

# FOCUS



## Health & Wellness Gap Analysis: A Regional Assessment of Health Disparities



## Acknowledgments

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### Health & Wellness Committee Members

- David Stanley, Brunswick County
- David Rice, New Hanover County
- Joshua Swift, New Hanover County
- Carolyn Moser, Pender County
- Jane Jones, CFCOG Area Agency on Aging
- Tamlyn Shields, UNCW, Live Fit Cape Fear
- Dr. Kenneth Blackman, Coastal Care NC

### LCFSCC Current & Past Executive Officers

- Shawn Ralston, New Hanover County
- Ben Andrea, New Hanover County
- Suraiya Rashid, Metropolitan Planning Organization
- Ashli Barefoot, Town of Leland
- Resea Willis, Brunswick Housing Organization
- Megan Matheny, WAVE Transit
- Rebekah Roth, Town of Burgaw

### LCFSCC Members

- Jacob Vares, Cape Fear COG
- Allen Serkin, Cape Fear COG
- Chris May, Cape Fear COG
- Linda Smith, AMEZ Housing
- Stan Turner, Cape Fear Community Development Corporation
- Maria Age, Cape Fear Community Development Corporation
- Kyle Breuer, Pender County
- Megan O'Hare, Pender County
- Adrienne Harrington, WMPO
- Ed Parvin, Town of Carolina Beach
- Jerry Haire, Town of Carolina Beach
- Paul D'Angelo, Wilmington Housing Authority
- Karyn Crichton, New Hanover County
- Wanda Coston, New Hanover County
- Jennifer Rigby, New Hanover County
- Phil Prete, City of Wilmington
- Christine Hughes, City of Wilmington
- Angela Faison, City of Wilmington
- Suzanne Rogers, City of Wilmington
- Teresa Campo, City of Wilmington
- Brian Chambers, City of Wilmington
- Todd Rademacher, Town of Surf City

### FOCUS Staff

- Al Sharp, Project Director
- Adrienne Cox, Project Manager

### Community Transformation Grant Staff:

- Betsy Redman, CTG Region 8 Lead
- Bob Barden, Active Living Lead

### The project was completed with the assistance of Holland Consulting Planners, Inc.:

- T. Dale Holland, AICP – Principal
- Wes MacLeod, ASLA – Urban Designer & Planner
- Summer Tippet – Administrative Assistant





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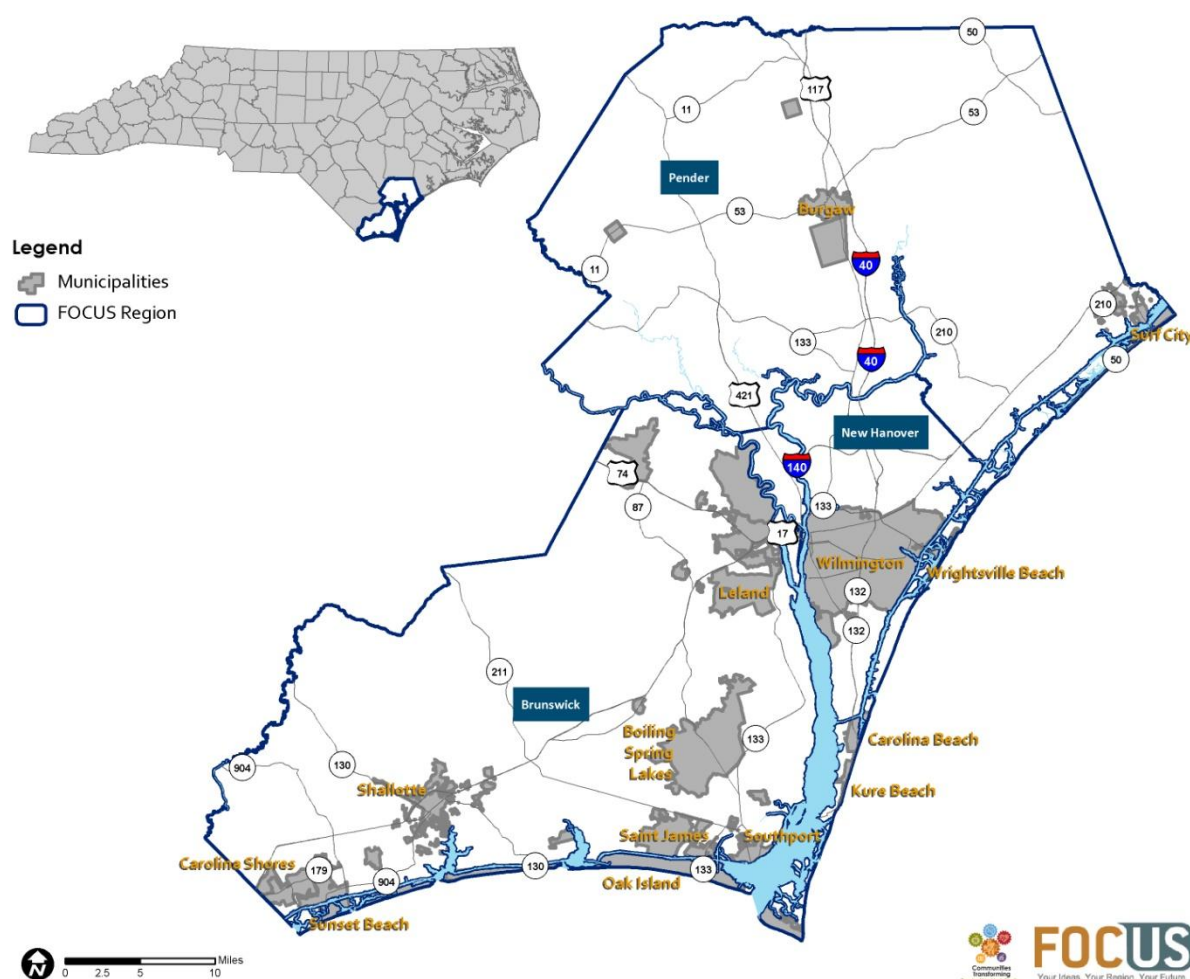
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## Section 1: Introduction

### Purpose

This report and assessment was initiated through North Carolina's Region 8 Community Transformation Collaborative from a grant received by the FOCUS Consortium of Southeastern NC. The FOCUS Consortium is tasked with creating a regional plan for sustainable development throughout Brunswick, New Hanover, and Pender Counties (see Map 1). The FOCUS region is located in North Carolina's coastal plain and is comprised of some of the fastest growing municipalities in the state. However, population growth in the region's rural jurisdictions is much less significant when compared to the urban areas.



