# Hurricane Matthew Resilient Redevelopment Plan

## Lee County


May 2017

Version 1.2

# Contents

# Change Log

| Version | Date | Summary of Changes |
|---|---|---|
| 1.1 | 6/16/17 | Minor Revisions |
| 1.2 | 8/25/17 | Labor and unemployment data updated |
| | | |
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# Executive Summary

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

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

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


**Figure 1. NCRRP Counties**

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

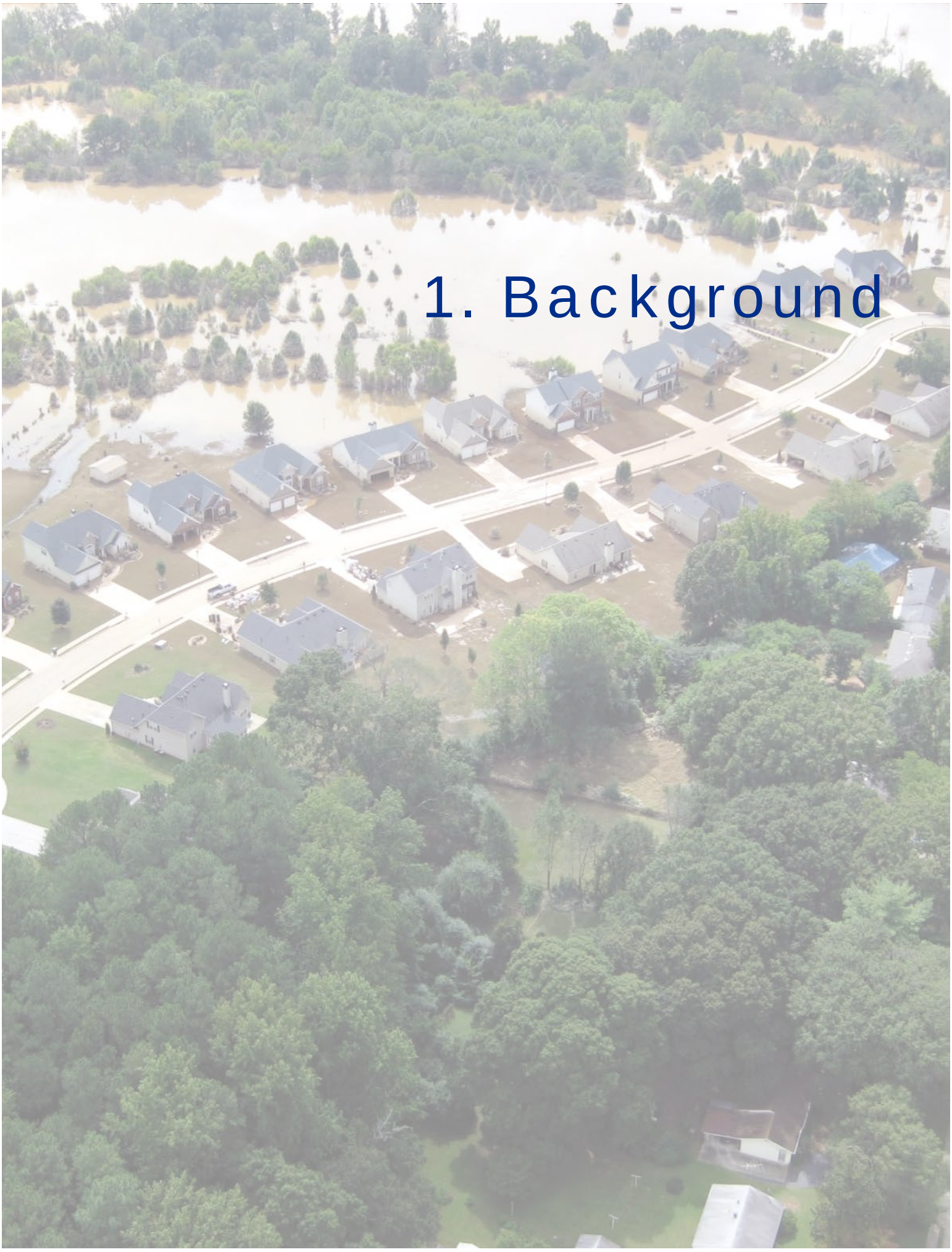
Implementation of the proposed projects and actions described in this plan is subject to applicable federal, state, and local laws and regulations. Proposed projects or actions may be eligible for state or federal funding, or could be accomplished with municipal, nonprofit, or private investments. However,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

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

After multiple public meetings, Lee County has identified 9 projects in four pillars: Housing, Infrastructure, Economic Development, and Environmental. Details of these projects can be found in Section IV of this plan.

| Pillar | Project/Action Count |
|---|---|
| Housing | 1 |
| Economic Development | 1 |
| Infrastructure | 5 |
| Environment | 2 |
| **Grand Total** | **9** |

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



# 1. Background

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## Summary of Hurricane Matthew Storm Damage

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

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

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

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

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

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

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

## State / Legislative Response

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

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

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

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

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

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

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

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

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

## Resilient Redevelopment Planning

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

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

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

## Scope of the Plan

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

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

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

## Local Participation and Public Engagement

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

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

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

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

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

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

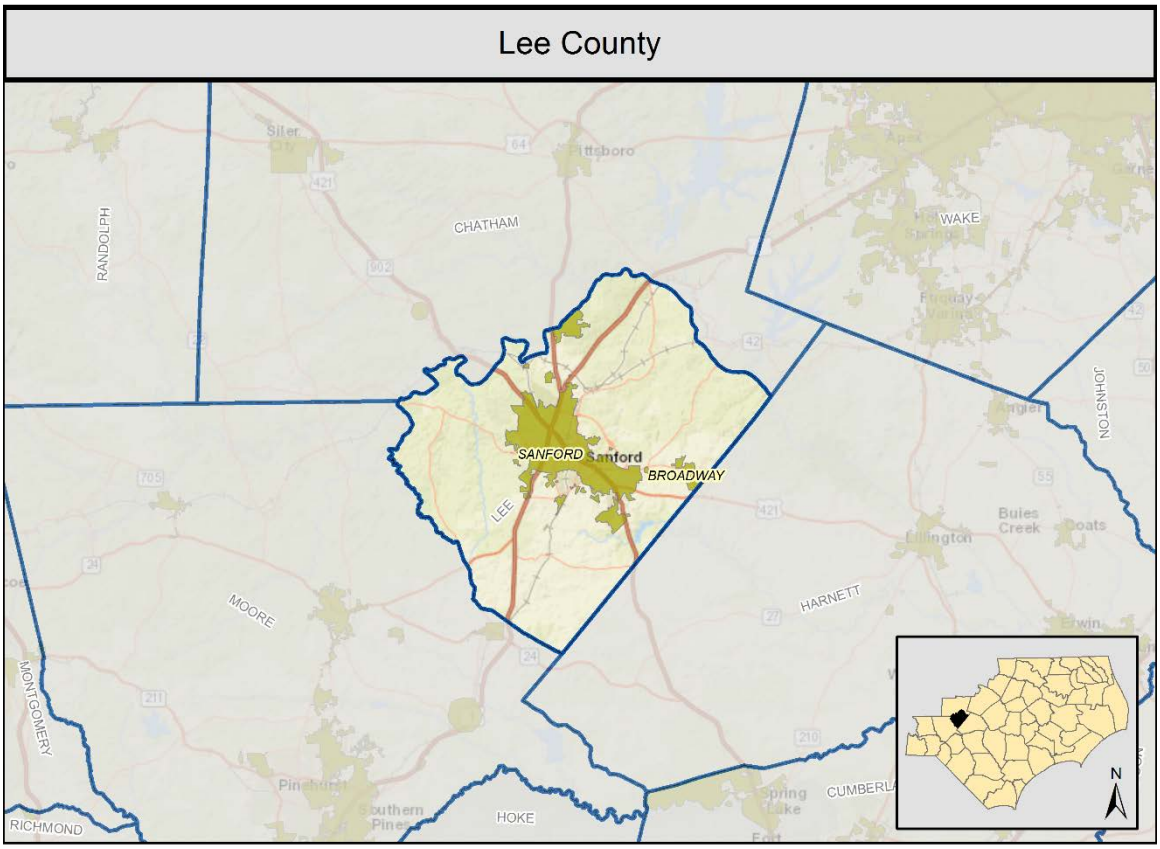
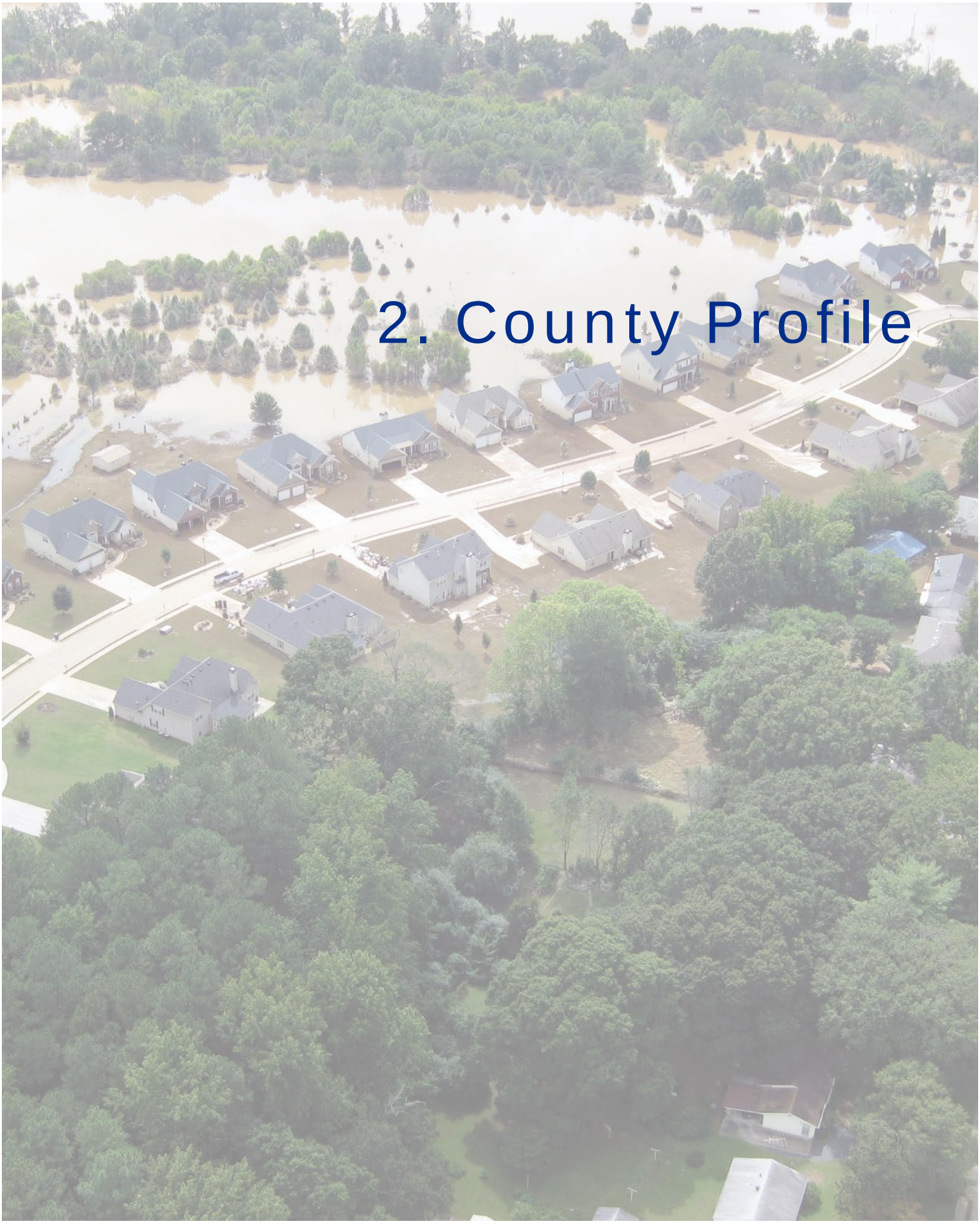



**Figure 2. Lee County and Neighboring Counties**

## Data, Assumptions, and Methodologies

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

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



# 2. County Profile

# 2. County Profile

Lee County is located in central North Carolina between the cities of Raleigh and Charlotte. It is comprised of two census-designated places: City of Sanford and Town of Broadway. Its current population is 59,418. This section provides a profile of housing, economics, infrastructure, environment, and administration within Lee County.

