvements, streetscape improvements, gateway and historic district treatments, parking modifications and transit amenities (short-term 2-5 years); and determining if two-way operation is feasible and desirable (long term 5-20 years).

The WUAMPO *Cape Fear Moving Forward 2045 Metropolitan Transportation Plan*¹² includes the following recommendations in the DCIA:

- RW-93 (US 17/76/Wooster Street streetscape improvements) planned for construction in 2030.
- RW-92 (US 17/76/Dawson Street streetscape improvements) planned for construction in 2030.
- RW-219 (US 17 Business/Market Street road diet) planned for construction in 2025.
- RW-20 (US 17/74/76 Causeway Improvements Phase 2) planned for construction in 2035.
- BP-370 – Sharrows along Front Street from Ann Street to the Cape Fear Memorial Bridge, with construction planned after 2045.

⁵ Town of Leland. Town Projects. Web. <https://www.townofleland.com/town-projects>

⁶ NCDOT. *Leland Comprehensive Bicycle Plan*. Web. 2008.

https://www.townofleland.com/sites/default/files/uploads/Planning%20and%20Inspections/master%20plans/2008_lelandbikeplanfinal.pdf

⁷ City of Wilmington. *Create Wilmington Comprehensive Plan*. Web. May 2016. <https://www.wilmingtonnc.gov/departments/planning-development-and-transportation/comprehensive-plan>

⁸ City of Wilmington. *Walk Wilmington Pedestrian Plan*. Web. July 2023.

<https://www.wilmingtonnc.gov/home/showpublisheddocument/16904/638291773502130000>

⁹ Wilmington/New Hanover County. *Comprehensive Greenway Plan*. Web. January 2013. https://www.wmpo.org/wp-content/uploads/2016/05/2013_wilmingtongreenwayplan_mainchapters_optimized.pdf

¹⁰ City of Wilmington. Rail Realignment Project. Web. <https://www.wilmingtonnc.gov/departments/major-projects/rail-realignment>

¹¹ WUAMPO. *Dawson and Wooster Street Corridor Plan*. Web. October 2007. https://www.wmpo.org/wp-content/uploads/2016/05/2007-10_DawsonWooster_FinalReport.pdf

¹² WUAMPO. *Cape Fear Moving Forward 2045 MTP*. Web. November 2020. <https://www.wmpo.org/mtp/>



- BP-669 – Crosswalk improvements at 3rd Street and Dawson Street with construction planned for 2025.
- BP-1 – On street bike lane on 5th Avenue from Cambell Street to Greenfield Lake Park with construction planned for 2040.
- BP-765 – Crosswalk improvement at 10th Street and Wooster Street with construction planned for 2025.
- BP-774 – Crosswalk improvement at 10th Street and Dawson Street with construction planned for 2025.
- PT-156 – WAVE Transit Route 204 extended service to 9 PM and weekends
- PT-149, 153 – WAVE Transit Route 201 rush hour service and earlier weekday service on high ridership route

Private Development Activity

The City of Wilmington Planner noted four development plans in the vicinity of the project:

- The Pearl II, a mixed-use development, was approved by the Wilmington City Council on June 6, 2023. The development includes 115 apartments and 873 square feet of commercial space at 3rd Street and 4th Street. Access to the site will be through right-in/right-out driveway on South 3rd Street and a right-in only driveway off Wooster Street. The development has a zero-lot line; however, the development will be set back from 4th Street to accommodate stormwater infrastructure.
- Kilimanjaro, at 924 South 3rd Street is a proposed 2,300 square foot restaurant/ bar that includes outside seating, at the intersection of South 3rd Street and Wright Street. This project is under review.
- 418 Wooster is located at 418 Wooster Street and is currently under review. The project is proposed to have 125 residential units and 852 square feet of commercial.
- 906 South 8th Street is under review. The project is proposed to have 18 residential units and 2158 square feet of commercial.

The City of Wilmington Development Tracker¹³ also includes the following projects:

- A residential/ commercial project, The Block on Front, is located at 102 Wright Street. The project includes 64 new apartments for workforce housing on the upper floors and small street-level shops. Plan review was completed in February 2023. The status shown on the City of Wilmington Development Tracker is Released- Project Review Complete; however, construction has not started.
- Plan review for R&S Storefront Mixed Use at the intersection of South 3rd Street/ Wright Street (1005 South 3rd Street) was completed in November 2021. The status shown on the City of Wilmington Development Tracker is Released- Project Review Complete; however, construction has not started.
- Plan review for a 150-foot concealed monopole tower for wireless communication, DT Wilmington Tower # NC-1029, located at 900 South Front Street, was completed in May 2019. The status shown on the City of Wilmington Development Tracker is Released- Project Review Complete; however, construction has not started.

Impacts

Is the project consistent or not consistent with existing plans, regulations, and policies at the local, regional, or state level?.

- ☒ CONSISTENT
- ☐ PARTLY CONSISTENT, PARTLY INCONSISTENT
- ☐ NOT CONSISTENT

Recommendation

- ☐ YES
- ☒ NO

¹³ City of Wilmington. Wilmington Development Tracker. Web.
<https://www.arcgis.com/apps/OnePane/basicviewer/index.html?appid=52308d392d91470880e5d7d6fdb2e76e>



DRIVEWAYS AND CROSS STREETS☒ YES☐ NOPresence*Are there any driveways or intersections located along the project corridor?*

Arterials within the Wilmington portion of the DCIA consist of the one-way pair of Wooster Street and Dawson Street (US 17/US 76), and South 3rd Street (US 421).

Approaches to/ from the bridge in Wilmington include South Front Street, South 3rd Street, Queen Street, Wooster Street and Dawson Street. US 17/US 76/US 421 provides access to the bridge from Brunswick County.

Cross streets in Wilmington include Surry Street, South Front Street, South 2nd Street, South 3rd Street, South 4th Street, South 5th Avenue, South 6th Street, Queen Street, Wooster Street, Dawson Street, and Wright Street. Brunswick County cross streets include USS North Carolina Road.

Approximately 124 driveways are within the Wilmington portion of the DCIA. Curb cuts for driveways that appear to be unused due to a small width or have other uses were not included in the total count. Off-street parking is prevalent in this portion of the DCIA. Some streets, or sections of streets, are surfaced with brick or cobblestone or have asphalt overlaying brick/stone.

The USS North Carolina Road provides access from US 74 to the Battleship North Carolina, an important tourist destination for the area. Additionally, USS North Carolina Road intersects Battleship Road (outside of the DCIA) which provides the only access to businesses along the western bank of the Cape Fear River, which are located within the DCIA.

Impacts*Is the project likely to result in access or accessibility impacts to driveways and cross streets?*

Impacts to driveways have been analyzed from a high-level perspective. Detailed investigations into driveway tie-ins will be conducted during final design. The proposed project may alter access to South Front Street, and direct access to 3rd Street to and from the bridge as a result of tying into the existing elevation from the new bridge, particularly with Alternative B.

☒ YES☐ NORecommendation

The NCDOT Project Manager should coordinate with affected property owners and businesses regarding access needs and options for temporary and permanent solutions to maintain access during construction and once the project is complete.

☒ YES☐ NO**BUSINESS AND ECONOMIC RESOURCES AND TRANSPORTATION ACTIVITY**☒ YES☐ NOPresence*Are any specific business and/or economic resources present in the Direct Community Impact Area (e.g. business parks or districts, distribution centers, manufacturing facilities, etc.)? Is there any documented activity related to goods movement in the Direct Community Impact Area (e.g. tractor-trailers, or industrial traffic)?*

Sixteen businesses are located within the DCIA.

There are 14 businesses located in the Wilmington portion of the DCIA:

- Cape Fear River Watch (617 Surry Street)
- Waterline Brewing Company (721 Surry Street)
- Art Factory Galleries (located in Waterline Brewing Company) (721 Surry Street)
- Southern Metals Recycling (13 Wright Street)
- Pinnacle Storage (211 Wright Street)
- Jacobi Lewis Company (622 South Front Street) (restaurant supply store)
- Cape Fear Solar Systems (901 South Front Street)
- Loc Queendom Hair Salon (925 South 3rd Street)
- Exxon (901 South 3rd Street)
- Burger King (819 South 3rd Street)
- Source Roofing Consultants (315 Dawson Street)



- Dollar General (406 Dawson Street)
- Davis Funeral Home (901 South 5th Avenue)
- Global Staffing Service LLC (822 South 6th Street)

The following businesses, located on Battleship Road, are within the Brunswick County portion of the DCIA:

- US Army Corps of Engineers (USACE) Wilmington District Repair Yard (232 Battleship Road NE)
- BellHart Marine boat repair shop (262 Battleship Road NE)

A heavy volume of traffic was observed using Wooster Street, Dawson Street, South Front Street and 3rd Street within the DCIA during a field visit on September 20, 2023. This traffic included tractor trailers and various other service-related company vehicles. These four streets serve as major transportation routes within the downtown, providing access to the state port and greater Wilmington area. These streets also link to state and interstate highways. These four streets experience both local and regional traffic related to the transport of materials and goods.

Additionally, the USS North Carolina battleship is located approximately 2,700 feet north of the Cape Fear Memorial Bridge on Eagles Island. While outside of the DCIA, this resource generates a large amount of visitor and special event traffic. The Battleship is accessible by land from US 17 and US 74 and can be seen when traveling west across the bridge.

Impacts

Is the project likely to result in impacts to business and economic resources?

Impacts to businesses, particularly along Front Street and Surry Street are possible, and may occur in the form of additional right of way and/or altering parking or access. Permanent impacts, if any, are dependent on project design and have not been determined at this time.

Construction activities may temporarily impact access and accessibility to surrounding businesses as well.

☒ YES

☐ NO

Recommendation

The NCDOT Project Manager should coordinate with affected property owners and businesses regarding access needs and options for temporary and permanent solutions to maintain access during construction and once the project is complete.

☒ YES

☐ NO

EMERGENCY MANAGEMENT SERVICES (EMS) OPERATIONS

Presence

Did the EMS local official note any emergency services operations within the Direct Community Impact Area that may be affected by the project, such as stations or corridors that are primary response routes?

The Brunswick County EMS Deputy Director noted the DCIA serves as their main ground transport route to the area trauma center, stroke center, and cardiac/ catheterization lab. This is also the direct route for mutual aid partners from New Hanover and Pender counties.

The Brunswick County Emergency Management Deputy Director noted roadways in the DCIA serve as main routes to access New Hanover Novant Hospital, the closest trauma center in the northern portion of New Hanover County.

The Leland Emergency Management Chief noted they provide fire protection for Eagle Island and ground transport (ambulance) services to Novant Medical Center, which is the primary hospital for EMS calls originating in northern Brunswick County. The Chief noted they utilize the bridge for emergency response.

The Leland Police Chief noted there are currently frequent motor vehicle crashes in the project area which "significantly" affect traffic during peak travel times and emergency response times.

The Leland Fire Department Chief noted the bridge is used to access property on Battleship Road south of the bridge.

☒ YES

☐ NO

☐ NO
RESPONSE



<u>Impacts</u> <i>As checked on Local EMS Input Form</i> Although construction activities have the potential to create temporary delays that could increase emergency response times, the proposed project would ultimately have a beneficial effect by increasing efficiency and improving access throughout the DCIA. Detour routes and construction methods have not yet been determined at this time. The Brunswick County EMS Deputy Director noted if the bridge was at reduced capacity during construction this would have a high impact on emergency services, and noted possible detours are approximately 10 miles longer. The Brunswick County Emergency Management Deputy Director noted there were limited detour routes in the area and any reduction in capacity would have a high impact on emergency services. The Leland Emergency Management Chief noted construction delays and the use of an offsite detour route would severely affect their ability to respond to emergencies and rated the impact as high. The Leland Police Chief noted if the bridge was at reduced capacity during construction this would have a high impact on response time, and that would significantly increase traffic on US 421 and the Isabel Holmes Bridge. The Leland Fire Department Chief noted if the bridge was at reduced capacity during construction this would have a low impact on their services.	☒ YES ☐ NO ☐ NO RESPONSE	
<u>Recommendation</u> Coordination with EMS services is recommended during construction to ensure access and acceptable response times throughout the DCIA.		☒ YES ☐ NO
SCHOOL BUS ROUTES <u>Presence</u> <i>Did the local school transportation official note any school bus routes within the Direct Community Impact Area that may be affected by the project?</i> An email received from the New Hanover County Schools Director of Transportation noted they did not have any concerns with the proposed project. An input form was not filled out.		☐ YES ☒ NO ☐ NO RESPONSE
<u>Impacts</u> <i>As checked on Local Schools Input Form</i>	☐ YES ☒ NO ☐ NO RESPONSE	
<u>Recommendation</u> Coordination with local school systems is recommended during project development and construction to ensure access to school bus stops and bus routes in the DCIA.		☒ YES ☐ NO
COMMUNITY RESOURCES <u>Presence</u> <i>Are there any notable community resources located in the Direct Community Impact Area, including places of worship; private and/or public schools; adult education and/or training facilities; daycares; cemeteries; private or public social service agencies; government facilities; other important destinations or resources for local residents?</i> One place of worship is located within the DCIA, Healing Waters Holy Temple Church (411 Wright Street). Grandma & Grandpa's Childcare is located at the intersection of South 3rd Street/ Queen Street. Davis Funeral Home is located at the intersection of Dawson Street and South 6th Street. The Dollar General, located at Dawson Street/South 5th Avenue, is a shopping destination for the community which likely serves as a grocery store to the area.		☒ YES ☐ NO



The Gullah Geechee are descendants of enslaved Africans who retained common tribal customs from their homelands and blended these traditions with “American” and Christian practices to form distinct cultural traditions in the form of language, arts, crafts, spirituality, and food. The Gullah Geechee Cultural Heritage Corridor, which spans from Florida to Wilmington including across the CFMB, is a National Heritage Area with a stated purpose to “preserve, share, and interpret the history, traditional cultural practices, heritage sites, and natural resources associated with Gullah Geechee people of coastal North Carolina, South Carolina, Georgia and Florida.”¹⁴ There are several sites associated with the corridor in downtown Wilmington just outside the DCIA.¹⁵		
Impacts <i>Is the project likely to impact identified community resources, either directly or by affecting user access?</i> Construction activities may temporarily impact access and accessibility to the churches, childcare facility, funeral home and/or Dollar General. Permanent impacts are dependent on project design and have not been determined at this time.	☒ YES ☐ NO	
Recommendation The NCDOT Project Manager should coordinate with community resource business owners to ensure access is maintained during construction.		☒ YES ☐ NO
COMMUNITY COHESION Presence <i>Were any specific signs or indicators of community cohesion observed / found within the Direct Community Impact Area?</i>		☐ YES ☒ NO
Impacts <i>Is the project likely to alter the overall functioning of an identifiable district (e.g. interactions between, or isolation of, persons and groups; or change in the physical makeup of the community)? Is the project likely to disrupt connections between neighborhoods and commercial, recreational, institutional and employment facilities and/or areas?</i>	☐ YES ☒ NO	
Recommendation		☐ YES ☒ NO
COMMUNITY HEALTH Presence <i>Are there any notable community health indicators (high numbers or rates of pedestrian and bicyclist crashes, high levels of physical inactivity, or low access to exercise opportunities?)</i> As noted above, there were two pedestrian crashes and one bicycle crash on the west side of the bridge between 2007 and 2022. On the east side of the bridge, there were 18 pedestrian crashes and 15 bicycle crashes between 2007 and 2022. The New Hanover County average pedestrian and bicycle crash rates were both higher than the statewide crash rates, whereas Brunswick County was lower. Access to exercise opportunities is 78.2% in Brunswick County and 95.1% in New Hanover County, both higher than the statewide 74.5%. Additionally, physical inactivity for Brunswick County was 20% and 19.1% for New Hanover County, both lower than the statewide 25.0%.		☒ YES ☐ NO
Impacts <i>Is the project likely to change any community health indicators?</i> As noted previously, the project would have a positive effect on community health by providing additional bicycle and pedestrian facilities within the DCIA, and therefore safer opportunities for bicyclists and pedestrians within the DCIA.	☒ YES ☐ NO	

¹⁴ Gullah Geechee Corridor. About. Web. 2023. <https://gullahgeecheecorridor.org/about/>

¹⁵ Gullah Geechee Cultural Heritage Corridor. Story Map. Web.

<https://queensuniv.maps.arcgis.com/apps/Shortlist/index.html?appid=8232463d62dc4b79a77a52cd8ac3c72a>



<u>Recommendation</u>		☐ YES ☒ NO
AREA/COMMUNITY CONCERNS <u>Presence</u> <i>Are there any known community concerns or controversy relative to the project? If concerns were voiced during Public Involvement activities, please attach the relevant comment sheets or meeting comment summary in the Appendix.</i> Various NCDOT projects to connect New Hanover and Brunswick Counties across the Cape Fear River and to replace the CFMB have been studied and in the news for many years. There are known community concerns about the project. As the subject project is developed and designs refined, the project is anticipated to receive more attention and discussion locally, regionally and statewide.		☒ YES ☐ NO
<u>Impacts</u> <i>Is the project likely to be incompatible with or not address community concerns?</i>	☐ YES ☒ NO	
<u>Recommendation</u> A web-based and/or in person Citizens Informational Workshop (CIW) is recommended with information distribution recommended through direct mail, regular press releases updating the project, and a NCDOT project web page.		☒ YES ☐ NO
OTHER IMPACTS <i>Are there any other potential impacts associated with the project?</i>	☐ YES ☒ NO	
<u>Recommendation</u>		☐ YES ☒ NO
RECURRING EFFECTS <u>Impacts</u> <i>Is the project likely to result in recurring effects on any populations and communities within the Direct Community Impact Area?</i>	☐ YES ☒ NO	
<u>Recommendation</u>		☐ YES ☒ NO
ENVIRONMENTAL JUSTICE (EJ) AND TITLE VI POPULATIONS <u>Presence</u> <i>Are there any populations living in the Demographic Study Area that meet the criteria for Environmental Justice and/or Title VI? If so, note which groups are present (check all that apply):</i> ☒ Minority ☒ Low-Income ☐ Title VI (non-EJ)		☐ Not present according to Census data and observation/local input ☐ Present ; Census data indicates presence but there is no observation/local input to confirm ☐ Present ; Census data does not indicate presence but communities were observed ☒ Present according to Census and communities were observed
Census data indicates a notable presence of minority and low-income populations meeting the criteria for Environmental Justice and populations protected by Title VI and related statutes within the Demographic Study Area (DSA), and minority and low-income communities were observed within the Direct Community Impact Area (DCIA) during the field visit and were noted by a local planner. Six Block Groups (BG) meet the criteria for EJ populations by exceeding the thresholds for minority and low-income populations, including Census Tract (CT) 201.08 BG 2, CT 111 BG 1, CT 111 BG 2, CT 112 BG 3, CT 113 BG 2, and CT 115.03 BG 2. There are bus and trolley stops within the DCIA, which could indicate the presence of low-income populations without access to personal transportation. The childcare facility at South 3rd/ Queen Street also indicates Title VI populations in the study areas.		



Impacts

Is the project likely to have a disproportionately high and adverse impact, including denial of benefits, on identified Environmental Justice and/or Title VI populations in the Direct Community Impact Area?

It is anticipated there may be residential relocations associated with Alternative B, particularly along Dawson Street, Wooster Street, Queen Street, and South 2nd Street. While it is too early in the design process to identify exact relocations, as the DSA primarily contains block groups meeting the low-income and minority EJ thresholds, impacts to EJ populations are anticipated.

While Alternative A is not anticipated to incur as many residential relocations, temporary EJ impacts associated with Alternative A could include disruptions to bus and trolley service within the DCIA.

- ☐ **No impacts;** no EJ or Title VI population present
- ☐ **No impacts;** EJ and/or Title VI population present
- ☐ **Community Impacts;** no EJ or Title VI population present
- ☒ **Impacts;** EJ and/or Title VI population present; "No" finding
- ☐ **Impacts;** EJ and/or Title VI population present; "Yes" finding

Recommendation

The NCDOT Project Manager should coordinate with NCDOT Public Involvement, Community Studies and Visualization to ensure that all public involvement activities include outreach materials appropriately focused on EJ populations. Public involvement and outreach activities must ensure full and fair participation of all potentially affected communities in the transportation decision-making process.

- ☒ YES
- ☐ NO

LIMITED ENGLISH PROFICIENCY [LEP] OR LANGUAGE ASSISTANCE [LA] POPULATIONS**Presence**

Are there any populations living in the Demographic Study Area that meet the criteria for Limited English Proficiency? Are there any populations within the Demographic Study Area that do not meet the LEP threshold but do meet the criteria for Language Assistance?

Census data does not indicate Limited English Proficiency (LEP) populations meeting the US Department of Justice LEP Safe Harbor threshold, but does indicate an Asian/Pacific language-speaking population exceeding 50 persons within the Demographic Study Area that may require language assistance. This population is within the Direct Community Impact Area, located in downtown Wilmington north of the bridge, just east of South 3rd Street.

- ☐ No LEP or LA
- ☒ No LEP, but LA population is present
- ☐ LEP population present
- ☐ [and LA population present]

Recommendation

Because notable Asian/Pacific language-speaking populations are located within the DCIA, with Tagalog (including Filipino)¹⁶ being the most common and thus requiring language assistance, the NCDOT Project Manager should consult with NCDOT Public Involvement to determine appropriate measures assuring meaningful public involvement to satisfy the requirements of Executive Order 12898.

- ☒ YES
- ☐ NO

¹⁶ USEPA. EJSCREEN Community Report. Web. <https://ejscreen.epa.gov/mapper/>



ADDITIONAL COMMUNITY CHARACTERISTICS**NOTABLE POPULATION GROWTH OR DECLINE**
☐ YES
☒ NO
Presence

Has the DSA experienced notable population growth or decline in recent years? If the average annualized DSA population growth is higher than 1.5%, note the growth in the county and how it compares.

☐ Decline ☐ Greater than 1.5% annual growth (in DSA)

STIP PROJECTS
☒ YES
☐ NO
Presence

Are there any reasonably foreseeable STIP projects within 3 miles of this project and/or that have the potential to affect or be affected by this project?

There are five STIP roadway or intersection projects within the DCIA that have the potential to affect or be affected by this project:

- U-5734- widen to multi-lanes US 421 (South Front Street) from Cape Fear Memorial Bridge to Burnett Boulevard (ROW 2025, Construction 2027).
- HL-0109- installation of traffic signals with pedestrian signal heads at intersection of South 3rd Street and Ann Street (ROW 2024, Construction 20245).
- HL-0110- installation of traffic signal with pedestrian signal heads at intersection of South 3rd Street and Orange Street (ROW 2024, Construction 2025).
- HS-2003Q- upgrade traffic signal, upgrade pavement markings, and add pedestrian accommodations at US 17 (Dawson Street) at US 421 (3rd Street) (Construction 2026).
- HS-2003Z- revise traffic signal and install pedestrian countdown heads at US 17/76 (Wooster Street) and SR 1217 (17th Street) (Construction 2026).

Additional projects are listed in the STIP within three miles of the project; however, they do not have the potential to affect or be affected by the project and are not included in the above list.

TRAFFIC GENERATING FACILITY OR NODE
☒ YES
☐ NO
Presence

Is there a node or facility that generates a notable level of vehicular or pedestrian traffic in the Direct Community Impact Area?

The Cape Fear Memorial Bridge itself generates a notable level of vehicular traffic. Wilmington is a regional economic hub for southeastern North Carolina. Commuters and vacationers use this bridge to access services, destinations and tourist areas located in New Hanover and Brunswick Counties. Additionally, the bridge is used for trucks accessing the Port of Wilmington. The 2021 NCDOT Annual Average Daily Traffic (AADT) for the Cape Fear Memorial Bridge was 60,500 vehicles with the Annual Average Daily Truck Traffic (AADTT) estimated at 3,890 trucks. The CFMB is one of two bridges providing access across the Cape Fear River. The bridges are located north and south of downtown Wilmington. Truck traffic is not permitted in downtown Wilmington; therefore the northern bridge is not viable for over-sized vehicles and drivers use the southern-situated CFMB.

ADDITIONAL RECOMMENDATIONS**EVALUATE ALTERNATIVE(S) THAT UTILIZE A TEMPORARY ON-SITE DETOUR**
☐ YES
☒ NO
EVALUATE ALTERNATIVE CONSTRUCTION WORK SCHEDULES
☐ YES
☒ NO
OTHER RECOMMENDATIONS
☐ YES
☒ NO


Indirect and Cumulative Effects [Transportation Impact Causing Activities (TICAs)]

TRAVEL TIMES <i>Will the project result in travel time savings of more than one minute?</i>	☐ YES ☒ NO
NEW NETWORK CONNECTIONS <i>Will the project permanently add to the existing road network (e.g., new location or new service roads)?</i>	☒ YES ☐ NO
PROPERTY ACCESS <i>Will the project provide new or expanded access to properties?</i>	☐ YES ☒ NO
CREATION OF ACTIVITY CENTERS <i>Will the project open areas for concentrated, moderate to high intensity land development or redevelopment?</i>	☐ YES ☒ NO
TICA SUMMARY / INDIRECT AND CUMULATIVE EFFECTS STATEMENT <i>Will the project result in one or more transportation impact-causing activities? Will the project require completion of the Indirect Effects Matrix?</i> The project will not alter travel patterns, reduce travel times, affect access to properties in the area, or open areas for development or redevelopment. Due to its minimal transportation impact-causing activities, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect and cumulative effects study will not be necessary.	☒ Absence of TICAs ☐ Presence of TICAs COMPLETION OF MATRIX: ☐ YES ☒ NO



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- Local Official Input Form: Jeremy Humphries, Chief, Town of Leland Police Department. jhumphries@townofleland.com. Local EMS Input Form.
- Local Official Input Form: Ronnie Hayes, Chief, Leland Fire Department. rhayes@townofleland.com. Local EMS Input Form.
- Local Official Input Form: John Grimes, Chief, Town of Leland Emergency Management. jgrimes@townofleland.com. Local EMS Input Form.
- Local Official Input Form: David McIntire, Deputy Director, Brunswick County Emergency Management. david.mcintire@brunswickcountync.gov. Local EMS Input Form.
- Local Official Input Form: Lyle Johnston, Deputy Director, Brunswick Co EMS. lyle.johnston@brunswickcountync.gov. Local EMS Input Form.
- Local Official Input Form: Abie Bonevac, Associate Planner, City of Wilmington Planning Department. abie.bonevac@wilmingtonnc.gov. Local Planner Input Form.
- Local Official Input Form: Kirstie Dixon, Director, Brunswick County Planning Department. kirstie.dixon@brunswickcountync.gov. Local Planner Input Form.
- Local Official Input Form: Mike Kozlosky, Executive Director, Wilmington Urban Area MPO. mike.kozlosky@wilmingtonnc.gov. Local Planner Input Form.
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APPENDIX ITEMS

- A. Summary of Demographics Used in Tabular Form
- B. Site Photographs
- C. Local Official Input Forms
- D. Health Indicators Table



APPENDIX A: SUMMARY OF DEMOGRAPHICS USED IN TABULAR FORM**Minority**

Geography	Total Population	White, Non-Hispanic		Minority Population*		Meets Thresholds	
		#	%	#	%	50%	10% over County
CT 201.08, BG 2	2,123	930	43.8%	1,193	56.2%	Yes	Yes
CT 202.05, BG 3	1,864	1,620	86.9%	244	13.1%	No	No
CT 111, BG 1	845	167	19.8%	678	80.2%	Yes	Yes
CT 111, BG 2	2,027	234	11.5%	1,793	88.5%	Yes	Yes
CT 112, BG 2	679	484	71.3%	195	28.7%	No	No
CT 112, BG 3	534	205	38.4%	329	61.6%	Yes	Yes
CT 113, BG 1	901	766	85.0%	135	15.0%	No	No
CT 113, BG 2	1,009	625	61.9%	384	38.1%	No	Yes
CT 115.03, BG 2	2,335	699	29.9%	1,636	70.1%	Yes	Yes
DSA	12,317	5,730	46.5%	6,587	53.5%	Yes	N/A
Brunswick County	133,789	108,794	81.3%	24,995	18.7%		
New Hanover County	225,175	173,110	76.9%	52,065	23.1%		
North Carolina	10,367,022	6,433,921	62.1%	3,933,101	37.9%		

* Minority population includes all races that are Non-White and Hispanic populations that are also White.

Source: US Census Bureau, American Community Survey 5-year Estimates (2017-2021), Table B03002, "Hispanic or Latino Origin by Race."



Race

Geography	Total Population	White		Black or African American		American Indian and Alaska Native Alone		Asian		Native Hawaiian/Pacific Islander		Some Other Race		Two or More Races		Total Non-White	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
CT 201.08, BG 2	2,123	959	45.2%	690	32.5%	7	0.3%	-	0.0%	-	0.0%	168	7.9%	299	14.1%	1,164	54.8%
CT 202.05, BG 3	1,864	1,638	87.9%	175	9.4%	-	0.0%	-	0.0%	-	0.0%	47	2.5%	4	0.2%	226	12.1%
CT 111, BG 1	845	167	19.8%	678	80.2%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	678	80.2%
CT 111, BG 2	2,027	253	12.5%	1,277	63.0%	-	0.0%	-	0.0%	169	8.3%	328	16.2%	-	0.0%	1,774	87.5%
CT 112, BG 2	679	497	73.2%	126	18.6%	-	0.0%	56	8.2%	-	0.0%	-	0.0%	-	0.0%	182	26.8%
CT 112, BG 3	534	205	38.4%	326	61.0%	3	0.6%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	329	61.6%
CT 113, BG 1	901	783	86.9%	51	5.7%	-	0.0%	16	1.8%	-	0.0%	-	0.0%	51	5.7%	118	13.1%
CT 113, BG 2	1,009	663	65.7%	190	18.8%	25	2.5%	16	1.6%	-	0.0%	22	2.2%	93	9.2%	346	34.3%
CT 115.03, BG 2	2,335	800	34.3%	868	37.2%	-	0.0%	-	0.0%	-	0.0%	315	13.5%	352	15.1%	1,535	65.7%
DSA	12,317	5,965	48.4%	4,381	35.6%	35	0.3%	88	0.7%	169	1.4%	880	7.1%	799	6.5%	6,352	51.6%
Brunswick County	133,789	111,535	83.4%	12,125	9.1%	561	0.4%	802	0.6%	4	0.0%	2,599	1.9%	6,163	4.6%	22,254	16.6%
New Hanover County	225,175	179,231	79.6%	28,326	12.6%	523	0.2%	2,953	1.3%	181	0.1%	5,681	2.5%	8,280	3.7%	45,944	20.4%
North Carolina	10,367,022	6,865,508	66.2%	2,193,147	21.2%	113,719	1.1%	314,690	3.0%	7,119	0.1%	372,381	3.6%	500,458	4.8%	3,501,514	33.8%

Source: US Census Bureau, American Community Survey 5-year Estimates (2017-2021), Table B02001, "Race."



Hispanic or Latino Population

Geography	Total Population	Hispanic		Not Hispanic	
		#	%	#	%
CT 201.08, BG 2	2,123	197	9.3%	1,926	90.7%
CT 202.05, BG 3	1,864	69	3.7%	1,795	96.3%
CT 111, BG 1	845	-	0.0%	845	100.0%
CT 111, BG 2	2,027	181	8.9%	1,846	91.1%
CT 112, BG 2	679	13	1.9%	666	98.1%
CT 112, BG 3	534	-	0.0%	534	100.0%
CT 113, BG 1	901	34	3.8%	867	96.2%
CT 113, BG 2	1,009	161	16.0%	848	84.0%
CT 115.03, BG 2	2,335	416	17.8%	1,919	82.2%
DSA	12,317	1,071	8.7%	11,246	91.3%
Brunswick County	133,789	6,690	5.0%	127,099	95.0%
New Hanover County	225,175	13,256	5.9%	211,919	94.1%
North Carolina	10,367,022	1,016,730	9.8%	9,350,292	90.2%

Source: US Census Bureau, American Community Survey 5-year Estimates (2017-2021), Table B03002, "Hispanic or Latino Origin by Race."



Poverty

Geography	Population for whom Poverty Status is Determined	Below Poverty Level		Under 50% of Poverty Level		Between 100% and 149% of Poverty Level		Meets Thresholds	
		#	%	#	%	#	%	25%	5% over County
CT 201.08, BG 2	2,123	362	17.1%	271	12.8%	222	10.5%	No	Yes
CT 202.05, BG 3	1,725	9	0.5%	-	0.0%	63	3.7%	No	No
CT 111, BG 1	845	154	18.2%	90	10.7%	136	16.1%	No	Yes
CT 111, BG 2	2,027	818	40.4%	429	21.2%	714	35.2%	Yes	Yes
CT 112, BG 2	664	54	8.1%	5	0.8%	3	0.5%	No	No
CT 112, BG 3	534	138	25.8%	32	6.0%	33	6.2%	Yes	Yes
CT 113, BG 1	890	120	13.5%	72	8.1%	94	10.6%	No	No
CT 113, BG 2	1,009	184	18.2%	20	2.0%	165	16.4%	No	Yes
CT 115.03, BG 2	2,333	111	4.8%	50	2.1%	657	28.2%	Yes	Yes
DSA	12,150	1,950	16.0%	969	8.0%	2,087	17.2%	No	N/A
Brunswick County	132,910	13,576	10.2%	7,233	5.4%	9,769	7.4%		
New Hanover County	218,563	29,750	13.6%	14,958	6.8%	19,211	8.8%		
North Carolina	10,092,759	1,379,672	13.7%	618,442	6.1%	935,611	9.3%		

Source: US Census Bureau, American Community Survey 5-year Estimates (2017-2021), Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."



Zero-Car Households

Geography	Occupied Housing Units	No Vehicle Available		One Vehicle Available		Two or More Vehicles Available	
		#	%	#	%	#	%
CT 201.08, BG 2	718	33	4.6%	223	31.1%	462	64.3%
CT 202.05, BG 3	725	13	1.8%	134	18.5%	578	79.7%
CT 111, BG 1	414	122	29.5%	127	30.7%	165	39.9%
CT 111, BG 2	942	357	37.9%	467	49.6%	118	12.5%
CT 112, BG 2	334	25	7.5%	156	46.7%	153	45.8%
CT 112, BG 3	313	125	39.9%	84	26.8%	104	33.2%
CT 113, BG 1	562	70	12.5%	306	54.4%	186	33.1%
CT 113, BG 2	642	100	15.6%	373	58.1%	169	26.3%
CT 115.03, BG 2	830	135	16.3%	125	15.1%	570	68.7%
DSA	5,480	980	17.9%	1,995	36.4%	2,505	45.7%
Brunswick County	57,812	1,437	2.5%	16,565	28.7%	39,810	68.9%
New Hanover County	97,852	6,381	6.5%	33,246	34.0%	58,225	59.5%
North Carolina	4,034,684	220,918	5.5%	1,262,874	31.3%	2,550,892	63.2%

Source: US Census Bureau, American Community Survey 5-year Estimates (2017-2021), Table B25044, "Tenure by Vehicles Available."



Limited English Proficiency

Geography	Total Adult Population, 18 years and older	Primary Language Group of Persons Who Speak English Less than Very Well								Meets Thresholds	
		Spanish		Other Indo-Euro		Asian/Pacific		Other			
		#	%	#	%	#	%	#	%	LEP	LA
CT 201.08, BG 2	1,723	36	2.1%	-	0.0%	6	0.3%	-	0.0%	N/A	No
CT 202.05, BG 3	1,657	8	0.5%	-	0.0%	-	0.0%	-	0.0%	N/A	No
CT 111, BG 1	685	-	0.0%	-	0.0%	-	0.0%	-	0.0%	N/A	No
CT 111, BG 2	1,437	15	1.0%	-	0.0%	-	0.0%	-	0.0%	N/A	No
CT 112, BG 2	624	-	0.0%	-	0.0%	56	9.0%	-	0.0%	N/A	Yes
CT 112, BG 3	453	-	0.0%	-	0.0%	-	0.0%	-	0.0%	N/A	No
CT 113, BG 1	878	-	0.0%	-	0.0%	-	0.0%	-	0.0%	N/A	No
CT 113, BG 2	886	32	3.6%	21	2.4%	-	0.0%	-	0.0%	N/A	No
CT 115.03, BG 2	1,727	-	0.0%	18	1.0%	-	0.0%	-	0.0%	N/A	No
DSA	10,070	91	0.9%	39	0.4%	62	0.6%	-	0.0%	No	N/A
Brunswick County	113,736	1,469	1.3%	174	0.2%	143	0.1%	83	0.1%		
New Hanover County	183,676	2,490	1.4%	551	0.3%	815	0.4%	145	0.1%		
North Carolina	8,064,707	264,523	3.3%	41,901	0.5%	61,668	0.8%	17,072	0.2%		

Source: US Census Bureau, American Community Survey 5-year Estimates (2017-2021), Table B16004, "Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over."



Population Change, 2000 to 2010

Geography 2020	ACS 2007-2011 Population*	ACS 2012-2016 Population	ACS 2017-2021 Population	Difference	Percent Change	Annualized Growth Rate
CT 201.08, BG 2	2,325	2,489	2,123	(202)	-8.7%	-0.9%
CT 202.05, BG 3	1,140	1,618	1,864	724	63.5%	5.0%
CT 111, BG 1	1,354	932	845	(509)	-37.6%	-4.6%
CT 111, BG 2	1,793	1,484	2,027	234	13.1%	1.2%
CT 112, BG 2	810	1,127	679	(131)	-16.2%	-1.7%
CT 112, BG 3	884	880	534	(350)	-39.6%	-4.9%
CT 113, BG 1	962	1,034	901	(61)	-6.3%	-0.7%
CT 113, BG 2	395	724	1,009	614	155.4%	9.8%
CT 115.03, BG 2	2,091	2,406	2,335	244	11.7%	1.1%
DSA	11,754	12,694	12,317	563	4.8%	0.5%
Brunswick County	105,242	119,167	133,789	28,547	27.1%	2.4%
New Hanover County	200,357	216,458	225,175	24,818	12.4%	1.2%
North Carolina	9,418,648	9,940,802	10,367,022	948,374	10.1%	1.0%

* ACS 2007-2011 and 2012-2016 population data has been re-appropriated to the 2020 census boundaries.

Source: US Census Bureau, American Community Survey 5-year Estimates (2007-2011, 2012-2016, and 2017-2021), Table B01003, "Total Population."