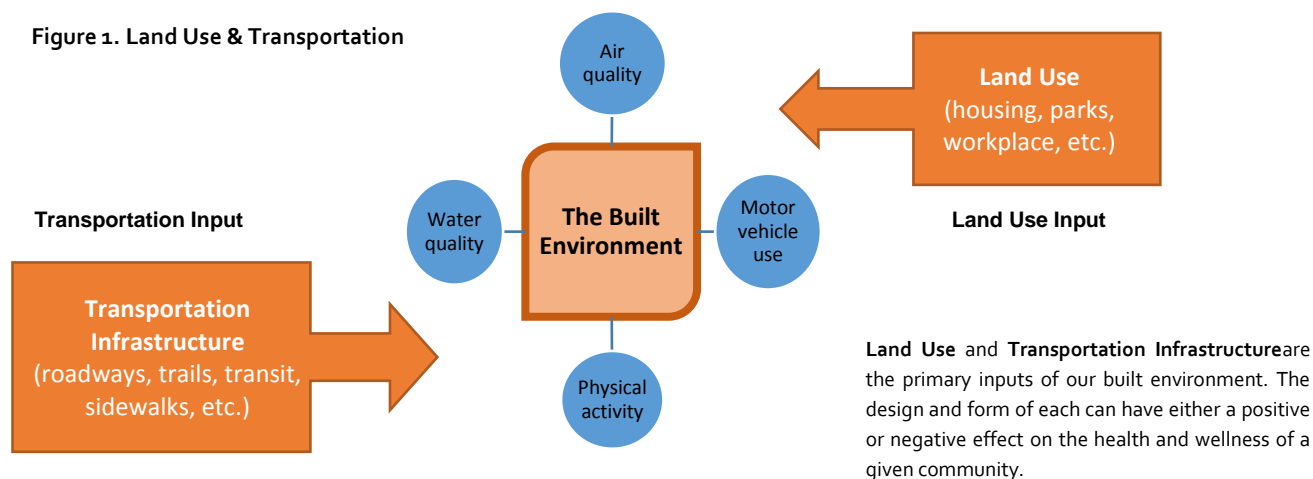
Map 1: FOCUS Regional Location

The goal of this Gap Analysis is to identify areas of the region that may face dire health issues. The Gap Analysis should serve as a tool for jurisdictions within the region seeking to improve public health outcomes through policy changes related to long-range fundamental improvements to the built environment. The built environment includes our neighborhoods, buildings, roadways, and parks.

Across the country, the design of residential developments, roadways, and settlement patterns all contribute to the relative health and wellness of citizens. Land use and transportation planning lay the foundation for changes to our built environment. These changes, in turn, affect our air and water quality, our level of motor vehicle use, and ease of access to open space amenities (physical activity opportunities).

Over the past ten years, community officials have seen an increasing need to address health disparities through changes to the built environment. This plan is a result of this evolving thought process and will be unlike most traditional planning documents—its focus is primarily on health-related issues. The diagram below details the impact of land use and transportation systems on our built environment.

Figure 1. Land Use & Transportation



## Process

As part of the FOCUS Health and Wellness Gap Analysis, a regional profile was drafted to depict existing demographic conditions as they relate to health. Analysis and maps pertaining to income, education, mobility, and population are included in the Regional Profile section. Statistics from each county's most recent Community Health Assessment and State of the County Health Report were used to establish a baseline of health issues facing the region. Health indicators or social determinants of health were then analyzed spatially to locate health disparate populations within the FOCUS region.

The Centers for Disease Control and Prevention (CDC) defines social determinants of health as "the complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities." These social structures and economic systems include the social environment, physical environment, access to health services, and structural and societal factors. The following social determinants of health were mapped to identify areas that may be in need of health and wellness-related capital improvements, community programming, and policy change:

- Elderly Concentration (65+)
- Median Household Income
- Educational Attainment – Persons (25+) with No High School Diploma



- Socioeconomic Status
- Mean Travel Time to Work
- Means of Travel to Work – Drove Alone
- Healthcare Provider Access
- Proximity to Dental Facilities
- Full-Service Grocery Availability
- Access to Active Transportation
- Elderly Transit Access
- Access to Physical Activity

### Historical Context of Planning & Public Health

In the 19th and early 20th centuries, architects and urban planners in cities across the country helped defeat infectious diseases like cholera and tuberculosis by retrofitting buildings, streets, neighborhoods, clean water systems, and parks. In particular, these buildings and streets were redesigned to increase air flow and provide daylight in an effort to combat bacteria. In the 21st century, planners and urban designers can again play a crucial role in combating the biggest public health epidemics of our time: obesity and related chronic diseases such as diabetes, heart disease, and some cancers. Today, an unhealthy diet and lack of physical activity are second only to tobacco use as the main cause of premature death in the United States.

### Planning: Land Use & Transportation Basics

The term land use planning is often used interchangeably with urban planning. At its most basic level, land use planning determines what parts of a community will be used for residential, commercial, industrial, or recreational uses. This effort is achieved through land use ordinances such as zoning and subdivision regulations. Places in which we live, work, and play – planned and regulated by the aforementioned ordinances – are connected by transportation networks.

Land use decisions also have an impact on the health and wellness of individuals within the community. Studies have shown that communities with a mix of land uses (residential, commercial, recreation, etc.) serve to increase the walkability of an area. Yet, conventional zoning districts often restrict multiple land uses, making new development single use in nature and thus contributing to a lack of walkability and active transportation users.



Roadways designed with only the automobile in mind, such as this intersection on US 17 in Sunset Beach, NC, deter pedestrians and bicyclists from use and create barriers to active transportation choices (Image Source: HCP).



Roadways designed for all users (Independence Blvd, Wilmington, NC, shown above) have proven to increase multi-modal travel and active transportation use (Image Source: HCP).

Transportation planning includes several components. In the United States, the automobile is often the dominant force behind urban design. Prior to the last decade, transportation planning primarily dealt with the efficient flow of only the automobile. The vast demand for private vehicular transportation regularly dictates the scale of our streets, the relationship between buildings, and the speed at which we experience our environment. A recent shift in thinking has changed the way departments of transportation now perceive roadway design.

Now, planning for all modes of travel – the pedestrian, bicyclist, transit user, and motorist – has become increasingly important. This element of transportation planning has a

tremendous effect on our ability to make travel mode choices. Roadways designed for all modes of use provide increased travel options with enhanced access to healthy food sources and support for a more active living lifestyle.

