

# Hurricane Matthew Resilient Redevelopment Plan

## Chatham 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 26 people lost their lives, and 100,000 homes, businesses, and government buildings sustained damage estimated at \$4.8 billion.<sup>1</sup> At the storm's peak, 3,744 individuals fled to 109 shelters across the region. More than 800,000 households lost power and 635 roads were closed, including the major east-west and north-south corridors.

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

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



**Figure 1: NCRRP Counties**

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

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

<sup>1</sup> 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, Chatham County has identified 16 projects in four pillars: Housing, Infrastructure, Economic Development, and Environmental. Details of these projects can be found in Section IV of this plan.

Pillar	Project/Action Count
Housing	1
Economic Development	0
Infrastructure	12
Environment	3
<b>Grand Total</b>	<b>16</b>

**Table 1. Chatham County Summary of Projects by Pillar**



An aerial photograph showing a residential neighborhood severely affected by flooding. The water is a murky brown color, inundating the streets and yards of several houses. The houses have light-colored roofs and walls. In the foreground, there is a large, dense area of green trees. The background shows more flooded areas with scattered trees and houses. The text "1. Background" is overlaid in the center of the image.

# 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. <sup>2</sup>

## 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.

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<sup>2</sup> *Governors McCrory's Request for Federal Assistance for Hurricane Matthew Recovery, November 14, 2016*



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

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

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

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

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

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

### **Resilient Redevelopment Planning**

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

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

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

## Scope of the Plan

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

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

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

## Local Participation and Public Engagement

Stakeholder engagement and public involvement was an essential component of the NCRRP initiative. Three robust rounds of discovery, analysis, collaboration, and interaction were held with each affected county. Each meeting had two components: an in-depth working session with county officials, subject matter experts, and planners from the 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 for finalization of the plan.

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

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

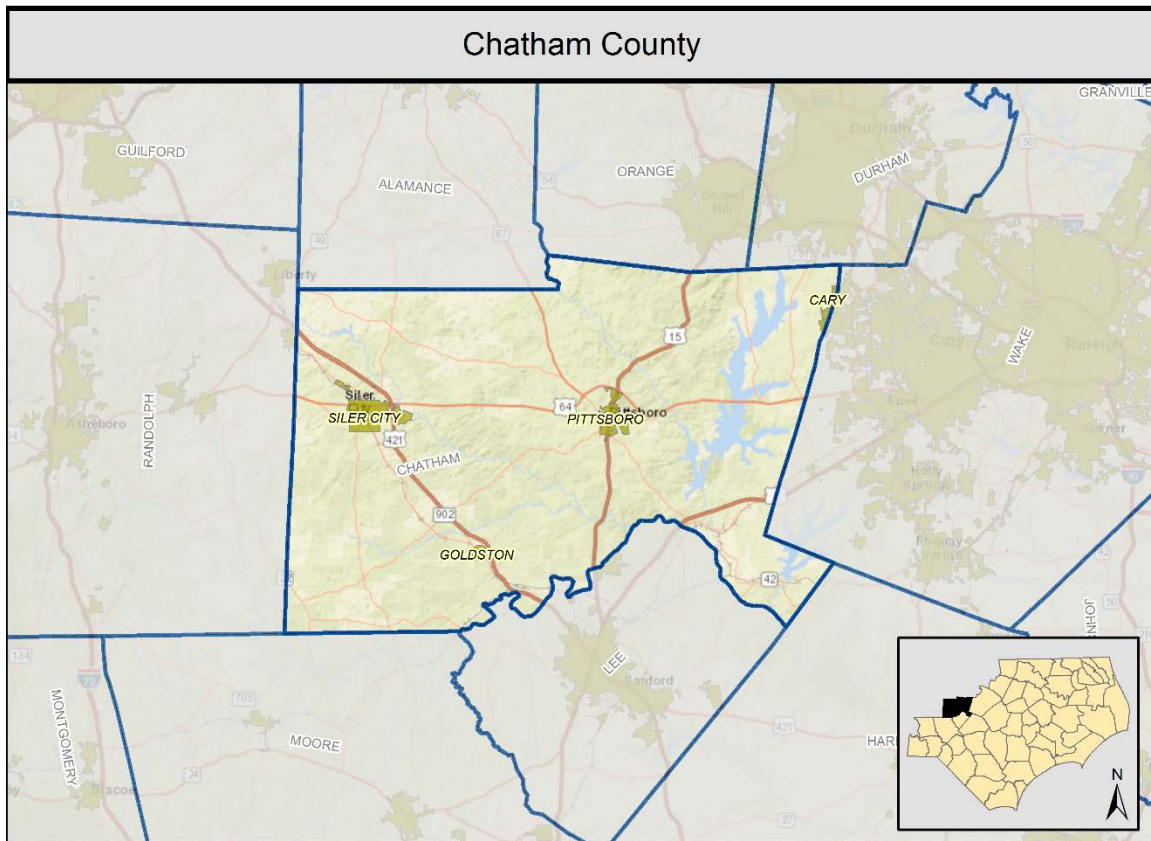


Figure 2: Chatham County and Neighboring Counties

### 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 neighborhood severely affected by flooding. The houses, which are mostly two-story structures with grey roofs, are surrounded by deep, brown floodwater. The water has inundated the yards and streets, leaving only the roofs and some upper floors of the buildings visible. In the background, a large body of water, possibly a lake or a wide river, is also flooded, with trees and vegetation partially submerged. The foreground is dominated by a dense forest of green trees, which appear to be on higher ground. The overall scene depicts a significant natural disaster impact on a community.

## 2. County Profile



## 2. County Profile

Chatham County is located in eastern North Carolina between Raleigh and Asheville. It is comprised of seven census-designated places: Bennett, Fearrington Village, Goldston, Gulf, Moncure, Pittsboro, and Siler City. Its current population is 67,431. This section provides a profile of housing, economics, infrastructure, environment, and administration within Chatham County.

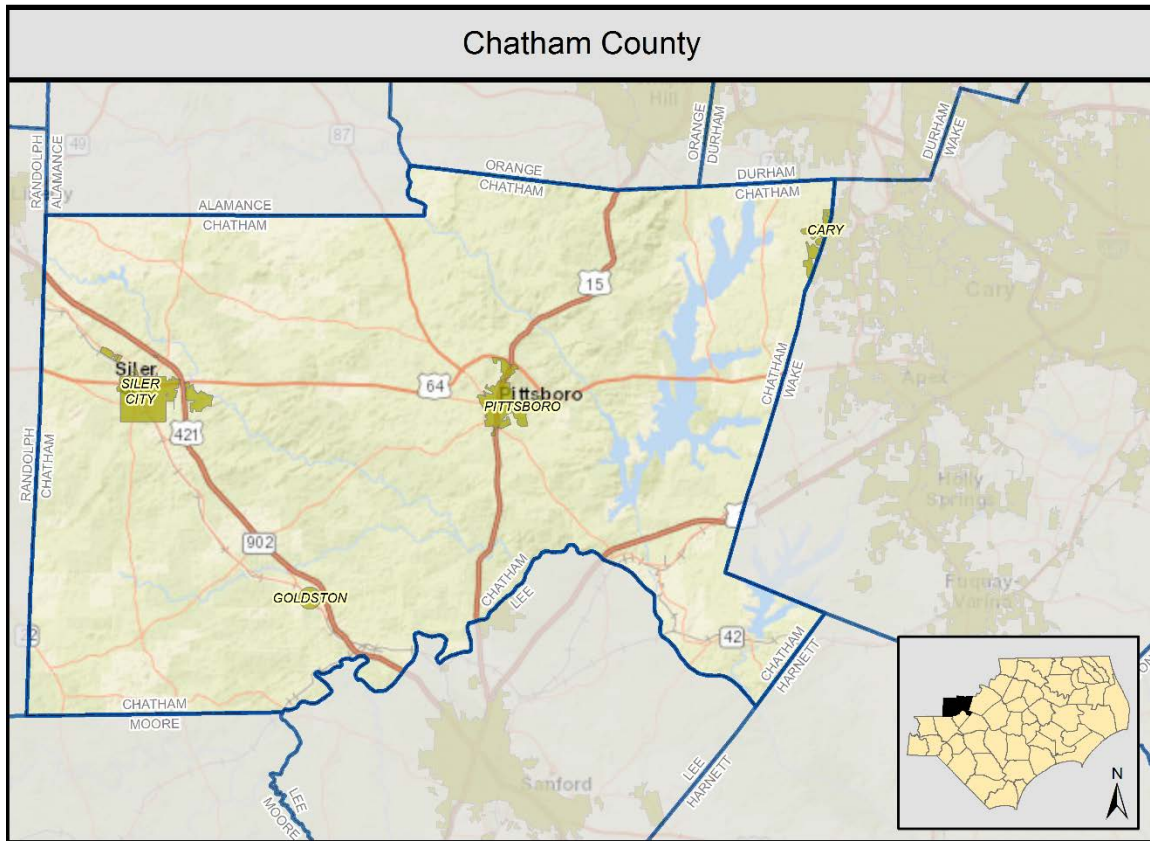


Figure 3: Chatham Base Map

### Demographic Profile

Demographics for Chatham 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

Chatham County has a population of 67,431. Siler City is the most populous place within Chatham County with a population of 8,193 and Bennett is the least populous place with a population of 190.<sup>3</sup>

<sup>3</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B01001, "Sex by Age."



## Population Change (2000 to 2010)

The Chatham County population grew between the 2000 and 2010 Census. In 2000 the population was 49,315 and in 2010 it was 63,505. The population increased by 14,190 people, or about 29 percent. In comparison, North Carolina grew by 19 percent from 8,049,313 people in 2000 to 9,535,483 in 2010.<sup>4</sup>

## Age

The median age in Chatham County is 46, which is slightly greater than that of North Carolina, which is 42. Within Chatham County, the Fearington Village population has the oldest median age, 73, and the Siler City population has the youngest median age, 35.<sup>5</sup>

## Race and Ethnicity

Chatham County is mostly White (79 percent) and African American (12 percent) with other races constituting the remaining 9 percent. In comparison, North Carolina is 70 percent White, 22 percent African American, 1 percent American Indian and Alaska Native, 3 percent Asian, less than 1 percent Native Hawaiian/Pacific Islander, 3 percent Some Other Race, and 2 percent Two or More Races. Refer to the table below.

Within Chatham County, all of the census-designated places are predominantly White. In Siler City, 42 percent of the population identifies as Non-White.

The Latino population in Chatham County is 13 percent compared to 9 percent for North Carolina. Siler City has the largest Latino population (46 percent) while Bennett, Gulf and Fearington Village do not have Latino populations according to the census data. Goldston has a Latino population of 0.4 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
Bennett	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fearington	97.5%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%
Goldston	84.2%	6.7%	3.5%	0.4%	0.0%	0.4%	4.9%	15.8%
Gulf	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Moncure	78.1%	15.6%	0.0%	0.0%	0.0%	6.3%	0.0%	21.9%
Pittsboro	69.0%	24.6%	0.6%	0.5%	0.5%	1.1%	3.7%	31.0%

**Table 2: Chatham 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 Chatham County, most of individuals identified as LEP speak Spanish while others speak Indo-Euro, Asian/Pacific, or other languages. Similarly, the primary language group for LEP individuals in North Carolina is Spanish. Within Chatham County, Siler City has the largest LEP population. The primary language group for LEP

<sup>4</sup> 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*

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

populations in Siler City, Moncure, and Pittsboro is Spanish. Bennett, Fearington Village, Goldston, and Gulf do not have a LEP population according to census data.<sup>6</sup>

### Poverty

In Chatham County, 14 percent of the population is below the poverty level compared to 17 percent of the North Carolina population. In Siler City, 26 percent of the populations are below the poverty level, 24 percent in Gulf, and 3 percent in Fearington Village.<sup>7</sup>

### Low and Moderate Income Individuals

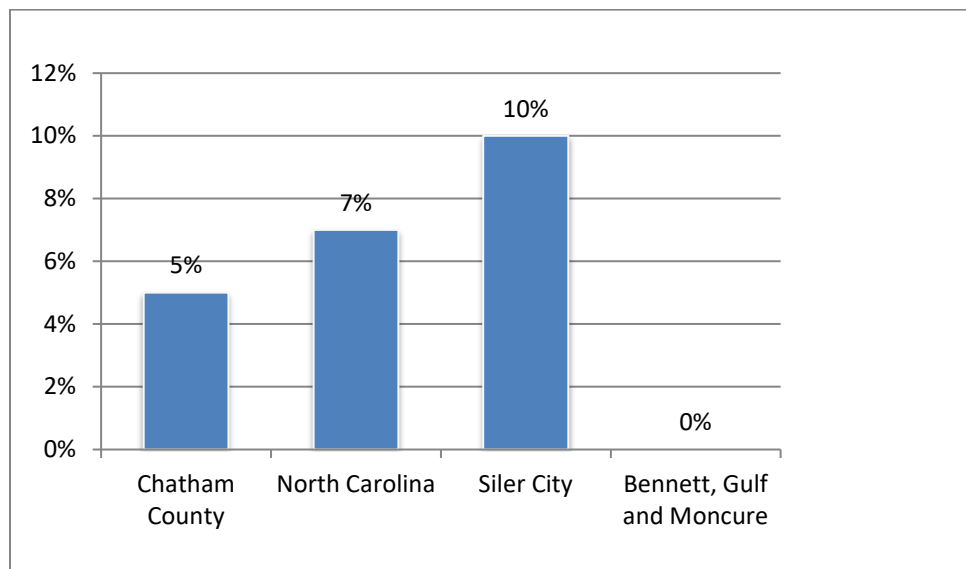
In Chatham County, 38 percent of the population is classified as low and moderate income (LMI) individuals based on the US Department of Housing and Urban Development's definition. In comparison, 39 percent of the North Carolina population is classified as LMI.<sup>8</sup>

### Median Household Income

The median household income of the population 25 to 64 years old is \$61,416 in Chatham County and \$53,000 in North Carolina. In Siler City median household income for this age group was \$31,171. Median household income was not available for the other census-designated places.<sup>9</sup>

### Zero Car Households

In Chatham County, 5 percent of households do not have a vehicle available compared to 7 percent of North Carolina households. Within Chatham County, Siler City has the highest percentage of households without access to a vehicle, 10 percent, while Bennett, Gulf and Moncure all have the lowest, 0 percent.<sup>10</sup>



<sup>6</sup> 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."

<sup>7</sup> 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."

<sup>8</sup> 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/>

<sup>9</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B19094, "Median Household Income in the Past 12 Months."

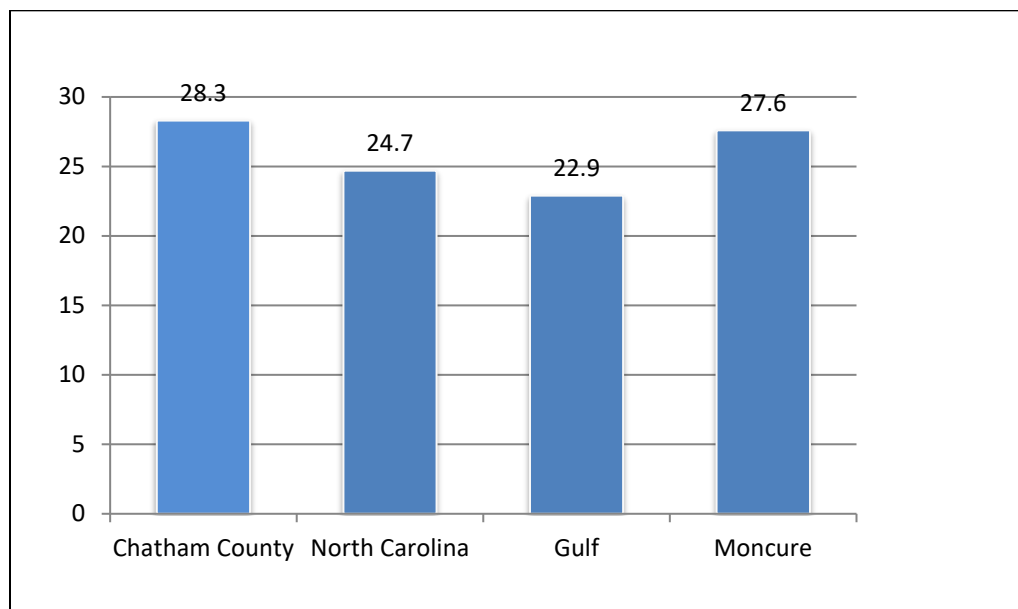
<sup>10</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25044, "Tenure by Vehicles Available."