APPENDIX B: SITE PHOTOGRAPHS



Figure 1: Cape Fear Memorial Bridge (view East-West)



Figure 2: Dram Tree Park, parking, boat access under CFMB



Figure 3: Bridge access from Wooster Street (westbound)



Figure 4: Bike tour on 5th Street



Figure 5: Grandma & Grandpas Childcare (3rd St)



Figure 6: Art Factory Galleries & Waterline Brewing Co. (Surry St)



APPENDIX C: LOCAL OFFICIAL INPUT FORMS**LOCAL EMS**

Name:	Donny Williams	
Title:	Chief	
Agency:	Wilmington Police Department	
Phone:	910-343-3610	
Email:	officeofthechief@wilmingtonnc.gov	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☐ Form returned on (date) ☐ Interview on (date) ☒ No response Comments:

Name:	Chris Walker	
Title:	Chief	
Agency:	Wilmington Fire Department	
Phone:	910-343-3918	
Email:	Chris.Walker@wilmingtonnc.gov	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☐ Form returned on (date) ☐ Interview on (date) ☒ No response Comments:

Name:	Steven Still	
Title:	Director	
Agency:	New Hanover County Emergency Management	
Phone:	910-798-6900	
Email:	sstill@nhcgov.com	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☐ Form returned on (date) ☐ Interview on (date) ☒ No response Comments:



Name:	Jeremy Humphries	
Title:	Chief	
Agency:	Leland Police Department	
Phone:	910-371-1100	
Email:	jhumphries@townofleland.com	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 9/11/2034 ☐ Interview on (date) ☐ No response Comments:

Name:	Ronnie Hayes	
Title:	Chief	
Agency:	Leland Fire Department	
Phone:	910-371-2727	
Email:	rhayes@townofleland.com	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 9/6/23 ☐ Interview on (date) ☐ No response Comments:

Name:	John Grimes	
Title:	Chief	
Agency:	Leland Emergency Management	
Phone:	910-332-4826	
Email:	jgrimes@townofleland.com	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 9/7/2023 ☐ Interview on (date) ☐ No response Comments:

Name:	David McIntire	
Title:	Deputy Director	
Agency:	Brunswick County Emergency Management	
Phone:	910-253-2577	
Email:	david.mcintire@brunswickcountync.gov	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 9/7/23 ☐ Interview on (date) ☐ No response Comments:



Name:	Lyle Johnston	
Title:	Deputy Director	
Agency:	Brunswick County EMS	
Phone:	910-253-2564	
Email:	lyle.johnston@brunswickcountync.gov	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 8/14/23 ☐ Interview on (date) ☐ No response Comments:

LOCAL PLANNER

Name:	Abie Bonevac	
Title:	Associate Planner	
Agency:	Wilmington Planning Department	
Phone:	910-765-0862	
Email:	abie.bonevac@wilmingtonnc.gov	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 9/27/23 ☐ Interview on (date) ☐ No response Comments:

Name:	Mike Kozlosky	
Title:	Executive Director	
Agency:	Wilmington Urban Area MPO	
Phone:	910-341-3258	
Email:	mike.kozlosky@wilmingtonnc.gov	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 8/18/23 ☐ Interview on (date) ☐ No response Comments:

Name:	Benjamin Andrea	
Title:	Planning & Inspections Director	
Agency:	Leland Planning Department	
Phone:	910-371-3390	
Email:	bandrea@townofleland.com	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on 8/28/23 ☐ Interview on (date) ☐ No response Comments:



Name:	Kirstie Dixon	
Title:	Director	
Agency:	Brunswick County Planning Department	
Phone:	910-253-2027	
Email:	kirstie.doxon@brunswickcountync.gov	
FIRST CONTACT DATE	METHOD(S)	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☒ Form returned on October 10, 2023 ☐ Interview on (date) ☐ No response Comments:

LOCAL SCHOOLS

Name:	Debbie Trafton	
Title:	Director of Transportation	
Agency:	New Hanover County Public School System	
Phone:	910-254-4298	
Email:	deb.trafton@nhcs.net	
FIRST CONTACT DATE	METHOD	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☐ Form returned on (date) ☒ Interview on 9/7/2023 ☐ No response Comments: Email received, no completed form

Name:	Lloyd Willis	
Title:	Director of Transportation	
Agency:	Brunswick County Schools	
Phone:	910-756-6998	
Email:	lwillis@bcswan.net	
FIRST CONTACT DATE	METHOD	RESULT
8/14/23, 9/6/23	☒ Email ☐ Phone ☐ In-person	☐ Form returned on (date) ☐ Interview on (date) ☒ No response Comments:



Local EMS Input Form

Local EMS Input Form for
CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT
COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: John Grimes
 Title/Position: Chief
 Organization/Agency: Leland Emergency Management
 Email: jgrimes@townofleland.com

Date: 8/14/23, 9/6/23
 Phone Number: 910-332-4826
 Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the *Save As* command) this file with a new file name for your records and e-mail the *new* file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 29, 2023.

Cheryl Hannah
 HDR
 101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034
 Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/76/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



For all applicable questions, please provide a detailed explanation of your response in the field provided.	Check if item is applicable
1. Are there any concerns related to EMS services for this project? Please be as specific as possible (e.g. location in a high call volume area, closure could affect response to schools, weight restrictions, expected new development in the area, coordination with partner agency required to facilitate service). <i>The route proposed, and construction timing makes impacts of traffic backups impossible to stop. Novant Medical Center (NHRMC) is the primary hospital for 98% of all EMS calls originating in the north end of Brunswick County. Traffic lane reductions will severely impact ground transport by ambulance. I would HIGHLY recommend that discussions with Brunswick County Emergency Services be initiated sooner than later as this project progresses. Fire Protection will be impacted in both Leland and Wilmington as bridge closures or lane reduction impact response times of emergency apparatus. I am unsure how the bridge will be constructed, but SIGNIFICANT involvement of area emergency services will be required.</i>	xxx ☐
2. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? <i>Yes. Many are listed below. The Town has the responsibility of fire protection for many businesses on Eagle Island. Construction and detours may severely affect our ability to respond. The reduction and complete closure of the route will impact egress/ingress before, during, and after a hurricane or other tropical event. Again, coordination with emergency services throughout this project will be important.</i>	xxx ☐
3. Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern? <i>See comments above</i>	xxx ☐
4. Rate the overall impact on emergency services if the roadway were at reduced capacity for up to a year: ☐ No Impact ☐ Low Impact ☐ Moderate Impact xxx ☐ High Impact	
5. Are road names referenced by the names locals would use? <i>I do not understand the question.</i>	xxx ☐
6. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? <i>Brunswick and New Hanover County Emergency Services (Fire, Police, Sheriff, Emergency Management) If you do not have their contact information, I can assist you in getting in contact with all of them. Possibly, Columbus County Emergency Services as well, though to a lesser degree.</i>	xxx ☐
7. Do you have any other concerns regarding the potential impact of this project on EMS services, or any additional comments? Please be as specific as possible. <i>It will be critical that pre-construction planning, regular meeting during construction, and follow up meetings as construction ends happen. Communication between emergency services and the construction team will be lifesaving. It is a must.</i>	xxx ☐



Local EMS Input Form for CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Jeremy Humphries

Title/Position: Chief

Organization/Agency: Leland Police Department

Email: jhumphries@townofleland.com

Date: 8/14/23, 9/6/23

Phone Number: 910-371-1100

Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the *Save As* command) this file with a new file name for your records and e-mail the *new* file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 29, 2023.

Cheryl Hannah

HDR

101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034

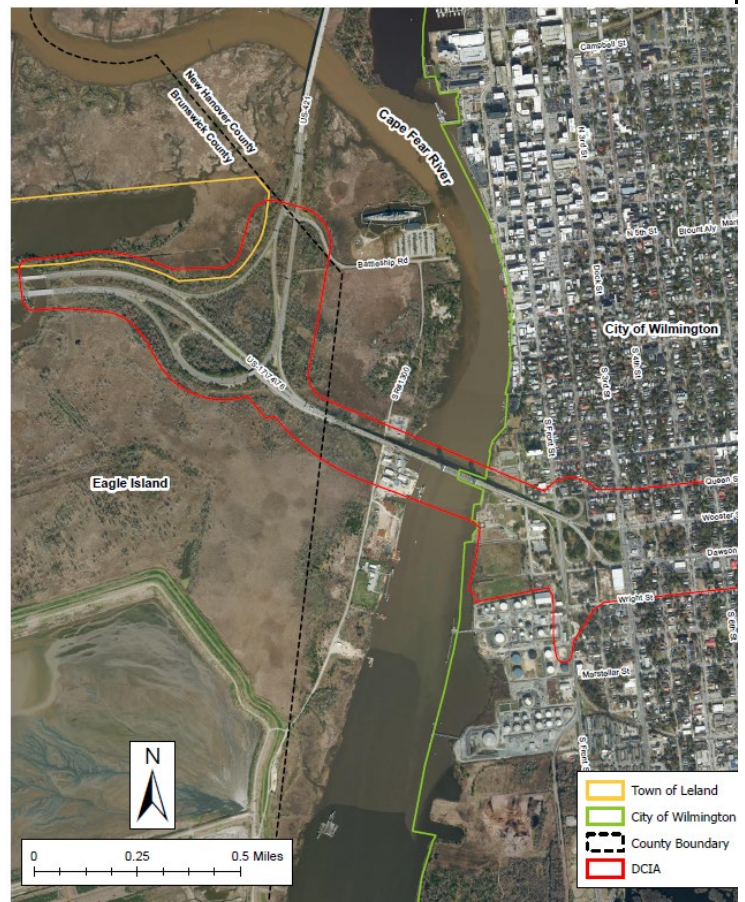
Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/76/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



For all applicable questions, please provide a detailed explanation of your response in the field provided.	Check if item is applicable
1. Are there any concerns related to EMS services for this project? Please be as specific as possible (e.g. location in a high call volume area, closure could affect response to schools, weight restrictions, expected new development in the area, coordination with partner agency required to facilitate service). There are frequent motor vehicle crashes which occur in the area of the project which can significantly affect traffic during peak travel times and the safety of those rendering aid.	X ☐
2. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? Depending on the times when the bridge will be at one lane causes a concern due to the amount of traffic traveling. The reduction in travel lanes will significantly increase traffic on 421 and the Isabel Homes Bridge. This can impact mutual aid request with our partners in New Hanover as well as add additional drive time to Novant Hospital when serving Involuntary Commitment Papers and investigating various cases when called to Novant for the initial report.	X ☐
3. Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern? Depending on scheduled events there is at least one event which occurs each year in New Hanover which travels into the Brunswick County side of the bridge, and it is the Ironman Triathlon. Other than this event which has occurred annually my only other concerns are mentioned in question 2.	X ☐
4. Rate the overall impact on emergency services if the roadway were at reduced capacity for up to a year: ☐ No Impact ☐ Low Impact ☐ Moderate Impact X ☐ High Impact	
5. Are road names referenced by the names locals would use? N/A	☐
6. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? Brunswick County Sheriff's Office, North Carolina State Highway Patrol, Wilmington Police, and New Hanover County Sheriff's Office Brunswick EMS, Leland Fire Acme-Delco Fire, and Novant Health.	X ☐
7. Do you have any other concerns regarding the potential impact of this project on EMS services, or any additional comments? Please be as specific as possible. N/A	☐



Local EMS Input Form for CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Lyle Johnston

Title/Position: Deputy Director

Organization/Agency: Brunswick Co. Emergency Management System

Email: lyle.johnston@brunswickcountync.gov

Date: 8/14/23

Phone Number: 910-253-2564

Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the *Save As* command) this file with a new file name for your records and e-mail the *new* file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 5, 2023.

Cheryl Hannah

HDR

101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034

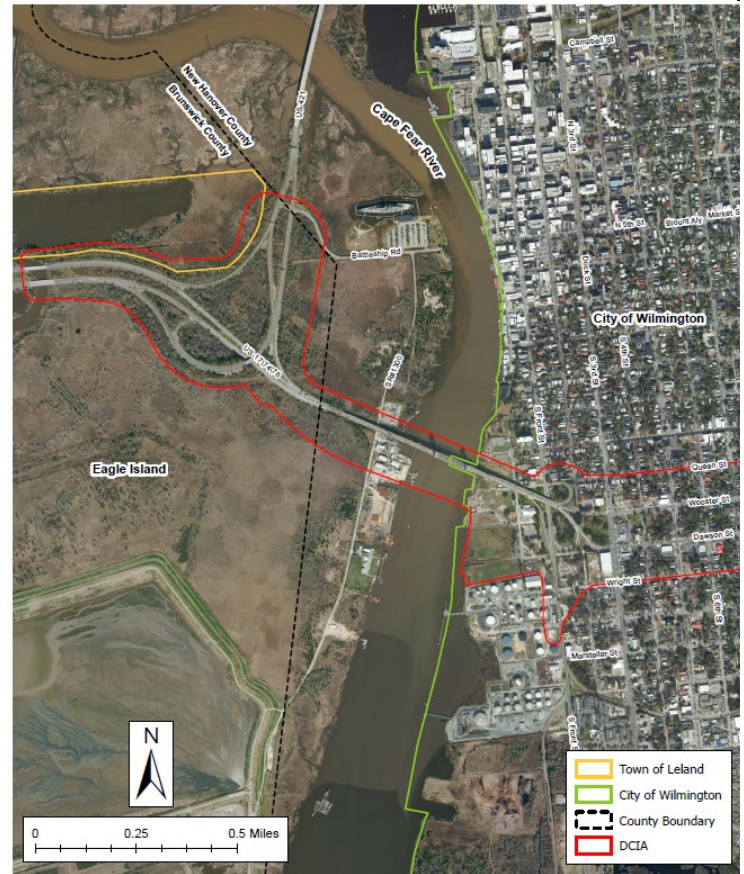
Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/76/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



For all applicable questions, please provide a detailed explanation of your response in the field provided.	Check if item is applicable
8. Are there any concerns related to EMS services for this project? Please be as specific as possible (e.g. location in a high call volume area, closure could affect response to schools, weight restrictions, expected new development in the area, coordination with partner agency required to facilitate service). This corridor is our main ground transport route for access to the area trauma center, stroke center, and cardiac cath lab. This is also our direct route for our mutual aid partners from New Hanover County and Pender County.	☒
9. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? The detour route is about 10 miles longer and puts you going through more of Wilmington to get to the hospital. Although it is interstate highway for most of it, there is one very long bridge that will cause a big traffic issue if an accident were to occur on the bridge.	☒
10. Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern?	☐
11. Rate the overall impact on emergency services if the roadway were at reduced capacity for up to a year: ☐ No Impact ☐ Low Impact ☐ Moderate Impact ☒ High Impact	
12. Are road names referenced by the names locals would use? Yes	☒
13. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)?	☐
14. Do you have any other concerns regarding the potential impact of this project on EMS services, or any additional comments? Please be as specific as possible.	☐



Local EMS Input Form for CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: David McIntire
 Title/Position: Deputy Director
 Organization/Agency: Brunswick County Emergency Management
 Email: david.mcintire@brunswickcountync.gov

Date: 8/14/23, 9/6/23
 Phone Number: 910-253-2577
 Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the *Save As* command) this file with a new file name for your records and e-mail the *new* file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 29, 2023.

Cheryl Hannah

HDR

101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034

Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/76/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



For all applicable questions, please provide a detailed explanation of your response in the field provided.	Check if item is applicable
15. Are there any concerns related to EMS services for this project? Please be as specific as possible (e.g. location in a high call volume area, closure could affect response to schools, weight restrictions, expected new development in the area, coordination with partner agency required to facilitate service). If this project continues as planned there will be significant impacts to our EMS department's ability to provide rapid transport to New Hanover Novant Hospital. This hospital is the closest trauma center for the north end of the county and also provides other life saving specialty services that when needed, time is the determining factor. Any detours that would be put in place would increase transport times and ultimately have a direct impact on patient outcome for those that require the specialty services like the trauma center, stroke services, cath lab, etc..	☒
16. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? There are limited detour routes available in this area. Traffic in this area is already horrific during rush hours in the morning and evening. The traffic backups will be extreme and affect the ability for vital services to move within the identified area and to commute to and from Wilmington.	☒
17. Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern? Any limitation of available lanes would have impact on this area. Obviously during spring and summer months these may be heightened.	☒
18. Rate the overall impact on emergency services if the roadway were at reduced capacity for up to a year: ☐ No Impact ☐ Low Impact ☐ Moderate Impact ☒ High Impact	
19. Are road names referenced by the names locals would use? Yes	☐
20. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? Brunswick County Sheriff's Office; Leland Fire and Police Departments.	☒
21. Do you have any other concerns regarding the potential impact of this project on EMS services, or any additional comments? Please be as specific as possible. Yes, see comments mentioned in #1	☐



Local EMS Input Form for

CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT

COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Ronnie Hayes

Title/Position: Chief

Organization/Agency: Leland Fire Department

Email: rhayes@townofleland.com

Date: 8/14/23, 9/6/23

Phone Number: 910-371-2727

Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the *Save As* command) this file with a new file name for your records and e-mail the *new* file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 29, 2023.

Cheryl Hannah

HDR

101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034

Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/76/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



For all applicable questions, please provide a detailed explanation of your response in the field provided.	Check if item is applicable
22. Are there any concerns related to EMS services for this project? Please be as specific as possible (e.g. location in a high call volume area, closure could affect response to schools, weight restrictions, expected new development in the area, coordination with partner agency required to facilitate service). NO	☐
23. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? Only concern is ensuring the ability to reach property on Battleship Rd. South of the current bridge.	☐
24. Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern? Ensuring the ability of fire apparatus to reach property on Battleship Rd. South of the current bridge.	☐
25. Rate the overall impact on emergency services if the roadway were at reduced capacity for up to a year: ☐ No Impact ☒ Low Impact ☐ Moderate Impact ☐ High Impact	
26. Are road names referenced by the names locals would use? Yes	☐
27. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? Brunswick County Emergency Services	☐
28. Do you have any other concerns regarding the potential impact of this project on EMS services, or any additional comments? Please be as specific as possible. No	☐



Local Planner Input Form

Local Planner Input Form for CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Benjamin Andrea
 Title/Position: Planning & Inspections Director
 Organization/Agency: Leland Planning Department
 Email: bandrea@townofleland.com

Date: 8/14/23
 Phone Number: 910-371-3390
 Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the **Save As** command) this file with a new file name for your records and e-mail the **new** file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 5, 2023.

Cheryl Hannah
 HDR
 101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034
 Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/76/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



Check those questions that apply and provide a detailed explanation of your response in the field provided.	Check if item is applicable
<i>Growth and Development</i>	
1. Are there any known plans for development in the vicinity of the project? Not in Leland's jurisdiction	☐
2. Are there any adopted plans for growth or economic development that could directly affect or be affected by this project? Potentially, yes. Increased efficiency of the transportation network between Leland and Wilmington can help stimulate economic growth and community development as identified in the Leland 2045 plan and other adopted plans.	☒
3. Are there plans to extend water/sewer lines or to build any new facilities, such as fire stations, schools, or other facilities, in the vicinity of the project? Not in Leland's jurisdiction.	☐
4. Are there any specific business and/or economic resources present in the project area, such as business parks, distribution centers, manufacturing facilities, etc.? Not in Leland's jurisdiction	☐
<i>Special Populations</i>	
5. Are you aware of any minority, low-income or limited English proficiency (LEP) populations/communities in the vicinity of the project? If so, please provide the locations of these populations in the area. <i>[If yes, proceed to Question 6. If no, skip to Question 7.]</i> Not in Leland's jurisdiction	☐
6. Are there specific community resources or services that are used by minority, low-income or LEP populations in the vicinity of the project? How is the project likely to affect minority and low-income populations? Not in Leland's jurisdiction	☐
7. Are there any tribal groups connected with land, religious, ethnic or other special populations with different mobility needs or outreach needs in the project area? Not in Leland's jurisdiction	☐
8. Who should we contact to discuss outreach needs for any special populations? Please provide input on community leader contacts, media sources or other ways to reach these populations. Not in Leland's jurisdiction	☐
<i>Access, Accessibility, and Mobility</i>	
9. Is there pedestrian or bicycle activity/traffic or transit use along the project? If so, please describe multimodal activity in the project area. The lack of existing pedestrian and bicycle accommodations on the existing bridge and adjacent 74-76-17 causeway are not conducive to bike/ped activity. WAVE Transit operates a RideMICRO system that uses this bridge and surrounding transportation network.	☐
10. Are there any existing access, accessibility, or mobility concerns or any barriers to non-auto travel in the area? Please consider all modes.	☒



Yes, as described above. The existing bridge and highways 74, 76, and 17 do not have dedicated pedestrian and bicycle infrastructure or improvements. Ideally such improvements should be considered with this project to stimulate safer bike/ped use in the area.	
11. Are there any adopted plans for pedestrian, greenway, bicycle, or transit facilities in the area? For each plan, please provide a description of how the plan applies to the project area, the title of the plan, its year of adoption, and the current status of its implementation. Comprehensive Bicycle Plan for Leland, NC, adopted in 2008 – proposes a bicycle connection from the Leland area along the 74-76-17 causeway to Eagles Island. Projects in this plan have been in planning and implementation phases since adoption. Plan is pending an update.	☒
Agricultural Operations	
12. Are you aware of any active agricultural operations in the vicinity of the project? If so, please describe these operations (e.g. size, ownership, crops, years farmed, suppliers, customers, value to the community). <i>[If yes, answer Question 12. If no, skip to Question 13.]</i> Not in Leland's jurisdiction	☐
13. Are farm support services—such as farm suppliers, equipment dealers, processing and storage facilities, and farmer's markets—located in the vicinity of the project? If so, please describe these services (e.g. type, location).	☐
14. Does the project lie within a VAD or EVAD district, or are you aware of any land with other farmland protections (plans, tax districts or credits, trust, agricultural zoning, deed restrictions)? If so, please describe the nature and location of these areas and properties.	☐
Other Notable Features	
15. Are there any recreational properties within the project area that were purchased or improved with Land and Water Conservation Act funds? Not to my knowledge	☐
16. Are there any other specific notable community resources or issues in the project area? (e.g. socio-economic resources, recreational resources, community safety concerns, cohesive neighborhoods, areas in decline) If so, please describe. See response to Question 10.	☐
Detours and Closures	
17. Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern? For eastbound traffic – morning week-day peak hours. For westbound traffic, evening week-day peak hours.	☐
18. <i>[If applicable]</i> Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? Yes. Traffic rerouted to the Isabella Holmes bridge will add significant vehicles into downtown Wilmington (3 rd Street primarily), MLK Jr. Parkway, and US Highway 421.	☐
19. Rate the overall impact on local planning objectives if the roadway were at reduced capacity for up to a year: ☐ Positive Impact ☐ No Impact ☐ Low Impact ☒ Moderate Impact ☐ High Impact	



Closing Questions

20. Are road names referenced by the names locals would use?

Yes

☐

21. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)?

No

☐

22. Do you have any additional comments about this project?

Please consider adding an observatory similar to the The Penobscot Narrows Bridge in Maine.

<https://www.maine.gov/mdot/pnbo/about/>

Such an observatory would add economic impact as a tourist destination and could help with bridge maintenance costs. I'm told 64,000 people toured the observatory in 2022, paying \$3 each (in addition to the \$6 park entry fee). The additional cost would be nominal compared to total project cost.

☐

Local Planner Input Form for
CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT
COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Abie Bonevac
 Title/Position: Associate Planner
 Organization/Agency: Wilmington Planning Department
 Email: abie.bonevac@wilmingtonnc.gov

Date: 8/14/23, 9/6/23
 Phone Number: 910-765-0862
 Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the *Save As* command) this file with a new file name for your records and e-mail the new file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 29, 2023.

Cheryl Hannah
 HDR
 101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034
 Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/74/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



the field provided.	Check if item is applicable
Growth and Development	
Are there any known plans for development in the vicinity of the project? there are four development plans in the vicinity of the project, the Pearl II, 418 Wooster, Manjaro, and 906 S 8th Street. The Pearl II is located at 719 S 3rd Street, 720 and 724 S 4th Street. Pearl II has received site plan approval and is vested for a mixed-use building for 108 residential units and 3,500 sq. Ft. of commercial. Wooster is located at 418 Wooster Street and is currently under review. The project is proposed to have 125 residential units and 852 sq. Ft. of commercial. The project has not yet been approved and is not vested. Manjaro is under review and is located at 924 S 3rd Street is a 2,500 sq. Ft. restaurant. The project has not yet been approved and is not vested. S 8th Street is under review. The project is proposed to have 18 residential units and 2158 sq. Ft. of commercial. The project has not yet been approved and is not vested.	☒
Are there any adopted plans for growth or economic development that could directly affect or be affected by this project? area is located in an Urban Mixed-use Center per the Create Wilmington Comprehensive Plan. The goals of the Urban Mixed-use Center is to support transit, walking, and biking and be the focal points of vibrant city life and activity. These locations are strategic for accommodating a significant share of future population and employment growth. This can be seen with the two projects mentioned above. Walk Wilmington Plan was adopted on July 18, 2023, and has identified this area as a priority location for pedestrian safety. New Hanover County and City of Wilmington Master Greenway Plan adopted in January 2013. Wilmington Vision 2020 Plan adopted December 14, 2004 and will be updated with the later Downtown Area Plan (currently assigned a consultant).	☒
Are there plans to extend water/sewer lines or to build any new facilities, such as fire stations, schools, or other facilities, in the vicinity of the project? Planning and Development Services department is not aware of any plans to build new facilities in the vicinity of the project. The department recommends confirming with Cape Fear River Utilities Authority, New Hanover County School System, and Fire Department.	☒
Are there any specific business and/or economic resources present in the project area, such as business parks, distribution centers, manufacturing facilities, etc.? There are not any specific businesses or economic resources present in the project area; however, the waterfront property is in the vicinity maintains industrial zoning.	☐
Special Populations	
Are you aware of any minority, low-income or limited English proficiency (LEP) populations/communities in the vicinity of the project? If so, please provide the locations of these populations in the area. [If yes, proceed to Question 6. If no, skip to Question 7.] The area has minority, low-income populations in the vicinity of the project.	☒



LEP populations in the vicinity of the project? How is the project likely to affect minority and low-income populations?	☒
Concerns to services that are used by minorities and low-income populations such as access to transit WAVE stops would be a concern as identified in the Walk Wilmington Plan 2023—this could include any sidewalk closures and bus stop relocations.	
Are there any tribal groups connected with land, religious, ethnic or other special populations with different mobility needs or outreach needs in the project area?	
I am not aware of any tribal groups, differing mobility needs or outreach needs in the project area.	
Who should we contact to discuss outreach needs for any special populations? Please provide input on community leader contacts, media sources or other ways to reach these populations.	☐
I am not aware of contact to discuss outreach needs for special populations, but would suggest reaching out to the City of Wilmington Communications department.	
Access, Accessibility, and Mobility	
Is there pedestrian or bicycle activity/traffic or transit use along the project? If so, please describe multimodal activity in the project area.	☒
There are a number of transit stops located in the project area and the area has a number of sidewalks to connect. These connections are encouraged and supported by the NHC and COW Master Greenway Plan and the Walk Wilmington Plan 2023. These emphasize the importance of safety for bicycle and pedestrians and re-routing bicycles and pedestrians who are already traveling along an identified hazardous area raises concerns.	
J. Are there any existing access, accessibility, or mobility concerns or any barriers to non-auto travel in the area? Please consider all modes.	☒
Yes, the Walk Wilmington Plan was adopted this year and identified this area as a Pedestrian High Injury Network and priority corridor. There are concerns regarding existing safety, so any detours and changes to the area may increase the pedestrian risk.	
L. Are there any adopted plans for pedestrian, greenway, bicycle, or transit facilities in the area? For each plan, please provide a description of how the plan applies to the project area, the title of the plan, its year of adoption, and the current status of its implementation.	☒
The Walk Wilmington Plan was adopted in 2023, see above for how the plan applies.	
WAVE Transit has their own short-term and long-term planning documents that guide them.	



Agricultural Operations

Are you aware of any active agricultural operations in the vicinity of the project? If so, please describe these operations (e.g. size, ownership, crops, years farmed, suppliers, customers, value to the community). <i>[If yes, answer Question 12. If no, skip to Question 13.]</i>	☐
Are farm support services—such as farm suppliers, equipment dealers, processing and storage facilities, and farmer’s markets—located in the vicinity of the project? If so, please describe these services (e.g. type, location).	☐
Does the project lie within a VAD or EVAD district, or are you aware of any land with other farmland protections (plans, tax districts or credits, trust, agricultural zoning, deed restrictions)? If so, please describe the nature and location of these areas and properties.	☐

Other Notable Features

Are there any recreational properties within the project area that were purchased or improved with Land and Water Conservation Act funds?	☐
Are there any other specific notable community resources or issues in the project area? (e.g. socio-economic resources, recreational resources, community safety concerns, cohesive neighborhoods, areas in decline) If so, please describe. mentioned above, the project area is in a high pedestrian injury area so there are concerns about access and safety.	☐

Detours and Closures

Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern? , for Azalea Festival, Riverfest, 4 th of July,	☒
<i>[If applicable]</i> Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes?	☐
Rate the overall impact on local planning objectives if the roadway were at reduced capacity for up to a year: ☐ Positive Impact ☐ No Impact ☐ Low Impact ☐ Moderate Impact ☒ High Impact	

Additional Questions

Are road names referenced by the names locals would use?	☐
Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? Cape Fear Public Utility Authority, WAVE Transit, Jessica Baldwin (Historic Preservation Planner)	☐
Do you have any additional comments about this project?	☐



Local Planner Input Form for CAPE FEAR MEMORIAL BRIDGE RELOCATION PROJECT COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Kirstie Dixon
 Title/Position: Director
 Organization/Agency: Brunswick County Planning Department
 Email: kirstie.dixon@brunswickcountync.gov

Date: 8/14/23, 9/6/23
 Phone Number: 910-253-2027
 Completed Via: ☒ Email ☐ Phone

Interview Information/Instructions

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the **Save As** command) this file with a new file name for your records and e-mail the **new** file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address below. We would greatly appreciate it if you would provide input and return the form back to us by September 29, 2023.

Cheryl Hannah
 HDR
 101 N 3rd Street, Suite 201, Wilmington, NC 28401-4034
 Phone: 910-398-9026

Project Information

The North Carolina Department of Transportation (NCDOT) proposes to replace functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/74/421 in New Hanover and Brunswick Counties. The corridor is a part of the Strategic Highway Network (STRAHNET) for military transportation and serves as a strategic corridor for hurricane evacuation. The replacement is needed to accommodate the high growth areas of the two counties and truck traffic increases that support the growing population, military preparedness, and port activities.

The Direct Community Impact Area (DCIA) is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project completion. It generally includes properties directly adjacent to the project and any properties with sole access points to the roadway.

The NCDOT is proposing two design alternatives: (A) fixed span 135-foot vertical clearance with trumpet interchange improvements and (B) movable span with 65-foot vertical clearance. NCDOT would like your comments and feedback on community resources and characteristics within the DCIA. Your feedback is important to identify these resources and mitigate potential impacts.



Check those questions that apply and provide a detailed explanation of your response in the field provided.	Check if item is applicable
Growth and Development	
1. Are there any known plans for development in the vicinity of the project? No.	☐
2. Are there any adopted plans for growth or economic development that could directly affect or be affected by this project? Overall economic growth and development as a whole is effected by this project as access from Brunswick County to Newhanover County impacts job, housing, medical and entertainment choices.	☒
3. Are there plans to extend water/sewer lines or to build any new facilities, such as fire stations, schools, or other facilities, in the vicinity of the project? No.	☐
4. Are there any specific business and/or economic resources present in the project area, such as business parks, distribution centers, manufacturing facilities, etc.? A few varied businesses that require water (i.e. boat repairs; water cruise lines; etc.)	☒
Special Populations	
5. Are you aware of any minority, low-income or limited English proficiency (LEP) populations/ communities in the vicinity of the project? If so, please provide the locations of these populations in the area. <i>[If yes, proceed to Question 6. If no, skip to Question 7.]</i> Minority/low income – City of Wilmington; None – Brunswick County	☒
6. Are there specific community resources or services that are used by minority, low-income or LEP populations in the vicinity of the project? How is the project likely to affect minority and low-income populations? Not aware as the related area is within the City of Wilmington's jurisdiction.	☐
7. Are there any tribal groups connected with land, religious, ethnic or other special populations with different mobility needs or outreach needs in the project area? None in which we are aware.	☐
8. Who should we contact to discuss outreach needs for any special populations? Please provide input on community leader contacts, media sources or other ways to reach these populations. Human service organizations that serve special needs populations.	☐
Access, Accessibility, and Mobility	
9. Is there pedestrian or bicycle activity/traffic or transit use along the project? If so, please describe multimodal activity in the project area. Bike/Pedestrian traffic for leisure activities and getting to work/school. Public transportation van service for work; personal errands; medical appointments; shopping.	☒
10. Are there any existing access, accessibility, or mobility concerns or any barriers to non-auto travel in the area? Please consider all modes. Safety issues for those riding bicycles and motor scooters as well as those walking. There is no separate or area for small, motorized vehicle, bicycles, and pedestrians to be separated from the vehicular traffic.	☒
11. Are there any adopted plans for pedestrian, greenway, bicycle, or transit facilities in the area? For each plan, please provide a description of how the plan applies to the project area, the	☒
title of the plan, its year of adoption, and the status of its implementation. There are no adopted plans, only compliance with NCDOT's Complete Streets Manual, which separates vehicular traffic from pedestrian/bicycle traffic when constructing roads.	



Agricultural Operations

- | | |
|--|--------------------------|
| 12. Are you aware of any active agricultural operations in the vicinity of the project? If so, please describe these operations (e.g. size, ownership, crops, years farmed, suppliers, customers, value to the community). <i>[If yes, answer Question 12. If no, skip to Question 13.]</i>
No. | ☐ |
| 13. Are farm support services—such as farm suppliers, equipment dealers, processing and storage facilities, and farmer’s markets—located in the vicinity of the project? If so, please describe these services (e.g. type, location).
Not within the Brunswick County side of the proposed project. | ☐ |
| 14. Does the project lie within a VAD or EVAD district, or are you aware of any land with other farmland protections (plans, tax districts or credits, trust, agricultural zoning, deed restrictions)? If so, please describe the nature and location of these areas and properties.
No. | ☐ |

Other Notable Features

- | | |
|---|--------------------------|
| 15. Are there any recreational properties within the project area that were purchased or improved with Land and Water Conservation Act funds?
Not aware of any. | ☐ |
| 16. Are there any other specific notable community resources or issues in the project area? (e.g. socio-economic resources, recreational resources, community safety concerns, cohesive neighborhoods, areas in decline) If so, please describe.
No. | ☐ |

Detours and Closures

- | | |
|--|-------------------------------------|
| 17. Are there any future time periods or events that you know of where road reduction in number of lanes for construction would be of particular concern?
This is the most traveled bridge between Brunswick and New Hanover Counties. It is used daily for work-related and health-related trips. Lane reductions during peak commuting times during the day would be of special concern. | ☒ |
| 18. <i>[If applicable]</i> Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes?
The condition of the obvious bridge to the used for detour (Isabelle Holmes) is questionable for increased traffic. Possible detours are already congested with current daily traffic. Any detour would lessen the number of alternative options available for use. | ☒ |
| 19. Rate the overall impact on local planning objectives if the roadway were at reduced capacity for up to a year:
☐ Positive Impact ☐ No Impact ☐ Low Impact ☐ Moderate Impact ☒ High Impact | |

Closing Questions

- | | |
|---|-------------------------------------|
| 20. Are road names referenced by the names locals would use?
Many refer to the Highway Number (i.e. US 74-76; US 17) as opposed to the actual road names. | ☒ |
| 21. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)?
Belville Town Manager Athina Williams; Leland town Manager David Hollis; Navassa Mayor Eulis Willis; Brunswick Transit Director Yvonne Hatcher. | ☒ |
| 22. Do you have any additional comments about this project?
This project is desperately needed. It can be used as an opportunity to introduce to others | ☒ |

transportation alternatives they have never considered, a a very high percentage of users utilize automobiles. Consideration should be given to increasing Park and Ride Lots, providing bus shuttle service and increased traditional bus service to accommodate most needs. Water taxis should also be considered.



Local Schools Input Form

From: [Deb Trafton](#)
To: [Hannah, Cheryl](#)
Cc: [Love, Emily](#); [Jamie Hinnant](#); [David Bittner](#)
Subject: Re: NCDOT Project HB-0039 Request for Local Input-Trafton
Date: Thursday, September 7, 2023 4:53:41 PM
Attachments: [VerticalLine.png](#)
[Instagram.png](#)
[Facebook.png](#)
[NHCSLogo_50x52.png](#)
[Twitter.png](#)
[YouTube.png](#)

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello,

Thanks for reaching out. I couldn't find in my emails your first attempt to send this to me, so glad you sent it again.

While we haven't completed the form yet, be advised that we don't foresee any issues with this project. We always appreciate the opportunity to provide feedback!

Have a good night,

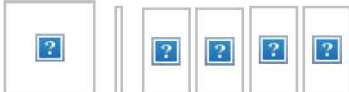
We're hiring bus drivers! [Apply Now to be a Bus Driver.](#)

Debbie Trafton

Director of Transportation

[New Hanover County Schools](#)

P: 910-254-4298



PUBLIC RECORDS LAW NOTICE: Please be advised that e-mails and attachments sent from this e-mail address, as well as e-mails, replies and attachments sent to this e-mail address, may be "public records" under North Carolina Public Records Law, NCGS Chapter 132. All "public records" are subject to disclosure to the media and the public.

On Wed, Sep 6, 2023 at 9:15 AM Hannah, Cheryl <Cheryl.Hannah@hdrinc.com> wrote:

Ms. Trafton,

Just wanted to follow up to give you another opportunity to provide input on NCDOT Project HB-0039 which propose the relocation of the Cape Fear Memorial Bridge in New Hanover and Brunswick County. Your feedback is an important part of project planning.

For your reference, I've re-attached the blank input form which includes a map of the



project's Direct Community Impact Area.

Please let us know if you have any questions. Thank you!

Cheryl W Hannah

Senior Transportation Planner

HDR

101 N 3rd Street, Suite 201
Wilmington, NC 28401-4034
D 910-398-9026

Cheryl.Hannah@hdrinc.com

hdrinc.com/follow-us



APPENDIX D: HEALTH INDICATORS TABLE

CHARACTERISTIC	SMALLEST DATA LEVEL	DCIA	BRUNSWICK COUNTY	NEW HANOVER COUNTY	NORTH CAROLINA	DATA SOURCE	NOTES
Number of Pedestrian or Bicyclist Crashes in DCIA (Ped/Bike)	DCIA	20 / 16				http://ncdot.maps.arcgis.com/home/index.html	Click on Spatial Data Viewer, click on Add Data, enter NCDOT_BikePedCrash, click on Add Count the number of crashes within the DCIA from 2007-2016 using NCDOT's Bicyclist and Pedestrian Crash Map.
Average Pedestrian Crash Rate	City of Wilmington		1.06	2.83	2.77	http://www.pedbikeinfo.org/pbcats_nc/	Crashes per 10,000 residents, avg. of 2012-2016 crash totals, 2014 pop
Average Bicyclist Crash Rate	City of Wilmington		0.82	2.70	1.03	http://www.pedbikeinfo.org/pbcats_nc/	Crashes per 10,000 residents, avg. of 2012-2016 crash totals, 2014 pop
Physical Inactivity	New Hanover County		20.0%	19.1%	25.0%	http://www.courtyhealthrankings.org/app/north-carolina/2019/overview	Percent of adults aged 20+ reporting no leisure-time physical activity, 2015
Access to exercise opportunities	New Hanover County		78.2%	95.1%	74.5%	http://www.courtyhealthrankings.org/app/north-carolina/2019/overview	Percentage of individuals who reside in a census block within a half mile of a park or (urban) one mile of a rec. facility or (rural) three miles of a rec. facility, 2010 & 2019





Appendix E

Cultural Resources Coordination



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

August 30, 2023

Dr. Wenonah Haire
Catawba Indian Nation, Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, SC 29730

Dear Dr. Haire:

The North Carolina Department of Transportation is starting the project development, environmental, and engineering studies for the replacement of functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/74/421 in New Hanover and Brunswick Counties as project HB-0039. The Federal Highway Administration (FHWA) is the lead federal agency for compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA) and a Permit is anticipated under the Section 404 Process with the US Army Corps of Engineers (USACE). A project vicinity map is attached. The coordinates of this project are approximately: **34.227700, -77.952387**.