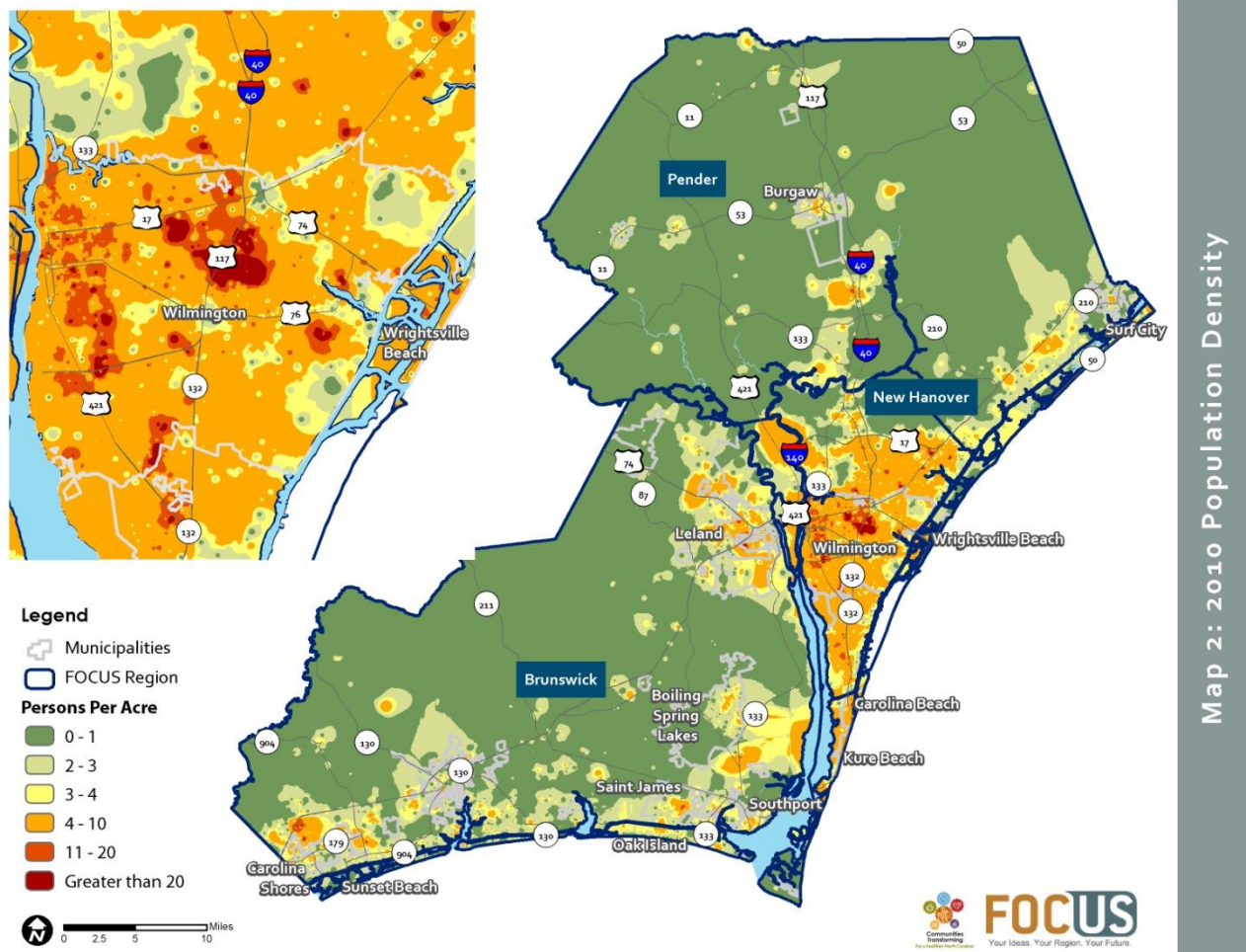
### How to Use this Report

The FOCUS Health and Wellness Gap Analysis is composed of four sections. The introductory section provides purpose, process, and background information on the relationship between planning and public health. Section Two includes a regional profile, demographic information that also has an impact on health outcomes, and statistics such as educational attainment, population density, concentrations of the elderly, median household income, and housing values. Section Three is composed of health and wellness related analyses, including mapped health indicators and barriers to active lifestyles. Section Four provides policies and strategies for public health improvements within the region that may be initiated through local planning departments or through coordination with county health departments. This section also includes a Health and Wellness Priority Areas map which should be used to focus policy change and capital improvements that will have a positive impact on health outcomes.

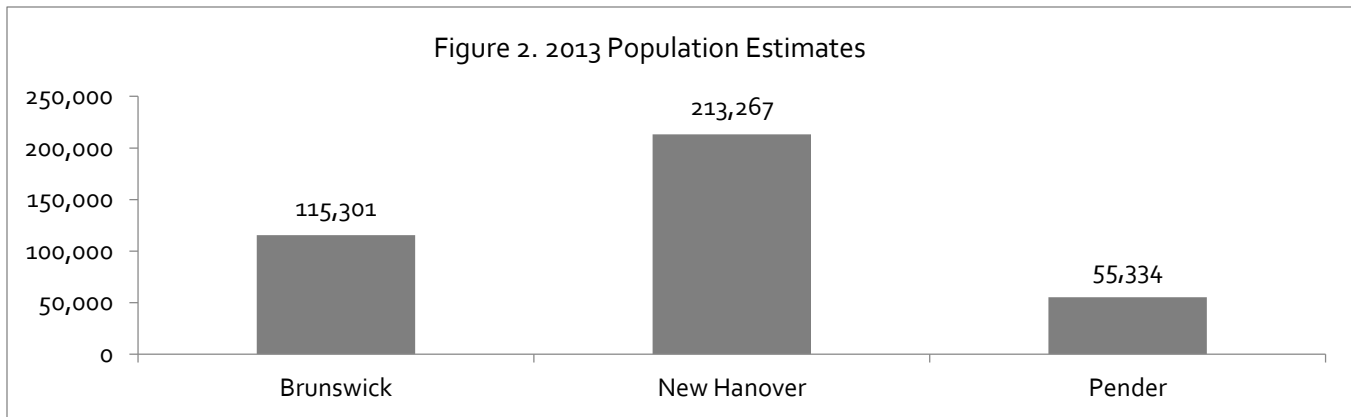
## Section 2: Regional Profile

## Population

The FOCUS region has both urban, rural, and coastal communities within its jurisdiction, contributing to significant differences in population distribution (see Map 2). The more rural areas of the region lack population density, whereas the urban areas in Wilmington, Leland, and several coastal communities account for the most densely populated locations (see Map 2). Within the region, New Hanover County's population is nearly double that of Brunswick County and close to four times higher than the total population of Pender County, despite its much smaller geographic area. Yet, all three counties are composed of wetland and conservation areas that limit population growth and development. These areas pose significant constraints to development and account for the smaller populations that exist in rural Brunswick and Pender Counties. See Appendix 5 for more information.