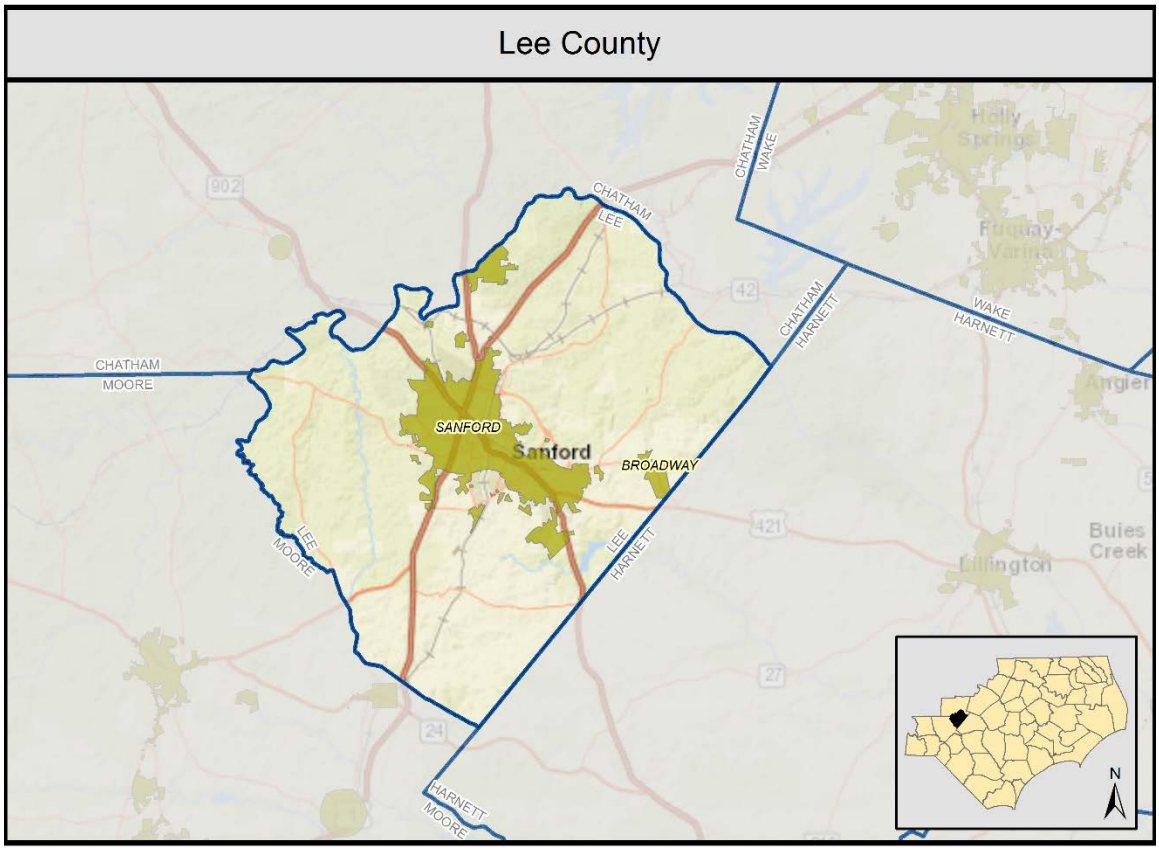



**Figure 3. Lee Base Map**

## Demographic Profile

Demographics for Lee 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

Lee County has a population of 59,418. Sanford is the most populous place within Lee County with a population of 28,988, and Broadway is the least populous place with a population of 1,242.[3]

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

## Population Change (2000 to 2010)

The Lee County population increased during the decade between the 2000 Census and the 2010 Census. In 2000, the population was 49,028 and in 2010 it was 57,866. The population increased by 8,838 people, or 18 percent. In comparison, North Carolina grew by 19 percent from 8,049,313 people in 2000 to 9,535,483 in 2010.[4]

## Age

The median age in Lee County is 37.5 years old, which is lower than the median age for North Carolina. Within Lee County, the Broadway population has the oldest median age at 47.6 years old, and the Sanford population has the youngest median age 35 years old.[5]

## Race and Ethnicity

Lee County is mostly White (69 percent) and African American (19 percent), with other races constituting the remaining 12 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.[6]

Within Lee County, Broadway and Sanford are predominantly White. In Sanford, 25 percent of the population identifies as Black or African American while only 12 percent of the population in Broadway identifies as Black or African American.

The Latino population in Lee County is 19 percent, compared to 9 percent for North Carolina. Sanford has the largest Latino population (22.9 percent), while Broadway has a smaller Latino population at 12.4 percent according to the census data.

| Geography | White | Black or African American | American Indian and Alaska Native | Asian | Native Hawaiian/ Pacific Islander | Some Other Race | Two or More Races | Total Non-White |
|---|---|---|---|---|---|---|---|---|
| Broadway town | 76.7% | 12.1% | 0.0% | 1.8% | 0.0% | 2.8% | 6.6% | 23.3% |
| Sanford city | 60.7% | 25.4% | 0.3% | 1.4% | 0.0% | 9.0% | 3.1% | 39.3% |
| Lee County | 69.2% | 19.1% | 0.6% | 1.1% | 0.1% | 7.5% | 2.5% | 30.8% |
| North Carolina | 69.5% | 21.5% | 1.2% | 2.5% | 0.1% | 3.0% | 2.4% | 30.5% |

**Table 2. Lee County Race and Ethnicity**

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

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

[6] *Source: U.S. Census Bureau, American Community Survey 5-Year Estimates (2011-2015), Table B02001, "Race" and Table B03002, "Hispanic or Latino Origin by Race."*

### Limited English Proficiency

Limited English Proficiency (LEP) is defined as populations 18 years or older that speak English less than very well. In Lee County, most of individuals identified as LEP speak Spanish, while others speak Indo-European, Asian/Pacific, or other languages. Similarly, the primary language group for LEP individuals in North Carolina is Spanish. Within Lee County, Sanford has the largest LEP population. The primary language group for LEP populations in Sanford is Spanish. In Broadway, the primary language group for LEP populations is Asian/Pacific.[7]

### Poverty

In Lee County, 18 percent of the population is below the poverty level compared to 17 percent of the North Carolina population. In Sanford, 21.5 percent of the population lives below the poverty level, while in Broadway this number is 20.2 percent.[8]

### Low- and Moderate-Income Individuals

In Lee County, 41.6 percent of the population is classified as low- and moderate-income (LMI) individuals based on the U.S. Department of Housing and Urban Development's definition. In comparison, 39 percent of the North Carolina population is classified as LMI.[9]

### Median Household Income

The median household income of the population aged 25 years old to 64 years old is $50,547 in Lee County and $53,000 in North Carolina. Broadway has the highest median household income for this age group at $73,563, [10]

[7] *Source: U.S. 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."*

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

[9] *Source: U.S. 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/*

[10] *and Sanford has the lowest at $46,982.*

*Source: U.S. Census Bureau, American Community Survey 5-Year Estimates (2011-2015), Table B19094, "Median Household Income in the Past 12 Months."*

## Zero Car Households

In Lee County, nearly 7 percent of households do not have a vehicle available, which is comparable to 7 percent of North Carolina households. Within Lee County, Sanford has the highest percentage of households without access to a vehicle at 9.6 percent, while Broadway has the lowest percentage at 2.1 percent.[11]

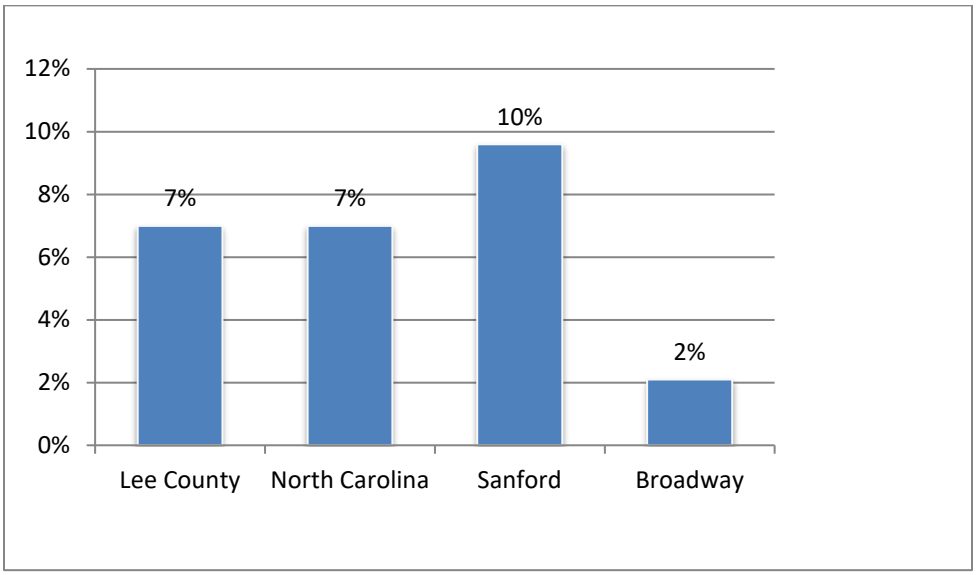



**Figure 4. Zero Car Households by Percentage**

## Commuting: Travel Time to Work, Means of Transportation

The majority of Lee County residents, 84 percent, commute alone to work by vehicle, which is slightly higher than the North Carolina average of 81 percent. Within Lee County, Broadway has the largest percentage of commuters traveling alone at 84.3 percent, and Sanford has a slightly smaller percentage at 82.7 percent.

Broadway has the largest percentage of residents commuting by public transportation at 0.8 percent. In comparison, 1 percent of North Carolina commuters use public transportation. A slightly greater percentage of Sanford residents commute by walking, bicycle, or motorcycle, 2.7 percent, than the North Carolina average of 2 percent.

The mean commute time to work for Lee County residents is 23.4 minutes. In comparison, the North Carolina mean commute time is 24.7 minutes. Within Lee County, Broadway has the shortest mean commute time at 19.8 minutes, while Sanford has the longest at 22.5 minutes.[12]

[11] *Source: U.S. Census Bureau, American Community Survey 5-Year Estimates (2011-2015), Table B25044, "Tenure by Vehicles Available."*
[12] *Source: U.S. Census Bureau, American Community Survey 5-Year Estimates (2011-2015), Table B08301, "Means of Transportation to Work" and Table GCT0801, "Mean Travel Time to Work of Workers 16 Years and Over Who Did Not Work at Home (Minutes)."*

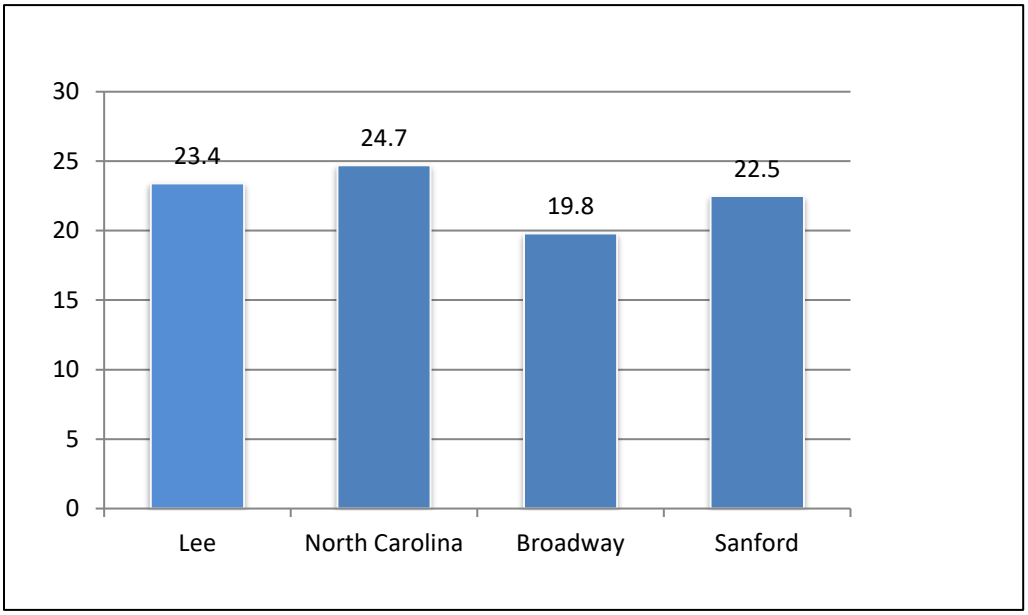



**Figure 5. Mean Commute Time to Work in Minutes**

## Housing Profile

Lee County has more than 24,000 housing units, 70 percent of which are single-family homes, 14.7 percent are multi-family units, and 14.8 percent is classified as manufactured housing.

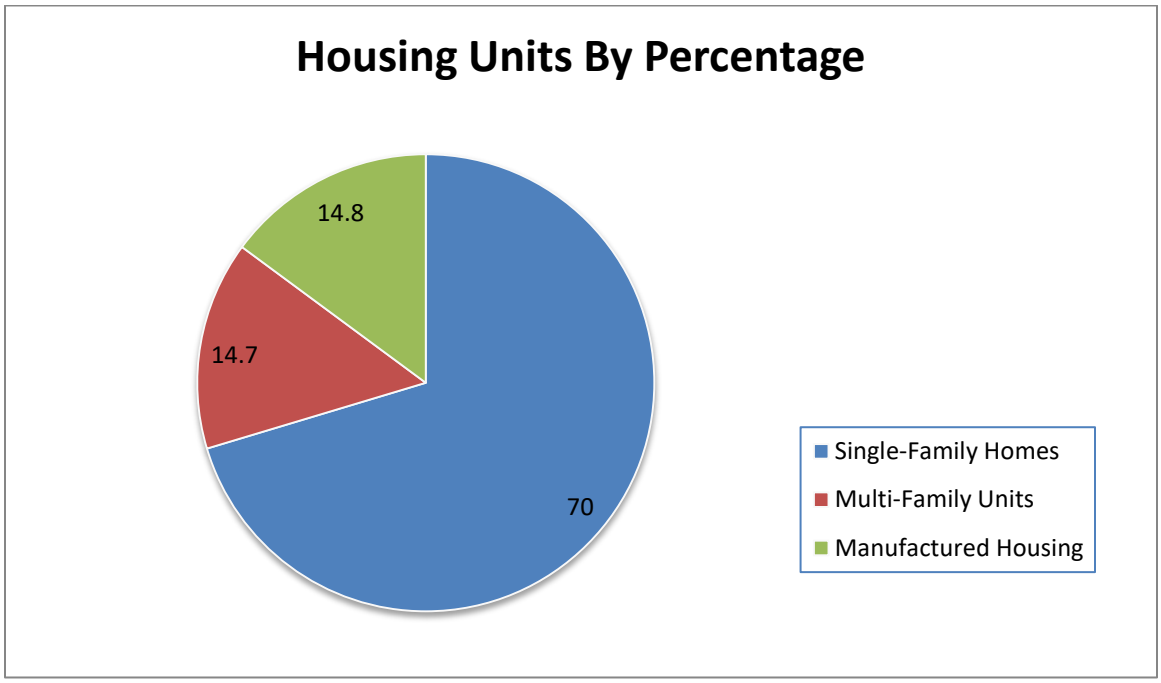



**Figure 6. Housing Units By Percentage**

In Lee County, 12.4 percent of housing units are vacant, compared with 15 percent for North Carolina. Within Lee County, Sanford has a slightly larger percentage of vacant housing units at 12.3 percent, while Broadway has an 11-percent vacancy rate.