We would appreciate any information you might have that would be helpful in evaluating potential environmental impacts of the project including recommendation of alternates to be studied. Your comments may be used in the preparation of a NEPA Environmental Document.

In accordance with Section 106 of the NHPA, we also request that you inform us of any historic properties of traditional religious or cultural importance that you are aware of that may be affected by the proposed project. Be assured that, in accordance with confidentiality and disclosure stipulations in Section 304 of the NHPA, we will maintain strict confidentiality about certain types of information regarding historic properties.

Please respond by October 2, 2023 so that your comments can be used in the scoping of this project. If you have any questions concerning this project, or would like any additional information, please contact me at trhowell1@ncdot.gov or (910) 341-2000.

Thank you,

DocuSigned by:

Trace Howell

B7CB1410AB0E489...

Trace R Howell, PE, PMP

NCDOT Senior Project Manager – Division 3, Project Development Unit

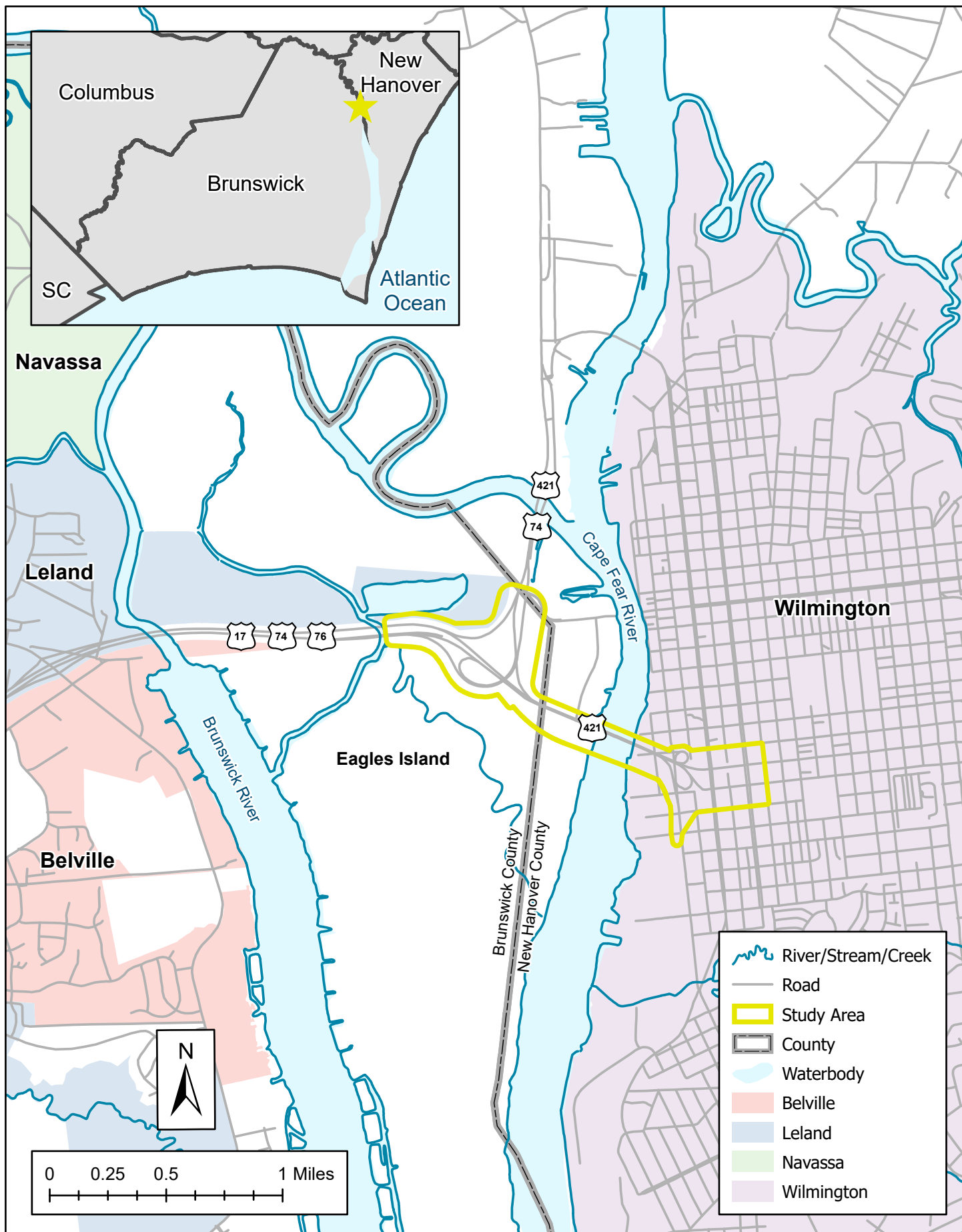
cc: Matt Wilkerson, NCDOT Archaeology Team Leader

Mailing Address:
5501 BARBADOS BOULEVARD
CASTLE HAYNE, NC 28429

Telephone: (910) 341-2000
Fax: (910) 675-0143
Customer Service: 1-877-368-4968

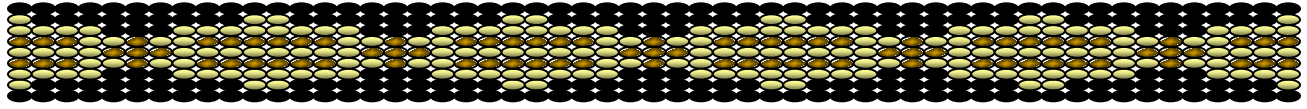
Website: www.ncdot.gov

Location:
HIGHWAY DIVISION 3
5501 BARBADOS BOULEVARD
CASTLE HAYNE, NC 28429



Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427
Fax 803-328-5791



October 3, 2023

Attention: Trace Howell
NC Dept. of Transportation
5501 Barbados Boulevard
Castle Hayne, NC 28429

Re. THPO #	TCNS #	Project Description
2023-193-249		replacement of functionally obsolete Bridge No. 13 over the Cape Fear River on US 17/74/421 in New Hanover and Brunswick Counties as project HB-0039

Dear Mr. Howell,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Rogers at 803-328-7369, or e-mail Caitlin.Rogers@catawba.com.

Sincerely,

Wenonah G. Haire
Tribal Historic Preservation Officer

23-07-0005



HISTORIC ARCHITECTURE AND LANDSCAPES

EFFECTS REQUIRED FORM

This form only pertains to Historic Architecture and Landscapes for this project. It is not valid for Archaeological Resources. You must consult separately with the Archaeology Group.

PROJECT INFORMATION

Project No:	HB-0039	County:	New Hanover
WBS No.:	50603.1.1	Document Type:	EA/FONSI
Fed. Aid No:		Funding:	☒ State ☐ Federal
Federal Permit(s):	☒ Yes ☐ No	Permit Type(s):	USACE, USCG

Project Description:

Replace Bridge 13 (Cape Fear Memorial Bridge) on US 421 over the Cape Fear River. A study area, encompassing the bridge location as well as the interchange of US 421 and US 74/76 in Brunswick County (on the west side of the Cape Fear River) and the interchange of US 74/76 with Wooster Street and Dawson Street (on the east side of the Cape Fear River in the City of Wilmington) was developed to facilitate the environmental review process at this stage. The study area submitted by the project manager has been used as the Area of Potential Effects (APE) for historic architectural resources. Project is currently state-funded, but NCDOT anticipates future Federal funding.

SUMMARY OF HISTORIC ARCHITECTURE AND LANDSCAPES REVIEW

Description of review activities, results, and conclusions:

Review of project area on HPOWeb GIS data was conducted in July 2023. There are two National Register-listed properties in the area, the Wilmington HD(NH0003) and the USS North Carolina(NH0004). The Wilmington Historic District contains a local historic preservation overlay district and the USS North Carolina is a state-owned site that also a National Historic Landmark. Bridge 13 is a contributing resource within the Wilmington Historic District but also has an individual survey site number (NH2326) because it is currently recommended for individual eligibility as a part of NCDOT's Statewide Historic Bridge Survey update. The 1969 bridge is eligible under Criterion C as an example of an uncommon movable type with distinctive engineering - the first and only vertical lift bridge constructed in the state.

No additional survey is required for the project. The APE has been reviewed for historic resources numerous times over the past decade with redevelopment and transportation projects, including U-5734 (S. Front Street). In addition, the ongoing historic bridge survey contains the most recent recommendations of eligibility for historic bridges.

The historic boundaries for the bridge are the footprint of the bridge superstructure and substructure and shall be marked on the design plans to assess the potential impacts of the project in an effects assessment with the State and Federal agencies. The historic boundaries for the

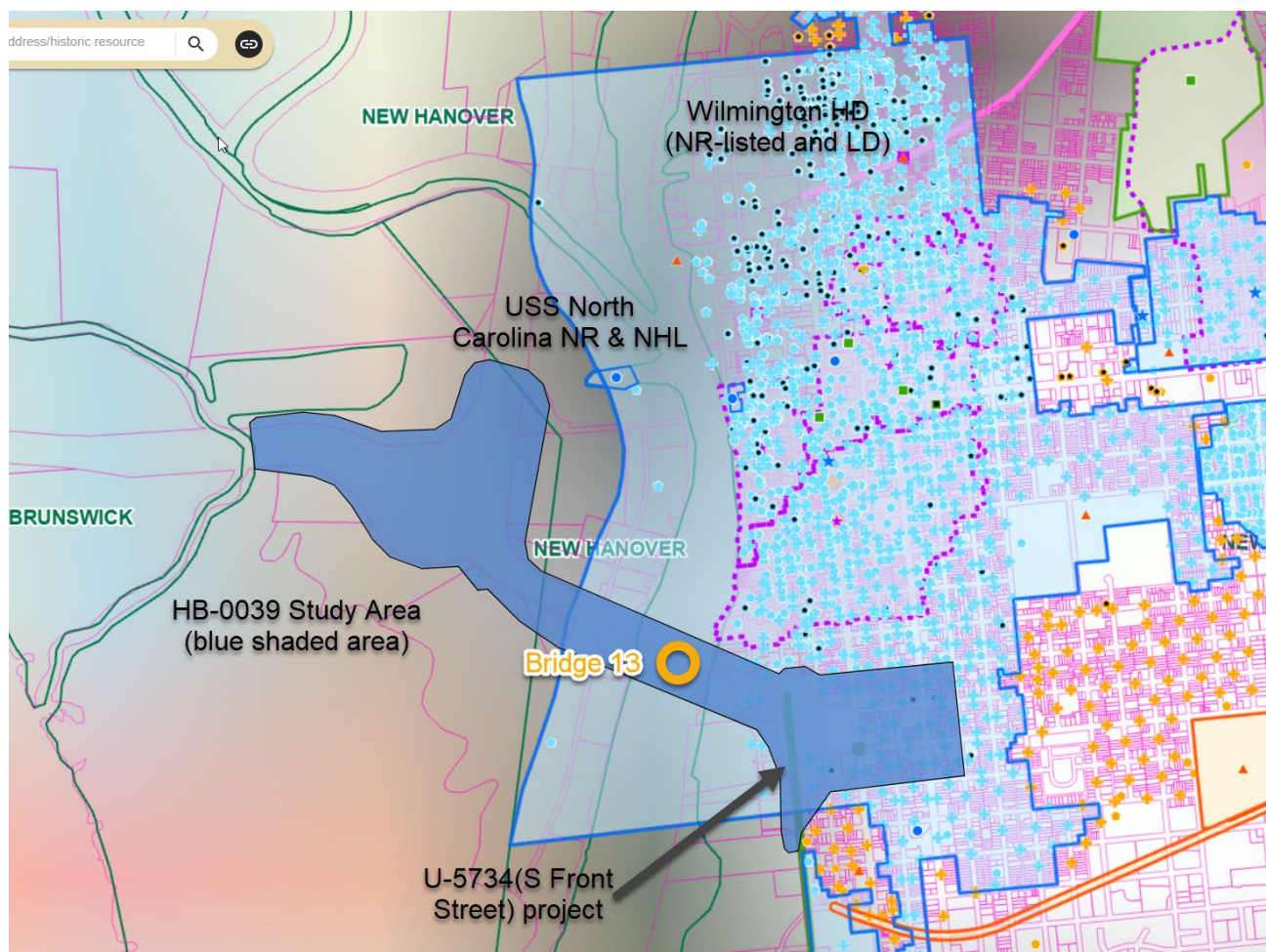
Wilmington Historic District and the local overlay district can be downloaded from HPOWeb. The HPO will also be interested to know how the project will be viewed from and affect the views of the USS North Carolina.

SUPPORT DOCUMENTATION

☒ Map(s) ☐ Previous Survey Info. ☐ Photos ☐ Correspondence ☐ Design Plans



R-5927 Study Area Map provided by Project Manager



HPOWeb July 2023

FINDING BY NCDOT ARCHITECTURAL HISTORIAN

Historic Architecture and Landscapes -- ****EFFECTS REQUIRED****

Mary Pope Furr

8/9/2023

NCDOT Architectural Historian

Date



Appendix F

Phase I Geoenvironmental Report



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

January 2, 2024

MEMORANDUM TO: Trace Howell, PE, PMP
Senior Project Manager
Project Development Unit-Division 3

FROM: Craig Haden
GeoEnvironment
GeoEnvironmental Section
Geotechnical Engineering Unit

TIP NO: HB-0039
WBS: 50603.1.1
COUNTY: NEW HANOVER
DIVISION: 3
DESCRIPTION: Replace Bridge # 13 over Cape Fear River on US 421

SUBJECT: **GeoEnvironmental Phase I Report**

The GeoEnvironmental Section of the Geotechnical Engineering Unit performed a Phase I field investigation on December 19, 2023 for the above referenced project to identify geoenvironmental sites of concern. The purpose of this report is to document sites of concern within the project study area that are or may be contaminated. These sites of concern should be included in the environmental planning document in an effort to assist the project stakeholders in reducing or avoiding impacts to these sites. Sites of concern may include, but are not limited to, underground storage tank (UST) sites, dry cleaning facilities, hazardous waste sites, regulated landfills and unregulated dumpsites.

Findings

Nine (9) sites of concern were identified within the proposed study area. We anticipate low monetary and scheduling impacts resulting from these sites. See the following table and figure for details.

Please note that discovery of additional sites not recorded by regulatory agencies and not reasonably discernible during the project reconnaissance may occur. The GeoEnvironmental Section should be notified immediately after discovery of such sites so their potential impact(s) may be assessed.

Sites of concern identified in this report should be reviewed by the GeoEnvironmental Section once the Final Right of Way plans are complete to determine if Phase II Investigations and Right of Way Recommendations are necessary prior to right of way being acquired.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH, NC 27699-1589

Telephone: (919) 707-6850
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

If there are questions regarding the geoenvironmental issues, please contact me, at (919) 707-6871.

cc:

John Pilipchuk, LG, PE, State Geotechnical Engineer

Brian Hanks, PE, State Structures Engineer

Brent Hall, Locations and Surveys

Keith Garry, State Utilities Manager

Anthony Law, Division Construction Engineer

Kaye Baggett, Division Right of Way Agent

Thomas Santee, PE, Geotechnical Regional Manager

Dean Argenbright, LG, Regional Geological Engineer

Luis Pages, State Negotiator

row-notify@ncdot.gov

roadwaydesign@ncdot.gov

hydraulics_notify@ncdot.gov

(01) Property Name:

Eagle Island Engineer Yard
232 Battleship Rd
Leland, NC 28451

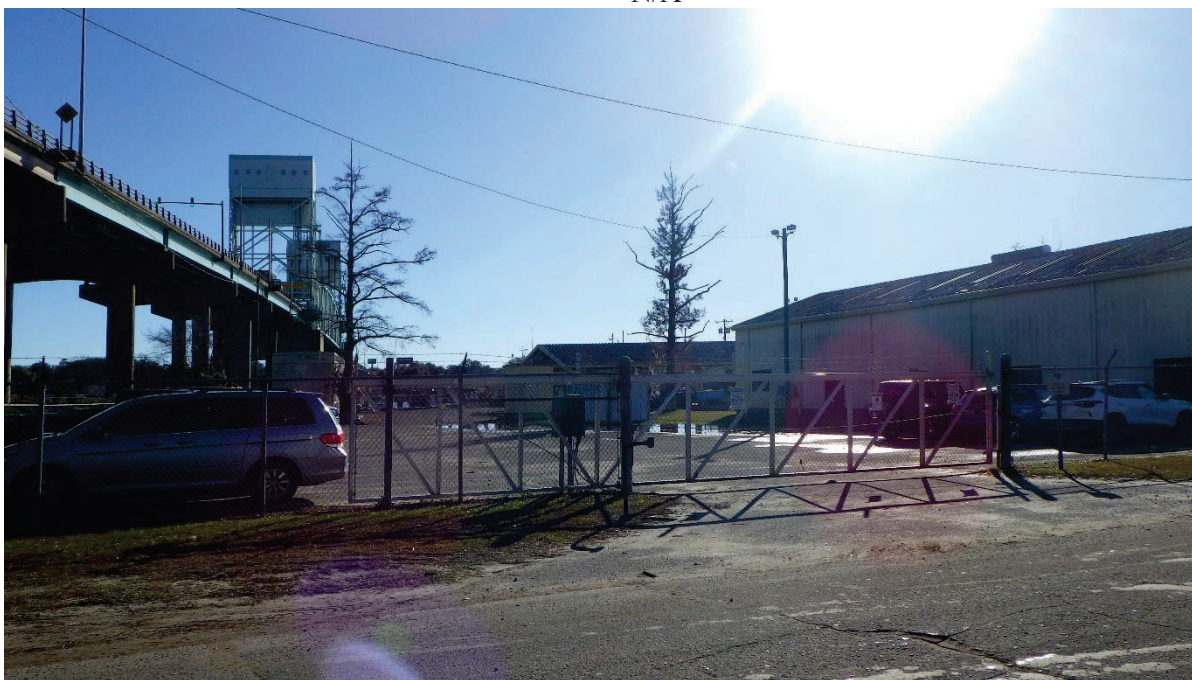
Property Owner:

United States of America
1849 C Street NW
Washington, DC 20240

Facility ID: N/A**Incident Type/Number:** 85428**UST Owner:**

N/A

N/A

**Anticipated Impacts:** Low

This site is currently the Engineer Yard owned by the US Army Corp of Engineer. The site is used as a repair and storage/maintenance facility. It is located on the east side of Battleship Rd at US 17 Business on the west of the Cape Fear River. In 1996 petroleum contaminated soil and groundwater was encountered while excavating for a new boat slip. Approximately 1000 tons of contaminated soil and 7300 gallons of contaminated water were removed from the site. Source of the contamination appeared to be from localized spills occurring from past operations at Eagle Island.

(02) Property Name:

Former Wilmington Coal Gas Plant
606 Surry St
Wilmington, NC 28401

Property Owner:

Duke Energy Progress LLC.
PO Box 1007
Charlotte, NC 28201

Facility ID: NCD986188910



Anticipated Impacts: Low-Medium

This parcel is currently a vacant lot. It is the former location of the Wilmington Manufactured Gas Plant. The site is listed as an Inactive Hazardous Waste Site under the Superfund Section. According to DEQ online reports, Bi-Annual groundwater sampling is currently on going. For the exception of one monitoring well the area of groundwater sampling appears to be outside the proposed study area.

(03) Property Name:

NCDOT Property (Former Riverman II LLC
Property)
712 Surry St
Wilmington, NC 28401

Property Owner:

NC Department of Transportation
1546 Mail Service Center
Raleigh, NC 27611

UST Owner:

N/A

Facility ID: N/A

Incident Type/Number: 8250

N/A



Anticipated Impacts: Low

This parcel is currently a vacant lot. It was acquired by NCDOT as an advanced acquisition in May 2023. According to the October 20, 2022, Phase II Environmental Site Assessment provided by the former property minor soil and groundwater contamination is present at the property.

(04) Property Name:

Vacant Lot (Former City Gas & Transmission)
801 Surry St
Wilmington, NC 28401

Property Owner:

Colonial Carolina Inc
1002 S. Front St
Wilmington, NC 28401

Facility ID: NCD986186518**Incident Type/Number:** 3493, 8119**UST Owner:**

N/A

N/A

**Anticipated Impacts:** Low-Medium

This vacant lot is part of the former Oil Refinery that operated at 801 Surry St from the 1970s to the mid-1990s. The facility was declared a superfund site in the mid-1990s. In 1997 the US EPA took over cleanup. The site was cleaned up and approximately 50,000 cubic yards of contaminated soil was removed. The area within the study area appears to be where the former office building was located. This site was identified as site 1 in the 2018 U-5734 GeoEnvironmental Phase I report.

(05) Property Name:

Southern Metals Recycling
13 Wright St
Wilmington, NC 28401

Property Owner:

Southern Metals Recycling
PO Box 2139
Wilmington, NC 28402

Facility ID: NCN000407584

Incident Type/Number: N/A

UST Owner:

N/A

N/A



Anticipated Impacts: Medium-High

This active Metal Recycling facility is located in the northwest quadrant of S. Front St and Wright St. The site is being cleaned up and is scheduled to permanently close December 22, 2023. The Facility is listed in the DEQ Waste management Superfund - Inactive hazardous site database. The facility is not listed in the UST Section Registry and there are no known incidents associated with it. This site was identified as site # 2 in the 2018 U-5734 GeoEnvironmental Phase I report.

(06) Property Name:

Colonial Terminals
1002 S. Front St
Wilmington, NC 28401

Property Owner:

CTI of North Carolina, Inc
PO Box 576
Savannah, GA 31402

Facility ID: 00-0-0000022441, NCD981476708

Incident Type/Number: 5059, 6107, 3283

UST Owner:

Colonial Terminals Inc
1002 S. Front St
Wilmington, NC 28401

**Anticipated Impacts: Medium**

This site currently operates as Colonial Fuels bulk storage facility. It is located on the southwest quadrant of S. Front St and Wright St. The facility occupies approximately 33 acres. The Facility is listed in the DEQ Waste management Superfund - Inactive hazardous site database. It is listed as a large quantity generator. There are numerous bulk storage ASTs on the property and several incidents are associated with the site. According to the UST Section Registry there is one current 1000-gallon oil/water separator. One tank was closed in 1955, two in 1976, one in 1978 and one in 1994. There were several monitoring wells observed during the site investigation. This site was identified as site # 4 in the 2018 U-5734 GeoEnvironmental Phase I report.

(07) Property Name:

DTS LLC Property
102 Wright St
Wilmington, NC 28401

Property Owner:

DTS LLC
401 Chestnut ST
Suite A
Wilmington, NC 28401

Facility ID: 00-0-0000020574**Incident Type/Number:** 19136**UST Owner:**

Springer-Eubank Co Inc.
123 Shipyard Blvd
Wilmington, NC 28412

**Anticipated Impacts:** Low

This site is currently a vacant lot. It is located on the east side of S. Front between Wright St and Meares St. It is the former location of Springer Eubanks Bulk Plant. According to the UST Section Registry four (4) tanks were removed in 1993. Incident # 19136 is associated with this facility and was closed out in 2004. There is a possible old pump island located in the middle of the gravel lot. No monitoring wells were observed during the site investigation. This site was identified as site # 3 & 5 in the 2018 U-5734 GeoEnvironmental Phase report. This property (parcel 019_U-5734) was investigated in August 2023 for advanced ROW acquisition. NO USTs or contamination were identified.

(08) Property Name:

Scotchman #3325

901 S. 3rd St

Wilmington, NC 28401

Property Owner:

RILP NC2, LP

11995 El Camino Real

San Diego, CA 92130

Facility ID: 00-0-0000021405

Incident Type/Number: 14965, 48249

UST Owner:

RILP NC2, LP

11955 El Camina Real

San Diego, CA 92130



Anticipated Impacts: Low

This site currently operates as a convenience store/gas station. It is located on the southeast quadrant of S. 3rd St and Dawson St. According to the UST Section Registry there are four USTs currently in use. Incident #'s 14965 and 48249 are associated with this site and both have been closed out. Four monitoring wells that appeared to be abandoned were observed during the site investigation. There is a "Notice of Residual Petroleum" attached to the property deed.

(09) Property Name:

Vacant Lot Former Exxon # 4-3957
315 Wooster St
Wilmington, NC 28401

Property Owner:

3RD and Wooster LLC
82 Hanover St, Suite 5
Portland, ME 4101

Facility ID: NONCD0003064, 00-0-0000020189**Incident Type/Number:** 10031**UST Owner:**

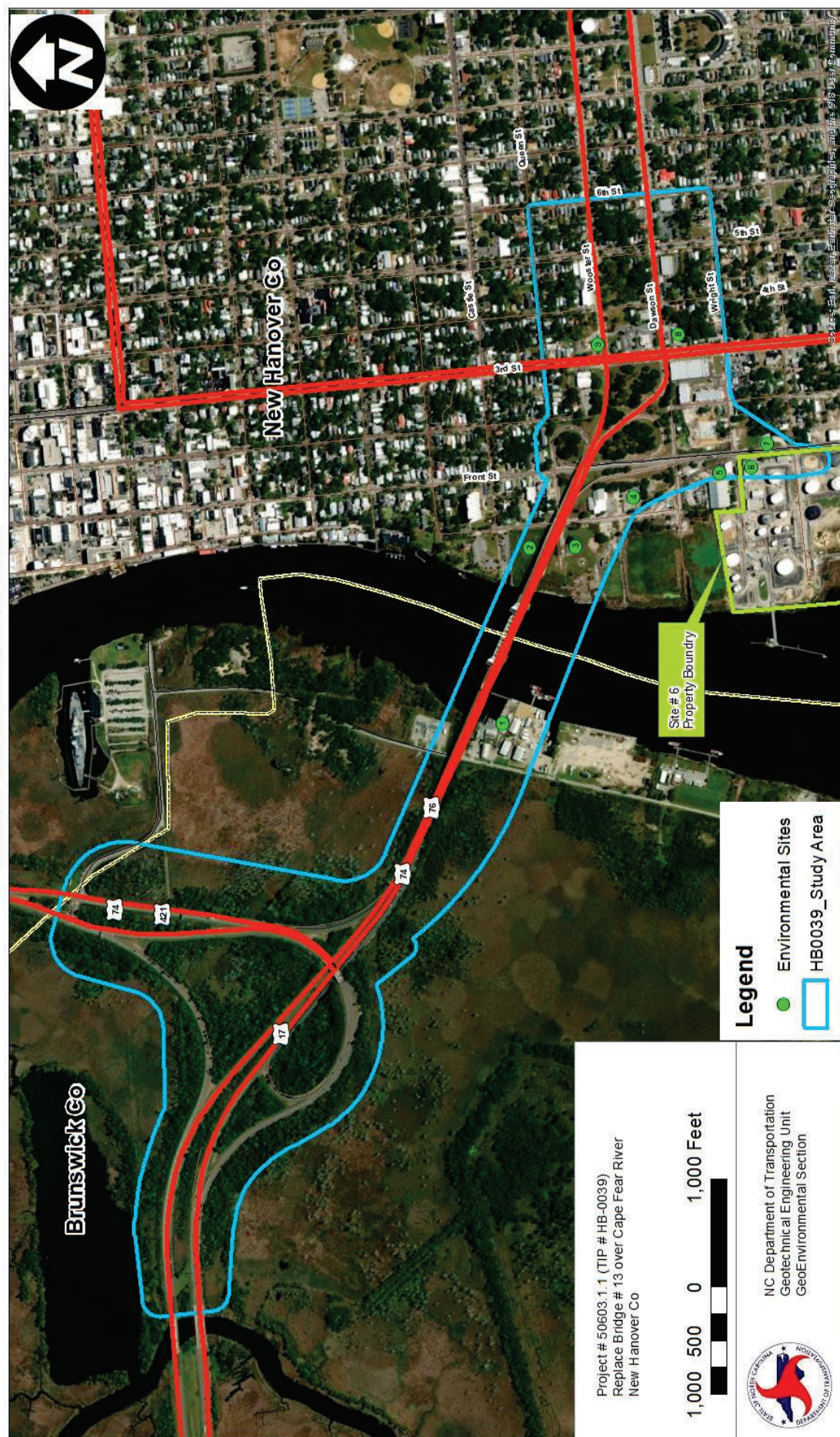
Exxon Co. USA
4550 Dacoma, 3rd Floor.
Houston, TX 77092

**Anticipated Impacts:** Medium-High

This site is currently a vacant lot. It is the former location of Exxon # 4-3957. It is located on the northeast quadrant of S. 3rd St and Wooster St. According to the UST Section Registry seven USTs were removed in 1993. Incident # 10031 is associated with this site and was closed out in 1998. The site was turned over to Inactive Hazardous Waste Section for the Tetrachloroethane (PCE) contaminated groundwater identified in a 1998 phase II investigation. The source of PCE contaminated groundwater is unknown and may be from an off-site source. In October 2021 the current property owner submitted Brownfields Property application and Consent Fee. On February 9, 2022 DEQ issued a Letter of Eligibility. A 2022 Phase II conducted for the prospective developer identified PCE and Vinyl chloride above DEQ 2L standards but below the Non-Residential groundwater screening levels in one groundwater sample. No monitoring wells were observed during the site investigation.

Appendix A

Location of GeoEnvironmental Sites of Concern





Appendix G

Public Comment Summary

Public Comment Summary and NCDOT Response

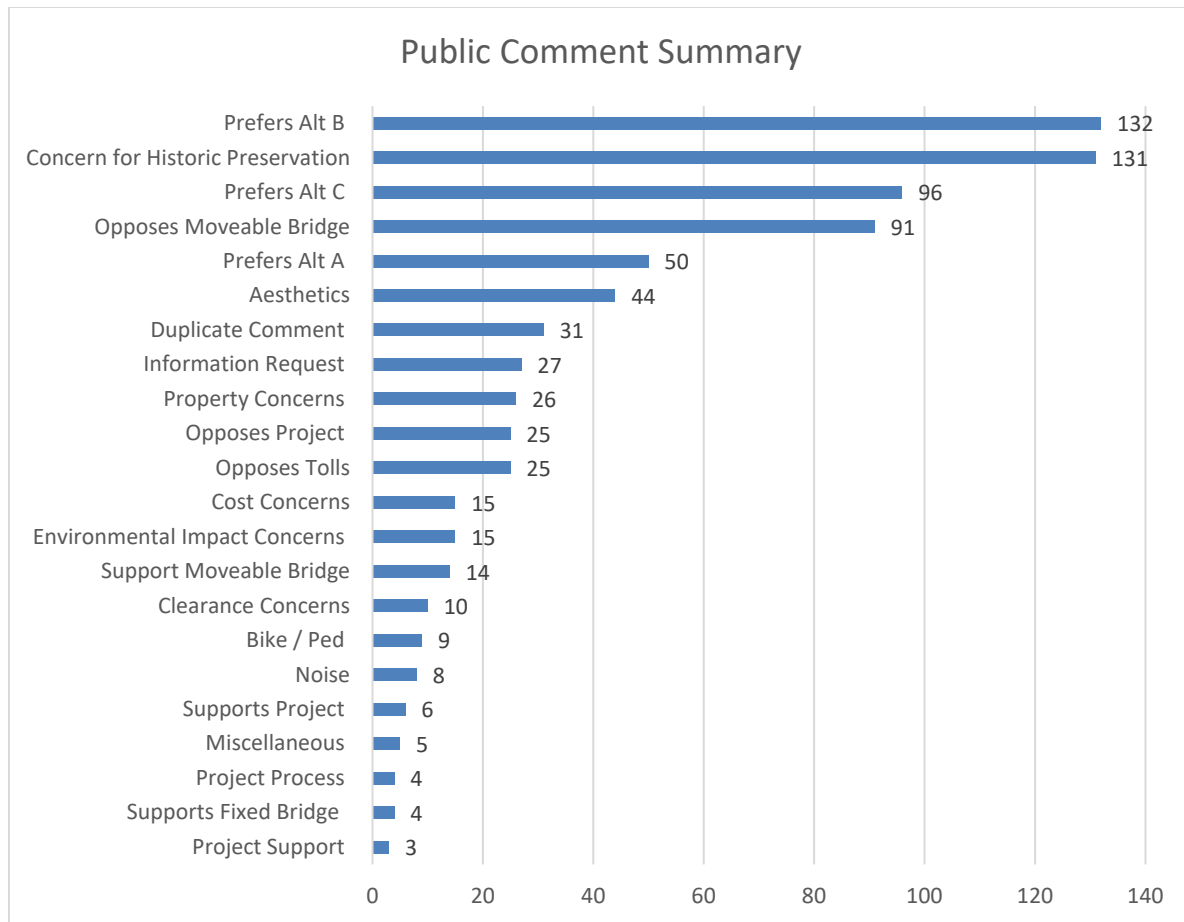
Project:	NC Department of Transportation (NCDOT) State Transportation Improvement Program (STIP) Project HB-0039		
Subject:	HB-0039 Comment Summary and NCDOT Response to Public Comments October 2024 Public Outreach		
Dates:	October 8, 2024	Time: 5:00 PM – 7:00 PM (Wilmington, NC)	
	October 9, 2024	Time: 5:00 PM – 7:00 PM (Leland, NC)	
Locations:	Cape Fear Community College – Daniels Hall 502 N. Front Street Wilmington, NC 28401		
	North Brunswick High School 114 Scorpion Drive, NE Leland, NC 28451		
Notes By:	HDR		

The North Carolina Department of Transportation (NCDOT) held in-person public meetings on October 8, 2024 and October 9, 2024 in Wilmington, New Hanover County and Leland, Brunswick County. On October 8th there were 163 total attendees and on October 9th, there were 83 total attendees.

On October 8, 2024, a Local Officials Informational Meeting was held in Wilmington and attended by staff members or representatives from the City of Wilmington, Wilmington Metropolitan Planning Organization (WMPO), New Hanover County, Wilmington Police Department, the Federal Highway Administration, NCDOT (Division 3), and HDR (consultant). On October 9, 2024, a Local Officials Informational Meeting was held in Leland and attended by staff members or representatives from Brunswick County, Town of Leland, Cape Fear Council of Governments, WMPO, NCDOT (Division 3), and HDR (consultant).

The comment period for the project extended from October 1, 2024 to October 28, 2024. 763 comments were received during this time by 532 members of the public through the project's publicinput.com website, project phone line, e-mails to the project e-mail address, or comment sheets left at the public meetings. Comments were categorized by themes; some comments reflected multiple themes and a total of 821 total themes were recorded. The below chart and table summarize comment themes and representative comments.

NCDOT STIP Project HB-0039
Public Comment Summary



NCDOT STIP Project HB-0039
Public Comment Summary

Subject	Count	Percent	Description / Representative Comment
Prefers Alt B	132	16%	Preference for higher vertical clearance for shipping, commerce, and potential future development.
Concern for Historic Preservation	131	16%	Concern regarding impacts to historic homes.
Prefers Alt C	96	12%	Cost effective, raises vertical clearance for commerce, and minimizes impacts to historic and natural resources.
Opposes Moveable Bridge	91	11%	General opposition to a moveable bridge; concern about associated congestion.
Prefers Alt A	50	6%	Minimizes impacts to historic properties, maintains existing bridge footprint.
Aesthetics	44	5%	Suggestions for aesthetic appearance of bridge.
Duplicate Comment	31	4%	Duplicate comments left by the same users.
Information Request	27	3%	Requests for additional information, printed information, and phone calls.
Property Concerns	26	3%	Concerns about specific properties, landownership, general concern regarding relocations.
Opposes Project	25	3%	General opposition to the project; support for keeping existing bridge as-is.
Opposes Tolls	25	3%	General opposition to implementing tolls.
Bike / Ped	23	3%	Support for bicycle and pedestrian accommodations across the replacement bridge.
Design Question	19	2%	Alternative or design specific questions, recommendation for consideration of tunnel.
Traffic Concerns	17	2%	Note concerns regarding existing traffic operations, future year volumes, and traffic patterns of alternatives.
Cost Concerns	15	2%	General concern regarding the cost of the bridge replacement project
Environmental Impact Concerns	15	2%	Wetlands, water quality impact concerns
Support Moveable Bridge	14	2%	Support for a moveable bridge, retains charm of Wilmington.
Clearance Concerns	10	1%	Support or criticism of potentially raising the vertical clearance, potential for future cruise ships.
Supports Project	9	1%	General support of project.
Noise	8	1%	Noise impact concerns.
Miscellaneous	5	<1%	Broad opinions on transportation projects.

NCDOT STIP Project HB-0039
Public Comment Summary

Project Process	4	<1%	Skeptical of process, project development process questions.
Supports Fixed Bridge	4	<1%	Support for a fixed bridge, assertion that it improves traffic operations over a moveable, general comment.
Total	821	100%	

Summary of Comments Received by Topic and NCDOT Responses

Prefer Alternative A (50)

Comments noted.

Opposes Project (25)

Comments noted.

Prefer Alternative B (132)

Comments noted.

Supports Moveable Bridge (14)

Comments noted.

Prefer Alternative C (96)

Comments noted.

Supports Fixed Bridge (4)

Comments noted.

Supports Project (9)

Comments noted.

Miscellaneous (5)

Comments noted.

Duplicate Comment (31)

Comments noted.

Concern For Historic Preservation (131)

NCDOT has coordinated with the State Historic Preservation Office (SHPO) throughout the development of this project, which has included evaluation of any sites that are listed on, or considered eligible for listing on, the National Register of Historic Places (NRHP).

- **Neighborhood Impact**

NCDOT will continue to make efforts to avoid and minimize impacts to neighborhoods surrounding the project to the greatest extent practicable during final design and construction. If the acquisition of private property is required, NCDOT Right-of-Way and Relocation procedures will be followed.

Opposes Moveable Bridge (91)

- **Traffic Operations**

The project is being designed to address project future traffic volume needs which include both local and regional growth in traffic. The scale of the project is appropriate to meet future traffic needs and to maintain adequate traffic operations for all road users. NCDOT will continue to

make efforts to further avoid and minimize impacts due to the project to the greatest extent practicable during final design and construction.

The current movable bridge only has on-demand opening between 6:00 PM and 6:00 AM with additional lift times at approximately 10:00 AM and 2:00 PM, so it should not currently interfere with typical weekday peak traffic hours (typically 7-9AM and 4-6PM), and if the future bridge were moveable, it would be expected to follow a similar timeline for openings.

