Hurricane Matthew Resilient Redevelopment Plan

New Hanover County

May 2017

Version 1.2

Contents

Change Log

Version	Date	Summary of Changes
1.1	6/19/17	Minor Revisions
1.2	8/25/17	Labor and unemployment data updated

Executive Summary

In October 2016, Hurricane Matthew caused widespread destruction in the Caribbean and up the Eastern Seaboard of the United States. In North Carolina, at least 26 people lost their lives, and 100,000 homes, businesses, and government buildings sustained damage estimated at $4.8 billion.[1] At the storm's peak, 3,744 individuals fled to 109 shelters across the region. More than 800,000 households lost power and 635 roads were closed, including the major east-west and north-south corridors.

In December 2016, the North Carolina General Assembly established the North Carolina Resilient Redevelopment Planning (NCRRP) program as part of the 2016 Disaster Recovery Act (*Session Law 2016-124*). The purpose of the program is to provide a roadmap for community rebuilding and revitalization assistance for the communities that were damaged by the hurricane. The program empowers communities to prepare locally driven recovery plans to identify redevelopment strategies, innovative reconstruction projects, and other needed actions to allow each community not only to survive but also to thrive in an era when natural hazards are increasing in severity and frequency.

The NCRRP consists of planning and implementation phases and is managed through North Carolina Emergency Management.

Figure 1. NCRRP Counties

This document is a snapshot of the current needs of the County regarding holistic recovery and redevelopment. The plan will evolve as the county analyzes the risk to its assets, identifies needs and opportunities, determines the potential costs and benefits of projects, and prioritizes projects. As projects are more fully defined, the potential impact on neighboring communities and the region may lead to modifications.

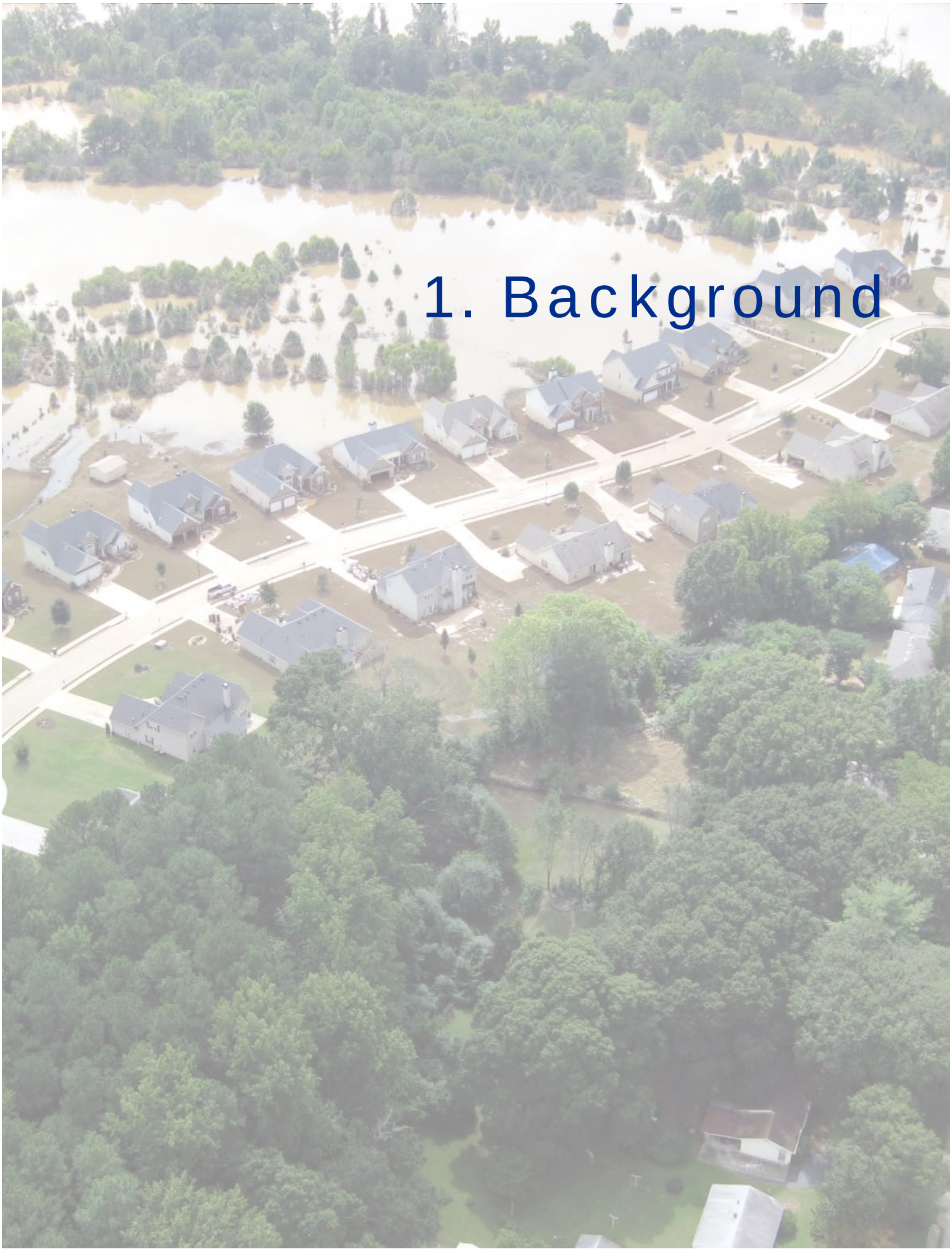
Implementation of the proposed projects and actions described in this plan is subject to applicable federal, state, and local laws and regulations. Proposed projects or actions may be eligible for state or federal funding, or could be accomplished with municipal, nonprofit, or private investments. However, inclusion of a project or action in this plan does not guarantee that it will be eligible for recovery funding.

[1] *State of North Carolina Supplemental Request for Federal Assistance Hurricane Matthew Recovery,* https://governor-new.s3.amazonaws.com/s3fs-public/documents/files/Hurricane%20Matthew%20Relief--2017%20Federal%20Request%20%28002%29.pdf.

After multiple public meetings, New Hanover County has identified 16 projects in four pillars: Housing, Infrastructure, Economic Development, and Environmental. Details of these projects can be found in Section IV of this plan.

Pillar	Project/Action Count
Housing	1
Economic Development	1
Infrastructure	10
Environment	4
Grand Total	**16**

Table 1. New Hanover County Summary of Projects by Pillar



1. Background

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Summary of Hurricane Matthew Storm Damage

Hurricane Matthew was an extraordinarily severe and sustained event that brought record-level flooding to many areas in eastern North Carolina's coastal plain, sound, and coastal communities. Hurricane Matthew hit North Carolina on October 8, 2016, as a Category 1 storm. Communities were devastated by this slow-moving storm primarily by widespread rainfall. During a 36-hour period, up to 18 inches of heavy rainfall inundated areas in central and eastern North Carolina.

Riverine flooding began several days after Hurricane Matthew passed and lasted for more than 2 weeks. New rainfall records were set in 17 counties in the Tar, Cape Fear, Cashie, Lumber, and Neuse River watersheds. Entire towns were flooded as water levels throughout eastern North Carolina crested well beyond previously seen stages.

During the peak of the hurricane, 800,000 households lost power and 635 roads were closed, including a section of I-40 West in Johnston County that was closed for 7 days, and sections of I-95 North and South in Robeson and Cumberland Counties that were closed for 10 days.

Approximately 88,000 homes were damaged and 4,424 were completely destroyed. Losses totaled more than $967 million, representing an economic loss as high as 68% of the damages, or $659 million, not expected to be covered by insurance or FEMA assistance.

North Carolina Governor McCrory requested FEMA assistance on October 9, 2016, and FEMA subsequently declared a major disaster (DR-4285) for North Carolina on October 10, 2016, for 48 counties encompassing approximately 325 cities, towns, townships, and villages.

Preliminary estimates indicate more than 30,000 businesses suffered physical or economic damage, and 400,000 employees were affected as a result. Hurricane Matthew also had a significant impact on the agriculture and agribusiness economy in eastern North Carolina. The nearly 33,000 agricultural workers and 5,000 agricultural-support workers hit by the storm account for more than half of the state's agriculture and agriculture-support workforce.

Initial economic analysis of the impacts of crop and livestock losses caused by Hurricane Matthew estimated the loss of more than 1,200 jobs and roughly $10 million in state and local income and sales tax revenue. 2.[2]

State / Legislative Response

North Carolina's response to Hurricane Matthew included 2,300 swift-water rescues using 79 boats and more than 90 air rescues. North Carolina also deployed over 1,000 National Guard and State Highway Patrol to assist with rescue and sheltering missions. There were 3,744 individuals transported to 109 shelters across central and eastern North Carolina during the storm's peak.

FEMA's disaster declaration made 50 counties eligible for FEMA assistance, 45 of which are eligible for Individual Assistance and Public Assistance and 5 of which are eligible for Public Assistance only.

[2] *Governors McCrory's Request for Federal Assistance for Hurricane Matthew Recovery, November 14, 2016*

- There were 81,832 individuals registered for FEMA/state assistance.
- Federal/state financial assistance in the amount of $92.5 million was approved to help flood survivors recover.
- Small Business Administration (SBA) loans approved for individuals after Hurricane Matthew totaled $65.6 million.
- SBA loans approved for businesses after Hurricane Matthew totaled $23.2 million.

After the immediate response period, North Carolina Governor McCrory and the North Carolina General Assembly took the steps summarized below to obtain and allocate long-term funding for Hurricane Matthew.

November 1: The Hurricane Matthew Recovery Committee is established. Preliminary damage assessments are completed, and the State Emergency Response Task Force continues to administer programs and identify needs unmet by existing federal programs.

November 14: Governor McCrory formally submits North Carolina's request for supplemental federal disaster assistance to the delegation as Congress returns to work.

Late November/Early December: Congress appropriates supplemental disaster assistance for North Carolina. After the supplemental federal disaster recovery assistance package is received, Governor McCrory submits a supplemental state disaster assistance package (House Bill 2) recommendations to the General Assembly and calls a special session. Governor McCrory then signs the Hurricane Matthew Recovery Act to fund disaster recovery efforts.

This supplemental federal assistance was to focus on housing, infrastructure, economic development, and the environment. These four pillars were to be funded through the following programs and agencies: The U.S. Department of Housing and Urban Development's Community Development Block Grant–Disaster Recovery (CDBG-DR) program, Army Corps of Engineers Operations and Maintenance, the FEMA National Dam Safety Program, the Federal Highway Administration's Emergency Highway Funding, and the U.S. Department of Agriculture's Emergency Conservation and Watershed Protection programs.

Resilient Redevelopment Planning

The purpose of the NCRRP program is to provide a roadmap for communities in eastern North Carolina to rebuild and revitalize after being damaged by Hurricane Matthew. The program empowers communities to prepare locally driven, resilient redevelopment plans to identify redevelopment strategies, innovative reconstruction projects, and other actions to allow each community not only to survive, but also to thrive in an era when natural hazards are increasing in severity and frequency.

The NCRRP process employs a holistic approach to planning that includes four pillars: housing, infrastructure, economic development, and the environment. Redevelopment strategies and reconstruction projects for each of the four pillars is included in each plan.

The NCRRP process consists of planning and implementation phases and is managed through North Carolina Emergency Management (NCEM).

Scope of the Plan

This document is a snapshot of the County's current needs for achieving holistic recovery and redevelopment. The plan will evolve as the County analyzes the risk to its assets, identifies needs and opportunities, determines the potential costs and benefits of projects, and prioritizes the projects. As projects are more fully defined, the potential impact on neighboring communities and the region may lead to modifications.

Planning objectives are to (1) develop strategic, resilient redevelopment plans and actions, and (2) to define any unmet funding needed to implement such actions after taking into account other funding sources.

The resulting resilient redevelopment plans will be the foundation for any supplemental funding received through Congress, the North Carolina General Assembly, and other funding sources. These plans will also be the basis for the state's Recovery Action Plan, which is required by the U.S. Department of Housing and Urban Development before the state can expend funds received from the CDBG-DR program.

Local Participation and Public Engagement

Stakeholder engagement and public involvement was an essential component of the NCRRP initiative. Three robust rounds of discovery, analysis, collaboration, and interaction were held with each affected county. Each meeting had two components: an in-depth working session with county officials, subject matter experts, and planners from the affective counties and municipalities; and a public open house. The purpose of each meeting was as follows:

Meeting 1 – Initiated the planning process and validated the existing data pertaining to damage and impacts.

Meeting 2 – NCEM presented draft documentation of resilient redevelopment strategies and received feedback from community leaders and the public.

Meeting 3 – NCEM presented refined resilient redevelopment strategies based on feedback from Meeting 2 and received additional feedback for finalization of the plan.

Each of the 50 counties that were declared a major disaster by the President of the United States as a result of Hurricane Matthew under the Stafford Act (P.L. 93-288) participated in the resilience redevelopment planning process. Each municipality in those counties, as well as the five economic development regions that sustained damage from Hurricane Matthew, were also invited to participate.

The counties impacted by the storm cover the eastern half of North Carolina and occupy parts of the piedmont, sand hills, and coastal areas of the state. A map depicting the counties that participated in the process is shown below.

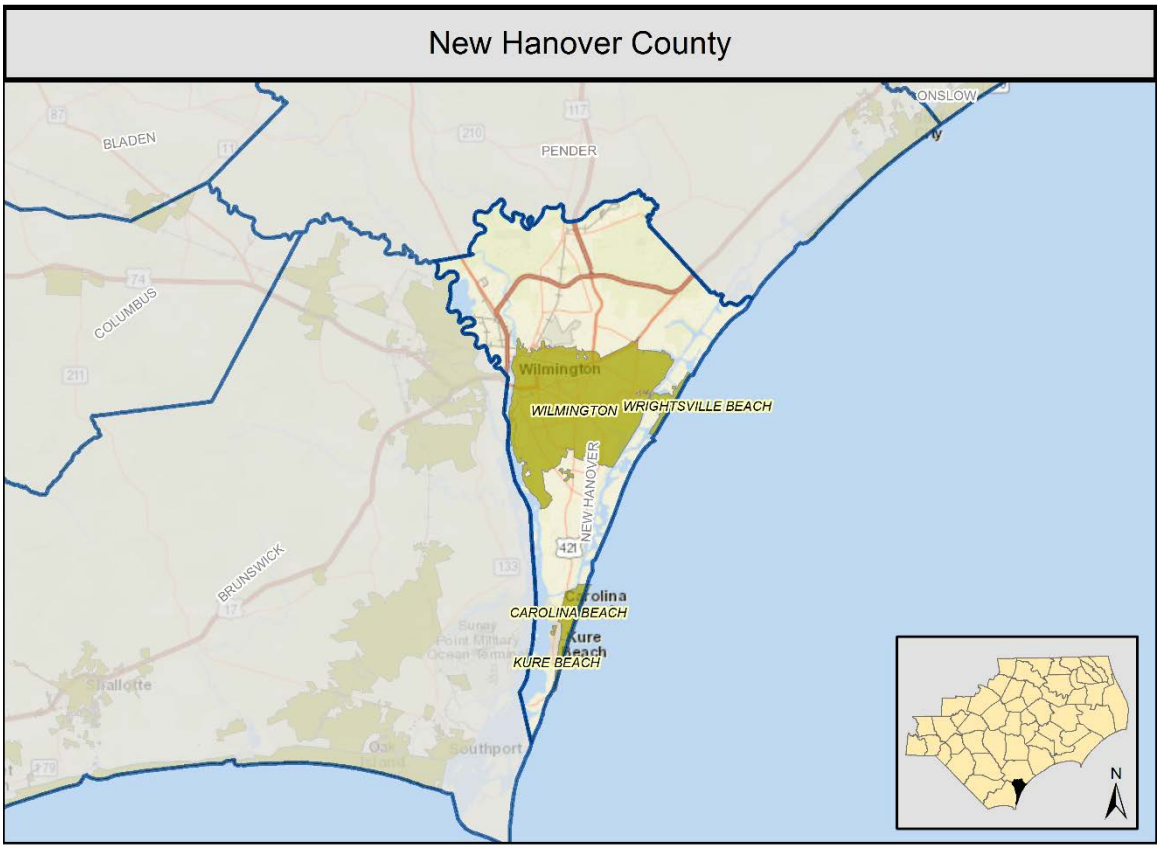
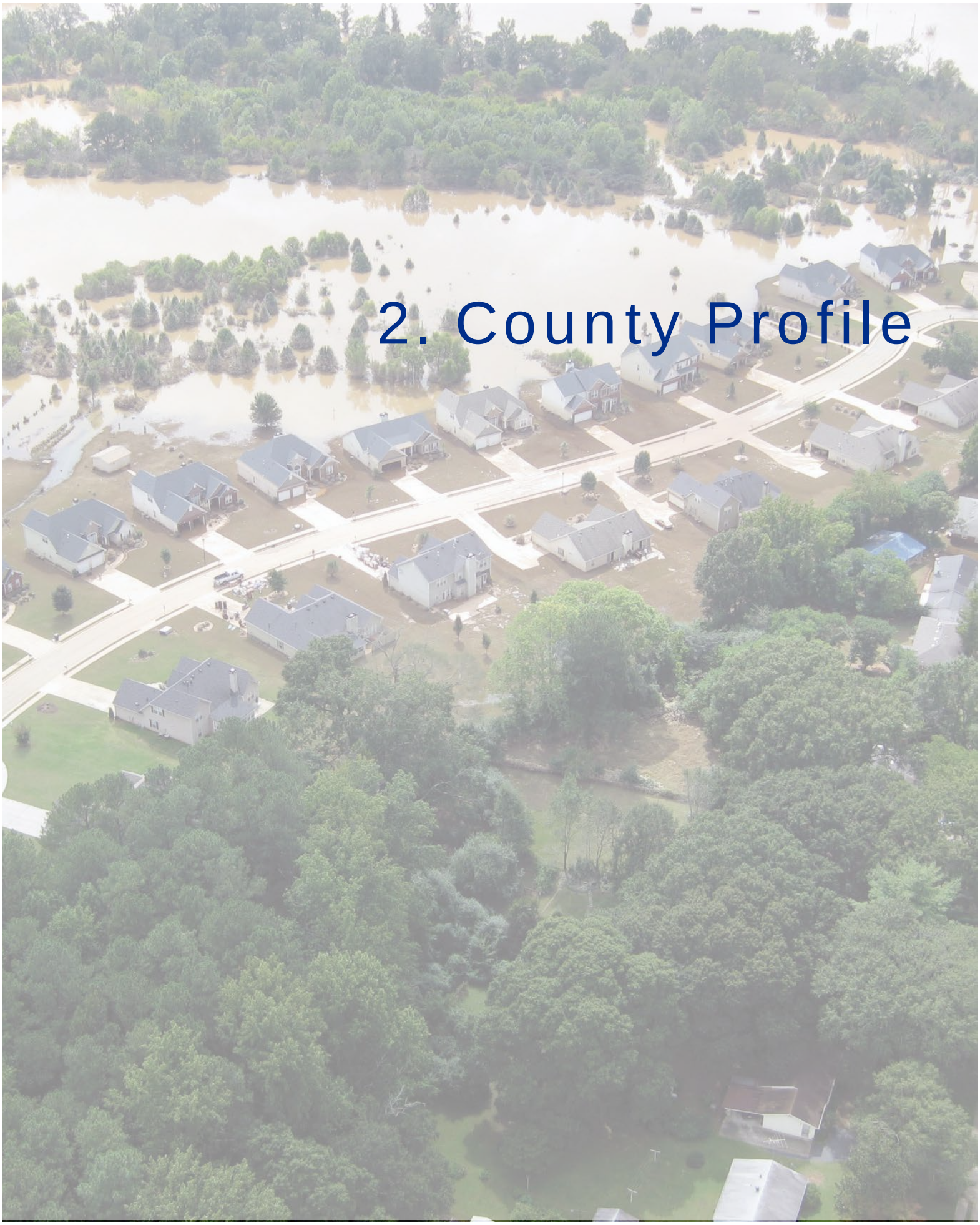


Figure 2. New Hanover County and Neighboring Counties

Data, Assumptions, and Methodologies

NCEM has assembled a wealth of data, resources, and technical expertise from state agencies, the private sector, and the University of North Carolina system to support the development of innovative best practice strategies.