Of the occupied housing units, 67 percent are owner-occupied compared to 65 percent in North Carolina; 33 percent are renter-occupied compared to 35 percent in North Carolina.

The median housing value in Lee County is $136,900. In comparison, the median housing value in North Carolina is $140,000. Within Lee County, Broadway has the highest median housing value: $147,200. Sanford has the lowest median housing value: $135,200.

According to the National Housing Preservation Database, Lee County has 1,587 affordable housing units. Most of the affordable housing is located within Sanford.[13]

## Economic / Business Profile

Lee County is home to a diverse array of businesses, from manufacturing to health services. According to the U.S. Census Bureau's Longitudinal-Employer Household Dynamics Program, the largest concentrations of jobs within Lee County are in Sanford along U.S. Highway 421 (US 421).[14]

## Labor Force

According to the local area unemployment statistics (LAUS) from the Labor and Economic Analysis Division (LEAD) for the unadjusted data for all periods in 2016, the civilian labor force population of Lee County is 26,239.[15] Within Lee County, Sanford has the largest percentage of residents in the labor force at 63 percent, while Broadway has the smallest percentage at 56 percent.

The civilian unemployment rate in Lee County is 5.9 percent. In comparison, the North Carolina civilian unemployment rate is 5.1 percent.[15] Within Lee County, Sanford has the smallest civilian unemployment rate at 10 percent, while Broadway has the largest at 13 percent.[16]

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*[13] Sources: U.S. 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*
*[14] Source: U.S. Census Bureau Longitudinal-Employer Household Dynamics Program*
*[15] Source: Civilian Population and Unemployment Rate - Labor and Economic Division (LEAD) of North Carolina Department of Commerce – Local Area Unemployment Statistics http://d4.nccommerce.com/LausSelection.aspx*
*[16] Source: U.S. Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B23025, "Employment Status for the Population 16 Years and Over."*

## Major Employers

The top 10 employers in Lee County[17] represent the manufacturing, public administration, education, and health service industries, and are listed in order of total employees.

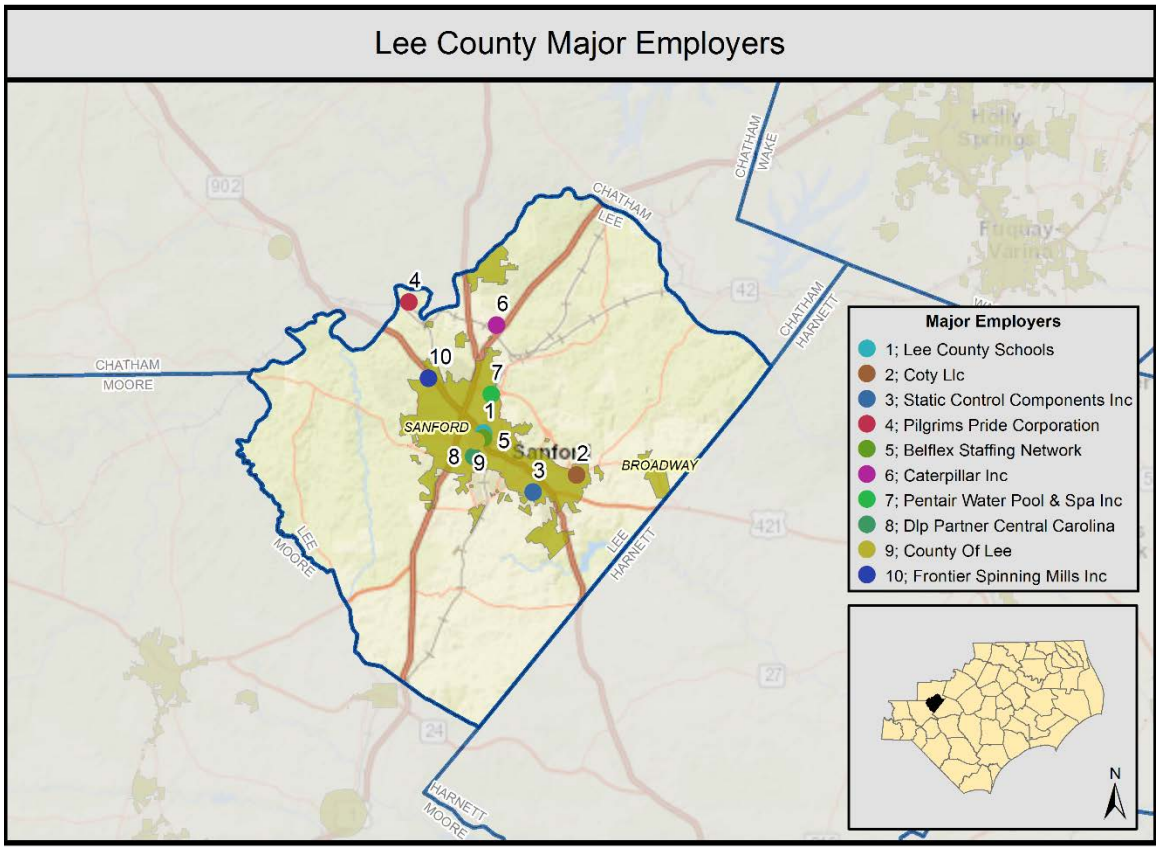



**Figure 7. Major Employers by Number of Employees**

## Economic Development

Lee County has diverse target sectors as part of its economic development plan. These include advanced manufacturing, life sciences, energy, and defense-related industries.

Central Carolina Community College also has a campus in Sanford offering employment and training.[18]

[17] *Sources: NC Department of Commerce*
[18] *Sources: Lee County Economic Development*

## Infrastructure Profile

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

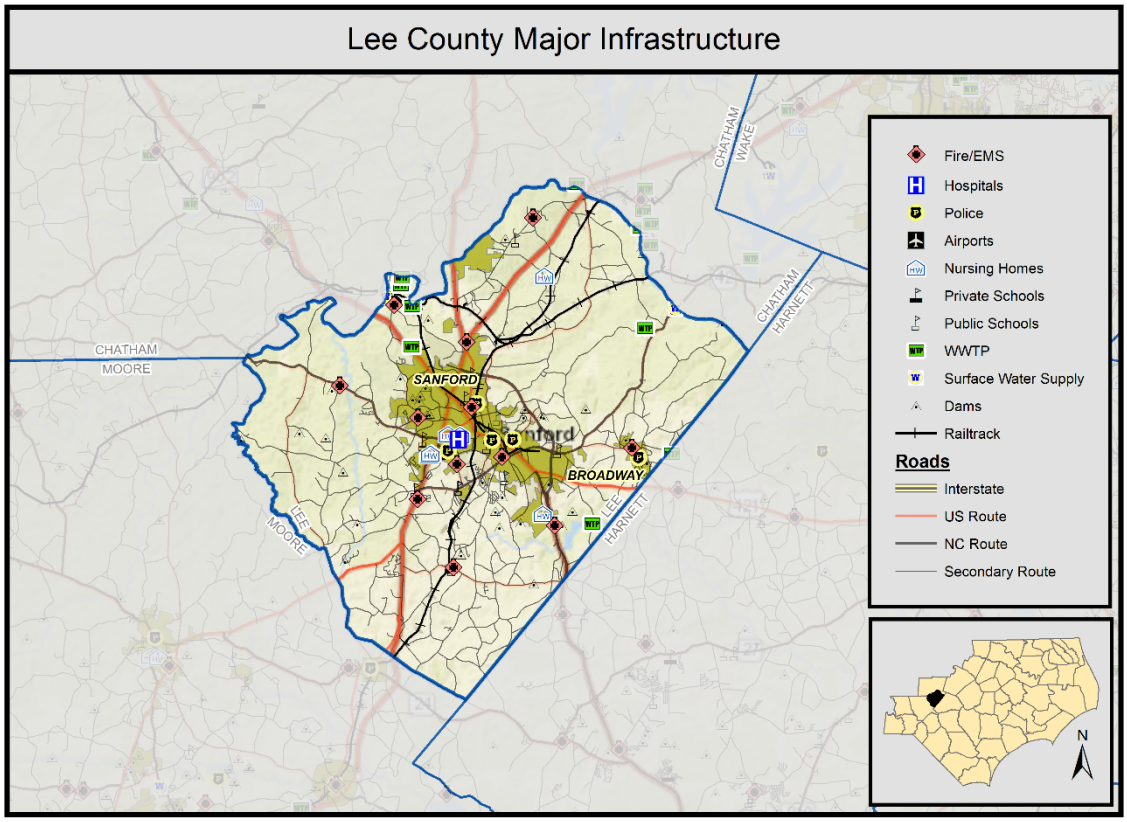



**Figure 8. Lee County Major Infrastructure**

## Transportation

Lee County is connected to the region by US 1 and US 421. NC 87 is a major east-west highway that provides Lee County with access to Greensboro to the west and Fayetteville to the east. Lee County also is served by rail from Norfolk Southern, CSX, and G&W Atlantic & Western Railway. The Port of Wilmington is slightly more than two hours away by rail or highway. The Raleigh Executive Jetport has a 6,500-foot runway capable of handling large aircraft up to 100,000 pounds.

## Health

Central Carolina Hospital is the only hospital located in Lee County. It is part of the Duke LifePoint Hospital System and is located in Sanford on Carthage Street.

## Education

Lee County Public Schools administers eight elementary, three middle, and four high schools. Central Carolina Community College is located in Sanford and is a member of the North Carolina Community College System.[19]

[19] *Sources: Lee County Public Schools and Central Carolina Community College*

## Water

The municipalities of Sanford and Broadway operate water supply systems, which provide drinking water to Lee County. Carolina Trace also has its own private water supply system. The City of Sanford operates the Yarborough Lake Reservoir on the Cape Fear River. The average withdrawal is 7.7 million gallons per day (MGD). Broadway purchases its water from the City of Sanford. It averages just under 0.1 MGD.[20]

## Power

There are five solar farms located within Lee County in the vicinity of the US 1 corridor. Four of these power plants have a net summer capacity of 5 megawatts, with one at 6.5 megawatts.[21]

## Environmental Profile

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

## Water Resources

The Cape Fear River and Deep River form the northern border for Lee County. Various tributaries to each of these rivers flow to the north. Wetlands are present at each of these rivers and their tributaries. Wetlands also are present in the southern portion of the county near the Upper Litter River, its tributaries, and Trace Lake. The most common wetland type in Lee County is freshwater forested/shrub wetland.[22]

## Natural and Managed Areas

According to the North Carolina Natural Heritage Program, there are very few natural areas of high, very high, or exceptional value in Lee County. There are several managed areas under state ownership within Lee County. Managed areas are properties and easements where natural resource conservation is one of the current primary management goals, or they are of conservation interest. These areas in Lee County are mostly all along the Cape Fear River and Deep River.[23]

## Biodiversity and Wildlife Habitat

The North Carolina 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 Cape Fear River, Deep River, and their tributaries. These areas rank between a 7 and 10, with 10 being the highest possible score. Other areas of the county rank 5 to 6. Most of the county is unrated.[24]

[20] *Sources: NC Division of Water Resources, Local Water Supply Plans*
[21] *Source: U.S. Department of Energy, U.S. Energy Mapping System*
[22] *Source: NC Natural Heritage Program*
[23] *Source: NC Natural Heritage Program*
[24] *Source: NC Natural Heritage Program*

## Parks and Recreation

The Lee County Parks and Recreation Department maintains several parks and facilities in Lee County. The most prominent is San-Lee Park. It is located on 177 acres off of US 421 east of downtown Sanford. The park includes a nature center, mountain bike trail, nature trails, a fishing program, boat rentals, and a campground.[25]

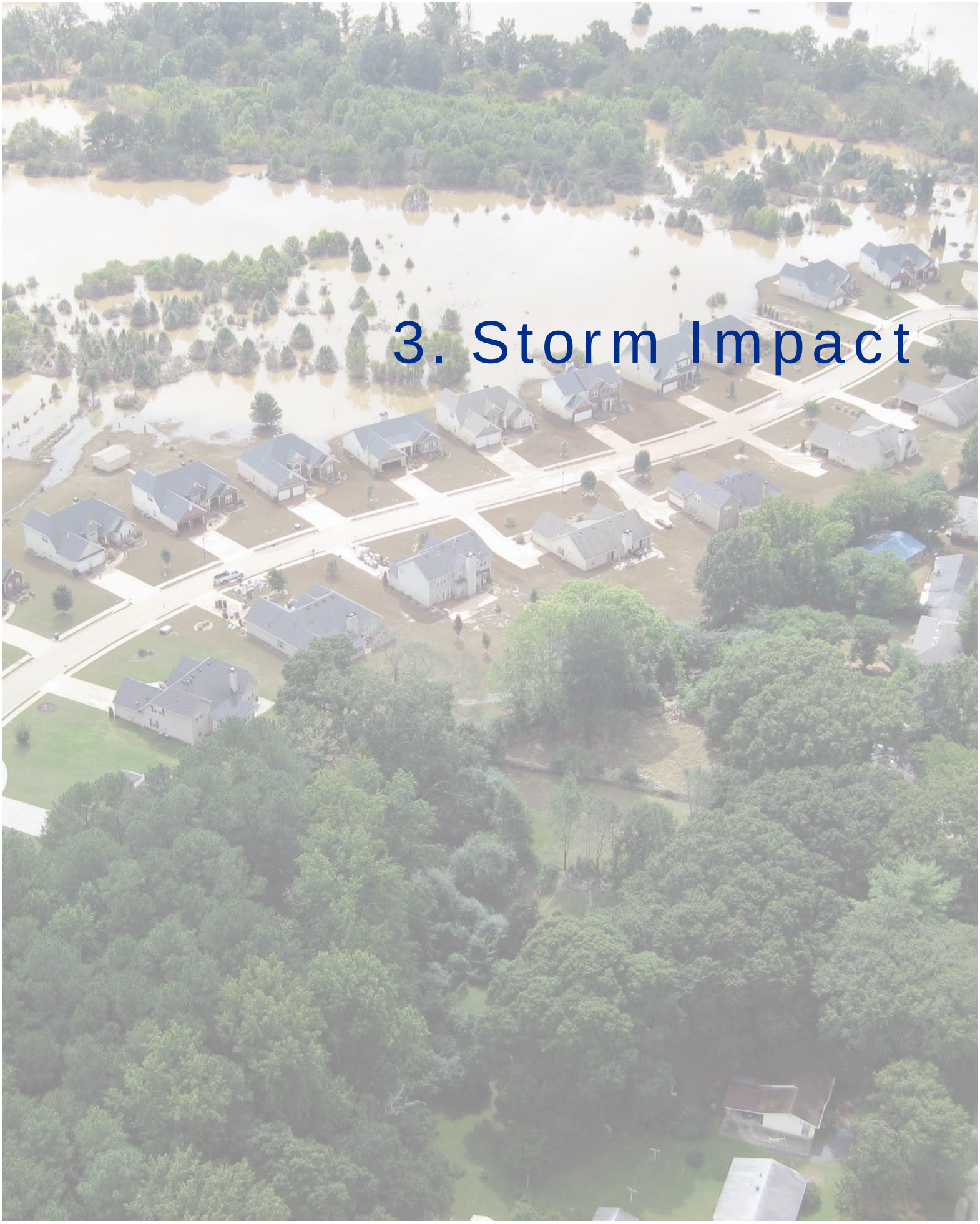
## Administrative Profile

The administrative capabilities of Lee 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 Lee 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. Lee 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, Unified Development Ordinance, Open Space Management Plan, Capital Improvements Plan 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.