The Alternative C (100' fixes +/- 35') design is a fixed span and would not have bridge lifts.

- **Operations and Maintenance Costs**

Operations and maintenance costs are expected to increase as the bridge ages and traffic increases. Average annual maintenance costs were estimated at \$550,000 in 2019 NCDOT completed a major deck rehabilitation in Spring 2024 with an estimated construction cost of \$13 million. Maintenance costs are anticipated with any infrastructure project. The funds allocated for the project are to be used specifically for the proposed project. NCDOT maintenance funds are allocated from a separate source within NCDOT and cannot be transferred.

Aesthetics (44)

Visualizations shown at the public meetings do not necessarily reflect what aesthetic treatments will be used on the bridge. Final appearance will differ depending on which Alternative is selected. NCDOT recognizes the role the aesthetic appearance of the bridge plays in positively impacting the community. The materials and appearance of the bridge have not yet been determined and will take place in later stages of project development.

Information Requests (27)

Comments to be addressed individually.

Property Concerns (26)

- **Residential/Property Impacts**

In certain instances, private property must be acquired to provide North Carolinians with a safe and modern transportation system. When a property is shown to be impacted, many factors have been taken into consideration in determining that the affected site is the most practical location for the transportation project.

Once a preferred alternative corridor is determined, the design will be further refined and will take into consideration engineering feasibility, safety, economics, public well-being, and the least amount of impact and inconvenience to the public. NCDOT will continue to avoid and minimize residential relocations to the greatest extent practicable. Affected property owners will be contacted by a NCDOT or NCDOT-contracted right-of-way agent to explain the plans, discuss any impacts to their property, and provide information regarding property owner rights.

Public Comment Summary

Appraisals and negotiations with the state will then take place. Property appraisals take into consideration several factors including, lot size, square footage, any updates or improvements, location, and the current real estate market. The proposed project would not be the only factor considered when determining property values and the amount of any compensation.

NCDOT will continue to make efforts to avoid and minimize impacts to neighborhoods surrounding the project to the greatest extent practicable during final design and construction. If the acquisition of private property is required, NCDOT Right-of-Way and Relocation procedures will be followed.

Opposes Tolls (25)

In January 2024, the WMPO Board voted to modify the WMPO's Prioritization 7.0 submittal to evaluate a toll option. A tolling option was included in the 2026-2035 DRAFT State Transportation Improvement Plan (STIP). Future affirmation by the WMPO Board would be required for the replacement bridge to be delivered as a tolled facility. And the WMPO Board can withdraw any approval of a toll option up until NCDOT advertises the bridge replacement contract.

Bike/Pedestrian (23)

- Support of Complete Streets

Comments noted.

- Safety

NCDOT is committed to improvements to provide for all modes of transportation and has continued to coordinate efforts with the City of Wilmington, the Town of Leland, Brunswick County and New Hanover County to incorporate these improvements into the project in compliance with applicable design and cost-sharing guidelines. In areas where existing sidewalks are being disturbed, the proposed design shows these sidewalks being replaced. In areas where future pedestrian accommodations are proposed, the design has been developed to facilitate their future construction.

Design Question (19)

Comments noted. Specific design questions to be addressed on an individual basis.

Traffic Concerns (17)

The project is being designed to address project future traffic volume needs which include both local and regional growth in traffic. The scale of the project is appropriate to meet future traffic needs and to maintain adequate traffic operations for all road users. NCDOT will continue to make efforts to further avoid and minimize impacts due to the project to the greatest extent practicable during final design and construction.

Environmental Impact Concerns (15)

Minimization measures for unavoidable impacts will be developed through coordination with federal and state environmental regulatory and resource agencies including the United States Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, US Army Corps of Engineers, and the NC Division of Environmental Quality, among other state and federal agencies. Following identification of the preferred alternative, designs will be refined. NCDOT will continue to evaluate ways to modify the alternative to further avoid and minimize impacts to physical and natural environments. Impacts to wetlands and streams that cannot be avoided or further minimized will be compensated with mitigation agreed to by the permitting agencies.

Water quality concerns will be avoided and/or mitigated through compliance with state and federal regulations covering watershed protection, floodplain protection, stream and river buffers, and stormwater management.

NCDOT will continue to avoid and minimize impacts due to the project to the greatest extent practicable during final design and construction.

- **Wetland Impacts**

Surface waters (lakes, rivers, and streams) and wetlands are subject to jurisdictional considerations under the Section 404 and Section 401 program of the Clean Water Act. Under this program, any action that proposes to place fill material into these areas falls under the jurisdiction of the U.S. Army Corps of Engineers and the North Carolina Division of Water Resources.

The North Carolina Division of Coastal Management carries out the state's Coastal Area Management Act, the Dredge and Fill Law and the federal Coastal Zone Management Act of 1972 in the 20 coastal North Carolina counties. Any action that impacts the resources that falls under their jurisdiction will also require their consideration and authorization.

As required by law, during the development of the preliminary design, efforts were made to avoid and minimize impacts to wetlands and streams wherever practicable. Several wetlands avoidance and minimization measures have been incorporated into the proposed project, including alignment revisions.

Cost Concerns (15)

The right-of-way, construction, and utility relocation costs presented at the October 2024 public meetings are based on the conceptual design plans. The project has been included in the Metropolitan Planning Organization's Metropolitan Transportation Plan for several years as a fiscally constrained project. NCDOT maintenance funds are allocated from a separate source within NCDOT and cannot be transferred.

NCDOT received a \$242 million grant as part of the Large Bridge Project awards through FHWA's Bridge Investment Program. NCDOT and the Wilmington Metropolitan Planning Organization (WMPO) will work collaboratively to identify the necessary funding to deliver the project.

Once a preferred alternative is identified, the updated traffic forecast will include both tolling and non-tolling scenarios with estimates of what percentage of trucks and passenger cars would be anticipated to use the roadway under each scenario.

Vertical Clearance Concerns (10)

In coordination with the US Coast Guard (USCG), FHWA and NCDOT have performed extensive research and analysis on waterway usage as well as the sizes and frequencies of vessels that navigate the Cape Fear River. NCDOT has completed a Preliminary Navigation Impact Report which has been submitted to the US Coast Guard and the US Army Corps (USACE) Section 408. The US Coast Guard will provide a recommendation for the minimum vertical clearance for the proposed bridge in an upcoming Preliminary Navigation Clearance Determination, in coordination with USACE. Conversations with the USCG and USACE are ongoing and will play an important role in the selection of the preferred alternative.

- **Economic Development**

The USCG will provide a recommendation for minimum vertical clearance for the proposed bridge in an upcoming Preliminary Navigation Clearance Determination, in coordination with the USACE Section 408. Conversations with the USCG and USACE are ongoing and will play an important role in the selection of the preferred alternative.

Project Process (4)

- **Support of Project Process**

Comments noted.

- **Skeptical of Project Development Process**

The purpose of the project planning phase is to identify the best transportation solution for the project. Milestones are incorporated into the schedule to ensure that Federal and State regulatory agencies are informed throughout the lifecycle of the project. The current State Transportation Improvement Program (STIP) lists the project as HB-0039.

Opportunities to further minimize the impacts to the human and natural environment will continue to be evaluated during the refinement of preliminary and final designs.

Noise (3)

A preliminary traffic noise analysis will be completed for the proposed project to assess current and future noise levels. Once the analysis is complete, the results will be documented in an initial noise study called a Traffic Noise Report (TNR). This TNR will present predicted traffic

noise impacts based on the project's preliminary design and will identify locations where noise abatement preliminarily meets feasibility and reasonableness criteria.

When this noise study is complete, maps will be posted on the project website that show the areas likely for noise abatement based on that preliminary analysis. If the TNR identifies areas likely to qualify for noise abatement, then additional noise studies will be conducted as part of the project's final design activities to identify recommended noise barrier locations.



Appendix H

Section 404/ NEPA Merger Process Materials

PURPOSE AND NEED AND STUDY AREA DEFINED

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge)
over the Cape Fear River

New Hanover and Brunswick Counties

STIP Project HB-0039

North Carolina Department of Transportation

Division 3



MERGER CONCURRENCE POINT NUMBER 1

December 14, 2023 / 10:00 AM – 12:00 PM

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Figures (*attached*)

Figure 1: Vicinity Map

Figure 2: Environmental Features Map

Figure 3: Other Projects in Area

1. Introduction

The purpose of this meeting is to reach concurrence on CP 1, Purpose and Need and Study Area defined.

Lead federal agency: Federal Highway Administration (FHWA)

Primary points of contact for the subject project are:

Agency	Name
FHWA	Seth Wilcher
U.S. Army Corps of Engineers (USACE)	Thomas Steffens
North Carolina Division of Water Resources (NCDWR)	Hannah Sprinkle
North Carolina Department of Transportation (NCDOT)	Trace Howell

1.1 Project Description

NCDOT proposes to replace Bridge # 640013 over the Cape Fear River on US 421 in New Hanover and Brunswick Counties. Based on the 2020 Feasibility Study, NCDOT identified two alternatives for consideration in project development as listed below. Each alternative includes the following typical section: three 12-foot lanes in each direction separated by a 22-foot median, 10-foot inside shoulders, 15-foot multi-use path on the north side of the bridge, and 12-foot outside paved shoulders.

- Alternative A: Movable span 65' vertical clearance
- Alternative B: Fixed span 135' vertical clearance with trumpet interchange improvements

Both alternatives would modify the existing eastern loop ramps at S. Front Street and tie into the current one-way pair of Wooster Street and Dawson Street in downtown Wilmington. Across the river, the bridging of Eagle Island wetlands would extend to the US 17/US 74/ US 421 interchange, with possible ramp modifications to that interchange with Alternative B. The proposed study area shown in Figure 1 encompasses all such modifications.

The proposed project is approximately 0.66 miles in length with a proposed design speed of 50 miles per hour over the river. The project is programmed in the 2024-2033 State Transportation Improvement Program (STIP) as project HB-0039 for preliminary engineering only. The project location is shown in Figure 1.

1.2 Project History and Merger Plan

The Wilmington Metropolitan Planning Organization (WMPO) *Cape Fear Moving Forward 2045* Metropolitan Transportation Plan (MTP) was adopted November 18, 2020. The MTP identified the subject project as "US 76/421/17/17 BUS/Cape Fear Memorial Bridge Replacement". The project is ranked 58th out of 79 projects in the Fiscally-Constrained Roadway Project List, and 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.

As noted above, the project is included in the current STIP as project HB-0039 and is being managed by NCDOT Division 3. The current cost estimates for the project are shown in **Table 1**. The proposed project schedule is included in **Table 2** and is based on the Merger Plan. The schedule and cost estimates are draft and subject to change.

Table 1. Cost Estimates

Phase	Estimated Costs	
	Alternative A: 65' Vertical Clearance Movable Structure	Alternative B: 135' Vertical Clearance Fixed Structure
Right of Way	\$5,640,000	\$41,715,000
Utilities	\$1,998,000	\$3,688,000
Construction Total	\$744,200,000	\$400,600,000
Total	\$751,839,000	\$446,003,000

NOTE: All cost estimates are preliminary and subject to change.

Table 2. Project Schedule*

Milestone	Anticipated Date
CP 2	Winter 2024
CP 2A meeting	Winter/Spring 2024
Public Meeting	Winter 2024
CP 3 (LEDPA Determination)	Fall 2024
CP 4A	Winter 2024/2025
CP 4B	TBD
CP 4C	TBD
Begin ROW Acquisition	Post Year
Begin Construction	Post Year

*Draft, subject to change

1.3 Other Projects Nearby

The NCDOT 2024-2033 STIP includes the following projects that intersect the HB-0039 study area:

- U-5734 (Front Street Widening) is scheduled for right-of-way (ROW) in 2025 and construction in 2027.
- HS-2003Q proposes upgrading the traffic signal, pavement markings, and adding pedestrian accommodations to the intersection of US 17 (Dawson Street) at US 421 (3rd Street). The project is scheduled for construction in 2026.

The WMPO Cape Fear *Moving Forward 2045 Metropolitan Transportation Plan (MTP)* includes the following projects intersecting the study area:

- RW-93 (US 17/76/Wooster Street streetscape improvements) planned for construction in 2030.
- RW-92 (US 17/76/Dawson Street streetscape improvements) planned for construction in 2030.

- BP-1 proposes on-street bicycle lanes along 5th Street from Campbell Street to Greenfield Lake Park.
- BP-669 proposes crosswalk improvements at 3rd Street and Dawson Street with construction planned for 2025.
- BP-370 proposes sharrows on Front Street from Ann Street to the Cape Fear Memorial Bridge, with construction planned after 2045.

Additionally, the City of Wilmington is currently studying the Wilmington Rail Realignment Project which is studying the realignment of the existing CSX freight rail line between Navassa (Davis Yard) and the Port of Wilmington. The preferred alternative for the project crosses the Cape Fear River just south of the existing bridge.

2. Existing Conditions

2.1 Transportation Features

The existing Cape Fear Memorial Bridge carries US 17 Business/ US 76/ US 421, a freeway, across the Cape Fear River, linking the City of Wilmington’s urban core on the east with one of the fastest growing counties in North Carolina, Brunswick, on the west.¹ The existing bridge is a four-lane steel center-span vertical-lift bridge on a non-interstate Strategic Highway Network (STRAHNET) route.² The posted speed limit along US 17 Business / US 76/ US 421 eastbound is 45 mph and 55 mph westbound over the bridge.

Table 3 lists basic information about each facility, including NCDOT’s functional classification, 2021 Average Annual Daily Traffic (AADT), existing lanes, lane width, functional classification, and posted speed limit.

Table 3. Existing Roadway Characteristics

Facility	Existing Feature		Functional Classification ³	2021 AADT (vpd*) ⁴
	Lanes (width in feet)	Speed Limit (mph)		
US 17/76	4	45	Freeway	55,000-84,999
US 421	4	35	Other Principal Arterial	10,000 – 19,999
Front Street	2	25	Minor Arterial	2,000-4,999

* “vehicles per day”

Annual average daily traffic (AADT) volumes in 2023 over the Cape Fear Memorial Bridge are approximately 65,200 vehicles per day (vpd).⁵ These volumes are expected to increase to 94,900 vpd in 2050 in the No-Build scenario.

¹ The Brunswick County Data Book, Summer 2023 (https://www.brunswickcountync.gov/wp-content/uploads/2023/08/Data-Book-2023-Draft_Communications-Approved.pdf)

² Strategic Highway Network (STRAHNET) is a Department of Defense designation given to roads that provide “defense access, continuity, and emergency capabilities for movements of personnel and equipment in both peace and war.”

³ NCDOT Functional Class Mapper, <https://www.arcgis.com/home/item.html?id=029a9a9fe26e43d687d30cd3c08b1792>

⁴ NCDOT Annual Average Daily Traffic Mapper, <https://ncdot.maps.arcgis.com/apps/webappviewer/index.html?id=964881960f0549de8c3583bf46ef5ed4>

⁵ HB-0039 Traffic Forecast, September 26, 2023

In the 2023 Base Year No-Build Scenario, 2 of 12 freeway sections operate at LOS E or F in both the AM and PM peak periods.⁶ With the expected increase in traffic volumes along the corridor in 2050, further operational degradation at the intersections is expected without improvements to the corridor. In the 2050 No-Build Scenario, 6 of 12 freeway segments operate at a LOS E or worse in the AM peak period and 9 of 12 freeway segments in the PM peak period.

2.2 Environmental Features

Environmental resources in the project area are shown in the Environmental Features Map (Figure 3). The study area is part of the Brunswick River- Cape Fear River basin (U.S. Geological Survey [USGS] Hydrologic Unit [HUC] 030300050503). There are no water supply watersheds (WS-I or WS-II) within or within 1.0 mile downstream of the study area. Both banks of the Cape Fear River are identified as Primary Fish Nursery Areas. The Cape Fear River is also classified as an anadromous fish spawning area by the North Carolina Division of Marine Fisheries (NCDMF) and the North Carolina Wildlife Resources Commission (NCWRC). The Cape Fear River is also designated as critical habitat for the Atlantic Sturgeon with documentation for both Shortnose Sturgeon and Atlantic Sturgeon. The waters of the Cape Fear River north of the bridge are designated as joint waters, and waters south of the bridge as coastal waters. The Cape Fear River is classified as a 303(d) stream for Dissolved Oxygen, from upstream mouth of Toomers Creek to Greenfield Creek.

The study area falls in a sensitive environmental and historic area of North Carolina. The eastern portion of the project is located in downtown Wilmington in the Wilmington Historic District, a National Register Historic District, and the western portion of the project is located in Brunswick County in a primarily undeveloped area. Dram Tree Park is located on the east side of the river north of the Cape Fear Memorial Bridge within the study area, and is subject to Section 6(f) protections. Eagle Island lies between the Cape Fear and Brunswick Rivers and consists of approximately 2,100 acres that are primarily wetlands and remain undeveloped.

Other resources located within the study area include the below:

- The Cape Fear Historic Byway is located in downtown Wilmington and follows Front Street and Castle Street within the project area.
- The Wilmington Riverwalk follows the east bank of the Cape Fear River, including within the project area.
- There are two community resources within the study area, Healing Waters Holy Temple Church of God and Grandma and Grandpa's Daycare.
- Eleven hazardous materials sites are located within the project study area: two active underground storage tanks (USTs), six non-UST Abandoned Storage Tank Incidents, and three brownfield sites.
- Wetlands are located within the project study area, including potential CAMA Areas of Environmental Concern.
- The entirety of study area from the eastern bank of the Cape Fear River to the west is located in a 100-Year floodplain.
- US Army Corps of Engineers Section 408 projects and resources.

⁶ HB-0039 Draft Capacity Analysis Report, November 2023

3. Project Purpose and Need

3.1 Identified Needs

The need for this project can be described as follows:

The NCDOT 2020 Feasibility Study for this project states the 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. The 2021 annual average daily traffic (AADT) on the bridge was approximately 69,000 vehicles, including 8,280 trucks, according to the National Bridge Inventory (NBI). Traffic volumes are projected to increase to 94,900 by 2050, based on the 3.27% annual growth rate projected by the NBI. The Cape Fear Memorial Bridge was constructed in 1969 and is also classified as functionally obsolete by the NBI.

Structure Safety Reports compiled for NCDOT indicate the bridge condition was rated fair in 2016, and the deck, superstructure, and substructure Condition Ratings were all rated satisfactory in 2018. These elements were awarded a grade of six out of nine under the National Bridge Inventory Condition Ratings. Repair and maintenance costs are expected to increase as the bridge ages and traffic increases. In 2019, approximately \$15 million was spent on a major rehabilitation for the bridge, and average annual maintenance costs were estimated at \$550,000. NCDOT is completing another major deck rehabilitation in Spring 2024 with an estimated construction cost of \$13 million.

3.2 Proposed Purpose

The purpose for the proposed project is to replace the functionally-obsolete US 17/ 74/ 421 bridge over the Cape Fear River (Cape Fear Memorial Bridge) and to address the forecasted capacity needs of the bridge corridor in the design year.

4. Project Study Area Defined

The proposed Project Study Area was developed to address the Purpose and Need of HB-0039 and is shown in figures attached. The study area ranges between approximately 750 - 2,700 feet wide and begins just east of Alligator Creek and extends approximately 3 miles east along US 17/ 74/ 421 to the study area terminus near S. 6th Street in downtown Wilmington. The study area also extends along the following intersecting roads:

- Approximately 2,200 linear feet north along US 17
- Approximately 1,800 linear feet south along S. Front Street
- Approximately 900 linear feet south along S. 3rd Street, S. 4th Street, and S. 5th Street

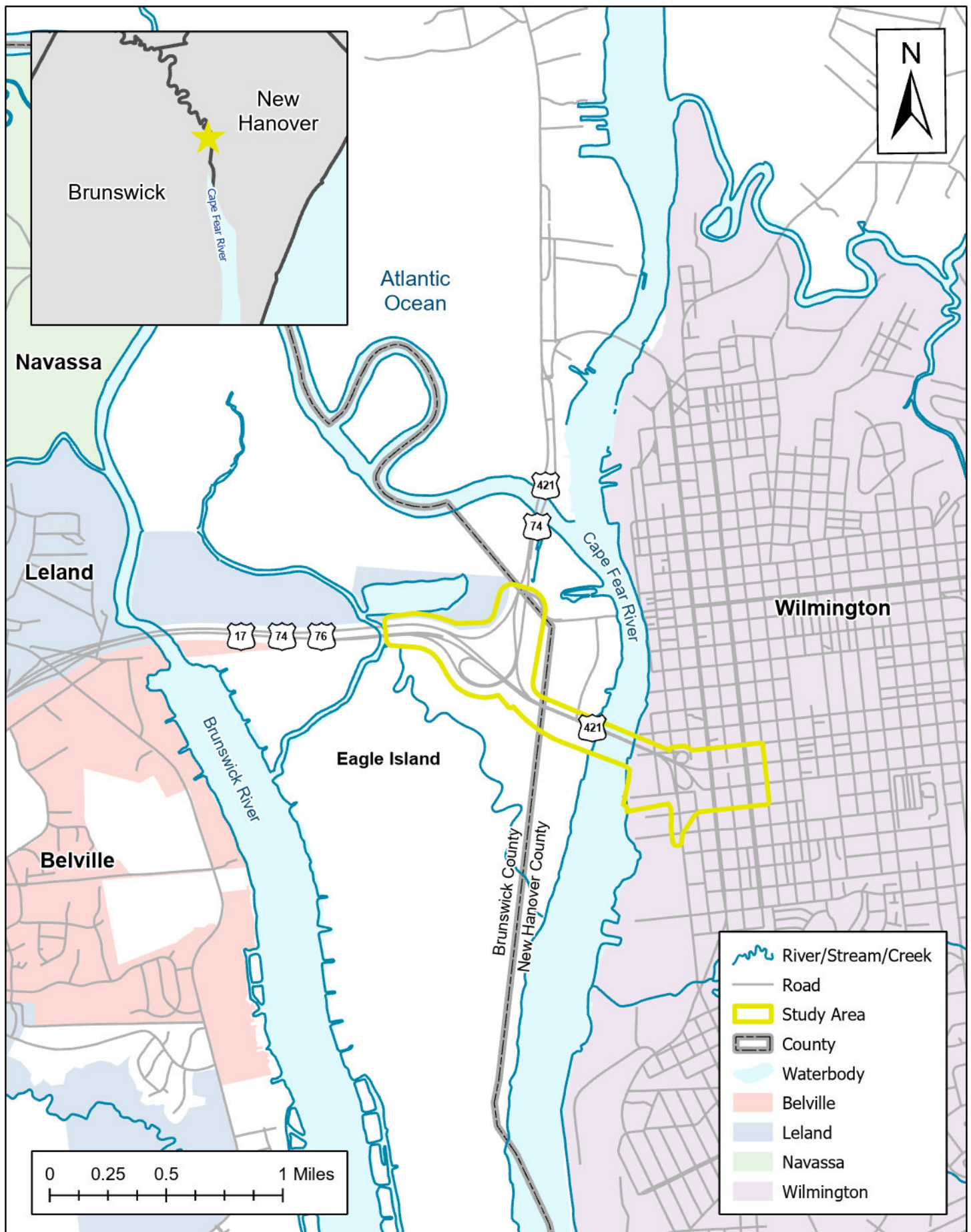
5. Avoidance and Minimization

Avoidance and minimization measures will be implemented throughout the project development process.

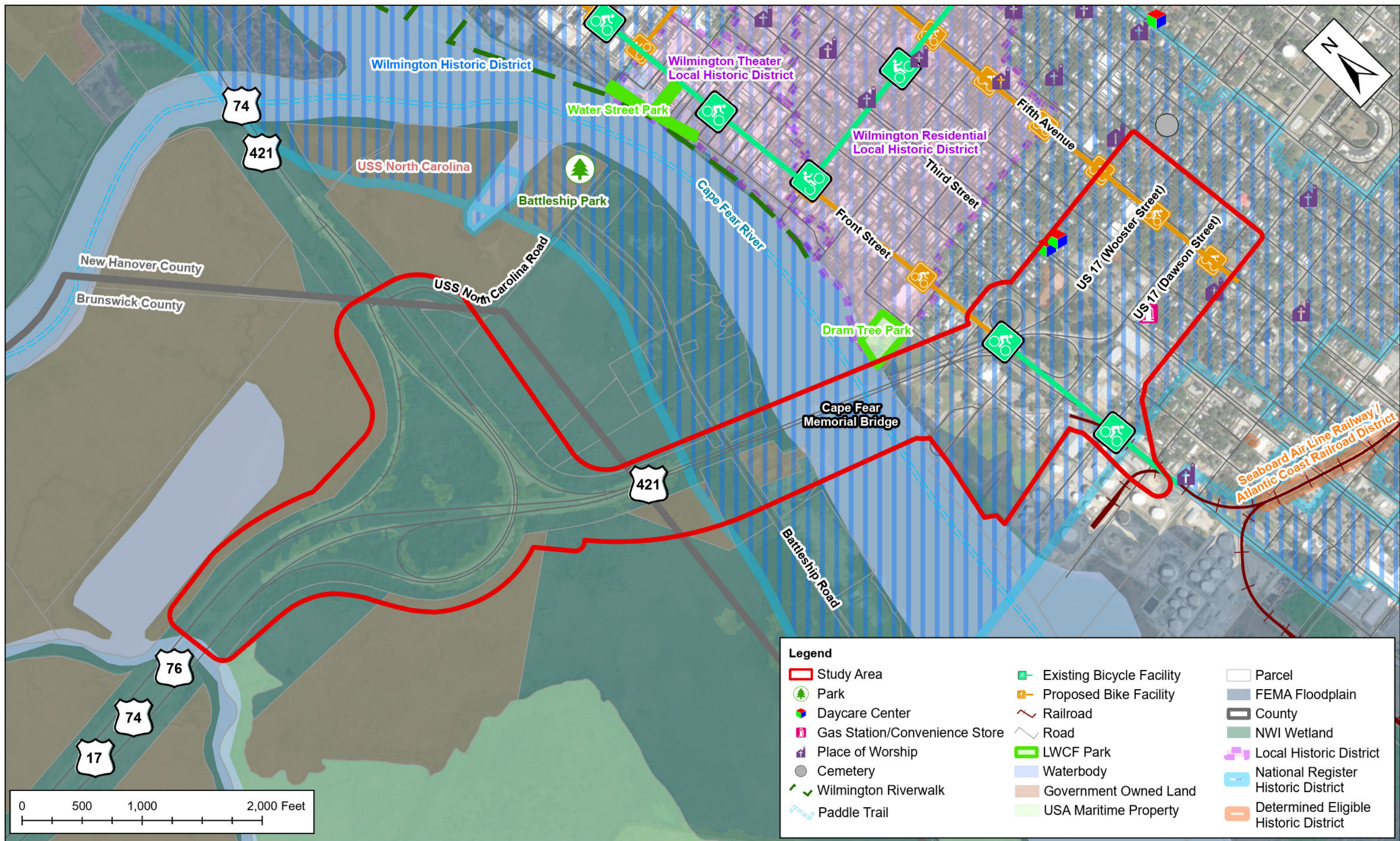
6. Merger Plan Review/Next Steps

Based on the Merger Plan for the project, NCDOT proposes that the next Merger Meeting, CP 2 (Alternatives Considered) take place in Early 2024 and CP 2A (Major Hydraulic Crossing Structures and Alignment Defined) take place Winter/Spring 2024. Prior to the next Merger Meeting, NCDOT is expected to complete the Hydraulic Planning Report, natural systems studies, and functional roadway designs based on surveyed data will be available for review.

It is anticipated that both the CP 2 and CP 2A meetings will be held within the following calendar year; Merger Team members will be notified of any changes that require a revision of this timetable through an updated Merger Plan, which will be updated throughout the project development process and serve as a living document.



VICINITY MAP
HB-0039 | BRUNSWICK & NEW HANOVER COUNTY
FIGURE 1





Date of Summary: 12/14/23, rev. 2/20/24

Concurrence Point (CP) 1 Meeting Summary

Purpose & Need, Study Area Defined

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over
the Cape Fear River

New Hanover and Brunswick Counties

STIP No. HB-0039

Thursday December 14, 2023 / 10:00 AM **Amended 2/6/24 based on NCDOT follow up discussions with
SHPO/EPA**

Meeting Attendees

Name	Organization	E-mail Address
Monte Matthews	US Army Corps of Engineers (USACE)	Monte.K.Matthews@usace.army.mil
Tom Steffens	USACE	Thomas.A.Steffens@usace.army.mil
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Clarence Coleman*	FHWA	clarence.coleman@dot.gov
Jack Williams*	US Coast Guard	jack.h.williams2@uscg.mil
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Matt Wilkerson*	NCDOT Cultural Resources	mtwilkerson@ncdot.gov
Mary Pope Furr*	NCDOT Cultural Resources	mpfurr@ncdot.gov
Jeff Dayton	HDR	jeffrey.dayton@hdrinc.com
Phillip Rogers	HDR	phillip.rogers@hdrinc.com
Emily Poole	HDR	emily.poole@hdrinc.com

*Attended via phone/Teams

On December 14, 2023, NCDOT hosted a Concurrence Point (CP) 1 meeting to establish Purpose & Need and Study Area limits for the STIP Project HB-0039, replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over the Cape Fear River. NCDOT distributed the meeting packet to the participating agencies and team members for their review prior to the meeting on November 30, 2023.

NCDOT EPU began the meeting with a brief summary of the purpose of the meeting, and introductions were made by each member of the group present or participating via telephone. Following introductions, the CP1 Packet was reviewed and discussed. The following summarizes the main topics discussed.

- Division 3 noted NCDOT has applied for a federal grant for this project, and is waiting to hear back on the results.
 - HDR noted prior to the meeting, there was a question about the length of the study area in comparison to the existing bridge structure.
 - USEPA inquired whether the proposed structure would be longer.
 - HDR confirmed that the existing bridge structure itself is approximately 0.66 miles in length, and the proposed structures would likely be slightly longer.
 - HDR noted two WMPO nearby projects, Wooster Street and Dawson Street streetscape improvements, are funded through the City's Transportation Bond Program and scheduled for construction in 2024-2025.
 - WMPO noted they anticipated traffic on Front Street to be higher.
 - HDR stated traffic presented in Table 3 of the packet reflected North Front Street, and traffic on South Front Street would likely be higher. HDR also noted the draft Traffic Analysis Technical Memorandum was under review by NCDOT.
 - HDR noted the study area contained populations exceeding the Environmental Justice (EJ) threshold for low-income and minority, and the draft Community Characteristics Report (CCR) was under review by NCDOT.
- HDR reviewed the identified needs for the project, and noted the CFMB serves as the main connection between Brunswick County and the New Hanover Regional Medical Center. HDR also noted the next major deck rehabilitation is scheduled to begin in January 2024.
- NCDOT Division 3 noted the bridge served as a major throughfare between Brunswick and New Hanover Counties, providing connections to Cape Fear Community College, UNC Wilmington, and cultural resources in Wilmington. They also noted they had heard

- feedback from the public on the upcoming deck repairs as lanes will need to be shut down.
- NCDOT EPU noted the upcoming rehabilitation was an approximately \$5 million maintenance cost.
 - NCDOT EPU noted the purpose statement was revised to address capacity needs as well as the state of disrepair and costly rehabilitation efforts: “The purpose for the proposed project is to replace the functionally-obsolete US 17/76/421 bridge over the Cape Fear River (Cape Fear Memorial Bridge) and to address the forecasted capacity needs of the bridge corridor in the design year.”
 - WMPO inquired whether the purpose statement should address structural rehabilitation and deficiency.
 - NCDOT EPU noted typically language included in purpose statements for bridge replacements was general as the condition of the bridge was subject to change.
 - USEPA inquired whether any modeling had been completed to determine whether the proposed three lanes in each direction would address the need.
 - HDR noted the traffic analysis was under review by NCDOT but showed an improvement from the existing and future no-build scenarios, however, with the bridge tying into downtown, the scope of the project was limited to the bridge replacement and approaches.
 - USEPA noted in the future, documentation would need to demonstrate this improvement to address the need of the project.
 - USACE inquired whether the project was anticipated to be design build.
 - NCDOT Division 3 noted design build was an option.
 - NCDOT EPU noted if the project won the USDOT grant, this could change, and there were other options for alternative delivery that could be considered such as Construction Manager/General Contractor (CM/GC).
 - USACE inquired whether tolling was still an option.
 - NCDOT Division 3 confirmed.
 - USACE noted if tolling became a possibility, they would ask NCDOT work with the local officials to show support of tolling.
 - NCDOT EPU noted the decision had not been made yet but the group would reconvene to discuss purpose and need if tolling was a likelihood.
 - WMPO stated the Board had been asked to provide NCDOT with a decision on whether the project should consider tolling as an option for prioritization by February 1, 2024.
 - NCDOT inquired whether there was still a requirement for a “toll-free” route if tolling is pursued.
 - NCDOT Division 3 noted they were not aware of this requirement.
 - USEPA stated that since the bridge transverses a predominately EJ area, NCDOT should be aware of the potential for tolling costs to disproportionately affect EJ populations if a toll bridge is considered in the future.
 - WMPO noted in February 2022 they had asked NCDOT to investigate all funding opportunities and that a funding option had not yet been selected.
 - USACE inquired whether this included Public-Private Partnership (P3) options.
 - WMPO confirmed.
 - USACE noted that was fine but the group would need to re-group if P3 was selected as the funding option for the project as this could change things, and they wanted USEPA and FHWA to be comfortable with EJ analysis associated with the funding options.
 - USEPA noted there had been other bridge projects converted to toll roads which had not considered alternatives for EJ communities.

- NCDOT inquired whether the federal grant had a resiliency or sea level rise component.
 - HDR confirmed, and noted the grant addressed resiliency.
 - NCDOT inquired whether this should be incorporated into the purpose and need and alternative analysis.
- USACE inquired whether there was a “use or lose” date for grant funding if awarded.
 - NCDOT Division 3 confirmed, but noted there were different dates depending on the award date.
 - NCDOT EPU noted there was flexibility with federal grants, and money could likely be put towards the design side of the project and not necessarily construction.
- NCDOT ECAP inquired whether the grant would fund the entire bridge replacement, and noted the Alligator River Bridge Replacement recently won a grant for a portion of the project, and as a result many other bridge projects were put on hold.
 - HDR noted it would not fund the entire project but the project team had coordinated with the NCDOT STIP/SPOT offices.
- NCDOT EPU inquired whether the study area presented in the CP1 packet reflected the scoping packet.
 - HDR noted it had been modified slightly to capture all potential improvements.
- NCDOT Division 3 noted the delineations were almost complete for the project, and had primarily been completed previously with the Cape Fear Crossing project.
- NCHPO inquired whether the group should assume the new bridge is south of the current bridge, to maintain access to the existing bridge during construction.
 - Division 3 confirmed this was correct.
- NCHPO inquired whether Alternative B (135’ fixed span) the bottom of the bridge would be at 135 feet, which is the height of the towers on the existing bridge.
 - Division 3 noted it would be lower, as the bottom of the deck in the open position is 135 feet and the towers are above the raised deck.
 - HDR stated the vertical clearance (bottom of the girder) would be 135 feet for navigational purposes.
 - NCHPO inquired how tall the bridge would be.
 - HDR noted this depended on the girder and bridge deck height and had not been determined at this time.
 - NCHPO noted the bridge would need fencing for safety of pedestrians.
 - Division 3 confirmed.
- NCHPO noted they believed the study area was too small given the anticipated visual impacts.
 - NCDOT EPU inquired whether NCHPO would like the study area to be as large as the Section 106 Area of Potential Effects (APE).
 - NCHPO noted yes it needed to be larger as the project was federally funded with Section 4(f) resources.
 - FHWA inquired whether their concerns were based on visual impacts of the bridge.
 - NCHPO noted visual impacts and concerns that the group was not considering impacts of tying into Front Street.
 - FHWA inquired whether NCDOT could review the design impacts anticipated on Front Street.
 - Division 3 noted from a design standpoint and how the alternatives tie into downtown Wilmington and Front Street, this was considered and incorporated into the study area.
 - HDR confirmed the study area captured the design and as part of the public meetings renderings would be prepared to display potential visual impacts, including from the Battleship and downtown Wilmington.

- Division 3 noted they agreed the Section 106 APE was larger than the study area, unsure whether the study area needed to match the APE.
 - NCHPO noted the team should be assessing long term and indirect and cumulative effects, and the traffic which would increase in the future and indirectly effect historic resources including visual and construction impacts. NCHPO stated the Front Street project (STIP Project # U-5734) anticipates higher traffic as a result of HB-0039.
 - Division 3 inquired whether NCHPO thought HB-0039 would be causing more traffic.
 - NCHPO stated drivers were not currently using Front Street to access the CFMB as they would in the future.
 - HDR noted traffic forecasts are based on a regional model which incorporates all surrounding projects.
- NCHPO noted they could agree to the purpose and need but not the study area.
 - NCDOT EPU noted they may not have enough design information to answer NCHPO's questions on the larger area.
 - NCDOT inquired the downside of expanding the study area.
 - Division 3 noted the current study area captures all direct impacts, and eliminates wetland delineations and other work in areas that would not be impacted in a larger area.
 - NCDOT EPU also noted potential public perception concerns if a large study area was drawn with no proposed alignments, residents and business owners may think they are impacted.
 - USEPA noted it sounded as though NCHPO was requesting an analysis of a larger study area to justify the smaller study area to move forward.
 - NCDOT EPU noted should a Future Land Use Study Area (FLUSA) be prepared it would capture potential indirect and cumulative impacts, typically prepared at a later date once alternatives were selected. The CCR was currently underway, and may recommend an Indirect and Cumulative Effects (ICE) report.
 - HDR noted the draft CCR was under review which includes the Direct Community Impact Area boundary and assessment of community impacts.
- NCDOT EPU noted study areas often were tweaked through the project development process based on alternative development, roadway profiles, etc. and inquired whether NCHPO would abstain from concurrence on study area, with the understanding the project team would revisit the study area based on how ongoing studies played out.
 - NCHPO noted they agreed with this approach.
 - USACE noted the merger guidance states, "It is generally best to establish a slightly wider than anticipated study area to ensure inclusion of service roads, potential roadway realignments, avoidance of impacts to parks and potential historic resources, and sufficient storage for turning movements." and the merger plan states alternative design would be based on LIDAR data.
 - NCDOT EPU noted final surveys were not available at this point and this information was not yet available.
 - USACE agreed with the approach to revisit the study area.
 - NCDOT EPU noted NCDOT would gather information from community studies and NCDOT Historic Architecture.
 - NCDOT inquired whether the group could agree to a larger study area, and if necessary revisit to make the study area smaller.