**Figure 4. Zero Car Households by Percentage****Commuting: Travel Time to Work, Means of Transportation**

The majority of Chatham County residents commute alone to work by vehicle, 77 percent, which is similar to North Carolina average of 81 percent. Within Chatham County, Moncure has the largest percentage of commuters commuting alone, 92 percent, and Fearington Village has the least, 70 percent.<sup>11</sup>

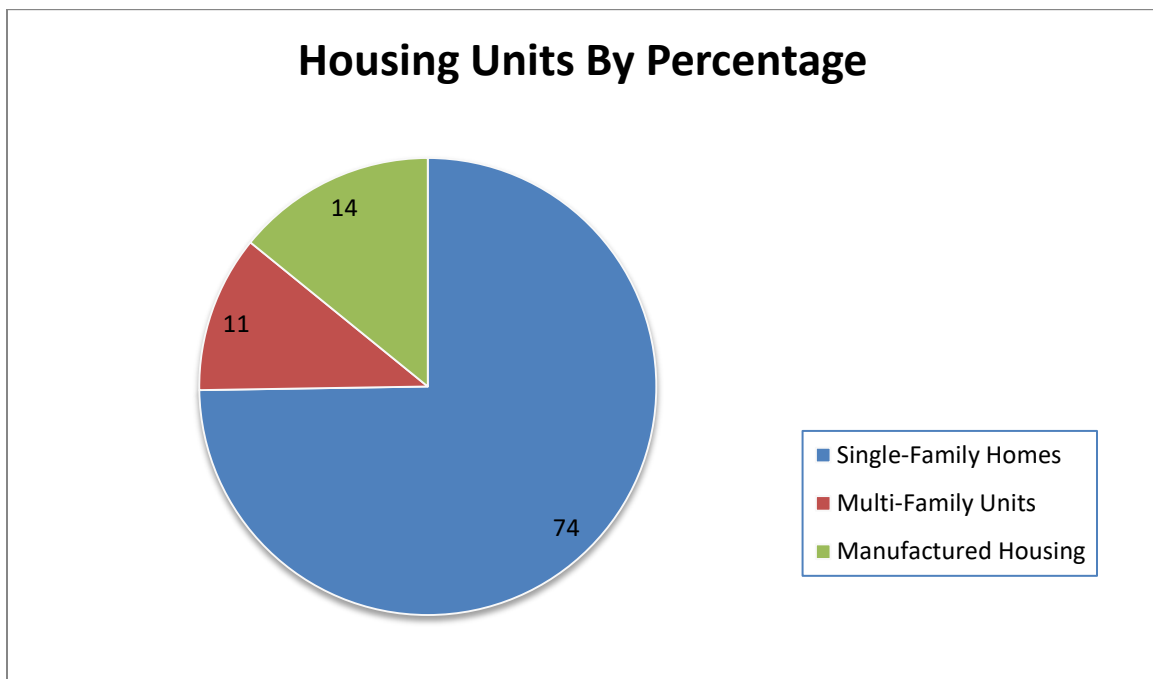
Fearington Village has the largest percentage of residents commuting by public transportation: 8.6 percent. In comparison, 1 percent of North Carolina commuters use public transportation. A greater percentage of Fearington Village residents commute by walking, bike, or motorcycle than the North Carolina average of 2 percent.

The mean commute time to work for Chatham County residents is 28.3 minutes. In comparison, the North Carolina mean commute time is 24.7 minutes. Within Chatham County, Gulf has the shortest mean commute time at 22.9 minutes while Moncure has the longest at 27.6 minutes.

**Figure 5. Mean Commute Time to Work in Minutes****Housing Profile**

Chatham County has over 29,000 housing units, 74 percent of which are single-family homes, 11 percent multi-family units, and 14 percent manufactured housing.

<sup>11</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B08301, "Means of Transportation to Work" and Table GCT0801, "Mean Travel Time to Work of Workers 16 Years and Over Who Did Not Work at Home (Minutes)."



**Figure 6. Housing Units by Percentage**

In Chatham County 9 percent of housing units are vacant, which is lower than the percentage for North Carolina, 14 percent. Within Chatham County, Moncure has the largest percentage of vacant housing units, 13 percent, while Bennett, Fearington Village, and Gulf has the least: 0 percent.

Of the occupied housing units, 77 percent are owner-occupied compared to 65 percent in North Carolina; 23 percent are renter-occupied compared to 35 percent in North Carolina.

The median housing value in Chatham County is \$223,500. In comparison, the median housing value in North Carolina is \$140,000. Within Chatham County, Fearington Village has the highest median housing value: \$288,000. Moncure has the lowest median housing value: \$93,000.

According to the National Housing Preservation Database, Chatham County has 506 affordable housing units. Most of the affordable housing is located within Siler City.<sup>12</sup>

## **Economic / Business Profile**

Chatham County largest share of jobs are in the manufacturing industry, with other jobs coming from retail trade, Health Care, and educational services. According to the US Census Bureau's Longitudinal-Employer Household Dynamics Program, the largest concentrations of jobs within Chatham County are in downtown Pittsboro, downtown Siler City, and Fearington Village.<sup>13</sup>

## **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 Chatham County is

<sup>12</sup> 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

<sup>13</sup> Source: US Census Bureau Longitudinal-Employer Household Dynamics Program

34,224.<sup>14</sup> Within Chatham County, Bennett has the largest percentage of residents in the labor force, 75 percent, while Farrington Village has the smallest: 22 percent.

The civilian unemployment rate in Chatham County is 4.2 percent. In comparison, the North Carolina civilian unemployment rate is also 5.1 percent.<sup>14</sup> Within Chatham County, Bennett and Moncure have the smallest civilian unemployment rate at 0 percent while Gulf has the largest: 29 percent.<sup>15</sup>

## Major Employers

The top ten employers in Chatham County<sup>16</sup> represent the manufacturing, retail, education and health service industries, and are listed in order of total employees:

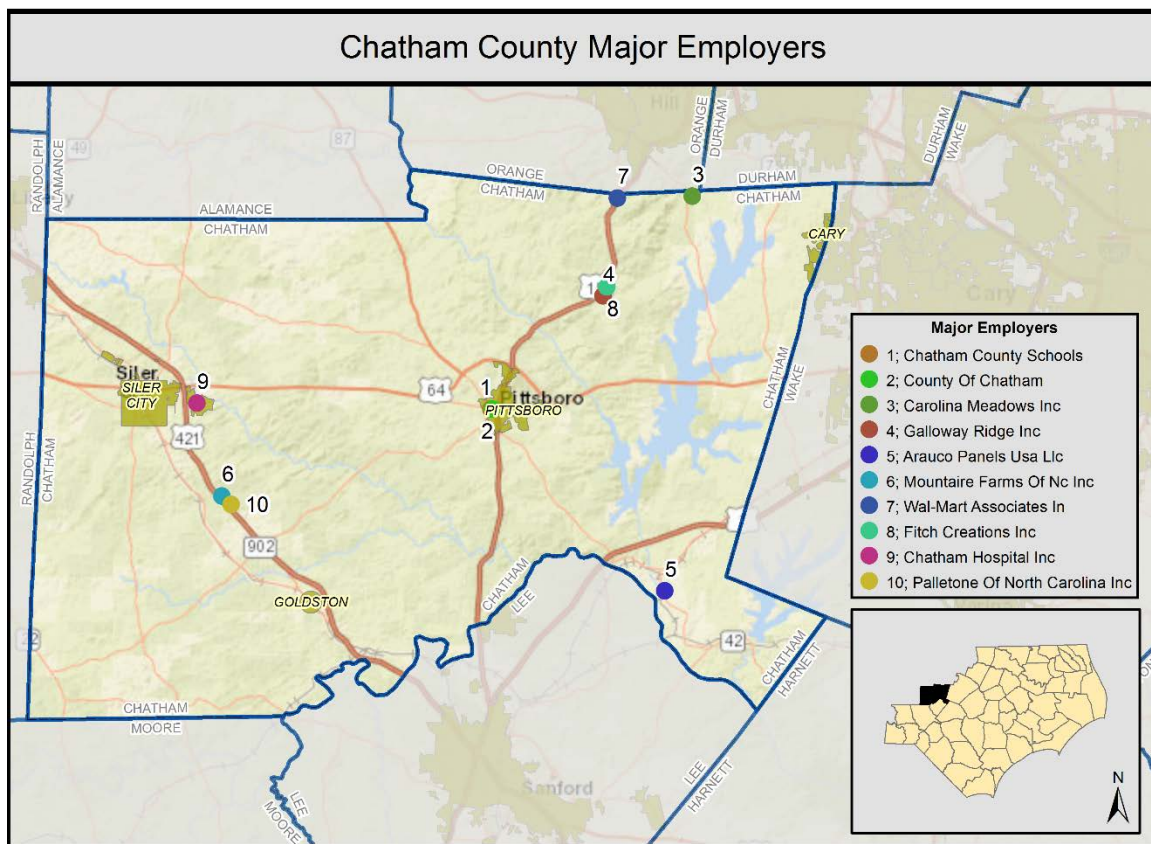


Figure 7: Major Employers by Number of Employees

## Economic Development

Chatham County Economic Development is an organization aimed at *“Building on the County's strategic location between the Triad and Triangle, we are positioning Chatham as the preferred location for emerging growth companies.”* The organization has established goals, which include working on targeted attraction of new businesses and in supporting infrastructure improvements.

<sup>14</sup> 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>

<sup>15</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B23025, "Employment Status For The Population 16 Years And Over."

<sup>16</sup> Sources: NC Department of Commerce



They have identified sites for development such as a mixed-use development called Chatham Park and the Chatham-Siler City Advanced Manufacturing Site.<sup>17</sup>

## Infrastructure Profile

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

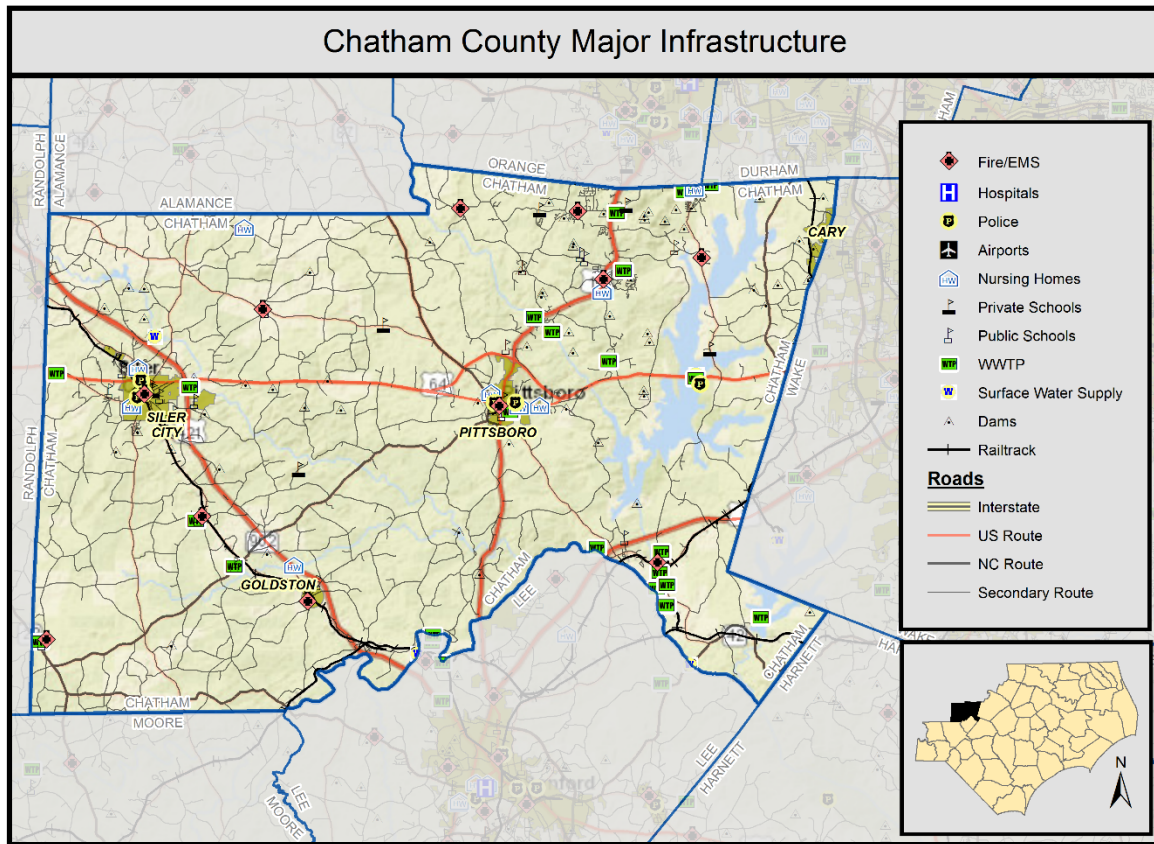


Figure 8: Chatham County Major Infrastructure

## Transportation

Chatham County is connected to the region by US 64, US 15-501 and US 421. US 64 runs east-west through Chatham County with access to Raleigh to the east and Asheboro to the west. US 421 and US 15-501 run north-south. Chatham County is served by two public transportation providers such as Chatham Transit Network and Chapel Hill Transit. The county is served by rail from Norfolk Southern, and CSX. The American Tobacco Trail also passes through the northeast corner of the county.

## Health

Chatham Hospital is the only hospital located in Chatham County. It is part of the UNC Health Care System and is located in Siler City.

<sup>17</sup> Sources: Chatham County Economic Development

## Education

Chatham County Public School System administers five elementary, three middle, and three high schools. Central Carolina Community College has two campuses in Chatham County and is a member of the North Carolina Community College System.<sup>18</sup>

## Water

There are municipal water supply systems in Cary, Pittsboro, Sanford, and Siler City that serve parts of Chatham County with drinking water. Chatham County also serves the county with its own supply plants. Municipal wastewater is treated at the Bynum, Pittsboro, Fearrington Village, Jordan Lake, and Siler City Waste Water Treatment Plants.<sup>19</sup>

## Power

One power producer in Chatham County is Piedmont Biofuels Industrial, located near Pittsboro. There are several solar farms in Chatham County, including Vickers which has a net summer capacity of 2 megawatts and Moncure Farm which has a capacity of 5 MW. There are also two hydropower plants in Chatham County, Lockville Hydropower and Jordan Hydroelectric.<sup>20</sup>

## Environmental Profile

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

### Water Resources

The Rocky River flows east-west through the middle of Chatham County. The Deep River flows along Chatham's southeastern border with Lee County. Also, the Haw River is located in the eastern portion of the county.

Jordan Lake can be found in the eastern portion of Chatham County, covering over 13,000 acres. The southern end of Sharon Harris Reservoir also lies in Chatham County.<sup>21</sup>

### Natural and Managed Areas

According to the NC Natural Heritage Program, there are several natural areas of high, very high, or exceptional value in Chatham County. They are found along the Rocky River and its tributaries, along the Deep River, and along the Haw River.

There are several managed areas under state ownership within Chatham 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 Chatham County include: the area along the Haw River and along the Haw River.<sup>22</sup>

<sup>18</sup> Sources: Chatham County Public Schools and Central Carolina Community College

<sup>19</sup> Sources: NC Division of Water Resources, Local Water Supply Plans; and the Neuse Regional Water and Sewer Authority

<sup>20</sup> Source: US Department of Energy, US Energy Mapping System

<sup>21</sup> Source: NC Natural Heritage Program

<sup>22</sup> Source: NC Natural Heritage Program

## 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 Rocky River and its tributaries and along the Haw River. These areas rank between a 7 and 10, with 10 being the highest possible score. Other areas of the county rank 5 to 6. Most of the county is unrated.<sup>23</sup>

## Parks and Recreation

The Chatham County Parks and Recreation Department maintains several parks and facilities in Chatham County. The Northeast District Park has recreational baseball fields; the Northwest District Park has boating. There is also the Southwest District Park and the Park at Briar Chapel. The American Tobacco Trail also passes through the north of Chatham County.<sup>24</sup>

## Administrative Profile

The administrative capabilities of Chatham County and the municipalities within the County are discussed in great detail within Section 7 of the Cape Fear Regional Hazard Mitigation Plan (2016). The assessment evaluates the capabilities of the County and municipalities to implement mitigation actions across the areas of planning and regulatory capabilities, administrative and technical capabilities, fiscal capabilities, and political capabilities. Many more details about the capabilities of Chatham County and the municipalities can be found in that document.

