

Hurricane Matthew Resilient Redevelopment Plan

Washington County



May 2017

Version 1.2

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Change Log

Version	Date	Summary of Changes
1.1	6/15/17	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 25 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) initiative 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.

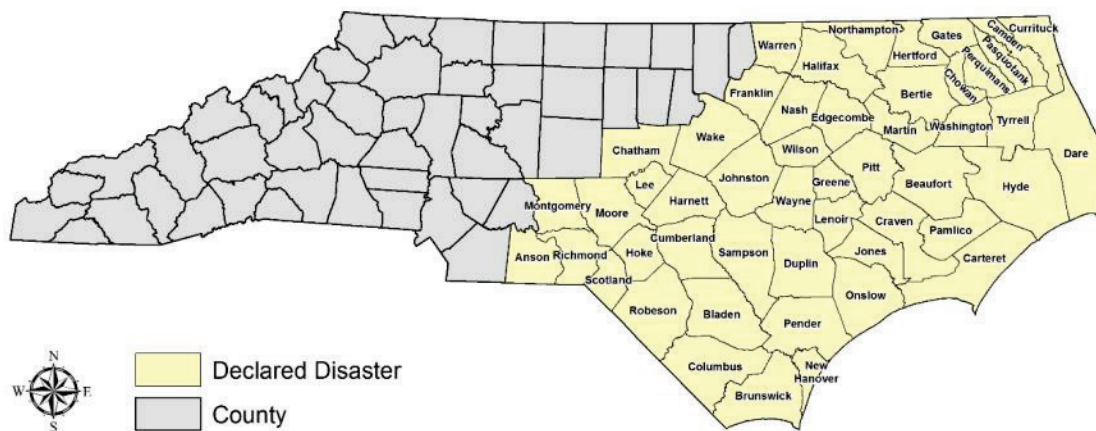


Figure 1. NCRRP Counties

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, Washington County has identified 16 projects in four pillars: Housing, Economic Development, Infrastructure, and Environment. Details of these projects can be found in Section 4 of this plan.

Pillar	Project/Action Count
Housing	4
Economic Development	4
Infrastructure	8
Environment	0
Grand Total	16

Table 1. Washington County Summary of Projects by Pillar



1. Background

1. Background

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

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.

- There were 81,832 individuals registered for FEMA/state assistance.

² Governor McCrory's Request for Federal Assistance for Hurricane Matthew Recovery, November 14, 2016

- 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) recommendation 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 initiative 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 initiative 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 initiative 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. Four 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 affected 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.

Meeting 4 – NCEM presented actions developed during the course of the planning process and allowed the county to rank actions; apply High, Medium, or Low Prioritization; and approve inclusion of the actions in the final 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 resilient 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.

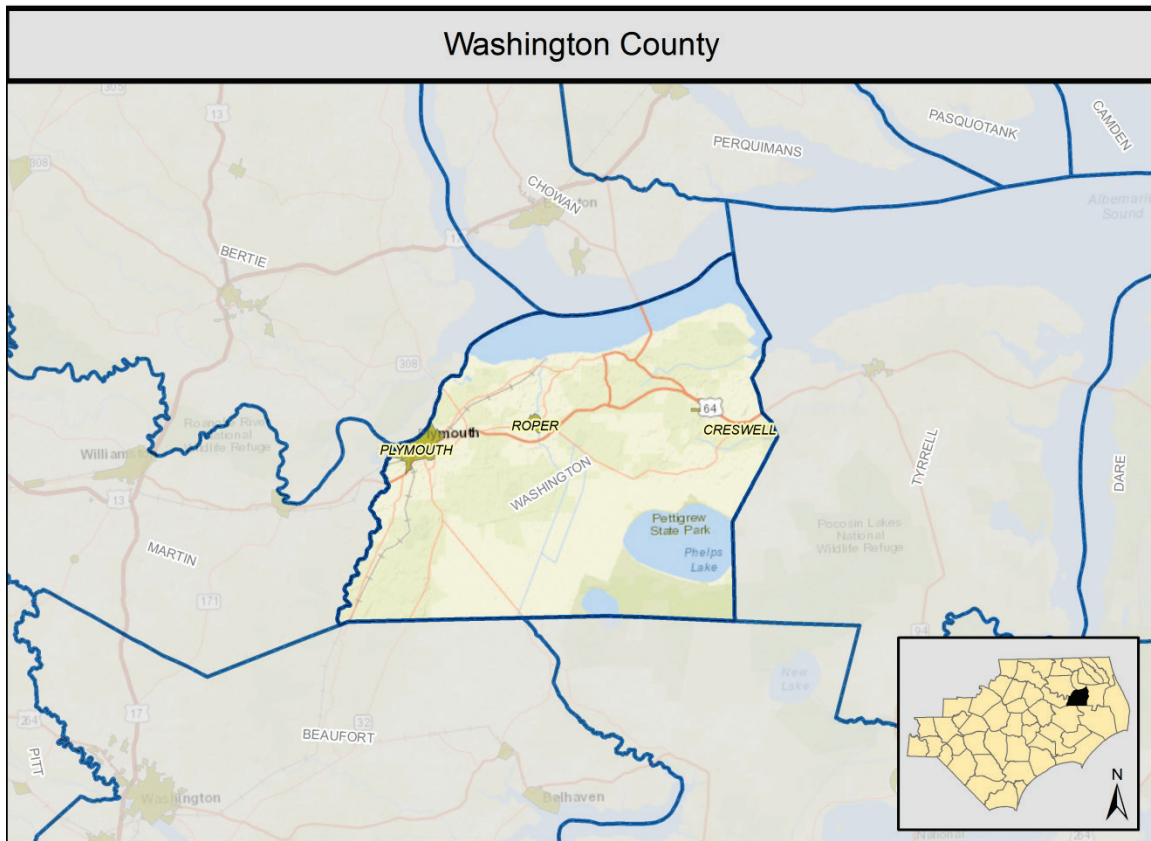


Figure 2. Washington County and Neighboring Counties

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.

An aerial photograph showing a residential area severely affected by flooding. In the upper half of the image, a large body of muddy, brown floodwater has inundated the landscape, submerging numerous trees and parts of several houses. The water appears to be flowing from the top left towards the center. Below the flooded area, a cluster of houses with grey roofs and light-colored siding is visible. Some of these houses are partially surrounded by water, while others are on slightly elevated ground. A network of roads and paths crisscrosses the area, some of which are also flooded. The lower half of the image is dominated by a dense forest of green trees, which appears to be less affected by the immediate flooding. The overall scene conveys a sense of significant environmental impact and potential property damage.

2. County Profile

2. County Profile

Washington County is located in eastern North Carolina between Raleigh and the Outer Banks. It is comprised of three census-designated places: the towns of Creswell, Plymouth, and Roper. Its current population is 12,668. This section provides a profile of housing, economics, infrastructure, environment, and administration within Washington County.

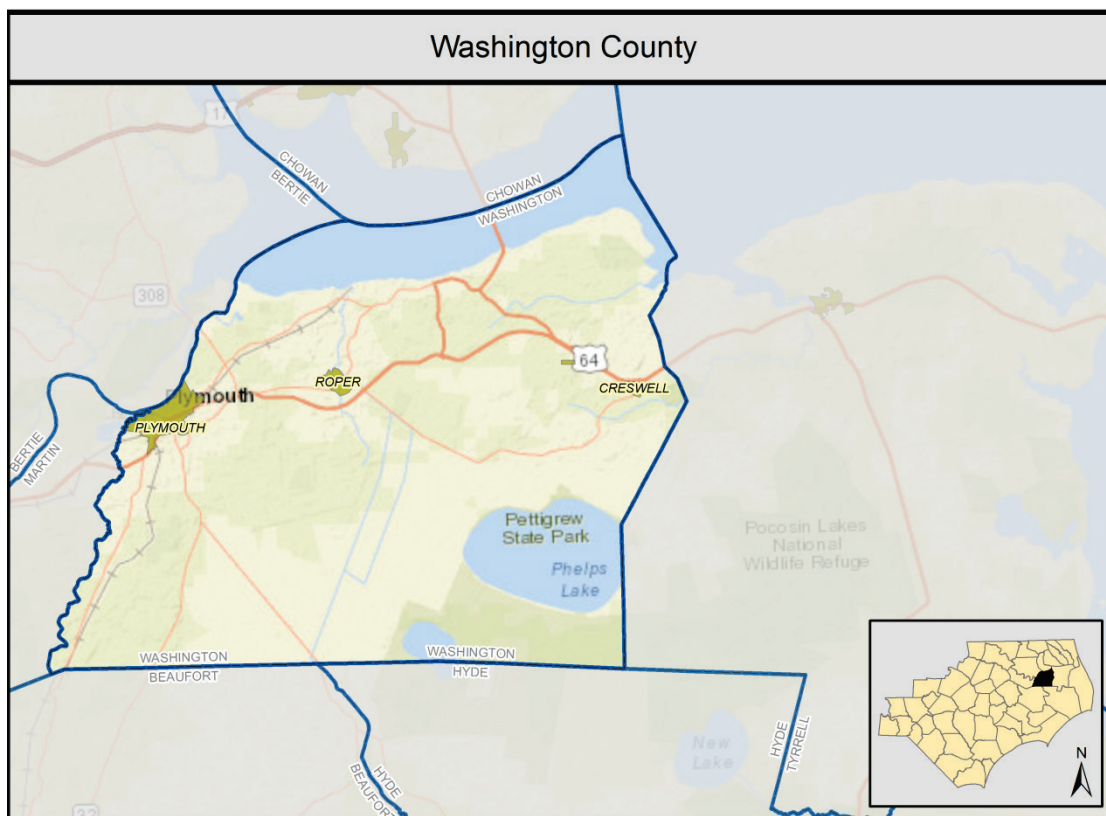


Figure 3. Washington Base Map

Demographic Profile

Demographics for Washington 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

Washington County has a population of 12,668. Plymouth is the most populous place within Washington County with a population of 3,736 and Creswell is the least populous place with a population of 294.³

Population Change (2000 to 2010)

The Washington County population decreased slightly between the 2000 and 2010 Census. In 2000 the population was 13,723 and in 2010 it was 13,228. The population declined by 495 people, or approximately 3.6

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

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 Washington County is 45, which is slightly higher than the median age of 42 for North Carolina. Within Washington County, the Plymouth population has the oldest median age, 48, and the Roper population has the youngest median age, 31.³

Race and Ethnicity

Washington County is mostly African American (49 percent) and White (47 percent) and with other races constituting the remaining 4 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.⁵

Within Washington County, Plymouth and Roper are predominantly African American while Creswell is predominately White.