- HDR noted the current proposed study area captures all potential service roads, loops, roadway realignments, and ties and is larger than the anticipated designs and captures all direct impacts.
 - NCHPO noted they would abstain and take a further look, and potentially could adjust the area to not study all resources in a larger area such as historic resources in a larger area and not wetlands.
 - USEPA concurred with this approach as long as the follow up meeting was held prior to CP2.
 - NCHPO, Division 3, and USACE concurred.
 - USEPA proposed holding CP1 in two parts, and held CP1 study area in early 2024 prior to CP2.
 - Division 3 noted the concurrence form would be revised to only capture purpose and need for today's meeting.
 - ***Action Item: At the close of the meeting, NCDOT and FHWA/USACE staff determined a follow up discussion was needed to clarify the proposed study area (as noted by FHWA during the meeting) would not restrict future visual, indirect and cumulative effects, and other Section 106 analyses, which would be based on larger boundaries (such as a Future Land Use Study Area, utilized for indirect and cumulative effects analyses and Area of Potential Effects utilized for Section 106). See below.***
 - USACE inquired whether NCDOT would have a better idea of tolling in January/February.
 - WMPO noted the decision would be given to NCDOT by February 1st.
 - Division 3 stated NCDOT should also be notified if the project was eligible for the federal grant at this point.
 - FHWA noted they believed questions raised today would be covered in the project development process including visual impacts and the APE, and the study area did not restrict future indirect and cumulative analysis.
 - NCDWR inquired whether the project team would have any additional information on the Wilmington Realignment Project and whether the preferred alternative would impact this project at CP2.
 - Division 3 stated no, but NCDOT was coordinating with the City of Wilmington.
 - NCDOT noted for the Coastal Area Management Act (CAMA) Permit, they would need to be aware of where the CAMA Areas of Concern (AEC) were to ensure avoidance and minimization and for the Least Environmentally Damaging and Practicable Alternative (LEDPA) selection.
 - USACE inquired whether the wetland delineation would be complete prior to CP2 and provided to USACE.
 - Division 3 confirmed.
 - Meeting adjourned.
-

Next Steps/Action Items:

- A follow-up meeting with representatives from FHWA, NCDOT, USACE and the NC HPO was held on January 25, 2024 to address NC HPO's comments regarding the proposed study area for the HB-0039 project. NC HPO expressed reservations in the CP1 meeting that the proposed study area was not large enough to fully address potential effects to historic properties, particularly effects such as visual intrusions on the existing viewshed, traffic impacts, increases in noise levels, and changes to land use.
- FHWA and NCDOT communicated their own concerns that enlarging the study area to encompass these kinds of secondary effects would likely create unnecessary and costly work for

several other resource areas. For instance, archaeological or biological surveys might be required for areas that have no potential for ground disturbance or changes to existing habitat, respectively. Further, FHWA and NCDOT expressed concerns that the enlarged study area proposed by NC HPO could result in erroneous public perception that the proposed bridge and its approaches would be constructed far outside the actual alignments being considered.

- FHWA and NCDOT made clear that the merger team's study area is not necessarily a one-size fits all boundary, i.e. – it does not preclude resource-specific effects analyses that extend outside the study area as deemed appropriate. FHWA and NCDOT communicated that they fully intend to analyze visual, noise, traffic, and land use conditions when assessing potential effects to historic properties, and acknowledged that those analyses will likely extend outside the merger study area. The two transportation agencies anticipate extensive coordination with the NC HPO as they work to assess effects as part of Section 106 and Section 4(f) requirements.
- The project team will send a CP1 form to the merger signatories following finalization of this meeting summary.
- The CP2 meeting will be scheduled in early Spring 2024.

Please direct any comments or questions to NCDOT Project Manager Trace Howell at trhowell1@ncdot.gov, or Consultant Project Manager Jeff Dayton at jeffrey.dayton@hdrinc.com.

Section 404/NEPA Merger Project Team Meeting Agreement

Concurrence Point No. 1

Project Purpose and Need and Study Area Defined

Project Name/Description: Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over the Cape Fear River. **STIP Project: HB-0039**

Project Purpose and Need Statement:

The **need** for this project can be described as follows:

The NCDOT 2020 Feasibility Study for this project states the 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. The 2021 annual average daily traffic (AADT) on the bridge was approximately 69,000 vehicles, including 8,280 trucks, according to the National Bridge Inventory (NBI). Traffic volumes are projected to increase to 94,900 by 2050, based on the 3.27% annual growth rate projected by the NBI. The Cape Fear Memorial Bridge was constructed in 1969 and is also classified as functionally obsolete by the NBI.

Structure Safety Reports compiled for NCDOT indicate the bridge condition was rated fair in 2016, and the deck, superstructure, and substructure Condition Ratings were all rated satisfactory in 2018. These elements were awarded a grade of six out of nine under the National Bridge Inventory Condition Ratings. Repair and maintenance costs are expected to increase as the bridge ages and traffic increases. In 2019, approximately \$15 million was spent on a major rehabilitation for the bridge, and average annual maintenance costs were estimated at \$550,000. NCDOT is completing another major deck rehabilitation in Spring 2024 with an estimated construction cost of \$13 million.

The **purpose** for the proposed project is to replace the functionally-obsolete US 17/ 74/ 421 bridge over the Cape Fear River (Cape Fear Memorial Bridge) and to address the forecasted capacity needs of the bridge corridor in the design year.

Project Study Area

The proposed Project Study Area was developed to address the Purpose and Need of HB-0039 and is shown in **Figure 1** attached. The study area ranges between approximately 750 - 2,700 feet wide and begins just east of Alligator Creek and extends approximately 3 miles east along US 17/ 74/ 421 to the study area terminus near S. 6th Street in downtown Wilmington. The study area also extends along the following intersecting roads:

- Approximately 2,200 linear feet north along US 17
- Approximately 1,800 linear feet south along S. Front Street

- Approximately 900 linear feet south along S. 3rd Street, S. 4th Street, and S. 5th Street. Include a brief description of the concurred upon study area. Include rough dimensions. Include the date on which the agreed upon study area map was finalized. This may become important if the project has delays.

The Merger Team has concurred on this date of December 14, 2023, on the above project purpose and need and the study area as shown in **Figure 1** for STIP Project HB-0039.

Seth Wilcher 2/28/2024
Federal Highway Administration Date

Tom Steffens 2/27/2024
US Army Corps of Engineers Date

Gary Jordan 2/21/2024
US Fish and Wildlife Service Date

Amy Chapman 2/22/2024
NC Division of Water Resources Date

Amanetta Sommerville 2/21/2024
US Environmental Protection Agency Date

Cathy Brittingham 2/26/2024
NC Division of Coastal Management Date

Kimberlee Harding 2/28/2024
NC Division of Marine Fisheries Date

Travis Wilson 2/23/2024
NC Wildlife Resources Commission Date

3/6/2024
State Historic Preservation Office Date

Trace Howell 2/21/2024
NC Department of Transportation Date

Mike Kozlosky 2/21/2024
Wilmington MPO Date

Jack Williams 2/22/2024
US Coast Guard Date

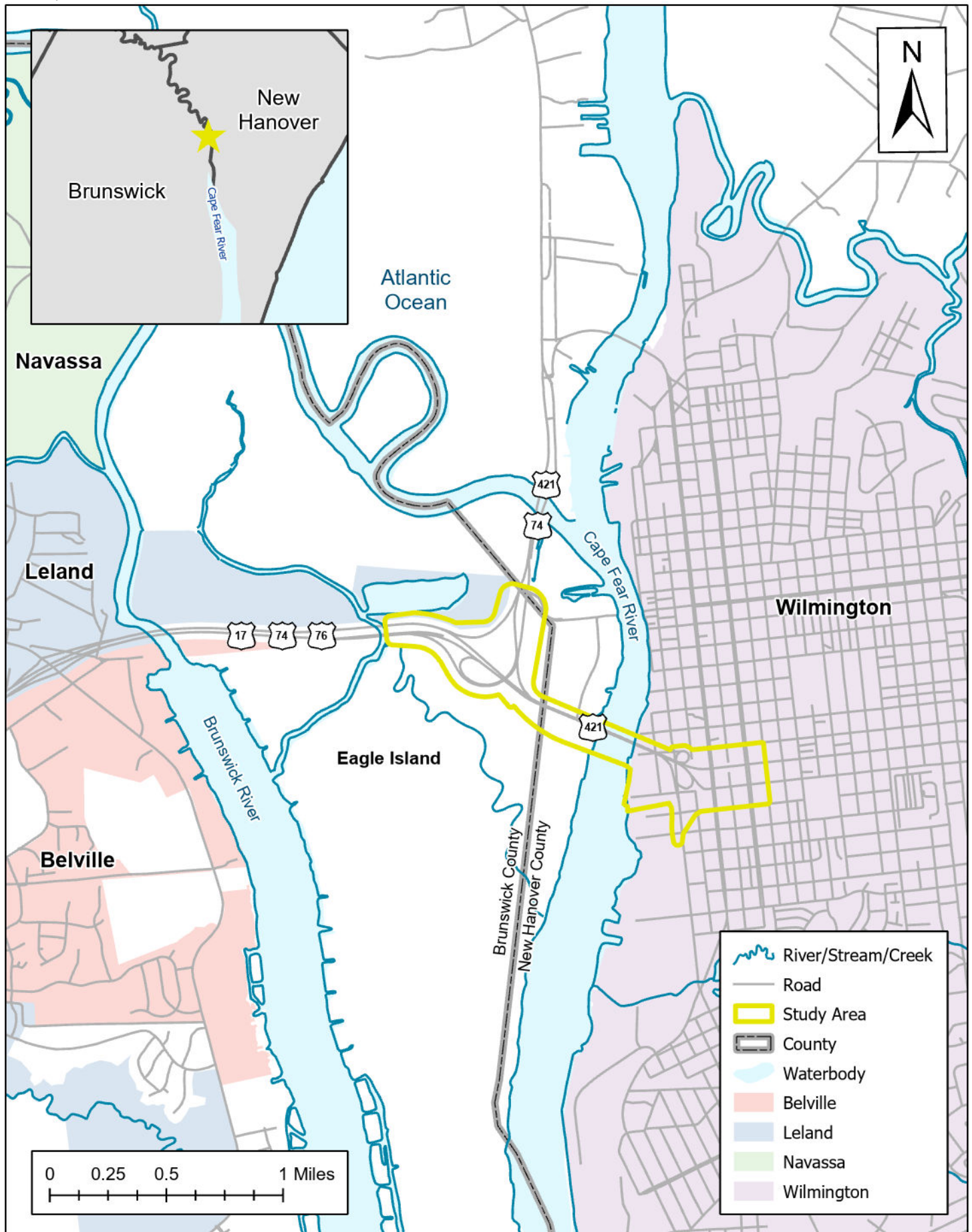
Fritz Rohde 2/29/2024
National Oceanic and Atmospheric Administration Date

- Approximately 900 linear feet south along S. 3rd Street, S. 4th Street, and S. 5th Street. Include a brief description of the concurred upon study area. Include rough dimensions. Include the date on which the agreed upon study area map was finalized. This may become important if the project has delays.

The Merger Team has concurred on this date of December 14, 2023, on the above project purpose and need and the study area as shown in **Figure 1** for STIP Project HB-0039.

_____ Federal Highway Administration Date	_____ NC Wildlife Resources Commission Date
_____ US Army Corps of Engineers Date	<u>Renee Gledhill-Early</u> 2/22/2024 _____ State Historic Preservation Office Date
_____ US Fish and Wildlife Service Date	_____ NC Department of Transportation Date
_____ NC Division of Water Resources Date	_____ Wilmington MPO Date
_____ US Environmental Protection Agency Date	_____ US Coast Guard Date
_____ NC Division of Coastal Management Date	_____ National Oceanic and Date Atmospheric Administration
_____ NC Division of Marine Fisheries Date	

The State Historic Preservation Office's concurrence with CP1 is with the understanding that additional studies to address the direct and indirect as well as the cumulative and foreseeable effects of the undertaking will be addressed in accord with Section 106 of the National Historic Preservation Act, Section 4(f) of the Department of Transportation Act, and NEPA.



VICINITY MAP

HB-0039 | BRUNSWICK & NEW HANOVER COUNTY

FIGURE 1

**DETAILED STUDY ALTERNATIVES CARRIED FORWARD
AND BRIDGING DECISIONS AND ALIGNMENT REVIEW**

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge)
over the Cape Fear River

New Hanover and Brunswick Counties

STIP Project HB-0039

North Carolina Department of Transportation

Division 3



MERGER CONCURRENCE POINT NUMBER 2 and 2A

April 11, 2024 / 10:00 AM

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Appendices

- Figures (listed below)
- Preliminary Designs
- Proposed Bridge Profiles

Figures (included with packet)

Vicinity Map

Environmental Features Map

Alternatives Map

Jurisdictional Features Map

1. Introduction

The purpose of this meeting is to reach concurrence on CP 2 and 2A, Detailed Study Alternatives and Major Hydraulic Crossings.

Lead federal agency: Federal Highway Administration (FHWA)

Primary points of contact for the subject project are:

Agency	Name
FHWA	Seth Wilcher
U.S. Army Corps of Engineers (USACE)	Thomas Steffens
North Carolina Division of Water Resources (NCDWR)	Amy Chapman
North Carolina Department of Transportation (NCDOT)	Trace Howell

1.1 Project Description

NCDOT proposes to replace Bridge # 640013 over the Cape Fear River on US 421 in New Hanover and Brunswick Counties. NCDOT identified three alternatives for consideration in project development as listed below. Each alternative includes the following typical section: three 12-foot lanes in each direction separated by a 22-foot median including 11-foot inside shoulders, 15-foot multi-use path on the north side of the bridge, and 12-foot outside paved shoulders (see image below).

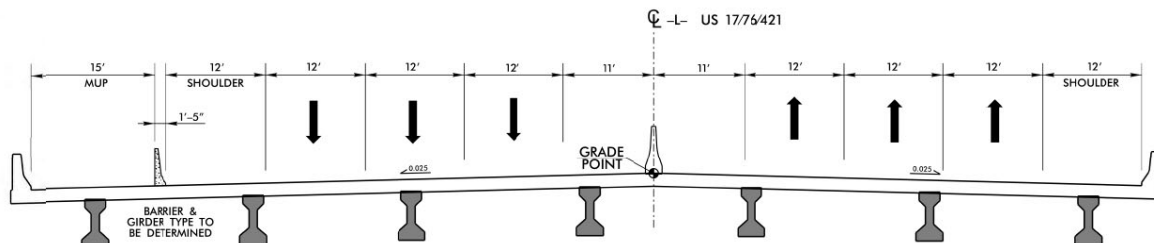


Image 1. Proposed bridge typical section

- Alternative A: Movable span 65-135' vertical clearance
- Alternative B: Fixed span 135' vertical clearance with trumpet interchange improvements
- Alternative C: Fixed span 65' vertical clearance

Each alternative would modify the existing eastern loop ramps at S. Front Street and tie into the current one-way pair of Wooster Street and Dawson Street in downtown Wilmington. Across the river, the bridging of Eagle Island wetlands would extend to the US 17/US 74/ US 421 interchange, with possible ramp modifications to that interchange with Alternative B. The proposed study area shown in Figure 1 encompasses all such modifications.

The existing bridge is approximately 0.66 miles in length with a proposed design speed of 50 miles per hour over the river. The project is programmed in the 2024-2033 State Transportation Improvement Program (STIP) as project HB-0039 for preliminary engineering only. The project location is shown in Figure 1.

1.2 Cost Estimate and Merger Plan

The Wilmington Metropolitan Planning Organization (WMPO) *Cape Fear Moving Forward 2045* Metropolitan Transportation Plan (MTP) was adopted November 18, 2020. The MTP identified the subject project as “US 76/421/17/17 BUS/Cape Fear Memorial Bridge Replacement”. The project is ranked 58th out of 79 projects in the Fiscally-Constrained Roadway Project List, and 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.

As noted above, the project is included in the current STIP as project HB-0039 and is being managed by NCDOT Division 3. The current cost estimates for the project are shown in **Table 1**. The proposed project schedule is included in **Table 2** and is based on the Merger Plan. The schedule and cost estimates are draft and subject to change.

Table 1. Cost Estimates

Phase	Estimated Costs		
	Alternative A: 65-135' Vertical Clearance Movable Structure	Alternative B: 135' Vertical Clearance Fixed Structure	Alternative C: 65' Vertical Clearance Fixed Structure
Right of Way	\$19,700,000	\$48,600,000	\$19,700,000*
Utilities	\$2,000,000	\$3,700,000	\$2,000,000
Construction	\$744,200,000	\$400,600,000	\$247,700,000
Total	\$765,900,000	\$452,900,000	\$255,388,000

NOTE: All cost estimates are preliminary and subject to change.

*Should property values upstream of the existing bridge be affected by Alternative C, the right of way cost estimate is anticipated to increase but is not known at this time.

Table 2. Project Schedule*

Milestone	Anticipated Date
Public Meeting	Summer 2024
CP 3 (LEDPA Determination)	Fall 2024
CP 4A	Winter 2024/2025
CP 4B	TBD
CP 4C	TBD
Begin ROW Acquisition	Post Year
Begin Construction	Post Year

*Draft, subject to change

2. Summary of CP 1 Project Purpose and Need and Study Area Defined

The Merger team met on December 14, 2023 to discuss CP 1, Purpose and Need, and Study Area. The Merger team subsequently concurred via electronic signature on March 6, 2024. The final merger packet as presented at the meeting and concurred upon is located [here](#). The Project Study Area is shown in Figure 1 and there have been no changes to the study area since CP 1.

Concurrence Point 2: Detailed Study Alternatives

4. Summary of Alternatives Considered

4.1 No Build Alternative

The No-Build Alternative only includes minor restoration activities to ensure the safety, maintenance, and continued operation of the existing highway. It does not require additional right of way or any improvements to the highway that would generate impacts to human or natural resources. Although it will not provide increased mobility and connectivity required to meet the Purpose and Need of the project, the No-Build Alternative will be carried forward to provide a basis for comparison with other alternatives carried forward for detailed study for this proposed action.

4.2 Build Alternatives

NCDOT proposes three alternatives for consideration in project development as listed below and depicted in Figures 3a and 3b. Each alternative includes the following typical section: three 12-foot lanes in each direction separated by a 22-foot median including 11-foot inside shoulders, 15-foot multi-use path on the north side of the bridge, and 12-foot outside paved shoulders.

- Alternative A: Movable Structure 65-135' vertical clearance
- Alternative B: Fixed Structure, 135' vertical clearance
- Alternative C: Fixed Structure, 65' vertical clearance

Each alternative would slightly modify the existing eastern loop ramps at S. Front Street and tie into the current one-way pair of Wooster Street and Dawson Street in downtown Wilmington. Across the river, the bridging of Eagles Island wetlands would extend to the US 17/US 76/US 421 interchange, with possible ramp modifications to that interchange with Alternative B.

4.3. Alternatives Eliminated

At present, no alternatives have been eliminated. The NCDOT recommends moving forward with all three build alternatives, Alternatives A, B, and C, for future study and evaluation as well as the No-Build alternative.

5. Analysis of Build Alternatives

Table 3 shows environmental features within the Project Study Area of each alternative being carried forward. Measurements were quantified using slope stakes plus 40 feet. Streams and wetlands represent field delineated resources, though they have not been verified by the agencies at the time of this packet.

Table 3. Resource Presence in Project Study Area

	Alternative A (65-135' movable)	Alternative B (135' fixed)	Alternative C (65' fixed)
Length [bridge length] (mile)	1.47 [1.24]	1.85 [1.31]	1.47 [1.24]
Natural Environment¹			
100-Year Floodplain (acre)	3.3	28.1	3.3
Section 404 Wetlands (acre)	1.11	10.40	1.11
Section 404/CAMA Wetlands (acre)	0	0.11	0
Human Environment			
Parcels	26	72	26
Churches/Cemeteries (#)	1 (Healing Waters Holy Temple Church) ²	1 (Healing Waters Holy Temple Church) ²	1 (Healing Waters Holy Temple Church) ²
Community Resources (#)	1 (Dollar General)	1 (Dollar General)	1 (Dollar General)
Presence of Historic Resources (yes/no) ³	Yes	Yes	Yes
Section 4(f) (yes/no) ⁴	TBD	TBD	TBD
Environmental Justice Populations (yes/no) ⁵	Yes	Yes	Yes
Physical Environment¹			
Hazardous Material Sites (#)	2	2	2

NOTES:

1. Measurements quantified using a 40-foot buffer of the slope stakes of the roadway approaches. Bridged areas are not included at this time.
2. No impacts are anticipated to Healing Waters Holy Temple Church with any of the alternatives.
3. All three alternatives fall within the National Register (NR) Wilmington Historic District. The CFMB is a contributing resource within this district and has been recommended for individual eligibility. Additionally, the USS North Carolina NR-listed resource is located approximately 0.6 miles north of the project on the west side of the Cape Fear River.
4. Section 106 effects have not been determined at this time. The final determination of resources eligible for NRHP listing and therefore also Section 4(f) properties will be determined by NCHPO.
5. All three alternatives intersect six census block groups that exceed the threshold for Environmental Justice for both minority and poverty populations, two in Brunswick County and four in New Hanover County.

6. Summary of Public Involvement

A Public Involvement Plan (PIP) has been developed for the project. A wide range of methods are planned for public engagement and participation at all stages of the project, including an informal, drop-in style public meeting, a local officials' informational meeting, small group meetings with stakeholders, and a formal public hearing with opportunities to submit formal comments for the public record. Additional information and materials will be generated and distributed via the project website, social media, and a project-specific hotline and e-mail address. It is anticipated the public meeting will be held in summer 2024.

Concurrence Point 2A: Major Hydraulic Crossings**7. Water Resources**

Water resources in the study area are part of the Cape Fear River basin [U.S. Geological Survey (USGS) Hydrologic Unit Code 03030005]. One stream was identified in the study area, the Cape Fear Memorial River (Table 4).

Table 4. Streams in the study area

Stream Name	Map ID	NCDWR Index Number	Best Usage Classification	Bank Height (ft)	Bankfull width (ft)	Depth (in)
Cape Fear River	Cape Fear River	18-(71)	SC	12	850-1100	20+

The Cape Fear River has not been designated as an Outstanding Resource Water (ORW). There are no designated High-Quality Waters (HQW) or water supply watersheds (WS-I or WS-II) within, or within 1.0 mile downstream of the study area. The portion of the Cape Fear River (AU segments 18-(71)a2a and 18-(71)a2b) within the project study area was identified on the North Carolina 2022 Final 303(d) list. The Brunswick River (AU segments 18-77a, and 18-77b), and Alligator Creek (AU Segment 29-33-1-1) located within a mile of the project study area were identified on the Final 2022 303(d) list.

Three wetlands were identified within the study area (Table 5). The location of these wetlands is shown on Figure 4. All wetlands in the study area are located within the Cape Fear River basin, USGS Hydrologic Unit Code 03030005.

Table 5. Characteristics of wetlands in the study area

Map ID	NCWAM Classification	Forested	NCWAM Rating	Hydrologic Classification	404/401 or 401	CAMA	Area (ac.) in Study Area
8WA	Salt/Brackish Marsh	N	High	Tidal	404/401	Y	2.49
9WA	Salt/Brackish Marsh	N	High	Tidal	404/401	Y	13.14
9WB	Estuarine Woody Wetland	Y	High	Tidal	404/401	N	66.03
						Total	81.66

The Cape Fear River has been designated as an anadromous fish spawning area by the North Carolina Division of Marine Fisheries (NCDMF) and the North Carolina Wildlife Resource Commission (NCWRC). Also, the Cape Fear River is identified as a primary nursery area by NCDMF. The Cape Fear River is also identified as a sturgeon spawning water by NMFS. An in-water construction moratorium is in effect from February 1 through June 30 for these waters. The Cape Fear River has been designated by the United States Army Corps of Engineers (USACE) as a Navigable Water under Section 10 of the Rivers and Harbors Act. Multiple Coastal Area Management Act (CAMA) Areas of Environmental Concern (AEC) were identified in the study area and are displayed in Figure 4.

8. Major Hydraulic Crossings

Major hydraulic crossings are those with a contributing drainage area requiring conveyance greater than 30 square feet or more. One potential major hydraulic crossing was identified for the proposed project. All of the proposed alternatives are hydraulically adequate. The existing structure was designed for ship passage and is well above any increased surface elevations from significant rainfall events. There is no current or historical flooding issues in the project area according to Division staff. More information can be found in the March 2024 Preliminary Hydraulic Planning Report in the project files.

9. Avoidance and Minimization

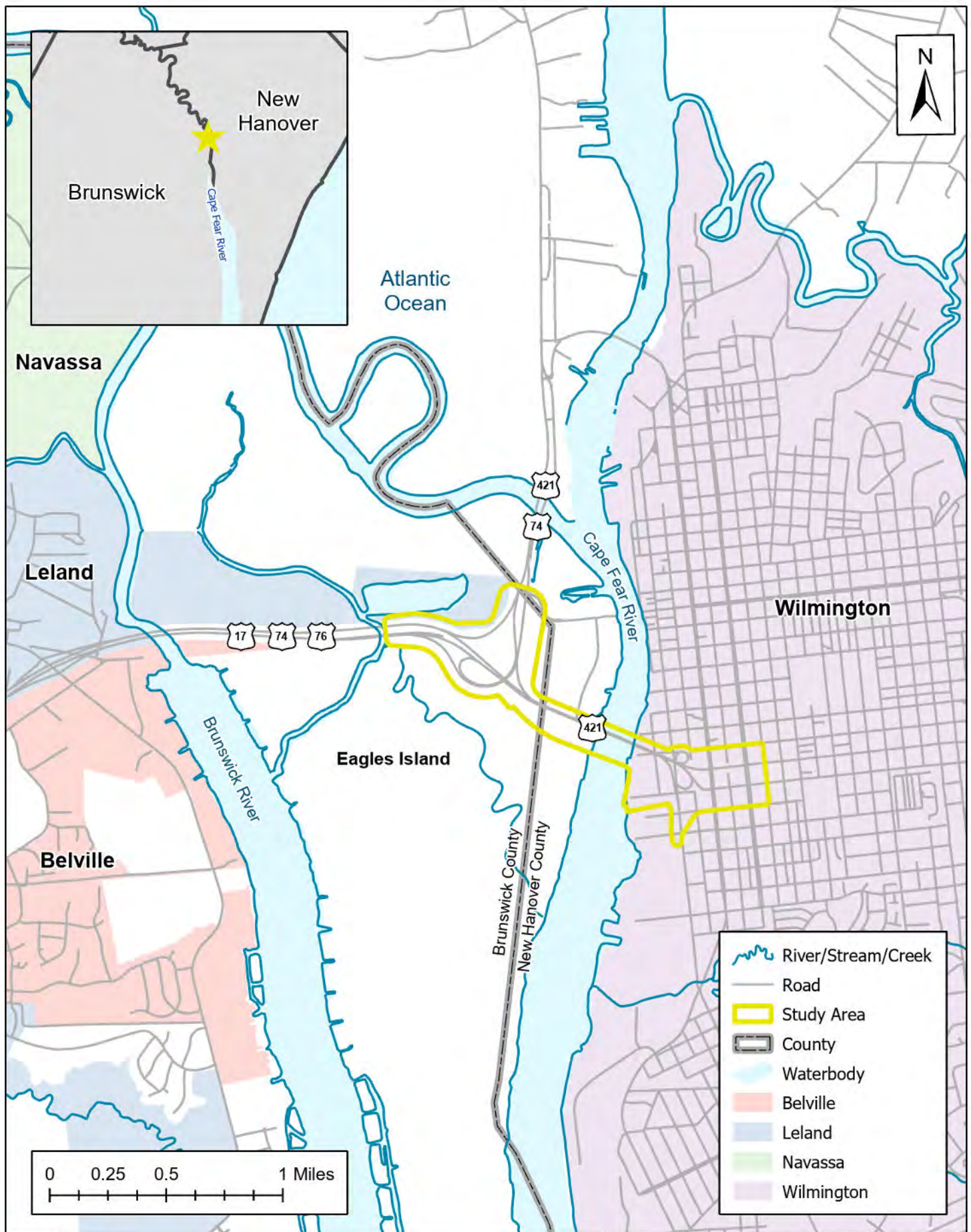
Avoidance and minimization measures will be implemented throughout the project development process. The following are avoidance and minimization measures to date:

- Alternatives shifted to the south of the existing bridge to avoid Dram Tree Park
- Utilizing existing fill section of roadway approaches to minimize impacts

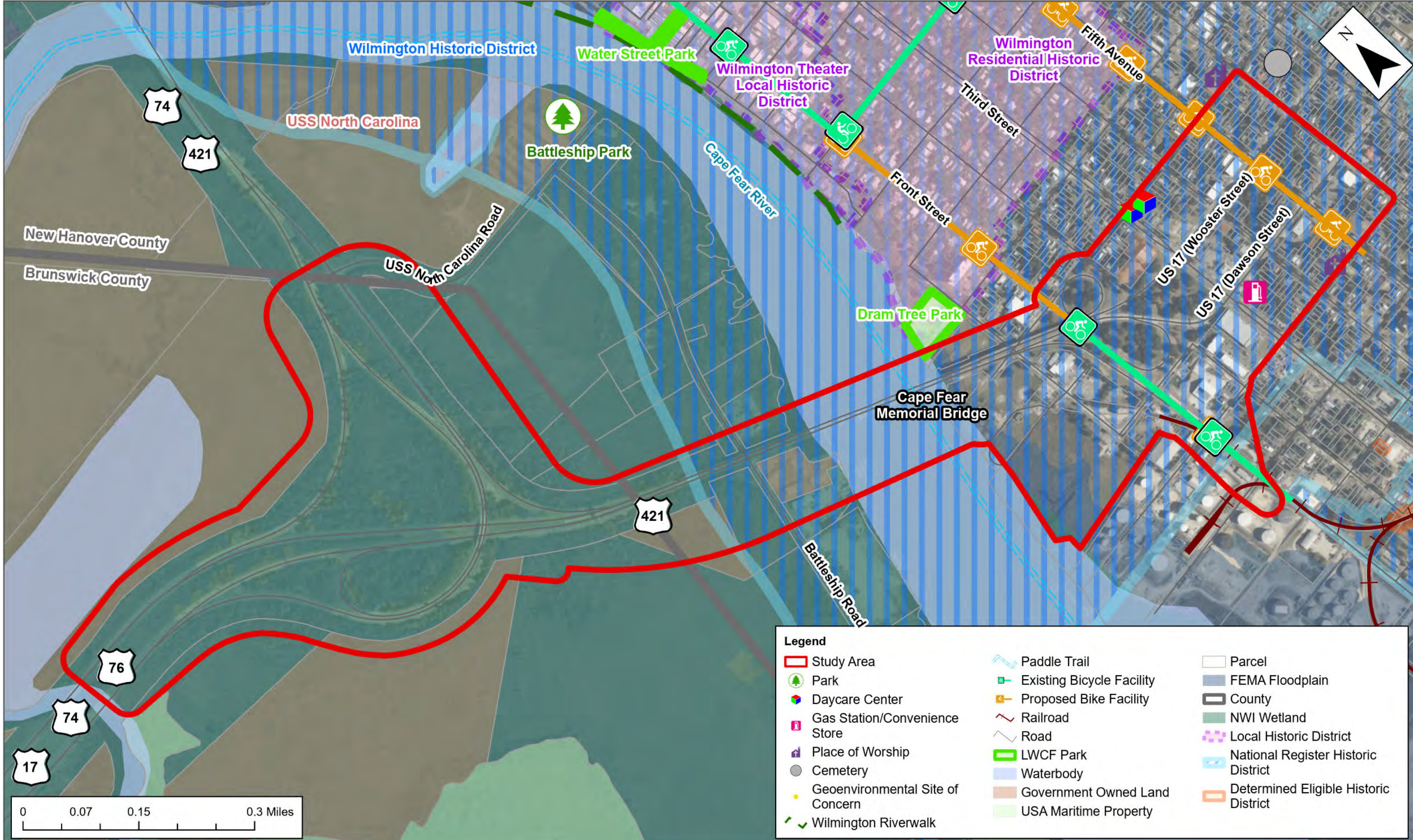
10. Merger Plan Review/Next Steps

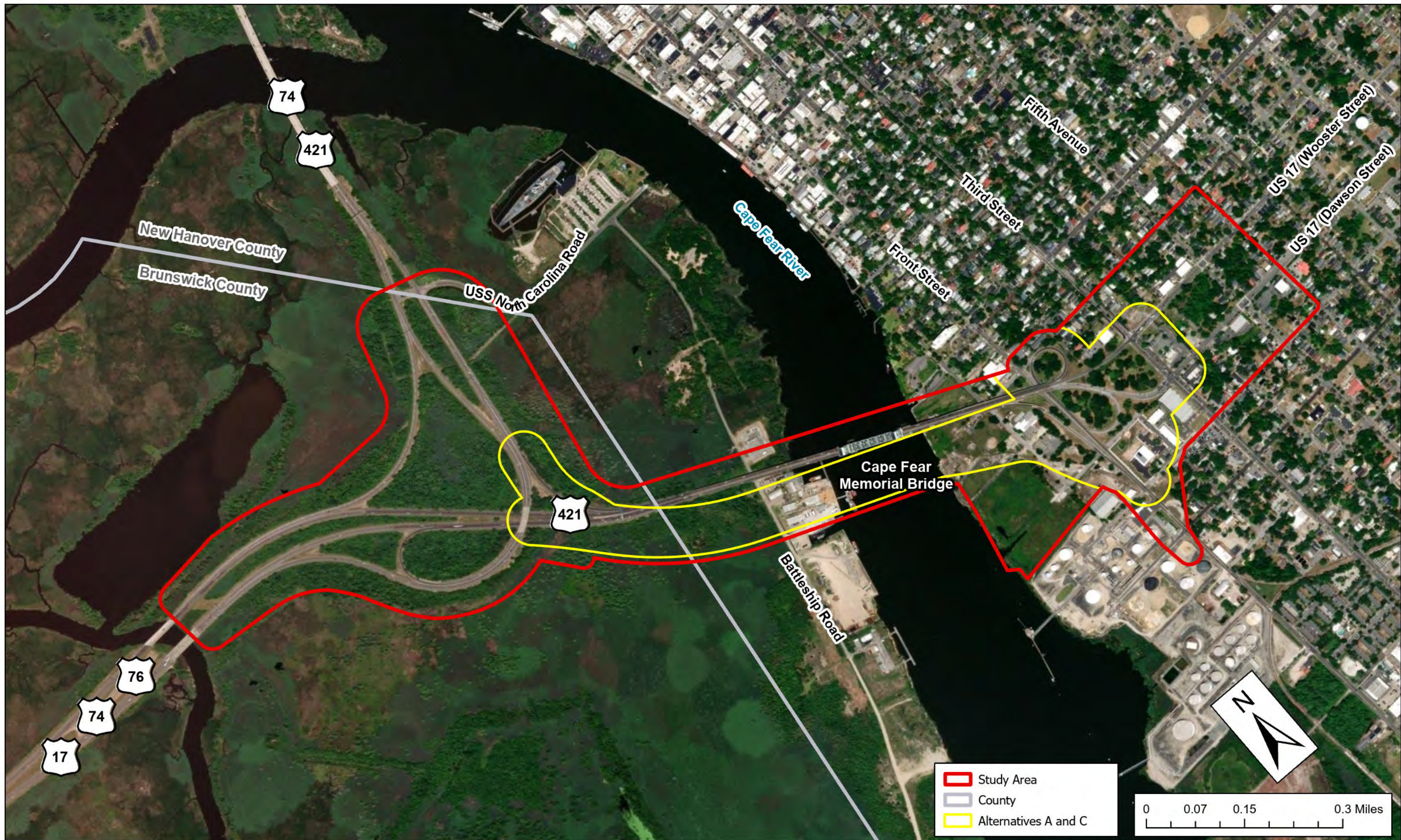
Based on the Merger Plan for the project, NCDOT proposes that the CP 3 (LEDPA/Preferred Alternative Selection) Meeting take place in the fall of 2024. Prior to the next Merger Meeting, NCDOT is expected to conduct public involvement, coordinate with US Coast Guard on their navigation studies, consult with SHPO for Section 106 effects, coordination with US Army Corps of Engineers for Section 408, and complete a detailed alternative analysis.

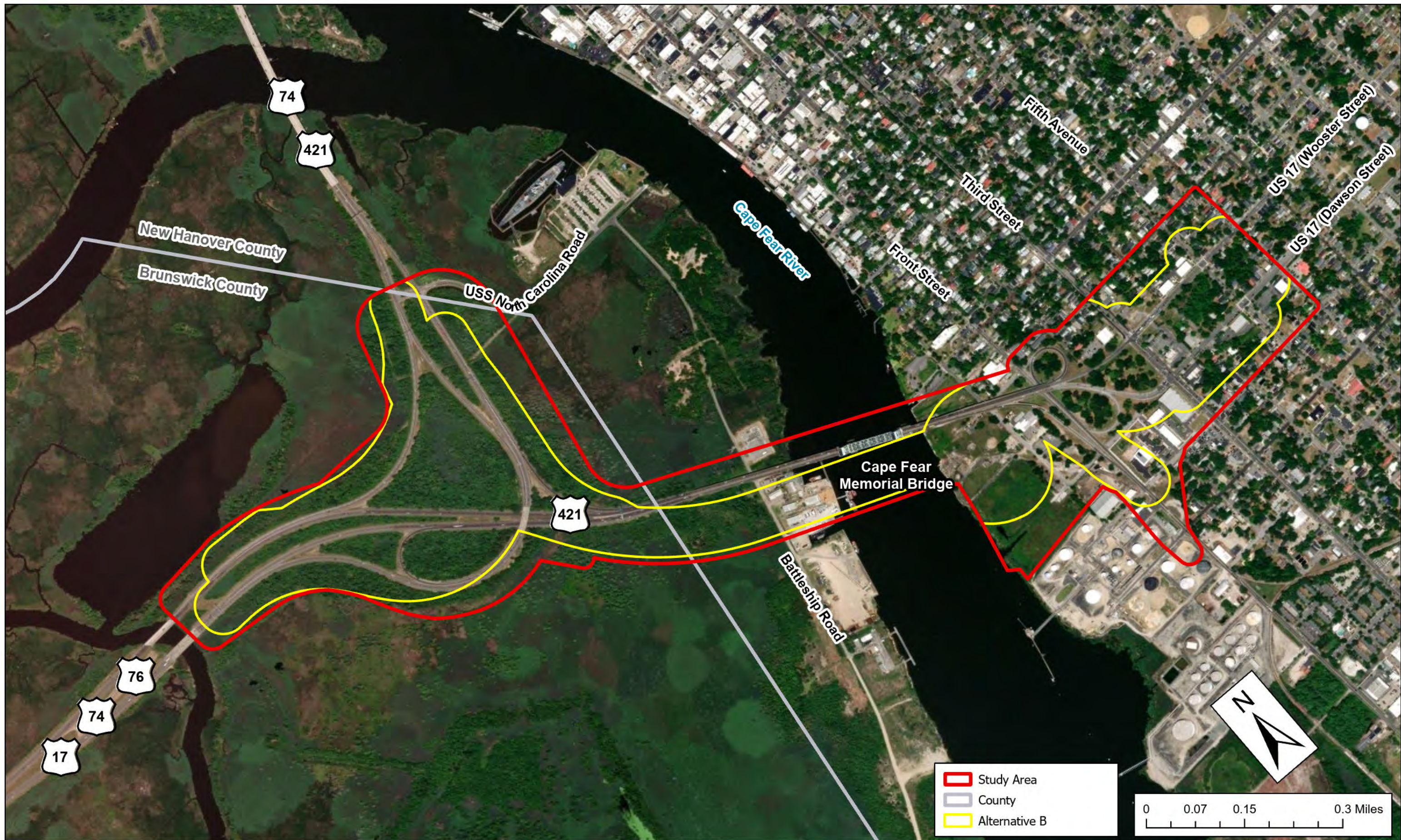
It is anticipated that the CP 3 meeting will be held within the current calendar year; Merger Team members will be notified of any changes that require a revision of this timetable through an updated Merger Plan, which will be updated throughout the project development process and serve as a living document.