Source: US Census Bureau

**Table 1. Population 1980-2010 with 2013 Estimates**

Population 1980 - 2010	FOCUS Region		North Carolina	
<b>1980 Population</b>	157,885	% Change	5,795,278	% Change
<b>1990 Population</b>	200,120	27%	6,626,118	14%
<b>2000 Population</b>	274,529	37%	8,049,319	21%
<b>2010 Population</b>	362,315	32%	9,535,483	18%
<b>2013 Population (Estimate)</b>	383,902	6%	9,848,060	3%

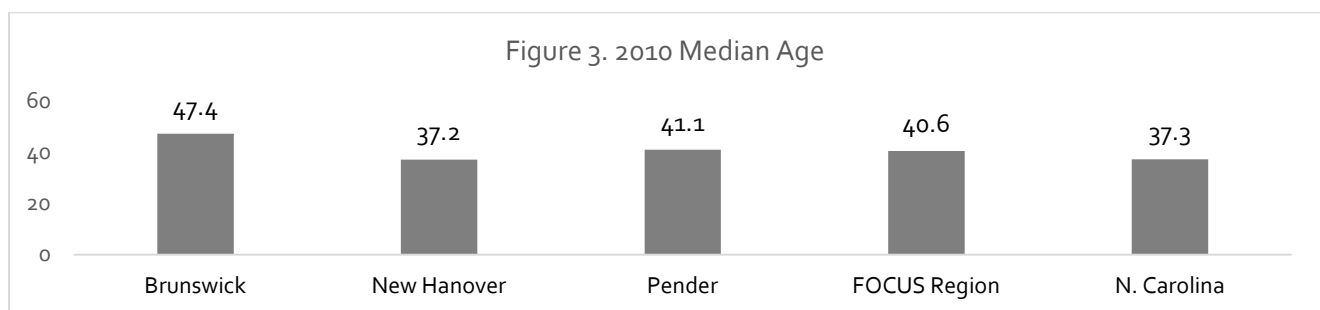
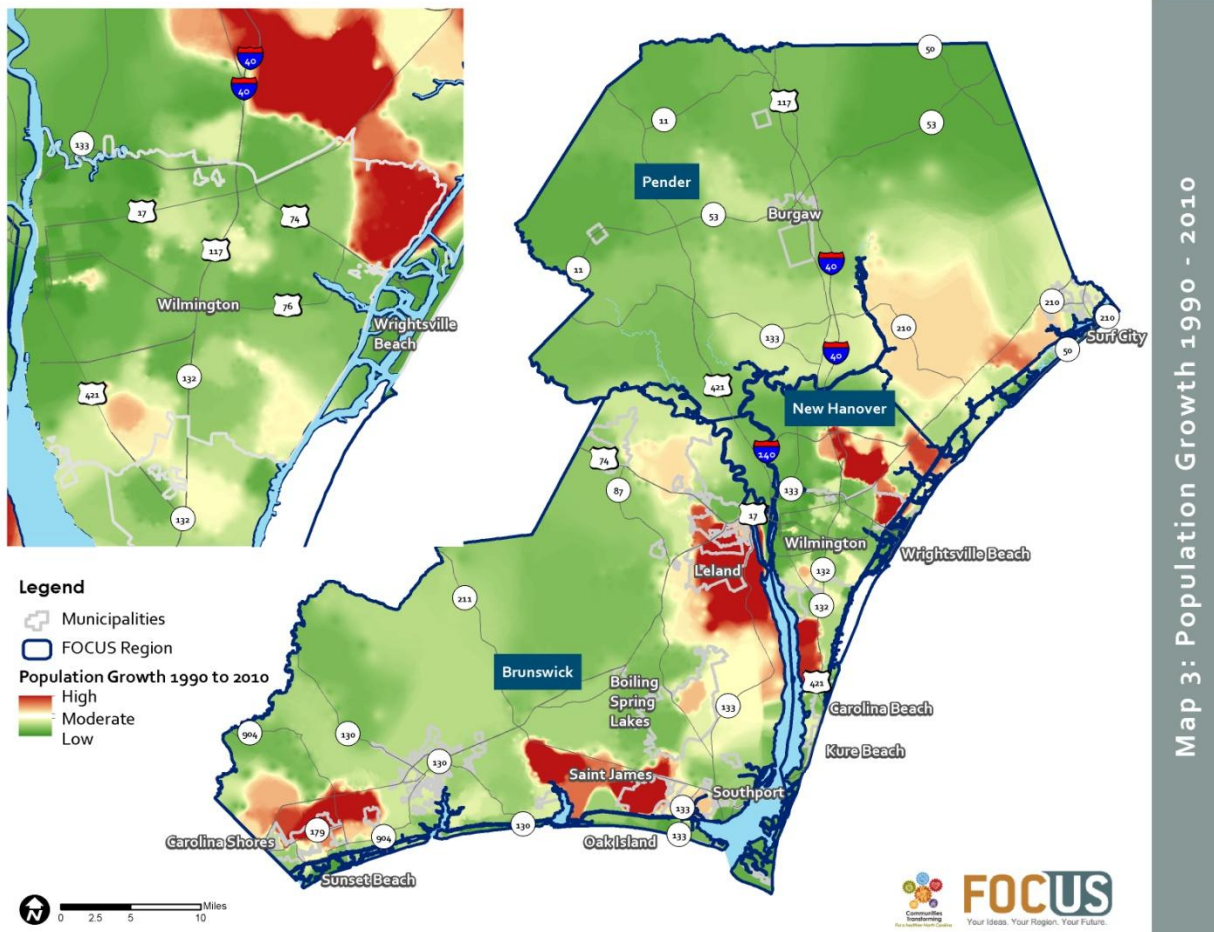
Source: US Census Bureau

Counties from this region have experienced a dramatic increase in population over the last thirty years, significantly outpacing the average population growth across the state of North Carolina (see Table 1). Portions of Brunswick County, such as Leland and communities along the coast, were among the fastest growing locations in the nation at times over the past twenty years. The most dramatic change in population across the region occurred from 1990 to 2000 (see Table 1).