The Latino population in Washington County is 4.7 percent compared to 9 percent for North Carolina. Roper has the largest Latino population (11 percent), Creswell has the second highest (6.1 percent), and Plymouth has the smallest (1.1 percent).

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
Creswell	63.9%	36.1%	0.0%	0.0%	0.0%	0.0%	0.0	36.1%
Plymouth	33.0%	65.4%	0.2%	0.0%	0.0%	1.1%	0.3	67.0%
Roper	20.4%	77.8%	0.0%	0.0%	0.0%	0.0%	1.8	79.6%
Washington County	46.9%	49.1%	0.79%	1.2%	.98%	.63%	.40%	53.1%
North Carolina	69.5%	21.5%	1.2%	2.5%	0.1%	3.0%	2.4%	30.5%

Table 2. Washington 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 Washington County, all individuals identified as LEP speak Spanish. Similarly, the primary language group for LEP individuals in North Carolina is Spanish. Within Washington County, Roper has the largest LEP population.⁶

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 B02001 Race and Table B03002 Hispanic or Latino Origin by Race.

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.

Poverty

In Washington County, 22 percent of the population is below the poverty level compared to 17 percent of the North Carolina population. In Roper, 55 percent of the populations are below the poverty level, 33 percent in Plymouth, and 22 percent in Creswell.⁷

Low and Moderate Income Individuals

In Washington 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 \$35,039 in Washington County and \$53,000 in North Carolina. Median household income was not available for the individual communities.⁹

Zero Car Households¹⁰

In Washington County, 12 percent of households do not have a vehicle available compared to 7 percent of North Carolina households. Within Washington County, Roper has the highest percentage of households without access to a vehicle, 33 percent, while Creswell has the lowest percentage: 7 percent.

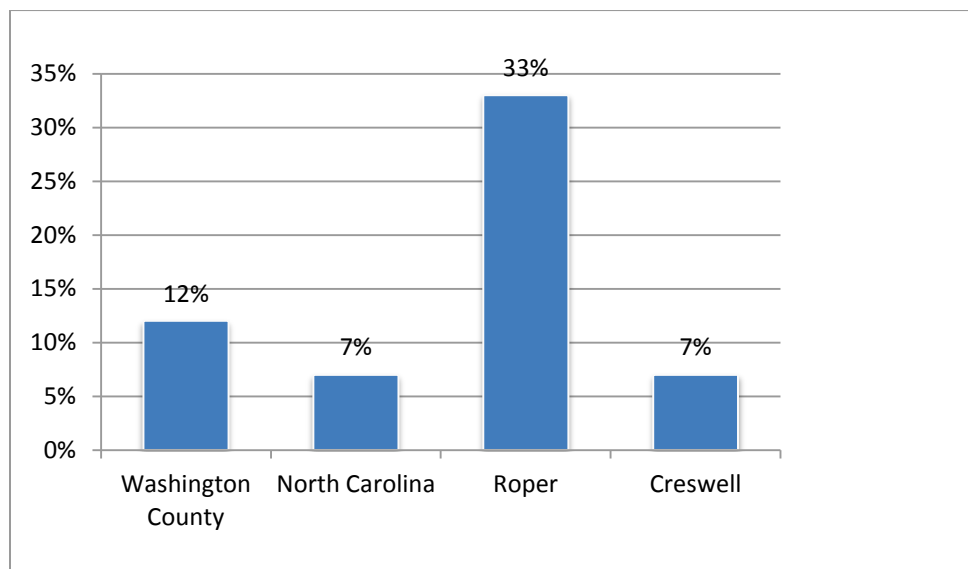


Figure 4. Zero Car Households by Percentage

Commuting: Travel Time to Work, Means of Transportation¹¹

The majority of Washington County residents commute alone to work by vehicle, 81 percent, which is the same as the North Carolina average. Within Washington County, Creswell has the largest percentage of commuters

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/>

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).

commuting alone, 92 percent, Plymouth is second with 81 percent, and Roper has the smallest percentage with 69 percent.

None of the populations in Washington County commute using public transportation. A small percentage of Roper and Creswell residents commute by walking, bike, or motorcycle (2 percent and 5 percent respectively). The North Carolina average is 2 percent.

The mean commute time to work for Washington County residents is 25.9 minutes. In comparison, the North Carolina mean commute time is 24.7 minutes. Within Washington County, Plymouth has the shortest mean commute time at 18.5 minutes while Creswell has the longest at 30.5 minutes.

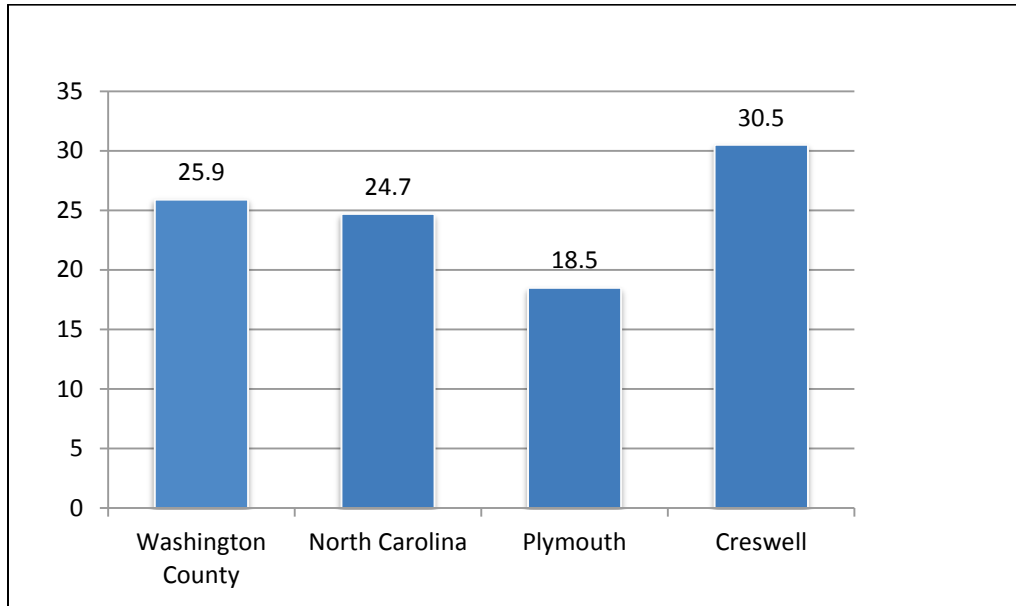


Figure 5. Mean Commute Time to Work in Minutes

Housing Profile¹²

Washington County has over 6,455 housing units, 64 percent of which are single-family homes, 10 percent multi-family units, and 26 percent manufactured housing.

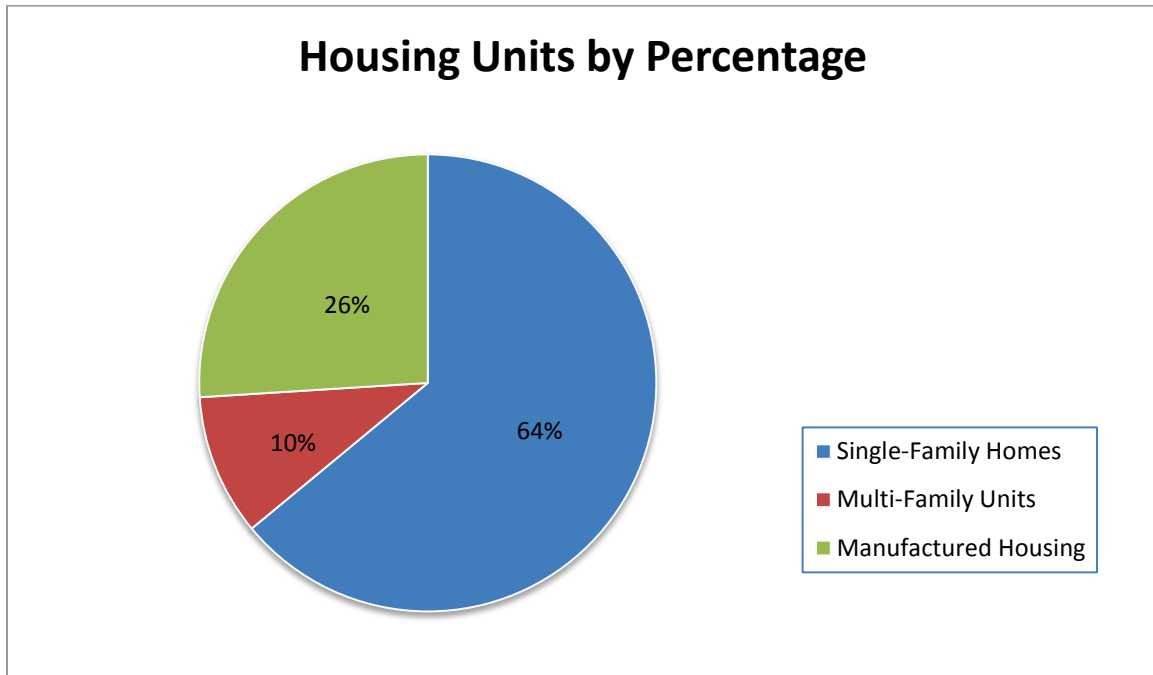


Figure 6. Housing Units by Percentage

In Washington County 19 percent of housing units are vacant, which is slightly higher than the percentage for North Carolina (15 percent). Within Washington County, Creswell, Plymouth, and Roper have an equal percentage of vacant housing units, 20 percent.

Of the occupied housing units, 69 percent are owner-occupied compared to 65 percent in North Carolina; 31 percent are renter-occupied compared to 35 percent in North Carolina.

The median housing value in Washington County is \$82,700. In comparison, the median housing value in North Carolina is \$140,000. Within Washington County, Creswell has the highest median housing value: \$97,000. Roper has the lowest median housing value: \$65,900.

According to the National Housing Preservation Database, Washington County has 571 affordable housing units.

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.

