

Mid-Currituck Bridge (STIP R-2576) DRAFT Cumulative Impact Report for Water Quality

Prepared for:

*North Carolina Department of Transportation
North Carolina Turnpike Authority*

Interagency Meeting
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Presented by:

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Purpose of the Draft Report

- Comprehensive analysis of potential water quality effects of the cumulative impact of planned and expected development in next 20 years in three Probable Development Areas (PDAs) associated with the Mid-Currituck Bridge (MCB).
- Scope developed with input from regulatory agencies.
- Supports Section 404/401 and CAMA Major Permit applications - Spring 2021.

Purpose of the Draft Report Continued



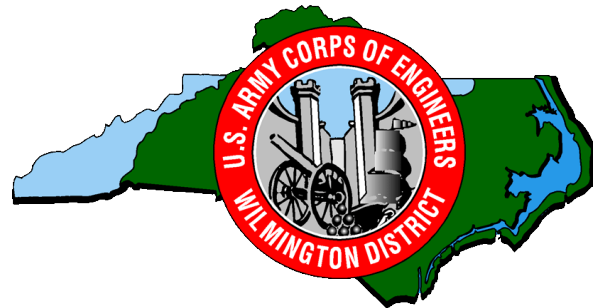
- Regional planning study.
- Build on previous FEIS analysis with water quality focus.
- Compare Build versus No-Build alternatives and existing condition.

Regulatory Background

- Meets 2004 NCDWQ (currently NCDWR) guidance for cumulative impact studies for the 401 Water Quality Certification.
 - “...does not result in cumulative impacts, based upon past or reasonably anticipated future impacts, that cause or will cause a violation of downstream water quality standards.” (15A NCAC 2H .0506(b)(4) and (c)(4))
- Based on review of scientific literature, interviews with local officials, GIS analysis, and site visits.
- Time frame for study: 20 years (until 2040).
 - Explicitly suggested as time frame in 2004 NCDWQ Guidance.
 - Design year for traffic forecast to 2040 (now also 20 years).

Agency Coordination

- Critical input sought:
 - NCDWR staff from the Central and Washington Regional Office;
 - U.S. Army Corps of Engineers from the Washington Field Office;
 - Currituck County staff (i.e., County Manager, County Planner, and County Engineer); and
 - Coordination and data retrieval from the Albemarle Regional Health Services.



General Agency Responsibilities



- Currituck County:
 - Planning and zoning:
 - Small Area Plans.
 - Potable water.
 - One public, non-discharge wastewater facility.
- Albemarle Regional Health Services:
 - On-site wastewater (septic tanks and drain fields).
- NCDWR:
 - Compliance with water quality standards.
 - Non-discharge wastewater facilities.
 - Approval of associated groundwater lowering measures.

Document Preparation

- Authors of the Report:
 - Moffatt & Nichol
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 - WSP, USA
- Review Team:
 - NC Department of Transportation
 - NC Turnpike Authority
 - HNTB
 - Lochner