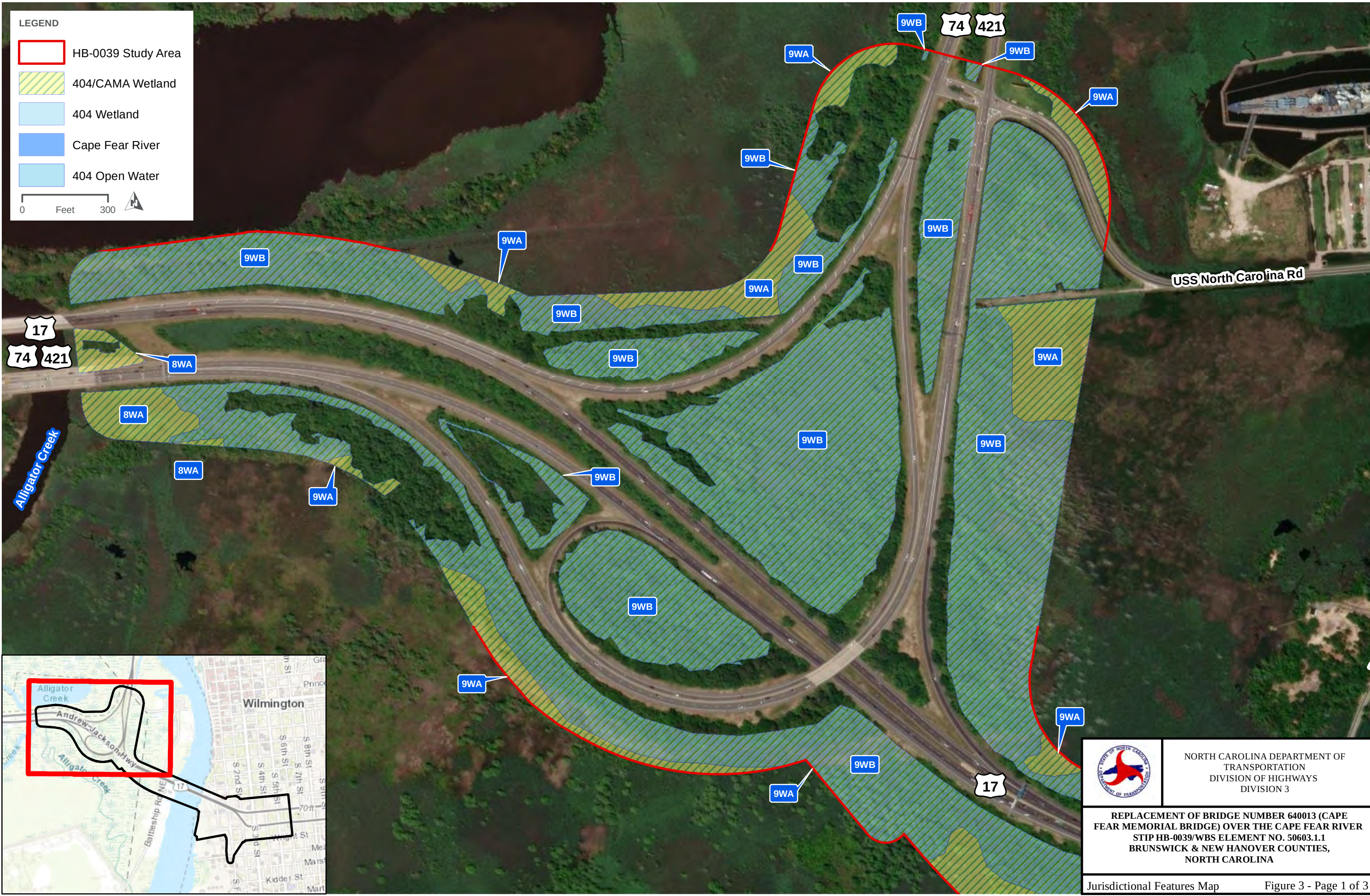


VICINITY MAP
HB-0039 | BRUNSWICK & NEW HANOVER COUNTY
FIGURE 1

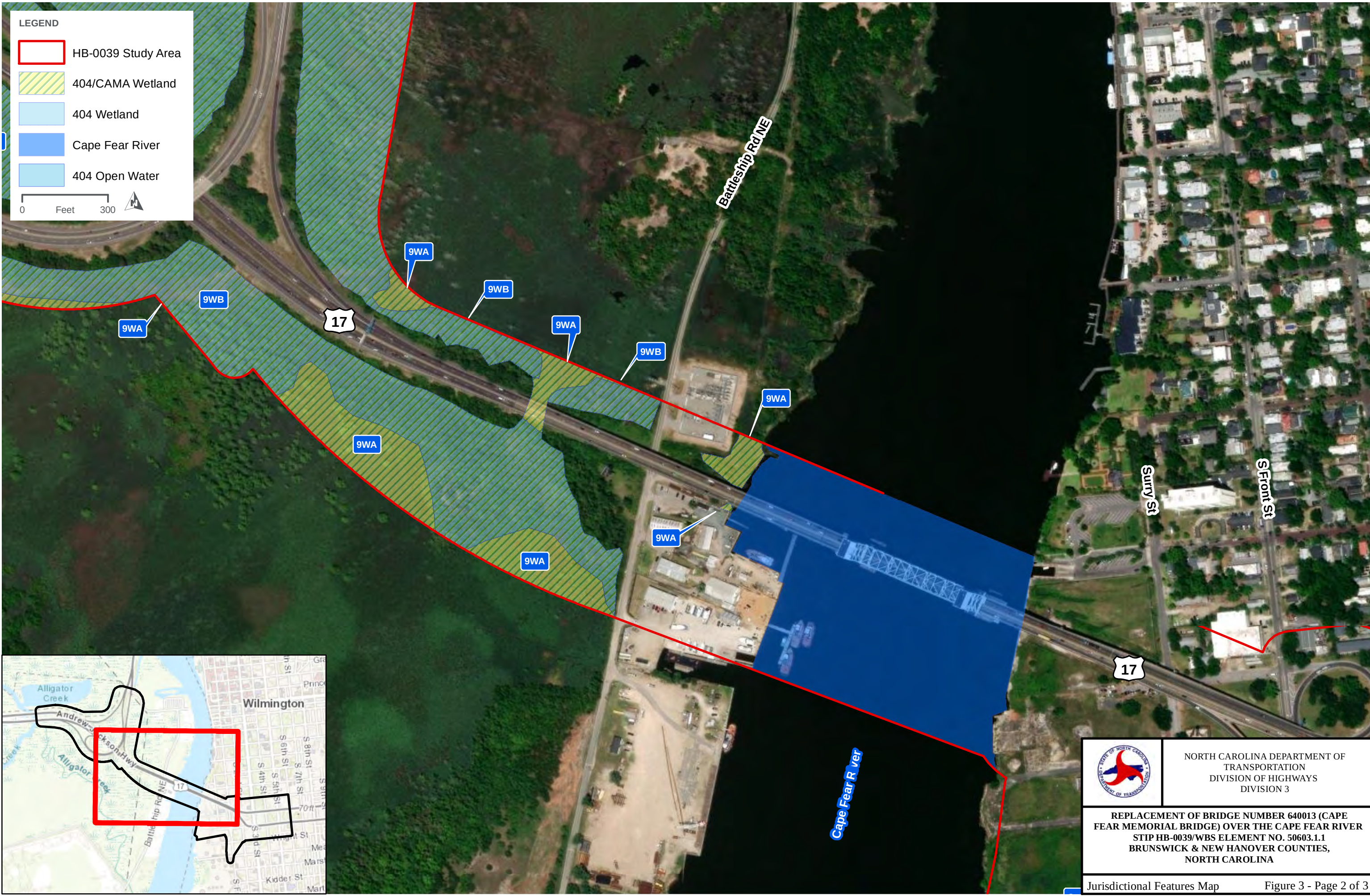








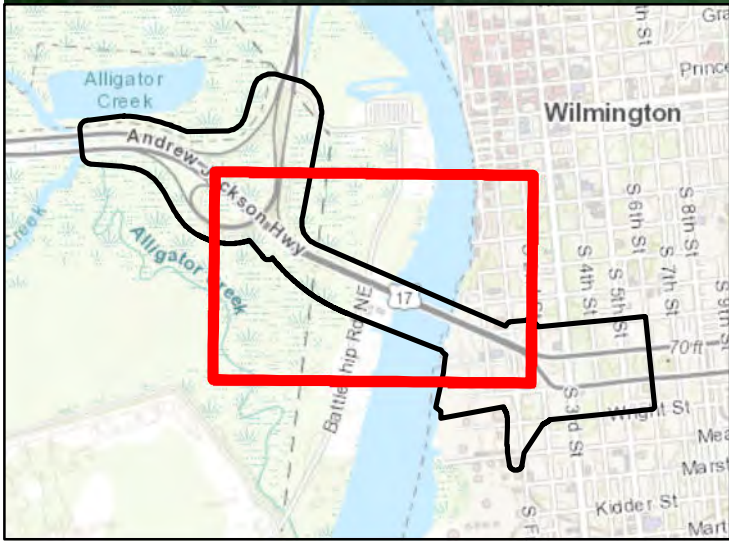
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	REPLACEMENT OF BRIDGE NUMBER 640013 (CAPE FEAR MEMORIAL BRIDGE) OVER THE CAPE FEAR RIVER STIP HB-0039/WBS ELEMENT NO. 50603.1.1 BRUNSWICK & NEW HANOVER COUNTIES, NORTH CAROLINA
	Jurisdictional Features Map



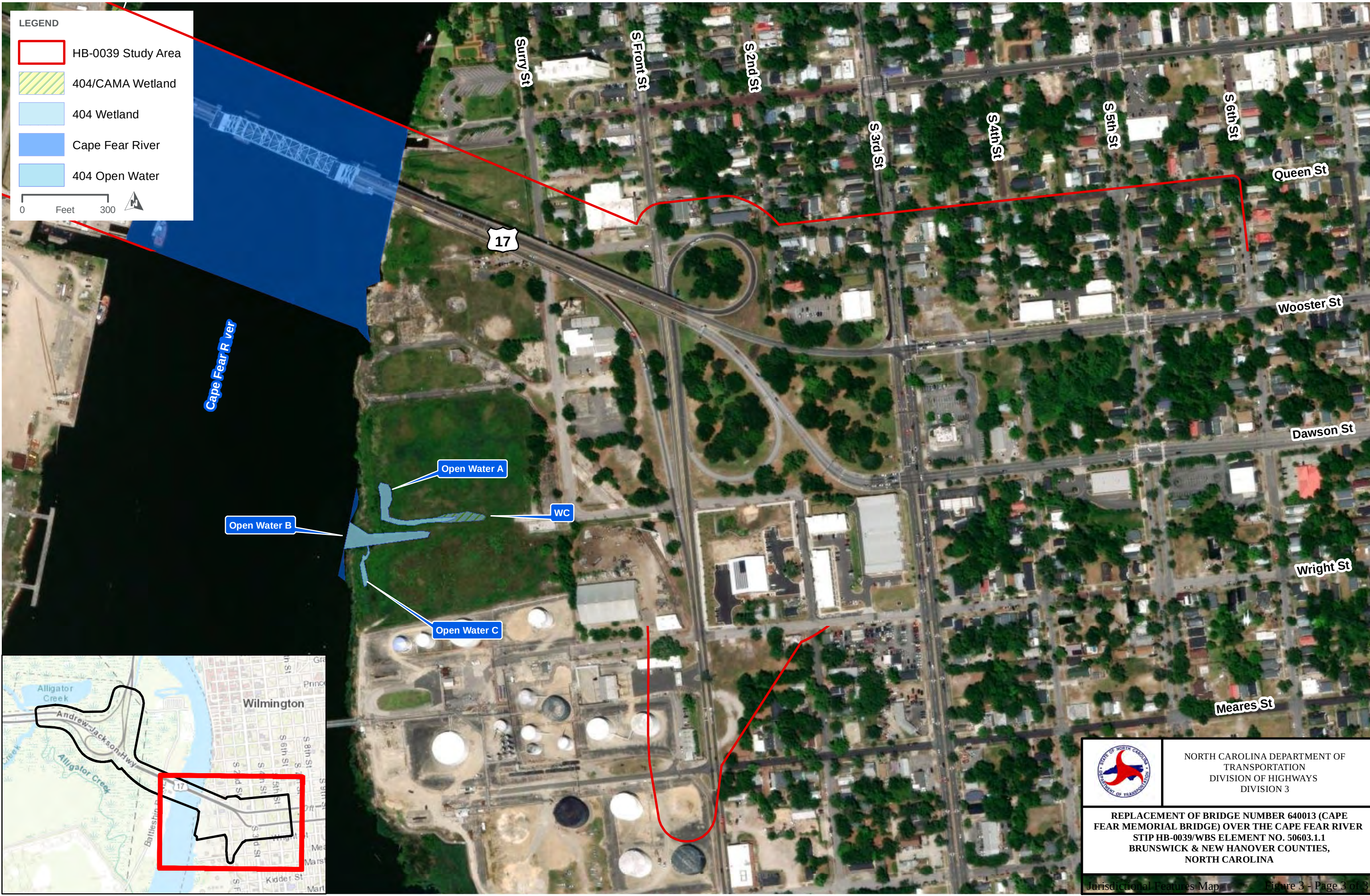
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- HB-0039 Study Area
- 404/CAMA Wetland
- 404 Wetland
- Cape Fear River
- 404 Open Water

0 Feet 300



	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS DIVISION 3
REPLACEMENT OF BRIDGE NUMBER 640013 (CAPE FEAR MEMORIAL BRIDGE) OVER THE CAPE FEAR RIVER STIP HB-0039/WBS ELEMENT NO. 50603.1.1 BRUNSWICK & NEW HANOVER COUNTIES, NORTH CAROLINA	
Jurisdictional Features Map Figure 3 - Page 2 of 3	



LEGEND

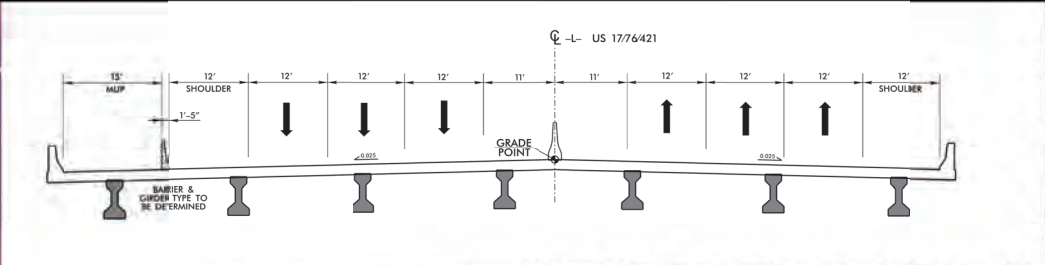
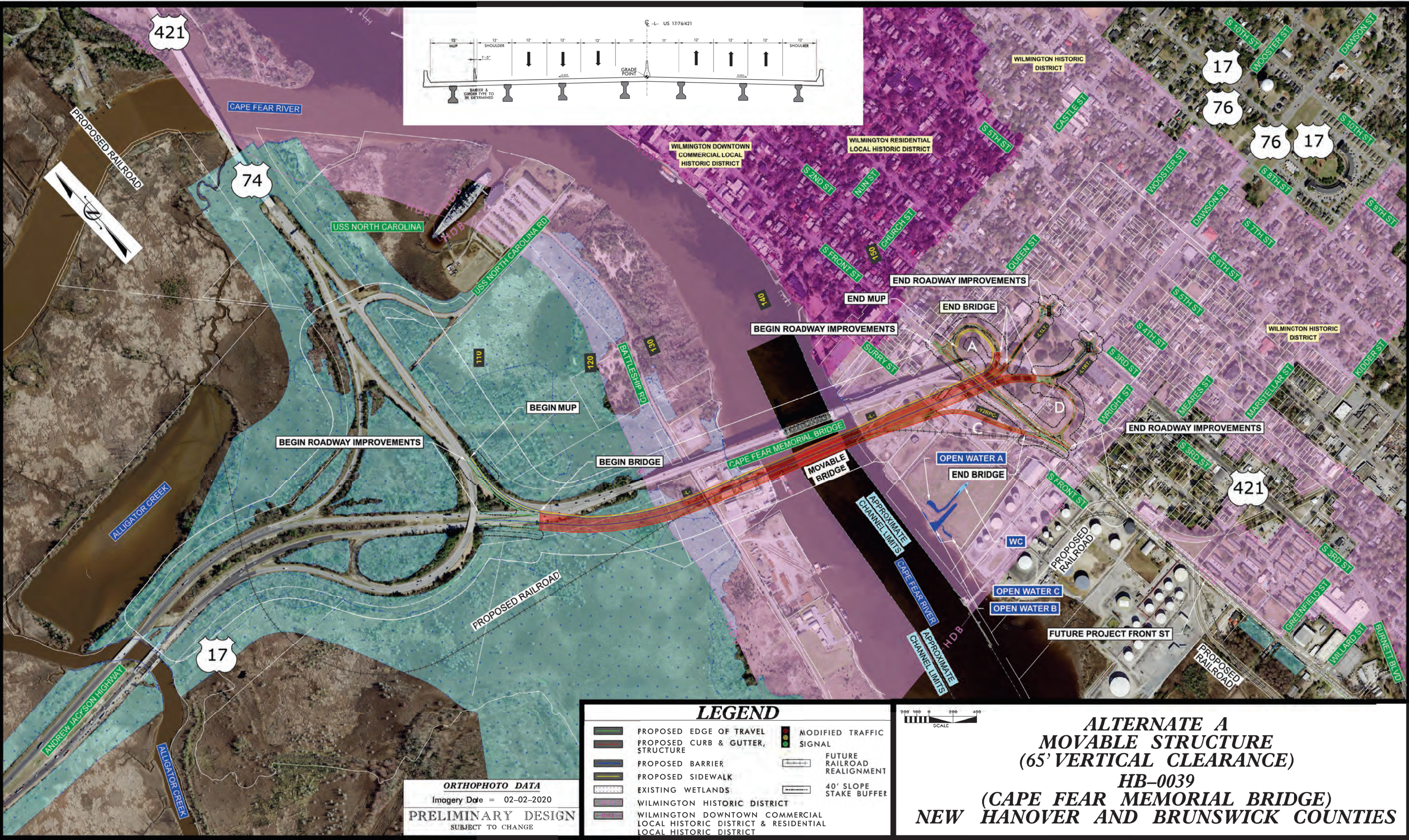
- HB-0039 Study Area
- 404/CAMA Wetland
- 404 Wetland
- Cape Fear River
- 404 Open Water

0 Feet 300



NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 3

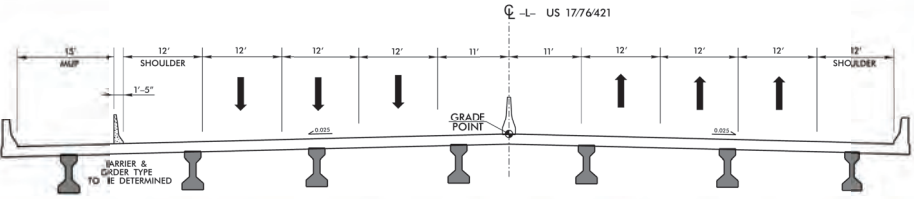
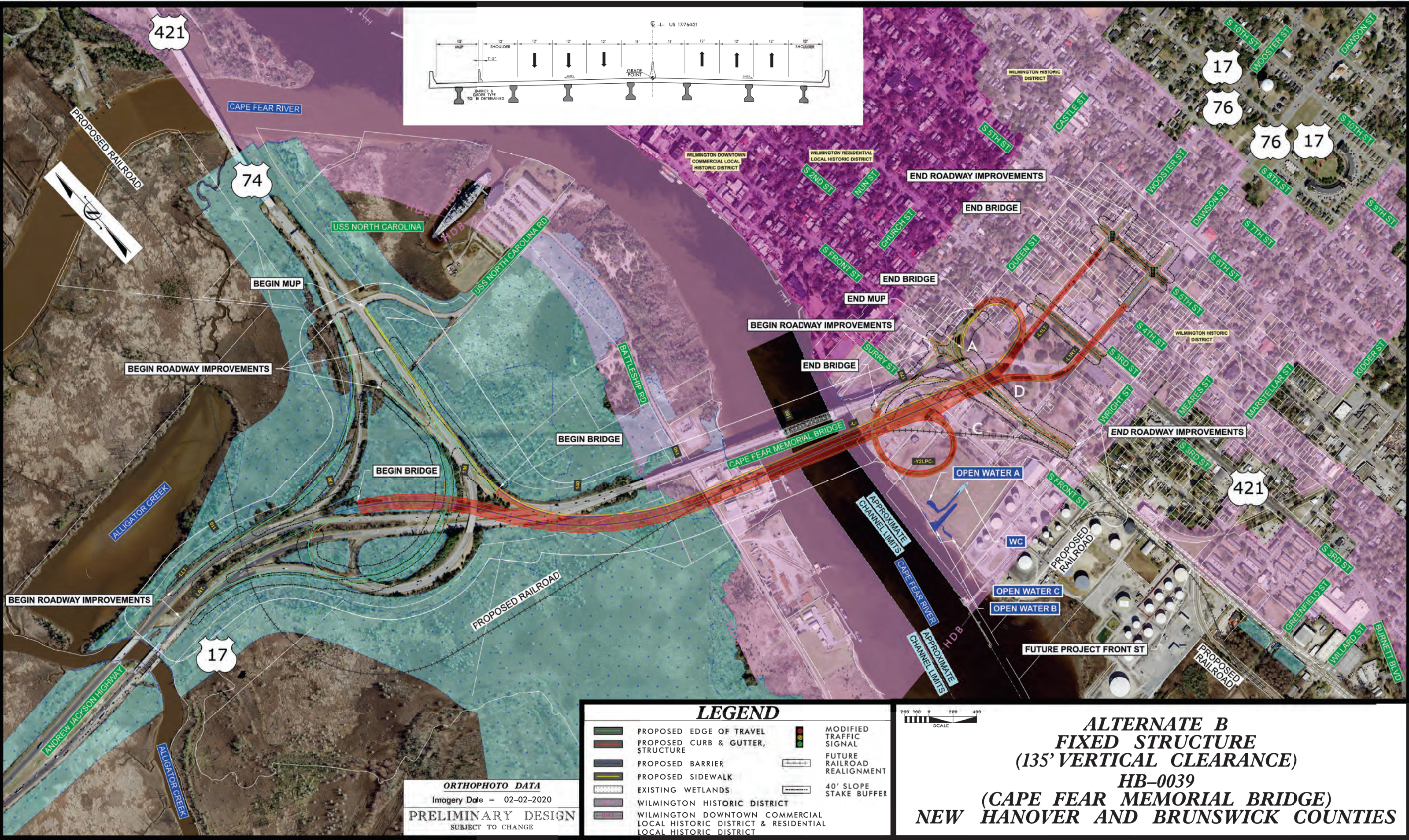
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FEAR MEMORIAL BRIDGE) OVER THE CAPE FEAR RIVER
STIP HB-0039/WBS ELEMENT NO. 50603.1.1
BRUNSWICK & NEW HANOVER COUNTIES,
NORTH CAROLINA

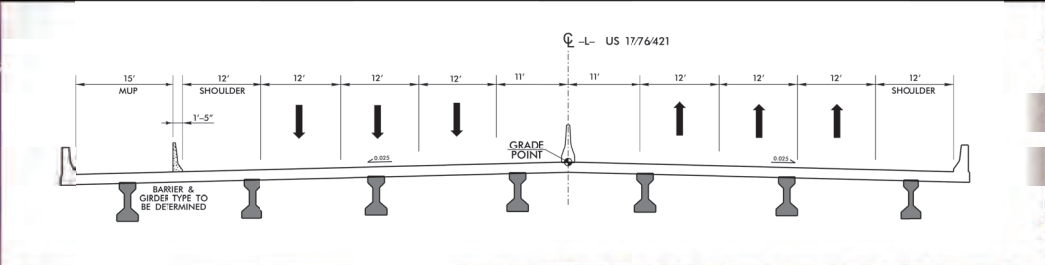
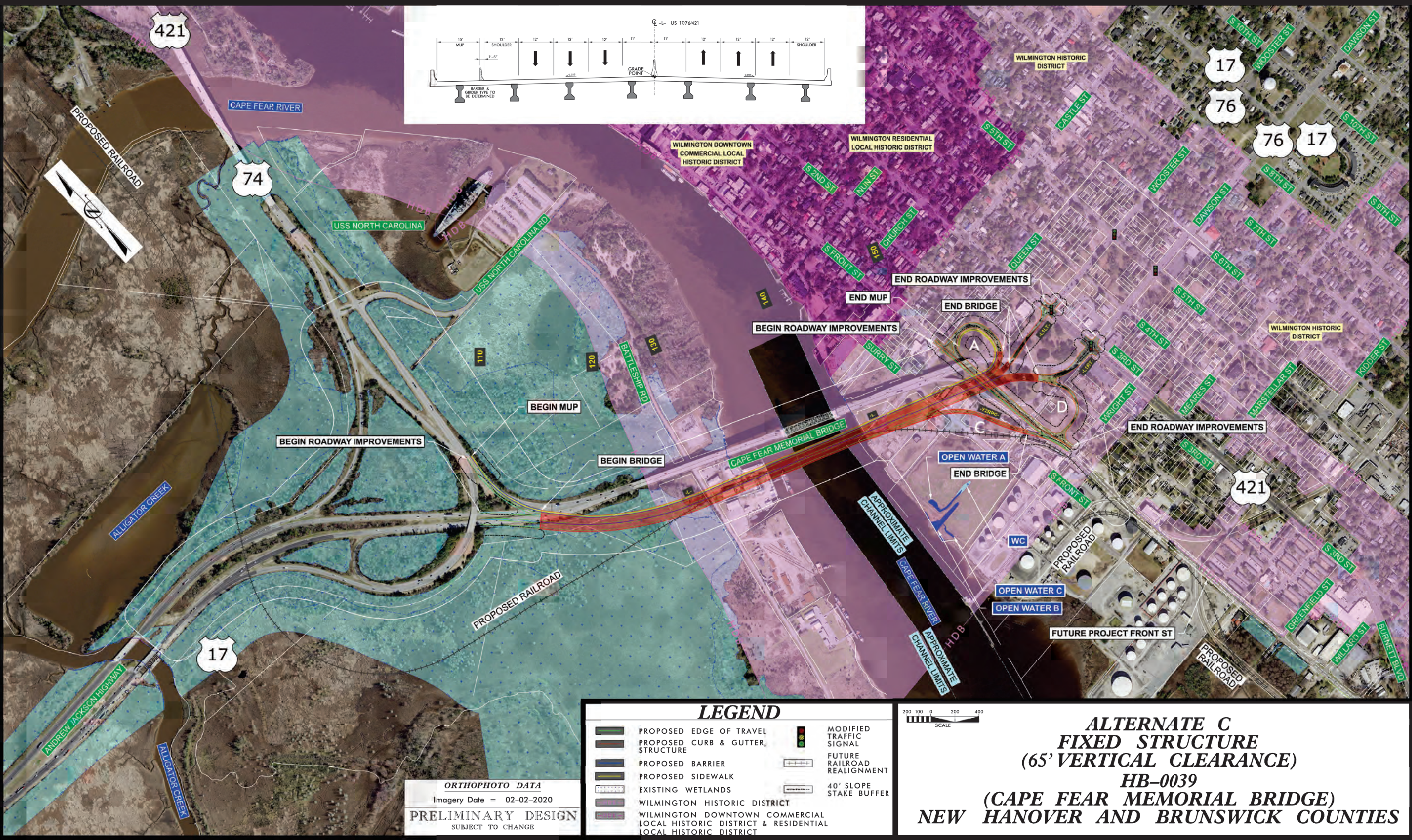


LEGEND			
	PROPOSED EDGE OF TRAVEL		MODIFIED TRAFFIC SIGNAL
	PROPOSED CURB & GUTTER, STRUCTURE		FUTURE RAILROAD REALIGNMENT
	PROPOSED BARRIER		40' SLOPE STAKE BUFFER
	PROPOSED SIDEWALK		
	EXISTING WETLANDS		
	WILMINGTON HISTORIC DISTRICT		
	WILMINGTON DOWNTOWN COMMERCIAL LOCAL HISTORIC DISTRICT & RESIDENTIAL LOCAL HISTORIC DISTRICT		

ALTERNATE A
MOVABLE STRUCTURE
(65' VERTICAL CLEARANCE)
HB-0039
(CAPE FEAR MEMORIAL BRIDGE)
NEW HANOVER AND BRUNSWICK COUNTIES

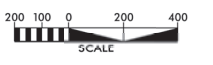
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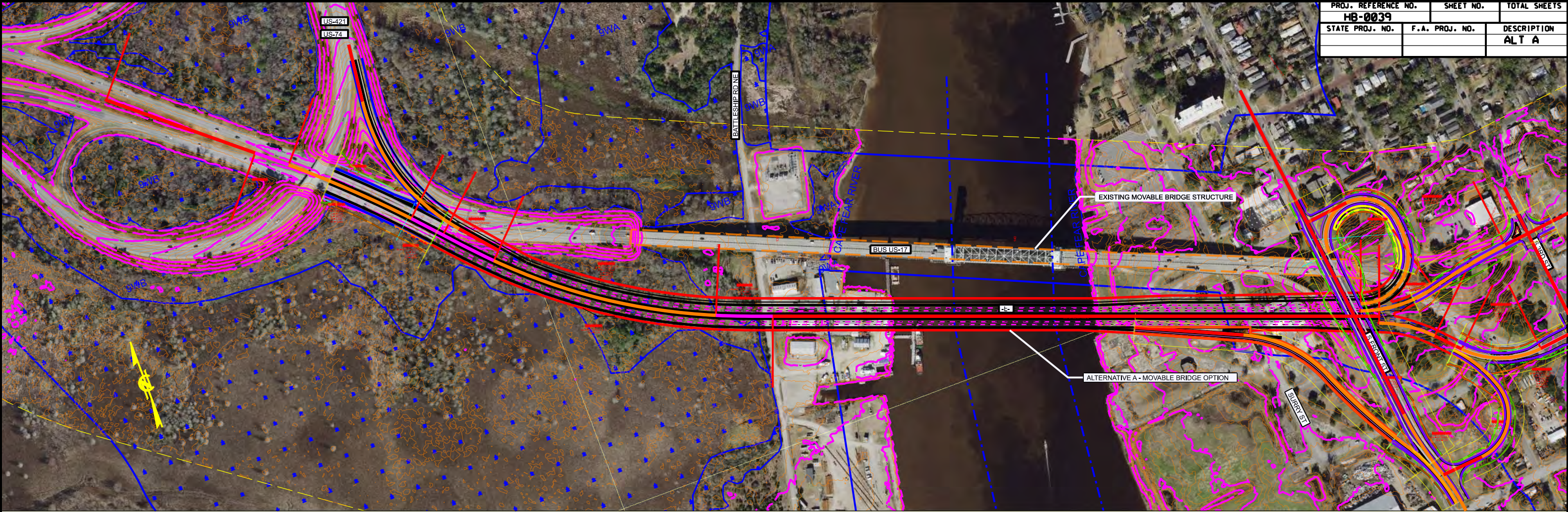


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	PROPOSED CURB & GUTTER, STRUCTURE		FUTURE RAILROAD REALIGNMENT
	PROPOSED BARRIER		40' SLOPE STAKE BUFFER
	PROPOSED SIDEWALK		
	EXISTING WETLANDS		
	WILMINGTON HISTORIC DISTRICT		
	WILMINGTON DOWNTOWN COMMERCIAL LOCAL HISTORIC DISTRICT & RESIDENTIAL LOCAL HISTORIC DISTRICT		

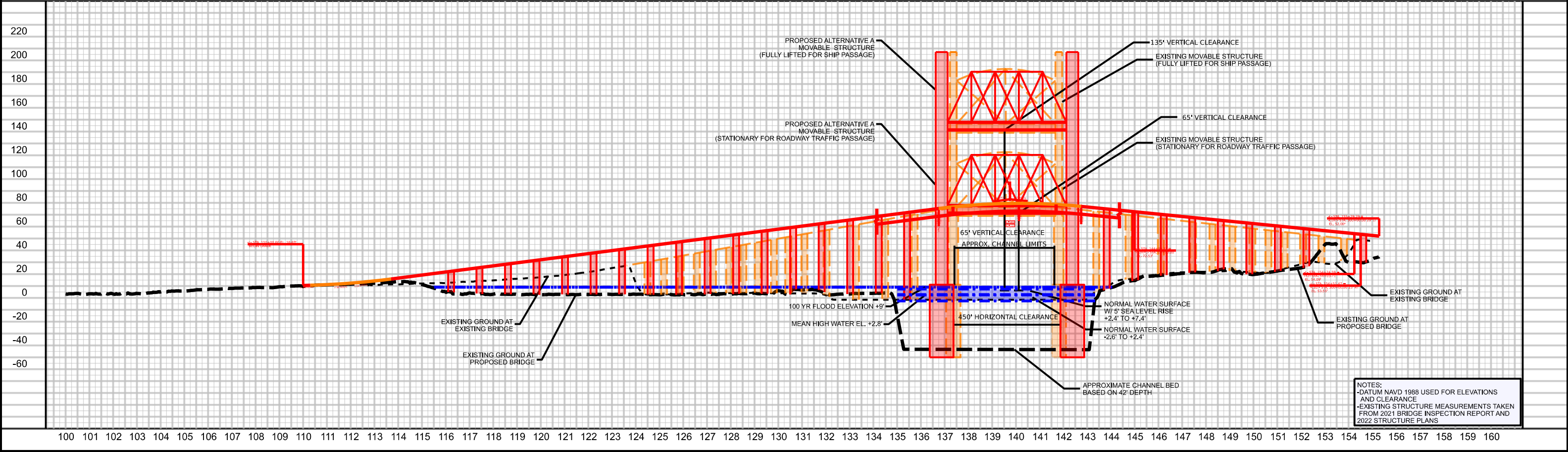
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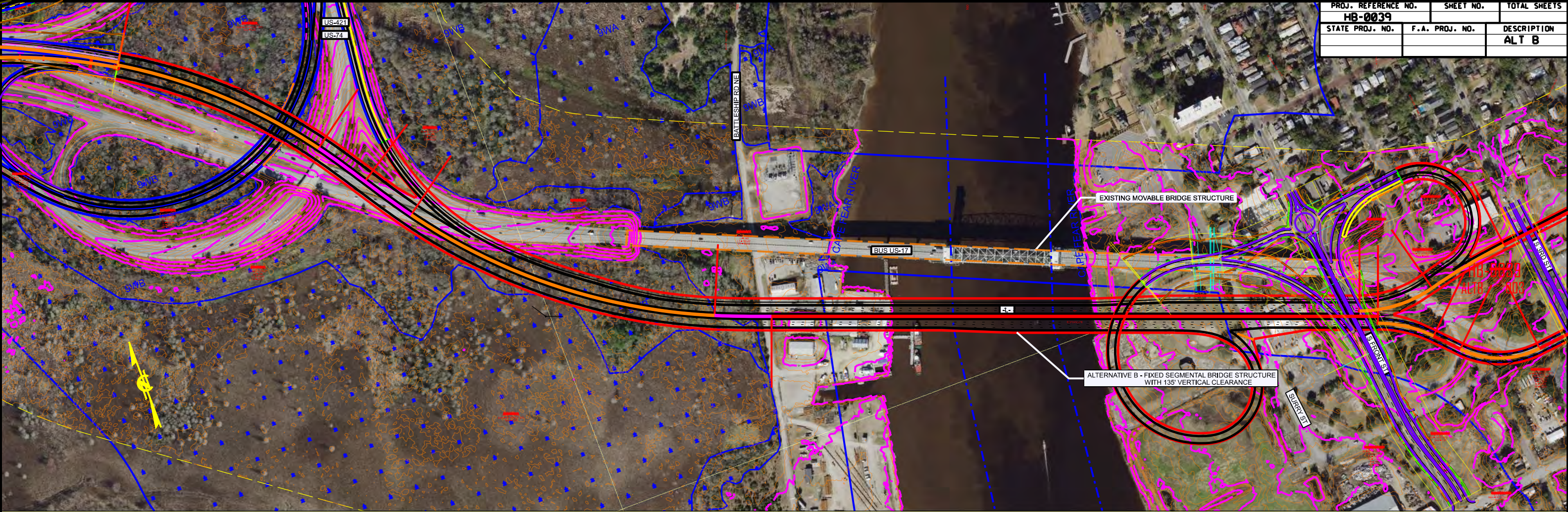


**ALTERNATE C
FIXED STRUCTURE
(65' VERTICAL CLEARANCE)
HB-0039
(CAPE FEAR MEMORIAL BRIDGE)
NEW HANOVER AND BRUNSWICK COUNTIES**

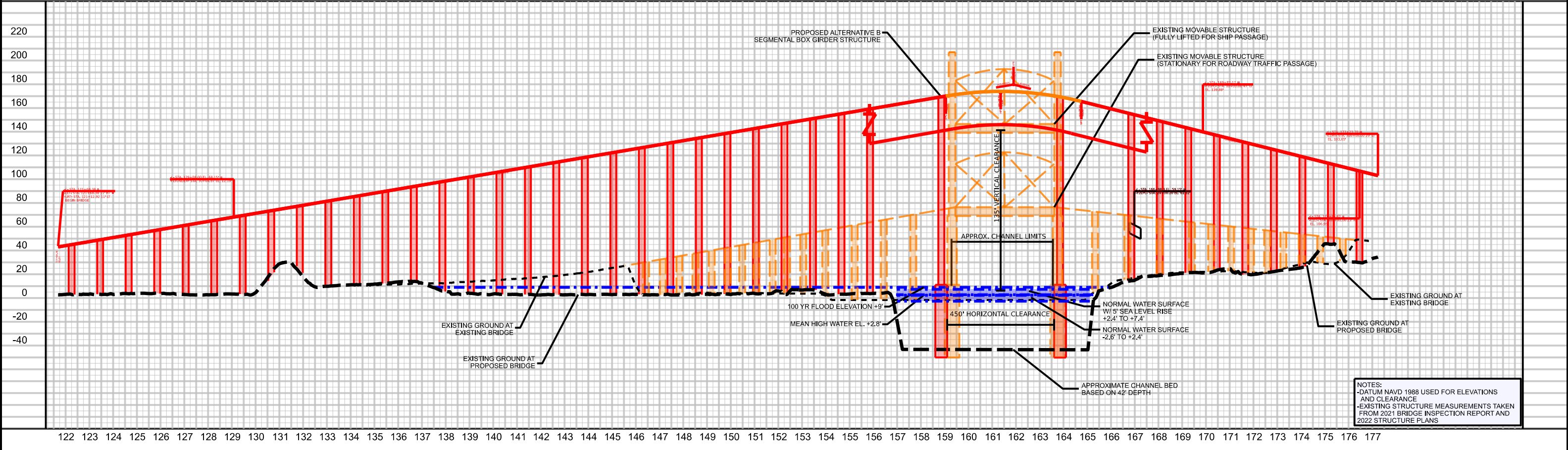


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HB-0039			
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
		ALT A	