Economic/Business Profile

Washington County is home to a range of businesses, including Agriculture, Forestry, Fishing and Hunting; Manufacturing; Retail Trade; Educational Services; Health Care and Social Assistance; Accommodation and Food Services; and Public Administration.¹³

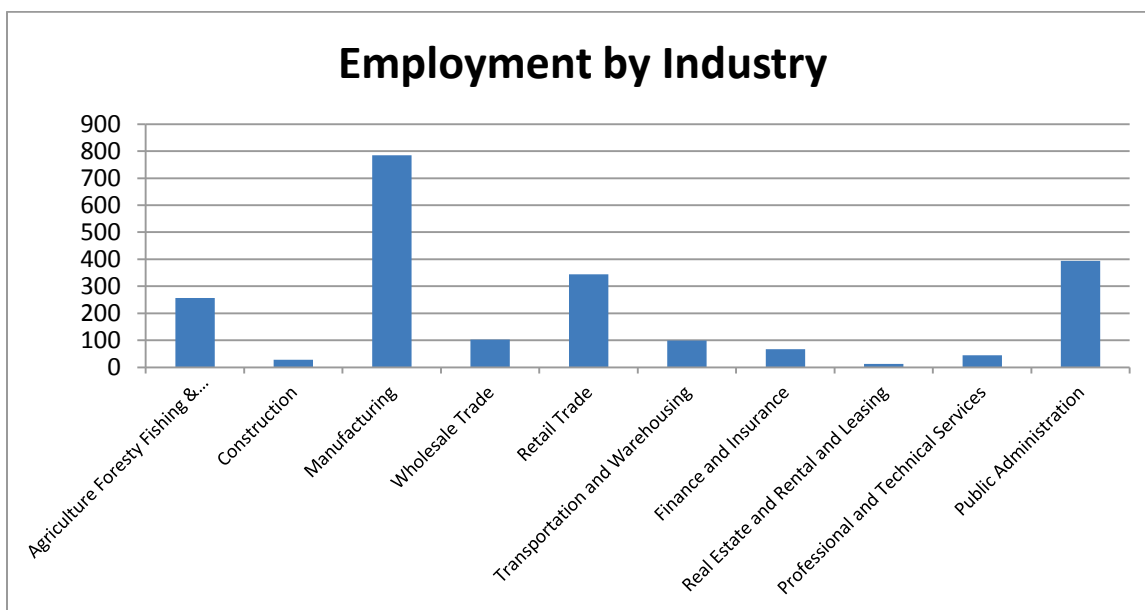


Figure 7. Employment by Industry

According to the US Census Bureau's Longitudinal-Employer Household Dynamics Program, the largest concentrations of jobs within Washington County are in the western part of the county in and around Plymouth.¹⁴

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 Washington County is 4,921.¹⁵ Within Washington County, Creswell has the largest percentage of residents 16 years or over in the labor force, 60 percent, while Plymouth has the smallest: 47 percent.¹⁶

The civilian unemployment rate in Washington County is 7.4 percent. In comparison, the North Carolina civilian unemployment rate is 5.1 percent.¹⁵ Within Washington County, Creswell has the smallest civilian unemployment rate at 6 percent while Roper has the largest: 19 percent.¹⁶

13 Source: AccessNC – North Carolina Department of Commerce, April 2017:
<http://accessnc.nccommerce.com/DemoGraphicsReports/pdfs/countyProfile/NC/37187.pdf>

14 Source: US Census Bureau Longitudinal-Employer Household Dynamics Program

15 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>

16 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 Washington County¹⁷ represent the manufacturing; public administration; education and health service industries; leisure and hospitality; and trade, transportation and utilities sectors, and are listed in order of total employees.

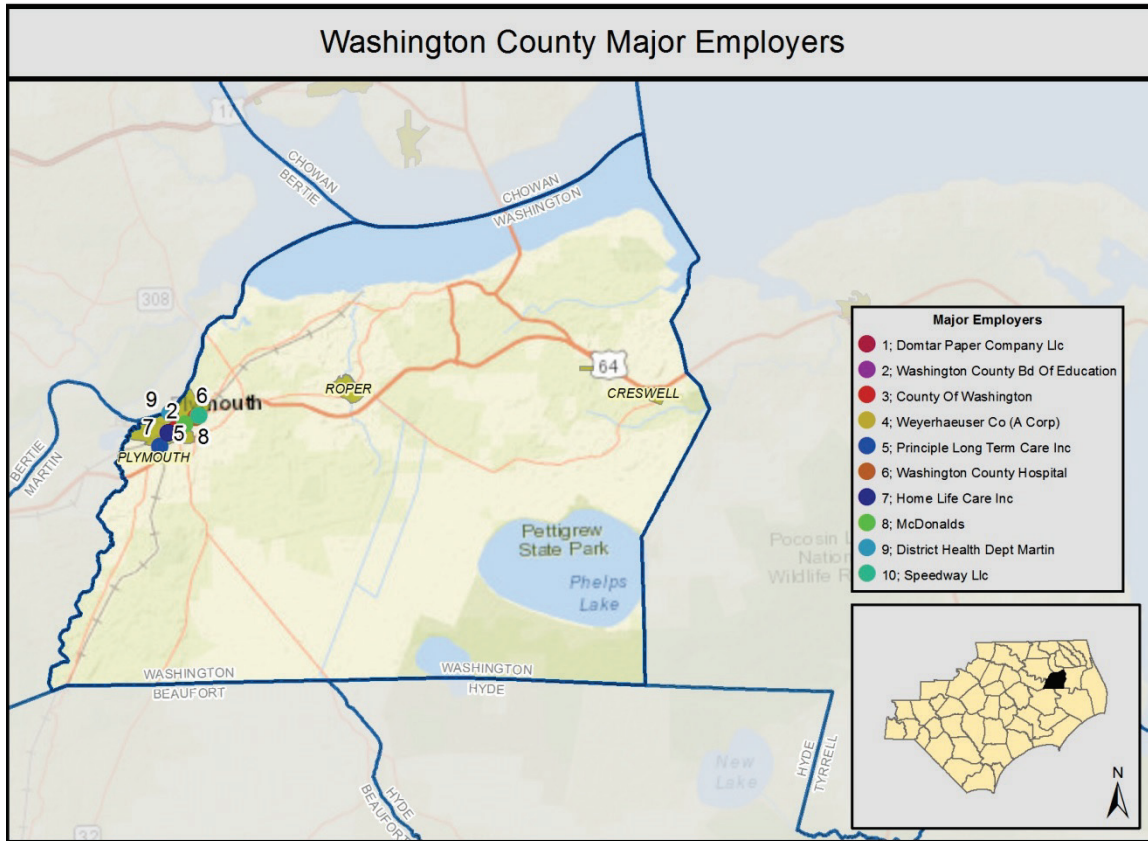


Figure 8. Major Employers by Number of Employee

Economic Development¹⁸

Washington County maintains an Economic Development Department. There are no community colleges located in Washington County.

¹⁷ Source: NC Department of Commerce

¹⁸ Sources: Washington County and North Carolina Community College System

Infrastructure Profile

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

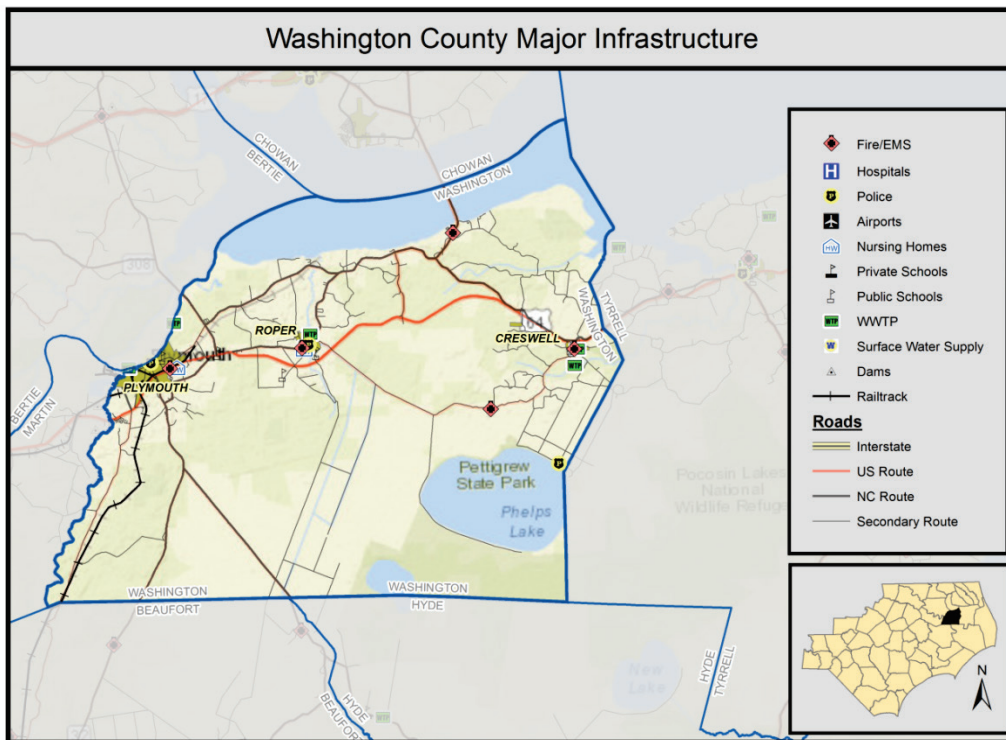


Figure 9. Washington County Major Infrastructure

Transportation

Major highways in Washington County include US 64, NC 32, NC 45, NC 94, NC 99, and NC 308.

Health

Washington County Hospital (WCH) in Plymouth is the only hospital located in Washington County. WCH is a 25-bed critical access hospital located on Highway 64 East. The hospital offers a broad range of services including emergency, surgery services, radiology, laboratory, physical rehabilitation, Plymouth primary care rural health clinic, acute care, pulmonary rehabilitation, and swing bed.

Education¹⁹

Washington County Public Schools administers two elementary, two middle, and two high schools. The nearest community colleges are Martin Community College in Williamston, NC (in neighboring Martin County) and Beaufort County Community College in Washington, NC (in neighboring Beaufort County).

Water

The Plymouth Water System is owned by the City of Plymouth and provides drinking water to Washington County. This system includes an estimated 28 total miles of distribution system lines. The system's finished

¹⁹ Sources: Washington County Public Schools and North Carolina Community College System

water storage capacity is 0.750 million gallons. The Plymouth Waste Water Treatment Plant has a permitted capacity (MGD) of 1.200).²⁰

Power

There is one solar farm located within Washington County. This power plant has a net summer capacity of 5 megawatts.²¹

Environmental Profile

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

Water Resources

Albemarle Sound is located along the northern border of Washington County. The Roanoke River runs along the western border of the county. Conaby Creek, Phelps Lake, and Pungo Lake are other large water bodies located within the county. There are a variety of wetlands present throughout the county, including riverine, non-riverine, and headwater.²²

Natural and Managed Areas

According to the NC Natural Heritage Program, there are several natural areas of high, very high, or exceptional value in Washington County. There are several managed areas under state and federal ownership within Washington County. Managed areas are properties and easements where natural resource conservation is one of the current primary management goals, or are of conservation interest. These areas in Washington County include: Bull Neck Swamp, Pettigrew State Park, Pocosin Lakes National Wildlife Refuge, Roanoke River Reserve, Tidewater Research Station, and Van Swamp Game Land DNP.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 Neuse River and its tributaries. These areas rank between a 7 and 10, with 10 being the highest possible score. Other areas of the county rank 5 to 6. Portions of Washington County do fall within the 7-10 range.²²

Parks and Recreation

The Town of Plymouth Parks and Recreation Department provides park facilities and programs to accommodate the needs and interests of local residents and visitors. This includes sports, nature walks, and children's playground facilities. The Washington County Recreation Department The Washington County Recreation Department provides county-wide recreation programs for youth ages 5 to 18 as well as senior citizens. Locations include Town of Plymouth facilities, Washington County Recreation Center, Columbia Gymnasium, and Roper Elementary Gym.²³

²⁰ Sources: NC Division of Water Resources, Local Water Supply Plans

²¹ Source: US Department of Energy, US Energy Mapping System

²² Source: NC Natural Heritage Program

²³ Sources: NC Natural Heritage Program, Town of Plymouth Parks and Recreation Department, Washington County Recreation Department

Administrative Profile

Washington County is covered under the Northeastern North Carolina Hazard Mitigation Plan, which was last updated in 2016. The county has emergency services and planning departments with the capacities to assist in hazard mitigation planning and disaster preparedness. Smaller communities within Washington County may need assistance in the administration and implementation of projects due to their limited staff capacity.