Broadway and Sanford have "moderate" capabilities. They have administrative resources that would likely be able to assist with implementing the strategies in this plan, though Sanford has more capacity. In addition, they have the plans, policies and procedures in place that indicate higher capability due to size.[26]

[25] *Sources: NC Natural Heritage Program, Lee County Parks and Recreation Department*
[26] *Sources: NCEM*



# 3. Storm Impact

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## 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 three inches to eight inches in the central regions of North Carolina and eight inches 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 already had received above-normal rainfall in the month of September, leading to wet antecedent conditions prior to Hurricane Matthew. Total rainfall depth for Lee County is highlighted graphically in the figure below.

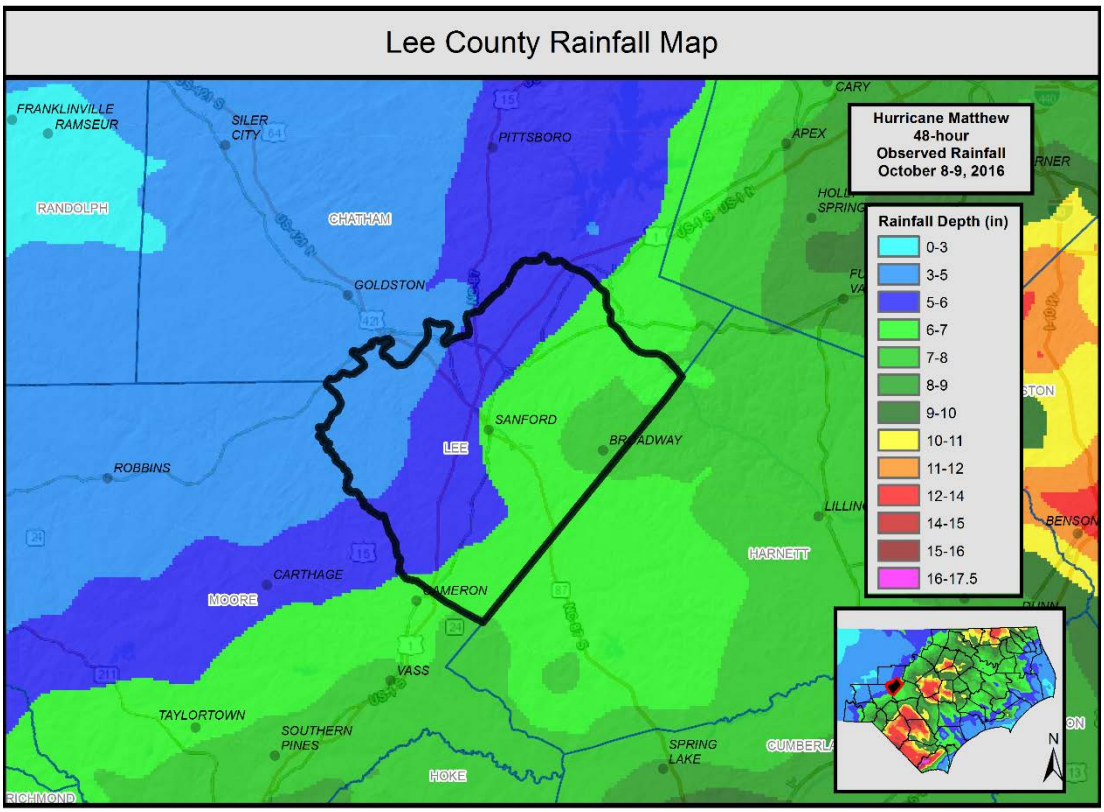



**Figure 9. 48-hour Observed Rainfall Depth (October 8-9, 2016)**

## Housing

According to FEMA Individual Assistance claims as of March 17, 2017, there were 190 registrations for Individual Assistance in Lee County as a result of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew still may be pending, so this number may not reflect the final claims data from the event. This also does not take into account other historic impacts to the county or other areas of concern for flooding that may not have occurred during this storm. With that in mind, the planning team attempted to take a comprehensive look at both Hurricane Matthew impacts and any historic impacts that local officials felt would validate areas that should be considered at high risk to future flooding.

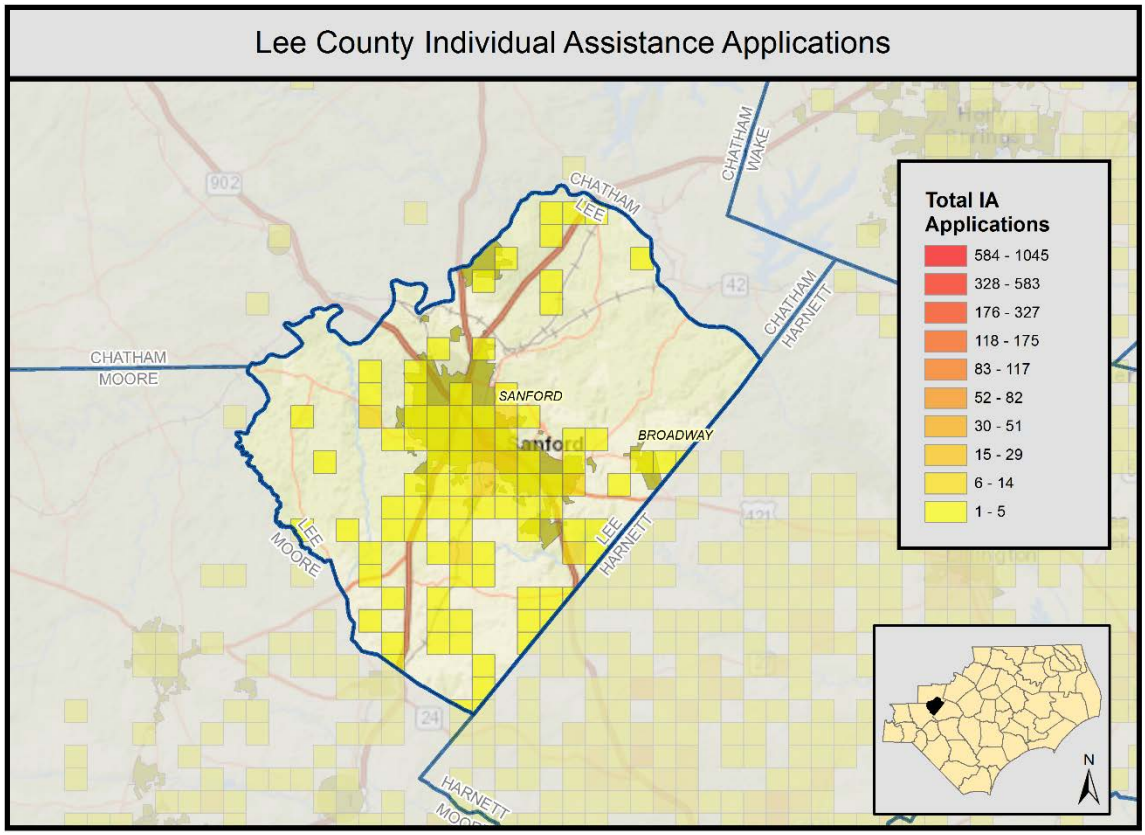



**Figure 10. Lee County IA Applications by Area**

The week prior to Hurricane Matthew, the region experienced a major rain storm, which severely saturated the soils. The winds caused by the hurricane toppled many trees, causing much of the damage to homes during the hurricane. Though displacement of families was not an issue caused by Hurricane Matthew, Lee County is concerned that it could be a significant problem following future events that track closer to the county.

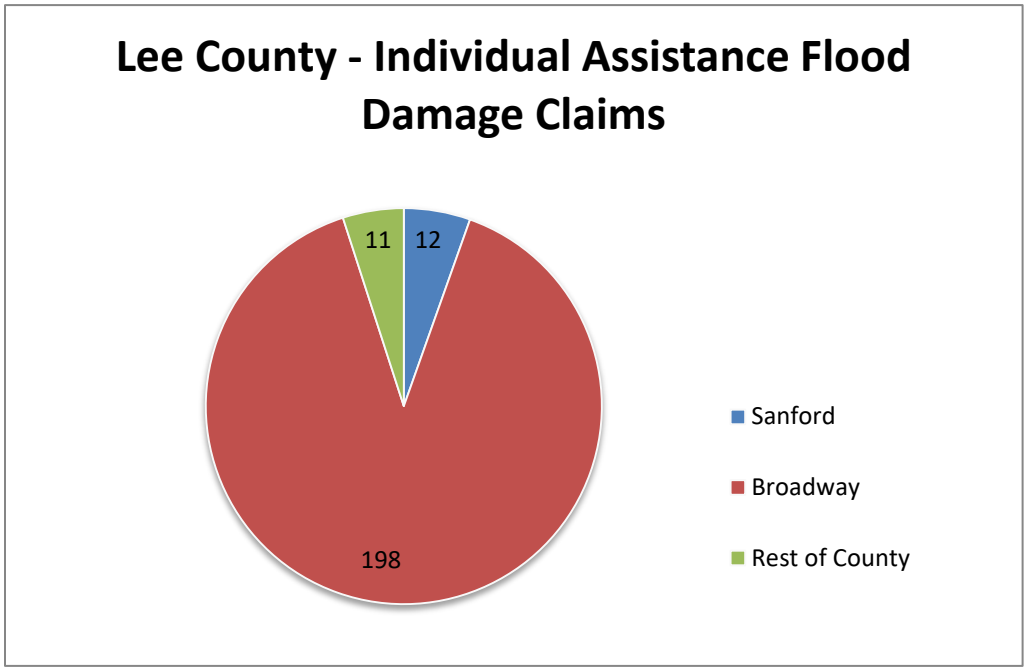



**Figure 11: Number of IA Flood Damage Claims by Area**

## Economic Development

Impacts to the economy in Lee County from Hurricane Matthew were minimal. Flooding did not directly impact commercial or industrial facilities, though the loss of water pressure and power created indirect impacts for businesses as well as the labor force. Energy and electric co-ops estimated 50 percent of customers were without power in the county (with repair times ranging from several hours to a week in remote locations), causing Lee County schools, city buildings, and businesses to experience closures and delays. The power outage also caused traffic issues for residents commuting to and from work.

## Infrastructure

Though damage was minimal throughout the county, Hurricane Matthew impacted local infrastructure by damaging water infrastructure and causing power outages. Water line breaks occurred at two locations: one was an eight-inch main damaged due to culvert failure, resulting in loss of pressure and an advisory for residents to boil water. Approximately 50 percent of energy customers were without power for multiple days. Outages occurred for three days at the Emergency Operations Center, various county and municipal buildings, and those schools acting as shelters, resulting in reliance on generators.

According to Public Assistance claims, which often are tied closely to infrastructure damage, as of March 17, 2017, there were $7,004 of claims in Lee County as a result of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew still may be pending, so this number may not reflect the final claims data from the event.