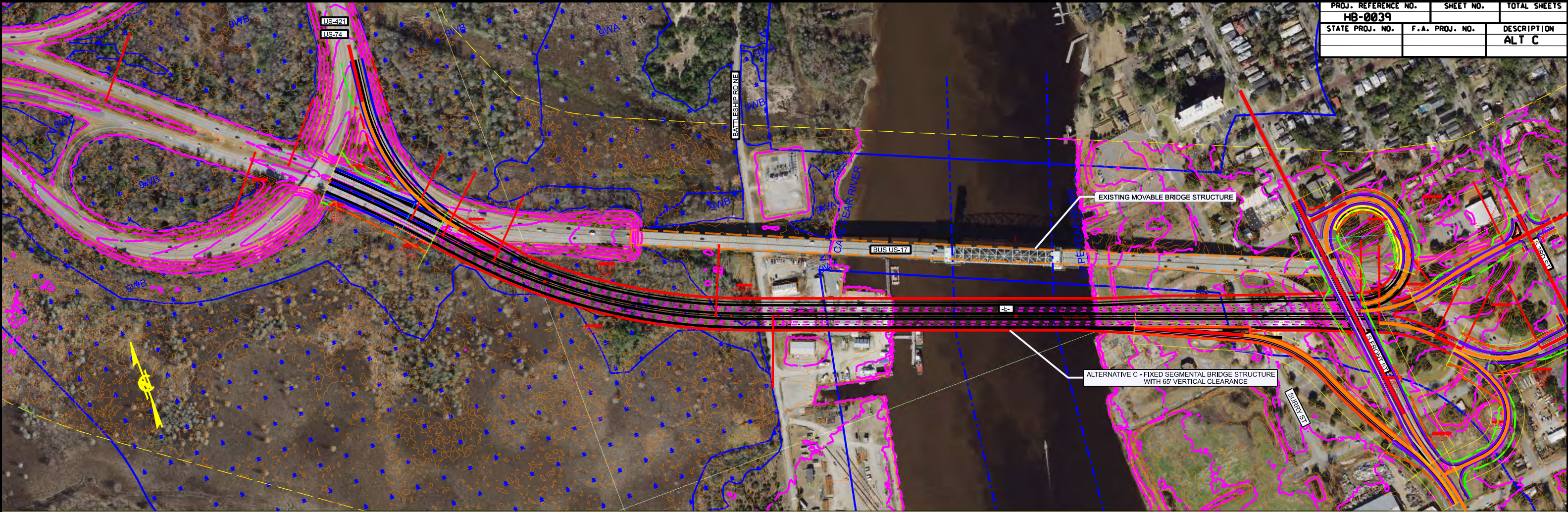




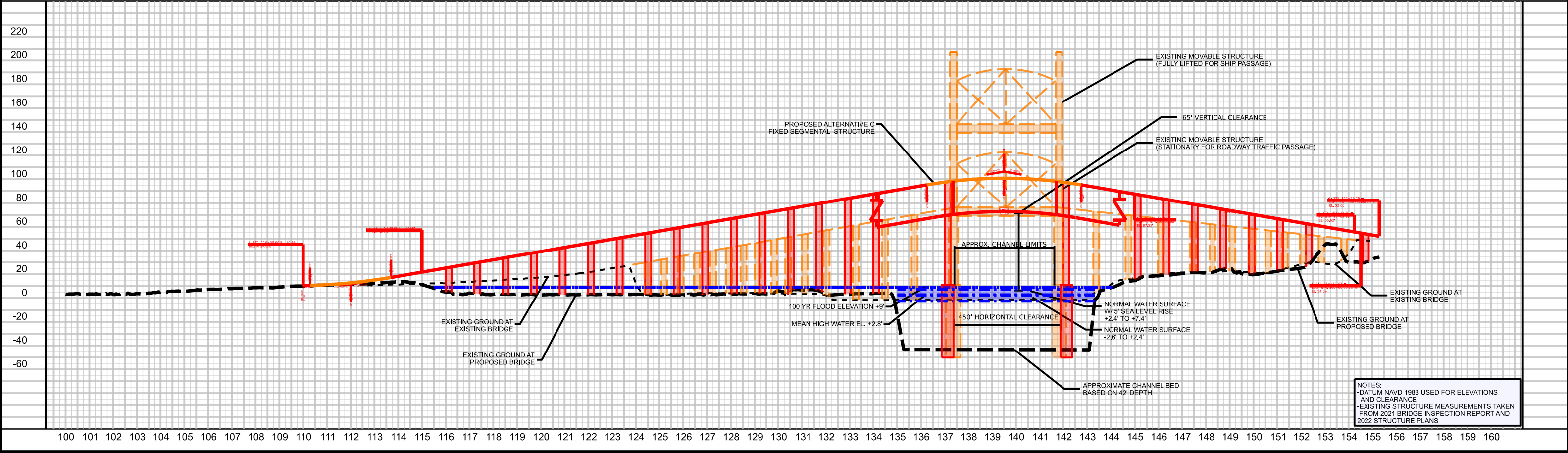
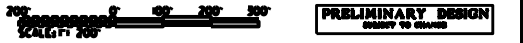
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HB-0039		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
		ALT B



NOTES:
-DATUM NAVD 1988 USED FOR ELEVATIONS AND CLEARANCE
-EXISTING STRUCTURE MEASUREMENTS TAKEN FROM 2021 BRIDGE INSPECTION REPORT AND 2022 STRUCTURE PLANS



PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
HB-0039		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
		ALT C



Date of Summary: 4/18/24, rev. 5/14/24

Concurrence Point (CP) 2 and 2A Meeting Summary

Detailed Study Alternatives Carried Forward and Bridging Decisions and Alignment Review

Replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over
the Cape Fear River

New Hanover and Brunswick Counties

STIP No. HB-0039

Thursday April 11, 2024 / 10:00 AM

Meeting Attendees

Name	Organization	E-mail Address
Tom Steffens*	US Army Corps of Engineers (USACE)	Thomas.A.Steffens@usace.army.mil
Gary Jordan*	US Fish and Wildlife Service (USFWS)	gary_jordan@fws.gov
Seth Wilcher*	Federal Highway Administration (FHWA)	seth.wilcher@dot.gov
Jack Williams*	US Coast Guard (USCG)	jack.h.williams2@uscg.mil
Garcy Ward*	NC Division Water Resources (DWR)	garcy.ward@deq.nc.gov
Kimberlee Harding*	NC Division of Marine Fisheries (DMF)	kimberlee.harding@deq.nc.gov
Stephen Lane*	NC Division of Coastal Management (DCM)	stephen.lane@deq.nc.gov
Cathy Brittingham	DCM	cathy.brittingham@deq.nc.gov
Travis Wilson*	NC Wildlife Resource Commission (WRC)	travis.wilson@ncwildlife.org
Renee Gledhill-Earley*	NC Historic Preservation Office (NCHPO)	renee.gledhill-earley@dnocr.nc.gov
Luan Cao*	NCHPO	luan.cao@dnocr.nc.gov
Amanetta Somerville*	US Environmental Protection Agency (USEPA)	somerville.amanetta@epa.gov
Fritz Rohde*	NOAA Fisheries	fritz.rohde@noaa.gov
Mike Kozlosky	Wilmington Urban Area Metropolitan Planning Organization (WMPO)	mike.kozlosky@wilmingtonnc.gov
Katie Hite*	NCDOT Division 3	kehite@ncdot.gov
David Leonard*	NCDOT Division 3	dbleonard@ncdot.gov
Trace Howell*	NCDOT Division 3 PM	trhowell1@ncdot.gov
Mason Herndon	NCDOT Division 3	tmherndon@ncdot.gov
Ray Lovinggood*	NCDOT Hydraulics	rlovinggood@ncdot.gov
Mark Staley*	NCDOT Roadside Environmental	mkstaley@ncdot.gov
Morgan Weatherford	NCDOT Environmental Policy Unit (EPU)	mdweatherford@ncdot.gov
Mike Sanderson	NCDOT EPU	jmsanderson@ncdot.gov
Marissa Cox*	NCDOT EPU	mrcox@ncdot.gov
Christine Farrell*	NCDOT EPU	cefarrell@ncdot.gov
Michael Turchy*	NCDOT Environmental Coordination & Permitting (ECAP)	maturchy@ncdot.gov
Wesley Cartner*	NCDOT Project Management Unit	wcartner@ncdot.gov

David Stutts*	NCDOT Structures Management Unit (SMU)	dstutts@ncdot.gov
Matt Wilkerson*	NCDOT Cultural Resources	mtwilkerson@ncdot.gov
Mary Pope Furr*	NCDOT Cultural Resources	mpfurr@ncdot.gov
Jeff Dayton	HDR	jeffrey.dayton@hdrinc.com
Phillip Rogers	HDR	phillip.rogers@hdrinc.com
Emily Poole	HDR	emily.poole@hdrinc.com

*Attended via phone/Teams

On April 11, 2024, NCDOT hosted a combined Concurrence Point (CP) 2 and 2A meeting to gain concurrence on Detailed Study Alternatives (CP 2) and Bridging Decisions and Alignment Review (CP2A) for the STIP Project HB-0039, replacement of Bridge Number 640013 (Cape Fear Memorial Bridge) over the Cape Fear River. NCDOT distributed the meeting packet to the participating agencies and team members for their review prior to the meeting on March 28, 2024.

NCDOT EPU began the meeting with introductions made by each member of the group present or participating via telephone. USACE gave a brief summary of the purpose of the meeting. Following introductions, the CP 2 and 2A Packet was reviewed and discussed. The following summarizes the main topics discussed.

- HDR noted one alternative was added after the CP 1 meeting, Alternative C a fixed span 65' vertical clearance.
 - NCDOT Hydraulics clarified the existing bridge has 65' minimum vertical clearance (when in the closed position) and 135' maximum vertical clearance (when in the open position).
- USEPA inquired whether relocations had been determined at this time.
 - HDR noted they had not but would be prior to CP3.
 - USEPA requested the relocation report identify whether relocations occur predominately in Environmental Justice (EJ) areas.
 - Division 3 confirmed.
- HDR noted the packet included that the Cape Fear River is identified as a sturgeon spawning water by NMFS, and therefore an in-water construction moratorium is in effect from February 1 through June 30 for these waters. Additionally, the Cape Fear River is a Primary Nursery Area (PNA) which includes an in-water construction moratorium through September 30.
 - NOAA Fisheries clarified the Cape Fear River is designated Critical Habitat for Atlantic Sturgeon by NMFS, not sturgeon spawning water.
 - *Post meeting note: Via e-mail to the merger team, DMF noted they and NMFS concur on the moratorium period of February 15 through June 30 for the project.*
 - Division 3 noted the project team would make those corrections moving forward.
- USEPA inquired whether the merger team could hold an update meeting prior to CP3 as there were a lot of moving parts.
 - Division 3 inquired whether this could be handled via e-mail.
 - USEPA noted that would be fine.
 - Division 3 inquired whether there were any specific updates the project team should provide.
 - USEPA noted any decisions made regarding vertical clearance.
- NCHPO inquired what the USCG's role in the project was and whether they would make the final determination on vertical clearance.
 - Division 3 stated the project team was currently working on a Navigational Impact Report (NIR) which will be submitted to the USCG, who will then provide the project team with a

preliminary determination on vertical clearance. The Wilmington Harbor is also a USACE Section 408 project and the USACE Section 408 team will also provide guidance on vertical clearance requirements.

- HDR noted the Draft NIR would be ready to submit in late May/early June.
- USACE noted they received an e-mail from their Section 408 representative (Ronnie Smith) morning and read the e-mail to the merger team, as summarized here, and to be sent to the merger team following the meeting. The e-mail noted the authorized depth of the federal project in this location is 38 feet and believe the minimal vertical clearance is 125 feet. The Section 408 team is working to find the class and size vessel identified when the federal navigation project was authorized. The 408 team discussed a fixed bridge with 65' clearance, and it is unlikely they would provide approval.
- USCG noted in 2021, the vertical clearance recommended for the Wilmington Rail Project was 135'. Between 2018 and 2020, there were 117 lifts of the Cape Fear Memorial Bridge.
 - NOAA Fisheries inquired whether these lifts were associated with commercial or recreational traffic (sailboats).
 - USCG stated per the NIR, commercial.
- SHPO inquired whether the project team could consider a fixed alternative higher than 65' and lower than 135'.
 - Division 3 confirmed, and proposed the group consider a fixed 100' vertical clearance alternative and remove the fixed 65' vertical clearance alternative from further study.
- USCG noted once they receive the NIR, it will be sent out for public notice, and see what input is provided by the public and mariners before making a preliminary recommendation. USCG will consider whether any larger vessels are expected to travel in the study area in the next 50-100 years.
- Division 3 noted the USCG clearance guidance recommended 100 feet on the northeast river, which is assumed to refer to the northeast Cape Fear River. The Kinder Morgan facility upriver recently sold, and as a result the number of openings has greatly decreased.
- NCHPO noted the cost estimates included a note associated with Alternative C's right-of-way cost and requested additional information.
 - HDR noted when the original concepts were developed and Kinder Morgan was still in operation, it would need to be purchased if a 65' fixed vertical clearance alternative was chosen, however that has not been quantified at this time.
- NCHPO stated a major cost of the current bridge was associated with the movable components. They inquired how much money would be spent on maintenance moving forward with a movable span.
 - HDR noted the CP1 packet included information on maintenance costs.
 - Division 3 stated since 2008 NCDOT has invested \$33 million in major rehabilitation to maintain the deck, substructure, and superstructure to keep in satisfactory condition. \$15 million was spent in 2024 to replace the deck. In addition, NCDOT spends over \$500,000 on regular maintenance and operations.
 - NCHPO inquired whether NCDOT could use the existing maintenance costs to estimate future costs associated with a movable span.
 - DCM noted for other projects, life cycle costs were taken into consideration, such as access roads and utility relocation costs.
 - Division 3 noted as the project continues towards CP3 and refine the designs, additional information can be provided.

- NCHPO inquired why the multi-use path (MUP) proposed across the bridge extended to the Battleship with Alternative B, but did not with Alternative A or Alternative C.
 - Division 3 noted the multi-use path followed the limits of construction for each alternative. Alternative B's construction limits extend further on each side of the bridge due to the higher vertical clearance, therefore, the MUP extends further.
 - HDR noted Brunswick County and WMPO have several bicycle and pedestrian facility recommendations in local plans that would connect to the proposed MUP.
- Division 3 inquired whether the merger team could move forward with Alternative C to present to the public, as the Kinder Morgan property had recently been sold and there was a reduction in CFMB openings.
 - USCG noted multiple alternatives can be considered. However, it needs to accommodate existing navigation, coordination with stakeholders, and input from USACE Section 408.
- DCM noted in previous projects USCG issued the permit for the bridge and USACE issued the permit for the approaches, and inquired whether this project would also follow suit.
 - USACE confirmed.
- NCHPO stated if the replacement bridge allows for larger ships, whether the Cape Fear River north of the project would need to be dredged deeper, and associated foreseeable impacts should be assessed as part of this project (such as larger ships creating larger waves and maintaining a sea wall).
 - USEPA noted a lot of the impacts would be determined by the minimum vertical clearance.
 - FHWA noted none of the proposed alternatives include a higher vertical clearance than the existing bridge. Therefore, larger ships wouldn't pass upstream so the project did not need to that analysis.
 - Division 3 added the Wilmington Harbor USACE Section 408 Project extends up to the rail bridge upstream of the Isabel Holmes bridge. The bridge on US 74/76/421 is a fixed span 55' vertical clearance bridge. The Section 408 project is currently 25' deep but authorized to 38' deep.
 - FHWA stated they would only expect that analysis to occur if any of the alternatives had a higher vertical clearance than the existing bridge.
- NOAA Fisheries noted they heard the deed for the former Kinder Morgan property required future development be industrial.
 - Division 3 confirmed.
- DCM noted the proposed cross section is wide, and inquired whether multiple cross sections could be carried forward (such as, with a narrower MUP) for potential permitting purposes.
 - Division 3 noted NCDOT would conduct avoidance and minimization and look at minimizing the typical section if possible, but traffic studies have shown the proposed six lanes are warranted, and 11' inside shoulders are needed for emergency services pull off.
 - HDR noted the Charleston Ravenel Bridge between Mt. Pleasant and Charleston includes a 12-foot MUP and in conversations with the City they have noted they wish they had utilized a wider MUP. The Ashley River pedestrian bridge currently under construction will include an 18-foot MUP.
 - DCM inquired whether there was analysis that showed how much the MUP was projected to be used.
 - WMPO noted the long-term plan is to connect Leland and Belville to Wilmington via bicycle and pedestrian accommodations for regional connectivity.

- EPU noted NCDOT's Complete Streets Policy will also help inform multimodal accommodations and require NCDOT coordinate with local governments to incorporate bicycle and pedestrian accommodations in plans.
- DCM inquired whether the MUP would have benefits to low to moderate income families.
 - WMPO confirmed, and noted this could be quantified as part of HDR's analysis.
 - DCM note they do not typically permit improvements that cause additional impacts.
- WMPO noted their long range plan includes a 10' MUP which can be modified.
- SMU inquired whether Division 3 has received any feedback on the new Surf City Bridge which includes a 10' MUP.
 - Division 3 noted it has been very successful and had been used by communities on each side.
- DCM inquired whether NCDOT had an update on tolling which was discussed at the CP1 meeting.
 - WMPO noted their Board had approved the project to be considered for tolling. The project was submitted to NCDOT as a toll option, and statewide scores will be released in late April.
 - Division 3 noted the project will be submitted for the Bridge Investment Program Grant and the Multimodal Project Discretionary Grant.
 - USEPA inquired whether the project team would analyze the impacts of a potential toll on surrounding EJ communities, and recommended this analysis occur prior to a determination being made on whether the project will be tolled.
 - Division 3 noted if the project moved forward as a tolling project, the community studies technical reports would be updated to include an assessment of tolling impacts on EJ communities.
 - DCM noted tolling would also increase impacts to other resources due to the potential need for toll booths, approach roads, etc.
 - WMPO noted the Board's resolution was explicit in noting the tolling option was submitted for scoring purposes only, to compare against the non-tolled option.
 - USEPA inquired whether the purpose and need of the project would change with a tolled facility.
 - Division 3 noted the purpose of the project was to replace a functionally obsolete structure, and the funding source shouldn't affect the purpose.
 - USEPA noted a tolling facility may affect traffic on the bridge, and the study area would need to change as traffic may be diverted.
 - HDR commented that the Turnpike Authority is preparing a traffic and revenue study.
- NCHPO inquired whether the schedule could be pushed out as there is no funding.
 - Division 3 noted in order to apply for grants, concepts and estimates have to be prepared.
- NCHPO inquired why NCDOT is considering the 65' fixed bridge alternative.
 - Division 3 suggested the 65' fixed vertical clearance bridge be removed and replaced with a 100' fixed vertical clearance bridge.
 - DCM inquired when the USCG NIR study would be complete as that may determine the vertical clearance.
 - Division 3 stated USACE Section 408 would determine the vertical clearance. Division 3 noted if 125' was recommended as the minimum vertical clearance, that could serve as a minimization of the 135' bridge.
 - DCM noted the purpose of CP2 was to select alternatives to carry forward for detailed study, not actually conduct the detailed studies.
 - USACE agreed.
 - HDR noted the project team would also like to obtain public feedback on the alternatives.

- USEPA noted it did not make sense to present alternatives that aren't permissible to the public.
- Division 3 recommended adding a 100' fixed vertical clearance bridge as 100' vertical clearance was the recommendation from USCG on the Northeast Cape Fear River, and it may not impact the interchange to the west of the bridge like Alternative B (135' Fixed) will.
- FHWA asked if the merger team might consider eliminating Alternative C and noting the ultimate height for Alternatives A and B will be dependent upon USACE/USCG requirements but will not exceed 135' vertical clearance.
 - USEPA noted the cost analysis should include both movable and fixed alternatives, as the movable components are more expensive and should be compared. USEPA recommended adding a 100' fixed vertical clearance for comparison.
- Division 3 inquired whether the merger team was comfortable with moving forward with the following alternatives:
 - Alternative A: 65-135' Vertical Clearance Movable Structure
 - Alternative B: 135' Vertical Clearance Fixed Structure
 - Alternative C: 100' Vertical Clearance Fixed Structure
- No opposition was voiced.
- DCM noted it would be helpful to document the source of the 100' fixed vertical clearance recommendation.
 - USCG noted they believe the Northeast River recommendation was a different channel. They noted the recommendation provided to the recent Wilmington Rail Project was 135' minimum vertical clearance.
- Division 3 noted the combined CP2 and 2A concurrence form would be sent to the merger team following finalization of these minutes.
 - USACE inquired whether there would be a note that Alternative B could range from 125' to 135', and recommended a note be included on the form the vertical clearances could change based on ongoing studies and input from USACE and USCG.
 - Division 3 confirmed.

NOTE: Based on comments received from SHPO, a +/- 35' vertical clearance range was added to the Alternative C 100' fixed alternative on the CP2 signature form, to clarify that 100' fixed vertical clearance is for study comparison and the final vertical clearance will be determined by the USACE 408 Section and USCG.

Next Steps/Action Items:

- USACE to forward Section 408 e-mail correspondence read aloud to the merger team.
- The project team will send the CP2 and 2A form to the merger signatories following finalization of this meeting summary.
- The project team will provide technical study updates prior to CP3, including the NIR and any determination on vertical clearance requirements from USCG and/or USACE.
- The CP3 meeting will be scheduled in Fall 2024 following public involvement.

Please direct any comments or questions to NCDOT Project Manager Trace Howell at trhowell1@ncdot.gov, or Consultant Project Manager Jeff Dayton at jeffrey.dayton@hdrinc.com.

Section 404/NEPA Merger Project Team Meeting Agreement

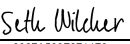
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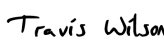
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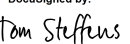
STIP Project: HB-0039

The Merger Team has concurred on this date of April 11, 2024, on the following major hydraulic crossing over the Cape Fear River. Bridge lengths provided are approximate and subject to change based on further studies and input from the US Army Corps of Engineers and US Coast Guard on vertical clearance.

- Alternative A: Movable span 65-135' vertical clearance: 1.24-mile-long bridge
- Alternative B: Fixed span 135' vertical clearance: 1.31-mile-long bridge
- Alternative C: Fixed span 100' vertical clearance (+/- 35' to be determined by the USACE 408 Section and USCG): 1.28-mile-long bridge

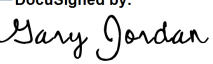
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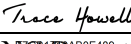
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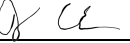
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06/06/2024
State Historic Preservation Office Date

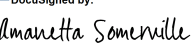
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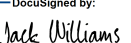
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Wilmington MPO Date

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05/21/2024
US Environmental Protection Agency Date

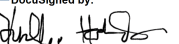
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National Oceanic and Atmospheric Administration Date

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NC Division of Marine Fisheries Date



Appendix I

Community Studies Tolling Considerations Memorandum

Memo: Community Studies Tolling Considerations

Date: Wednesday, July 15, 2026

Project: NCDOT STIP No. HB-0039, Cape Fear Memorial Bridge Replacement

To: NCDOT

From: HDR

Subject: Community Studies Tolling Considerations

1. Project Overview

1.1 Project Description

The N.C. Department of Transportation (NCDOT) proposes replacing Bridge 13 over the Cape Fear River on US 17/US 76/US 421 in New Hanover and Brunswick counties.

1.2 Project Location and Setting

The project study area encompasses the Cape Fear Memorial Bridge and adjoining areas of Wilmington in New Hanover County and Eagles Island in Brunswick County. East of the Cape Fear River, the study area extends through downtown Wilmington generally between Front Street and S 6th Street, and includes a mix of residential, commercial, and institutional, land uses. West of the Cape Fear River, the study area includes Eagles Island, an approximately 2,100-acre area situated between the Cape Fear and Brunswick Rivers that consists primarily of wetlands and remains largely undeveloped. Industrial and marine-related uses, including private terminal operations and a U.S. Army Corps of Engineers repair facility, are located along the riverfront and Battleship Road corridor. The Eagles Island portion of the study area extends west from the Cape Fear River and includes the US 17/US 76/US 421 transportation corridor and areas near Alligator Creek.

1.3 Project Alternatives

1.3.1 Build Alternatives

The three build alternatives include:

- Alternative A: Movable span 65-135' vertical clearance
- Alternative B: Fixed span 135' vertical clearance with trumpet interchange improvements

- Alternative C: Fixed span 100' vertical clearance (+/- 35' to be determined by the US Army Corps of Engineers (USACE) 408 Section and US Coast Guard (USCG)

Each alternative would slightly modify the existing eastern loop ramps at S Front Street and tie into the current one-way pair of Wooster Street and Dawson Street in downtown Wilmington. Across the river, the bridging of Eagles Island wetlands would extend to the US 17/US 76/US 421 interchange, with possible ramp modifications to that interchange with Alternative B.

In coordination with the US Army Corps of Engineers and US Coast Guard, it was determined that the construction of a bridge with a vertical clearance less than 135 feet above the current Mean Higher High Water (MHHW) elevation would be injurious to the purposes of the federal project and the usefulness of the federal project would be negatively impacted. As such, Alternative C, which had a 100-foot vertical clearance, was eliminated from further evaluation.

1.4 Demographic Data

Demographic data was gathered and assessed for the Demographic Study Area (DSA), including all census block groups within the project study area (see **Image 1**).

1.4.1 Population Growth

Historical American Census Survey (ACS) data was used to compare population changes from 2007 to 2021. The DSA experienced a 0.5% annualized growth increase on average compared to New Hanover County (1.2%) and Brunswick County (2.4%) during this time period. A majority of the block groups within the Demographic Study Area saw a decrease in population with the exception of Census Tract (CT) 202.05 Block Group (BG) 3, CT 113 BG 2, and CT 115.03 BG 2, which had annualized growth rates of 5.0%, 9.8%, and 1.1% respectively.

1.4.2 Low Mobility Populations

ACS data was also used to examine low-mobility populations including older adults and residents under the age of 18, people with disabilities, and those with limited access to a personal vehicle. Approximately 18.2% of the population the DSA includes residents under the age of 18, which is comparable to Brunswick and New Hanover Counties, but below the statewide percentage. Additionally, approximately 21.1% of the population in the DSA are over the age of 65, which is below Brunswick County but above the New Hanover County and statewide percentages. See **Image 2** for additional information on population by age group.

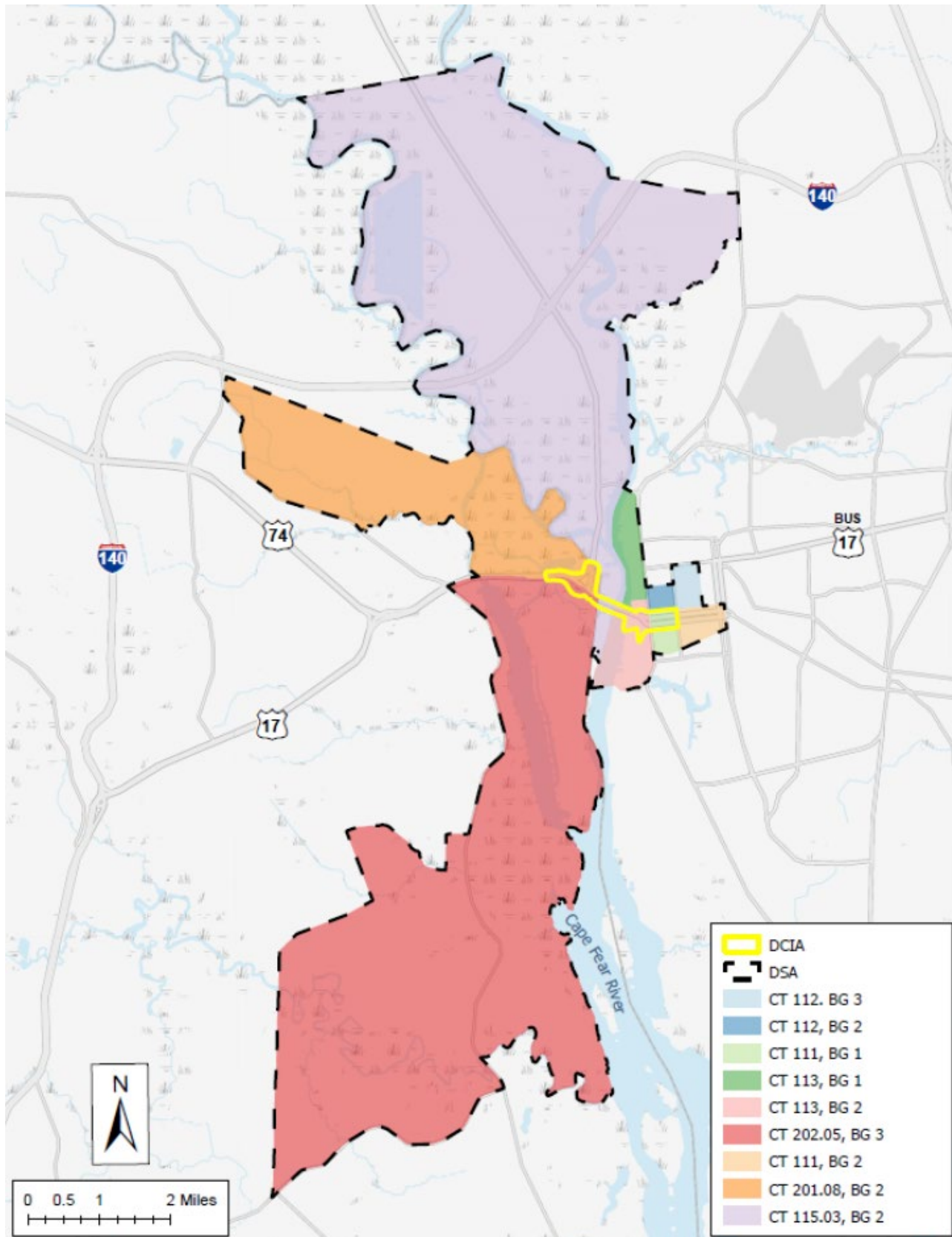


Image 1. Demographic Study Area (DSA)

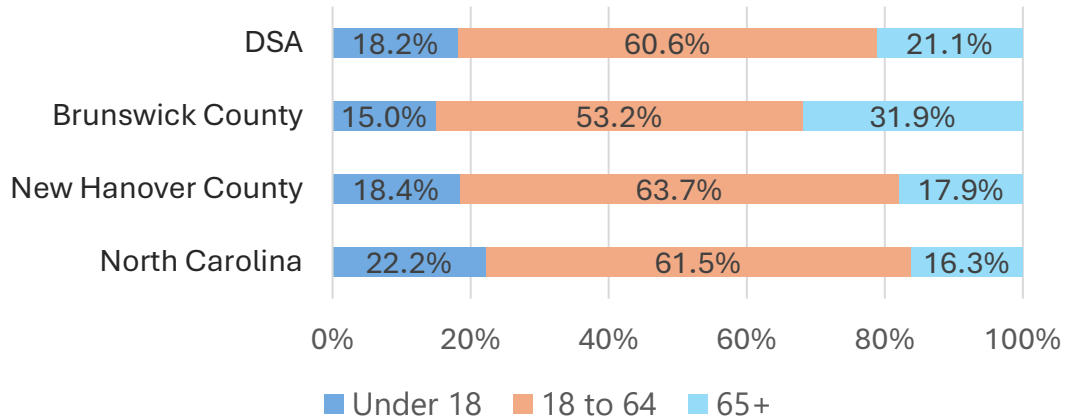


Image 2. Population by Age Group

As reflected in **Table 1** below, approximately 17.9% of households in the DSA do not have access to a vehicle. This percentage is considerably higher than Brunswick County (2.5%) and New Hanover County (6.5%). Median household income for the DSA is approximately \$69,548 which is below Brunswick County and New Hanover. The elevated concentration of households without access to a vehicle combined with lower household incomes suggests that residents within the DSA may have greater dependence on alternative transportation options such as walking, biking, transit, and ride share.

Similarly, approximately 18.1% of the population within the DSA reports having a disability, compared to 15.2% in Brunswick County and 12.1% in New Hanover County. While the DSA's disability population exceeds both counties, it varies considerably across block groups, ranging from 7.3% to 29.4%. As disability-related low mobility trends are often associated with the location of nursing homes and assisted living facilities, it should be noted there is a concentration of nursing home facilities in New Hanover County, near the intersection of US 421 and US 117 southeast of the Cape Fear Memorial Bridge, outside of the study area. Additional nursing and long-term care facilities are located elsewhere on the New Hanover County side of the river, although they are not located in the immediate vicinity of the project.

Table 1. Low Mobility Populations

Geography	Median income (dollars)	Zero Car Households	Disability
CT 201.08, BG 2	\$64,324	4.6%	9.48%
CT 202.05, BG 3	\$144,926	1.8%	3.13%
CT 111, BG 1	\$40,469	29.5%	24.21
CT 111, BG 2	\$33,031	37.9%	21.50%
CT 112, BG 2	\$80,445	7.5%	11.98%
CT 112, BG 3	\$66,293	39.9%	31.24%
CT 113, BG 1	\$74,160	12.5%	6.59%
CT 113, BG 2	\$61,838	15.6%	6.89%
CT 115.03, BG 2	\$60,446	16.3%	22.33%
DSA	\$69,548	17.9%	13.87%
Brunswick County	\$80,763	2.5%	15.2%
New Hanover County	\$76,184	6.5%	12.1%

Source: 2024 ACS 5-year estimates

1.4.3 Poverty Populations

As indicated in **Table 2**, ACS data indicates that the DSA experiences a notably higher concentration of poverty compared to Brunswick County, though it is comparable to New Hanover County and statewide averages. Within the DSA, 16% of the population lives below the poverty level, compared to 10.2% in Brunswick County and 13.6% in New Hanover County. An additional 8% of DSA residents live at less than 50% of the poverty level, reflecting a population experiencing severe economic hardship.

A block group is considered to have a notable census-based presence of poverty if the percentage of residents in any poverty category is at least 5 percentage points higher than the corresponding Brunswick or New Hanover County percentage or if any poverty category equals or exceeds 25 percent (see **Table 2** below). Census Tract (CT) 201.08, Block Group (BG) 2, CT 111, BG 1, CT 113, BG 2 meet the poverty threshold of poverty percentages being 5% over the county. CT 111, BG 2, CT 112, BG 3, and CT 115.03, BG 2 poverty levels are both higher than 25% and 5% over the county average (see **Image 3** below). These block groups surround the bridge in both New Hanover and Brunswick Counties.

Table 2. Poverty Populations

Geography	Population for whom Poverty Status is Determined	Below Poverty Level		Under 50% of Poverty Level		Between 100% and 149% of Poverty Level		Meets Thresholds	
		#	%	#	%	#	%	25 %	5% over County
CT 201.08, BG 2	2,123	362	17.1%	271	12.8%	222	10.5%	No	Yes
CT 202.05, BG 3	1,725	9	0.5%	-	0.0%	63	3.7%	No	No
CT 111, BG 1	845	154	18.2%	90	10.7%	136	16.1%	No	Yes
CT 111, BG 2	2,027	818	40.4%	429	21.2%	714	35.2%	Yes	Yes
CT 112, BG 2	664	54	8.1%	5	0.8%	3	0.5%	No	No
CT 112, BG 3	534	138	25.8%	32	6.0%	33	6.2%	Yes	Yes
CT 113, BG 1	890	120	13.5%	72	8.1%	94	10.6%	No	No
CT 113, BG 2	1,009	184	18.2%	20	2.0%	165	16.4%	No	Yes
CT 115.03, BG 2	2,333	111	4.8%	50	2.1%	657	28.2%	Yes	Yes
DSA	12,150	1,950	16.0%	969	8.0%	2,087	17.2%	No	N/A
Brunswick County	132,910	13,576	10.2%	7,233	5.4%	9,769	7.4%		
New Hanover County	218,563	29,750	13.6%	14,958	6.8%	19,211	8.8%		
North Carolina	10,092,759	1,379,672	13.7%	618,442	6.1%	935,611	9.3%		

Source: US Census Bureau, American Community Survey 5-year Estimates (2017-2021), Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."