An aerial photograph showing a residential neighborhood severely impacted by flooding. The water is a murky, brownish-yellow color, submerging large areas of the landscape. In the upper half of the image, a large body of water has inundated a wooded area, with only the tops of many trees visible. Below this, a residential street is shown with several houses. The yards and surrounding areas are completely underwater. The houses are mostly two-story structures with light-colored siding and dark roofs. Some houses have their basements or lower floors submerged. The lower half of the image shows a dense forest of green trees, which appears to be less affected by the flooding, though some water is visible at the edges of the wooded area. The overall scene depicts significant property damage and displacement due to a storm event.

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 Washington County is highlighted graphically in the figure below.

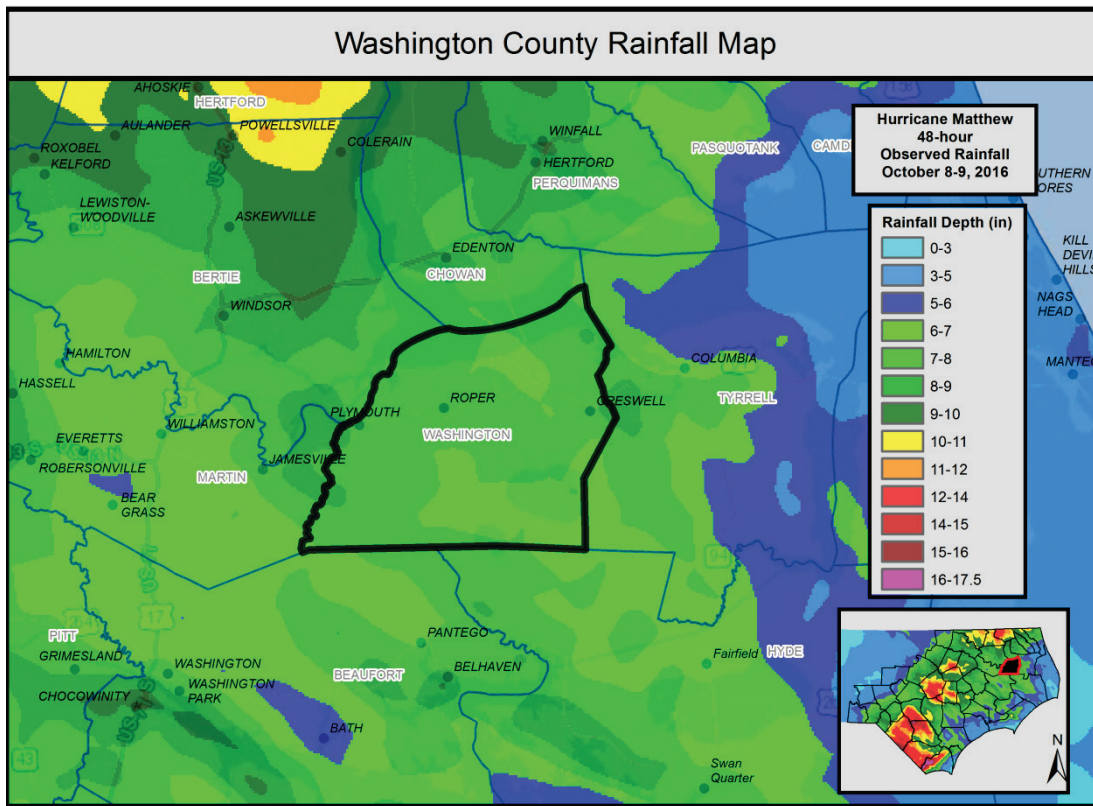


Figure 10. 48-hour Observed Rainfall Depth (October 8-9, 2016)

Riverine Flooding Summary

USGS documented stream gage data in the report “Preliminary Peak Stage and Streamflow Data at Selected Stream gaging Stations in North Carolina and South Carolina for Flooding Following Hurricane Matthew, October 2016”. Stream gage data from the USGS report for Washington County and nearby gages is summarized in Table 3.

USGS Gage	County	River Name and Location	Drainage Area (sq mi)	Peak Matthew Elevation (ft)	Previous Record (ft)
02084557	Washington	Van Swamp near Hoke, NC	23.0	8.02	7.43

Table 3. Washington County USGS Stream gage Data

The USGS data validates what was experienced in the county. Details of impacts categorized under housing, economic, infrastructure, and environment are included in the following sub-sections.

Housing

According to Individual Assistance claims as of March 2017, there were 322 impacted houses in Washington County because of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew might still be pending, so this number may not reflect the final claims data from the event. This also does not take into account other historic impacts to the county or other areas of concern for flooding that may not have occurred during this storm. With that in mind, the planning team attempted to take a comprehensive look at both Hurricane Matthew impacts and any historic impacts that local officials felt would validate areas that should be considered at high risk for future flooding.

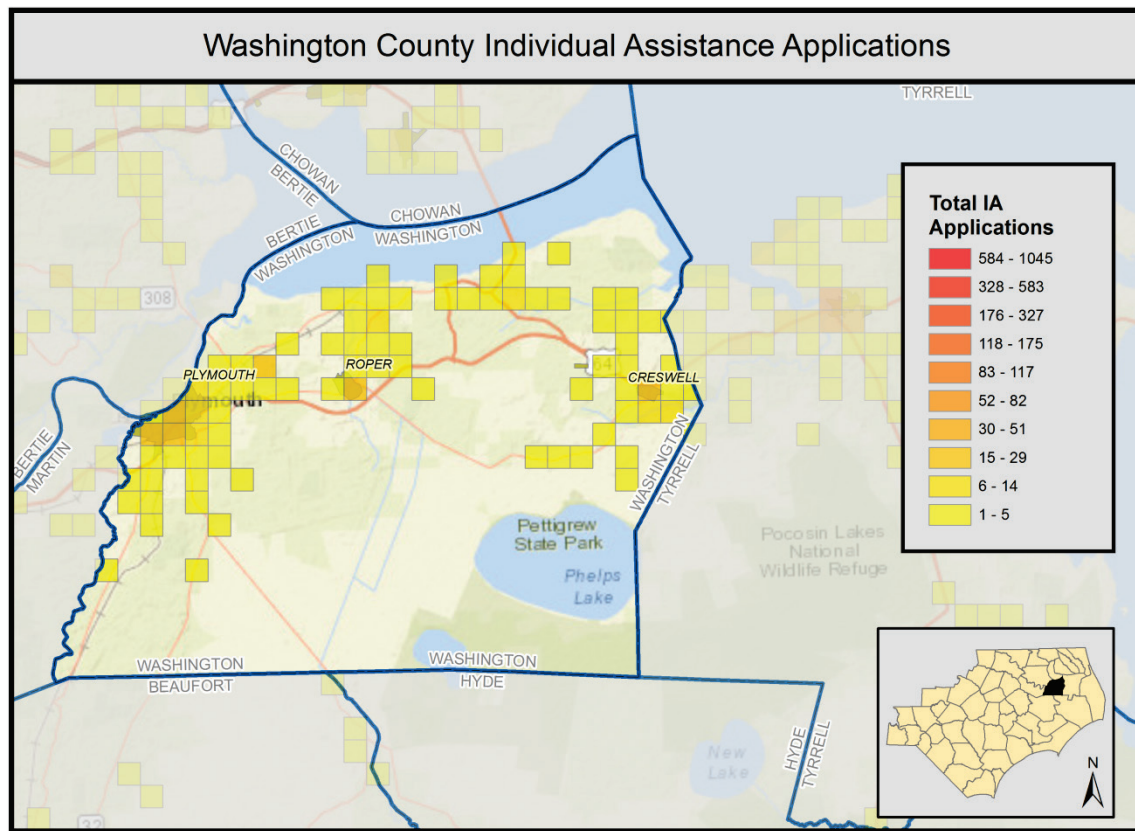


Figure 11. Washington County IA Applications by Area

The bullets below summarize some of the major impacts to housing identified by local officials in multiple meetings.

- **Homes Flooded from Hurricane Matthew:** Many properties throughout the county are located in flood-prone areas. These areas flooded during both Hurricane Matthew and previous storm events. Based on historic flooding information, these communities include a significant amount of repetitive loss properties.
 - Areas experiencing especially significant impacts include Weston Road in the Town of Creswell and 4th Street in the Town of Plymouth.

- Of particular concern is a senior housing complex on Water Street in the Town of Plymouth. During Hurricane Matthew, both access routes to this street were flooded, leaving older residents stranded until the waters receded.