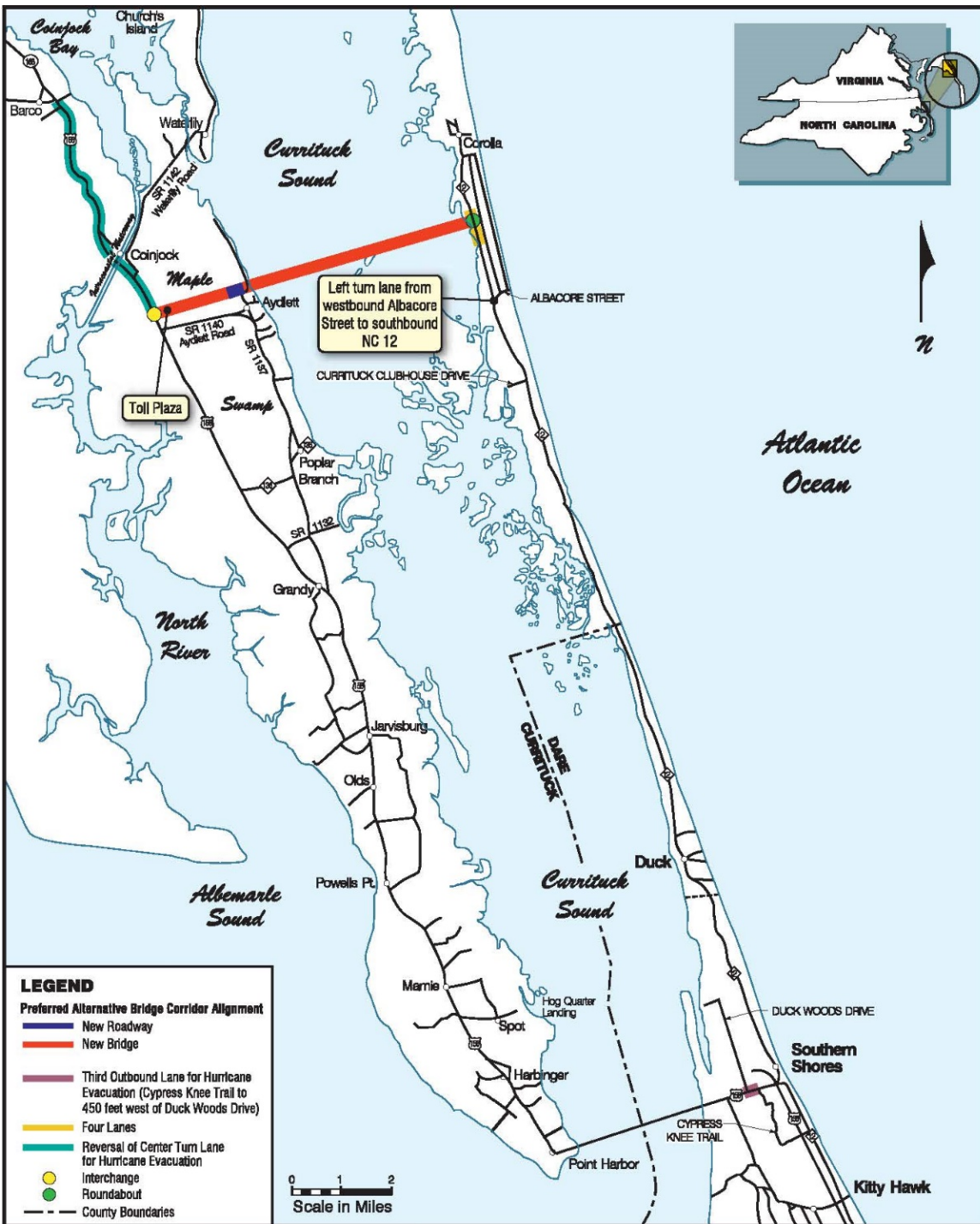


Components of the Report: Overview

- Executive Summary
- Project Background (Chapters 1-5)
- Literature Review (Chapter 6)
- GIS Analysis (Chapter 7)
- Non-Discharge (Reuse/Reclaimed Wastewater) Systems (Chapter 8)
- Septic Tanks/Drain Fields (Chapter 9)
- Groundwater Lowering Measures (Chapter 10)
- Sea Level Rise (Chapter 11)
- Flooding (Chapter 12)
- Stormwater Management (Chapter 13)
- Spills/Emergencies (Chapter 14)
- Planning (Chapter 15)
- Potable Water (Chapter 16)
- Summary (Chapter 17)
- Regulatory and Non-Regulatory Solutions (Chapter 18)
- Conclusions and Recommendations (Chapter 19)
- Appendices