Implementation of the proposed projects and actions described in this plan is subject to applicable federal, state, and local laws and regulations. Inclusion of a project or action in this plan does not guarantee that it will be eligible for recovery funding. However, proposed projects or actions may be eligible for state or federal funding or could be accomplished with municipal, nonprofit, or private investment.



2. County Profile

2. County Profile

New Hanover County is located on the eastern North Carolina southeast coast. It is comprised of eighteen census-designated places: Bayshore, Blue City Farms, Carolina Beach, Castle Hayne, Hightsville, Kings Grant, Kure Beach, Murraysville, Myrtle Grove, Northchase, Ogden, Porters Neck, Sea Breeze, Silver Lake, Skippers Corner, Wilmington, Wrightsboro, and Wrightsville Beach. Its current population is 213,091. This section provides a profile of housing, economics, infrastructure, environment, and administration within New Hanover County.

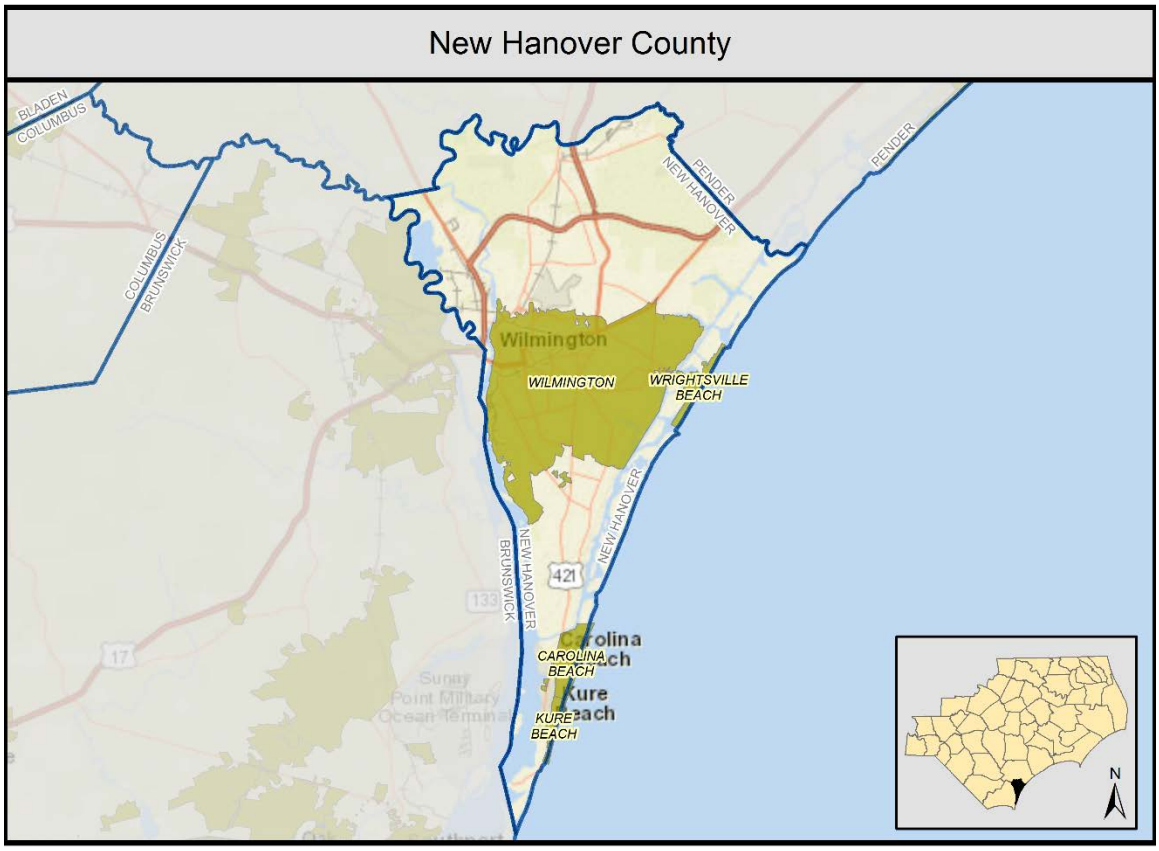


Figure 3. New Hanover Base Map

Demographic Profile

Demographics for New Hanover County and census-designated places within the county are summarized and compared to statewide averages in this profile. The demographic data is from the 2000 Census, 2010 Census, and 2011-2015 American Community Survey five-year estimates.

Population

New Hanover County has a population of 213,091. Wilmington is the most populous place within New Hanover County with a population of 111,998 and Blue Clay Farms is the least populous place with a population of 12.[3]

[3] *Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B01001, "Sex by Age."*

Population Change (2000 to 2010)

The New Hanover County population increased between the 2000 and 2010 Census. In 2000 the population was 160,307 and in 2010 it was 202,667. The population increased by 42,360 people, or 26.4 percent. In comparison, North Carolina grew by 19 percent from 8,049,313 people in 2000 to 9,535,483 in 2010.[4]

Age

The median age in New Hanover County is 38, which is below the median age of 42 for North Carolina. Within New Hanover County, the Kure Beach population has the oldest median age, 55, and the Wilmington population has the youngest median age, 35. The Blue Clay Farms Information is not available.[5]

Race and Ethnicity

New Hanover County is mostly White (81 percent) and African American (14 percent) with other races constituting the remaining 5 percent. In comparison, North Carolina is 70 percent White, 22 percent African American, 1 percent American Indian and Alaska Native, 3 percent Asian, less than 1 percent Native Hawaiian/Pacific Islander, 3 percent Some Other Race, and 2 percent Two or More Races. Refer to the table below.

Within New Hanover County, all areas are predominantly White. Wrightsboro and Hightsville have the highest percentage of African American residents. In Skippers corner and Silver Lake, 5 percent of the population identifies as Some Other Race.

The Latino population in New Hanover County is 5 percent compared to 9 percent for North Carolina. Skippers Corner has the largest Latino population (19 percent) while Blue Clay Farms and Sea Breeze do not have Latino populations according to the census data.

Geography	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
Bayshore	92.9%	3.4%	0.0%	1.1%	0.0%	0.0%	2.6%	7.1%
Blue Clay Farms	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carolina Beach	93.6%	2.2%	0.0%	0.4%	0.0%	0.3%	3.5%	6.4%
Castle Hayne	84.5%	15.5%	0.0%	0.0%	0.0%	0.0%	0.0%	15.5%
Hightsville	71.7%	28.3%	0.0%	0.0%	0.0%	0.0%	0.0%	28.3%
Kings Grant	84.4%	11.9%	0.6%	1.7%	0.0%	0.8%	0.5%	15.6%
Kure Beach	97.9%	0.4%	0.3%	0.0%	0.0%	0.0%	1.3%	2.1%
Murraysville	81.9%	13.3%	0.0%	2.7%	0.0%	0.7%	1.4%	18.1%
Myrtle Grove	94.7%	3.5%	0.0%	0.0%	0.0%	0.7%	1.2%	5.3%
Northchase	74.6%	18.2%	0.0%	3.6%	1.5%	0.0%	2.1%	25.4%
Ogden	97.3%	0.0%	0.0%	0.6%	0.0%	0.0%	2.0%	2.7%

[4] *Source: Minnesota Population Center. National Historical Geographic Information System: Version 11.0 [Database]. Minneapolis: University of Minnesota. 2016 http://doi.org/10.18128/D050.V11.0. Census 2000/Census 2010 Time Series Tables Geographically Standardized*

[5] *Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B01001, "Sex by Age."*

Geography	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
Porters Neck	90.7%	8.6%	0.0%	0.4%	0.2%	0.0%	0.1%	9.3%
Sea Breeze	79.2%	17.7%	0.0%	0.0%	0.0%	0.0%	3.0%	20.8%
Silver Lake	77.7%	8.4%	1.5%	0.4%	0.0%	5.1%	7.0%	22.3%
Skippers Corner	76.2%	15.5%	0.7%	0.0%	0.0%	5.4%	2.1%	23.8%
Wilmington	76.5%	18.9%	0.4%	1.7%	0.0%	1.2%	1.3%	23.5%
Wrightsboro	65.6%	28.7%	2.1%	0.5%	0.0%	0.0%	3.3%	34.4%
Wrightsville Beach	98.7%	0.0%	0.0%	0.2%	0.0%	0.0%	1.1%	1.3%

Table 2. New Hanover County Race and Ethnicity

Limited English Proficiency

Limited English Proficiency (LEP) is defined as populations 18 years or older that speak English less than very well. In New Hanover County, most of individuals identified as LEP speak Spanish while others speak Indo-Euro, Asian/Pacific, or other languages. Similarly, the primary language group for LEP individuals in North Carolina is Spanish. Within New Hanover County, Skippers Corner has the largest LEP population. The primary language group for LEP populations in most areas is Spanish. In Northchase, the primary language group is Other Indo-Euro while Blue Clay Farms does not have a LEP population according to census data.[6]

Poverty

In New Hanover County, 18 percent of the population is below the poverty level compared to 17 percent of the North Carolina population. In Blue Clay Farms, 100 percent of the population is below the poverty level. Castle Hayne, Hightsville, Silver Lake, and Wilmington have populations below the poverty level above 20 percent. Sea Breeze has the lowest poverty level at 3.5 percent. [7]

Low and Moderate Income Individuals

In New Hanover County, 39 percent of the population is classified as low and moderate income (LMI) individuals based on the US Department of Housing and Urban Development's definition. In comparison, 39 percent of the North Carolina population is classified as LMI.[8]

Median Household Income

The median household income of the population 25 to 64 years old is $56,200 in New Hanover County and $53,000 in North Carolina. Porters Neck has the highest median household income for this age group, $103,500,

[6] *Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B16004, "Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over."*

[7] *Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."*

[8] *Source: US Department of Housing and Urban Development, Estimate of Low and Moderate Income Individuals, https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places/*

and Wrightsboro has the lowest: $40,000. Median household income was not available for Bayshore, Blue Clay Farms, Castle Hayne, Hightsville, Kings Grant, Silver Lake, and Wrightsville Beach.[9]

Zero Car Households

In New Hanover County, 7 percent of households do not have a vehicle available equal to the 7 percent of North Carolina households. Within New Hanover County, Wilmington has the highest percentage of households without access to a vehicle, 9 percent, while Blue Clay Farms, Castle Hayne, Hightsville, and Sea Breeze have the lowest percentage: 0 percent.[10]

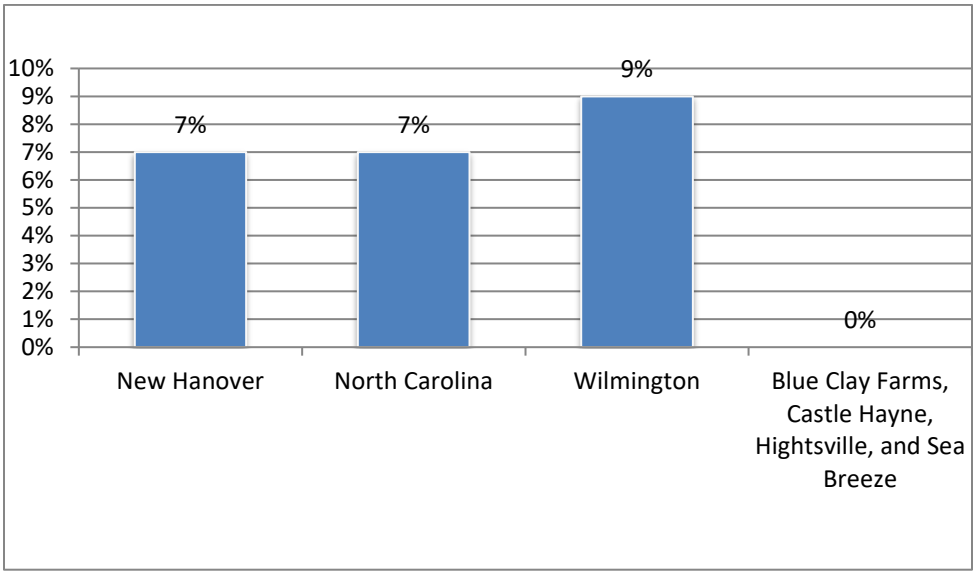


Figure 4. Zero Car Households by Percentage

Commuting: Travel Time to Work, Means of Transportation

The majority of New Hanover County residents commute alone to work by vehicle, 78 percent, which is similar to North Carolina average of 81 percent. Within New Hanover County, Sea Breeze has the largest percentage of commuters commuting alone, 87 percent, and Kure Beach has the least: 66 percent.

Silver Lake has the largest percentage of residents commuting by public transportation: 3 percent. In comparison, 1 percent of North Carolina commuters use public transportation. A greater percentage of Carolina Beach, Kure Beach, Sea Breeze, Silver Lake and Wilmington, residents commute by walking, biking, or motorcycle than the North Carolina average of 2 percent.

The mean commute time to work for New Hanover County residents is 20.4 minutes. In comparison, the North Carolina mean commute time is 24.7 minutes. Within New Hanover County, Hightsville has the shortest mean commute time at 15.7 minutes while Kure Beach and Skippers Corner have the longest at 34.8 minutes.[11]

[9] *Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B19094, "Median Household Income in the Past 12 Months."*
[10] *Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25044, "Tenure by Vehicles Available."*
[11] *Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B08301, "Means of Transportation to Work" and Table GCT0801, "Mean Travel Time to Work of Workers 16 Years and Over Who Did Not Work at Home (Minutes)."*

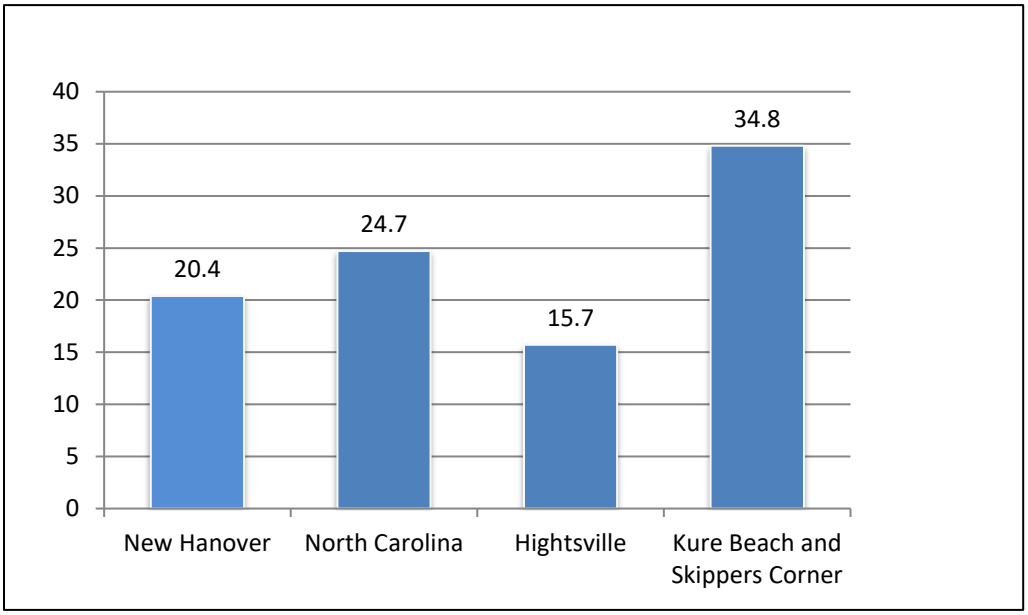


Figure 5. Mean Commute Time to Work in Minutes

Housing Profile

New Hanover County has over 104,100 housing units, 61 percent of which are single-family homes, 34 percent multi-family units, and 5 percent manufactured housing.

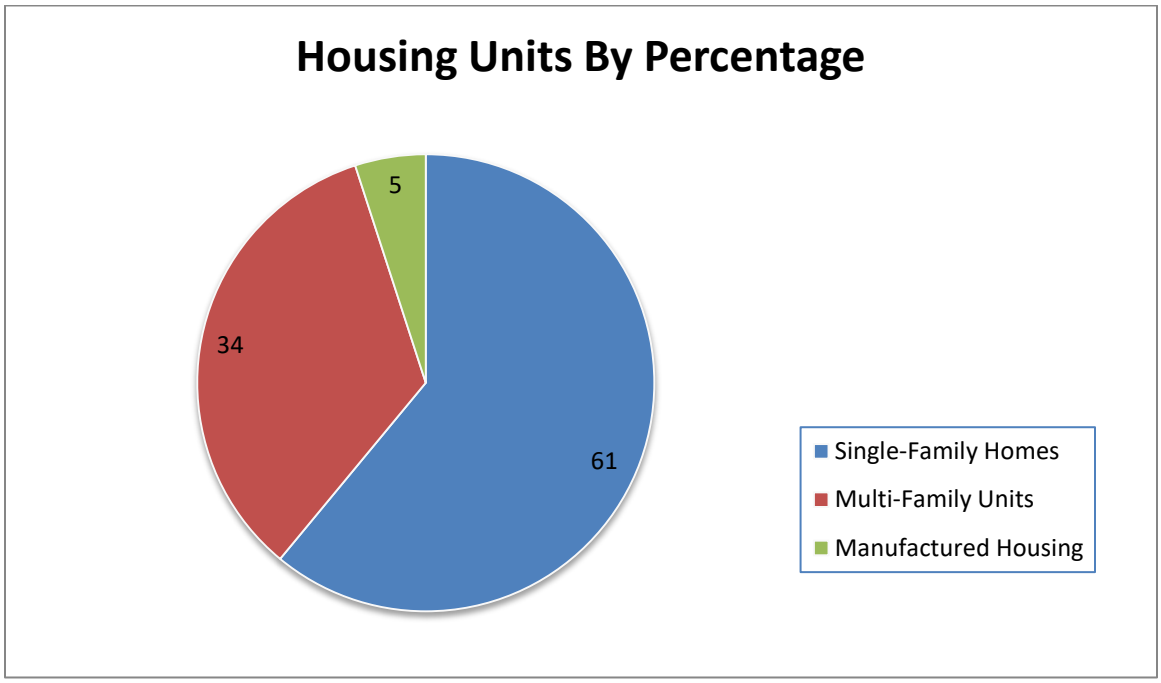


Figure 6. Housing Units By Percentage

In New Hanover County 15 percent of housing units are vacant, which is the same percentage for North Carolina. Within New Hanover County, Carolina Beach has the largest percentage of vacant housing units, 54 percent, while Blue Clay Farms has the least: 0 percent.