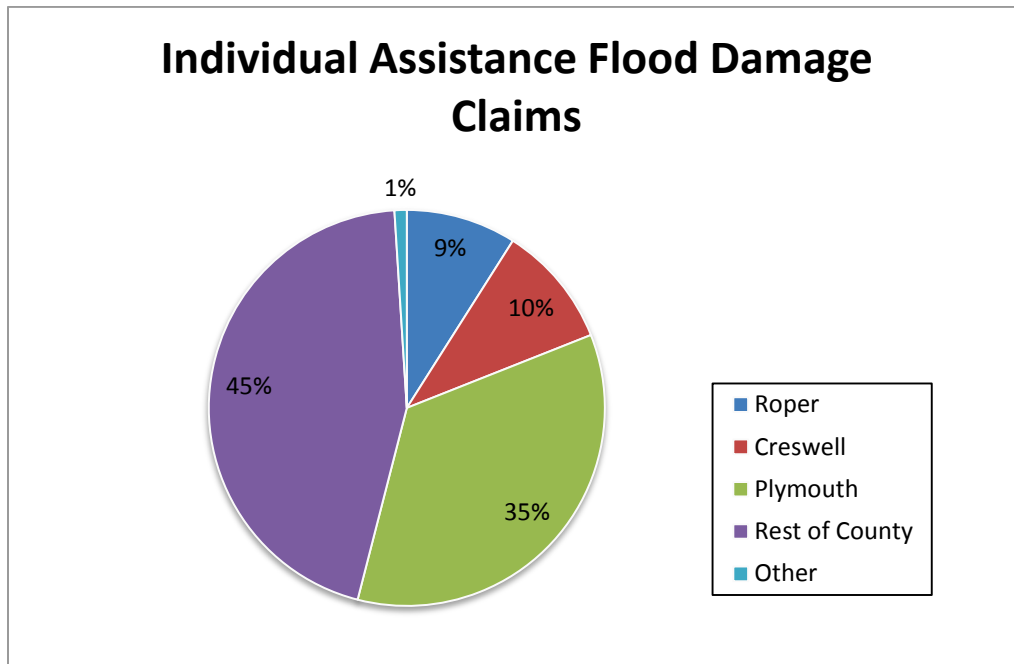


Figure 12. IA Flood Damage Claims by Area

Economics / Business / Jobs

Local officials in multiple meetings identified impacts to the economy in Washington County from Hurricane Matthew to the economy/businesses/jobs.

- **Direct Impacts to Businesses:** Several businesses in Washington County were damaged during Hurricane Matthew and were unable to operate for a period of time thereafter. A Pizza Hut restaurant near Highway 64 in Plymouth was closed from October to March, resulting in significant economic impact for the business and its employees. A car dealership in this area also had to close as a result of flooding.
- **Agricultural/Forestry Impacts:** The agriculture and forestry industries in Washington County experienced both direct and indirect impacts. Direct impacts to agriculture occurred when cropland flooded, while direct impacts to forestry resources occurred when trees were knocked down before they reached the size required for sale. Indirect impacts to agriculture and forestry resources occurred because road and infrastructure damage prevented companies from moving their goods through the supply chain as usual.

Infrastructure

According to Public Assistance (PA) claims, which are often closely tied to infrastructure, as of 2017 there was \$0 of claims in Washington County as a result of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew might still be pending, so this number may not reflect the final claims data from the event.

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 identified by local officials from multiple meetings.

- **Plymouth Sewer Treatment Plant and Lift Station:** During Hurricane Matthew, the entry road to this sewer treatment plant (Gage Lane) flooded, preventing both access and egress to the facility. This not only prevented utilities staff from accessing the plant in case of an emergency, it also temporarily trapped employees within the facility. Plymouth Lift Station experienced flooding as well.
- **Widespread Drainage Blockages:** Local officials stated that much of the widespread flooding in the county occurred because many drainage routes are blocked with debris. This prevents the drainages from efficiently transporting water, causing backups and ultimately flooding of adjacent areas.
- **Washington County Courthouse:** During Hurricane Matthew, this important municipal building flooded. The elevator shaft of the building, as well as the basement (which houses County E-911 services and the county jail) were affected by flooding.

The following roads were closed during and after Hurricane Matthew:

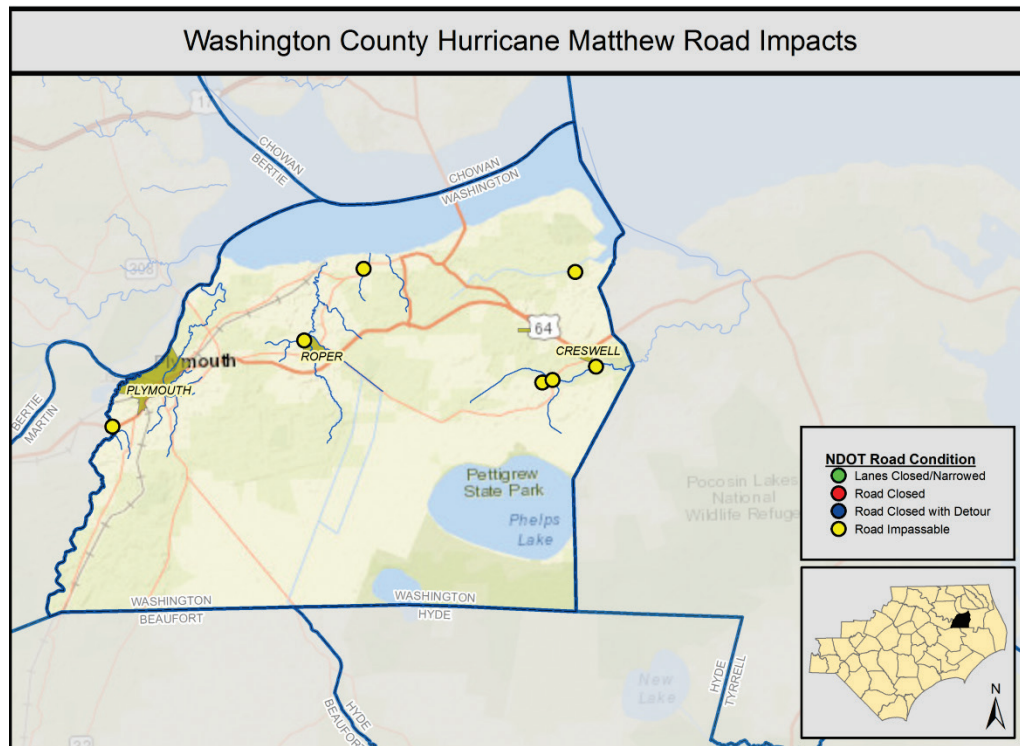


Figure 13. Impacted NCDOT Structures in Washington County

Ecosystems / Environment

Environmental impacts in Washington County as a result of Hurricane Matthew link to other impacts in housing, economic development, and infrastructure and are broad in nature. In some cases, preexisting damage or lack of attention to forests, wetlands, and natural systems created new impacts during Hurricane Matthew. These impacts likely will recur for future storm and flood events.

- **Public Health Hazards of Standing Water:** Following Hurricane Matthew, pools of standing water lingered throughout the county. These pools represent ideal breeding conditions for mosquitos. An increase in mosquito populations presents a threat to people, pets and livestock.

An aerial photograph showing a residential neighborhood severely affected by flooding. The water is a murky brown color, submerging many trees and parts of the houses. The houses are mostly two-story structures with grey roofs. The flooding is extensive, covering a large portion of the upper half of the image. The text "4. Strategies for Resilient Redevelopment" is overlaid in the center of the image in a bold, dark blue font.

4. Strategies for Resilient Redevelopment

4. Strategies for Resilient Redevelopment

This section provides details about the resilience and revitalization strategies and actions identified in Washington 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	4
Economic Development	4
Infrastructure	8
Environment	0
Grand Total	16

Table 4. Washington County Summary of Projects by Pillar

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

Pillar	Action Name	Priority	Overall Ranking
Housing	Housing Action 1: Elevation Projects	High	1
Infrastructure	Infrastructure Action 4: Drainage Improvement Study	High	2
Infrastructure	Infrastructure Action 6: Retrofit County Court House	High	3
Infrastructure	Infrastructure Action 3: Lift Station Mitigation Study	High	4
Infrastructure	Infrastructure Action 8: Generator Installation	High	5
Economic Development	Economic Development Action 3: Debris Removal from Drainage Corridors	High	6
Infrastructure	Infrastructure Action 2: Elevate Treatment Plant Entry Road	High	7
Housing	Housing Action 2: Land Use Planning	Medium	8
Infrastructure	Infrastructure Action 5: River Gauge Installation	Medium	9

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Infrastructure Action 7: Weather Alert Radios	Medium	10
Infrastructure	Infrastructure Action 1: Retrofit Roads and Bridges	Medium	11
Economic Development	Economic Development Action 4: Remove Abandoned Structures	Medium	12
Housing	Housing Action 4: Flood Insurance Education	Medium	13
Economic Development	Economic Development Action 2: Agricultural Risk Reduction Study	Medium	14
Economic Development	Economic Development Action 1: Business Owner Outreach	Medium	15
Housing	Housing Action 3: Relocate Elderly Housing Complex	Low	16

Table 5. 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

High Priority Housing Strategies

Pillar	Action Name	Priority	Overall Ranking
Housing	Housing Action 1: Elevation Projects	High	1

Table 6. Washington High Priority Housing Summary

This project represents the housing strategy that Washington County indicated is the highest priority to address. Additional detail on the project can be found below:

- Elevation of Damaged Homes:** During Hurricane Matthew, five homes within the county experienced extensive flooding, causing serious problems for the homeowners, and were identified as likely candidates for elevation. Elevating these properties reduces the likelihood of damage during future storm events, increases the value of the properties, reduces flood insurance rates for residents, and reduces public health issues associated with flooding, such as mold and mosquitos. In addition, residents of elevated homes are less likely to require emergency assistance or evacuation during future storms, leaving emergency personnel available for other emergency situations.