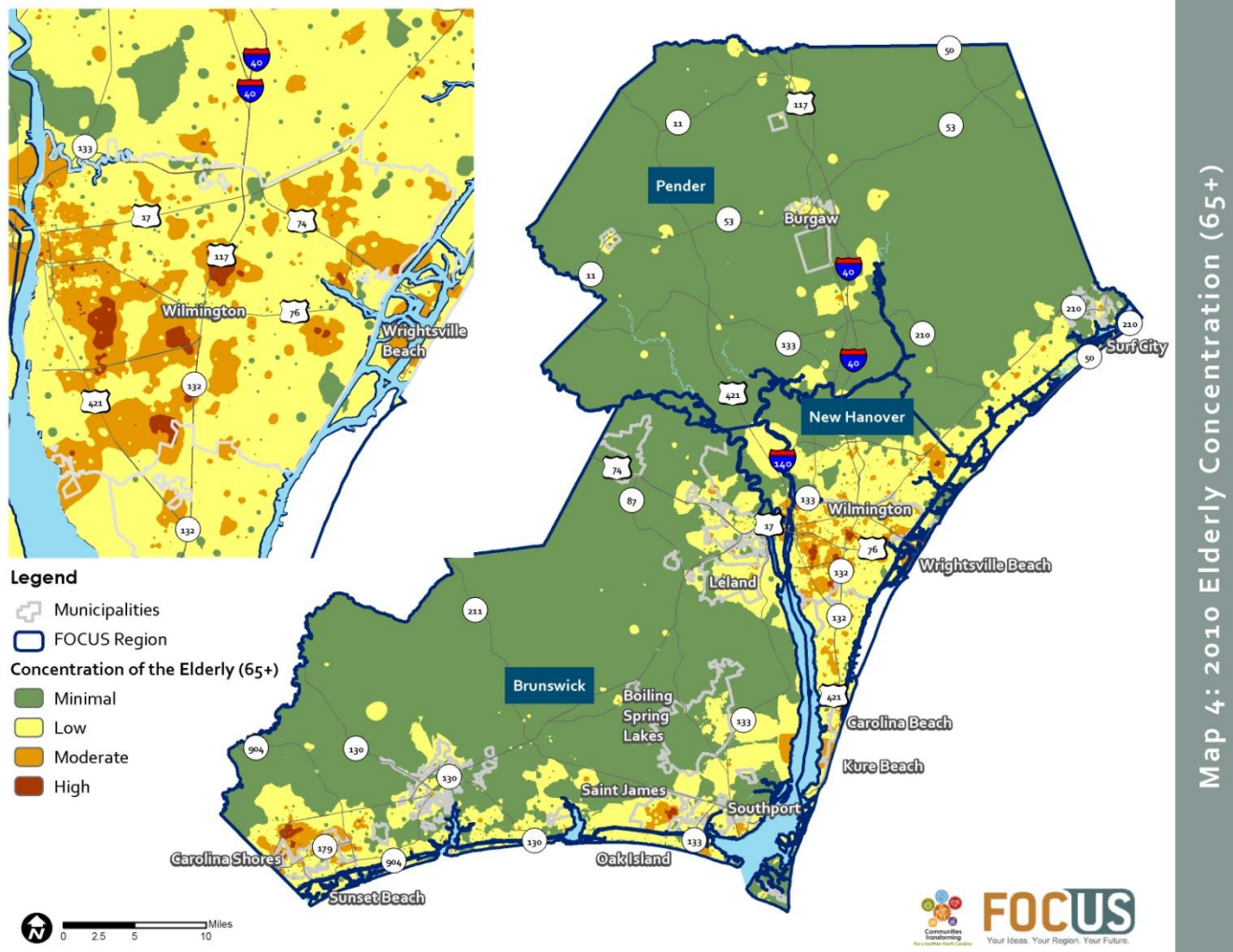
The aerial photo (shown above) depicts the Town of Leland, west of Wilmington, which experienced dramatic growth over the last twenty years. (Image Source: Google Maps)

When looking at growth from a spatial perspective, however, it is clear that growth over the last twenty years has been primarily concentrated in the outlying areas of Wilmington and suburban communities along the Brunswick County coast (see Map 3). Suburban areas west, south, and north of Wilmington experienced greater than 100% growth from 1990 to 2010. Similar growth patterns along the urban fringe of major municipalities have been consistent with that of other North Carolina communities and the nation as a whole during that time.



Source: US Census Bureau

In terms of age, residents of the FOCUS region are older (40.6 years) than the 2010 statewide median age figure of 37.3 years. According to 2010 Census data, Brunswick County's median age is significantly higher than that of New Hanover County or Pender County. This circumstance is likely due to the prevalence of retirement-aged communities within Brunswick County. Elderly concentrations within the region are located within Wilmington and the majority of New Hanover County, along the Pender County coast, and within the retirement-aged communities of St. James and Carolina Shores in Brunswick County.