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

Pittsboro and Siler City have “moderate-high capabilities” as well. They both have Planning departments that would likely be able to assist with implementing the strategies in this plan as well. In addition, they have the plans, policies and procedures in place that indicate high capability. The Town of Goldston would likely need support from other agencies in order to implement actions in this plan due to limited administrative capabilities.

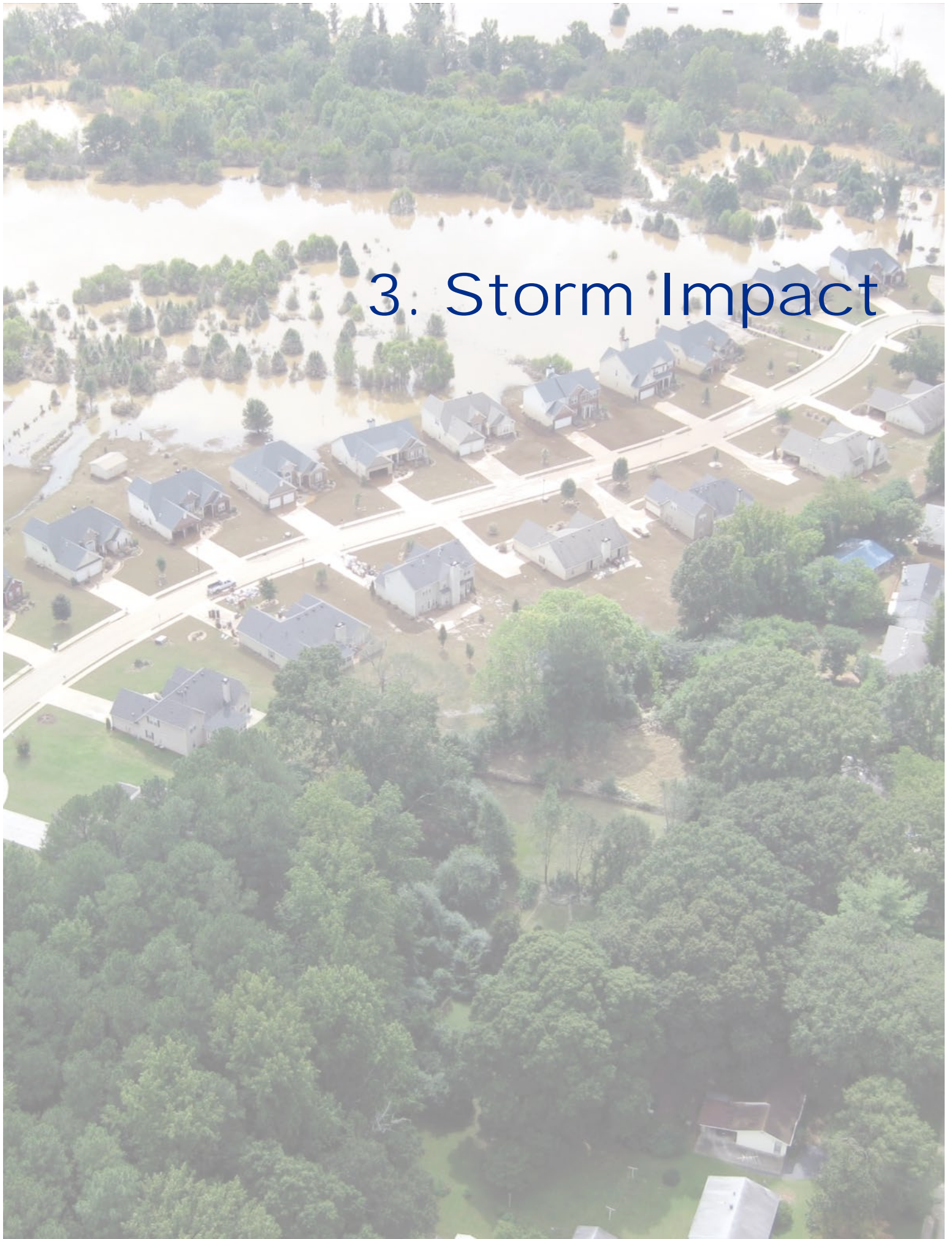
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<sup>23</sup> Source: NC Natural Heritage Program

<sup>24</sup> Sources: NC Natural Heritage Program, Chatham County Parks and Recreation Department



### 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 Chatham County is highlighted graphically in the figure below;

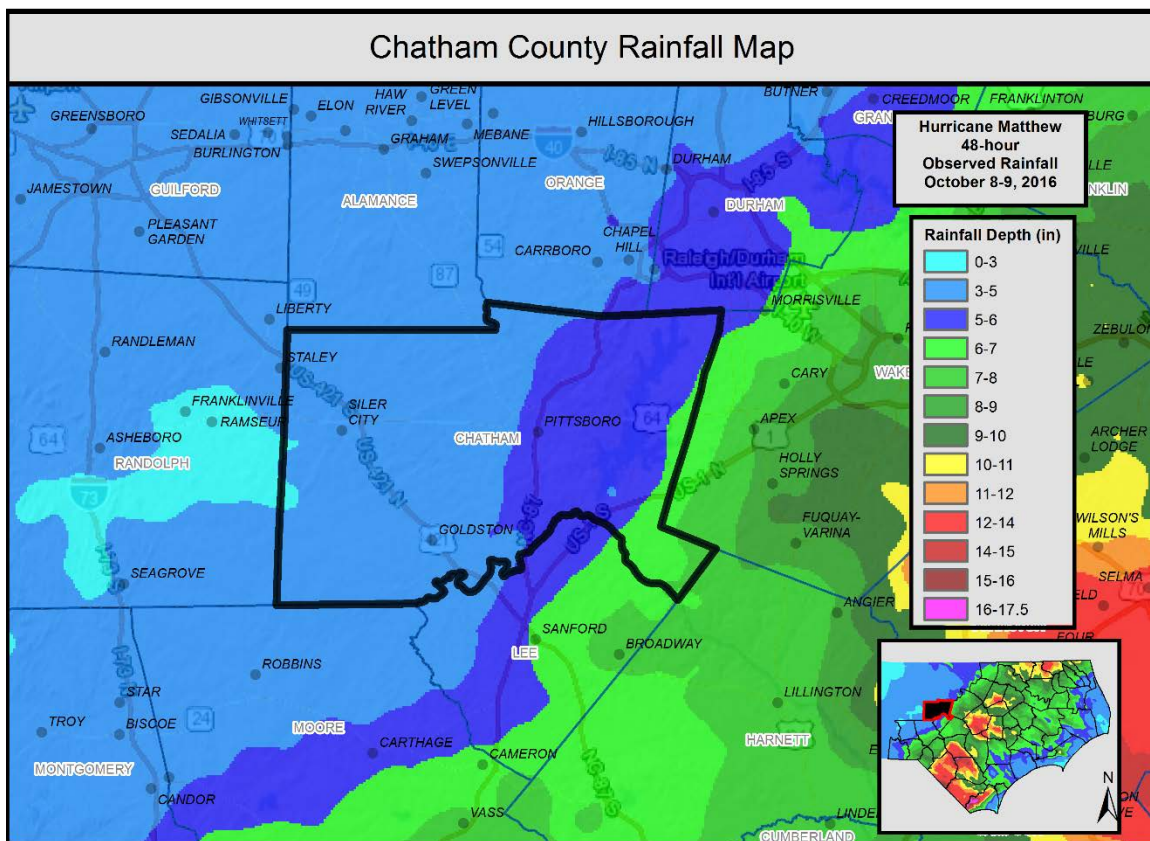


Figure 9: 48-hour Observed Rainfall Depth (October 8-9, 2016)

#### Riverine Flooding Summary

In general, riverine flooding during and after Hurricane Matthew was not a county-wide event that impacted large areas of the Chatham County population. Several roads in the area were impassable during the storm as a result of localized flooding but road closures were not widespread or long lasting. USGS documented stream gage data in the report "Preliminary Peak Stage and Streamflow Data at Selected Streamgaging Stations in North Carolina and South Carolina for Flooding Following Hurricane Matthew, October 2016". Stream gage data from the USGS report for Chatham County and nearby gages is summarized below;



USGS Gage	County	River Name and Location	Drainage Area (sq. mi)	Peak Matthew Elevation (ft.)	Previous Record (ft.)
02096960	Chatham	Haw River near Bynum, NC	1,750.0	14.98	21.76
02098206	Chatham	Haw River near Moncure, NC	1,691.0	14.24	10.73
02102000	Chatham	Deep River at Moncure, NC	1,434.0	11.45	17.20
02101800	Chatham	Tick Creek Near Mount Vernon Springs, NC	15.5	8.6	13.41
02101726	Chatham	Rocky River at US 64 near Siler City, NC	68.7	16.52	19.52

**Table 3: Chatham County USGS Stream Gage Data**

The USGS gage data generally validates the limited flooding experienced throughout Chatham County from Hurricane Matthew.

Localized flooding occurred at various locations throughout the County. In the northeastern part of the county near Chapel Hill, Cedar Lake Road (a private road) was washed out between two ponds stranding or preventing residents from reaching nearby rental homes.

### Coastal Flooding Summary

Chatham County has no coastline and thus did not experience coastal flooding during Hurricane Matthew.

### Housing Impacts

According to FEMA Individual Assistance claims as of March 20, 2017, there were 28 registrations for Individual Assistance in Chatham County as a result of Hurricane Matthew. There was one NFIP claim and zero SBA Home loan applications. Additional claims from Hurricane Matthew may still be pending, so these totals may not reflect the final claims data from the event.

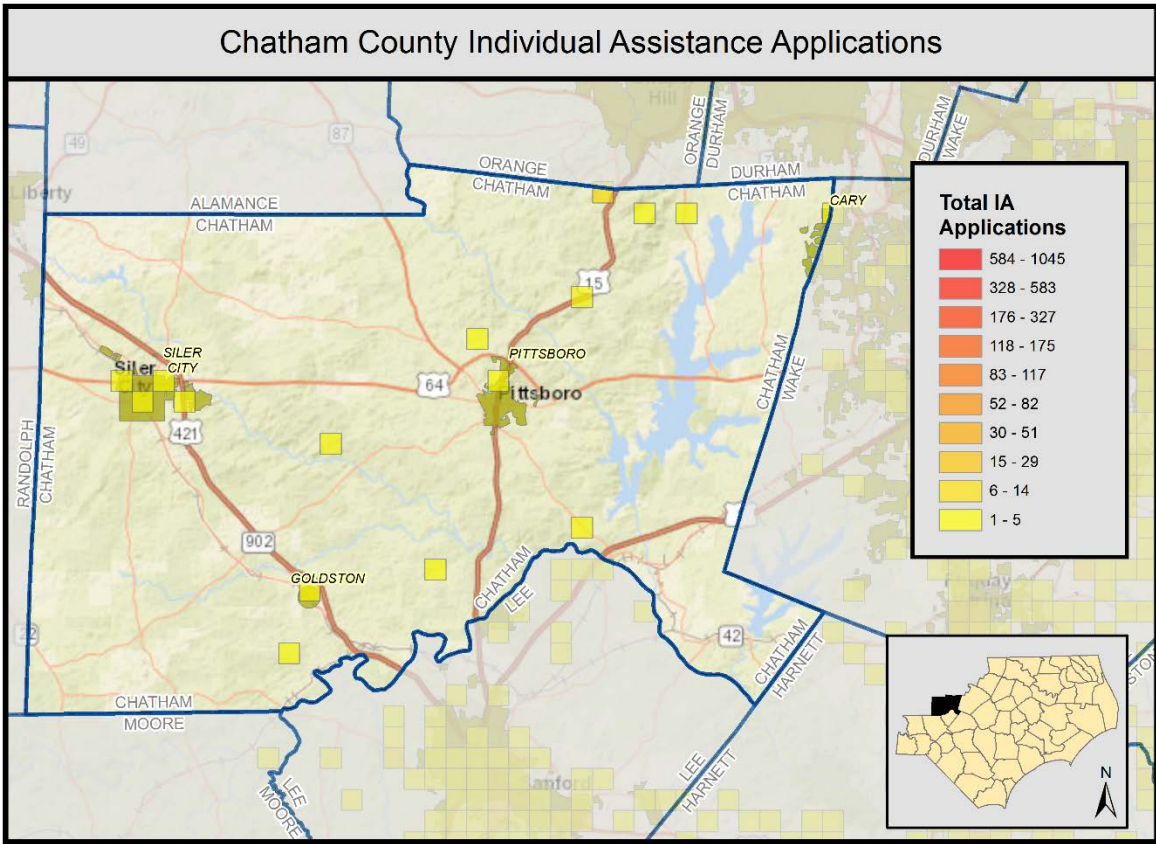


Figure 10: Chatham County IA Applications by Area

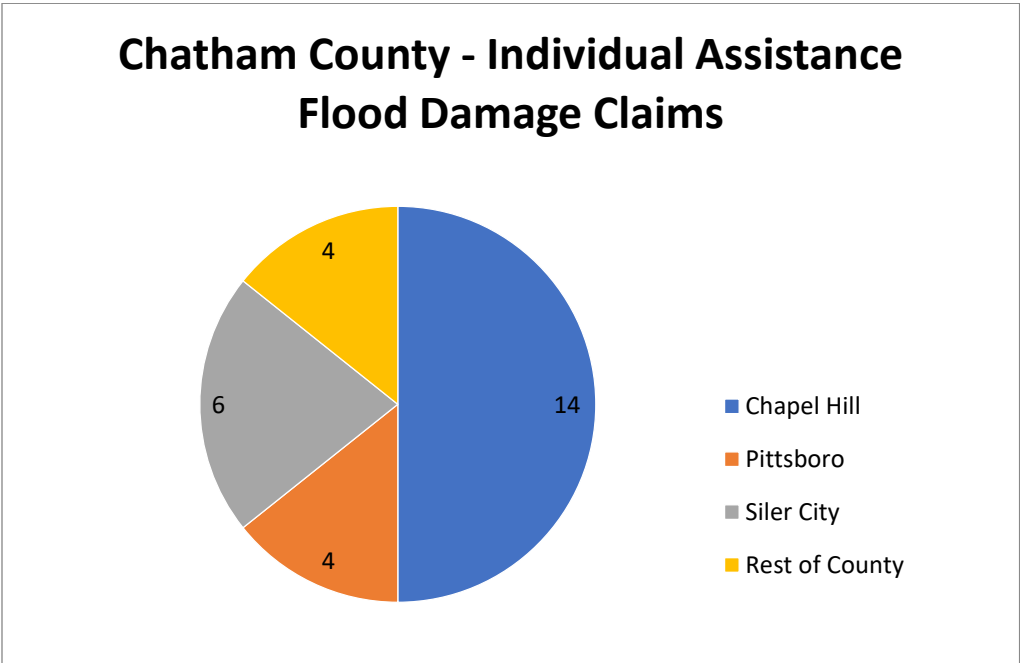


Figure 11: Number of IA Flood Damage Claims by Area

Based on meetings with County personnel and representatives from several of the towns in Chatham County, impacts to housing from Hurricane Matthew were sporadic and considered minimal. Of the 28 IA claims, only 10 received assistance and 8 of those were located where Cedar Lake Road was washed out in the northeastern

part of the county near Chapel Hill. In that area, approximately 8 rental units are currently inaccessible but the units themselves apparently were not damaged.

Building footprints were compared with the SFHA to identify areas where flooding could impact populated areas. In general, a majority of the buildings in the SFHA are located in the most populated areas of Chatham County including the towns of Siler City, Pittsboro, and Moncure. In unincorporated areas of the county most of the buildings located in the SFHA are along the Haw River and tributaries to the Haw River.

Based on an analysis of claims data there are approximately two miles of unstudied streams in Chatham County that may have experienced flooding but are not mapped as SFHA on the FEMA FIRM maps. Local officials in Siler City have requested that the tributary to Rocky River Tributary 1 in the 14<sup>th</sup> Street/15<sup>th</sup> Street area also be studied to understand flooding impacts in that area.