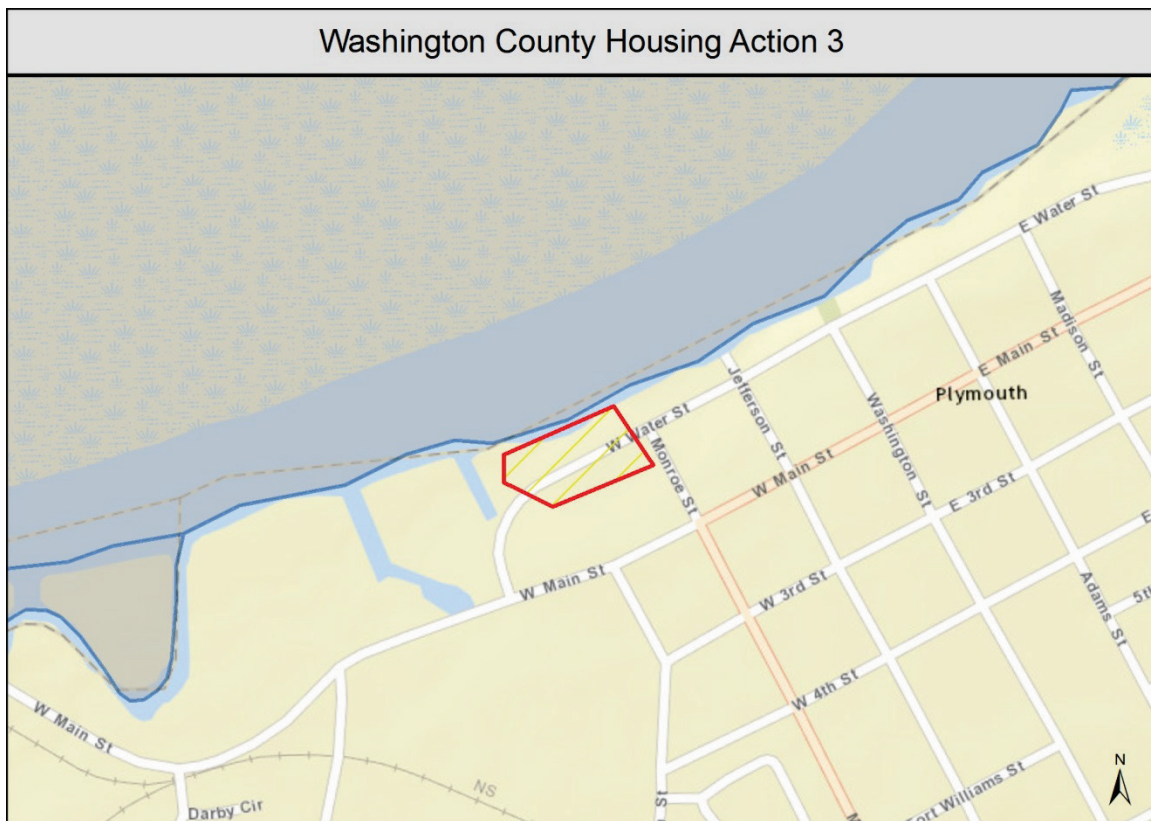


Figure 14. Housing Action 3: Elevation of Damaged Homes

Housing Action 1: Elevation of Damaged Homes

County: Washington

Priority Grouping: High Priority

Priority Ranking: 1

Project Timeframe: 1-2 years

Location: Countywide

Project Summary: Additional funding for five (5) potential elevation projects that have been previously identified and also validated through Hurricane Matthew damages.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Several homes within the county have experienced recurrent damage and will likely continue to experience damage in future storm events unless improvements are made.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with the flood mitigation goals of the hazard mitigation plan.	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	No impact.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	100-200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
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	Agree
What impacts to the environment of the county will result from this project?	No impact.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$251K - \$500K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Medium Priority Housing Strategies

Pillar	Action Name	Priority	Overall Ranking
Housing	Housing Action 2: Land Use Planning	Medium	8
Housing	Housing Action 4: Flood Insurance Education	Medium	13

Table 7. Washington Medium Priority Housing Summary

These project represents the housing strategy that Washington County indicated is of a medium priority to address. Additional detail on the project can be found below:

- **Update Local Land Use Plans:** Updating land use plans within the county to reflect the best available knowledge in risk reduction, floodplain mapping, and resilience opportunities will allow the county and its municipalities to make better-informed planning decisions. By steering future development away from flood-prone areas, this strategy would reduce future storm-related damage to housing, businesses and infrastructure elements. This strategy will also increase the county's overall disaster resiliency by allowing normal operations within the county to resume more quickly following storm events.
- **This is a county-wide project so to project area map is included.**

Housing Action 2: Land Use Planning

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 8

Project Timeframe: 1-2 years

Location: Countywide

Project Summary: Update local land use plan(s), policies and ordinances to better reflect risk reduction, floodplain mapping, and resilience opportunities.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Current land use plans which may not include the most current resiliency approaches exacerbated impacts of Hurricane Matthew by placing development in flood-prone areas.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Incorporating flood data into land use plans will reduce the likelihood that businesses will locate in flood-prone areas. This in turn will reduce the economic impacts of future storms.	Agree
For how long will this solution be effective?	Less than 10 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	It would also reduce the amount of contamination flushed into waterways from urban areas during rain events.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

- **Flood Insurance Education Program:** Confusion and misunderstandings about flood insurance programs may have contributed to relatively low levels of flood insurance within the county. Preparation of a discrete, comprehensive flood insurance education program would allow various County and municipal departments to conduct seminars and individualized educational sessions as a part of existing departmental activities.
- **This is a county-wide project so no project area map is included.**

Housing Action 4: Flood Insurance Education

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 13

Project Timeframe: 1-2 years

Location: Countywide

Project Summary: Education and awareness programs related to flood insurance.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	If additional homes had carried flood insurance during Hurricane Matthew individuals could have recovered more quickly and with less assistance from government entities.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with goals of the hazard mitigation plan to minimize damages from natural hazards.	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	No impact.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	No impacts.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Low Priority Housing Strategies

Pillar	Action Name	Priority	Overall Ranking
Housing	Housing Action 3: Relocate Elderly Housing Complex	Low	16

Table 8. Washington Low Priority Housing Summary

This project represents the housing strategy that Washington County indicated is of a lower priority to address. Additional detail on the project can be found below:

- **Relocate Elderly Housing Complex:** Relocate elderly housing complex in Plymouth to prevent future flood damage, isolation and evacuation issues, emergency response issues, etc.

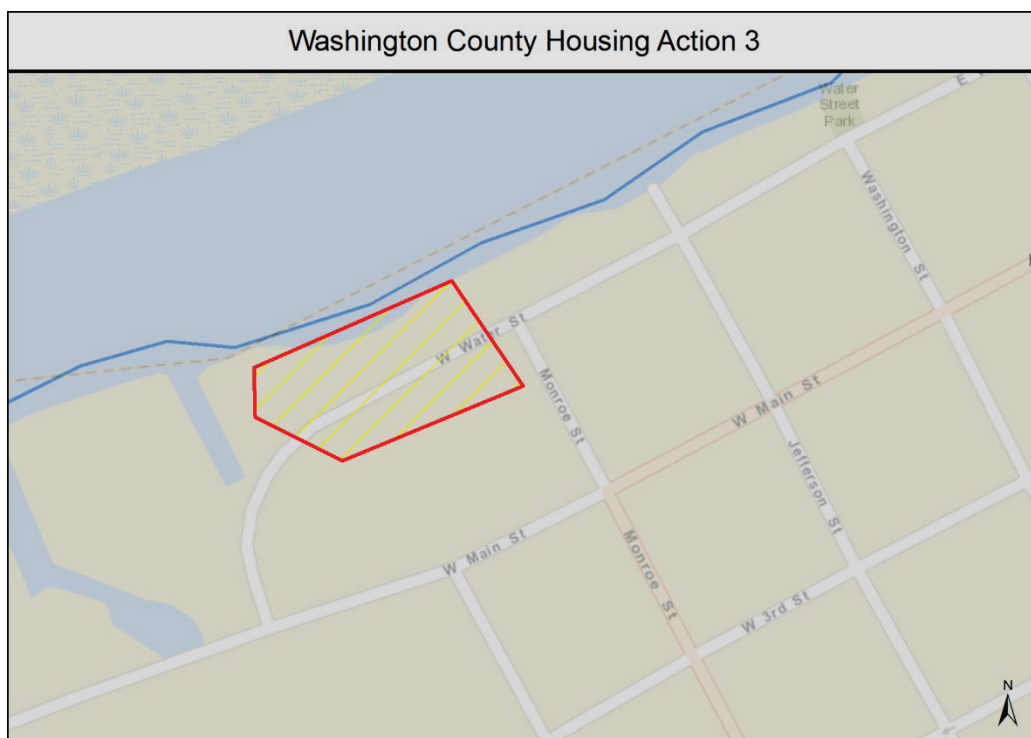


Figure 15. Housing Action 3: Relocate Elderly Housing Complex

Housing Action 3: Relocate Elderly Housing Complex

County: Washington

Priority Grouping: Low Priority

Priority Ranking: 16

Project Timeframe: 2-3 years

Location: West Waters Street

Project Summary: Relocate elderly housing complex in Plymouth to prevent future flood damage, isolation and evacuation issues, emergency response issues, etc.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This community was stranded during Hurricane Matthew when access roads to their neighborhood flooded necessitating dangerous and costly rescues by emergency personnel.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with flood protection and mitigation goals of the hazard mitigation plan.	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	No impacts.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	No impacts.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$1M+	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	Local	Agree

Economic Development Strategies

High Priority Economic Development Strategies

Pillar	Action Name	Priority	Overall Ranking
Economic Development	Economic Development Action 3: Debris Removal from Drainage Corridors	High	6

Table 9. Washington High Priority Economic Development Summary

This project represents the housing strategy that Washington County indicated is the highest priority to address. Additional detail on the project can be found below:

- Debris Removal from Drainage Corridors:** Flooding impacts from Hurricane Matthew were exacerbated by the congestion of county and municipal waterways, creeks, and ditches both with organic matter and with debris swept downstream by the storm. This strategy would collaborate with applicable regulatory agencies and public and private landowners to remove debris from waterways throughout the county. Restoring hydraulic efficiency in these waterways will reduce economic damage and social disruption by reducing the extent and duration of flooding throughout the county and its municipalities. Appropriately resizing undersized culverts would also help to process water and alleviate drainage/flooding problems during a storm event. A detailed drainage study would be needed in order to identify all culverts and restrictions.
- This is a county-wide project so no project area map is included.**

Economic Development Action 3: Debris Removal from Drainage Corridors

County: Washington

Priority Grouping: High Priority

Priority Ranking: 6

Project Timeframe: 1-2 years

Location: Countywide

Project Summary: Debris removal, including stormwater debris, from drainage corridors (both private and public).