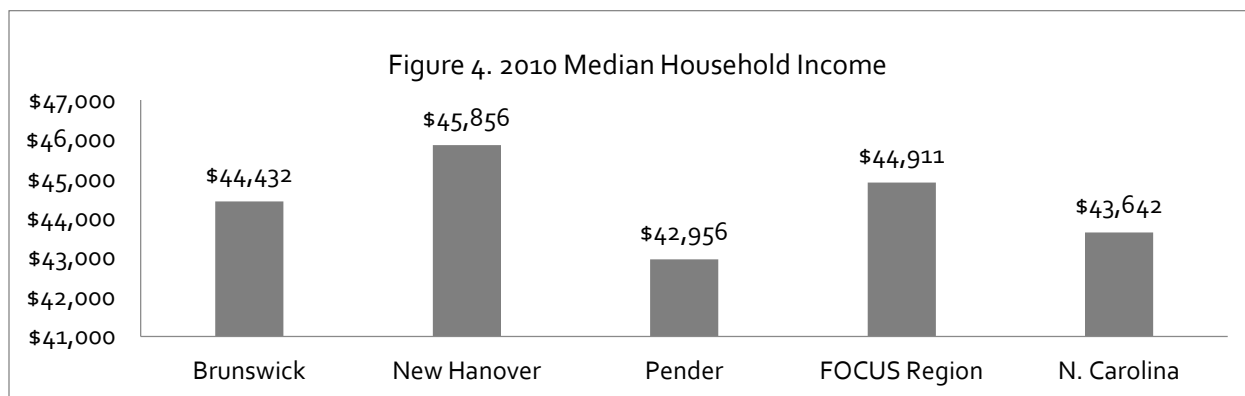




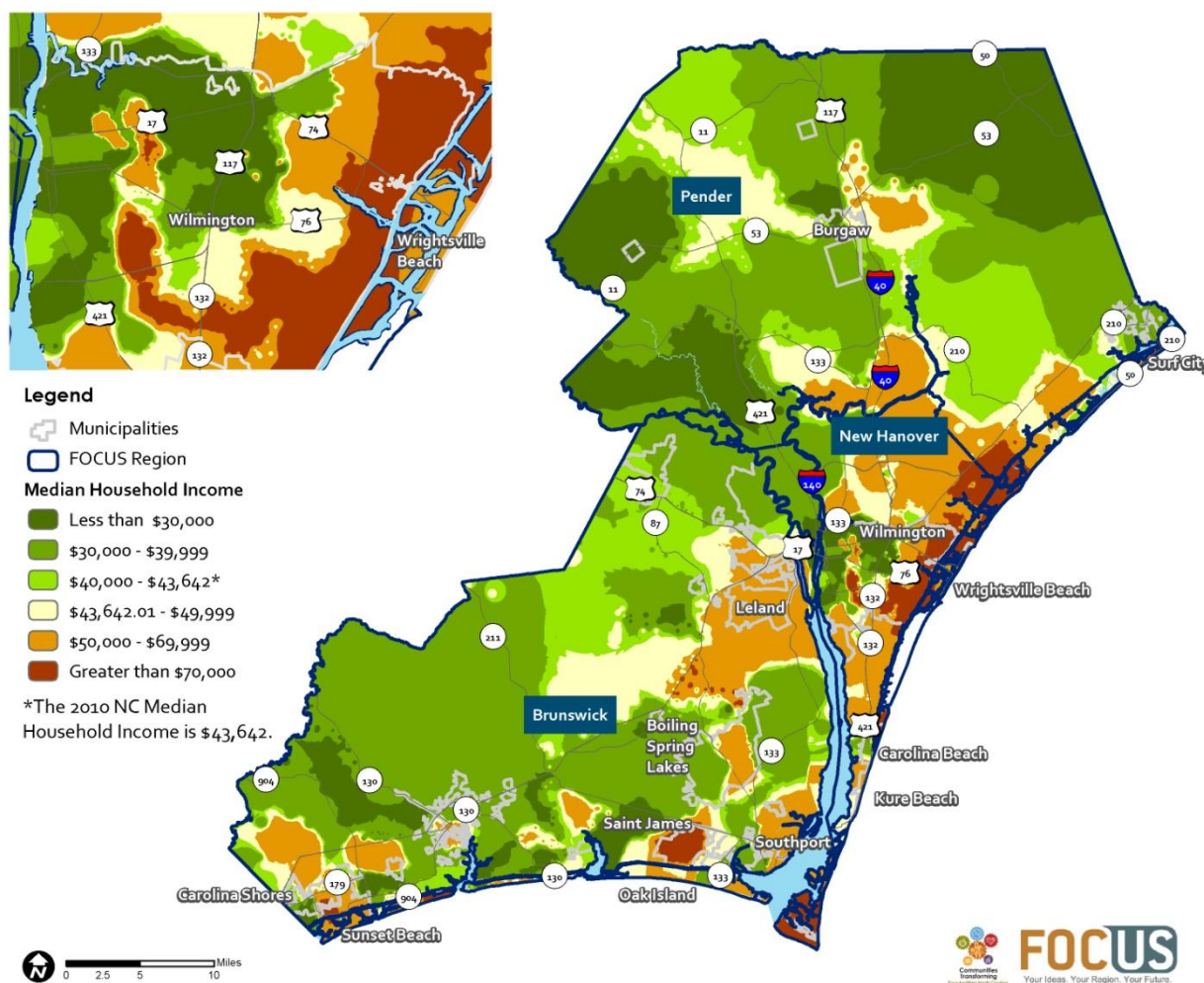
## Income

Income plays a significant role in health outcomes of individuals. Countless studies have noted the correlation between low-income populations and unhealthy lifestyles. Median household income in the FOCUS region is generally consistent with figures for the state. In North Carolina, the 2010 median household income figure was \$43,642 compared to \$44,911 for the region as a whole. Median household income for Brunswick and New Hanover counties is higher than the statewide figure; however, income figures in Pender County are approximately 4.4% less than that of the region. In fact, many residents of the rural areas of Brunswick and Pender counties live below the statewide median household income figure.

The wealthiest portions of the region are located near the coastal communities of Figure Eight Island, Wrightsville Beach, and the Village of Bald Head Island (see Map 5). Unincorporated rural areas in Brunswick and Pender counties, such as Ash and Maple Hill, significantly lag behind the region in terms of income. Within the City of Wilmington, concentrations of low income households are located in the mid-town area and just east of downtown.



Source: US Census Bureau



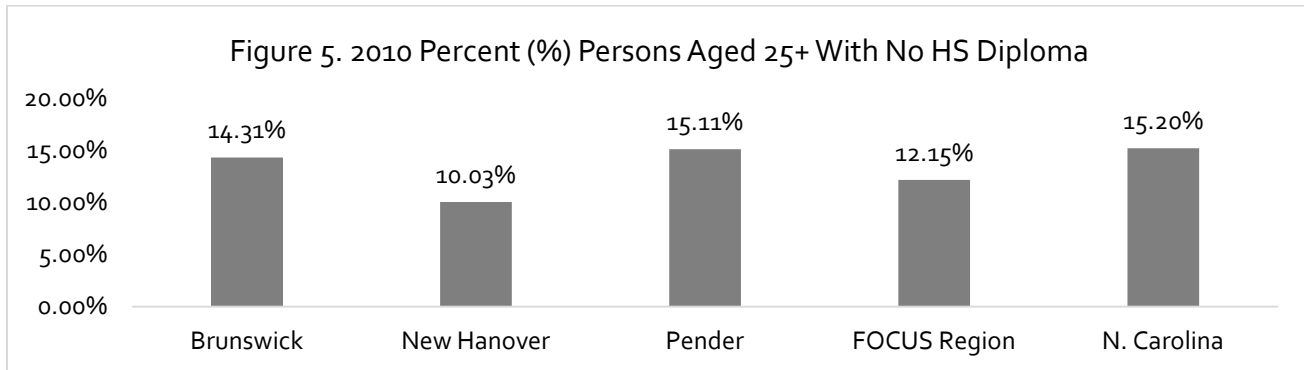
Map 5: 2010 Median Household Income

## Educational Attainment

Educational attainment is a key factor in the overall health of humans across the United States. There is a well-known, large, and recurrent association between education and health. This pattern has been observed in many countries and time periods, and for a wide variety of health measures. The differences between the more and the less educated are significant: in 1999, the age-adjusted mortality rate of high school dropouts ages 25 to 64 was more than twice as large as the mortality rate of those with some college education<sup>1</sup>.