### Economics / Business / Jobs

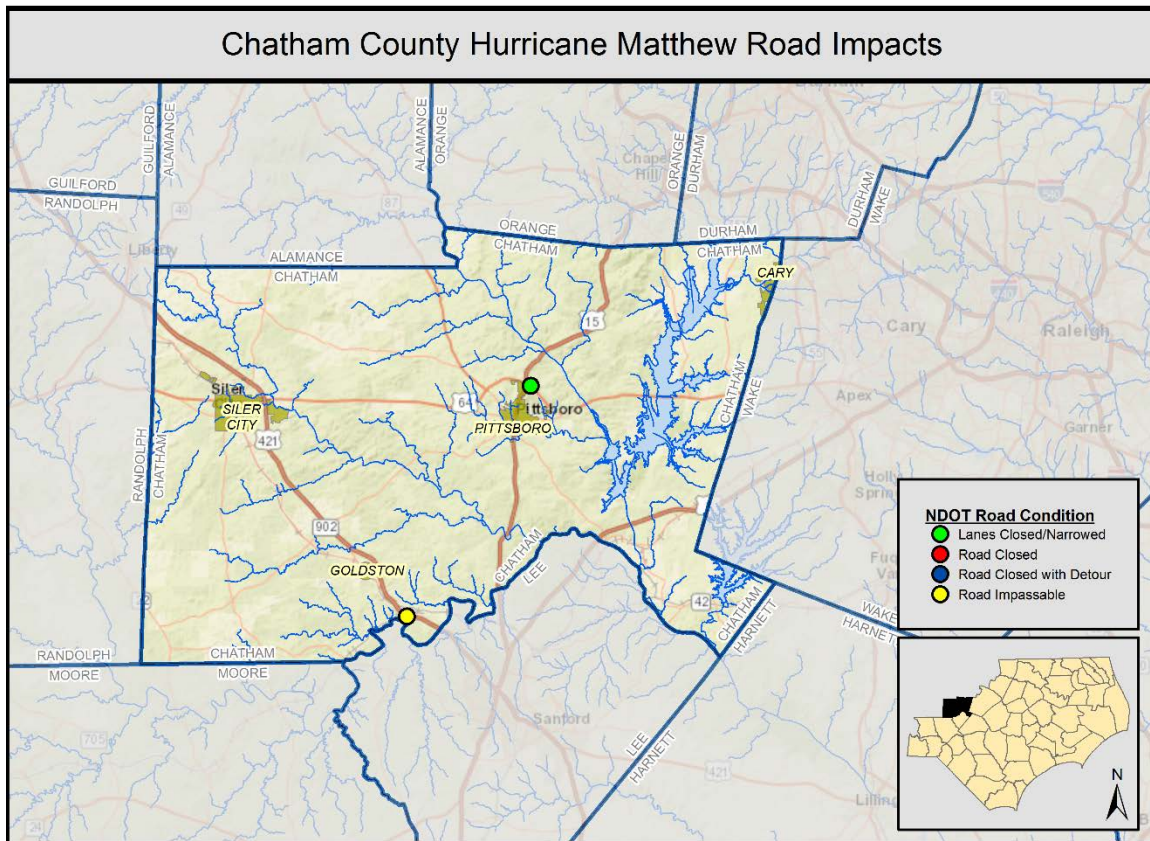
If there were impacts to the economy in Chatham County from Hurricane Matthew they were very minor or short lived. As of March 20, 2017, there were seven business applications for loans from the SBA. Impacts to the economy/businesses/jobs that were identified by local officials from the event are summarized below;

- **Downtown Areas Impacted:** Local officials did not report any damage to downtown areas in any of the municipalities in Chatham County.
- **Employment:** There are no known impacts to employment in Chatham County resulting from Hurricane Matthew.

### Infrastructure

According to Public Assistance claims data, which are often closely tied to infrastructure, as of March 17, 2017 there were no Public Assistance Projects submitted for Chatham County as a result of Hurricane Matthew. Additional claims from Hurricane Matthew may still be pending, so this number may not reflect the final claims data from the event.

Although infrastructure impacts from Hurricane Matthew were minimal, County personnel indicated that Jeremiah Drive in northeastern Chatham County is an area of concern that has experienced flooding in many events prior to Hurricane Matthew. Jeremiah Drive is an NCDOT maintained road that serves a small number of houses. The grade of road makes it vulnerable to flooding from Overcup Creek when Jordan Lake water levels are high. Road flooding can strand residents and prevent emergency responder access to these residents. The road was flooded in January 2016 by 4-5 feet. Local officials have implemented an alert system for the affected homes when rising water levels threaten road flooding.



**Figure 12: Impacted NCDOT Structures in Chatham County**

Local officials from Siler City indicated that the city owned and maintained bridge on WWTP Road that serves as secondary access to the City's waste water treatment plant was damaged during Hurricane Matthew. This bridge which crosses Love's Creek is just downstream of US Hwy 421. Although no structural damage was reported, the bridge experienced overtopping and superficial damage that needs repair.

Siler City officials have expressed a need for comprehensive stormwater enhancements to solve recurring flooding issues at several locations. Among other potential projects, the City has identified the need to upsize a culvert at East 5<sup>th</sup> Street and Camelia Lane and the potential to daylight an underground pipe system adjacent to West 2<sup>nd</sup> Street in the vicinity of North Evergreen Avenue and North Fir Avenue.

### **Ecosystems / Environment**

Overall, environmental impacts in Chatham County as a result of Hurricane Matthew were minimal. No damage information or specific issues were raised in the meetings with government officials related to this pillar.



An aerial photograph showing a residential neighborhood that has been severely flooded. The water is a murky, brownish-yellow color, covering the streets, lawns, and surrounding forested areas. Several houses with light-colored roofs and walls are visible, some partially submerged. The trees are mostly green, but many are isolated in the floodwater. The overall scene depicts the aftermath of a significant flood event.

## 4. Strategies for Resilient Redevelopment



## 4. Strategies for Resilient Redevelopment

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

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

Pillar	Project/Action Count
Housing	1
Economic Development	0
Infrastructure	12
Environment	3
<b>Grand Total</b>	<b>16</b>

**Table 4. Chatham County Summary of Projects by Pillar**

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

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Chatham Infrastructure Action 4: Emergency Shelter Generators	High	1
Infrastructure	Chatham Infrastructure Action 8: Town of Pittsboro Critical Facilities Generator Replacement	High	2
Infrastructure	Chatham Infrastructure Action 3: Town of Siler City Stormwater Improvements	High	3
Infrastructure	Chatham Infrastructure Action 9: Town of Pittsboro Stormwater Improvements	High	4
Housing	Chatham Housing Action 1: Senior Center Building Resiliency	High	5
Infrastructure	Chatham Infrastructure Action 11: Flood Gage Installation at Two Locations	High	6
Infrastructure	Chatham Infrastructure Action 10: Town of Pittsboro Aerial Sewer Crossing Improvements	High	7
Infrastructure	Chatham Infrastructure Action 17: Town of Siler City Aerial Sewer Crossing Improvements	Medium	8

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Chatham Infrastructure Action 7: Town of Siler City NCDOT Culvert Upgrade (2 <sup>nd</sup> Avenue)	Medium	9
Environment	Chatham Environment Action 14: Fire Department Equipment Enhancement	Medium	10
Environment	Chatham Environment Action 15: Detailed Flood Studies of Unmapped Areas with Future Conditions	Medium	11
Infrastructure	Chatham Infrastructure Action 6: Town of Siler City WWTP Access Bridge Repair	Medium	12
Infrastructure	Chatham Infrastructure Action 13: Town of Siler City Greenway Trail Repairs	Medium	13
Infrastructure	Chatham Infrastructure Action 12: Town of Pittsboro Greenway Trail Repairs	Medium	14
Infrastructure	Chatham Infrastructure Action 5: Jeremiah Drive Roadway Enhancement	Low	15
Environment	Chatham Environment Action 16: Debris Removal from Rocky River Tributary 1	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

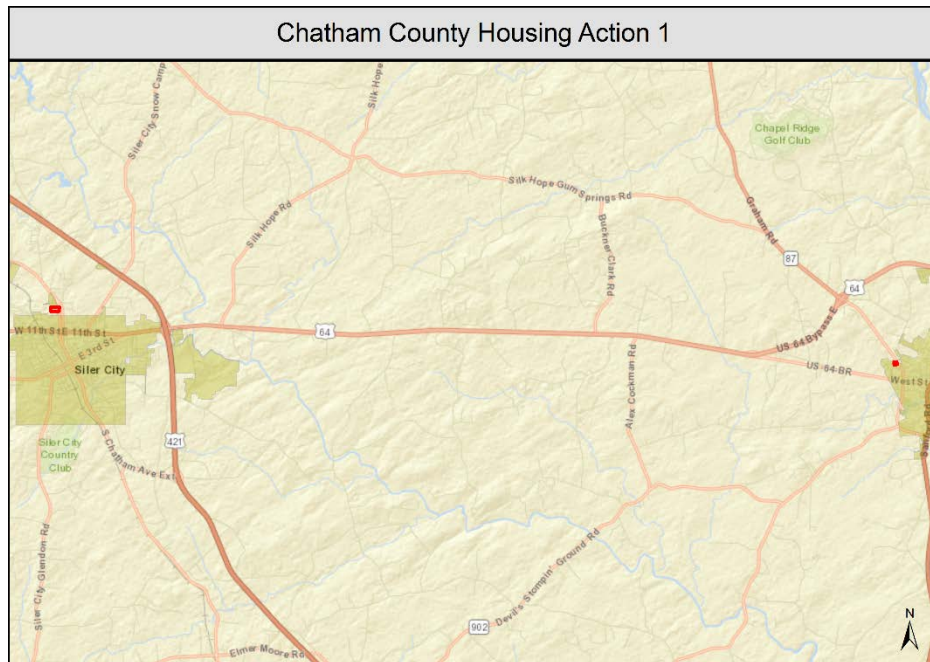
### High Priority Housing Strategies

Pillar	Action Name	Priority	Overall Ranking
Housing	Chatham Housing Action 1: Senior Center Building Resiliency	High	5

**Table 6. Chatham High Priority Housing Summary**

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

- Senior Center Building Resiliency:** Chatham County has two senior activity centers. These centers serve as special needs shelters and are considered critical infrastructure. The centers serve the county during events by preparing meals for other shelters and also serving as a shelter if needed. The shelters have many large decorative windows. Unlike traditional shelters such as schools that typically house people in hallways and other interior areas without many windows, due to the Senior Center layouts, people may be sheltered within vicinity of the windows putting them at risk. This project would retrofit the Senior Centers with custom storm shutters on the exterior windows in order to better protect the buildings and inhabitants from storm damage. There is an ongoing project through state mitigation to address this issue.



**Figure 13. Senior Center Building Resiliency**

## Senior Center Building Resiliency

**County:** Chatham

**Priority Grouping:** High Priority

**Priority Ranking:** 5

**Project Timeframe:** 1-year

**Location:** Western Chatham Senior Center, 112 Village Lake Rd, Siler City, NC 27344 & Eastern Chatham Senior Center, 365 NC-87, Pittsboro, NC 27312

**Project Summary:** Chatham County has two Senior activity centers. These centers serve as special needs shelters and are considered critical infrastructure. The centers serve the county during events by preparing meals for other shelters and also serving as a shelter if needed. The shelters have many large decorative windows. Unlike traditional shelters such as schools that typically house people in hallways and other interior areas without many windows, due to the Senior Center layouts, people may be sheltered within vicinity of the windows putting them at risk. This project would retrofit the Senior Centers with custom storm shutters on the exterior windows in order to better protect the buildings and inhabitants from storm damage. There is an ongoing project through state mitigation to address this issue.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.		N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?		N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.		N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws		N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	None	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$0- \$50K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	County	N/A

## Infrastructure Strategies

### High Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Chatham Infrastructure Action 4: Emergency Shelter Generators	High	1
Infrastructure	Chatham Infrastructure Action 8: Town of Pittsboro Critical Facilities Generator Replacement	High	2
Infrastructure	Chatham Infrastructure Action 3: Town of Siler City Stormwater Improvements	High	3
Infrastructure	Chatham Infrastructure Action 9: Town of Pittsboro Stormwater Improvements	High	4
Infrastructure	Chatham Infrastructure Action 11: Flood Gage Installation at Two Locations	High	6
Infrastructure	Chatham Infrastructure Action 10: Town of Pittsboro Aerial Sewer Crossing Improvements	High	7

**Table 7. Chatham High Priority Infrastructure Summary**

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

- Backup Power for Chatham County Emergency Shelters:** Currently, the Chatham County emergency shelters (critical infrastructure) utilize portable generators during and after events. There are a number of logistic issues associated with this approach and the transportation of the generators ties up emergency personnel that could be utilized elsewhere for response and recovery. This strategy would provide dedicated backup power with generators for designated emergency shelters and potentially other identified critical facilities. 2 of the 4 schools being used for emergency shelters are already pre-wired for generator use. There is a strong preference for the use of natural gas or propane as fuel source if possible. This is a current mitigation project being worked on and some costs have been developed. Four generators are needed.



## Backup Power for Chatham County Emergency Shelters

**County:** Chatham

**Priority Grouping:** High Priority

**Priority Ranking:** 1

**Project Timeframe:** 1-year

**Location:** Countywide

**Project Summary:** Currently, the Chatham County emergency shelters (critical infrastructure) utilize portable generators during and after events. There are a number of logistic issues associated with this approach and the transportation of the generators ties up emergency personnel that could be utilized elsewhere for response and recovery.

This strategy would provide dedicated backup power with generators for designated emergency shelters and potentially other identified critical facilities. 2 of the 4 schools being used for emergency shelters are already pre-wired for generator use. There is a strong preference for the use of natural gas or propane as fuel source if possible.

This is a current mitigation project being worked on and some costs have been developed. Four generators are needed.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.		N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?		N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?		N/A
Explain any benefits or impacts to the economy of the county from this project.		N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	>6	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws		N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	No Impact	N/A
What impacts to the environment of the county will result from this project?	None	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$251K - \$500K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	County	N/A

- **Town of Pittsboro – Critical Facilities Generator Replacement:** The generator serving as backup power for the Pittsboro Town Hall is unreliable and has failed to operate on several occasions when needed. Reliable back-up power is required for this critical infrastructure building.