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Inefficient drainage including congestion caused by debris within waterways contributed to flooding during Hurricane Matthew.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Improving drainage within the county will reduce flooding of businesses during future storm events.	Agree
For how long will this solution be effective?	Less than 10 years	Agree
How effective is the risk reduction?	>200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
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?	No Impact	Agree
What impacts to the environment of the county will result from this project?	Improving drainage will reduce the residence time of water detained by obstructions in county waterways. This will improve water quality and reduce the likelihood of mosquito outbreaks.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$101K - \$250K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Medium Priority Economic Development Strategies

Pillar	Action Name	Priority	Overall Ranking
Economic Development	Economic Development Action 4: Remove Abandoned Structures	Medium	12
Economic Development	Economic Development Action 2: Agricultural Risk Reduction Study	Medium	14
Economic Development	Economic Development Action 1: Business Owner Outreach	Medium	15

Table 10. Washington Medium Priority Economic Development Summary

These three projects represent the economic development strategies that Washington County indicated are of a medium priority to address. Additional detail on the projects can be found below:

- **Removal of Abandoned Structures:** The presence of approximately 175 abandoned structures in the floodplain within the county and its municipalities presents a public health and safety hazard. During Hurricane Matthew and other storms, unanchored utilities and other debris from the structures were swept into the floodway by wind and floodwaters. This debris could have contaminated storm water or blocked its flow, causing additional flooding. Removal of these structures would also improve community aesthetics and property values, and could attract additional residents to the county, tying in directly with economic development.
- **This is a county-wide project so no project area map is included.**

Economic Development Action 4: Remove Abandoned Structures

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 12

Project Timeframe: 5 years

Location: Countywide

Project Summary: Removal of 75 abandoned structures, some located in the floodplain and some flooded during Matthew.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Removal of these abandoned structures would reduce the amount of development in the floodway allowing flood waters to flow and recede naturally rather than pooling and potentially accumulating contaminants.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Removing these abandoned structures and replacing them with green space makes the county more attractive to future residents and businesses and eliminates potentially costly public safety concerns.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	50-100 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
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	Agree
What impacts to the environment of the county will result from this project?	Removing these abandoned structures eliminates their capacity to serve as breeding grounds for pest and vector species.	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$251K - \$500K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

- **Agricultural Risk Reduction Study:** Impacts to both agricultural and forestry operations within the county occurred as a result of Hurricane Matthew. Because these industries are complex and affect many individuals within the county, this strategy is comprised of a study to develop the most effective potential measures to protect, insure or minimize future losses of agricultural crops and forestry resources. This strategy would also benefit tourism opportunities within the county, as there are a number of historic plantations in the Lake Phelps and Creswell areas that experience frequent damage during storms.
- **This is a county-wide project so no project area map is included.**

Economic Development Action 2: Agricultural Risk Reduction Study

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 14

Project Timeframe: 1 year

Location: Countywide

Project Summary: Develop study to determine appropriate potential measures for protecting, insuring, or minimizing future losses to agricultural crops and forestry resources.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	These industries suffered significant losses as a result of Hurricane Matthew.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Agriculture and forestry represent important components of the county's economy and increasing their resiliency against future storm events will result in an economic benefit for the entire county.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	<50 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	Improving the resiliency of agricultural and forestry areas will help maintain ecosystem function following storm events including reducing soil erosion and discharge of organic matter into waterways.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$51K - \$100K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Between 51 and 75%	Agree
Who will administer this project?	County	Agree

- **Business Owner Outreach:** Although the impacts of future storms cannot be known in advance, helping local businesses prepare for disasters increases the economic resiliency of the county as a whole. Providing training on pre-disaster mitigation and continuity of operations planning for local businesses will help those businesses recover more quickly following disasters, reduce job losses, business closures, and other economic impacts. This training seminar would likely take place at the start of hurricane season and would be combined with existing events, such as the Regional Public Officials Conference, in order to maximize participation and reduce costs.
- **This is a county-wide project so no project area map is included.**

Economic Development Action 1: Business Owner Outreach

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 15

Project Timeframe: 1 year

Location: Countywide

Project Summary: Outreach program targeted toward local business owners to promote pre-disaster mitigation and continuity of operations planning.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Following Hurricane Matthew several businesses in the county were unable to recover and reopen. Improved planning could minimize this risk.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	This project will help businesses in the county become more resilient not only against flood events but also against other natural and human disasters. This will allow for continuity of operations and uninterrupted economic activity.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	<50 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	N/A	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Infrastructure Strategies

High Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Infrastructure Action 4: Drainage Improvement Study	High	2
Infrastructure	Infrastructure Action 6: Retrofit County Court House	High	3
Infrastructure	Infrastructure Action 3: Lift Station Mitigation Study	High	4
Infrastructure	Infrastructure Action 8: Generator Installation	High	5
Infrastructure	Infrastructure Action 2: Elevate Treatment Plant Entry Road	High	7

Table 11. Washington High Priority Infrastructure Summary

These five projects represent the infrastructure strategies that Washington County indicated are the highest priority to address. Additional detail can be found below:

- **Conduct Drainage Improvement Study:** Inefficient drainage throughout the county, including blockages caused by accumulation of debris, increased the severity of flooding during Hurricane Matthew. Because impacts and causes of the poor drainage are widespread, a comprehensive countywide drainage study would identify the most effective methods to alleviate repetitive flooding.
- **This is a county-wide project so no project area map is included.**

Infrastructure Action 4: Drainage Improvement Study

County: Washington

Priority Grouping: High Priority

Priority Ranking: 2

Project Timeframe: Unknown

Location: Countywide

Project Summary: Conduct comprehensive, countywide drainage improvement study to understand and address widespread drainage issues throughout the county to alleviate repetitive flooding.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Much of the flooding during Hurricane Matthew was exacerbated by inefficient or clogged drainage.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Improving drainage will reduce the amount of time businesses are closed and increase the capacity of residents and visitors to travel within the county following a disaster.	Agree
For how long will this solution be effective?	Less than 10 years	Agree
How effective is the risk reduction?	>200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?		Agree
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	Agree
What impacts to the environment of the county will result from this project?	Increasing the efficiency of drainage systems will reduce the amount of standing water following a storm which reduces the amount of available vector habitat.	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$251K - \$500K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

- **Washington County Courthouse:** During Hurricane Matthew, both the elevator shaft and the basement of the courthouse experienced flooding. Rerouting the building's drain spouts and routing them to a central storm drain will alleviate the flooding and ensure continuity of operations for important services in the building, such as E-911, finance, and the county jail.

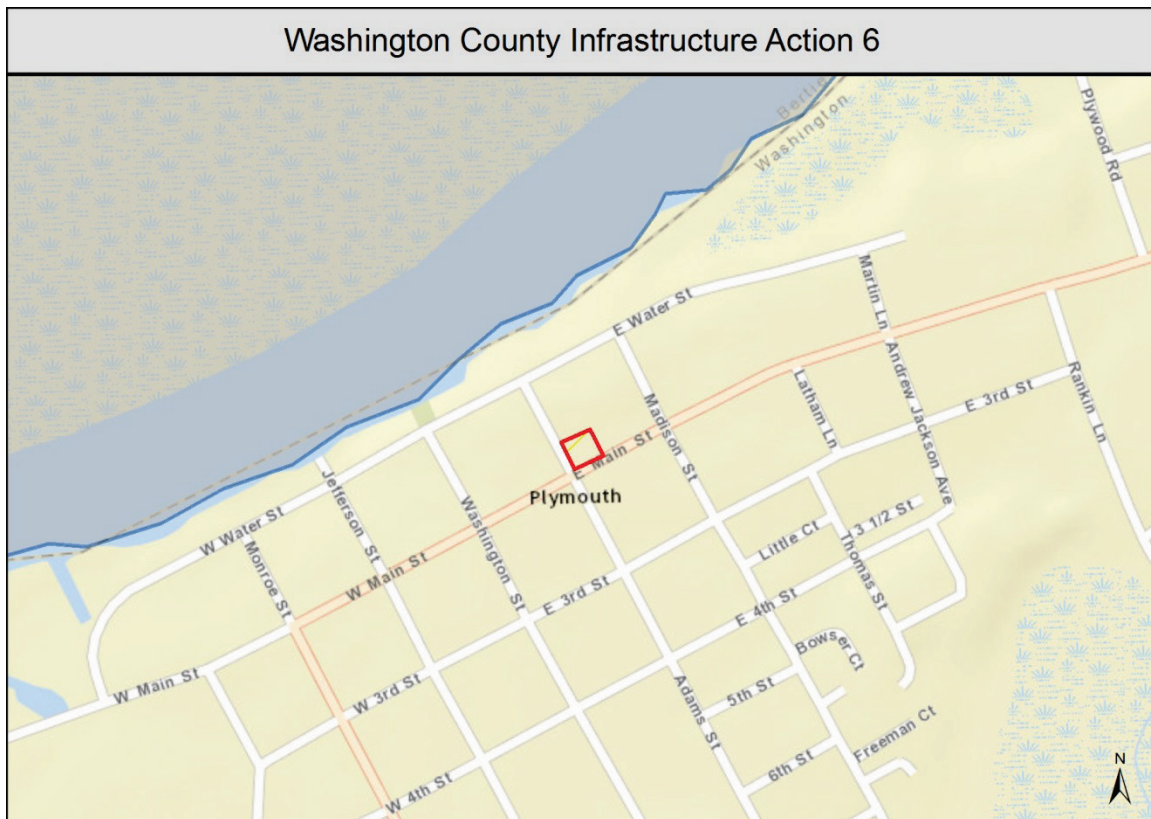


Figure 16: Infrastructure Action 6: Retrofit County Court House

Infrastructure Action 6: Retrofit County Court House

County: Washington

Priority Grouping: High Priority

Priority Ranking: 3

Project Timeframe: 1 year

Location: 120 Adams Street Plymouth NC 27962

Project Summary: Reroute and tie in downspouts to one central storm drain to alleviate flooding at Washington County Court House, including flooding of basement and elevator shaft which flooded during Hurricane Matthew and is repetitive during heavy rain events.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew the courthouse experienced flooding in the basement and the elevator shaft.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	N/A	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	50-100 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	N/A	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

- **Alleviate Flooding at Lift Station:** During Hurricane Matthew, the Plymouth East Main Street lift station experienced flooding, which could have led to failure and accidental discharges. The Johnson Court lift station experienced isolation and inaccessibility as a result of Hurricane Matthew. An engineering/feasibility study will determine the best way(s) to alleviate flooding at these lift stations.