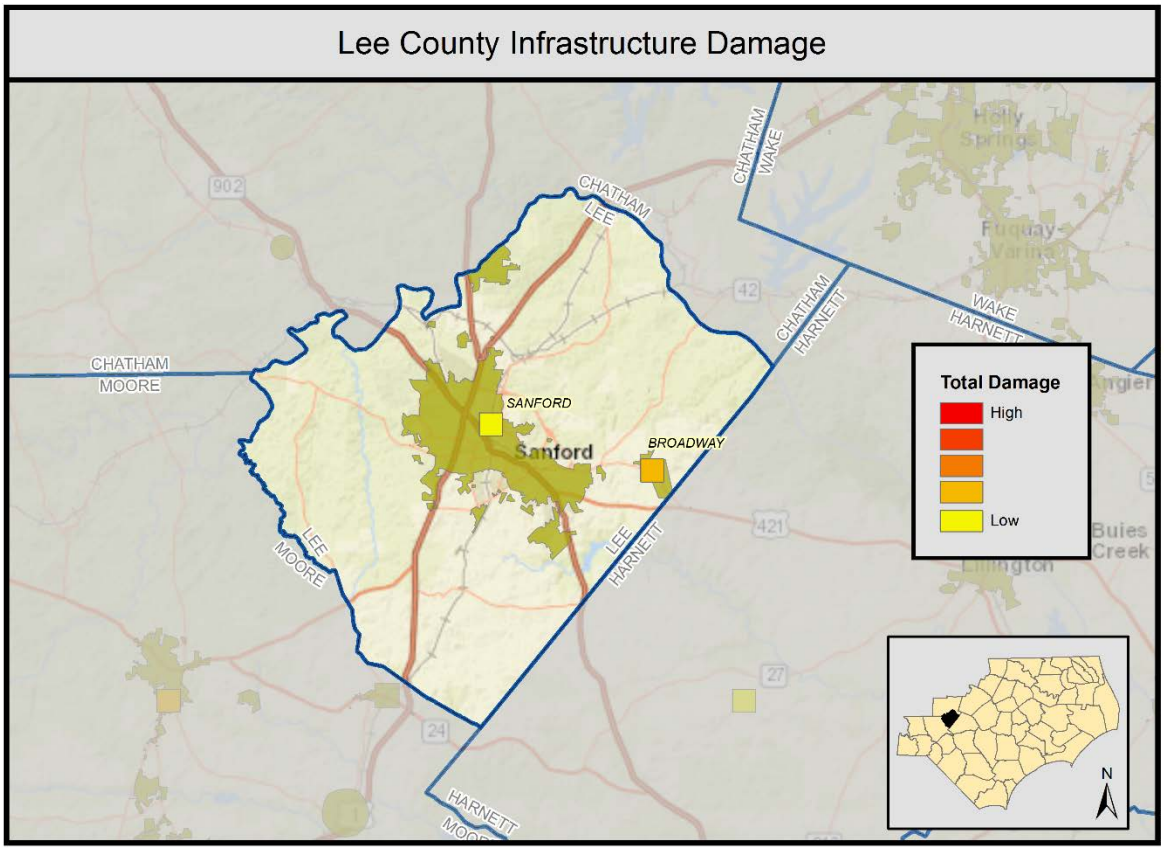



**Figure 12. Lee County Infrastructure Damage**

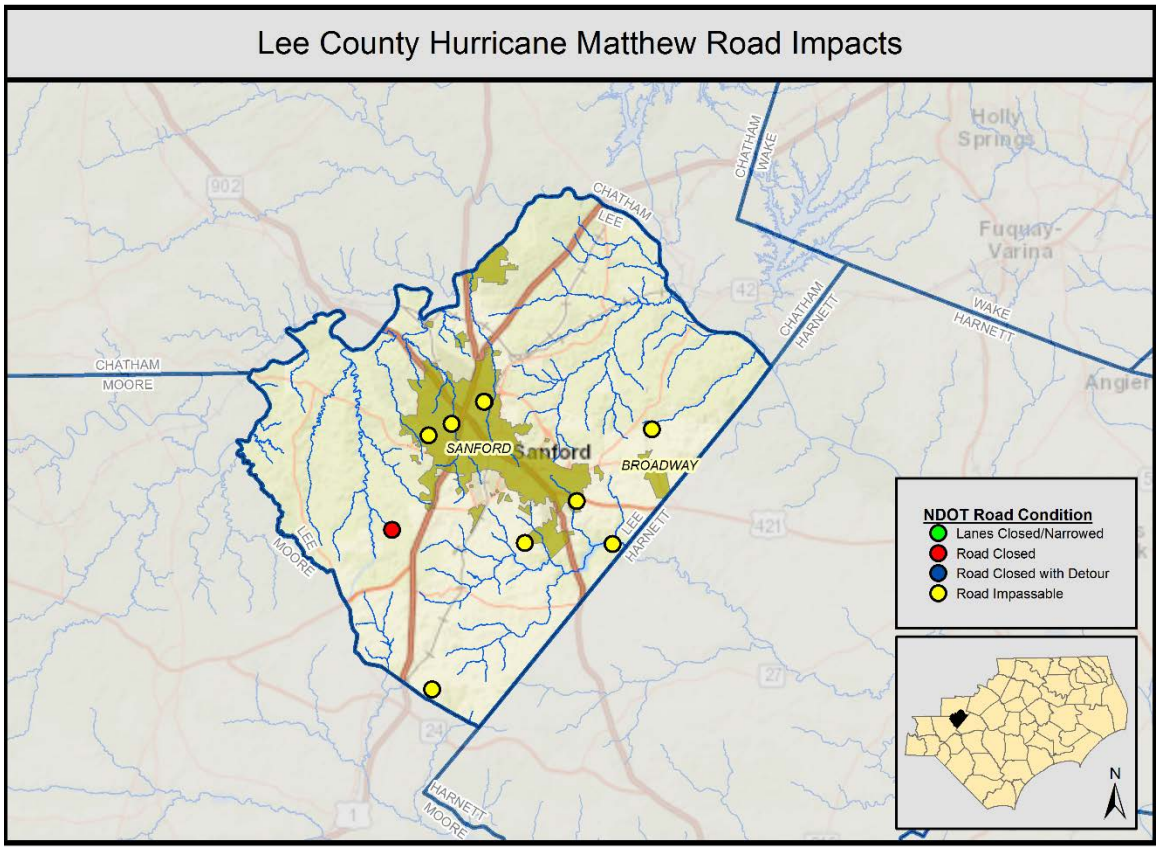
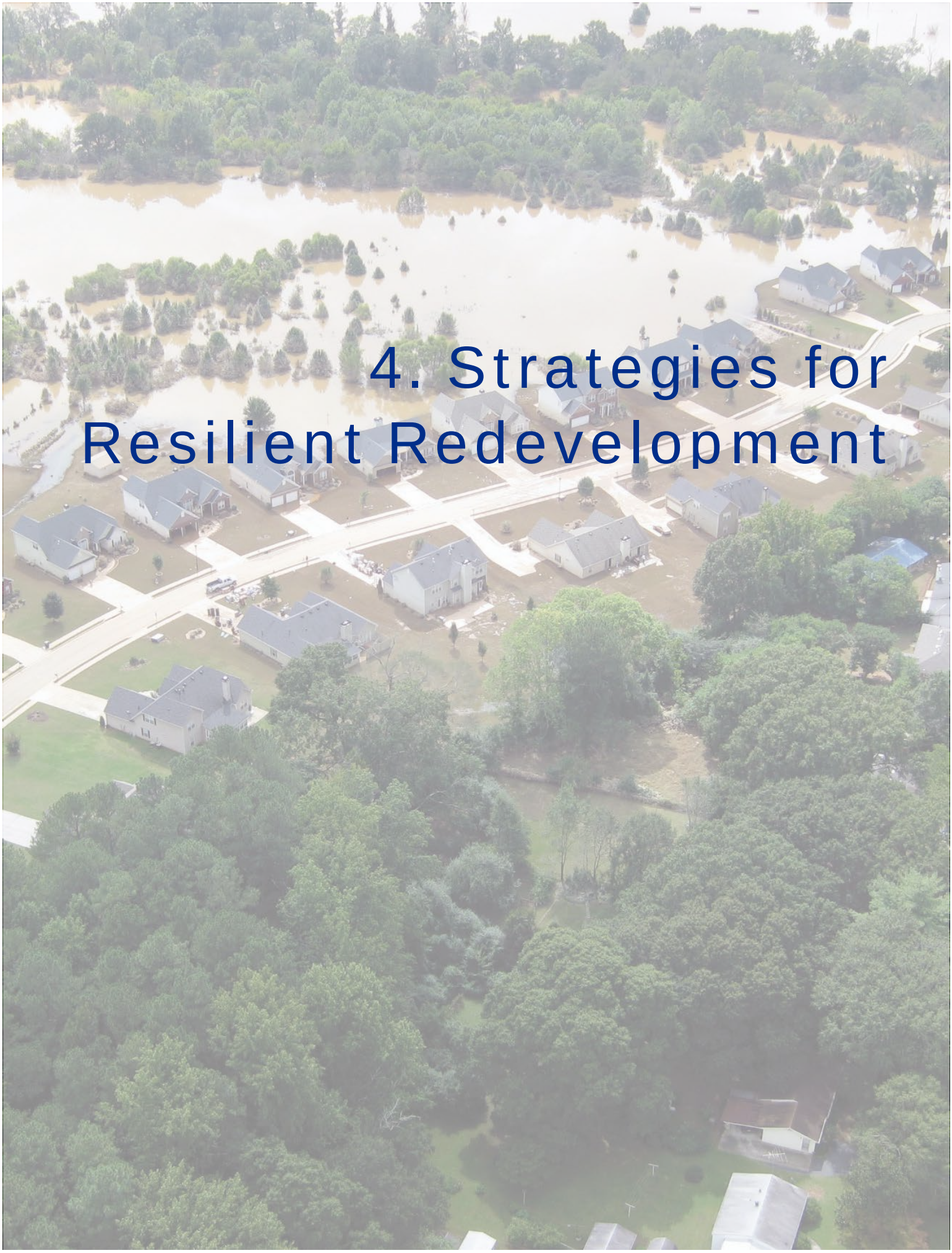



**Figure 13. Impacted NCDOT Structure in Lee County**

## Ecosystems / Environment

Overall, environmental impacts in Lee County as a result of Hurricane Matthew were minimal, resulting mainly in toppled trees. Debris buildup, including downed trees, occurred in local streams during Matthew's heavy rains. In future rains, this debris may be trapped underneath bridges and in culverts, causing damming that can back up water upstream and result in additional flooding, or which may lead to culvert or bridge failure. Downed trees in natural areas directly adjacent to densely populated residential areas around Lake Trace also could increase local wildfire risk.



# 4. Strategies for Resilient Redevelopment

# 4. Strategies for Resilient Redevelopment

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

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

| Pillar | Project/Action Count |
|---|---|
| Housing | 1 |
| Economic Development | 1 |
| Infrastructure | 5 |
| Environment | 2 |
| **Grand Total** | **9** |

**Table 3. Lee County Summary of Projects by Pillar**

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

| Pillar | Action Name | Priority | Overall Ranking |
|---|---|---|---|
| Infrastructure | Sanford Water Supply Redundancy and Technology Upgrades | **High** | 1 |
| Infrastructure | Backup/Redundant Power Solutions to Reduce Outage Issues | **High** | 2 |
| Environment | Little Buffalo Creek Stream Restoration/ Debris Removal | **High** | 3 |
| Infrastructure | Mitigate septic system failure at Greenwood Elementary | **Medium** | 4 |
| Housing | Sanford Residential Property Acquisition/Demolition | **Medium** | 5 |
| Infrastructure | Extension of Commerce Drive to Lee Avenue | **Medium** | 6 |
| Economic Development | Sanford Commercial Property Acquisition/Demolition | **Medium** | 7 |
| Environment | Lake Trace Residential Areas Wildfire Fuel Reduction | **Medium** | 8 |
| Infrastructure | Sanford Dialysis Clinic Mitigation | **Medium** | 9 |

**Table 4. Projects by Rank**

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

## Housing Strategies

## Medium Priority Housing Strategies

| Pillar | Action Name | Priority | Overall Ranking |
|---|---|---|---|
| Housing | Sanford Residential Property Acquisition/Demolition | **Medium** | 5 |

**Table 5. Lee Medium Priority Housing Summary**

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

- **Sanford Residential Property Acquisition/Demolition:** The City of Sanford proposes to acquire and demolish 13 flood-prone residential properties as a strategy to remove or reduce flood risk to structures in high-risk areas and improve drainage in the area.

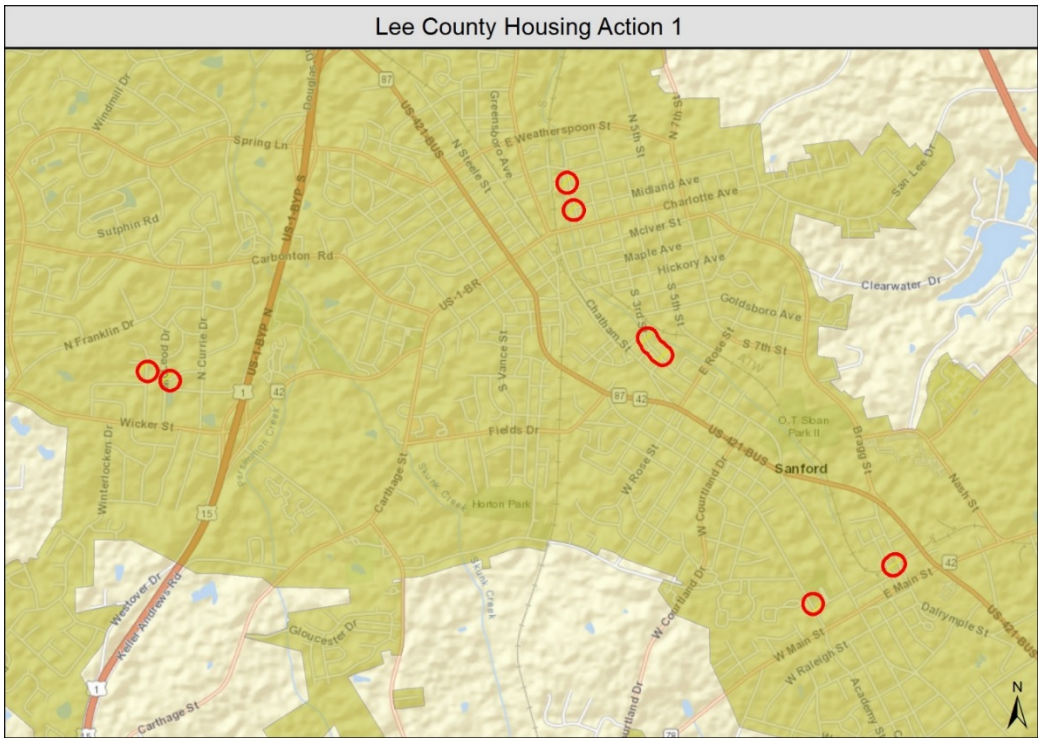



**Figure 14. Sanford Residential Property Acquisition/Demolition**

# Sanford Residential Property Acquisition/Demolition

**County:** Lee

**Priority Grouping:** Medium Priority

**Priority Ranking:** 5

**Project Timeframe:** 1-3 years

**Location:** 13 residential properties in Sanford located at: Third St - 707, 715, 807, 809, 813; First St - 115, 305; Caroline Dr - 2401; Arlington Cir - 308; Overbrook Dr - 2422; Globe St – 208, 316; Woodland Ave - 2231

**Project Summary:** Flooding during heavy rain events causes damage to residential properties in Sanford. The City will assess homeowner and community interest in voluntary acquisition of 13 floodprone residential properties as a strategy to remove or reduce flood risk to structures in high-risk areas and improve drainage in the area.