Of the occupied housing units, 57 percent are owner-occupied compared to 65 percent in North Carolina; 43 percent are renter-occupied compared to 35 percent in North Carolina.

The median housing value in New Hanover County is $214,300. In comparison, the median housing value in North Carolina is $140,000. Within New Hanover County, Wrightsville Beach has the highest median housing value: $732,900. Silver Lake has the lowest median housing value: $137,200.

According to the National Housing Preservation Database, New Hanover County has 3,570 affordable housing units. Most of the affordable housing is located within Wilmington.[12]

Economic / Business Profile

New Hanover County is home to a diverse array of businesses from retail and health care to Accommodations and Food Service. According to the US Census Bureau's Longitudinal-Employer Household Dynamics Program, the largest concentrations of jobs within New Hanover County are in Wilmington, between Front St. and College Rd.[13]

Labor Force

According to the local area unemployment statistics (LAUS) from the Labor and Economic Analysis Division (LEAD) for the unadjusted data for all periods in 2016, the civilian labor force population of New Hanover County is 116,676. [14] Within New Hanover County, Murraysville has the largest percentage of residents in the labor force, 77 percent, while Blue Clay Farms has the smallest: 0 percent.

The civilian unemployment rate in New Hanover County is 4.7 percent. In comparison, the North Carolina civilian unemployment rate is 5.1 percent.[14] Within New Hanover County, Porters Neck has the smallest civilian unemployment rate at 1.2 percent while Hightsville has the largest: 25.5 percent.[15]

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[12] Sources: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25002, "Occupancy Status"; Table B25003, "Tenure"; Table B25024 "Units in Structure"; Table B25077, "Median Value (Dollars)."
National Housing Preservation Database
[13] Source: US Census Bureau Longitudinal-Employer Household Dynamics Program
[14] Source: Civilian Population and Unemployment Rate - Labor and Economic Division (LEAD) of North Carolina Department of Commerce – Local Area Unemployment Statistics http://d4.nccommerce.com/LausSelection.aspx
[15] Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B23025, "Employment Status for the Population 16 Years and Over."

Major Employers

The top ten employers in New Hanover County represent the manufacturing, public administration, education and health service industries, and are listed in order of total employees.[16]

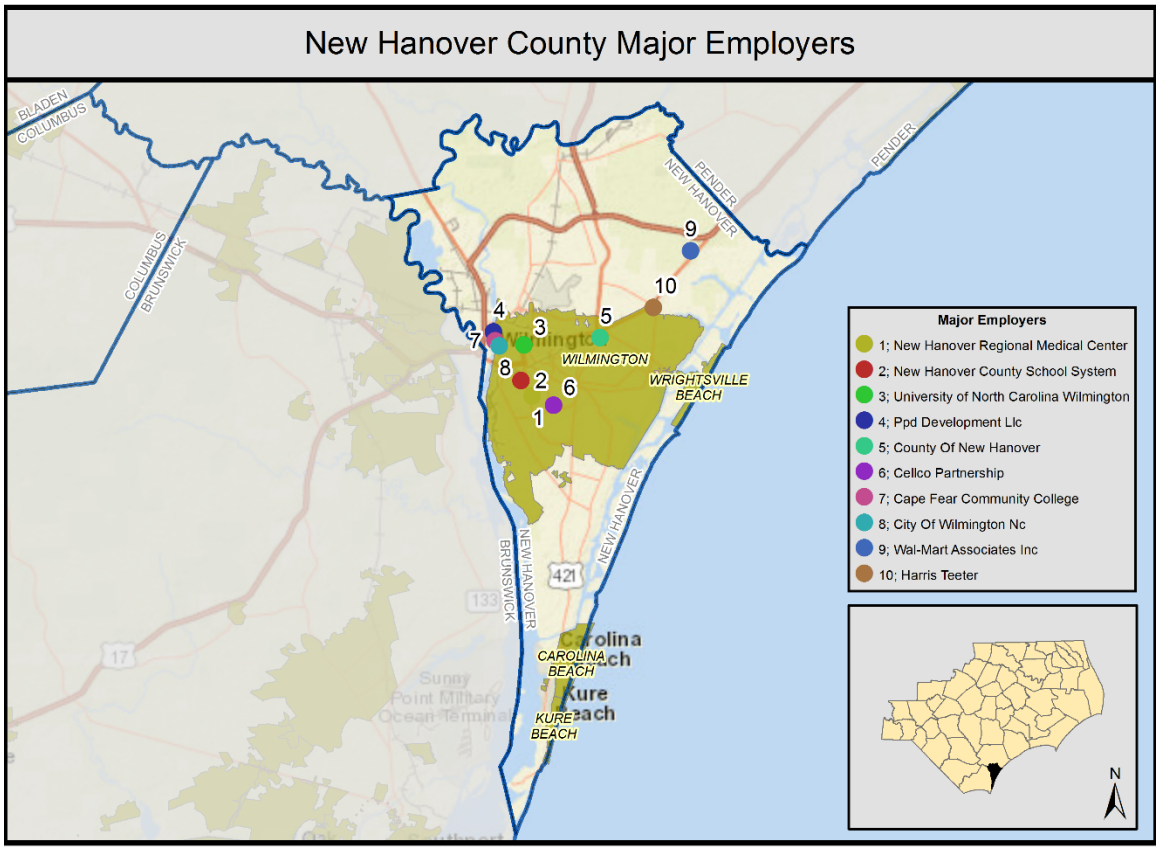

Figure 7. Major Employers by Number of Employees

Economic Development

The ILM Business Park and Aviation Service District is located in New Hanover County. The ILM includes 140 acres zoned Airport Industrial with many acres having rail and road access. The park is also less than 10 miles from the Port of Wilmington.

New Hanover County Board of Commissioners adopted a comprehensive plan in 2016. It "provides a detailed implementation plan that will help achieve the overall vision for the future of New Hanover County."

"With over 23,000 students enrolling in classes every year, Cape Fear Community College is a major economic development partner in southeastern North Carolina. CFCC is dedicated to providing world-class workforce training and quality higher education for the citizens of New Hanover County"[17]

[16] *Sources: NC Department of Commerce*
[17] *Sources: New Hanover government, Wilmington Business Development, Cape Fear Community College*

Infrastructure Profile

Transportation, health, education, water, and power infrastructure are summarized for New Hanover County in the sections that follow.

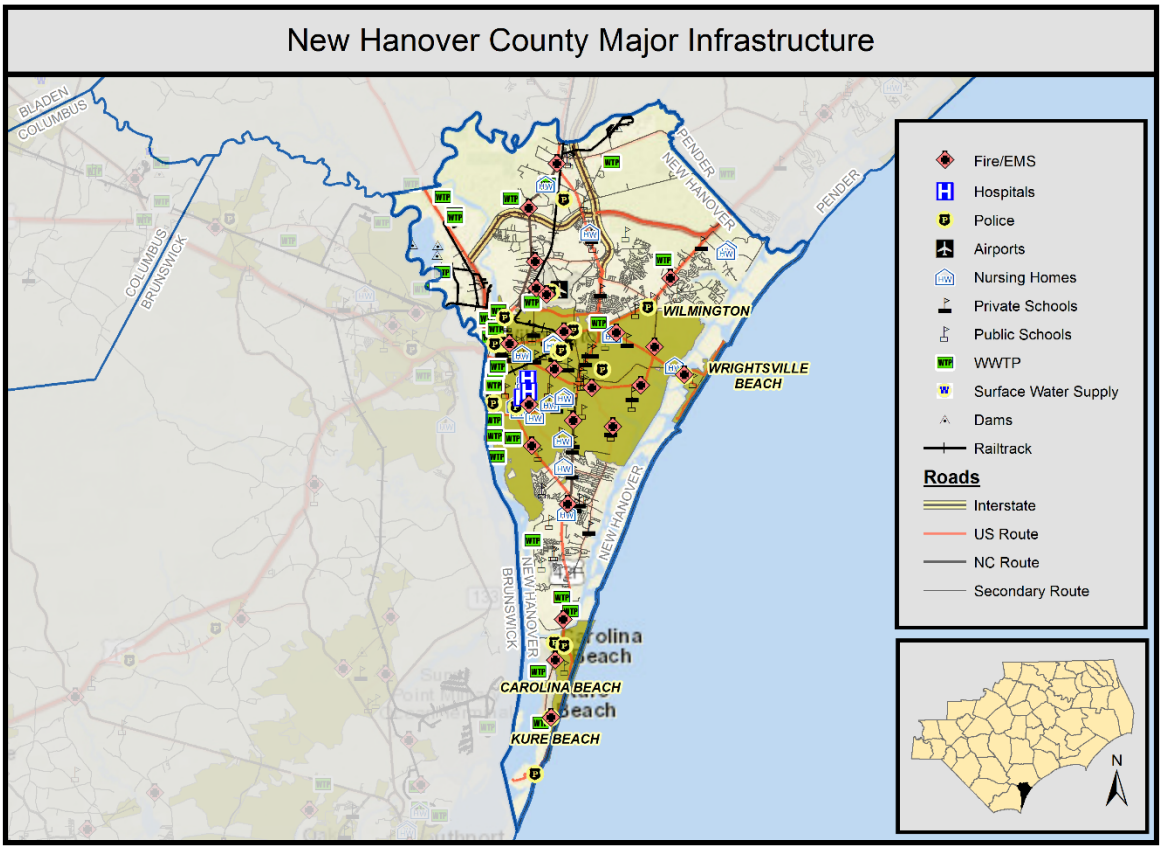

Figure 8. New Hanover County Major Infrastructure

Transportation

New Hanover County is connected to the region by US 17 and I 40. US 17 travels north south along the coast of North Carolina, it provides New Hanover County with access with the East coast. I 40 is a major east west highway connecting the county with Raleigh and western areas beyond. New Hanover County serves as a rail terminal for CSX. The Wilmington International Airport (ILM) is also located in New Hanover County and provides flights both international and Domestic.

Health

Cape Fear Hospital and New Hanover Regional Medical Center serve New Hanover County medical needs.

Education

New Hanover County Public Schools administers twenty elementary, ten middle, and nine high schools. Cape Fear Community College is located in Wilmington and is a member of the North Carolina Community College System. Also, located in Wilmington is the University of North Carolina Wilmington (UNCW).[18]

Water

The Cape Fear Public Utility Authority operates and maintains 3 wastewater treatment facilities in New Hanover County. These facilities have capacities of 10 MGD to 16 MGD. The Cape Fear Public Utility Authority also maintains two large water treatment facilities and two smaller ones.[19]

Power

There are no solar farms located within New Hanover County. The county does have four Petroleum Product Terminals located on the waterway in Wilmington. Electricity services are provided by Duke Energy and Piedmont Natural Gas.[20]

Environmental Profile

Water resources, natural areas, managed areas, biodiversity, wildlife habitat, and recreation are summarized for New Hanover County in the sections that follow.

Water Resources

New Hanover County touches the Atlantic Ocean to the east and Cape Fear waterway to the West. Much of the Eastern edge of the county is considered Estuarine and Marine Wetland. [21]

Natural and Managed Areas

According to the NC Natural Heritage Program, the coastal region of New Hanover County is considered very high or exceptional value natural areas. These areas are dedicated nature preserves and are managed under state ownership within New Hanover County. Managed areas are properties and easements where natural resource conservation is one of the current primary management goals, or are of conservation interest.[22]

Biodiversity and Wildlife Habitat

The NC Natural Heritage Program produces a biodiversity and wildlife habitat assessment for the state. According to this assessment, areas with the highest rating for biodiversity and wildlife habitat are along the coastal areas of New Hanover County. These areas rank between a 7 and 10, with 10 being the highest possible score. Other areas of the county rank 5 to 6 or impervious.[23]

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[18] *Sources: New Hanover County Schools and Cape Fear Community College*
[19] *Sources: NC Division of Water Resources, Local Water Supply Plans; and the Cape Fear Public Utility Authority*
[20] *Source: US Department of Energy, US Energy Mapping System*
[21] *Source: NC Natural Heritage Program*
[22] *Source: NC Natural Heritage Program*
[23] *Source: NC Natural Heritage Program*

Parks and Recreation

The New Hanover County Parks and Gardens Department maintains several parks and facilities in New Hanover County. This includes over 25 parks and athletic facilities and 2,900 acres of greenspace.[24]

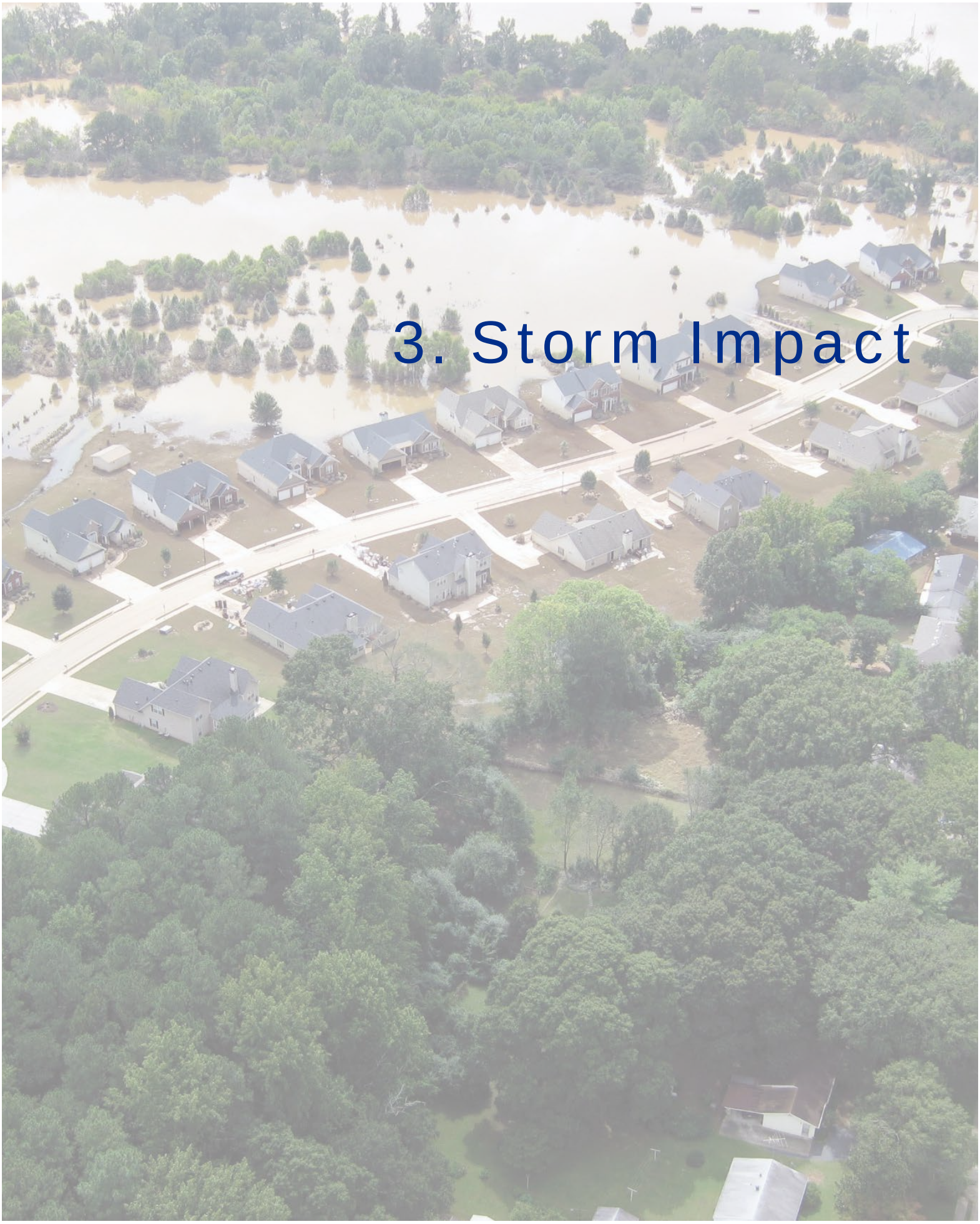
Administrative Profile

The administrative capabilities of New Hanover County and the municipalities within the County are discussed in great detail within Section 4 of the Southeast North Carolina Regional Hazard Mitigation Plan (2016). The assessment evaluates the capabilities of the County and municipalities to implement mitigation actions across the areas of planning and regulatory capabilities, administrative and technical capabilities, fiscal capabilities, and political capabilities. Many more details about the capabilities of New Hanover County and the municipalities can be found in that document.

In terms of administrative capabilities, the County has many of the staff and the necessary plans, policies and procedures in place that are found in communities with "high" capabilities. New Hanover County has Emergency Management and Planning departments with the capacities to assist in implementing the resilience strategies proposed in this plan. Some of the other indicators of capability for the County include the following: Comprehensive Land Use Plan, a Zoning Ordinance for portions of the County, Subdivision Regulations, and Floodplain Management Ordinance. These plans, policies and procedures help ensure that new development in the County will be managed in a responsible manner and will take place in non-hazardous areas.