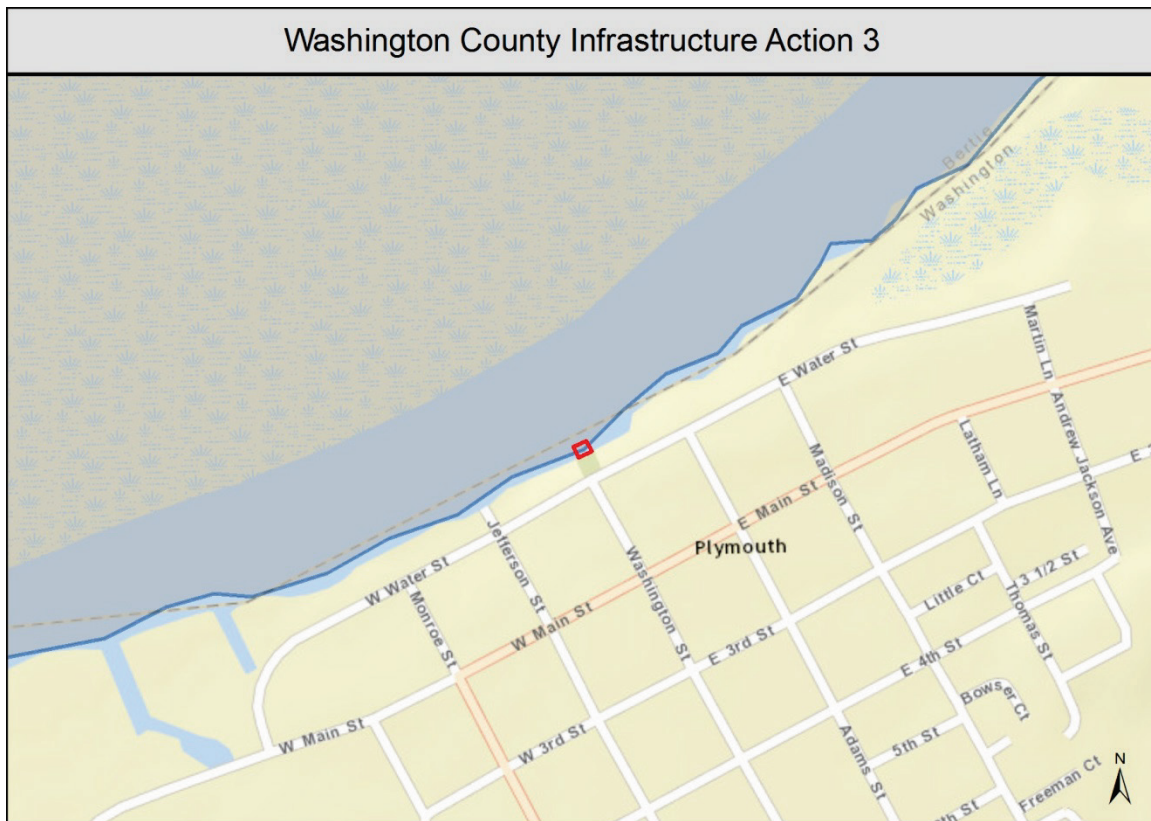


Figure 17: Infrastructure Action 3: Lift Station Mitigation Study

Infrastructure Action 3: Lift Station Mitigation Study

County: Washington

Priority Grouping: High Priority

Priority Ranking: 4

Project Timeframe: Unknown

Location: Johnson Court

Project Summary: Conduct engineering/feasibility study in coordination with municipal elected officials to determine best alternative(s) to alleviate flooding at and in the vicinity of the Plymouth Lift Station.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew the continued operation of this facility was threatened by floodwaters.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	N/A	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	>200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	Additional resiliency for pump stations reduces the probability of accidental discharges which would have significant impacts on downstream water quality and ecosystem health.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	Local	Agree

- **Generator Installation:** This project will support timely emergency information dissemination during a flood event by providing generators to the only radio station located in the county (two 22KW generators).
- **This is a project with no specific location currently identified so no project area map is included.**

Infrastructure Action 6: Generator Installation

County: Washington

Priority Grouping: High Priority

Priority Ranking: 5

Project Timeframe: 1 year

Location: Countywide

Project Summary: Support timely emergency information dissemination during a flood event by providing generators to the only radio station located in the county (two 22KW generators).

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew and previous storms several elderly members of the county population relied on radio as their primary means of receiving emergency information. Increasing the resiliency of the county's radio station improves its capacity to communicate this critical information during future storm events.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with goals of the hazard mitigation plan to minimize damages from natural hazards.	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	No impact.	Agree
For how long will this solution be effective?	Between 11 and 30 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	No impact.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

- Elevate Sewer Treatment Plant Entry Road:** The entry road to the Plymouth Sewer Treatment Plant (Gage Lane) was flooded during Hurricane Matthew. As a result, workers could not access the facility. Elevating the access road ensures continuity of operations for the plant and minimizes the likelihood of flood-related impacts such as accidental discharges. Note: Gage Lane not only flooded during Hurricane Matthew, but it floods routinely during heavy summer storm events as well.

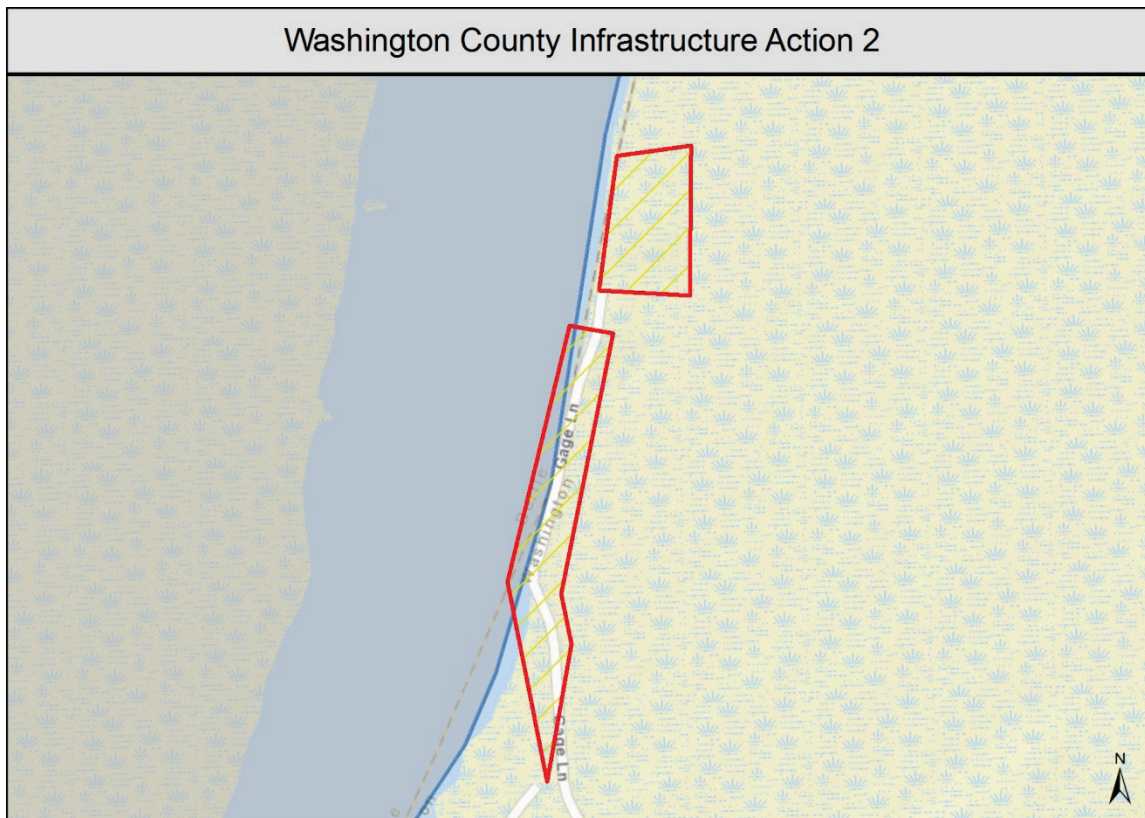


Figure 18: Infrastructure Action 2: Elevate Treatment Plant Entry Road

Infrastructure Action 2: Elevate Treatment Plant Entry Road

County: Washington

Priority Grouping: High Priority

Priority Ranking: 7

Project Timeframe: 1-2 years

Location: Gage Lane, Plymouth

Project Summary: Elevate entry road (Gage Lane) of the Plymouth Sewer Treatment Plant to alleviate flooding.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew this access road flooded preventing access to the station for a period of time following the storm.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	When the access road to the pump station is flooded employees cannot access the station and are precluded from work. Also any spills or discharges could affect downstream businesses.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	50-100 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	Flooding of the station or inability of staff to access the station for maintenance could result in accidental discharges which would have significant impacts on downstream water quality and ecosystem health.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$51K - \$100K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	Local	Agree

Medium Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Infrastructure Action 5: River Gauge Installation	Medium	9
Infrastructure	Infrastructure Action 7: Weather Alert Radios	Medium	10
Infrastructure	Infrastructure Action 1: Retrofit Roads and Bridges	Medium	11

Table 12. Washington Medium Priority Infrastructure Summary

These three projects represent the infrastructure strategies that Washington County indicated are of a medium priority to address. Additional detail can be found below:

- **River Gauge:** The lack of a river gauge in the vicinity of Plymouth, one of the county’s main population centers, hinders the ability of local officials to plan for rising floodwaters. Installation of a river gauge on the Roanoke River near Roanoke Shores would enhance the emergency response capability of not only Washington County but surrounding counties as well.
- **This is a project with no specific location currently identified so no project area map is included.**

Infrastructure Action 5: River Gauge Installation

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 9

Project Timeframe: 1-2 years

Location: Plymouth

Project Summary: Add river gauge on the Roanoke River off of Roanoke Shores just down from downtown (in the ETJ of Plymouth near lift station project also identified).

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew the lack of gauges within the upstream portion of the county prevented emergency response officials from having current information on flood height and flow rates.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	N/A	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	<50 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	N/A	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

- **Weather Alert Radios:** Many of the elderly residents of the county rely on the radio to receive information during emergencies. Thus, flooding of the local radio station could reduce the ability of emergency personnel to convey information. Providing two 22kW emergency generators to the county's radio station would support the timely dissemination of emergency information during a flood event. Additionally, the strategy could include purchasing weather alert radios to be distributed to residents in need, to ensure everyone within the county remains informed during an emergency. Note: even though the radio station is not in a mapped Special Flood Hazard Area, the station's property did flood during Hurricane Matthew and they did lose power during that event.
- **This is a county-wide project so no project area map is included.**

Infrastructure Action 7: Weather Alert Radios

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 10

Project Timeframe: 1 year

Location: Countywide

Project Summary: Purchase additional weather alert radios (approximately 200 units) for elderly population.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew and previous storms several elderly members of the county population relied on radio as their primary means of receiving emergency information. Providing these individuals with weather alert radios ensure that their ability to receive information is not interrupted by power outages or lack of functional radio equipment.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with goals of the hazard mitigation plan to minimize damages from natural hazards.	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	No impact.	Agree
For how long will this solution be effective?	Between 11 and 30 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	No impact.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

- **Retrofit Roads and Bridges Study:** Many roads and bridges throughout the county experience repetitive flooding during storm events, including many of the NCDOT culverts and crossings. Increasing the ability of these roads and bridges to accommodate large storm flows will ensure that county officials, first responders, and residents can travel throughout the county during and after storm events. Coordinating with NCDOT to conduct a targeted study would determine the most effective mitigation techniques for improving these infrastructure elements.
- **This is a county-wide project so no project area map is included.**

Infrastructure Action 1: Retrofit Roads and Bridges Study

County: Washington

Priority Grouping: Medium Priority

Priority Ranking: 11

Project Timeframe: Unknown

Location: Countywide

Project Summary: Coordinate with NCDOT, and potentially participate in a targeted study, to determine appropriate mitigation techniques for addressing roads and bridges that repetitively flood.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Many roads and bridges within the county have experienced repetitive storm damage and they will remain vulnerable until improvements are made.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	When roadways and bridges are flooded it reduces the ability of people to travel to their jobs and of businesses to transport their goods. Increasing the resiliency of the area's infrastructure will reduce the duration of economic interruption.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	<50 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	>6	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	Agree
What impacts to the environment of the county will result from this project?	N/A	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$1M+	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

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.