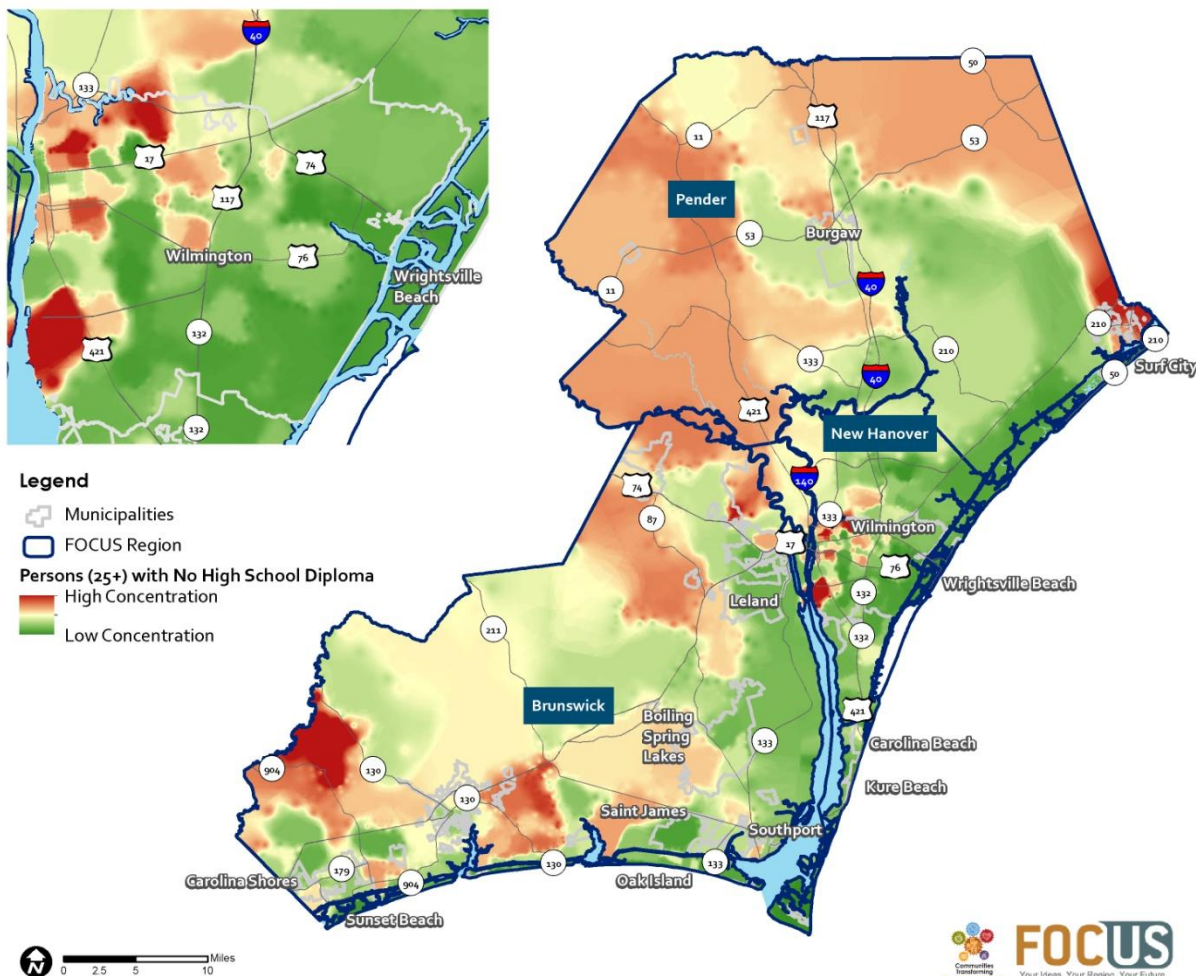
According to 2010 Census data, within the FOCUS region, approximately 15% percent of Pender County residents and approximately 14.5% of Brunswick County residents above the age of 25 did not complete high school. New Hanover County is the most educated of the three counties and has the highest percentage of residents over the age of 25 that have completed high school. Accordingly, 15.5% of North Carolinians over the age of 25 have not completed high school.

<sup>1</sup>Cutler, David M. & Adriana Lleras-Muney, Education and Health: Evaluating Theories and Evidence. National Bureau of Economic Research.



Source: US Census Bureau

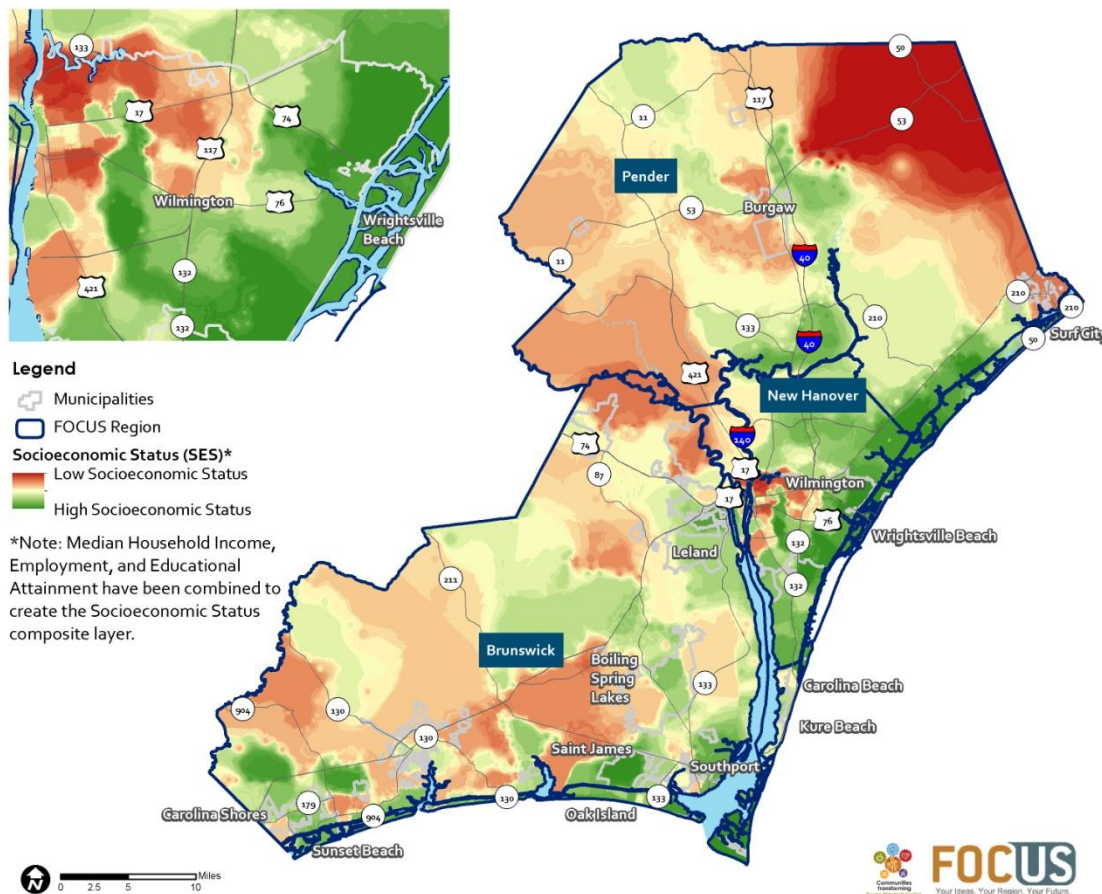
Locations in the FOCUS region with the largest concentrations of individuals with no high school diploma include unincorporated portions of western Brunswick County, northern Wilmington, western Pender County, and areas along the US 17/NC 210 and Onslow County border.