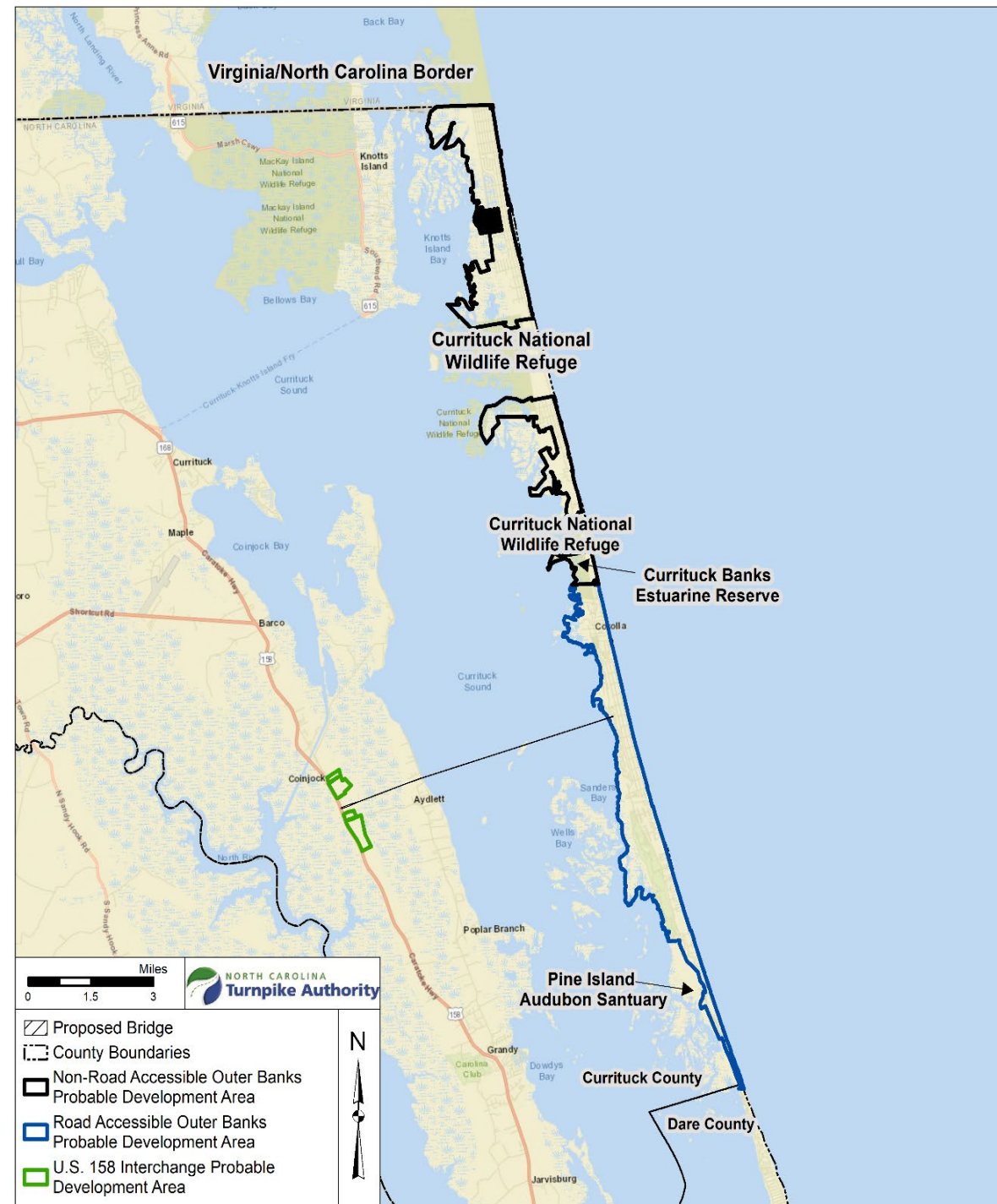
The Project: Mid-Currituck Bridge

- Proposed bridge from mainland near Aydlett to Outer Banks, Currituck County.
- Planning underway since 1975. NC Turnpike Authority current primary sponsor.
- Revaluation of the FEIS and ROD, March 6, 2019.
- **Purpose and Need:**
 1. Substantially improve traffic flow on NC 12 & U.S. 158;
 2. Substantially reduce travel times to the Currituck County Outer Banks; and
 3. Substantially improve hurricane clearance times.