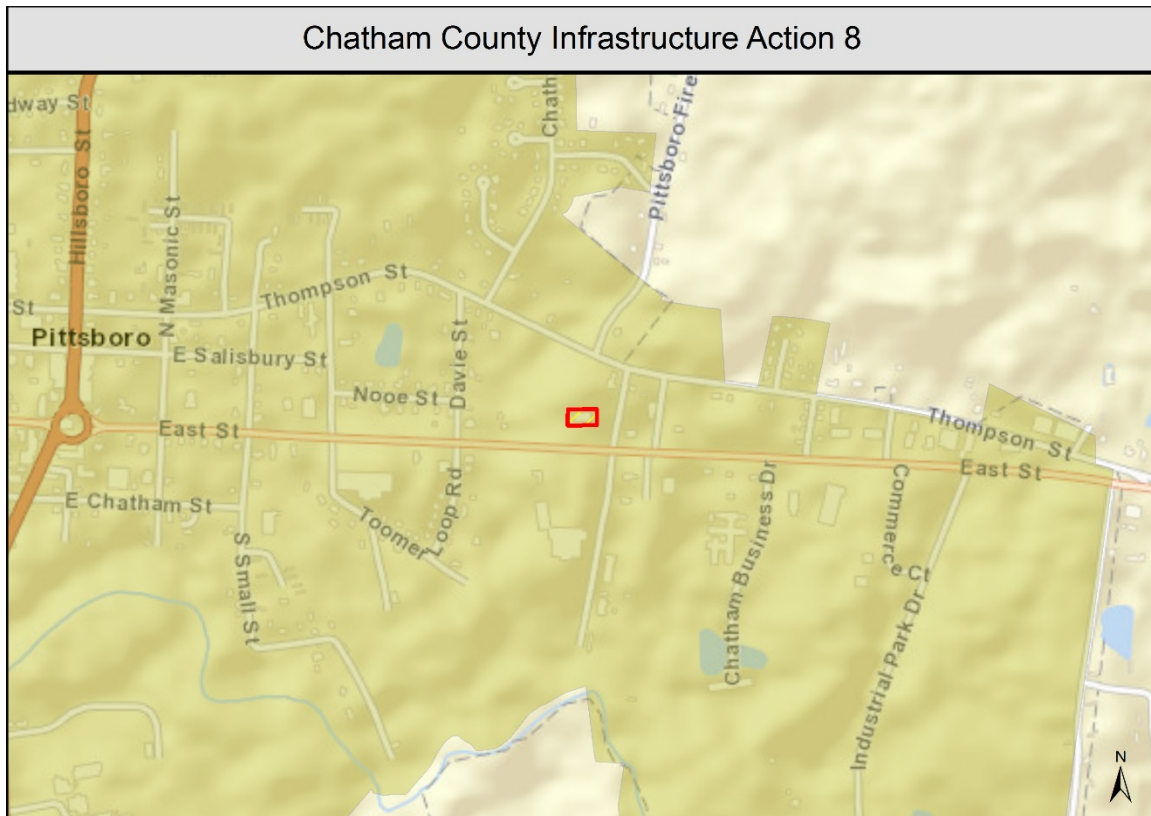


Figure 14. Town of Pittsboro Critical Facilities Generator Replacement

## Pittsboro Town Hall Backup Power

**County:** Chatham

**Priority Grouping:** High Priority

**Priority Ranking:** 2

**Project Timeframe:** 1-year

**Location:** 635 East St, Pittsboro, NC 27312

**Project Summary:** The generator serving as backup power for the Pittsboro Town Hall is unreliable and has failed to operate on several occasions when needed. Reliable back-up power is required for this critical infrastructure building.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need created by damage from Hurricane Matthew but it addresses an unmet need which could be affected by any large flooding event.	N/A
Consistent with existing plans (describe points of intersection/departure)	Hurricane Matthew had minimal effects in Chatham County; however this project will help the Pittsboro to sustain and properly respond to future storm events similar to Hurricane Matthew.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?		N/A
Explain any benefits or impacts to the economy of the county from this project.		N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	None	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$51K - \$100K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A

- **Town of Siler City - Stormwater Improvements:** Siler City has experienced a variety of Stormwater issues. A comprehensive Stormwater management plan is needed to investigate existing issues and make recommendations for projects to improve drainage and reduce flooding. Specific issues and potential projects identified include:
  1. The culvert for Loves Creek Tributary 3 at West 5<sup>th</sup> St is not functioning properly, undersized, and likely needs replaced. The potential for increased flooding downstream must be evaluated to prevent adverse impacts.
  2. Loves Creek Tributary 2 is piped under several parking lots but the system is undersized and causes flooding over the lots. Some lots have sinkholes developing and erosion (corner of W Raleigh and N Evergreen). The piped system likely needs to be day-lighted and associated culverts replaced.
  3. The culvert for Loves Creek Tributary 1 at North Chatham Av is undersized and likely needs replaced. The potential for increased flooding downstream must be evaluated to prevent adverse impacts.
  4. The culverts under West 3<sup>rd</sup> St and West Raleigh St are likely undersized and contribute to overtopping of the roads and flooding in the area. Two businesses in the area have implemented mitigation efforts to reduce the flooding impacts. The culverts need to be evaluated for potential upsizing. The potential for increased flooding downstream must be evaluated to prevent adverse impacts.
  5. The culvert for Rocky River Tributary 1 at North Av is undersized and contributes to residential structure flooding along 14<sup>th</sup> St. The culvert needs to be evaluated for potential upsizing. The potential for increased flooding downstream must be evaluated to prevent adverse impacts.
  6. Poor drainage on an adjacent lot causes flooding in the basement at 223C N Chatham Av 4-5 times a year. The basement serves as an Arts Incubator. Supplies and rent have been lost due to flooding. Grading and improvement of the channel draining the adjacent lot is needed. NC State has already implemented a project to handle roof drainage but the problem persists.



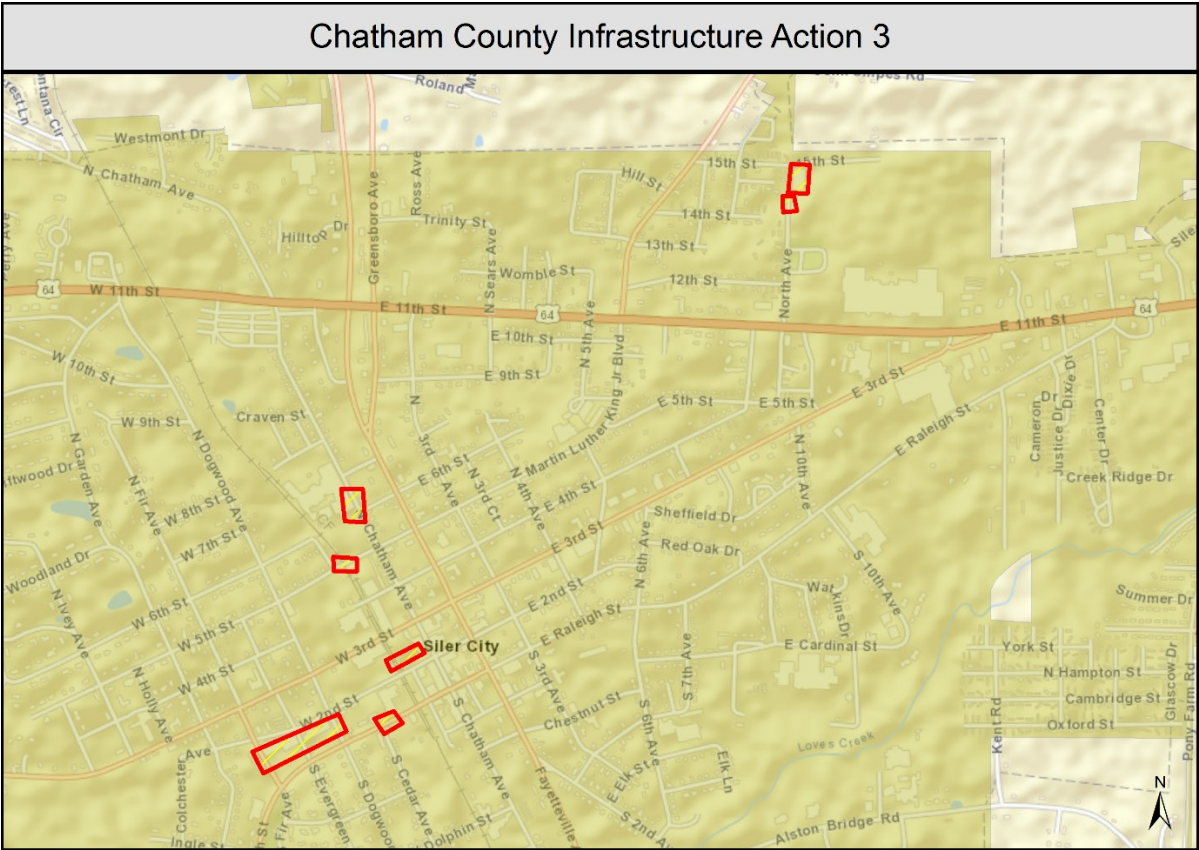


Figure 15. Town of Siler City Stormwater Improvements

## Siler City Stormwater Improvements

**County:** Chatham

**Priority Grouping:** High Priority

**Priority Ranking:** 3

**Project Timeframe:** 3-years

**Location:** Various Locations in Siler City

**Project Summary:** Siler City has experienced a variety of Stormwater issues. A comprehensive Stormwater management plan is needed to investigate existing issues and make recommendations for projects to improve drainage and reduce flooding. Specific issues to be addressed and potential solutions include:

W 5th St culvert for Loves Creek Tributary 3 is not functioning properly, is likely undersized, and needs replaced.

Loves Creek Tributary 2 is piped under several parking lots but the system is undersized and causes flooding over the lots. Some lots have sinkholes developing and erosion (corner of W Raleigh and N Evergreen). The piped system likely needs to be day-lighted. The Town is pursuing a grant for a \$100,000 study through the Clean Water Management Trust Fund.

Culvert under N Chatham Av for Loves Creek Tributary 1 is undersized and likely needs replaced.

Culverts under W 3rd St and W Raleigh St are likely undersized leading to overtopping of roads. Fitness Center at 308 W Raleigh St has already implemented structural mitigation efforts. Furniture Plant at 222 W Raleigh St has flooded and has pumps in place to mitigate lower level flooding. Both structures have flooded 4 times in 15 years.

North Av culvert may be undersized along Tributary to Rocky River Tributary 1 causing flooding in structures along 14th St. Flooding has been reported 4 times in 15 years. This reach is targeted for new study in separate RRP project.

Poor drainage on adjacent lot causes flooding in basement at 223C N Chatham Av 4-5 times a year. The basement serves as an Arts Incubator. Supplies and rent have been lost due to flooding. Grading and improvement of channel draining lot is needed. NC State has already implemented a project to handle roof drainage but the problem persists.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need created by damage from Hurricane Matthew but it addresses an unmet need which could be affected by any large flooding event.	N/A
Consistent with existing plans (describe points of intersection/departure)	New flood study is recommended for Tributary to Rocky River Tributary 1.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Reduction in flood damage. Reduction of lost rent and ability to utilize space as needed for storage etc. Improved drainage makes sites more attractive for potential buyers/developers.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	4-6	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	Unknown	N/A

What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$501K - \$1M	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Unknown	N/A
Who will administer this project?	Local	N/A

- Town of Pittsboro – Stormwater Improvements:** Pittsboro has experienced repeated overtopping of roadways and associated flooding in those areas at two primary locations:
  1. The culvert for Robeson Creek Tributary 3 at Oakwood Dr. is undersized and contributes to overtopping of the road 2-4 times a year. This project would evaluate upsizing the culvert to better pass flood events. Potential impacts from increased flooding downstream will need to be avoided.
  2. Thompson Street overtops from flooding just west of the intersection of Pittsboro Fire Tower Road. The culvert at this location is undersized to convey the existing flood volume. When Thompson St overtops, the communication tower for the Fire and Police department (critical infrastructure) at the top of Pittsboro Fire Tower Rd is cutoff from the west. In addition, traffic volume along Thompson St is anticipated to dramatically increase with planned development and construction of a new school. This project would upsize the culvert under Thompson St west of the intersection with Pittsboro Fire Tower Rd. Potential impacts from increased flooding downstream will need to be avoided.

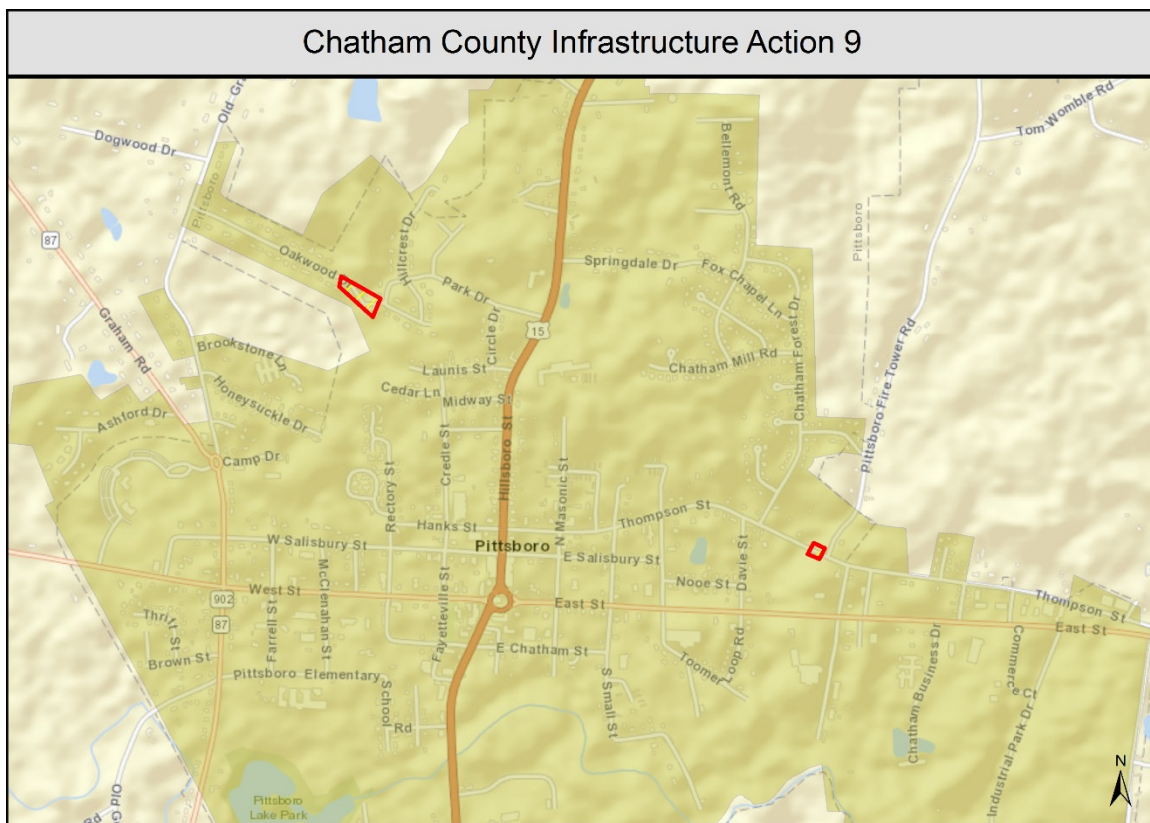


Figure 16. Town of Pittsboro Stormwater Improvements



## Pittsboro Stormwater Improvements

**County:** Chatham

**Priority Grouping:** High Priority

**Priority Ranking:** 4

**Project Timeframe:** 2-years

**Location:** Oakwood Dr crossing over Robeson Creek Tributary 3 & Thompson St just west of Pittsboro Fire Tower Road

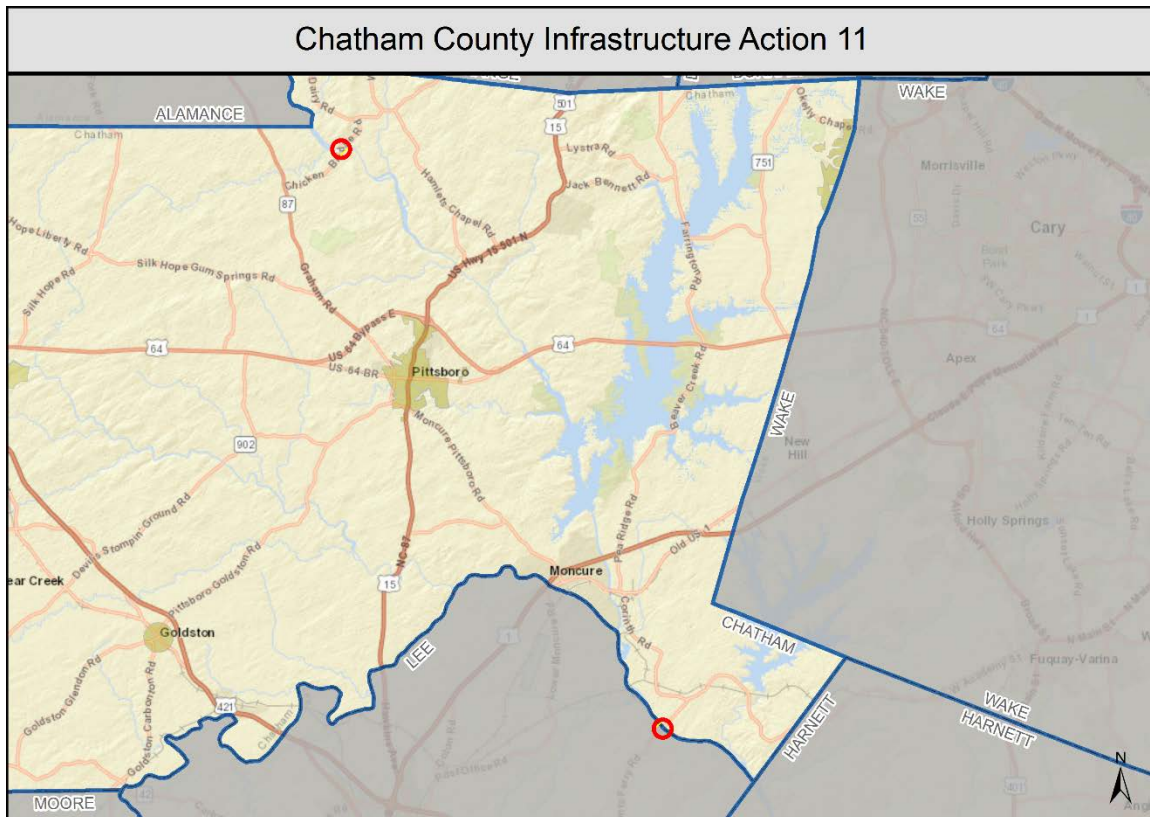
**Project Summary:** The culvert for Robeson Creek Tributary 3 at Oakwood Dr is undersized and contributes to overtopping of the road 2-4 times a year. The road was overtopped during Hurricane Matthew. Several houses upstream of Oakwood Dr and along Park Dr experience flooding. This project would evaluate upsizing the culvert to better pass flood events. Potential increased flooding downstream will need to be avoided.