13 residential properties in Sanford located at:
Third St - 707, 715, 807, 809, 813
First St - 115, 305
Caroline Dr - 2401;
Arlington Cir - 308
Overbrook Dr - 2422
Globe St – 208, 316
Woodland Ave - 2231

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The project area along Little Buffalo Creek regularly experiences flooding causing flood damage and erosion issues to properties. Acquiring and demolishing these properties will not only protect residents but will also allow natural drainage for the area and keep other properties from flooding or eroding. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. | 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 | N/A |
| For how long will this solution be effective? | More than 50 years | N/A |
| How effective is the risk reduction? | >200 year event | N/A |
| How many public facilities are involved in this project (buildings and infrastructure)? | 0 | N/A |
| Is coordination with other communities/counties needed to complete this project? | No | N/A |
| Is this project consistent with Federal Laws | Yes | N/A |
| To what degree does this project adversely impact local floodplain/coastal zone management? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Unknown | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |

| | | |
|---|---|---|
| What impacts to the environment of the county will result from this project? | Removing structures from the floodplain and maintaining the area as open space will allow the Little Buffalo Creek floodplain to begin to restore natural function. | N/A |
| What is the capability of the local government to administer this project? | Medium | N/A |
| What is the financial range of this project? | $501K - $1M | N/A |
| What is the level of public support for this project? | Unknown | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | Local | N/A |

## Economic Development Strategies

## Medium Priority Economic Development Strategies

| Pillar | Action Name | Priority | Overall Ranking |
|---|---|---|---|
| Economic Development | Sanford Commercial Property Acquisition/Demolition | **Medium** | 7 |

**Table7. Lee Medium Priority Economic Development Summary**

This project represents the economic development strategy that Lee County indicated is a medium priority to address. Additional detail on the project can be found below:

- **Sanford Commercial Property Acquisition/Demolition**: Flooding from Little Buffalo Creek, both during Hurricane Matthew and during heavy rain events in general, has caused damage to commercial properties in the City of Sanford. The City will assess business owner and community interest in voluntary acquisition of two commercial properties—one located at 149 Charlotte Avenue and the other at 152 Charlotte Avenue—as a strategy to remove or reduce flood risk to structures in high-risk areas around Little Buffalo Creek.

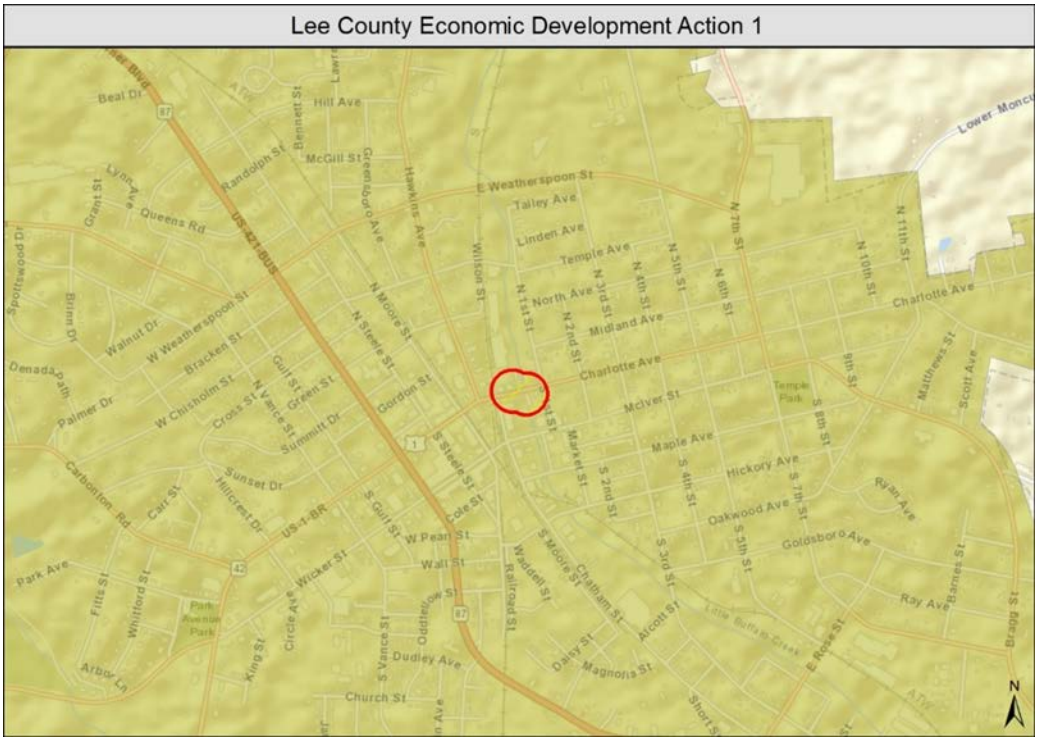



**Figure 15. Sanford Commercial Property Acquisition/Demolition**

# Sanford Commercial Property Acquisition/Demolition

**County:** Lee

**Priority Grouping:** Medium Priority

**Priority Ranking:** 7

**Project Timeframe:** 1-3 years

**Location:** 149 Charlotte Avenue and 152 Charlotte Avenue in Sanford, NC

**Project Summary:** Flooding from Little Buffalo Creek during Hurricane Matthew as well as heavy rain events cause damage to commercial properties in Sanford. The City will assess business owner and community interest in voluntary acquisition of two (2) commercial properties located at 149 Charlotte Avenue and 152 Charlotte Avenue as a strategy to remove or reduce flood risk to structures in high-risk areas around Little Buffalo Creek.

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The proposed project addresses an unmet need that has been created by damage from Hurricane Matthew by enabling the removal of flood-prone properties. Until these properties are no longer used there is still risk to people and property and losses will continue to occur. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. | 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. | The proposed project will not adversely affect the local economy. The proposed project will benefit the economy of the county by preventing future damages and loss of revenue for these businesses as they can relocate. | N/A |
| For how long will this solution be effective? | More than 50 years | N/A |
| How effective is the risk reduction? | >200 year event | N/A |
| How many public facilities are involved in this project (buildings and infrastructure)? | 0 | N/A |
| Is coordination with other communities/counties needed to complete this project? | No | N/A |
| Is this project consistent with Federal Laws | Yes | N/A |
| To what degree does this project adversely impact local floodplain/coastal zone management? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | High confidence | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment. The proposed project will benefit the environment of the county by protecting Little Buffalo Creek as these businesses are removed to allow more natural flow in this area. | N/A |
| What is the capability of the local government to administer this project? | Medium | N/A |
| What is the financial range of this project? | $251K - $500K | N/A |

| | | |
|---|---|---|
| What is the level of public support for this project? | Unknown | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | Local | N/A |

## Infrastructure Strategies

## High Priority Infrastructure Strategies

| Pillar | Action Name | Priority | Overall Ranking |
|---|---|---|---|
| Infrastructure | Sanford Water Supply Redundancy and Technology Upgrades | **High** | 1 |
| Infrastructure | Backup/Redundant Power Solutions to Reduce Outage Issues | **High** | 2 |

**Table 8. Lee High Priority Infrastructure Summary**

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

- **Sanford Water Supply Redundancy and Technology Upgrades:** Install a redundant water delivery line to Fuquay-Varina in Wake County to provide water source backup in case of future loss of service or operable pressure. To further update the system to make it more resilient during future events, upgrades to the monitoring systems should be integrated. Present-day advances in cloud technology and wireless communications have developed the ability for remote data collection, and, in some cases, remote operation. Data collection can include water use, back flow, pressure, leak detection, and water quality, to name a few. Having this technology and the ability to use the information would facilitate: (1) finding backflow situations in a timely manner, (2) locating and isolating transmission line problems using pressure loss data and remotely operated valves, and (3) activating transmission mains from other providers such that the switchover to backup supplies would be more timely and result in less disruption and customer impact.

# Sanford Water Supply Redundancy and Technology Upgrades

**County:** Lee

**Priority Grouping:** High Priority

**Priority Ranking:** 1

**Project Timeframe:** 3-5 years

**Location:** throughout Lee County

**Project Summary:** During Hurricane Matthew, two water main breaks caused pressure to significantly drop and rendered service inoperable. A boil water advisory was issued. To mitigate this problem, the proposed project will install a redundant line to Fuquay Varina (located in a different drainage basin) to provide water source backup in case of loss of service or operable pressure. To further update the system to make it more resilient to future events, upgrades to the monitoring systems should be integrated. Present day advances in cloud technology and wireless communications have developed the ability for remote data collection, and in some cases, remote operation. Data collection can include water use, back flow, pressure, leak detection and water quality to name a few. Having this technology, and the ability to use the information, would facilitate the ability to (1) find backflow situations on a timely basis, (2) locate and isolate transmission line problems using pressure loss data and remotely operated valves, and (3) activate transmission mains from other providers such that the switchover to backup supplies would be more timely and result in less disruption and customer impact.

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The proposed project addresses an unmet need that has been created by damage from Hurricane Matthew by mitigating loss of pressure that caused loss of service for all customers for days as well as allow faster identification of water line breaks so they can be promptly fixed without inconveniencing the whole system. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. | 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. | The proposed project will not adversely affect the local economy. The proposed project will benefit the economy of the county by ensuring consistency of water service so that businesses can operate reliably (especially manufacturing plants that require water). | N/A |
| For how long will this solution be effective? | More than 50 years | N/A |
| How effective is the risk reduction? | >200 year event | 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? | Yes | N/A |
| Is this project consistent with Federal Laws | Yes | N/A |
| To what degree does this project adversely impact local floodplain/coastal zone management? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | High confidence | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |

| | | |
|---|---|---|
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment. | N/A |
| What is the capability of the local government to administer this project? | Medium | N/A |
| What is the financial range of this project? | $1M+ | N/A |
| What is the level of public support for this project? | Unknown | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | Local | N/A |

- **Backup/Redundant Power Solutions:** Backup, supplemental, and redundant power is needed to create better energy assurance and consistent connectivity post-disaster and to make sure that critical facilities have sufficient power to maintain operations. Proposed projects include:
    - Add generators for backup power at the following 18 critical locations: backup shelter locations (3), Sanford City Hall, Civic Center, City Service Center, Lee County Administration/Finance Office, Sanford Planning/Inspections Building, and schools (10).
    - Modify the EOC generator with transfer switches to improve functionality.
    - Secure connectivity with schools through installation of Bi-Directional Amplifiers (BDA) at each location, while also providing radio connectivity between each school and central administration office.
    - Bury power lines from the hospital to downtown Sanford.
    - Purchase mobile generators and complete electrical conversions at the following critical intersections so intersection functions can be powered by generator:
        - NC 78 @ US 1
        - US 15-501 @ US 1
        - Rose Street @ Horner Boulevard
        - Carthage Street @ Horner Boulevard
        - Weatherspoon Street @ Horner Boulevard
        - Fields Drive @ Horner Boulevard/Woodland Avenue (Hospital Access)

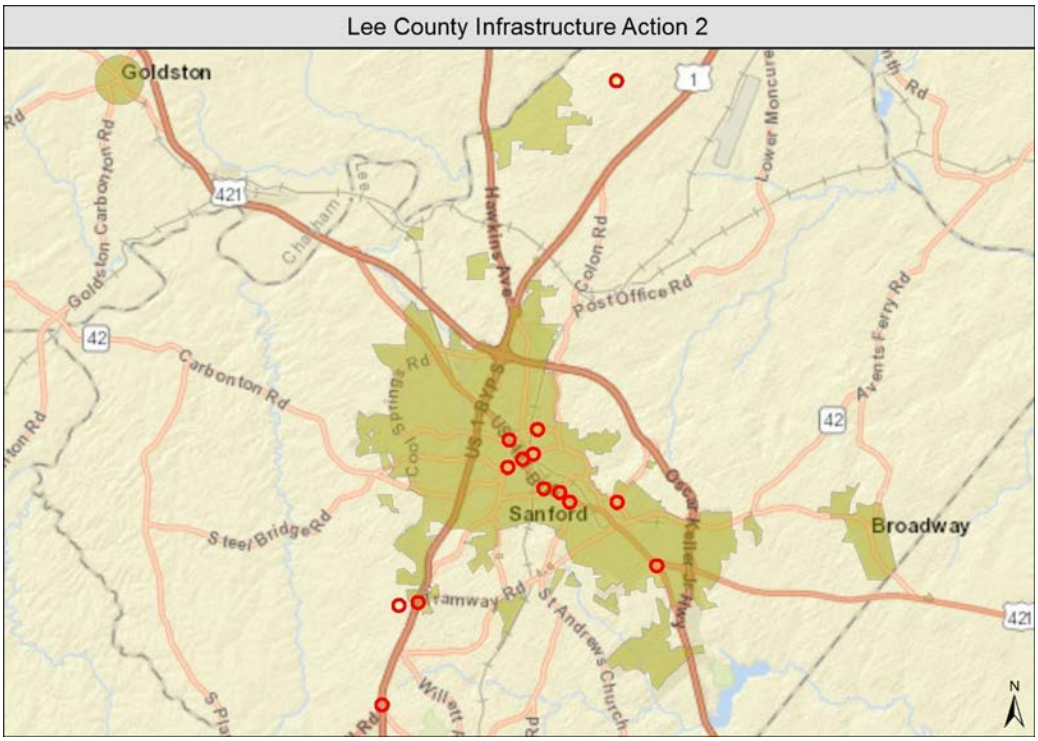



**Figure 16. Backup/Redundant Power Solutions**

# Backup/Redundant Power Solutions to Reduce Outage Issues

**County:** Lee

**Priority Grouping:** High Priority

**Priority Ranking:** 2

**Project Timeframe:** 1-3 years

**Location:** Lee County and Sanford

**Project Summary:** Loss of power caused by flooding and downed trees from saturated soil and high wind were the primary causes of power loss. Power was out for several days during/after Hurricane Matthew, making it difficult for county and city staff to respond and begin short term recovery. Overall, back-up, supplemental and redundant power is needed to create better energy assurance and consistent connectivity post-disaster and to make sure that critical facilities have sufficient power to maintain operations. Proposed projects include:

- Add generators for backup power at the following 18 critical locations: Backup shelter locations (3), Sanford City Hall, Civic Center, City Service Center, Lee County Administration/Finance Office, Sanford Planning/Inspections Building, Schools (10).
- Modify EOC generator with transfer switches to improve functionality
- Secure connectivity with schools through installation of Bi-Directional Amplifiers (BDA) at each location as well as providing radio connectivity between each school and central administration office.
- Bury power lines from hospital to downtown Sanford
- Purchase mobile generators and complete electrical conversions at the following critical intersections that need equipment converted to add a switch so can power by generator:
  - NC-78@US-1
  - US 15-501@US-1
  - Rose St@Horner Blvd
  - Carthage St@Horner Blvd
  - Weatherspoon St@Horner Blvd
  - Fields Dr@ Horner Blvd/Woodland Ave (Hospital Access)

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The proposed project addresses an unmet need that has been created by damage from Hurricane Matthew by providing power for emergency operations so residents and businesses can be served and protected during response and recovery from a hazard event. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. | 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. | The proposed project will not adversely affect the local economy. | N/A |
| For how long will this solution be effective? | Between 11 and 30 years | N/A |
| How effective is the risk reduction? | >200 year event | N/A |
| How many public facilities are involved in this project (buildings and infrastructure)? | >6 | N/A |
| Is coordination with other communities/counties needed to complete this project? | No | N/A |
| Is this project consistent with Federal Laws | Yes | N/A |
| To what degree does this project adversely impact local floodplain/coastal zone management? | No Impact | N/A |

| | | |
|---|---|---|
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | High confidence | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment | N/A |
| What is the capability of the local government to administer this project? | Medium | N/A |
| What is the financial range of this project? | $501K - $1M | N/A |
| What is the level of public support for this project? | Unknown | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | Local | N/A |

## Medium Priority Infrastructure Strategies

| Pillar | Action Name | Priority | Overall Ranking |
|---|---|---|---|
| Infrastructure | Mitigate septic system failure at Greenwood Elementary | **Medium** | **4** |
| Infrastructure | Extension of Commerce Drive to Lee Avenue | **Medium** | **6** |
| Infrastructure | Sanford Dialysis Clinic Mitigation | **Medium** | **9** |

**Table 9. Lee Medium Priority Infrastructure Summary**

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

- **Mitigate School Septic System Failure:** Construct sewer line access from Greenwood Elementary School to the City of Sanford wastewater system and eliminate septic system use at this location.

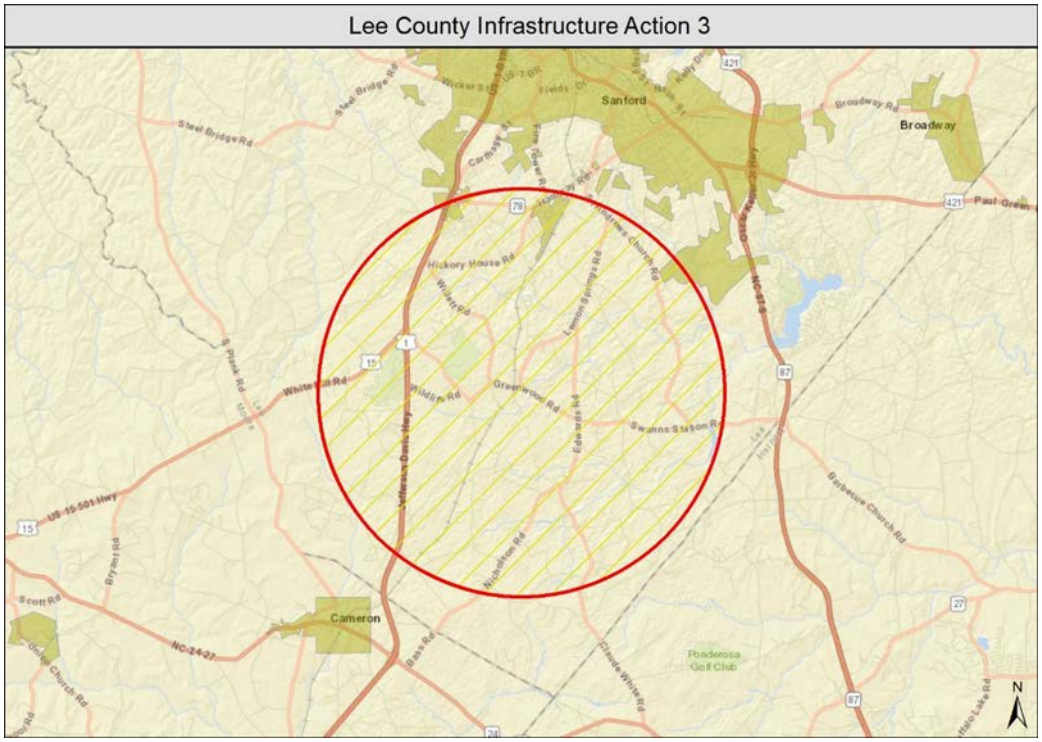



**Figure 17. Mitigate School Septic System Failure**

# Mitigate septic system failure at Greenwood Elementary

**County:** Lee

**Priority Grouping:** Medium Priority

**Priority Ranking:** 4

**Project Timeframe:** Approximately 1 year

**Location:** Greenwood Elementary School

**Project Summary:** Extreme rainfall the week prior to and during Hurricane Matthew saturated the ground, causing septic issues at Greenwood Elementary. The proposed project will mitigate septic system failure at Greenwood Elementary by constructing sewer line access to the City system for the school and eliminate septic system use at this location.

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The proposed project addresses an unmet need that has been created by damage from Hurricane Matthew by eliiminating loss of service that occurs when heavy rains inundate and damage septic drainage fields at this location. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. | 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. | The proposed project will not adversely affect the local economy. | N/A |
| For how long will this solution be effective? | More than 50 years | N/A |
| How effective is the risk reduction? | >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? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | High confidence | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment. The proposed project will benefit the environment of the county by eliminating septic system failure at a school which could cause health and safety hazards for students and staff. | 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? | Unknown | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | Local | N/A |

- **Extension of Commerce Drive to Lee Avenue:** Heavy rains such as those experienced during Hurricane Matthew cause flooding in a low spot at the Lee Avenue bridge crossing over Gasters Creek near Lochmere Drive. Flooding at this location cuts off access for residents, while also creating issues with emergency response to the area. The proposed project will extend Commerce Drive to Lee Avenue to offer another route to the area, as well as elevate the road at the low spot on Lee Avenue and increase the capacity of flow under the bridge.

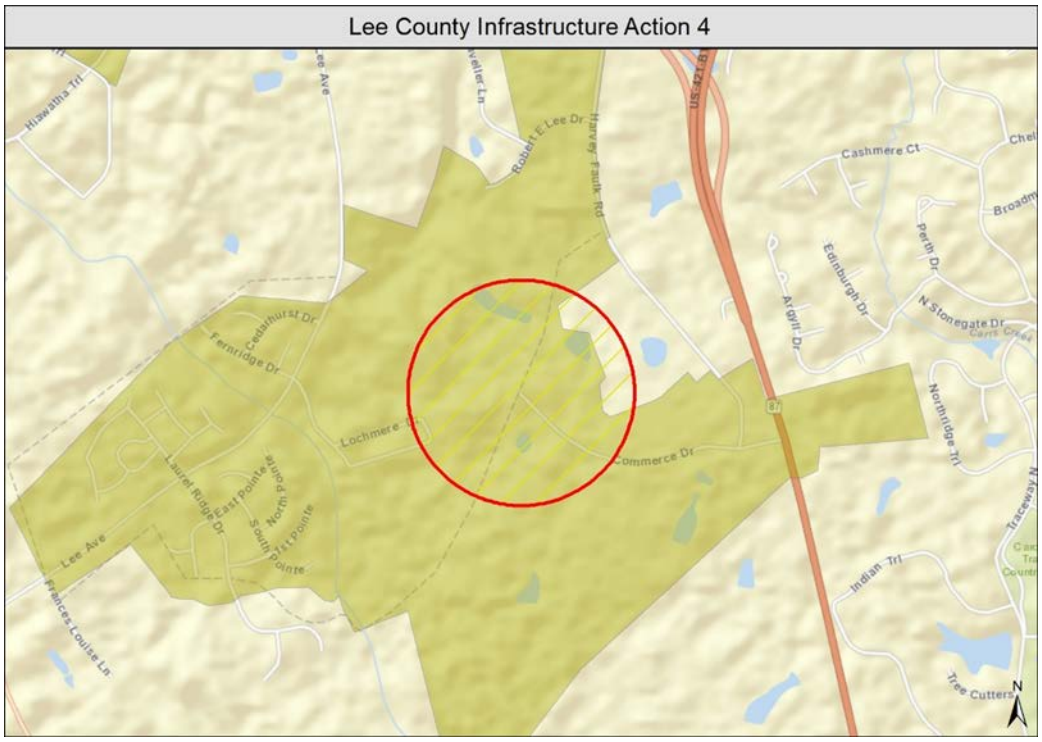



**Figure 18. Extension of Commerce Drive to Lee Avenue**

# Extension of Commerce Drive to Lee Avenue

**County:** Lee

**Priority Grouping:** Medium Priority

**Priority Ranking:** 7

**Project Timeframe:** approximately 1 year

**Location:** Commerce Drive in Sanford

**Project Summary:** Heavy rains such as those experienced during Hurricane Matthew cause flooding in a low spot at the Lee Avenue bridge crossing Gasters Creek near Lochmere Drive. Flooding at this location cuts off access for residents as well as creates issues with emergency response to the area. The proposed project will extend Commerce Drive to Lee Avenue in order to offer another route to the area, as well as elevate the road at the low spot on Lee Avenue and increase the capacity of flow under the bridge.

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The proposed project addresses an unmet need that has been created by damage from Hurricane Matthew by providing access to residents and businesses in an area cut off by flooding. This road extension will decrease response time for emergency personnel and allow access to properties typically cut off during flood events. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. | 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. | The proposed project will not adversely affect the local economy. | N/A |
| For how long will this solution be effective? | More than 50 years | N/A |
| How effective is the risk reduction? | >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? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | High confidence | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment. | N/A |
| What is the capability of the local government to administer this project? | High | N/A |
| What is the financial range of this project? | $501K - $1M | N/A |
| What is the level of public support for this project? | Unknown | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | Local | N/A |

- **Sanford Dialysis Clinic Mitigation:** During flood events and power outages, kidney dialysis patients experience issues getting to treatment, risking life-threatening consequences. Safety personnel must assist patients in getting to and from treatment, thus stripping important resources from performing other critical public safety duties. To protect dialysis patients and ensure that they can get the treatment they need during inclement weather, Lee County proposes to:
    - Acquire the Sanford Dialysis Clinic property at 1900 K. M. Wicker Memorial Drive and relocate the business outside of the floodplain. The flood-prone property then would be demolished and held as open space in perpetuity.
    - Develop a plan to improve transportation for dialysis patients during disasters.