Study Area Probable Development Areas (PDA)

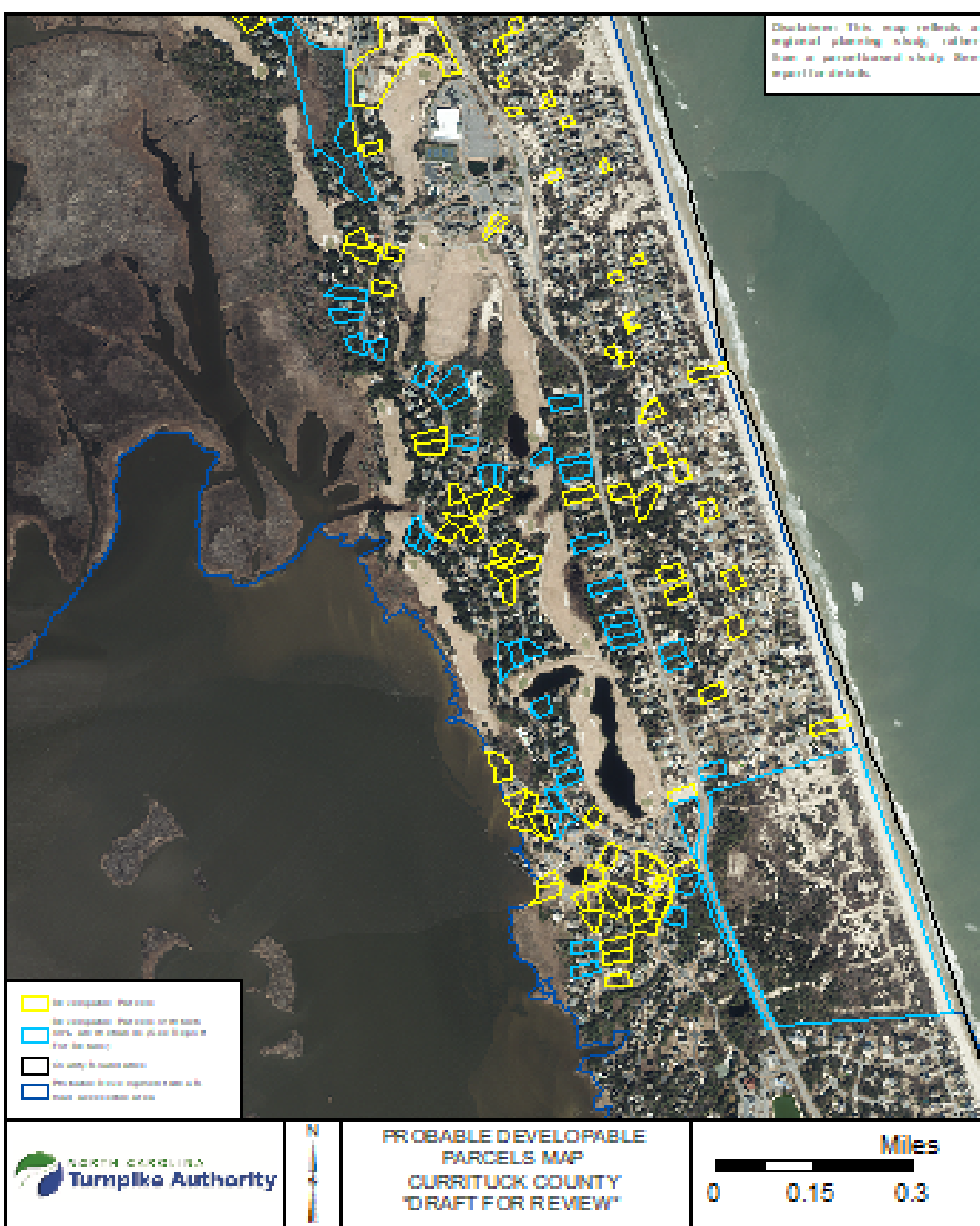
1. U.S. 158 Interchange PDA;
2. Road Accessible Outer Banks PDA (south of the paved NC 12 to the Dare/Currituck County line); and
3. Non-Road Accessible Outer Banks PDA (north of the paved NC 12 to the NC/VA state line).