Thompson Street overtops from flooding just west of the intersection of Pittsboro Fire Tower Road. The culvert at this location is undersized to convey the existing flood volume and the roadway may need elevation. When Thompson St overtops, the communication tower for the Fire and Police department (critical infrastructure) at the top of Pittsboro Fire Tower Rd is cutoff from the west. In addition, traffic volume along Thompson St is anticipated to dramatically increase with planned development and construction of a new school. This project would upsize the culvert under Thompson St west of the intersection with Pittsboro Fire Tower Rd.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Oakwood Dr was overtopped during Hurricane Matthew but may not be eligible for PA or mitigation funding. Thompson St was not overtopped during Hurricane Matthew but is known to during large storm events.	N/A
Consistent with existing plans (describe points of intersection/departure)	The flooding sources under Thompson St (west and east of Pittsboro Fire Tower Rd) are not currently mapped and are targeted for new detail study with Future Conditions mapping. If implemented the new culvert under Thompson St would need to be relocated.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	There is significant growth anticipated in this area of the county specifically in the Thompson St area. Prevention of road overtopping will help provide necessary access to new development areas.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
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	N/A
What impacts to the environment of the county will result from this project?	Unknown	N/A

What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$251K - \$500K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A

- Flood Gage Installation at 2 Locations:** Chatham County currently has 1 gage active in the FIMAN system. Installation of additional gages will better prepare the county during flood events and help protect lives by monitoring flood hazards real-time. Two locations have been identified and are part of a current mitigation project (Cape Fear River @ Rte 42 & Haw River @ Chicken Bridge Road). These two locations will monitor two of the largest flooding sources within the county at the upstream and downstream county extents, providing a good understanding of timing of flooding throughout the county during an event.



**Figure 17. Flood Gage Installation at Two Locations**

## FIMAN Gage Installations

**County:** Chatham

**Priority Grouping:** High Priority

**Priority Ranking:** 6

**Project Timeframe:** 1-year

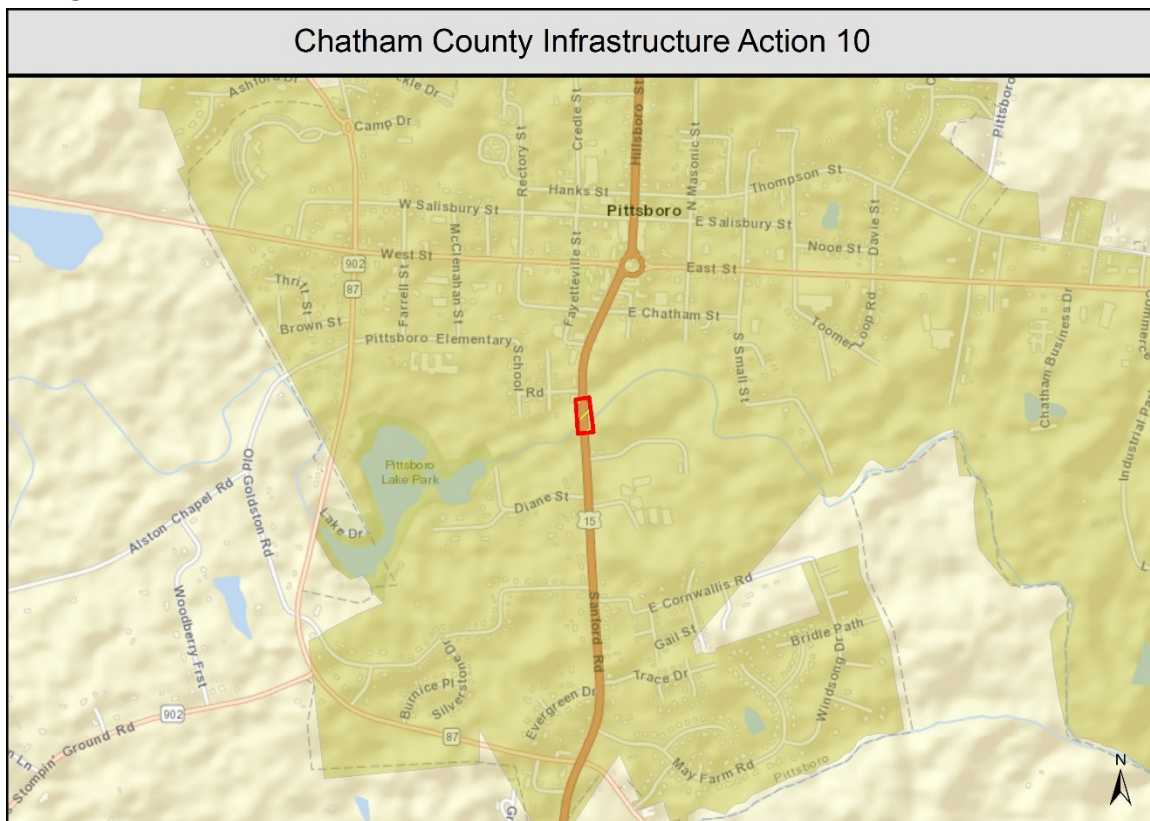
**Location:** Cape Fear River @ Rte 42 & Haw River @ Chicken Bridge Road

**Project Summary:** Chatham County currently has 1 gage active in the FIMAN system. Installation of additional gages will better prepare the county during flood events and help protect lives by monitoring flood hazards real-time. Two locations have been identified and are part of a current mitigation project. These two locations will monitor two of the largest flooding sources within the county at the upstream and downstream county extents, providing a good understanding of timing of flooding throughout the county during an event.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.		N/A
Consistent with existing plans (describe points of intersection/departure)	Map libraries will use existing hydraulic models from NCFMP.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?		N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?		N/A
Explain any benefits or impacts to the economy of the county from this project.		N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws		N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?		N/A
What is the capability of the local government to administer this project?	Unknown	N/A
What is the financial range of this project?	\$0- \$50K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	State	N/A



- **Town of Pittsboro – Aerial Sewer Crossing Improvements:** During Hurricane Matthew, the gravity sewer aerial crossing over Robeson Creek at Sanford Rd was shifted. The sewer line did not rupture, but needs to be repaired. This project would reinforce the pipe crossing to make it more resilient to damage during future events.



**Figure 18. Town of Pittsboro Aerial Sewer Crossing Improvements**

## Pittsboro Aerial Sewer Crossing Reinforcement

**County:** Chatham

**Priority Grouping:** High Priority

**Priority Ranking:** 7

**Project Timeframe:** 1-year

**Location:** Sanford Rd (Hwy 15) Crossing over Robeson Creek

**Project Summary:** During Hurricane Matthew, the gravity sewer aerial crossing over Robeson Creek at Sanford Rd was shifted. The sewer line did not rupture, but needs to be repaired. This project would reinforce the pipe crossing to make it more resilient to damage during future events. The Town of Pittsboro is currently working to obtain quotes.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The sewer crossing sustained some damage during Hurricane Matthew but may not be eligible for PA.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.		N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
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	N/A
What impacts to the environment of the county will result from this project?	A reinforced sewerline crossing will be less likely to rupture which would have significant environmental impacts.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$251K - \$500K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	Local	N/A

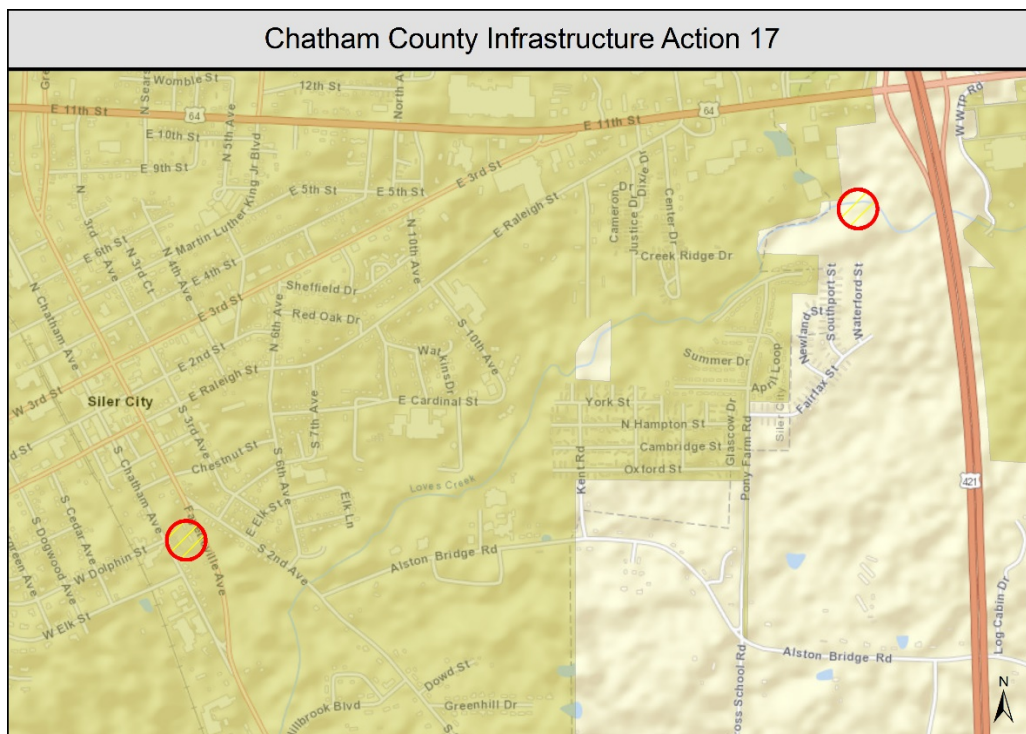
## Medium Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Chatham Infrastructure Action 17: Town of Siler City Aerial Sewer Crossing Improvements	Medium	8
Infrastructure	Chatham Infrastructure Action 7: Town of Siler City NCDOT Culvert Upgrade (2 <sup>nd</sup> Avenue)	Medium	9
Infrastructure	Chatham Infrastructure Action 6: Town of Siler City WWTP Access Bridge Repair	Medium	12
Infrastructure	Chatham Infrastructure Action 13: Town of Siler City Greenway Trail Repairs	Medium	13
Infrastructure	Chatham Infrastructure Action 12: Town of Pittsboro Greenway Trail Repairs	Medium	14

### Table 8. Chatham Medium Priority Infrastructure Summary

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

- Town of Siler City – Aerial Sewer Crossing Improvements:** During Hurricane Matthew, the gravity sewer aerial crossings over Loves Creek behind 1720 E. 11th St. and over Tributary to Loves Creek behind 340 Fayetteville Av in Siler City were damaged. The sewer lines did not rupture, but need to be repaired. This project would reinforce the pipe crossing to make them more resilient to damage during future events.



**Figure 19. Town of Siler City Aerial Sewer Crossing Improvements**

## Siler City Aerial Sewer Crossing Reinforcement

**County:** Chatham

**Priority Grouping:** Medium Priority

**Priority Ranking:** 8

**Project Timeframe:** 1-year

**Location:** Along Loves Creek behind 1720 E. 11th St, Siler City and along Tributary to Loves Creek behind 340 Fayetteville Av, Siler City

**Project Summary:** During Hurricane Matthew, the gravity sewer aerial crossings over Loves Creek behind 1720 E. 11th St. and over Tributary to Loves Creek behind 340 Fayetteville Av in Siler City were damaged. The sewer lines did not rupture, but need to be repaired. This project would reinforce the pipe crossing to make it more resilient to damage during future events.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.		N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Less risk of sewer interruption/backup from major flooding event.	N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	100-200 year event	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
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	N/A
What impacts to the environment of the county will result from this project?	Having re-enforced aerial sewer crossings will make them less likely to rupture and spill causing environmental issues.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$251K - \$500K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A



- **Town of Siler City – NCDOT Culvert Upgrade (2<sup>nd</sup> Avenue):** South 2nd Av (NCDOT road) has been overtopped by Loves Creek several times in the last 15 years. This project would replace the current culvert with a larger one to better pass flooding. The potential for increased flooding downstream must be evaluated to prevent adverse impacts.

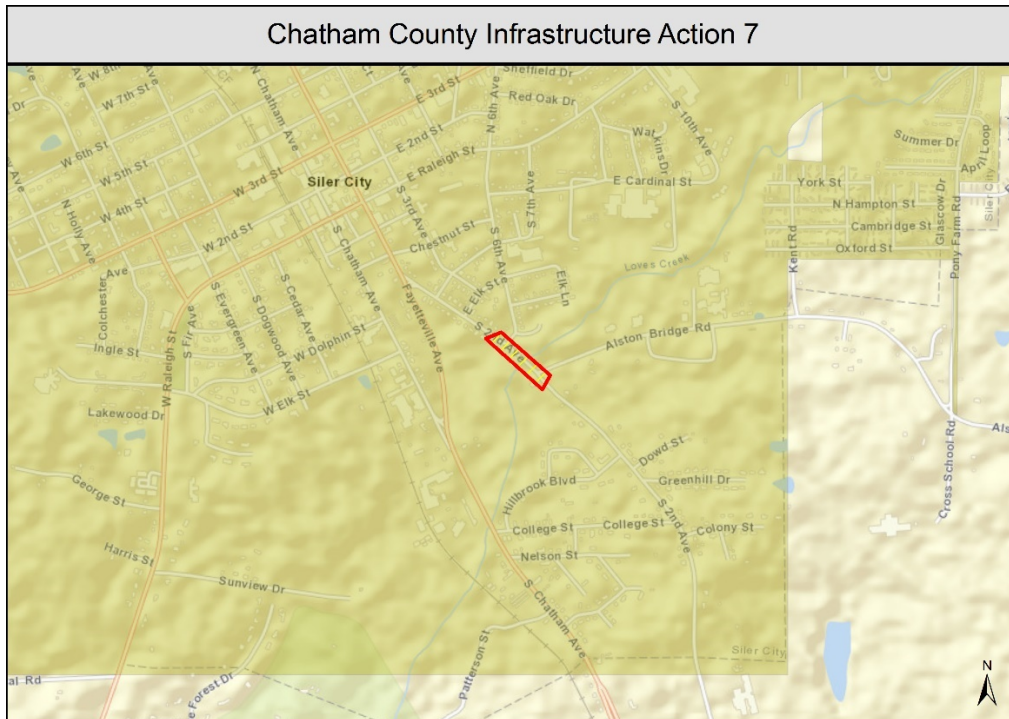


Figure 20. Town of Siler City NCDOT Culvert Upgrade (2<sup>nd</sup> Av)

## Siler City Culvert Upgrade

**County:** Chatham

**Priority Grouping:** Medium Priority

**Priority Ranking:** 9

**Project Timeframe:** 2-years

**Location:** S 2nd Avenue at Loves Creek

**Project Summary:** S 2nd Av (NCDOT road) is overtopped by Loves Creek during large flooding events. This project would replace the current culvert with a larger one to better pass flooding. Increased flooding downstream must be evaluated to prevent adverse impacts.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.		N/A
Consistent with existing plans (describe points of intersection/departure)	This project would work in conjunction with other Siler City SWM projects to reduce flooding in the town.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Unknown	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
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	N/A
What impacts to the environment of the county will result from this project?	Unknown	N/A
What is the capability of the local government to administer this project?	Unknown	N/A
What is the financial range of this project?	\$51K - \$100K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	State	N/A

- **Town of Siler City - WWTP Access Bridge Repair:** During Hurricane Matthew, the access bridge to the Siler City WWTP over Loves Creek was overtopped by approximately 2' of water. No structural damage was reported. Superficial damage to the asphalt and some concrete was observed. Although this bridge is no longer the primary access to the WWTP, it is still used several times a day and provides access to this critical infrastructure facility. A PA claim has been filed.