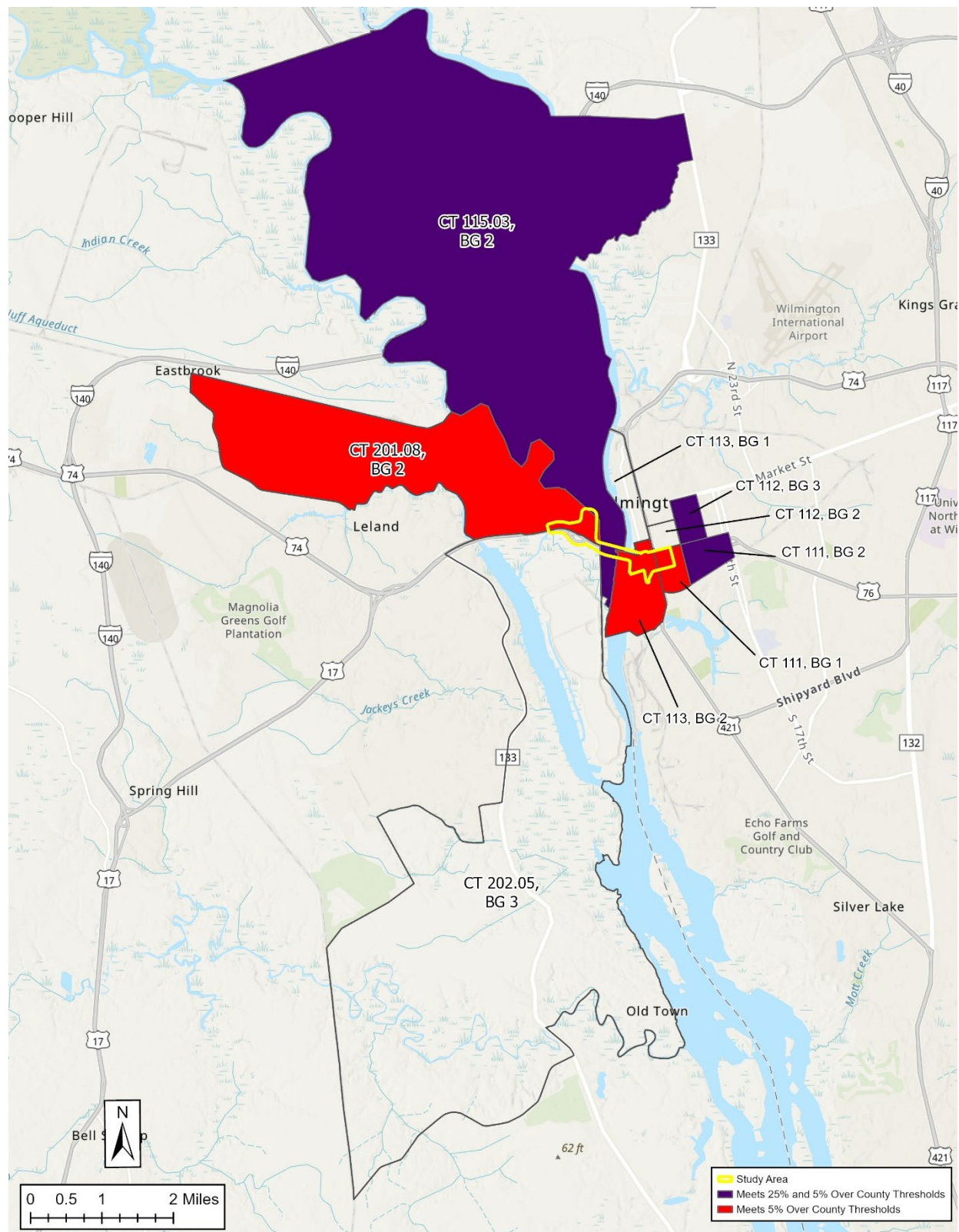


Image 3. Census Block Groups Exceeding Poverty Thresholds

1.5 Existing Traffic Operations

A Capacity Analysis Report was prepared for the project in February 2024 to assess traffic conditions in the base year (2023), in addition to the no-build and build scenarios for Alternatives A and B. In the 2023 no-build scenario, two freeway sections out of 12 analyzed were determined to operate at a Level of Service (LOS) E or F during each AM and PM peak hours, both in the vicinity of the Cape Fear Memorial Bridge at the US 74/421/NC 133 on/off ramps and Front Street on/off ramps. LOS E is described as having operations at capacity and extremely unstable due to no usable gaps in the traffic stream. LOS F describes forced or breakdown flow, with lowest driver comfort.¹ All intersections analyzed operated at an overall LOS D or better, indicating acceptable overall operations. Additional information on traffic operations for the project can be found in the Capacity Analysis Report.

1.5.1 Goods and Employment Movement

The Cape Fear Memorial Bridge plays a critical role in facilitating both the movement of goods and access to employment across the Cape Fear River into Downtown Wilmington and surrounding areas. As a vital connector between downtown Wilmington and key industrial and residential areas in Brunswick County, the bridge carries daily commuter traffic as well as commercial vehicles that transport freight to and from the Port of Wilmington, nearby manufacturing facilities, and regional distribution centers.

1.5.1.1 Goods Movement

The Port of Wilmington handles a wide variety of goods that reflect both regional economic strengths and global trade connections. A substantial portion of incoming cargo consists of commodities such as fertilizers, wood products, chemicals and automotive parts which support construction, agriculture, and manufacturing industries in the surrounding area. In addition, general cargo such as steel, project equipment, and machinery regularly enters the port, supplying industrial and infrastructure projects. Containerized goods such as apparel and furniture also move through the port, linking Wilmington to international supply chains and supporting regional distribution networks.² With rail lines that connect directly to or near the port, CSX railway enables efficient transfer of cargo between ships and inland markets.³

1.5.1.2 Employment Movement

According to the North American Industry Classification System (NAICS)⁴ 2023 industry data, professional, scientific, and technical services, accommodation and food services, and educational services are the top three industry sectors within the DSA (see **Table 3**).

¹ NCDOT. Level of Service Definitions. Web.

https://connect.ncdot.gov/projects/planning/TPBCTP/Camden%20County/Camden_LOS.pdf

² NC Ports: Port of Wilmington. 2026. Web. <https://ncports.com/port-facilities/port-of-wilmington/>

³ NC Ports: Capacity and Flexibility. 2026. Web. <https://ncports.com/port-facilities/port-of-wilmington/>

⁴ US Census Bureau. NAICS. 2026. Web. <https://www.census.gov/naics/>

Table 3: 2023 NAICS Job Counts by Industry Sector in the DSA

Industry	Count	Share
Professional, Scientific, and Technical Services	3,278	27.60%
Accommodation and Food Services	2,119	17.80%
Educational Services	1,286	10.80%
Construction	945	7.90%
Wholesale Trade	717	6.00%
Manufacturing	469	3.90%
Transportation and Warehousing	454	3.80%
Administrative and Support and Waste Management and Remediation Services	449	3.80%
Retail Trade	432	3.60%
Health Care and Social Assistance	422	3.50%
Finance and Insurance	395	3.30%
Other Services (excluding Public Administration)	334	2.80%
Real Estate and Rental and Leasing	196	1.60%
Arts, Entertainment, and Recreation	143	1.20%
Public Administration	122	1.00%
Information	67	0.60%
Utilities	51	0.40%
Management of Companies and Enterprises	17	0.10%

Employment movement trends were analyzed for the past 20 years using the US Census Bureau’s OntheMap tool, as depicted in **Table 4**.⁵ The data describes populations who live outside of the DSA and commute into, live within the DSA but commute elsewhere, and populations who both live and are employed within the DSA. As shown in the table below, the DSA has consistently functioned as a regional employment center, attracting more workers from outside the area than it exports to jobs elsewhere. This is likely the result of continual increased housing costs, lack of affordable housing, and location of job centers in comparison to Brunswick County.^{6,7} It should be noted the New Hanover County portion of the DSA contains a higher concentration of jobs in comparison to the Brunswick County portion. New Hanover County includes downtown Wilmington, and in 2023 contained approximately 11,300 jobs whereas the Brunswick side of the DSA contains approximately 650 jobs.

Within the DSA between 2013 and 2023, inbound commuting increased by nearly 28%, while outbound commuting declined by approximately 17%. Additionally, those who both

⁵ US Census Bureau OntheMap tool. 2026. Web. <https://onthemap.ces.census.gov/>

⁶ Port City Daily. “Housing committee: ‘Problem has gotten more challenging,’ 85% price increases since 2018.” Web. February 7, 2025. <https://portcitydaily.com/local-news/2025/02/07/housing-committee-problem-has-gotten-more-challenging-85-price-increases-since-2018/>

⁷ WHQR. “What a toll bridge would mean for the Cape Fear region’s economy.” May 11, 2026. Web. <https://www.whqr.org/local/2026-05-11/what-a-toll-bridge-would-mean-for-the-cape-fear-regions-economy>

live and work within the DSA increased by 31%, indicating that the local job market strengthened and retained a greater share of Wilmington-area residents.

Residents of the Brunswick County portion of the DSA are more likely to commute outside for employment, while the New Hanover County portion serves as the area's primary employment center, attracting a notable number of workers from outside the DSA.

Table 4. Employment Movement

Year	County	Employed in DSA, Live Outside	Live in DSA, Employed Outside	Employed and Live in DSA
2003	Brunswick County	528	1,075	18
	New Hanover County	9,582	2,952	531
	Total	10,010	4,027	549
2013	Brunswick County	385	2,644	13
	New Hanover County	8,560	3,717	360
	Total	8,945	6,361	373
2023	Brunswick County	558	1,828	40
	New Hanover County	10,818	3,504	450
	Total	11,376	5,332	490

2. Tolling Overview

2.1 Project Funding

2.1.1 Existing Funding

The proposed project was awarded a \$242 million Large Bridge Project Grant in July 2024.⁸ To date, NCDOT is providing a match of \$85 million. Combined, this funding totals \$327 million, approximately 30% of the current estimated project costs.

2.1.2 Role of Potential Tolling in Project

Based on 2025 NCDOT approved estimates, the total cost estimate for Alternative A is \$1,110,700,000, and \$1,029,800,000 for Alternative B. As such, both Alternatives A and B would require additional funding outside of the Large Bridge Investment Program Grant and NCDOT funds, and it is therefore assumed both alternatives would be tolled for the purposes of impact assessment.

⁸ FHWA. "Biden-Harris Administration Invests \$242 Million for Cape Fear Memorial Bridge Project in Wilmington, North Carolina." July 17, 2024. Web. <https://highways.dot.gov/newsroom/biden-harris-administration-invests-242-million-cape-fear-memorial-bridge-project>

2.2 Tolling Cost

2.2.1 Potential Tolling Rate

According to the Cape Fear Memorial Bridge Traffic and Revenue (T&R) Study prepared by CDM Smith in January 2024, tolls would be charged using cashless all-electronic toll collection methods including electronic toll collection (ETC), NC Quick Pass, and a license plate image program named Bill by Mail (BBM). Assumed toll rates would begin at \$2 for Class 1 (2-axle vehicles) via ETC in 2030 and \$6 for Class 2 and 3 (3 or more axle vehicles) via ETC in 2030 and increase annually based on the consumer price index. Details of the proposed tolling schedule can be found in **Table 5** below.

Table 5. Toll Charge Schedule by Year

Year	Class 1		Classes 2 & 3	
	ETC	BBM	ETC	BBM
2030	\$2.00	\$3.10	\$6.00	\$9.30
2035	\$2.20	\$3.40	\$6.70	\$10.30
2045	\$2.80	\$4.30	\$8.55	\$13.15

Additional traffic and revenue analyses and forecasts need to take place to support financing of the project. Furthermore, actual toll rates would be determined closer to when the project would open to traffic and will be set by the NC Turnpike Authority (NCTA) Board of Directors.

2.2.2 Cost Burden Across Income Groups

Based on the NCTA T&R Study and the methods described above to collect tolls, it is assumed based on current NC Quick Pass tolls, users without a credit card can visit a local license plate agency and pay the toll fee with cash. However, it should be noted that those who choose to pay via the bill-by-mail method are paying a 55% higher rate than those who choose to pay via the ETC method. Based on national financial data, lower-income individuals are more likely to be unbanked or underbanked and therefore may be less likely to have access to credit cards or electronic payment methods commonly used for toll payments.⁹

A tolled roadway facility can impose uneven burdens across income groups as toll costs represent a larger share of disposable income for lower-income travelers, effectively making the same trip more expensive for them relative to higher-income users. As previously noted, the DSA contains a higher percentage of poverty populations than Brunswick County, New Hanover County, and the state. In a scenario where individuals commute to and from work via the tolled Cape Fear Memorial Bridge paying via ETC, residents would pay \$4.00 per day, which adds up to an extra \$20 per week over five days. Over the course of 50 weeks, this totals an extra \$1,000 in transportation costs for a given employee, and higher if residents are paying via bill-by-mail. For planning purposes, a full-

⁹ Federal Deposit Insurance Corporation. National Survey of Unbanked and Underbanked Households Executive Summary. 2023. Web. [2023 FDIC National Survey of Unbanked and Underbanked Households](#)

time employee is assumed to work approximately 50 weeks per year, accounting for standard vacation and holiday leave. In addition, non-commuting work-related trips, such as construction, landscaping, maintenance, home healthcare aids or nurses, or other occupations where employees are expected to travel from job site to job site are anticipated to incur higher toll fees due to these types of work-related trips and will impact mostly lower-paid workers.

The average household size in both Brunswick and New Hanover counties is 2.19 persons.^{10,11} This annual toll expenditure would represent approximately 9 percent of total household income for those living at the poverty threshold for commuting trips only for those paying by ETC.¹² Households that do not have access to a credit card, are unable to maintain a prepaid toll account, or otherwise rely on the BBM payment methods (including paying cash at a License Plate Agency) would incur higher toll charges. Under the BBM structure, annual commuting-related toll costs would be approximately \$1,500 per driver, or 14 percent of total household income for those living at the poverty threshold. As a result, lower-income households may experience a disproportionately greater financial burden, not only from the toll itself but also from the higher BBM rates, which can function as an additional cost for travelers who face barriers to using ETC payment options. The additional transportation costs could place a notable financial strain on affected households, particularly lower-income households, and may increase reliance on alternative transportation options such as transit, walking, bicycling, or the use of non-tolled routes where available.

While higher-income drivers may absorb tolls as a convenience fee in exchange for travel time savings and reliability, lower-income individuals may be more likely to avoid the facility altogether, shift to longer or less reliable routes, or reduce trip-making, potentially affecting access to employment and essential services. Additionally, households with limited schedule flexibility, often correlated with lower wages, may be less able to take advantage of alternative travel options, further compounding inequities. Over time, this dynamic can create a stratified system where the benefits of faster, more reliable travel accrue more to higher-income users, while lower-income populations bear greater relative financial strain or diminished mobility.

Low-income travelers are often less likely to use electronic toll transponders and more likely to pay tolls through bill-by-mail programs due to a combination of financial, banking, and administrative barriers. Obtaining and maintaining a transponder frequently requires an upfront deposit, prepaid account balance, or access to a credit card or bank account, resources that may be less available to lower-income households. In contrast, bill-by-mail allows users to pay tolls after travel without setting up an account or maintaining a prepaid balance, making it a more accessible option for occasional users and those with limited financial flexibility. Additionally, some low-income individuals may be unaware of

¹⁰ US Census Bureau. Quick Facts, New Hanover County. Web. 2025.

<https://www.census.gov/quickfacts/fact/table/newhanovercountynorthcarolina/PST045225>

¹¹ US Census Bureau. Quick Facts, Brunswick County. Web. 2025.

<https://www.census.gov/quickfacts/fact/table/brunswickcountynorthcarolina/PST045225>

¹² US Census Bureau. Poverty Thresholds. Web. 2025. <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>

transponder discount programs or may be hesitant to enroll because of concerns about fees, account management, or privacy. As a result, despite typically higher per-trip toll rates associated with bill-by-mail, lower-income travelers may rely on this payment method more frequently than electronic transponder users.

Based upon the OntheMap data detailed in **Table 4** above, the majority of employed people do not work and live in the same county. As a result, it is likely that many commuters would be subject to paying tolls to commute to and from work. Additionally, according to the USDOT Bureau of Transportation Statistics average weekday household vehicle trips by census tract (per day) in the DSA is between five and six household trips.¹³ It should be assumed that at least two of these trips could be impacted by additional costs associated with tolling for commuters.

2.3 Potential Traffic Diversion

The presence of a tolled facility will likely result in diverted traffic for users unwilling to pay the toll. According to the Traffic and Revenue Study, approximately 90% of traffic diverting from the Cape Fear Memorial Bridge would divert to the Isabel Holmes Bridge, which would likely be accessed via 3rd Street in Wilmington. It is expected that average weekday traffic diverted to the Isabel Holmes Bridge increases by approximately 43% in 2030. It is anticipated that other routes, such as I-140, US 74 (Martin Luther King Jr. Parkway), US 421 and S 3rd Street will also be more heavily utilized as a result of diverting traffic. However, as traffic growth increases, less traffic would divert from the Cape Fear Memorial Bridge as travel time savings may make the tolled facility more appealing.

2.3.1 Diversion by Population Group

2.3.1.1 Low Mobility Populations

Implementing a toll could create additional transportation challenges for low-mobility populations, such as older adults, persons with disabilities, and households without access to a vehicle. As noted in Section 1.4.2, approximately 17.9% of households in the DSA do not have access to a vehicle, exceeding numbers Brunswick and New Hanover County. In addition, approximately 18.1% of the DSA population reports having a disability, slightly higher than Brunswick and New Hanover counties. These populations often have fewer transportation options and may be more reliant on transit, demand-response services, ridesharing, assistance from family members, or other transportation providers to access employment, healthcare, educational opportunities, and essential services. These populations may also depend more heavily on home delivery services for groceries, meals, prescriptions, and other necessities. Increased travel times and operating costs associated with a bridge toll could reduce the number of delivery drivers willing to serve certain areas or increase delivery fees, potentially affecting access to essential goods for residents with limited mobility or transportation options.

¹³ USDOT Bureau of Transportation Statistics: Average weekday household vehicle trips by U.S. Census Tract (per day). 2026. Web. <https://www.bts.gov/browse-statistical-products-and-data/surveys/average-weekday-household-vehicle-trips-us-census-tract>

In addition, the toll could increase traffic volume along local streets to divert around or avoid the tolled bridge. This potential increase in traffic volume along local streets could make conditions for biking and walking less safe for low-mobility populations. Higher traffic volumes on local roads could result in higher rates of vehicle-pedestrian or bicyclist conflicts, reduced comfort for pedestrians or bicyclists, and more difficult street crossings.

A potential increase in traffic volume could also impact transit operations. Those who rely on transit for day-to-day trips could experience longer travel times and reduced scheduling reliability, resulting in decreased transit attractiveness for the passenger and impacts to service planning for the transit provider.

While a tolled facility may improve traffic flow, reduce congestion, and provide more reliable travel times, the extent to which travelers benefit from these improvements will vary depending on their ability to absorb the additional transportation costs and actually use the toll bridge. As a result, some low-mobility individuals may choose to use longer, non-tolled routes, rely on less direct transportation options, or reduce the frequency of discretionary trips.

2.3.1.2 Household Transportation Impacts

The implementation of a toll on the Cape Fear Memorial Bridge may influence household travel behavior by increasing transportation costs or altering route choice decisions. Households that rely on the bridge for daily commuting, school trips, medical appointments, shopping, and other routine activities may seek alternate routes to avoid toll charges. While diversion can reduce out-of-pocket transportation expenses for tolls, it may result in longer travel distances, increased travel times, higher fuel consumption, and greater vehicle operating costs. Additional travel time and greater fuel costs associated with toll avoidance may be viewed as a more acceptable tradeoff than paying daily tolls.

2.3.2 Diversion by Geography

2.3.2.1 Impacts on Local Streets and Neighborhoods within Study Area

The potential toll scenarios for both alternatives showed an overall reduction in volumes within the vicinity of Cape Fear Memorial Bridge. With Alternative A, the introduction of tolling lowers Annual Average Daily Traffic (AADT) and volume-to-capacity (V/C) ratios across several segments, shifting conditions from near capacity to under capacity, including along S 3rd Street from Wooster Street to Market Street due to diversions as a result of drivers avoiding the tolled bridge. However, S 3rd Street from Market Street to Front Street is anticipated to increase in V/C, and shift from near capacity to at capacity with the introduction of a toll. Additionally, US 421 from the Cape Fear Memorial Bridge to the Isabel Holmes Bridge shows an increase in V/C under the tolled condition, exceeding capacity, likely due to traffic diversion as a result of the toll. S 5th Avenue is anticipated to remain under capacity with both the tolled and non-tolled scenarios, reflecting an increase in capacity from two to four lanes under future conditions.

Under Alternative B, tolling similarly reduces AADT and V/C ratios, including S 5th Avenue from Castle Street to Church Street and Castle Street east of S 3rd Street. As with

Alternative A, US 421 from the Cape Fear Memorial Bridge to the Isabel Holmes Bridge is anticipated to be over capacity in the tolled scenario.

The introduction of tolling under either alternative is expected to primarily reduce traffic volumes and associated roadway noise on and near the Cape Fear Memorial Bridge. However, toll-related traffic diversion is anticipated to increase volumes on select corridors, particularly US 421 between the Cape Fear Memorial Bridge and Isabel Holmes Bridge, which could result in localized increases in traffic noise. Overall, the toll scenarios are expected to redistribute traffic noise within the study area rather than create substantial increases in noise levels in comparison to existing conditions. Additional traffic information can be found in Appendix A, Table A.1, and the project's Environmental Assessment.

Alternative A proposes tying in the new bridge to the Wilmington Street network at S 3rd Street through signalized intersections at Wooster Street and Dawson Street. These signalized intersections would create controlled crossings for pedestrians, bicyclists, and motorists traveling along the east-west network crossing S 3rd Street.

Alternative B proposes tying in the new bridge at S 4th Street and Dawson Street, and S 5th Avenue and Wooster Street, bridging over S 3rd Street. Preliminary plans include the removal of signals on S 3rd Street, and as such, pedestrians, bicyclists, and motorists would rely primarily on natural gaps in traffic to cross the corridor, which could present challenges during peak travel periods. Although forecasted traffic volumes on most segments of S 3rd Street are lower than the no-build condition, and are anticipated to operate under capacity, the segment between Market Street and Campbell Street is projected to operate at capacity under the Alternative B Toll scenario. As a result, crossing opportunities along this segment may become more limited during peak periods despite the overall reduction in traffic volumes elsewhere on the corridor.

2.3.2.2 Impacts to New Hanover County vs. Brunswick County

As described in Section 1.5.2.1, OnTheMap data indicates that the majority of commuters traveling within the DSA do not both live and work within the same area, suggesting that many users of the Cape Fear Memorial Bridge travel between Brunswick County and New Hanover County for employment. The potential impacts of tolling and associated traffic diversion would likely differ between the two counties based on commuting patterns, destination locations, and household income.

For Brunswick County residents who commute to employment centers in New Hanover County or other purposes, a toll on the Cape Fear Memorial Bridge would introduce an additional daily transportation cost. Some commuters may choose to avoid the toll by diverting to alternate routes, which could result in longer travel distances, increased travel times, and higher vehicle operating costs. Others may reduce non-essential trips across the bridge, consolidate trips, or shift purchases and services closer to home to minimize toll expenditures. Over time, recurring toll costs could make commuting less attractive for some households, particularly households that are more sensitive to transportation cost increases.

For New Hanover County, traffic diversion as a result of the toll could increase volumes on local and collector roadways as travelers seek alternative routes. New Hanover County residents who regularly travel to employment, services, or destinations in Brunswick County may similarly face a choice between paying the toll to maintain a direct route or diverting to avoid toll costs. Additionally, because New Hanover County serves as the region's primary employment center and receives a substantial number of daily commuters from surrounding areas, tolling could influence broader travel or housing patterns. Recurring toll costs may increase the attractiveness of living closer to employment centers in New Hanover County for some workers, while reducing the attractiveness of longer cross-river commutes from Brunswick County. Additionally, this may incentivize Brunswick County workers to live in Brunswick County.

2.3.2.3 Impacts on Commuters

As noted above, the majority of commuters traveling within the DSA do not both live and work in the same area. As a result, a substantial number of commuters who rely on the Cape Fear Memorial Bridge for access to employment would be affected by potential tolling. For commuters who choose to use the tolled bridge, daily travel costs would increase, resulting in an estimated annual cost of approximately \$1,000 for a typical full-time commuter. For financially constrained households, these additional transportation expenses could represent a financial burden and may impact commuting decisions or employment accessibility.

Because New Hanover County serves as a major employment center and receives a substantial number of inbound commuters from Brunswick County and surrounding areas, toll costs could influence workforce travel patterns over time. Some workers may adjust travel behavior, consolidate trips, seek employment opportunities closer to home, or evaluate residential location choices based on the added cost of daily cross-river travel. As a result, tolling of the Cape Fear Memorial Bridge has the potential to affect commuter mobility, travel reliability, and access to employment opportunities throughout the region.

2.3.3 Access and Mobility Changes

2.3.3.1 Changes in Access to Employment, Healthcare, and Education

Downtown Wilmington serves as a major employment, healthcare, and educational center for the region. As such, residents in Brunswick County and other surrounding areas may rely on the Cape Fear Memorial Bridge to access jobs, medical services, college, and other essential destinations in Wilmington.

As noted above, tolls will create an additional transportation expense for workers who commute regularly between Brunswick County and employment centers in Wilmington. Over time, recurring travel costs could reduce the attractiveness of certain employment opportunities, and commuters seeking to avoid toll costs may also experience longer travel times and reduced commute reliability if they divert to alternative routes.

Novant Health New Hanover Regional Medical Center and associated medical facilities are located in Wilmington, approximately two miles east of the Cape Fear Memorial Bridge.

While healthcare facilities and physician offices are available in Brunswick County, major hospital services are more concentrated in New Hanover County. Individuals requiring frequent medical appointments, specialized care, or hospital-based services may incur additional transportation costs associated with traveling across the bridge. These costs may be particularly impactful for individuals with chronic medical conditions, older adults, and households requiring recurring healthcare visits.

Access to educational facilities for students, faculty, and staff who travel across the Cape Fear Memorial Bridge may be impacted by the potential toll. While K–12 schools are distributed throughout both counties, several major higher education institutions including Cape Fear Community College, Shaw University's Wilmington campus, and the University of North Carolina Wilmington are located in New Hanover County. Increased travel costs could affect access to educational programs, workforce training opportunities, childcare services, and other educational resources that require regular travel across the bridge.

Because employment centers, healthcare services, and higher education institutions are concentrated in New Hanover County, tolling the Cape Fear Memorial Bridge has the potential to affect regional accessibility by increasing the cost of travel between Brunswick and New Hanover counties. These effects would likely be most pronounced for households and workers who depend on frequent trips to access employment, healthcare, educational opportunities, and other essential services.

2.3.3.2 Truck Traffic/Goods Movement

Implementing a toll along the Cape Fear Memorial Bridge could influence traffic patterns and goods movement by changing route choices, travel costs, and system efficiency. For freight operators, tolls may encourage some users to divert to alternative, non-tolled routes to avoid costs, which can increase congestion on local roads and affect travel reliability. However, based on the current NCDOT North Carolina Truck Network, through truck traffic is only permitted on Wooster Street, Dawson Street, S 3rd Street south of Wooster Street, and the Cape Fear Memorial Bridge. S 3rd Street is truck restricted between Wooster Street and Market Street.¹⁴ According to the Potential Tolling Scenarios Traffic Analysis as depicted in **Table A.1**, local roadways remain under capacity under all tolling scenarios; the only roadway that is over capacity under both tolling scenarios for Alternatives A and B is US 421. For goods movement, added toll expenses can raise operating costs for trucking and logistics companies, potentially leading to higher prices for shipped goods or adjustments in routing and delivery schedules.

2.3.3.3 Potential Modal Shifts

Tolling the Cape Fear Memorial Bridge could influence potential modal shifts by affecting the relative cost and attractiveness of different travel options. As tolls increase the direct cost of driving, particularly for users commuting into downtown Wilmington, some users may choose to switch to alternative modes such as public transit, carpooling, biking, or walking, particularly if those options are convenient, reliable, and more affordable. This

¹⁴ NCDOT. North Carolina Truck Network Online Map. Web.
<https://ncdot.maps.arcgis.com/apps/mapviewer/index.html?webmap=a8f091b8fad4c5d8bb905bf44556a5d>

shift can be more pronounced for regular commuters and price-sensitive travelers. As described in Section 1.5.1.2, many commuters do not work and live within the same area and thus are likely to utilize the Cape Fear Memorial Bridge to commute to and from work. If the toll charge of approximately \$4.00 per day becomes cost prohibitive, commuters may utilize other modes of transportation to travel to and from work daily. However, if viable alternatives are limited or inadequate, the likelihood of modal shift may be minimal, and users may instead absorb the added costs or divert to other routes.

2.3.3.4 Impacts to Transit

The establishment of a toll on the bridge could impact on-demand transit and transit routes operating within downtown Wilmington by influencing both operating costs and service performance. Because on-demand transit providers operate flexibly and often cross key corridors, tolls can increase per-trip costs when vehicles use the bridge, potentially leading to higher fares, increased subsidy requirements, or modifications to service areas. If transit providers are not exempt from toll charges or do not receive funding to offset the additional costs, this could result in higher fares for users or modifications to service coverage, thereby reducing access to healthcare, employment, and essential services for transit-dependent households.

Several Wave Transit routes operation in downtown Wilmington within the study area.¹⁵ The 101 Princess Place route operates along Front Street, the 108 Market Street route operates along N 3rd Street and Market Street, the 206 Oleander route operates along S 3rd Street and the 210 Greenfield-17th Street. While none of these routes utilize the Cape Fear Memorial Bridge, it is possible that traffic diverted onto local streets as a result of the toll on the bridge could potentially affect bus travel times and safety for users crossing the street to get to and from bus stops.

According to the Potential Tolling Scenarios Traffic Analysis as depicted in **Table A.1**, roadway segments which these fixed transit routes operate are projected to operate at or under capacity with the implementation of tolling under both Alternatives A and B. As a result, while minor changes in traffic patterns may occur, substantial impacts to fixed route transit operations, travel times, or service reliability are not anticipated.

3. Recommendations

In understanding that tolling the Cape Fear Memorial Bridge will impact the greater New Hanover and Brunswick County communities, the following recommendations are intended to support informed decision-making and the successful implementation of the proposed tolling. These recommendations include stakeholder coordination and input, documentation of community concerns, and potential avoidance and minimization measures. Particular emphasis is placed on continuing meaningful stakeholder engagement, maintaining transparent communication with affected communities, and incorporating feedback into project development and implementation. The recommendations also identify opportunities to avoid, minimize, or mitigate potential

¹⁵ Wave Transit: Routes and Schedules. 2026. Web. <https://www.wavetransit.com/fixed-route-bus-schedule/>

adverse impacts related to mobility, access, and community quality of life. By balancing transportation objectives with stakeholder priorities and community needs, these recommendations provide a framework for advancing the project in a manner that is both effective and responsive to public concerns.

3.1 Stakeholder Identification

Coordination with stakeholders is a crucial component in understanding how a change, such as implementing a toll, will impact the communities surrounding and using the Cape Fear Memorial Bridge. Best practices for stakeholder identification when considering the implementation of a tolled bridge involve taking a comprehensive and inclusive approach to ensure all affected groups are recognized early in the planning process. This includes not only stakeholders, such as daily commuters, local residents, freight operators, and businesses, but also less visible or traditionally underrepresented groups, including low-income households, people with disabilities. Engaging community organizations, advocacy groups, and local institutions can help uncover perspectives that might otherwise be overlooked. Additionally, coordination with regional and local governments, transit providers, and emergency services is critical to understanding system-wide implications. Key stakeholders could include, but are not limited to:

- New Hanover County officials
- Brunswick County officials
- The City of Wilmington officials
- Local emergency services
- Local business owners
- Greater Wilmington Chamber of Commerce
- Brunswick Chamber of Commerce
- Wilmington Urban Area Metropolitan Planning Organization (WMPO)
- Wilmington Historic Preservation Commission
- North Carolina Ports Authority
- Novant Health
- Wave Transit
- Brunswick Business & Industry Development (BBID)
- University of North Carolina at Wilmington
- Cape Fear Community College (CFCC)
- Shaw University College of Adult and Professional Education (CAPE) Program
- Battleship North Carolina
- Local Homeowner's Associations

After NCDOT identifies all relevant stakeholders, it is recommended to engage them throughout project development to understand concerns, identify potential impacts, gather local knowledge, and develop measures to avoid, minimize, or mitigate adverse effects.

3.2 Engagement Strategies

Should the tolling option move forward for the Cape Fear Memorial Bridge, additional public engagement and education is recommended, as prior public involvement focused solely on project improvements.

Effective public engagement strategies for considering a toll on a bridge should be proactive, inclusive, transparent, and continuous throughout the planning process. NCDOT and NCTA should use a mix of engagement methods including, but not limited to, public meetings, workshops, online surveys, pop-up events, and social media, in order to reach diverse audiences, with targeted outreach to underrepresented and potentially impacted communities. Clear, accessible communication is essential, including explaining the purpose of tolling, how revenues will be used, and potential impacts on users.

3.3 Documentation of Community Concerns

Community concerns related to tolling should be systematically documented through a combination of public engagement activities, including surveys, public meetings, focus groups, and written or digital comment submissions.

To support transparent decision-making, NCDOT should systematically document all outreach activities and stakeholder feedback. Documentation may include meeting summaries, attendance records, survey results, comment databases, stakeholder contact logs, and formal response-to-comments matrices.

Public and stakeholder input should be evaluated to identify recurring themes, concerns, and priorities related to issues such as toll affordability, traffic diversion, mobility, access, economic impacts, and neighborhood effects. This information should then be used to inform project planning, and develop appropriate avoidance, minimization, and mitigation measures. By maintaining ongoing communication and demonstrating how stakeholder feedback influences project decisions, NCDOT can improve public understanding, build trust, and develop a tolling program that is responsive to community needs while achieving transportation goals.

3.4 Potential Avoidance and Minimization Measures

Potential avoidance and minimization measures for tolling focus on reducing negative financial, social, and mobility impacts, particularly for vulnerable populations. Potential options could include:

- *Toll exemptions or discounts:* Providing reduced or waived tolls for low-income users, people with disabilities, transit vehicles, or emergency services can lessen financial burdens. At present, the NC Turnpike Authority offers free NC Quick Pass accounts for first responder vehicles and governmental transit vehicles.¹⁶ For example, the I-485 project provides toll-free travel for vanpool transit ride-share

¹⁶ NC Quick Pass “Specialty Account Options.” Web. 2026. <https://www.ncquickpass.com/specialty-account-options/>

services, transit vehicles with a NC Quick Pass Transit account, and first responders with a first responder account.¹⁷

- *Income-based pricing programs:* Implementing income-based toll structures that adjust rates based on users' ability to pay.
- *Improved multimodal access:* Expanding pedestrian, bicycle, and carpool options (e.g., HOV lanes) to reduce dependence on tolled single-occupancy vehicle travel.
- *Caps or credits:* Offering toll caps (daily/monthly maximums) or travel credits to limit cumulative costs for frequent users.
- *Traffic diversion management:* Monitoring and mitigating spillover traffic on local roads through traffic calming, enforcement, or targeted improvements.
- *Phased implementation:* Slowly increasing tolling rates to allow communities time to adjust and provide feedback.
- *Public outreach and assistance programs:* Ensuring clear communication about tolling, along with assistance for account setup, payment options, and dispute resolution.

At present, the NC Turnpike Authority does not offer any discount programs for low-income users; all users are subject to the same toll rates and account policies. NCTA is examining the possibility of a tolling discount program. However, as of January 1, 2025, NC Quick Pass account holders save 50% on North Carolina tolls.¹⁸ It is recommended that the NC Turnpike Authority investigate the feasibility of some discount programs for users that are unable to pay tolls without undue hardship. Any potential avoidance and minimization measures would need to be jointly determined between NCDOT and NCTA.

¹⁷ NC Quick Pass I-485. Web. 2026. [I-485 Express Lanes - NC Quick Pass](#)

¹⁸ NC Quick Pass Customers to Save 50% on Tolls Beginning January 1, 2025. Web. <https://www.ncdot.gov/news/press-releases/Pages/2024/2024-12-06-ncqp-save-50.aspx>

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Appendix A. Tolling Traffic Analysis

Table A.1 Potential Tolling Scenarios Traffic Analysis

Existing/Projected Conditions						Alternative A (No Toll)				Alternative A (Toll)					Alternative B (No Toll)					Alternative B (Toll)				
Street Name	From	To	# of Through Lanes	2050 V/C Daily	Under, Near, or Over Capacity	Through Lanes	Generalized Service Capacity*	2050 V/C Daily	Under, Near, or Over Capacity	Through Lanes	Generalized Service Capacity*	Adjusted 2050 AADT**	2050 V/C Daily	Under, Near, or Over Capacity	Through Lanes	Generalized Service Capacity*	Adjusted 2050 AADT****	2050 V/C Daily	Under, Near, or Over Capacity	Through Lanes	Generalized Service Capacity*	Adjusted 2050 AADT**	2050 V/C Daily	Under, Near, or Over Capacity
S 3rd Street	Wooster Street	Castle Street	4	0.77	Near	4	36100	0.77	Near	4	36100	20686	0.57	Under	4	36100	16176	0.45	Under	4	36100	16176	0.45	Under
	Castle Street	Church Street	4	0.71	Near	4	36100	0.71	Near	4	36100	18553	0.51	Under	4	36100	17544	0.49	Under	4	36100	17544	0.49	Under
	Church Street	Market Street	4	0.72	Near	4	36100	0.72	Near	4	36100	19042	0.53	Under	4	36100	18396	0.51	Under	4	36100	18396	0.51	Under
	Market Street	Campbell Street	4	0.82	Near	4	30100	0.82	Near	4	30100	29222	0.97	At	4	30100	24567	0.82	Near	4	30100	27087	0.90	At
	Campbell Street	Front Street	4	0.80	Near	4	30100	0.80	Near	4	30100	28603	0.95	At	4	30100	23948	0.80	Near	4	30100	26468	0.88	Near
	North of Front Street		4	0.44	Under	4	70300	0.44	Under	4	70300	35266	0.50	Under	4	70300	30611	0.44	Under	4	70300	35651	0.51	Under
S 5th Avenue	Wooster Street	Castle Street	2	0.52	Under	4**	36100	0.25	Under	4**	36100	8042	0.22	Under	4**	36100	22218	0.62	Under	4**	36100	17178	0.48	Under
	Castle Street	Church Street	2	0.63	Under	4**	36100	0.31	Under	4**	36100	10033	0.28	Under	4**	36100	27046	0.75	Near	4**	36100	22006	0.61	Under
Castle Street	East of S 3rd Street		2	0.39	Under	2	17600	0.39	Under	2	17600	6870	0.39	Under	2	17600	13398	0.76	Near	2	17600	10878	0.62	Under
Market Street	S 3rd Street	S 5th Avenue	4	0.38	Under	4	38300	0.38	Under	4	38300	14416	0.38	Under	4	38300	16005	0.42	Under	4	38300	15501	0.40	Under
Front Street	Church Street	Nun Street	2	0.12	Under	2	17600	0.12	Under	2	17600	2113	0.12	Under	2	17600	4918	0.28	Under	2	17600	4918	0.28	Under
	Walnut Street	Hanover Street	2	0.26	Under	2	16000	0.26	Under	2	16000	8804	0.55	Under	2	16000	9656	0.60	Under	2	16000	12176	0.76	Near
US 421	CFMB	IHB	4	0.82	Near	4	70300	0.82	Near	4	70300	72170	1.03	Over	4	70300	57309	0.82	Near	4	70300	73551	1.05	Over
US 74 (IHB)	US 421	S 3rd Street	4	0.60	Under	4	70300	0.60	Under	4	70300	56704	0.81	Near	4	70300	41843	0.60	Under	4	70300	58085	0.83	Near

*Based on FDOT Generalized Service Volumes Capacity

**Based on current plans

*** Assumes 30% of vehicles will utilize the Isabel Holmes Bridge (IHB) to travel to the north of the Cape Fear Memorial Bridge. The T&R report assumed approximately 16.5% would be diverted from CFMB in total; however, this includes all destinations, whereas destinations to the north are anticipated to be more likely to utilize IHB

****Assumes 50% of vehicles diverted to/from S 5th Avenue in Alt B will use Castle Street to travel to/from S 3rd Street, 20% from Market Street, 30% from the surrounding grid like network, and 50% to the surrounding grid like network