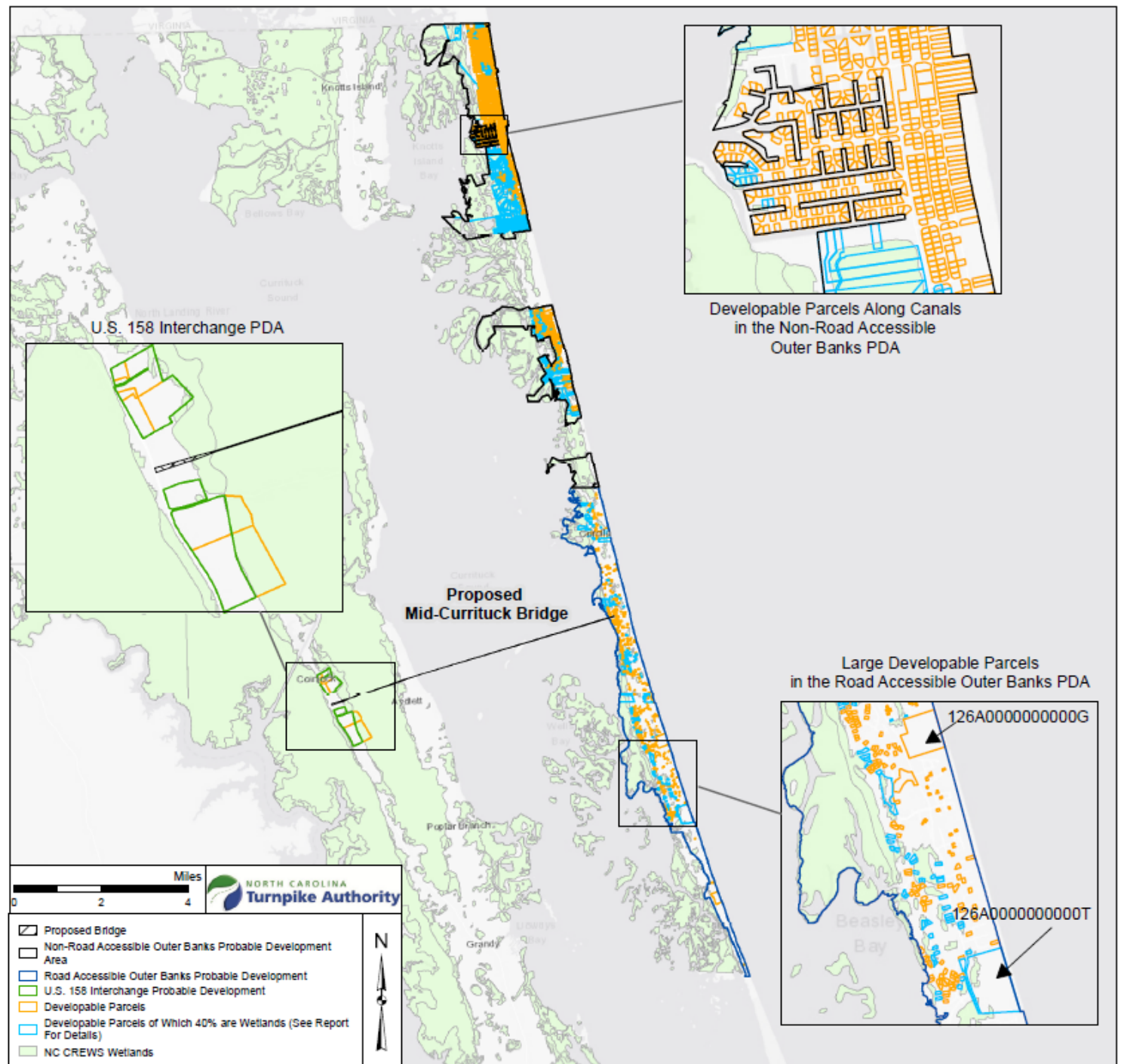
GIS Analysis Process

Factors Examined for Probable Development:

1. Existing development on the property;
2. Size of parcel;
3. Areas managed for conservation;
4. Open space designations;
5. Estuarine wetland presence;
6. Shoreline setback regulations;
7. Freshwater wetland coverage; and
8. Soil suitability for septic tanks.