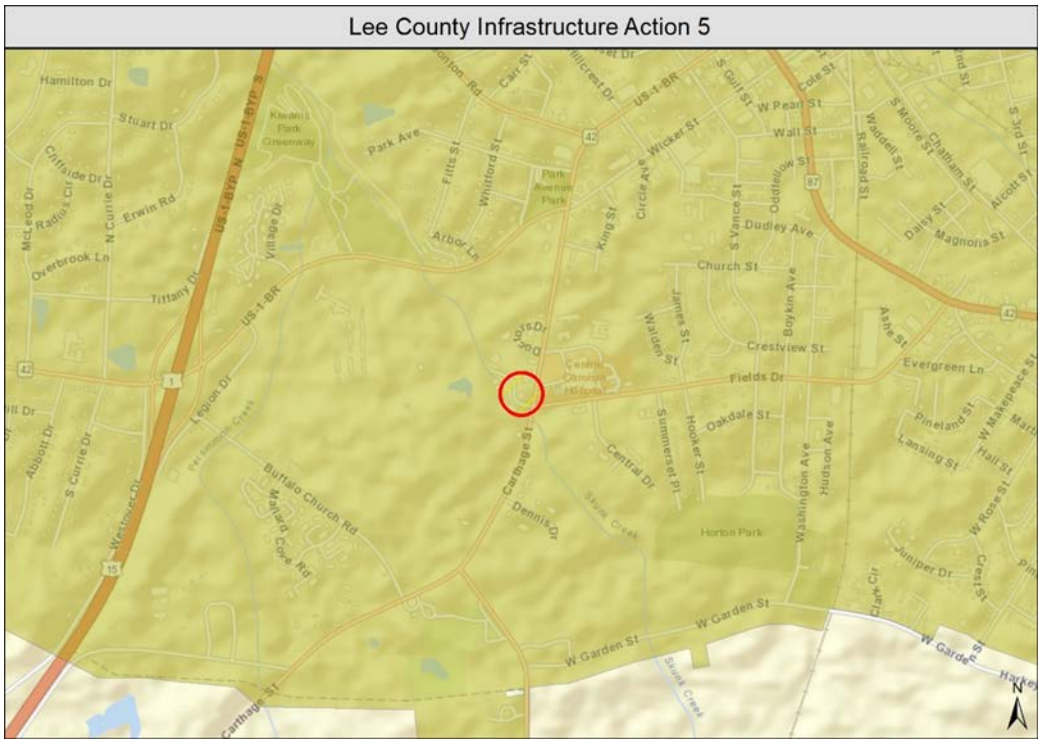



**Figure 19. Sanford Dialysis Clinic Mitigation**

# Sanford Dialysis Clinic Mitigation

**County:** Lee

**Priority Grouping:** Medium Priority

**Priority Ranking:** 9

**Project Timeframe:** 1-3 years

**Location:** 1900 K M Wicker Memorial Drive, Sanford, NC

**Project Summary:** During flood events and power outages, dialysis patients experience issues getting to treatment, risking life-threatening consequences. During a flood event or hurricane, safety personnel must assist patients in getting to and from treatment, thus stripping important resources from performing other critical public safety duties.
In order to protect dialysis patients and ensure that they can get the treatment they need during inclement weather, Lee County proposes to:
• Acquire the Sanford Dialysis Clinic property at 1900 K M Wicker Memorial Drive so that the business relocates outside of the floodplain. The floodprone property would then be demolished and held as open space in perpetuity.
• Develop a plan to improve transportation for dialysis patients during disasters.

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The proposed project addresses an unmet need that has been created by damage from Hurricane Matthew by enabling dialysis patients whose lives depend upon daily treatment to reach the facility for treatment without danger and enable them to receive care regardless of weather events. Their lives depend upon their ability to reach this facility daily. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. | 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. | The proposed project will not adversely affect the local economy. | N/A |
| For how long will this solution be effective? | More than 50 years | N/A |
| How effective is the risk reduction? | >200 year event | N/A |
| How many public facilities are involved in this project (buildings and infrastructure)? | 0 | N/A |
| Is coordination with other communities/counties needed to complete this project? | No | N/A |
| Is this project consistent with Federal Laws | Yes | N/A |
| To what degree does this project adversely impact local floodplain/coastal zone management? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | High confidence | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment. | N/A |

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

## Environmental, Ecosystem, and Agricultural Strategies

## High Priority Environmental Strategies

| Pillar | Action Name | Priority | Overall Ranking |
|---|---|---|---|
| Environment | Little Buffalo Creek Stream Restoration/ Debris Removal | **High** | 3 |

**Table 10. Lee High Priority Environmental Summary**

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

- **Little Buffalo Creek Stream Restoration/ Debris Removal:** Several decades ago, Little Buffalo Creek was straightened. Over the years, this work has resulted in erosion and unnatural flow. These unnatural changes in the water flow continue to erode banks and put properties at risk of flooding, particularly along First Street and at the golf course. The proposed project would restore the natural meandering channel to its proper depth and allow proper flow. This effort will restore natural floodplain functions and protect water-adjacent areas and infrastructure. Proposed commercial buyouts also are an integral part of this effort, as they are situated very close to the creek and must be removed to complete this stream restoration project.

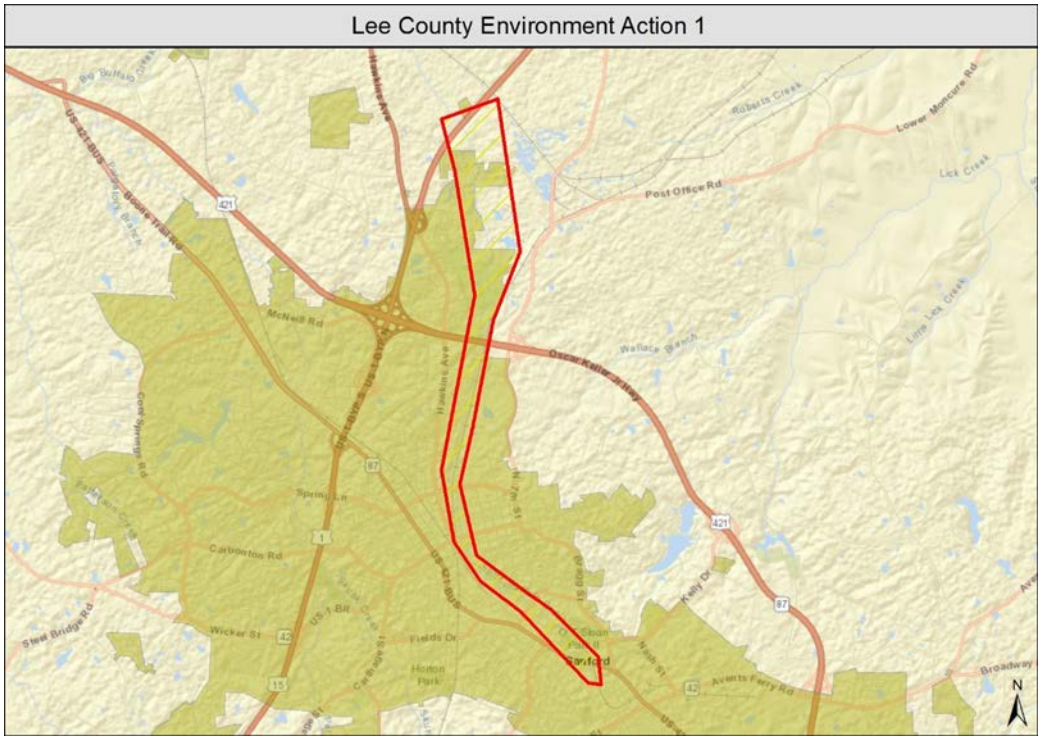



**Figure 20. Little Buffalo Creek Stream Restoration/ Debris Removal**

# Little Buffalo Creek Stream Restoration/Debris Removal

**County:** Lee

**Priority Grouping:** High Priority

**Priority Ranking:** 3

**Project Timeframe:** 1-2 years

**Location:** Little Buffalo Creek in Sanford

**Project Summary:** Several decades ago, Little Buffalo Creek was straightened, which over the years has resulted in erosion and unnatural flow. These unnatural changes in the water flow continues to erode banks and puts properties at risk to flooding, particularly along First Street and at the golf course. The proposed project would restore the natural meandering channel to its proper depth and allow proper flow. This effort will restore natural floodplain functions and protect water-adjacent areas and infrastructure. Proposed commercial buyouts are also an integral part of this effort, as they are situated very close to the creek and must be removed to complete this stream restoration project.

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | Stream restoration has been needed for many years and the heavy flows during Matthew exacerbated the issue. When another flood event occurs the County will be in a worse position than they were when Matthew occurred and flooding will damage more properties and infrastructure because the water can't flow properly in the current channels. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. The Cape Fear Regional Hazard Mitigation Plan includes a relevant goal to Protect and reserve the natural resources and environmentally sensitive areas within the region and this project helps achieve this. | 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. | The proposed project will not adversely affect the local economy. The proposed project will benefit the economy of the county by decreasing damage from drainage issues and flooding. | 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? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | High confidence | N/A |
| What impact will this action have on the local economy/tax base? | Less than 25% | N/A |
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment. The proposed project will benefit the | N/A |

| | | |
|---|---|---|
| | environment of the county by restoring natural function to the channels. | |
| What is the capability of the local government to administer this project? | Medium | N/A |
| What is the financial range of this project? | $1M+ | N/A |
| What is the level of public support for this project? | High | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | County | N/A |

## Medium Priority Environmental Strategies

| Pillar | Action Name | Priority | Overall Ranking |
|---|---|---|---|
| Environment | Lake Trace Residential Areas Wildfire Fuel Reduction | **Medium** | 8 |

**Table11. Lee Medium Priority Environmental Summary**

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

- **Lake Trace Residential Areas Vegetative Debris Removal:** As a result of Hurricane Matthew, many trees fell and littered forested areas. Along Lake Trace, numerous houses are situated within forested areas and the downed trees have created a wildfire fuel hazard. The Lake Trace area includes several subdivisions that are densely populated and have limited access for emergency vehicles if a fire should occur. The proposed project will remove fallen tree debris (wildfire fuel) from natural areas around densely populated Lake Trace to reduce wildfire fuel loads. To prevent future issues with wildfires in this access-limited community, enrollment into the National Fire Protection Association(NFPA) Firewise Communities Program would be encouraged. This would be instrumental in educating homeowners to become involved in taking individual responsibility for safeguarding their homes against the risk of wildfire.

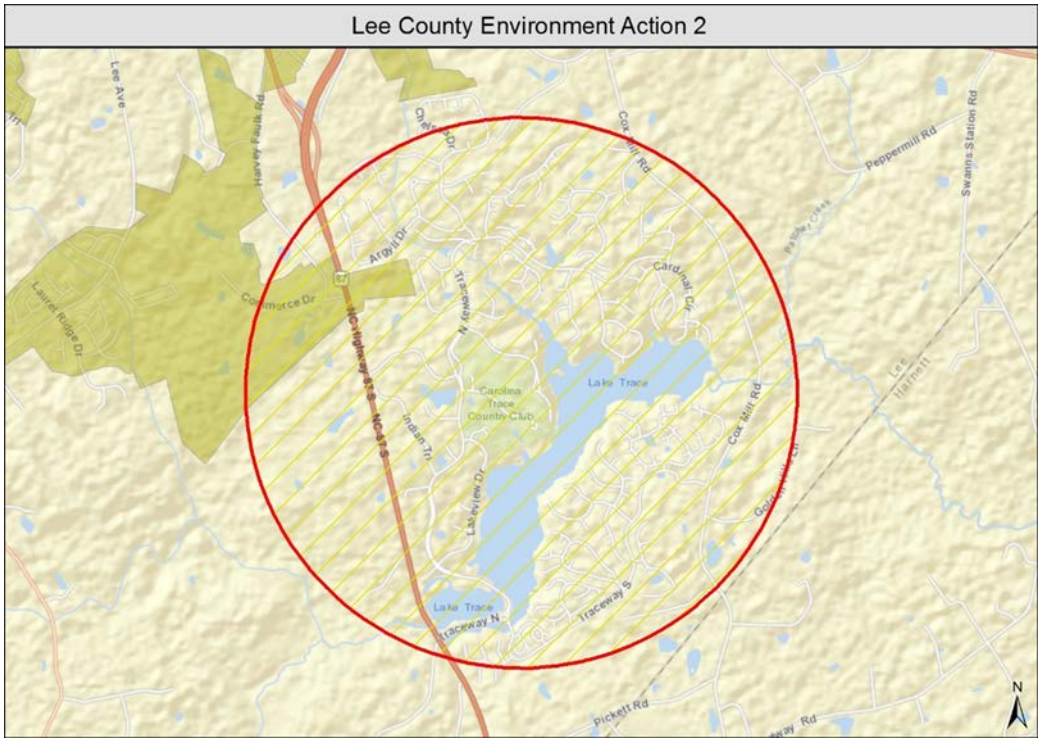



**Figure 21. Lake Trace Residential Areas Vegetative Debris Removal**

# Remove tree debris (wildfire fuel) from natural areas around densely populated Lake Trace

**County:** Lee

**Priority Grouping:** Medium Priority

**Priority Ranking:** 8

**Project Timeframe:** 1-2 years

**Location:** Lake Trace residential areas

**Project Summary:** As a result of Hurricane Matthew, many trees fell and littered forested areas. Along Lake Trace, many houses are situated within forested areas and the downed trees create a wildfire fuel hazard. The Lake Trace area includes several subdivisions which are densely populated and have limited access for emergency vehicles should a fire occur.
The proposed project will remove fallen tree debris (wildfire fuel) from natural areas around densely populated Lake Trace to reduce wildfire fuel loads. To prevent future issues with wildfires in this access-limited community, enrollment into NFPA's Firewise Communities Program would be encouraged. This would be key to educating homeowners to become involved in taking individual responsibility for preparing their homes from the risk of wildfire.

| Question | Response | Disposition |
|---|---|---|
| Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew. | The proposed project addresses an unmet need that has been created by damage from Hurricane Matthew by removing vegetative debris that litters a densely populated area and puts hundreds of homes at high risk to wildfire. | N/A |
| Consistent with existing plans (describe points of intersection/departure) | The proposed project is consistent with existing plans. The Cape Fear Regional Hazard Mitigation Plan includes relevant goals to Strive to maintain existing structures and infrastructure in such a manner that they will be as resilient as possible from natural hazards and Protect and preserve the natural resources and environmentally sensitive areas within the region and this project helps achieve this. | 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. | The proposed project will not adversely affect the local economy. The proposed project will benefit the economy of the county by decreasing potential widespread damage in the event of a wildfire. | 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? | No Impact | N/A |
| To what degree will it be possible to positively quantify the environmental benefits and ROI of this project? | Medium to high confidence | N/A |
| What impact will this action have on the local economy/tax base? | No Impact | N/A |

| | | |
|---|---|---|
| What impacts to the environment of the county will result from this project? | The proposed project will not create any adverse impacts to the environment. The environment will benefit from this project as the project will remove trees downed during the hurricane which will decrease wildfire fuel. | 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? | Unknown | N/A |
| What is the technical feasibility of this project? | Higher than 75% | N/A |
| Who will administer this project? | County | N/A |

## Summary

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