All of the municipalities in the County (Carolina Beach, Kure Beach, Wilmington and Wrightsville Beach) also have "high capabilities" as well. They all have administrative resources that would likely be able to assist with implementing the strategies in this plan. In addition, they have the plans, policies and procedures in place that indicate higher capability.[25]

[24] *Sources: NC Natural Heritage Program, New Hanover County Parks and Gardens Department*
[25] *Sources: New Hanover County, City of Wilmington*



3. Storm Impact

3. Storm Impact

Rainfall Summary

Hurricane Matthew officially made landfall as a Category 1 storm southeast of McClellanville, South Carolina early on October 8, 2016. The track and speed of the storm resulted in nearly two days of heavy precipitation over much of North Carolina that caused major flooding in parts of the eastern Piedmont and Coastal Plain. The storm produced widespread rainfall of 3-8 inches in the central regions of North Carolina and 8 to more than 15 inches in parts of eastern North Carolina. A number of locations received all-time record, one-day rainfall amounts. Many locations in the Coastal Plain of North Carolina had received above normal rainfall in the month of September leading to wet antecedent conditions prior to Hurricane Matthew. Total rainfall depth for New Hanover County is highlighted graphically in the figure below;

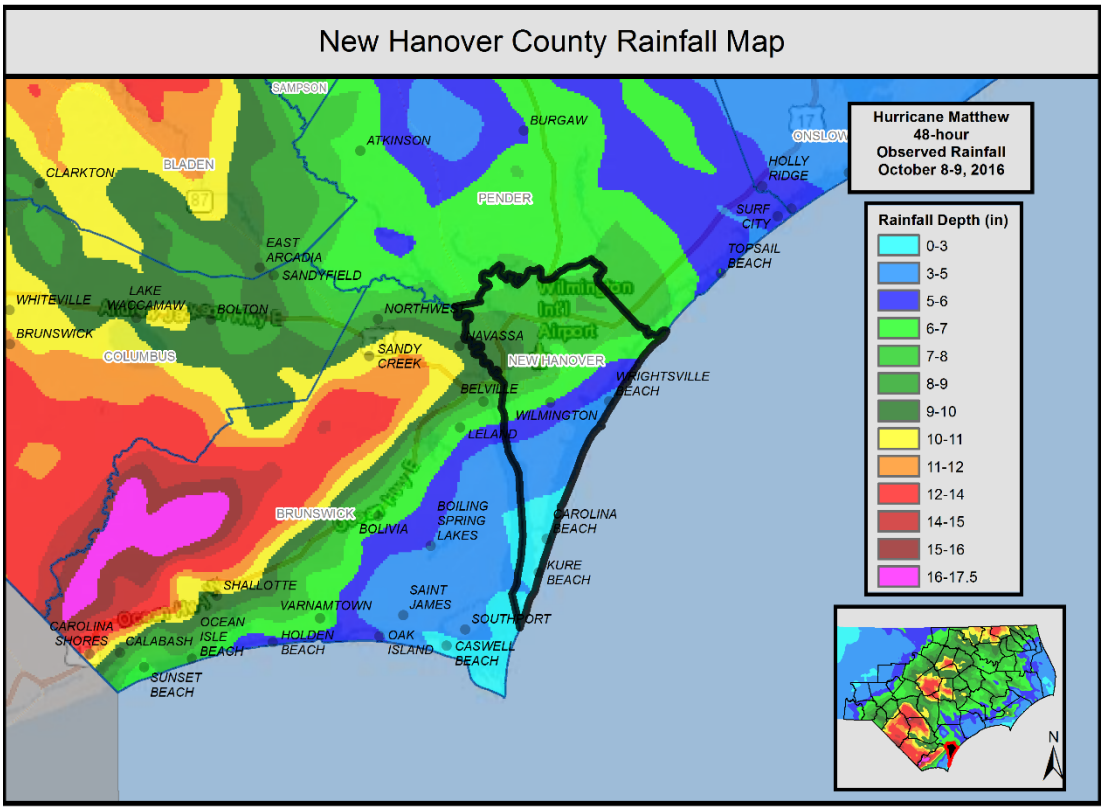


Figure 9. 48-hour Observed Rainfall Depth (October 8-9, 2016)

Riverine Flooding Summary

The effects of Hurricane Matthew on New Hanover County were most pronounced along the Cape Fear River in western New Hanover County. The Cape Fear River and Northeast Cape Fear River combine near downtown Wilmington. The mouth of Cape Fear River is just south of Wilmington so the portion of the Cape Fear River in New Hanover County is influenced by tides and storm surge. Flooding was experienced all along the Cape Fear in Wilmington and unincorporated New Hanover County. USGS documented stream gage data in the report "Preliminary Peak Stage and Streamflow Data at Selected Streamgaging Stations in North Carolina and South Carolina for Flooding Following Hurricane Matthew, October 2016." Stream gage data from the USGS report for

gages near New Hanover County is summarized below. The gage at Wilmington is not included since it is influenced by tides and storm surge.

USGS Gage	County	River Name and Location	Drainage Area (sq. mi)	Peak Matthew Elevation (ft.)	Record (ft.)
02108566	Pender	Northeast Cape Fear River near Burgaw, NC	920.0	17.83	22.77

Table 3. New Hanover County USGS Stream gage Data

Other areas of New Hanover County experienced some localized flooding, but in general, New Hanover County experiences frequent flooding and flooding caused by Hurricane Matthew was not a long-term event.

Coastal Flooding Summary

New Hanover County experienced coastal flooding as well as beach and dune erosion due to Hurricane Matthew. Hurricane Matthew peak surge elevations were measured at several USGS and NOAA coastal/tidal gage stations during the storm. Station records were analyzed along the coast of New Hanover County to compare Hurricane Matthew to the FEMA flood recurrence intervals. An approximate recurrence interval was determined for each site and this information is summarized for New Hanover County in the table below.

County	Site Description	Body of Water	Estimated Peak Surge (ft.)	Estimated Recurrence Interval
N. Hanover	Wilmington-Cape Fear River near US17	Sound	5.9	**25**
N. Hanover	Johnnie Mercer's Pier	Open Coast	7.5	**25**
N. Hanover	Kure Beach Fishing Pier	Open Coast	6.2	**25**
N. Hanover	Carolina Beach State Park Marina	Sound	5.4	**25**
N. Hanover	Fort Fisher Ferry Terminal	Sound	5.4	**25**
N. Hanover	Wrightsville Beach Boating Access	Sound	5.2	**25**
N. Hanover	N. Lumina Ave at Shell Island	Sound	5.2	**25**
N. Hanover	Inlet Watch Yacht Club	Sound	5.2	**25**
N. Hanover	Joyner Marina at Snows Cut	Sound	5.1	**25**
N. Hanover	USCG Station at Wrightsville Beach	Sound	5	**25**

Table 4. New Hanover County Coastal Flooding

The beach communities in New Hanover County experienced beach erosion, loss of sea oats, and dune loss in several locations. Some areas also had damage to public beach access ramps or need new ramps designed and constructed over dunes that have shifted significantly.

Power outages were common in the coastal communities during and following the storm. However, power was restored to most areas quickly.

Housing Impacts

Based on a review of NFIP claims, New Hanover County did not experience widespread impacts to housing from Hurricane Matthew. As of December 31, 2016, there were 23 NFIP claims in New Hanover County and one SBA

Home loan application. Additional claims from Hurricane Matthew may still be pending, so these totals may not reflect the final claims data from the event.

Based on meetings with County personnel and representatives from several of the towns in New Hanover County, impacts to housing from Hurricane Matthew were far less than other storms that have hit the area. With that in mind, the planning team attempted to take a comprehensive look at both Hurricane Matthew impacts and historic impacts that local officials felt would validate areas that should be considered at high risk to future flooding.

Based on a review of Individual Assistance Claims, NFIP Claims, and SBA home applications, it seems that housing was not significantly impacted in New Hanover County as a result of Hurricane Matthew. However, actual payouts and loans were very limited, potentially revealing that damage to housing was not widespread. The bullets below summarize some of the major impacts to housing that were identified.

- **Homes damaged from Hurricane Matthew:** In New Hanover County, NFIP claims were concentrated along coastal areas and in the City of Wilmington. Of the 23 NFIP claims, eight were located in Carolina Beach, two were in Wrightsville Beach, 12 were in the City of Wilmington and one was located in Castle Hayne in the northern part of the county.
- **Homes At-Risk of Future Flooding:** Concentrations of structures in the SFHA are found primarily in the coastal communities and along the Cape Fear River in Wilmington. Other areas include N. College Road at Murrayville Tributary, Blue Clay Road at Wildcat Branch, South College Road at Mott Creek, the Barnard Creek area south of Wilmington, and Burnt Mill Creek in the City of Wilmington. Based on an analysis of claims data, there are no unstudied streams in New Hanover County that experienced flooding during Hurricane Matthew.

Economics / Business / Jobs

As of March 20, 2017, there were two business applications for loans from the SBA indicating that impacts to the economy/businesses/jobs were minimal. Areas of flooding caused by Hurricane Matthew are summarized below.

- **Downtown Areas Impacted:** Local officials did not report any concentrated or widespread damage to downtown areas in any of the municipalities in New Hanover County. The City of Wilmington experienced flooding along the Cape Fear River during the storm and then again on October 14, 2016 as the Cape Fear River levels exceeded flood stage due to floodwaters moving through the river basin from areas of the State that received record rainfall. High river stage combined with high tides exacerbated flooding.
- **Employment:** According to the North Carolina Department of Commerce, the unemployment rate in New Hanover County before Matthew (in September of 2016) was 4.4%. In January of 2017, that rate increased to 5.1% although it is doubtful that increase can be attributed to Hurricane Matthew.

Infrastructure

According to Public Assistance claims data, which are often closely tied to infrastructure, as of March 17, 2017 there were 16 submitted projects for a total of $514,417 in New Hanover County as a result of Hurricane

Matthew. Additional claims from Hurricane Matthew may still be pending, so this number may not reflect the final claims data from the event.

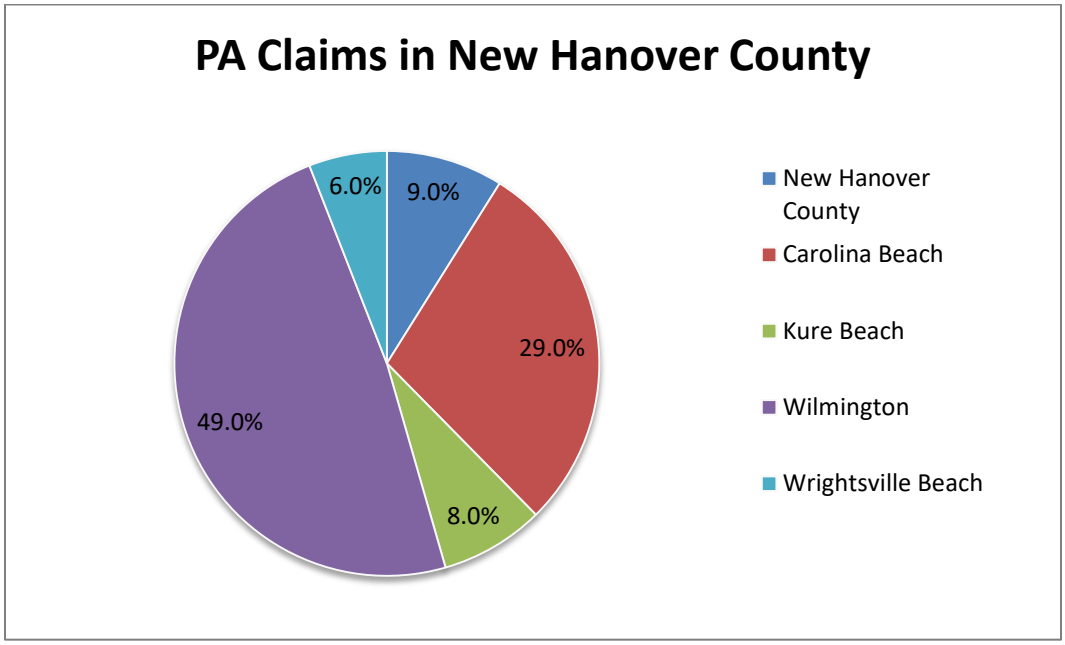


Figure 10. New Hanover County PA Claims by Area and Percentage

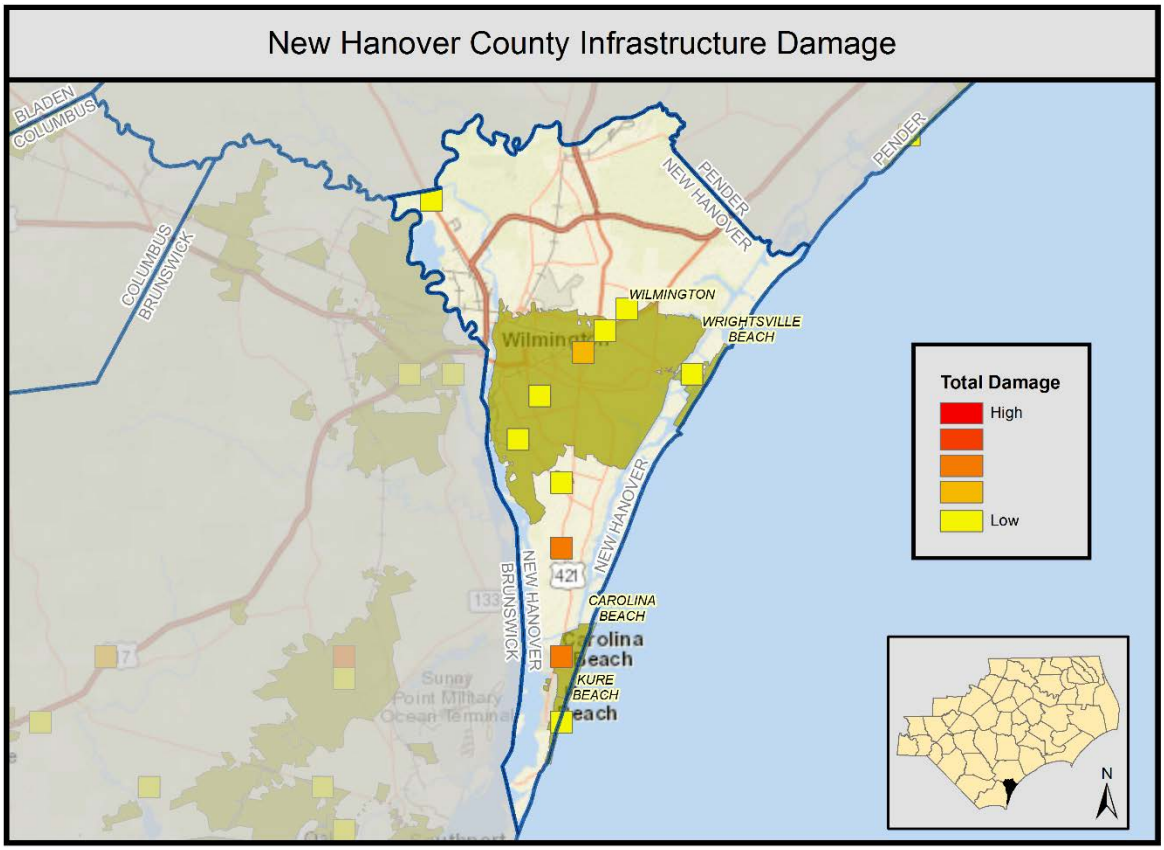


Figure 11. New Hanover County Infrastructure Damage

County infrastructure was one of the greatest areas of concern in the wake of Hurricane Matthew as there were several types of infrastructure that were damaged in multiple locations. The bullets below summarize some of the major impacts to infrastructure that were identified by local officials from the event.

- **Dam Issues:** There were no reported issues with any dams in New Hanover County during or following Hurricane Matthew.
- **Road/Bridge Flooding:** Other than localized road flooding that occurs frequently in heavy rainfall there are no known roadway damages or roadway closures in New Hanover County.