Major Water Quality Related Findings of the GIS Section



Findings: Non-Discharge (Reuse/Reclaimed) Wastewater Facilities

- Five permitted facilities in Road Accessible Outer Banks PDA.
- Water quality data for treated effluent and groundwater monitoring wells revealed:
 - Movement of nitrate/nitrogen toward Currituck Sound; and
 - Some coliform bacteria detected in monitoring wells.
- Two facilities with advanced nutrient removal design and three without.



Regulatory and Non-Regulatory Solutions: Non-Discharge Wastewater



Monterey Shores Facility Pond

- Non-discharge (reuse/reclaimed water) systems:
- NCDWR to address.
 - Sources of coliform bacteria in monitoring wells.
 - Suggest plants without advanced nutrient removal add advanced technology at permit renewal.
 - Especially important for the Ocean Sands facility once the settlement agreement on the two large parcels is implemented.

Findings: On-Site Treatment (Septic Tank/Drain Fields) of Wastewater

- Albemarle Regional Health Services: robust regulatory program.
- Developable lots in Road Accessible Outer Banks PDA:
 - Mostly within service areas of existing non-discharge facilities.
- Non-Road Accessible Outer Banks PDA:
 - Utilizes on-site treatment.
- Parcels greater than 100 feet from open water:
 - Parcels with suitable soils can utilize standard treatment methods.



Example of a Drain Field



Example of Pre-Treatment Pods for Septic Tanks

Regulatory and Non-Regulatory Solutions: On-Site Wastewater



U.S. 158 Interchange PDA
Existing Conditions

- Albemarle Regional Health Services probably need to address but maybe County Planning instead.
- U.S. 158 Interchange PDA:
 - Existing regulations adequate.
- Interior infill parcels near Ordinary High-Water Mark or other CAMA wetlands and open waters directly connected to Sound except finger canals:
 - Require 24-inch separation between trench and seasonal high-water table and 100' setback to open water OR
 - Require pretreatment for all undeveloped parcels within 100 feet of open water, including finger canals and Currituck Sound.
- Interior fill parcels within 100 feet of finger canals:
 - Upgrade regulations to require pretreatment.

Regulatory and Non-Regulatory Solutions: Groundwater Lowering



Hampton Pond Overview

- Groundwater lowering measures
 - NCDWR to address.
 - Require more comprehensive water quality sampling.
 - For expanded or new groundwater lowering, involve local universities to determine any effect on water quality in Currituck Sound.
 - Examine whether recent U.S. Supreme Court case supports development of a state regulatory process for groundwater lowering.

Regulatory and Non-Regulatory Solutions: Flooding, Sea Level Rise

- Currituck County and NCDWR to address.
- Flooding:
 - Improve tracking and management of flooding and spills/emergencies.
 - Require flood protection for Village at Ocean Hill wastewater facility at permit renewal (NCDWR to address).
 - Pine Island wastewater facility may need future protection from storm surge and sea level rise.
- Sea level rise:
 - Currituck County: adaptive management measures for septic tank permits.
 - NCDWR: adopt adaptive management measures for non-discharge permits.



Flooding in the Non-Road Accessible Outer Banks PDA

Regulatory and Non-Regulatory Solutions: Stormwater Management

- Currituck County to address.
 - U.S. 158 Interchange PDA:
 - Require on-site stormwater management for planned and expected commercial development.
 - Outer Banks PDAs:
 - Interior infill parcels – existing rules should be sufficient to protect downstream water quality.
 - Amend County stormwater and planning ordinances to require on-site stormwater management for all undeveloped parcels within 100 feet of open water (finger canals, tributaries, and Currituck Sound).