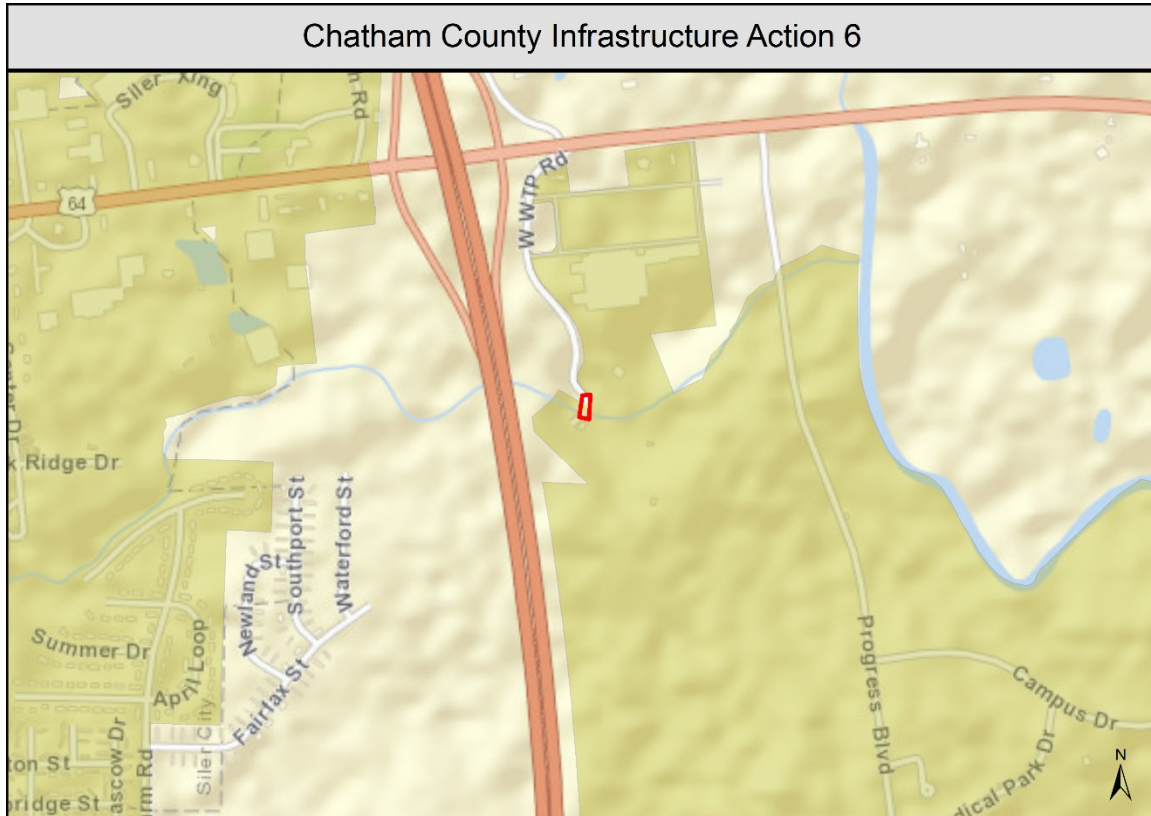


Figure 21. Town of Siler City WWTP Access Bridge Repair

## Siler City WWTP Access Bridge Repair

**County:** Chatham

**Priority Grouping:** Medium Priority

**Priority Ranking:** 12

**Project Timeframe:** 1-year

**Location:** 370 Waste Treatment Plant Rd, Siler City 27344

**Project Summary:** During Hurricane Matthew, the access bridge to the Siler City WWTP over Loves Creek was overtopped by approximately 2' of water. No structural damage was reported. Superficial damage to the asphalt and some concrete was observed. Although this bridge is no longer the primary access to the WWTP, it is still used several times a day and provides access to this critical infrastructure facility. A PA claim has been filed.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.		N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.		N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Less than 25%	N/A
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?	Unknown	N/A
What impacts to the environment of the county will result from this project?	Maintaining a secondary access to the WWTP improves accessibility for employees and therefore helps ensure the plant functions as needed with decreases the likelihood of failures or release of untreated wastewater.	N/A
What is the capability of the local government to administer this project?	Unknown	N/A
What is the financial range of this project?	\$0- \$50K	N/A
What is the level of public support for this project?	Low	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Unknown	N/A



- Siler City – Greenway Trail Repairs:** The Greenway Trail in Siler City was originally built by NCDOT approximately a year ago. Ownership and maintenance of the trail has been transferred to the Town of Siler City. The portion of the greenway adjacent to Moonrise Meadow Dr. is within the SFHA. The trail has flooded 3-4 times in the last year alone with repairs totaling around \$10k. This project would improve the trail and reduce future flooding by using more resilient material or constructing an elevated walkway where flooding occurs.

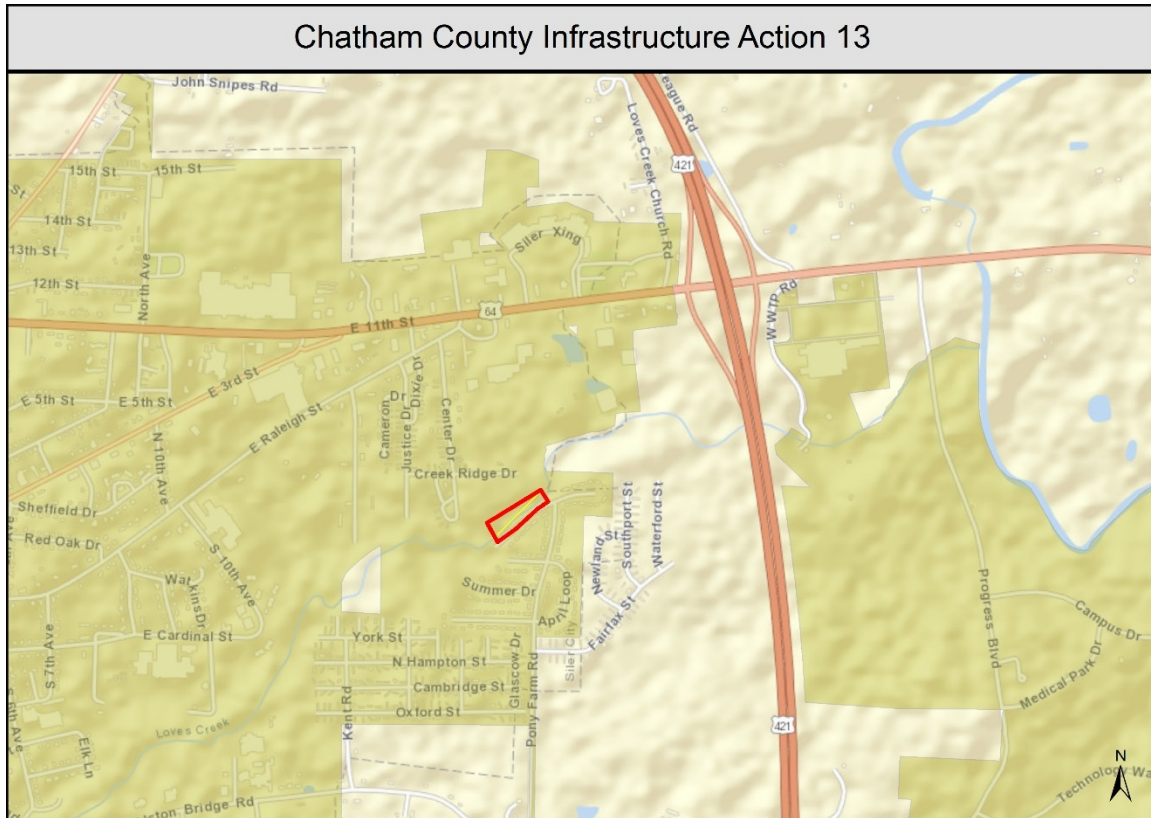


Figure 22. Town of Siler City Greenway Trail Repairs

## Siler City Greenway Trail Improvements

**County:** Chatham

**Priority Grouping:** Medium Priority

**Priority Ranking:** 13

**Project Timeframe:** 2-years

**Location:** Greenway Trail adjacent to Moonrise Meadow Dr in Siler City

**Project Summary:** The Greenway Trail in Siler City was originally built by NCDOT approximately a year ago. Ownership and maintenance of the trail has been transferred to the Town of Siler City. The portion of the greenway adjacent to Moonrise Meadow Dr is within the SFHA. The trail has flooded 3-4 times in the last year alone with repairs totaling around \$10k. This project would improve the trail by constructing an elevated walkway where flooding occurs, preventing future damage.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Repair of the greenway due to damage during Hurricane Matthew may not be eligible for PA and would likely only be repaired to pre-existing condition and no more resilient to flooding than it was.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Improvements to the greenway to prevent flooding will avoid future losses from necessary repairs.	N/A
For how long will this solution be effective?	Between 11 and 30 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
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?	Less than 25%	N/A
What impacts to the environment of the county will result from this project?		N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$51K - \$100K	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	Local	N/A

- **Town of Pittsboro – Greenway Trail Repairs:** The greenway trail in Pittsboro along Robeson Creek downstream of Sanford Rd was washed out during Hurricane Matthew. The trail is still open although no repairs have been made. This project would repair the greenway trail using more resilient material (asphalt as opposed to crushed stone).

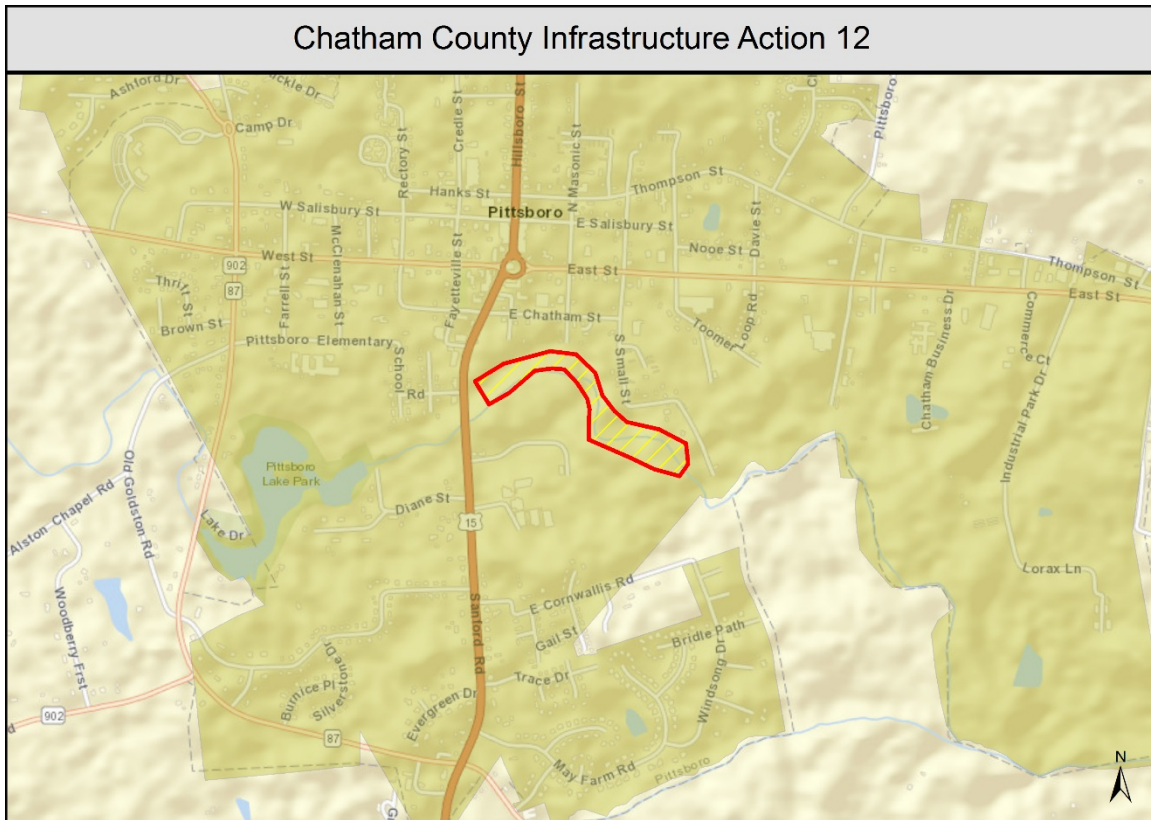


Figure 23. Town of Pittsboro Greenway Trail Repairs

## Pittsboro Greenway Trail Repair

**County:** Chatham

**Priority Grouping:** Medium Priority

**Priority Ranking:** 14

**Project Timeframe:** 1-year

**Location:** Greenway Trail adjacent to Robeson Creek downstream of Sanford Rd

**Project Summary:** The greenway trail in Pittsboro along Robeson Creek downstream of Sanford Rd was washed out during Hurricane Matthew. The trail is still open although no repairs have been made. This project would repair the greenway trail using more resilient material (asphalt as opposed to crushed stone).

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Repair of the greenway due to damage during Hurricane Matthew may not be eligible for PA and would likely only be repaired to pre-existing condition and no more resilient to flooding than it was.	N/A
Consistent with existing plans (describe points of intersection/departure)		N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Unknown	N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Minimal to low confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	Unknown	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$101K - \$250K	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A



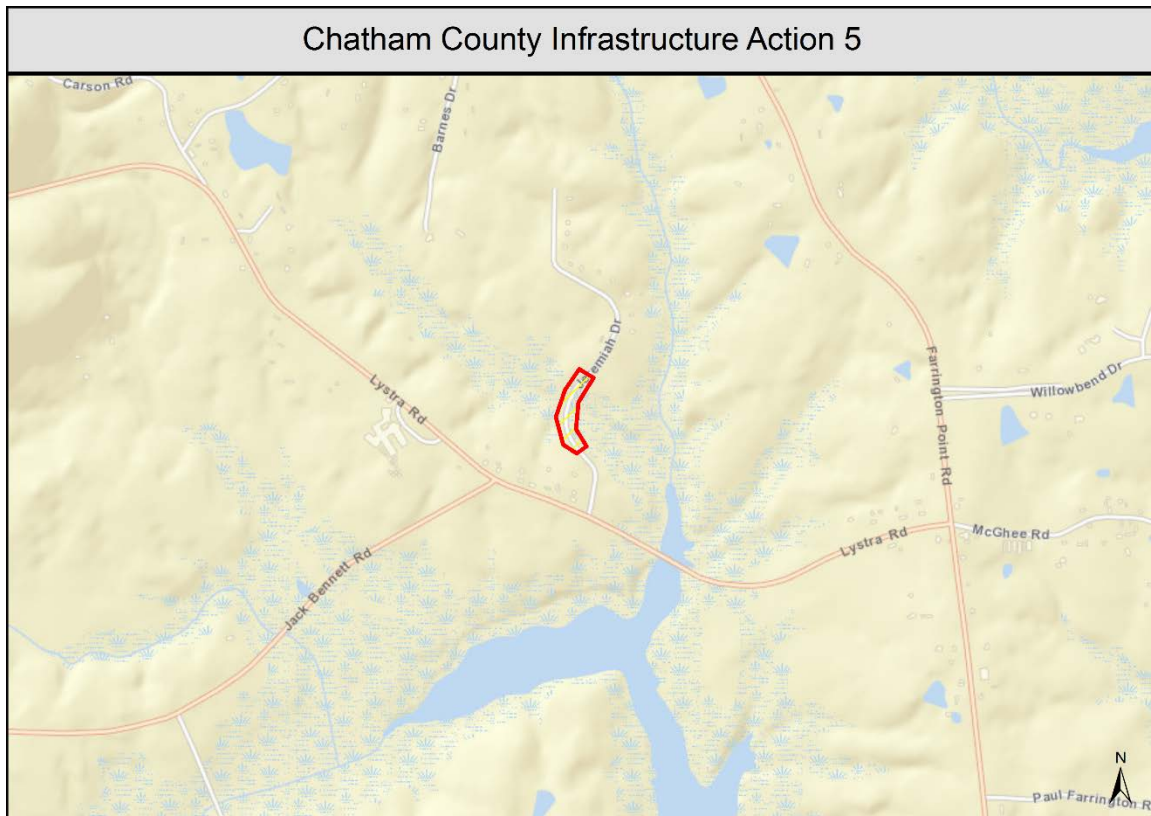
## Low Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Chatham Infrastructure Action 5: Jeremiah Drive Roadway Enhancement	Low	15

**Table 9. Chatham Low Priority Infrastructure Summary**

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

- Jeremiah Drive Roadway Enhancement:** Jeremiah Drive is a NCDOT road way that has experienced repeated flooding from Overcup Creek, a tributary affected by high water levels in Jordan Lake. This project would elevate at least 800' of road way that is currently within the SFHA. This road way was not modified during the construction of Jordan Lake. Jeremiah Drive is the only access road to several (6-8) houses. Elevation of Jeremiah Drive does not qualify for PA fund s and is not considered a mitigation project. This project must be prioritized by NCDOT. To date, the project has not scored well in NCDOT's ranking process due to the small amount of traffic and lack of fatalities. USACE owns the land.