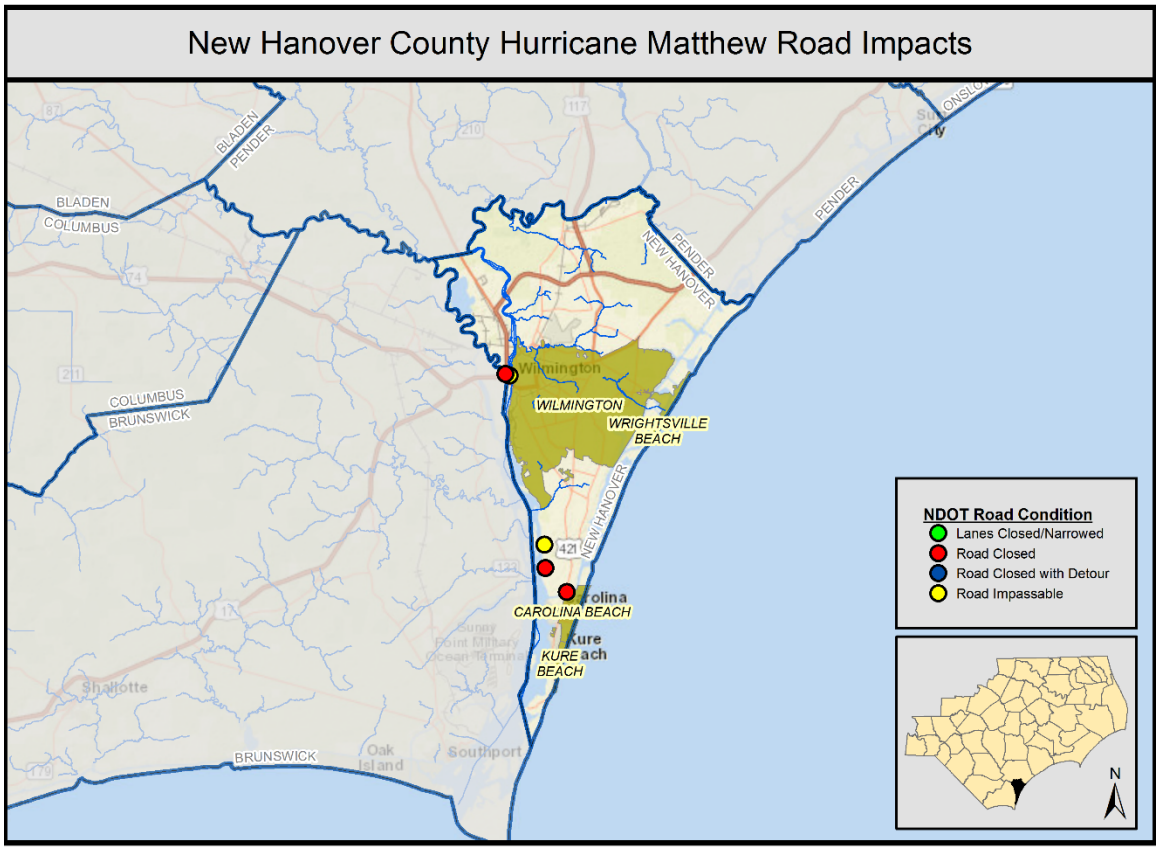


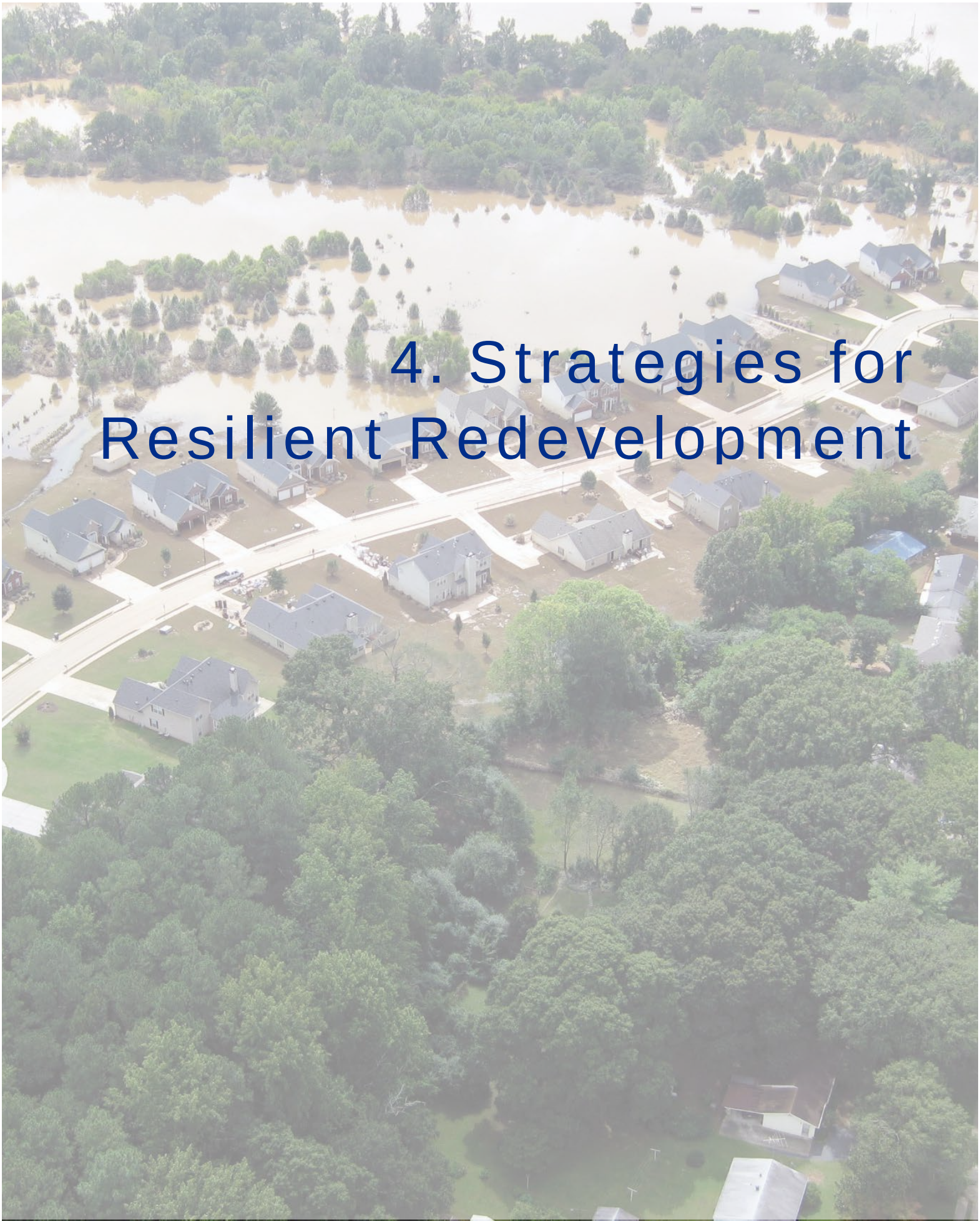
Figure 12. Impacted NCDOT Structure in New Hanover County

- **Water/Wastewater Infrastructure:** Water and wastewater infrastructure is critical to maintaining the health and well-being of the public in the wake of a storm event. Often, this infrastructure is threatened due to the necessity of placing it near water bodies, which naturally causes the risk to flooding. During Hurricane Matthew, there are no known wastewater facilities that were damaged.

  Major damage occurred to the 48-inch primary raw water transmission main crossing the Cape Fear River. This is the main water supply infrastructure for Brunswick, Pender, and New Hanover Counties. The damage created an emergency water supply situation for Brunswick, Pender, and New Hanover Counties following Hurricane Matthew. Repair of the transmission main was handled by the Lower Cape Fear Water & Sewer Authority.

Ecosystems / Environment

Overall, environmental impacts in New Hanover County as a result of Hurricane Matthew were minimal. Downed and damaged trees and debris were the primary impact to most areas of the county. Kure Beach and Wrightsville Beach experienced minor beach erosion. Local officials were surprised by how light the damage to the beaches was. The hardest hit beaches in the area are in Brunswick County, south of New Hanover County.



4. Strategies for Resilient Redevelopment

4. Strategies for Resilient Redevelopment

This section provides details about the resilience and revitalization strategies and actions identified in New Hanover County. These actions were identified and refined during three public meetings with local officials and county residents held in March and April 2017. The actions are tied to impacts from Hurricane Matthew and organized by the pillars of housing, economic development, infrastructure and environment. In addition to the public meetings, frequent coordination calls with County officials and data gathered from state agencies and organizations were utilized to formulate the actions listed below.

Meeting 1 was designed to introduce the community and County points of contact to the Resilient Redevelopment Planning process and goals. This meeting allowed the planning team to capture areas within the county that were damaged during Hurricane Matthew and to hear what potential mitigation actions had already been considered. Draft resilience actions were then presented at Meeting 2 of the planning process. This was done to garner general buy-in on the draft actions from the County-level planning teams and residents. More details on the actions were collected between Meetings 2 and 3 through research and follow-up phone calls and emails with the primary points of contact. Meeting 3 provided the opportunity to collect and finalize details for the draft actions. Meeting 4, scheduled in early May 2017, allowed the county points of contact to rank the identified actions, group them into High, Medium, and Low Priorities, and to approve their inclusion in the plan.

Pillar	Project/Action Count
Housing	1
Economic Development	1
Infrastructure	10
Environment	4
Grand Total	**16**

Table 5. New Hanover County Summary of Projects by Pillar

The following table is ordered by the rankings and priorities provided by New Hanover County during Meeting 4:

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Assistance for Creating County Unincorporated Areas Stormwater Management Utility	**High**	**1**
Environment	Stream Debris Removal	**High**	**2**
Infrastructure	Emergency Generator Upgrades for Critical Facilities	**High**	**3**
Infrastructure	Install/Improve Flood Warning System	**High**	**4**
Infrastructure	New Hanover County Logistics/Emergency Management Center	**High**	**5**
Environment	Stream Water Quality Mitigation	**Medium**	**6**
Environment	Expansion of Recreational Land/Preservation of Floodplain	**Medium**	**7**
Housing	Acquire/Elevate Flood Prone Structures/Properties	**Medium**	**8**
Environment	Airlie Gardens Stormwater Improvements	**Medium**	**9**

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	New Hanover County Vulnerable Local Road Upgrade	**Medium**	**10**
Infrastructure	New Hanover County Vulnerable NCDOT Road Upgrades	**Medium**	**11**
Economic Development	Create Resilient Employment Center	**Medium**	**12**
Infrastructure	City of Wilmington Stormwater Improvements	**High**	**NR**
Infrastructure	City of Wilmington Storm Drainage Rehabilitation	**High**	**NR**
Infrastructure	Town of Kure Beach Ethyl/Dow Bromine Extraction Ocean Intake Structure Removal	**High**	**NR**
Infrastructure	Town of Kure Beach Stormwater Outfall Repair	**High**	**NR**

Table 6. Projects by Rank

On the following pages, we have organized the projects and actions by pillar. Within each pillar, the projects are grouped by county priority. Please note that maps are provided for all projects that have a specific location within the county. Projects without maps are county-wide projects that will benefit citizens throughout the county.

Housing Strategies

Medium Priority Housing Strategies

Pillar	Action Name	Priority	Overall Ranking
Housing	Acquire/Elevate Flood Prone Structures/Properties	**Medium**	**8**

Table 7. Medium Priority Housing Strategies

Although New Hanover County as a whole suffered only moderate impacts with respect to housing from Hurricane Matthew, other storms have impacted housing, especially in areas of known flood hazards. To increase resiliency for future storm events the planning team and County officials developed the following strategy.

- **Acquire/Elevate Flood Prone Structure/Properties:** Consistent with the Southeastern NC Regional Hazard Mitigation Plan, New Hanover County will identify opportunities for acquisition, elevation, retrofitting, and/or reconstruction of hazard prone properties.

Acquire/Elevate Floodprone Structures/Properties

County: New Hanover

Priority Grouping: Medium Priority

Priority Ranking: 8

Project Timeframe: 1-3 years

Location: Various locations throughout New Hanover County

Project Summary: Consistent with the Southeastern NC Regional Hazard Mitigation Plan, New Hanover County will identify opportunities for acquisition, elevation, retrofitting, and/or reconstruction of hazard prone properties.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Although there was a very limited number of structures reported to have flooded from Hurricane Matthew in New Hanover County there are areas where risk of future flooding events can be removed or reduced by this action.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with the Southeastern NC Regional Hazard Mitigation Plan	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Elevation retrofit and/or reconstruction are preferred over acquisition the retain county tax base.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	100-200 year event	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	N/A
What impacts to the environment of the county will result from this project?	in areas were property is acquired floodplain can be protected and potentially used to mitigate and reduce nearby flooding problems.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$1M+	N/A
What is the level of public support for this project?	Unknown	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	County	N/A

Economic Development Strategies

Medium Priority Economic Development Strategies

Pillar	Action Name	Priority	Overall Ranking
Economic Development	Create Resilient Employment Center	**Medium**	**12**

Table 8. Medium Priority Economic Development Strategies

Due to relatively minor Hurricane Matthew impacts to New Hanover County in terms of economic development, the planning team worked with local county officials to examine ways to increase resiliency for future storm events and encourage economic growth.

- **Employment Center Economic Development:** The New Hanover County future land use map includes an "Employment Center" in the north central part of the County. Ideally, this area will serve as an employment and production hub, with office and light industrial uses predominating. This area will be ideal for innovative resilient development design and construction. All necessary utilities are near-by and available. With funding, New Hanover County could consider public/private partnerships and promote resilient development techniques in this area.

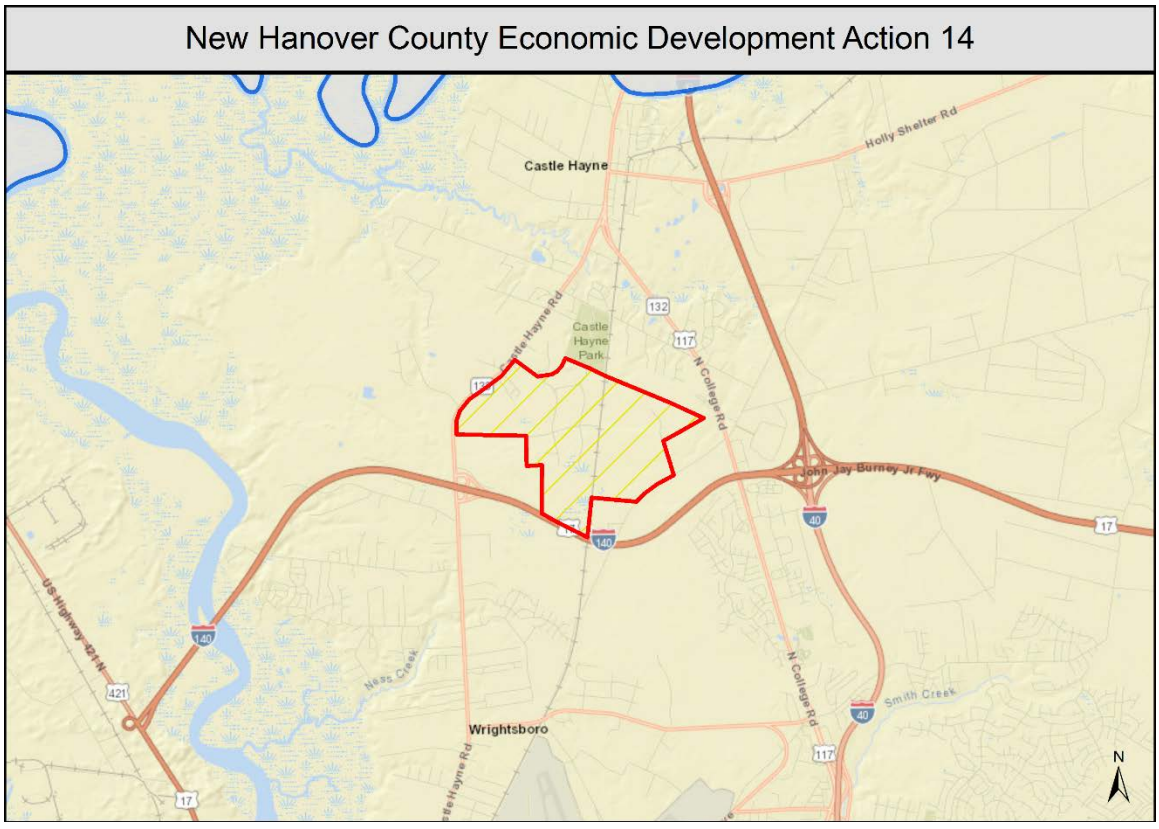


Figure 13. Economic Development Strategy – Future Employment Center

Create Resilient Employment Center

County: New Hanover

Priority Grouping: Medium Priority

Priority Ranking: 12

Project Timeframe: 3-5 years

Location: New Hanover County

Project Summary: The New Hanover County future land use map includes an "Employment Center" in the north central part of the County. Ideally, this area will serve as an employment and production hub, with office and light industrial uses predominating. This area will be ideal for creating and actively promoting as innovative resilient development design and construction. All necessary utilities are near-by and available. With funding, New Hanover County could consider public/private partnerships and promote resilient development techniques in this area.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not directly address an unmet need created by Hurricane Matthew. However, it could provide additional employment for nearby Pender County residents and enhance overall resiliency and diversification of the economy in the area.	N/A
Consistent with existing plans (describe points of intersection/departure)	This economic development area is identified in the New Hanover County 25-yr Future Land Use Plan	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Economic development of an employment center will further diversify the economy in New Hanover County adding to the strong beach tourism industry.	N/A
For how long will this solution be effective?	More than 50 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	Between 26 and 50%	N/A
What impacts to the environment of the county will result from this project?	One of the goals of this project would be to limit impacts to the environment using resilient and green development techniques.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$1M+	N/A
What is the level of public support for this project?	Unknown	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	County	N/A

Infrastructure Strategies

High Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Assistance for Creating County Unincorporated Areas Stormwater Management Utility	**High**	**1**
Infrastructure	Emergency Generator Upgrades for Critical Facilities	**High**	**3**
Infrastructure	Install/Improve Flood Warning System	**High**	**4**
Infrastructure	New Hanover County Logistics/Emergency Management Center	**High**	**5**
Infrastructure	City of Wilmington Stormwater Improvements	**High**	**NR**
Infrastructure	City of Wilmington Storm Drainage Rehabilitation	**High**	**NR**
Infrastructure	Town of Kure Beach Ethyl/Dow Bromine Extraction Ocean Intake Structure Removal	**High**	**NR**
Infrastructure	Town of Kure Beach Stormwater Outfall Repair	**High**	**NR**

Table 9. High Priority Infrastructure Strategies

The purpose of the strategies related to New Hanover County's infrastructure is to protect critical facilities and key routes needed to foster community resiliency, sustainability, and safety before, during, and after disasters. These strategies are essential in protecting citizen and community well-being, while augmenting an effective recovery from a potential future storm like Hurricane Matthew. In working with local officials, the planning team developed the following infrastructure strategies:

- **Assistance with Creating County Unincorporated Areas Stormwater Management Utility:** New Hanover County wants to establish the framework and equipment needed to administer a Stormwater Utility to fund future stormwater improvement projects across unincorporated New Hanover County.

Assistance with Creating County Unincorporated Areas Stormwater Management Utility

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 1

Project Timeframe: 1-2yrs

Location: New Hanover County Unincorporated Areas

Project Summary: New Hanover County wants to establish the framework and equipment needed to administer a Stormwater Utility to fund future stormwater improvement projects across unincorporated New Hanover County.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Localized flooding that occurred during Hurricane Matthew can be attributed to poor drainage in many cases. The County wants to actively mitigate these areas and establish a local funding source for on-going countywide stormwater improvement projects.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Stormwater utilities can have a great impact on the local economy by helping reduce flooding of infrastructure and businesses.	N/A
For how long will this solution be effective?	More than 50 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	Improved stormwater systems is likely to have water quality benefits depending on the type of project.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$101K - $250K	N/A
What is the level of public support for this project?	Unknown	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	County	N/A

- **Emergency Generator Upgrades for Critical Facilities**: In an effort to improve power reliability, New Hanover County has identified the need for upgrades to its capability to provide backup power to critical Facilities including the 5 emergency shelters, the County Emergency Operations Center and 911 Communications Center. New generators, automatic transfer switches, uninterruptible power supplies and telemetry upgrades are needed as follows:
    - Child Nutrition Warehouse (New 150 KW generator w/ATS)
    - Senior Resource Center (New 200 kW generator w/ATS)
    - Existing Eaton School Generator upgrades
    - Existing Johnson School Generator Upgrades
    - Existing Codington School Generator Upgrades
    - Telemetry Equipment and installation
    - Generator Platforms

Emergency Generator Upgrades for Critical Facilities

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 3

Project Timeframe: 1-2 yrs

Location: New Hanover County

Project Summary: In an effort to improve power reliability, New Hanover County has identified the need for upgrades to its capability to provide backup power to critical Facilities including the 5 emergency shelters, the County Emergency Operations Center and 911 Communications Center. New generators, automatic transfer switches, uninterruptible power supplies and telemetry upgrades are needed as follows:

-Child Nutrition Warehouse (New 150 KW generator w/ATS)
-Senior Resource Center (New 200 kW generator w/ATS)
-Existing Eaton School Generator upgrades
-Existing Johnson School Generator Upgrades
-Existing Codington School Generator Upgrades
-Telemetry Equipment and installation
-Generator Platforms

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Hurricane Matthew did not directly impact the eight facilities that will benefit from this action. However, this action will ensure adequate and reliable power supply to these critical facilities in accordance with the county's emergency management strategy.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	No economic impacts from this action.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	>6	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	No Impact	N/A
What impacts to the environment of the county will result from this project?	No environmental impacts.	N/A
What is the capability of the local government to administer this project?	High	N/A

What is the financial range of this project?	$251K - $500K	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	County	N/A

- **Install/Improve Flood Warning System**: New Hanover County currently has 2 gages active in the FIMAN system. Installation of additional gages will better prepare the county during flood events and help protect lives by monitoring flood hazards real-time. 10 potential locations have been identified throughout the county. These locations will monitor riverine and coastal flooding sources within the county at locations that will provide emergency officials a good understanding of flooding throughout the county during an event.