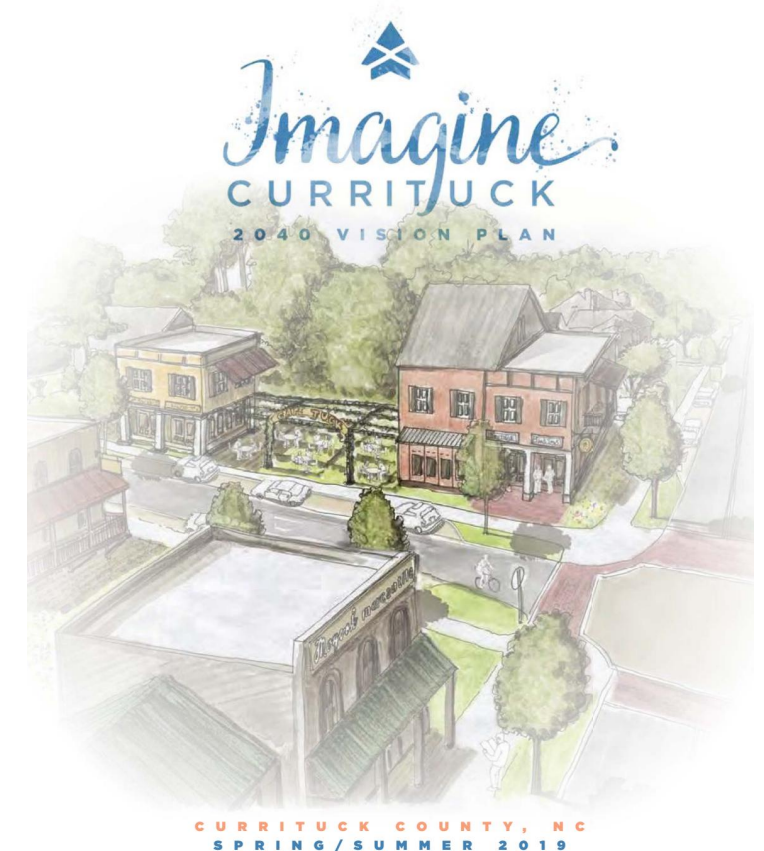
Road
Accessible
Outer Banks
PDA



Non-Road
Accessible
Outer Banks
PDA

Regulatory and Non-Regulatory Solutions: Spills, Potable Water, Planning

- Currituck County to address.
- Spills/Emergencies:
 - Existing County requirements should suffice.
 - Additional protection for some wastewater facilities.
- Potable water:
 - Taste and odor complaints have been reported by citizens in the Non-Road Accessible Outer Banks PDA although the water is safe to drink.
- Planning:
 - Implement Imagine Currituck Land Use Plan.
 - Implement Small Area Plans for specific locations.
 - Consider Small Area Plan for finger canal areas.
 - Encourage planning and ultimate design for the two large parcels subject to the settlement agreement.



Conclusions

- Study identified potential sources of pollution which could affect water quality in some cases including:
 1. Non-discharge wastewater plants;
 2. Septic tanks and drain fields; and
 3. Stormwater runoff.
- Not all planned and expected development would be sources of these pollutants. Parcels nearest open water pose highest risk.

Conclusions Continued

- Practical regulatory and non-regulatory approaches to address these sources of pollution are included in the document.
- Study found that Mid-Currituck Bridge will not result in adverse impacts to water quality when suggested solutions are implemented.
- These approaches will be discussed with the NCDWR and Currituck County and will undergo their review at that time.

Next Steps

- Receive agency comments on Draft Cumulative Impact Report for Water Quality at the December 16, 2020 Interagency Meeting.
- Final comments by January 15, 2021.
- Finalize Cumulative Impact Report for Water Quality by March 2021.
- Complete permit applications in the Spring of 2021.

Questions?