**Figure 24. Jeremiah Drive Roadway Enhancement**

## Jeremiah Drive Roadway Enhancement

**County:** Chatham

**Priority Grouping:** Low Priority

**Priority Ranking:** 15

**Project Timeframe:** 2-years

**Location:** Jeremiah Drive off of Lystra Rd (Rt 1717)

**Project Summary:** Jeremiah Drive is a NCDOT roadway that has experienced repeated flooding from Overcup Creek, a tributary affected by high water levels in Jordan Lake. This project would elevate at least 800' of roadway that is currently within the SFHA. This roadway was not modified during the construction of Jordan Lake. Jeremiah Drive is the only access road to several (6-8) houses. The road last flooded in January of 2016 by 4-5'. The road was not overtopped during Hurricane Matthew due to the dry weather proceeding the event and available storage within the lake. The roadway was monitored. An alert system has been implemented for the affected homes when water levels are rising. Elevation of Jeremiah Drive does not qualify for PA funds and is not considered a mitigation project. This project must be prioritized by NCDOT. To date, the project has not scored well in NCDOT's ranking process due to the small amount of traffic and lack of fatalities. USACE owns the land.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need created by damage from Hurricane Matthew but it addresses an unmet need which could be affected by any large flooding event.	N/A
Consistent with existing plans (describe points of intersection/departure)	Hurricane Matthew had minimal effects in Chatham County; however, this project will help the County to sustain and properly respond to future storm events.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Unknown	N/A
For how long will this solution be effective?	More than 50 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	High confidence	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	N/A
What impacts to the environment of the county will result from this project?	Unknown	N/A
What is the capability of the local government to administer this project?	Minimum	N/A
What is the financial range of this project?	\$501K - \$1M	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Between 51 and 75%	N/A
Who will administer this project?	State	N/A

## Environmental, Ecosystem and Agricultural Strategies

### Medium Priority Environmental Strategies

Pillar	Action Name	Priority	Overall Ranking
Environment	Chatham Environment Action 14: Fire Department Equipment Enhancement	Medium	10
Environment	Chatham Environment Action 15: Detailed Flood Studies of Unmapped Areas with Future Conditions	Medium	11

**Table 10. Chatham Medium Priority Environmental Summary**

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

- Fire Department Equipment Enhancement:** The various fire departments located within Chatham County act as first responders during water rescue events. Often, floodwaters are contaminated and considered health hazards. None of the fire departments in the County have adequate personal protective equipment (PPE) for water rescues. Additionally, the fire departments are routinely relied upon to clear roads following events to maintain emergency services access and allow recovery to begin. This strategy would provide proper PPE for water rescues and fire-rated equipment to support road clearing immediately following event. Specific PPE needs include; Dry Suits, Water Boots (with suitably tough soles), Gloves, Helmets, PFDs, and Throw Bags.

## Fire Department Equipment Enhancement

**County:** Chatham

**Priority Grouping:** Medium Priority

**Priority Ranking:** 10

**Project Timeframe:** 1-year

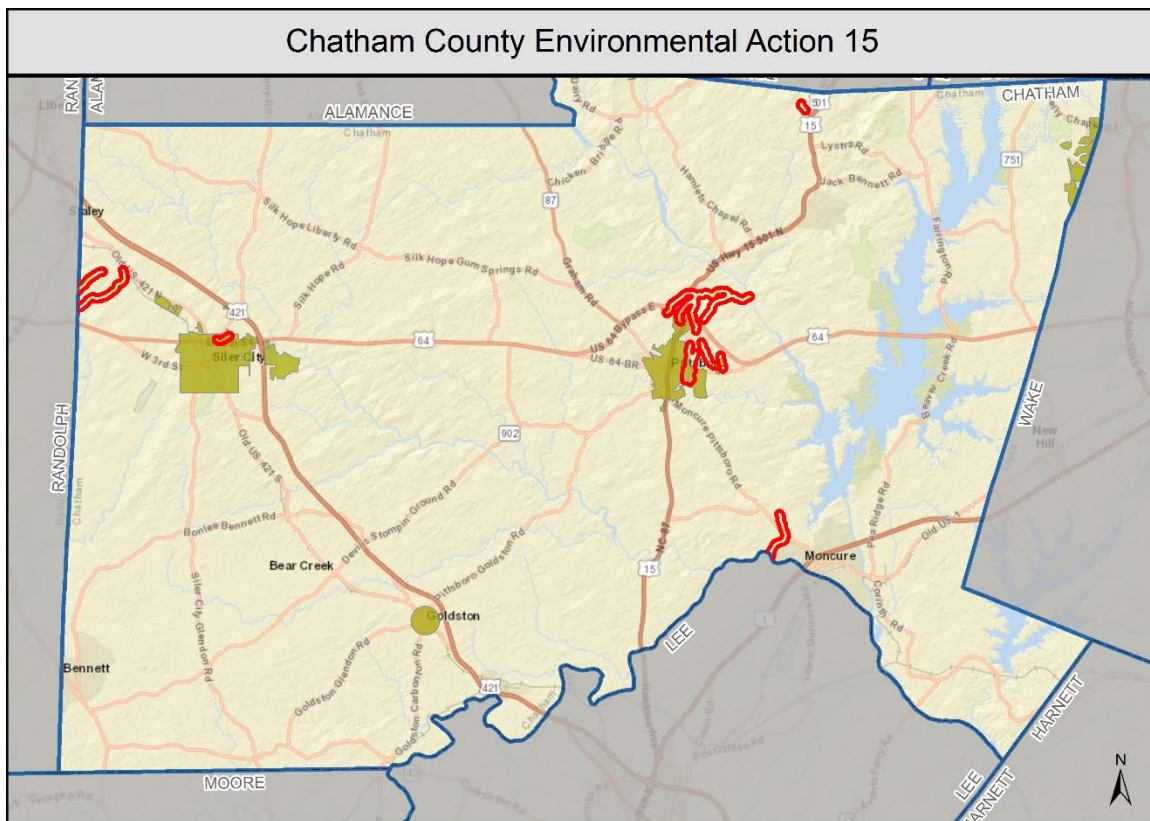
**Location:** Countywide

**Project Summary:** The various fire departments located within Chatham County act as first responders during water rescue events. Often, floodwaters are contaminated and considered health hazards. None of the fire departments in the County have adequate personal protective equipment (PPE) for water rescues. Additionally, the fire departments are routinely relied upon to clear roads following events to maintain emergency services access and allow recovery to begin. This strategy would provide proper PPE for water rescues and fire-rated equipment to support road clearing immediately following event. Specific PPE needs include; Dry Suits, Water Boots (with suitably tough soles), Gloves, Helmets, PFDs, and Throw Bags.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need created by damage from Hurricane Matthew but it addresses an unmet need which could be affected by any large flooding event.	N/A
Consistent with existing plans (describe points of intersection/departure)	Hurricane Matthew had minimal effects in Chatham County; however this project will help the County to sustain and properly respond to future storm events Matthew.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Getting roads cleared immediately following an event allows the community to begin recovery. The quicker this happens the less impact on the economy.	N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	Proper PPE during water rescues will protect the health of the responders.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$0- \$50K	N/A
What is the level of public support for this project?	High	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	County	N/A



- Detailed Flood Studies of Unmapped Areas with Future Conditions:** There are some areas within the county with identified flooding issues that are currently not mapped by FEMA. Other areas within the county are planned for development with potential flooding sources not mapped by FEMA. With the extent of planned development in Chatham County, there is also a desire to account for future conditions in new flood mapping. This will help the communities be more resilient to flood losses by adopting more conservative flood hazard areas based on future land use conditions. Identified stream reaches total approximately 17.15 miles of study and include the following areas:
  1. East Branch Price Creek in the Cedar Lake area.
  2. Unnamed Tributary to Deep River in the Moncure Pittsboro Rd area.
  3. Unnamed Tributary to Rocky River Tributary 1 in the 14th St, 15th St area in Siler City.
  4. Unnamed Tributary 1 to Brush Creek near Zion Church Rd.
  5. Reedy Fork near the Randolph County line.
  6. Unnamed Tributaries 1 and 2 to Robeson Creek in Pittsboro.
  7. Unnamed Tributaries 1 and 2 to Robeson Creek Tributary 2 adjacent to HWY 64 near Pittsboro.
  8. Haven Creek sub-shed including Haven Creek and 3 unnamed tributaries.



**Figure 25. Detailed Flood Studies of Unmapped Areas with Future Conditions**

## New Detailed Study of Unmapped Flooding Sources

**County:** Chatham

**Priority Grouping:** Medium Priority

**Priority Ranking:** 11

**Project Timeframe:** 3-years

**Location:** Countywide

**Project Summary:** There are some areas within the county with identified flooding issues that are currently not mapped by FEMA. Other areas within the county are planned for development with potential flooding sources not mapped by FEMA. Performing detailed hydrologic and hydraulic studies in these areas will better define flood risk for the County. With the extent of planned development in Chatham County, there is also a desire to account for future conditions in new flood mapping. This will help the communities be more resilient to flood losses by adopting more conservative flood hazard areas based on future land use conditions. Identified stream reaches include:

East Branch Price Creek in the Cedar Lake area.

Unnamed Tributary to Deep River in the Moncure Pittsboro Rd area.

Unnamed Tributary to Rocky River Tributary 1 in the 14th St, 15th St area in Siler City.

Unnamed Tributary 1 to Brush Creek near Zion Church Rd.

Reedy Fork near the Randolph County line.

Unnamed Tributaries 1 and 2 to Robeson Creek in Pittsboro.

Unnamed Tributaries 1 and 2 to Robeson Creek Tributary 2 adjacent to HWY 64 near Pittsboro.

Haven Creek subshed including Haven Creek and 3 unnamed tributaries.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need created by damage from Hurricane Matthew but it addresses an unmet need which could be affected by any large flooding event.	N/A
Consistent with existing plans (describe points of intersection/departure)	Hurricane Matthew had minimal effects in Chatham County; however this project will help the County to sustain and properly respond to future storm events similar to Hurricane Matthew.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	New flood hazards identified in areas of planned development will allow for better planning of the developments to mitigate potential flood impacts.	N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	N/A
What impacts to the environment of the county will result from this project?	New floodplains will be identified and fall under the protective aspects of the NFIP.	N/A

What is the capability of the local government to administer this project?	Minimum	N/A
What is the financial range of this project?	\$101K - \$250K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	State	N/A

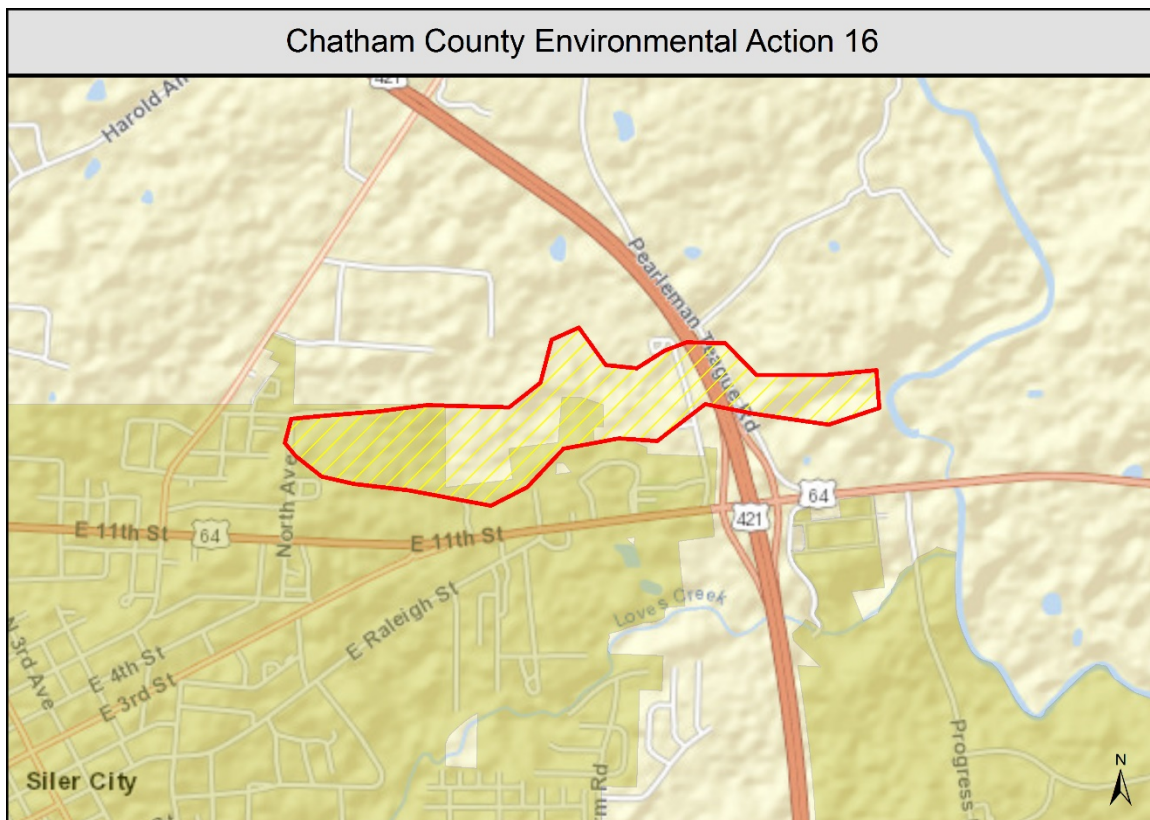
## Low Priority Environmental Strategies

Pillar	Action Name	Priority	Overall Ranking
Environment	Chatham Environment Action 16: Debris Removal from Rocky River Tributary 1	Low	16

**Table 11. Chatham Low Priority Environmental Summary**

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

- Debris Removal from Rocky River Tributary 1:** Rocky River Tributary 1 upstream of HWY 421 is in a predominantly wooded area. There is beaver activity in the area that coupled with other debris contributes to flooding upstream, specifically at 1407 North Avenue, where flooding has been reported. This project would relocate beavers in the area and remove debris from the floodplain of Rocky River Tributary 1 to help mitigate upstream flooding.



**Figure 26. Debris Removal from Rocky River Tributary 1**



## Rocky River Tributary 1 Debris Removal

**County:** Chatham

**Priority Grouping:** Low Priority

**Priority Ranking:** 16

**Project Timeframe:** 1-year

**Location:** Rocky River Tributary 1 upstream of HWY 421 in Siler City

**Project Summary:** Rocky River Tributary 1 upstream of HWY 421 is in a predominantly wooded area. There is beaver activity in the area that coupled with other debris contributes to flooding upstream, specifically at 1407 North Avenue, where flooding has been reported. This project would relocate beavers in the area and remove debris from the floodplain of Rocky River Tributary 1 to help mitigate upstream flooding.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need created by damage from Hurricane Matthew but it addresses an unmet need which could be affected by any large flooding event.	N/A
Consistent with existing plans (describe points of intersection/departure)	Hurricane Matthew had minimal effects in Chatham County; however this project will help the County to sustain and properly respond to future storm events similar to Hurricane Matthew.	N/A
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	N/A
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	N/A
Explain any benefits or impacts to the economy of the county from this project.	Potential flood damage/losses will be reduced to property.	N/A
For how long will this solution be effective?	Less than 10 years	N/A
How effective is the risk reduction?	Unknown	N/A
How many public facilities are involved in this project (buildings and infrastructure)?	0	N/A
Is coordination with other communities/counties needed to complete this project?	No	N/A
Is this project consistent with Federal Laws	Yes	N/A
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	N/A
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?	Less than 25%	N/A
What impacts to the environment of the county will result from this project?	Debris will be removed from the Rocky River Tributary 1 floodplain so it can function naturally. Beavers may be relocated.	N/A
What is the capability of the local government to administer this project?	High	N/A
What is the financial range of this project?	\$0- \$50K	N/A
What is the level of public support for this project?	Medium	N/A
What is the technical feasibility of this project?	Higher than 75%	N/A
Who will administer this project?	Local	N/A

## Summary

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