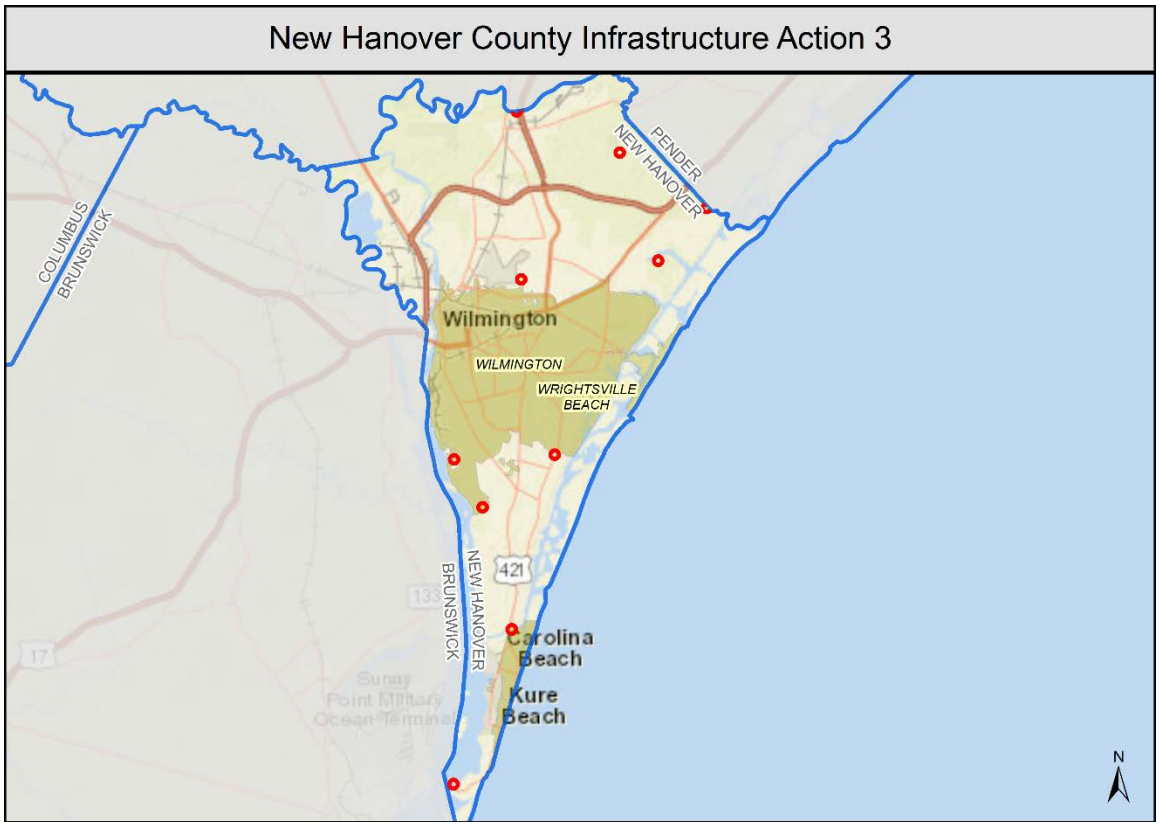


Figure 14. Infrastructure Strategy – Install/Improve Flood Warning System

Install/Improve Flood Warning System

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 4

Project Timeframe: 2-5 years

Location: Various locations across the County

Project Summary: New Hanover County currently has 2 gages active in the FIMAN system. Installation of additional gages will better prepare the county during flood events and help protect lives by monitoring flood hazards real-time. 10 potential locations have been identified throughout the county. These locations will monitor riverine and coastal flooding sources within the county at locations that will provide emergency officials a good understanding of flooding throughout the county during an event.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	There are currently only 2 gages in the FIMAN Network in New Hanover County. Additional gages will improve FIMAN for residents and businesses in flood prone areas.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Advanced flood warning can afford businesses and residents time to prepare and evacuate if necessary.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	N/A
What impacts to the environment of the county will result from this project?	No impacts to the environment will be necessary to install stream gages.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$251K - $500K	N/A
What is the level of public support for this project?	Unknown	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	State	N/A

- **New Hanover County Logistics/Emergency Management Center:** New Hanover Emergency Management equipment storage, back-up facilities, and training locations are spread all over the county in dated facilities. Some locations flood easily preventing access during events. The current Emergency Management equipment storage location has inadequate storage space, secure access issues, mold, and is in overall poor condition. The County seeks funding assistance for construction of a new EM Logistics and Equipment Facility to be constructed at 3950 Juvenile Center Rd. Castle Hayne NC. The County has applied for HMGP funding although this project does not meet all HMGP requirements.

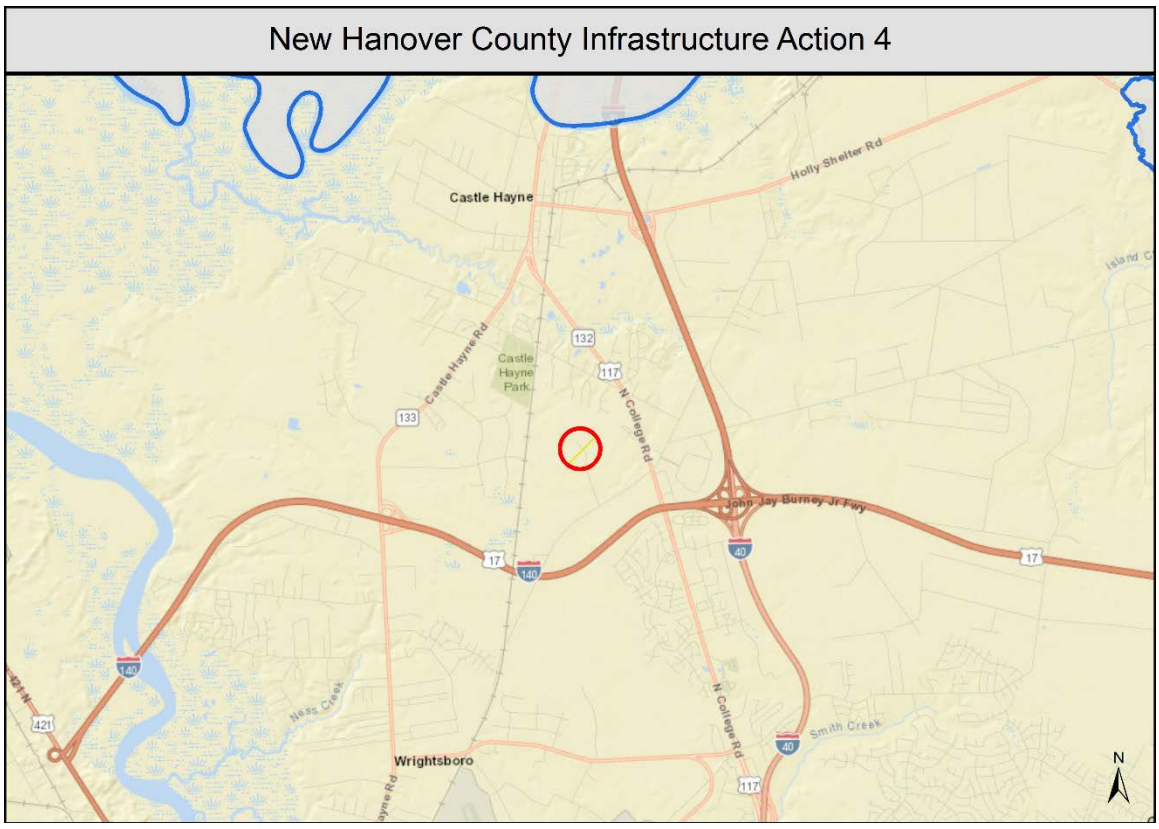


Figure 15. Infrastructure Strategy - New Logistics/Emergency Management Center

New County Logistics/Emergency Management Center

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 5

Project Timeframe: 1-2 years

Location: New Hanover County

Project Summary: The County would like to construct a new Logistics/Emergency Management Center to provide a centralized location for operations, training, and backup equipment storage for law enforcement, fire, regional response and emergency management organizations. The new center would house all of these different agencies together and better equip the County to respond to emergency situations.

Currently, County resources, back up facilities, and training locations are spread all over the county and in dated facilities. For example, the Emergency Management Division keeps most of their resources at a building constructed in 1950 which has inadequate storage, secure access issues, mold, and is in overall poor shape. The facility is not within a NFIP flood zone designation however routinely floods due to poor drainage and runoff. Due to deterioration and construction type, portions of the roof were blown off during Matthew. The County's back up location at the County jail is no longer available due to expansion of the jail. New Hanover County Fire Rescue and the Sheriffs Dept. currently have emergency response equipment and DPR (Domestic Preparedness Region) assets spread out throughout the county in non-secure locations. The County needs a resilient facility that would provide much needed utility and longevity. The County has identified a location on county owned property that has access to water and sewer, is elevated well above the nearest floodplain, and is centrally located in the county. By centralizing the storage, maintenance, training, and utilization of these resources, the county and region will be better positioned to successfully manage any crisis.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Due to deterioration and construction type the roof of the existing outdated facility was damaged during Matthew. This project will address the many concerns the County has about its ability to successfully manage extreme crises like Hurricane Matthew was in other areas of North Carolina.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	No impacts to the economy	N/A
For how long will this solution be effective?	Between 31 and 50 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	No Impact	N/A
What impacts to the environment of the county will result from this project?	No negative environmental impacts are expected.	N/A

What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$1M+	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	County	N/A

City of Wilmington Stormwater Improvements: The City of Wilmington has 4 proposed stormwater improvement projects to alleviate localized flooding and improve water quality. These projects are:

- Clear Run Branch Drainage Improvements. This project consists of installation of storm drain inlets and piping along College Acres Drive, culvert replacements at College Acres Ave and Mallard Street, and stream restoration of Clear Run between College Acres Drive and Mallard Street.
- Pirates Cove Drainage Improvements.
- Whispering Pines/Masonboro Drainage Improvements.
- Kelly Road Drainage Improvements.

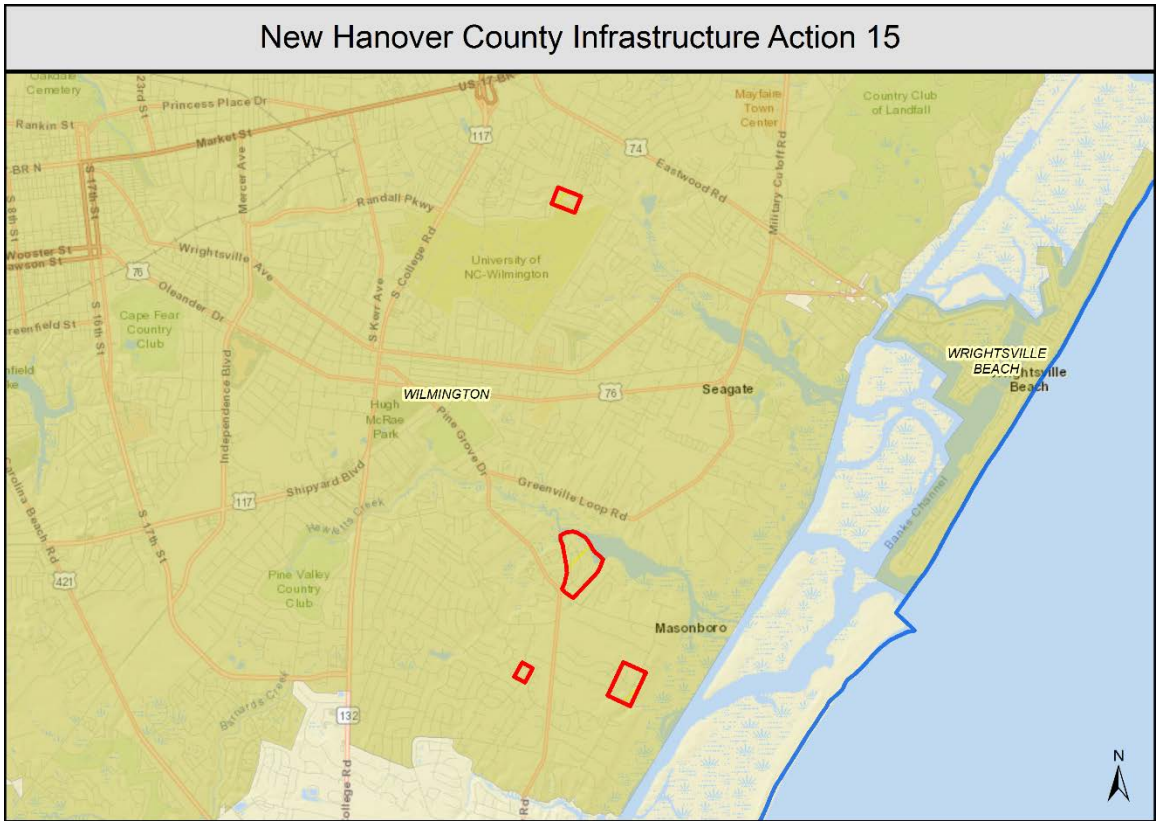


Figure 16. Infrastructure Strategy - Wilmington Stormwater Improvement Projects

City of Wilmington Stormwater Improvements

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 0

Project Timeframe: Clear Run Branch - YR 2017 through 2019
Pirates Cove - YR 2020 through 2021
Whispering Pines/Masonboro - YR 2020 through 2022
Kelly Road - YR 2021 through 2022

Location: City of Wilmington

Project Summary: The City of Wilmington has 4 proposed stormwater improvement projects to alleviate localized flooding and improve water quality. These projects are:
- Clear Run Branch Drainage Improvements. This project consists of installation of storm drain inlets and piping along College Acres Drive, culvert replacements at College Acres Ave and Mallard Street, and stream restoration of Clear Run between College Acres Drive and Mallard Street. This project has a total estimate cost of $4.6 million
- Pirates Cove Drainage Improvements. Cost estimated at $460,000
- Whispering Pines/Masonboro Drainage Improvements. Estimated cost $$2.1 million
- Kelly Road Drainage Improvements. Estimated cost $342,000

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Improved drainage will reduce the potential for flooding from future storm events.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Poorly functioning drainage infrastructure detracts new business and negatively affects housing prices. By improving the drainage home values are protected and new businesses are attracted to the area.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	50-100 year event	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	These projects are intended to control stormwater runoff and improve water quality.	N/A

What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$1M+	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A

- **City of Wilmington Storm Drainage Rehabilitation:** The City of Wilmington maintains a complex system of storm drains, pipes, ditches, ponds, culverts, creeks and wetlands. The City must perform storm drain rehabilitation as structures become aged or damaged due to large storm events. As a result of Hurricane Matthew, the City seeks assistance to offset additional costs of rehabilitation projects attributable to Hurricane Matthew.

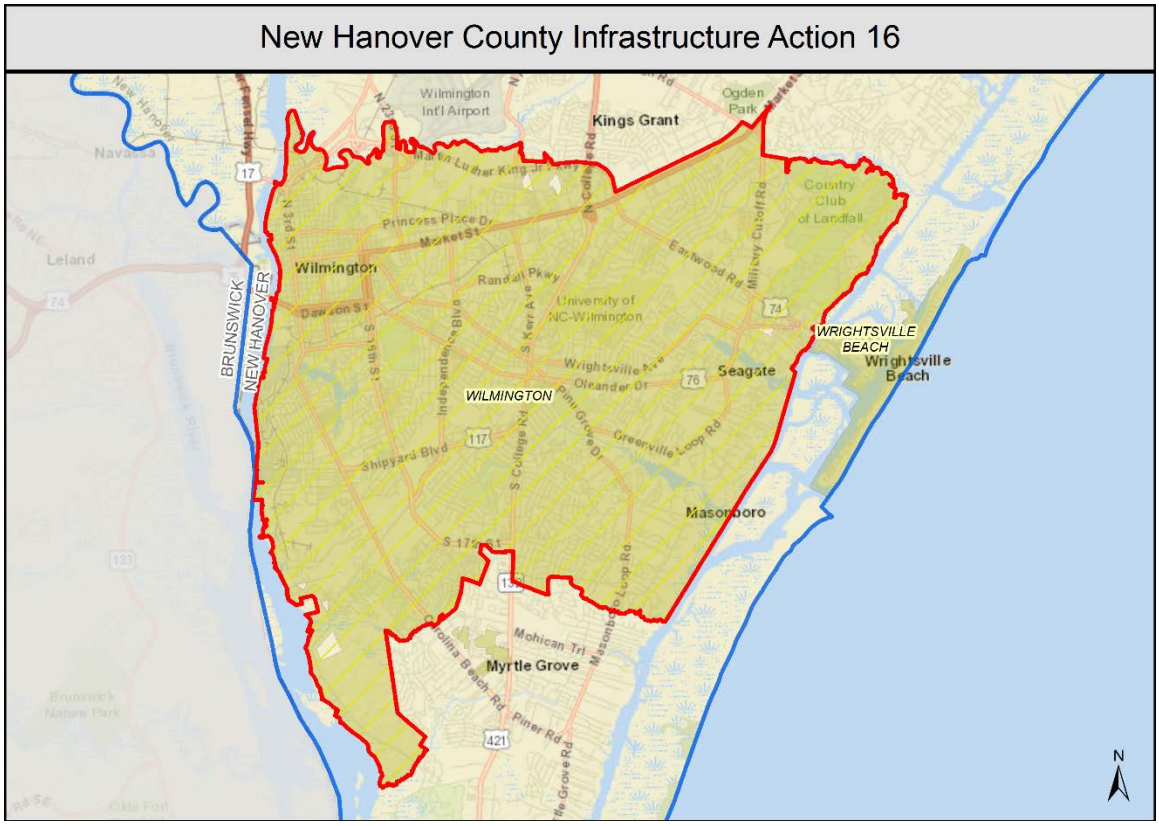


Figure 17. Infrastructure Strategy - Wilmington Storm Drainage Rehabilitation

City of Wilmington Storm Drainage Rehabilitation

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 0

Project Timeframe: 1-2 years

Location: City of Wilmington

Project Summary: The City of Wilmington maintains a complex system of storm drains, pipes, ditches, ponds, culverts, creeks and wetlands. The city must perform storm drain rehabilitation as structures become aged or damaged due to large storm events. As a result of Hurricane Matthew, the City seeks assistance to offset additional costs of rehabilitation projects attributable to Hurricane Matthew.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Drainage improvements will help reduce flooding issues.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Having improved utility infrastructure that functions as designed is attracted to drawing in new businesses.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	<50 year event	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	No impacts expected.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$501K - $1M	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A

- **Town of Kure Beach Stormwater Outfall Repair:** Over 20 stormwater outfalls were damaged during Hurricane Matthew. Repairs have been completed but the Town received funding for 75% of the approximately $140,000 cost of repair. Repair costs were much higher than originally estimated so the Town is seeking further funding assistance.

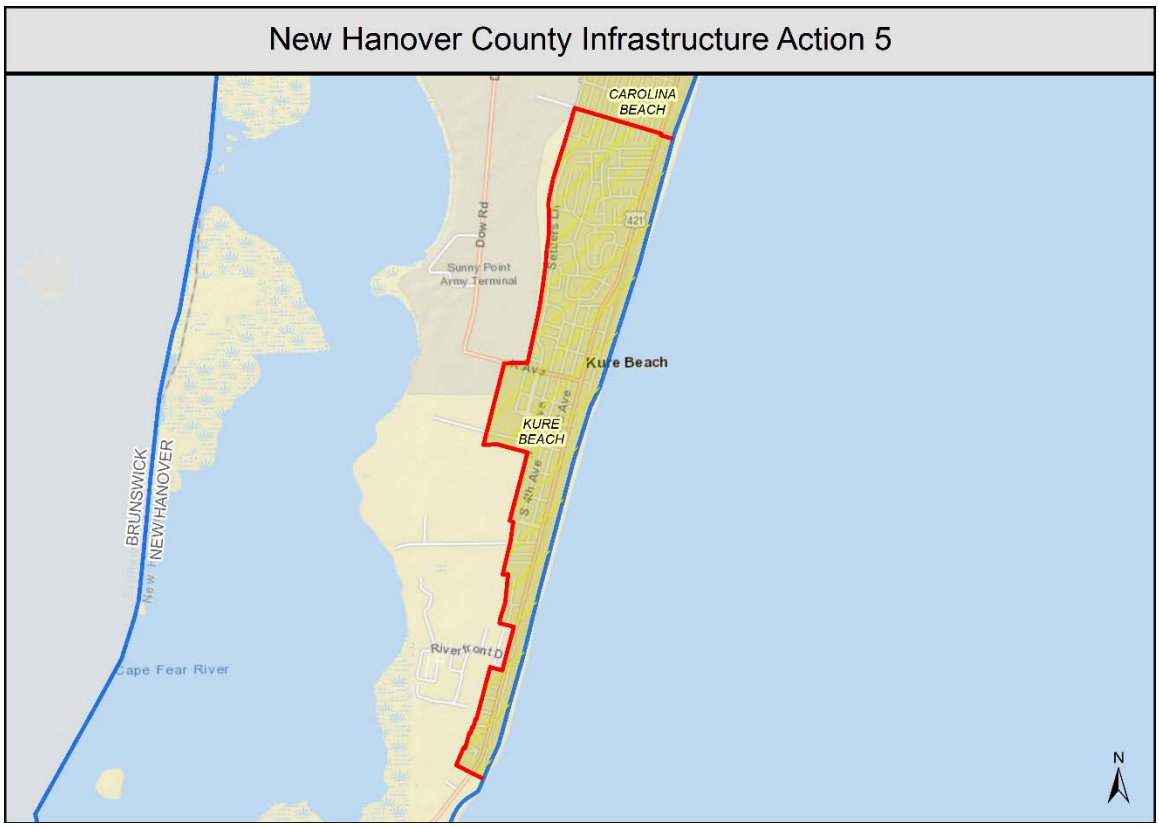


Figure 18. Infrastructure Strategy - Kure Beach Stormwater Outfall Repairs

Town of Kure Beach Stormwater Outfall Repair

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 0

Project Timeframe: Repairs have been made already, this action is to provide additional funding to offsets higher than expected costs incurred by the Town.

Location: Town of Kure Beach

Project Summary: Over 20 stormwater outfalls were damaged during Hurricane Matthew. Repairs have been completed but the Town received funding for 75% of the approximately $140,000 cost of repair. Repair costs were much higher than originally estimated so the Town is seeking further funding assistance.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The Town has already completed repairs to the damaged outfalls (damaged by Matthew) and received 75% reimbursement from PA claim. However, the total cost of repairs was higher than anticipated and the Town seeks funding to cover the un-met 25% of costs.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.		N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	No Impact	N/A
What impacts to the environment of the county will result from this project?	No known impacts to the environment.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$51K - $100K	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A

- **Remove remnants of Ethyl/Dow Bromine Extraction Ocean Intake Structure:** Remnants of the Ethyl/Dow Bromine Extraction Ocean Intake Infrastructure were exposed after Hurricane Matthew, especially during low tide. This presents a public health/public safety issue. The Town would like assistance with removal of the structure.

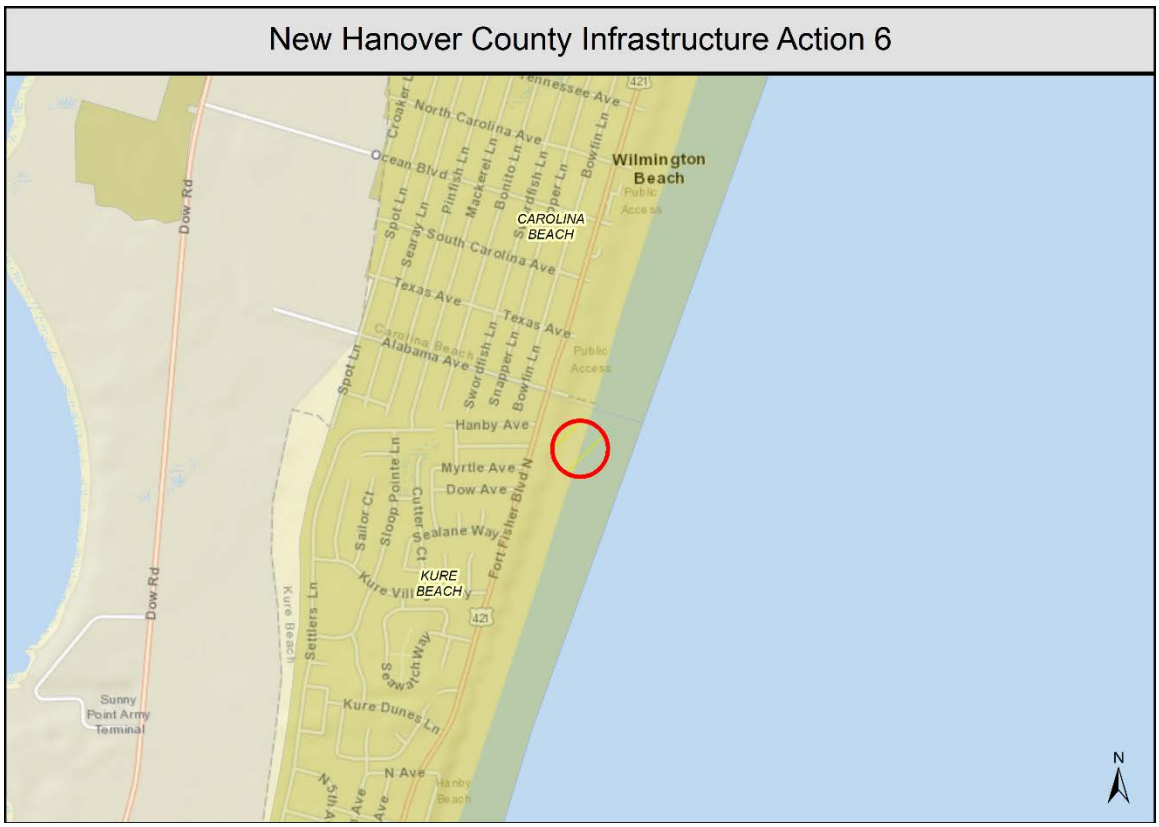


Figure 19. Infrastructure Strategy - Remove remnants of Ocean Intake Structure

Town of Kure Beach Ethyl/Dow Bromine Extraction Ocean Intake Structure Removal

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 0

Project Timeframe: 1-3 years

Location: Town of Kure Beach

Project Summary: Remnants of the Ethyl/Dow Bromine Extraction Ocean Intake Infrastructure were exposed after Hurricane Matthew, especially during low tide. This presents a public health/public safety issue. The Town would like assistance with removal of the structure.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Exposure of the ocean intake structure remnants by Hurricane Matthew is a public safety and health concern.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Beach tourism is a major economic generator for New Hanover County and Kure Beach. Maintaining safe beaches is a high priority for this area.	N/A
For how long will this solution be effective?	More than 50 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	N/A
What impacts to the environment of the county will result from this project?	No environmental impacts are expected.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$251K - $500K	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A

Medium Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	New Hanover County Vulnerable Local Road Upgrade	**Medium**	**10**
Infrastructure	New Hanover County Vulnerable NCDOT Road Upgrades	**Medium**	**11**

Table 10. Medium Priority Infrastructure Strategies

New Hanover County Vulnerable Local Road Upgrades: Several locations in New Hanover County experience localized flooding that can affect access to residents by emergency responders. Storm drainage upgrades to the following local roads (not-NCDOT maintained) would enhance access to and evacuation of communities during an event:

- Battleship Road - Storm drainage improvements along 0.7 miles of privately maintained roadway
- Bramble Court - Storm drainage improvements along 0.05 miles of privately maintained subdivision cul-de-sac roadway

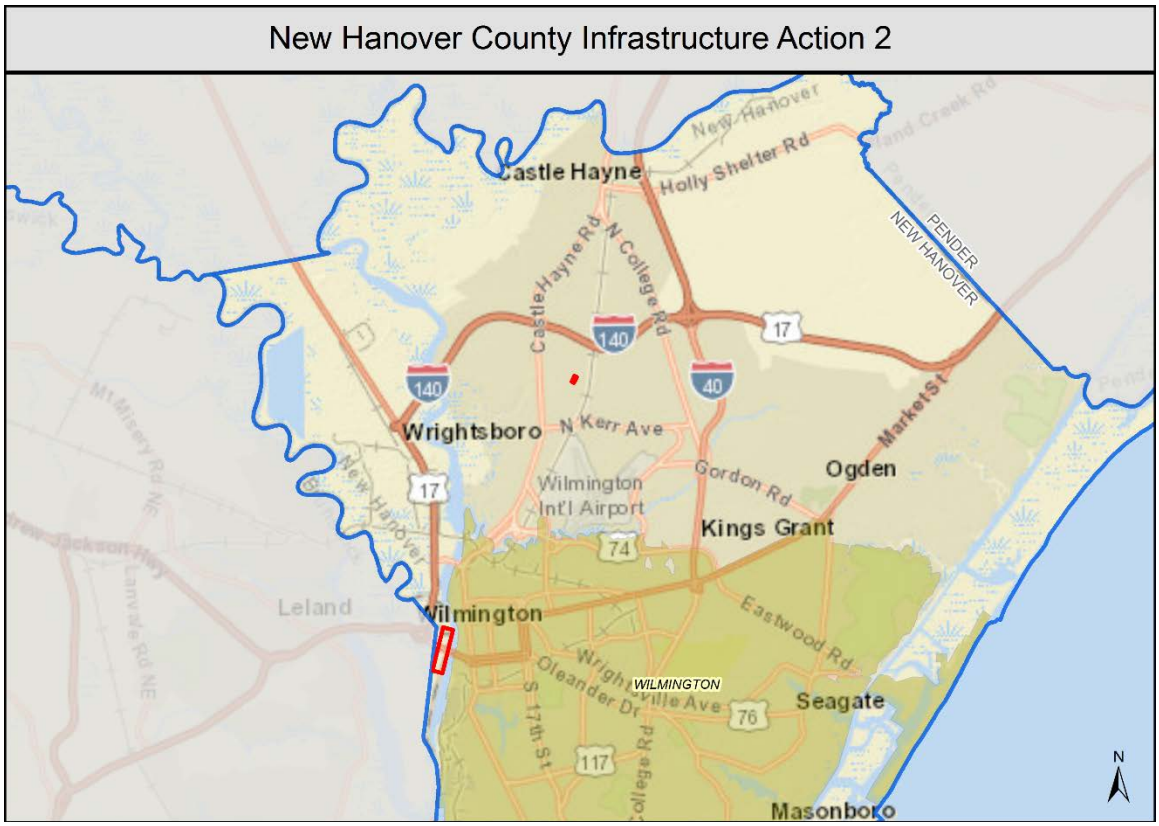


Figure 20. Infrastructure Strategy - Vulnerable Local Road Upgrades

New Hanover County Vulnerable Local Road Upgrades

County: New Hanover

Priority Grouping: Medium Priority

Priority Ranking: 10

Project Timeframe: 2-5yr

Location: New Hanover County

Project Summary: Several locations in New Hanover County experience localized flooding that can affect access to residents by emergency responders. Storm drainage upgrades to the following local roads (non-NCDOT) would enhance access to and evacuation of communities during an event.
-Battleship Road - Storm drainage improvements along 0.7 miles of privately maintained roadway
-Bramble Court - Storm drainage improvements along 0.05 miles of privately maintained subdivision cul-de-sac roadway

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Storm drainage improvements will reduce flooding along these roads improving emergency response capabilities during flooding events.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Roadway improvements should have a positive impact economically. In this case the impetus is safety. So at a minimum there should be significant benefits due to ability to evacuate and gain access for emergency responders.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	<50 year event	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Less than 25%	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	N/A
What impacts to the environment of the county will result from this project?	No impacts expected	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$1M+	N/A
What is the level of public support for this project?	Unknown	N/A
What is the technical feasibility of this project?	Between 26 and 50%	N/A
Who will administer this project?	County	N/A

- **New Hanover County Vulnerable NCDOT Road Upgrades:** Several locations in New Hanover County experience localized flooding that can affect access to residents by emergency responders. Storm drainage upgrades to the following NCDOT roads would enhance access to and evacuation of communities during an event.
    - River Road - Elevate 3.2 miles of roadway to reduce flooding potential from the Cape Fear River
    - Hewlett Drive – Upgrade failed stormwater infrastructure to ensure access to the Emergency Management Logistics Center during flooding events
    - Heritage Park Drive - Upgrade stormwater infrastructure to correct poor drainage and recurring flooding issues along 0.4 miles of residential subdivision street
    - NC117/N. College Road - Upsize culvert at Prince George Creek to reduce flooding potential
    - Castle Hayne - Upgrade Fulton Avenue storm drainage infrastructure to correct recurring flooding issues
    - Fleming Street & Flemington Road - Upgrade storm drainage infrastructure to correct recurring flooding issues
    - Roymac Drive and surrounding areas - Upgrade storm drainage infrastructure to correct recurring flooding issues

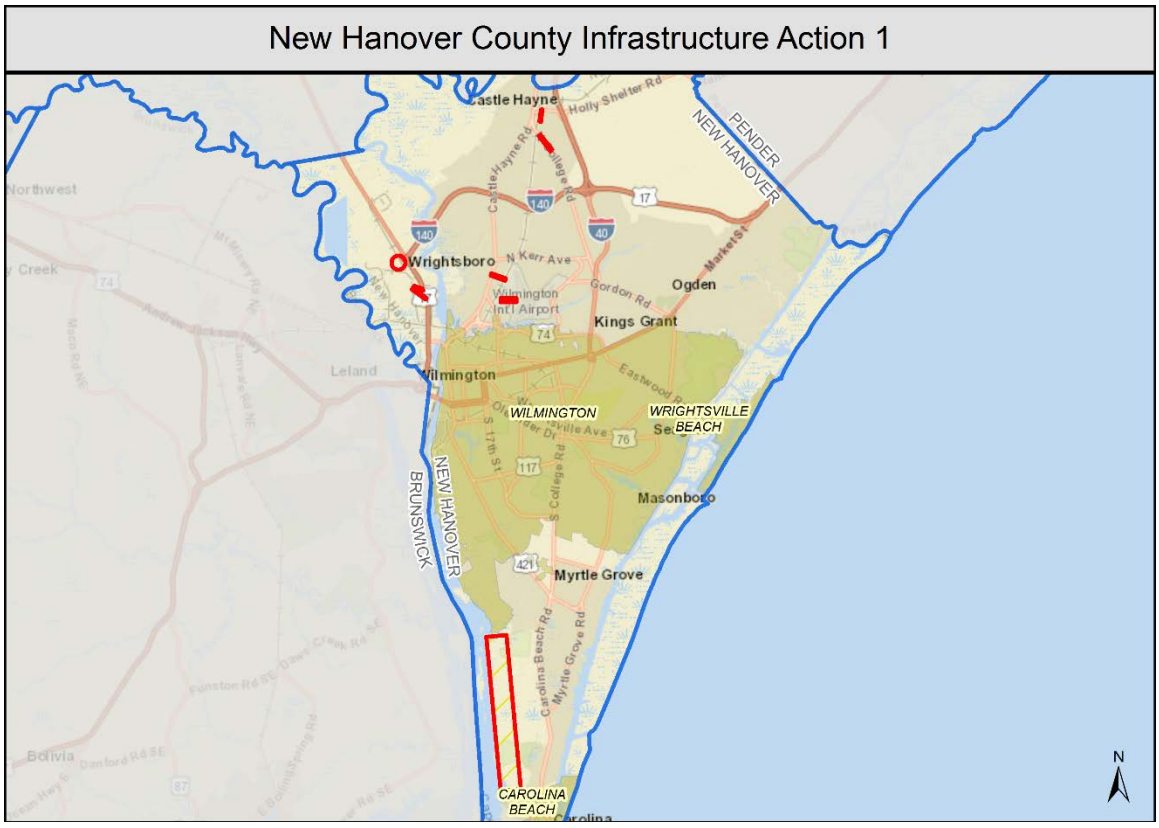


Figure 21. Infrastructure Strategy - NCDOT Road Upgrades

New Hanover County Vulnerable NCDOT Road Upgrades

County: New Hanover

Priority Grouping: Medium Priority

Priority Ranking: 11

Project Timeframe: 2-5 yr

Location: New Hanover County

Project Summary: Several locations in New Hanover County experience localized flooding that can affect access to residents by emergency responders. Storm drainage upgrades to the following NCDOT roads would enhance access to and evacuation of communities during an event.
- River Road - Elevate 3.2 miles of roadway to reduce flooding potential from Cape Fear River
- Hewlett Drive – Upgrade failed stormwater infrastructure to ensure access to Emergency Management Logistics Center during flooding events
- Heritage Park Drive - Upgrade stormwater infrastructure to correct poor drainage and recurring flooding issues along 0.4 miles of residential subdivision street
- NC117/N College Road - Upsize culvert at Prince George Creek to reduce flooding potential
- Castle Hayne - Upgrade Fulton Avenue storm drainage infrastructure to correct recurring flooding issues
- Fleming Street & Flemington Road - Upgrade storm drainage infrastructure to correct recurring flooding issues
- Roymac Drive and surrounding areas - Upgrade storm drainage infrastructure to correct recurring flooding issues

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Roadway flooding at these locations occurred during Hurricane Matthew. Improving these locations will make the County better able to withstand and bounce back from future events.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Road improvements to reduce flooding potential can positively affect the economy by allowing businesses to reopen and residents to return to work faster following a flooding event.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	>6	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Less than 25%	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	Unknown at this time	N/A

What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$1M+	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	State	N/A

Environmental, Ecosystem and Agricultural Strategies

High Priority Environmental Strategies

Pillar	Action Name	Priority	Overall Ranking
Environment	Stream Debris Removal	**High**	**2**

Table 11. High Priority Environmental Strategies

New Hanover County has a number of opportunities for enhancing environmental resources for resiliency, education, economic development and recreational purposes. The following strategies will address local concerns related to resiliency and environmental concerns.

- **Stream Debris Removal:** Clear vegetative debris and obstructions from approximately 900 linear feet of Whiskey Creek. The area around Whiskey Creek experiences nuisance flooding attributable to poor drainage and blockages in Whiskey Creek.

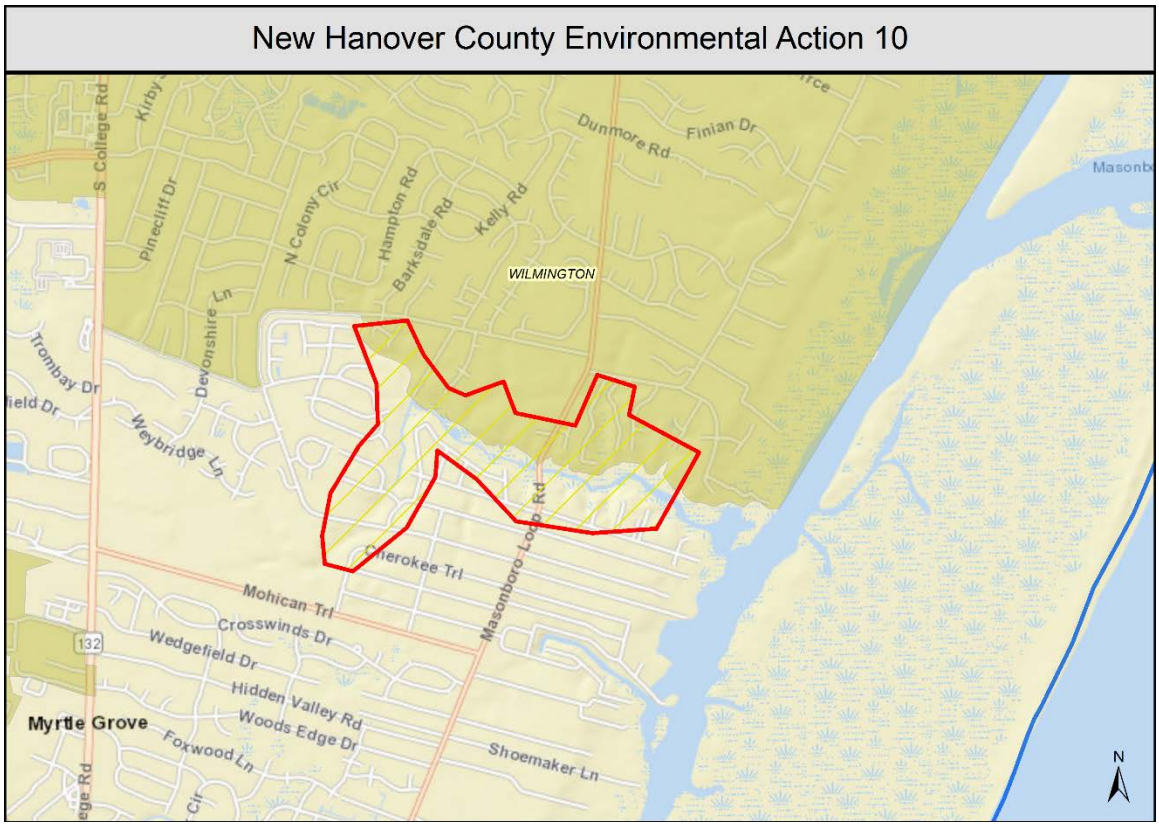


Figure 22. Environmental Strategy - Stream Debris Removal

Stream Debris Removal

County: New Hanover

Priority Grouping: High Priority

Priority Ranking: 2

Project Timeframe: 1-2 years

Location: Whiskey Creek New Hanover County

Project Summary: Clear vegetative debris and obstructions from approximately 900 linear feet of Whiskey Creek.

This action was submitted for HMGP funding.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Hurricane Matthew caused local flooding and drainage related nuisances in the vicinity of Whiskey Creek.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	No effect on the economy	N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	No Impact	N/A
What impacts to the environment of the county will result from this project?	This action will not impact the bed and banks of the stream so environmental impacts are expected to be minimal.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$101K - $250K	N/A
What is the level of public support for this project?	Unknown	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	County	N/A

Medium Priority Environmental Strategies

Pillar	Action Name	Priority	Overall Ranking
Environment	Stream Water Quality Mitigation	**Medium**	**6**
Environment	Expansion of Recreational Land/Preservation of Floodplain	**Medium**	**7**
Environment	Airlie Gardens Stormwater Improvements	**Medium**	**9**

Table 12. Medium Priority Environmental Strategies

- **Stream Water Quality Mitigation:** Preliminary source tracking efforts have determined that 7 tidal creeks within New Hanover County have been contaminated with bacterial contamination originating from human waste. Conditions seem to be exacerbated by storm events such as Hurricane Matthew. The County will be initiating a thermal imaging project in an attempt to identify point sources and pathways of this contamination and a structural BMP installation project to improve water quality. The innovative use of living shoreline to increase resilience of coastal areas by reducing erosion and degradation of salt marsh and other estuary areas is being considered. The overall goals would be to improve water quality, potentially re-invigorate the struggling shellfish industry by opening closed shellfish beds in Futch and Pages Creek, and improve shoreline stability and resiliency. Waterbodies to be included in this action are:
    - Motts Creek
    - Pages Creek
    - Bernards Creek
    - Futch Creek
    - Howe Creek
    - Prince George Creek
    - Smith Creek

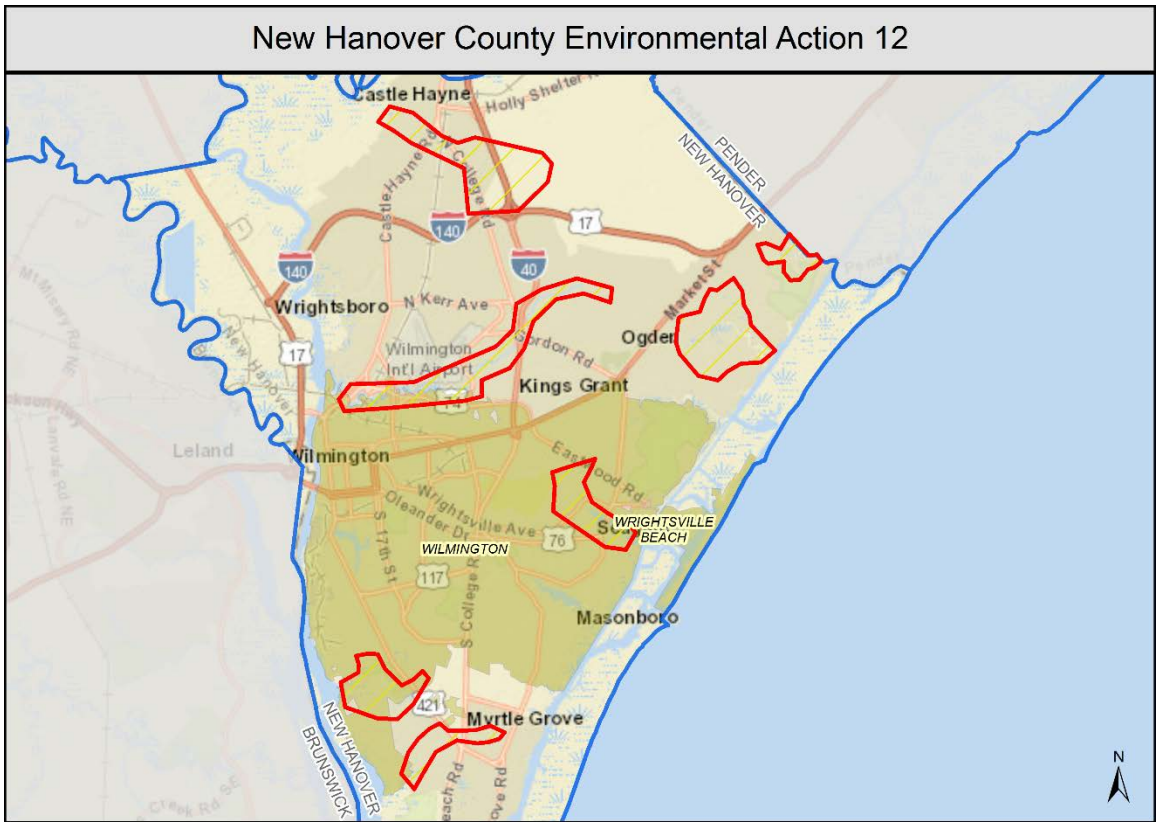


Figure 23. Environmental Strategy - Stream Water Quality Mitigation

Stream Water Quality Mitigation

County: New Hanover

Priority Grouping: Medium Priority

Priority Ranking: 6

Project Timeframe: 1-5 years

Location: New Hanover County

Project Summary: Preliminary source tracking efforts have determined that 7 tidal creeks within New Hanover County have been contaminated with bacterial contamination originating from human waste. Conditions seem to be exacerbated by storm events such as Hurricane Matthew. The County will be initiating a thermal imaging project in an attempt to identify point sources and pathways of this contamination and a structural BMP installation project to improve water quality. The innovative use of living shoreline to increase resilience of coastal areas by reducing erosion and degradation of salt marsh and other estuary areas is considered. The overall goals would be to improve water quality, potentially re-invigorate the struggling shellfish industry by opening closed shellfish beds in Futch and Pages Creek, and improve shoreline stability and resiliency.

Waterbodies to be included in this action are Motts Creek, Pages Creek, Bernards Creek, Futch Creek, Howe Creek, Prince George Creek, and Smith Creek.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	There is not a direct un-met need related to this action. However, this action fits into the overall idea of resiliency and sustainability in New Hanover County.	N/A
Consistent with existing plans (describe points of intersection/departure)	Unknown	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Improved water quality may allow the closed shellfish beds to reopen invigorating the struggling aquaculture economy.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	High confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	The overall goals of this action would be to improve water quality potentially re-invigorate the struggling shellfish industry by opening closed shellfish beds in Futch and Pages Creek and improve shoreline stability and resiliency.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$501K - $1M	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Between 26 and 50%	N/A
Who will administer this project?	County	N/A

- **Expansion of Recreational Land/Preservation of Floodplain**: In accordance with the Southeastern NC Regional Hazard Mitigation plan, New Hanover County will identify opportunities to acquire or purchase land located in storm hazard areas to conserve open space and preserve or enhance floodplain areas to reduce future flooding. The adoption of the FEMA Preliminary maps may result in properties becoming targets for acquisition or preservation of floodplain.

Expansion of Recreational Land/Preservation of Floodplain

County: New Hanover

Priority Grouping: Medium Priority

Priority Ranking: 7

Project Timeframe: 1-5 years

Location: Across New Hanover County

Project Summary: In accordance with the Southeastern NC Regional Hazard Mitigation plan, New Hanover County will identify opportunities to acquire or purchase land located in storm hazard areas to conserve open space and preserve or enhance floodplain areas to reduce future flooding. The adoption of the FEMA Preliminary maps may result in properties becoming targets for acquisition or preservation of floodplain.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Although there were only limited impacts caused by flooding from Hurricane Matthew this action will be beneficial to the County and limit potential impacts in future events.	N/A
Consistent with existing plans (describe points of intersection/departure)	This action is consistent with the Southeast NC Regional Hazard Mitigation Plan.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	This action is not expected to have any effect on the economy.	N/A
For how long will this solution be effective?	More than 50 years	N/A
How effective is the risk reduction?	100-200 year event	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	No Impact	N/A
What impacts to the environment of the county will result from this project?	Acquisition or protection of floodplain areas will limit loss of riparian buffer thus positively affecting water quality and offsetting the negative impacts of increased impervious area.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$1M+	N/A
What is the level of public support for this project?	Unknown	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	County	N/A

- **Airlie Gardens Stormwater Improvements:** The county plans to enhance its experiential learning center at Airlie Gardens by performing several closely related projects to enhance the variety of landscapes and ecosystems on the property. Airlie Gardens encompasses 67 acres of walking paths, a freshwater lake, and formal gardens that showcase seasonal blooms, mighty live oaks, historic structures, and contemporary sculpture. The County has planned projects focused on improving environmental issues at Airlie Gardens. Projects will include planting a Cypress Swamp, constructing a forebay to protect the existing lake, stream restoration to reconnect the stream to floodplain benches and the groundwater table, installation of water quality devices such as floating wetlands, and lake dredging to increase water depth in the lake.

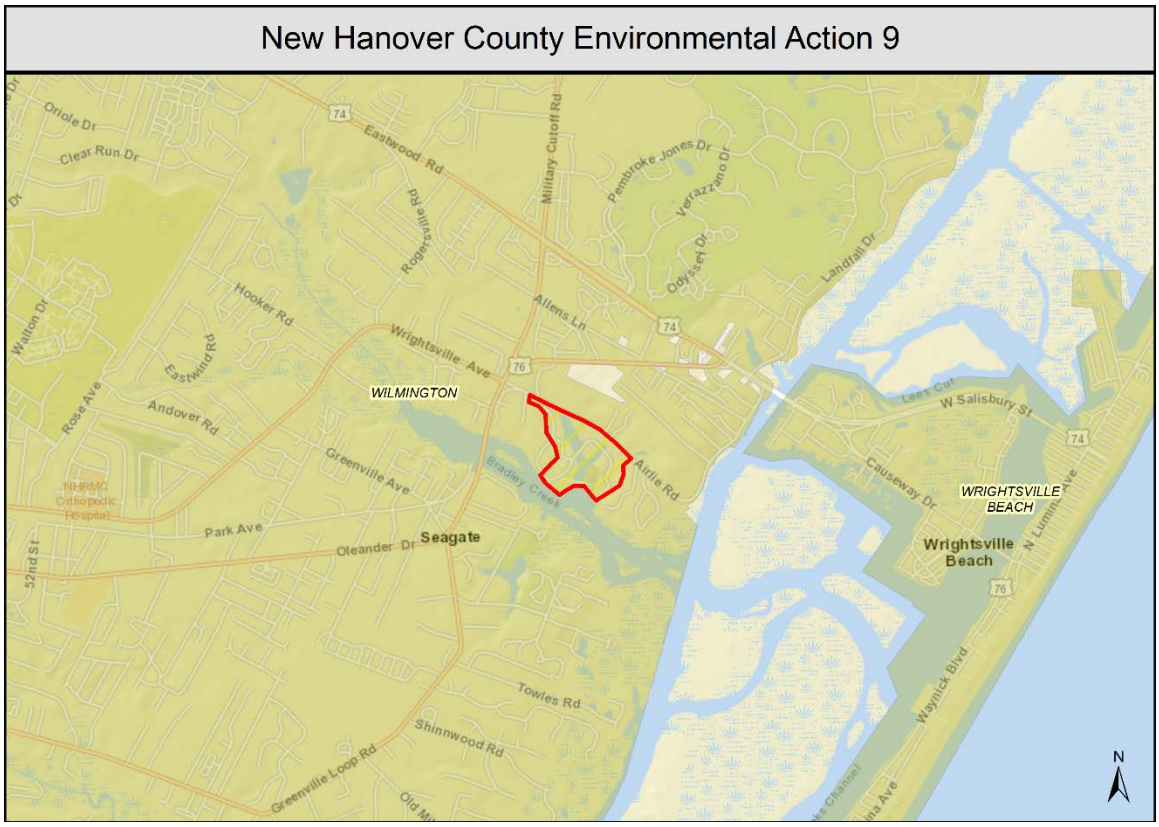


Figure 24. Environmental Strategy - Airlie Gardens Stormwater Improvements

Airlie Gardens Stormwater Improvements

County: New Hanover

Priority Grouping: Medium Priority

Priority Ranking: 9

Project Timeframe: 2-3 years

Location: New Hanover County

Project Summary: The county plans to enhance its experiential learning center at Airlie Gardens by performing projects to enhance the variety of landscapes and ecosystems on the property. Airlie Gardens encompasses 67 acres of walking paths, a freshwater lake, and formal gardens that showcase seasonal blooms, mighty live oaks, historic structures, and contemporary sculpture. The County has planned projects focused on improving environmental issues at Airlie Gardens. Projects will include planting a Cypress Swamp, constructing a forebay to protect the existing lake, stream restoration to reconnect the stream to floodplain benches and the groundwater table, installation of water quality devices such as floating wetlands, and lake dredging to increase water depth in the lake.

This action has been submitted for HMGP funding.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Hurricane Matthew rainfall contributed to degradation of the lake and streams on-site however this action is not a direct result of damage caused by Hurricane Matthew.	N/A
Consistent with existing plans (describe points of intersection/departure)	This project is consistent with the County Parks and Gardens master plan.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	This action will have limited benefits on the local economy.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	The main goal of this project is to enhance and protect the varied ecosystems of Airlie Gardens from the effects of upstream development that poses a direct threat to the health of Airlie Lake in particular.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	$251K - $500K	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	County	N/A

Summary

Implementation has already begun for some of these actions but for those that have not already been funded, the State of North Carolina will begin a process of prioritizing the actions and seeking to match a funding stream to each action. Those that are not matched with a funding source will be added to the State's Unmet Needs Report. Funding for Unmet Needs will be sought through additional funding from Congress and from the North Carolina General Assembly. Any action that cannot be matched to a funding source should be incorporated into the County's Hazard Mitigation Plan for consideration for future funding. It is important to seek to implement as many of these actions as feasible. Doing so will significantly contribute to helping improve the resiliency of North Carolina's communities.