## Socioeconomic Status

Many studies have attempted to provide a correlation between socioeconomic status and chronic disease. Obesity, whose leading contributors are poor nutrition and lack of physical activity is the second leading cause of death in the United States<sup>2</sup> and increases the risk factor for a number of chronic diseases. In general, obesity tends to be a multi-faceted problem with no “one solution” to combating its occurrence. However, there are certain segments of the population that are more likely to be obese, as obesity is more prevalent in the low socioeconomic status (SES) segments of society<sup>3</sup>. Investigations have shown similar results in urban, suburban, and rural communities. In addition, a childhood spent in poor social and economic conditions has been shown to lead to a less healthy adulthood. In both adolescent boys and girls, low SES and parental education levels were related to an unfavorable risk factor profile, indicating a need for early intervention in low SES communities.

To identify areas of the FOCUS region that are considered low in socioeconomic status, GIS analysis was used. Census estimates for educational attainment, employment, and income levels were combined to locate these areas. Concentrations of low SES are mainly found in the Maple Hill area of northeastern Pender County, unincorporated areas of Brunswick County, and Wilmington neighborhoods just east of downtown.



<sup>2</sup> Actual Causes of Death in the United States, 2000. Mokdad AH, Marks JS, Stroup DF, Gerberding JL, 2004, Journal of the American Medical Association, pp. 1238 - 1245.

<sup>3</sup> F as in Fat: How Obesity Threatens America's Future. Trust for America's Health, Robert Wood Johnson Foundation, 2012, pp. 18.



## Mobility

Mobility is generally defined as the movement of people from place to place. In the last hundred years, travel modes have shifted dramatically. Unfortunately, over the last forty years less emphasis has been placed on non-motorized forms of movement, often to the detriment of cyclists and pedestrians. Walking trips have experienced a dramatic decline in recent decades. From 1980 to 2010, the U.S. experienced nearly a 50% decrease in the number of individuals walking to work. During that same time, obesity rates for children and adolescents has more than tripled<sup>4</sup>.

In fact, it was not until 1998 that the Federal Highway Administration authored a guidance manual addressing the design of bicycle and pedestrian facilities<sup>5</sup>. More recently, walking and cycling have begun to emerge again as more popular options for both travel and health. Meeting the recommended daily exercise guidelines can be easily accomplished by such trips.



Non-motorized travelers face both real and perceived dangers when navigating major arterial roads within the FOCUS Region, such as the intersection of College Road and Oleander Drive in Wilmington, NC, shown above (Image Source: HCP).

**Table 1. 2010 Means of Transportation to Work**

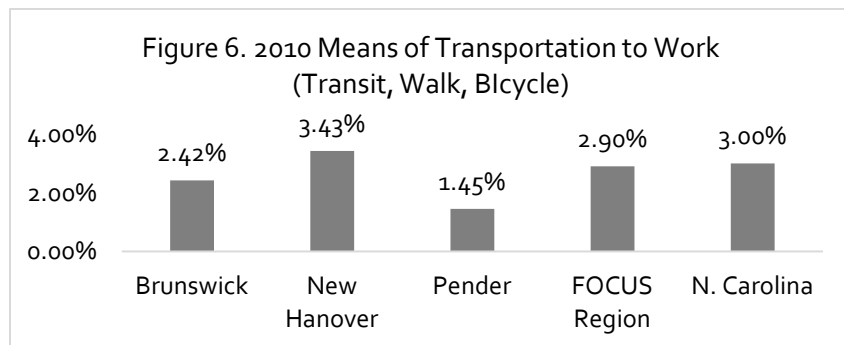
Means of Transportation to Work	FOCUS Region		North Carolina	
Drove alone	129,857	82.26%	3,365,544	81.87%
Carpooled	15,423	9.78%	413,599	10.06%
Public Transportation (excluding taxicab)	950	0.60%	42,911	1.04%
Taxicab	134	0.08%	4,021	0.10%
Motorcycle	259	0.16%	5,306	0.13%
Bicycle	780	0.49%	9,939	0.24%
Walked	2,646	1.68%	74,381	1.81%
Other means	947	0.61%	28,818	0.71%
Worked at home	6,855	4.34%	166,151	4.04%
Total Workers	157,851	100%	4,110,670	100%

Source: US Census Bureau

<sup>4</sup>High Body Mass Index for Age among US Children and Adolescents, 2003 - 2006. Ogden, C, Carroll, M and Flegal, K. 2008, Journal of the American Medical Association, pp. 2401 - 2405.

<sup>5</sup>FHWA. Improving Conditions for Bicyclists and Pedestrians. Washington, D.C.:s.n., 1998.

According to the 2010 Census, approximately 2% of workers in the FOCUS region walked to work while less than 1% (780) traveled by bicycle (see Table 2). Approximately 2.9% (4,376) of workers in the FOCUS region traveled to work by an active transportation mode (walking, cycling, or transit). Statewide, only 3% of workers reported one of these active transport modes as their means of travel to work.

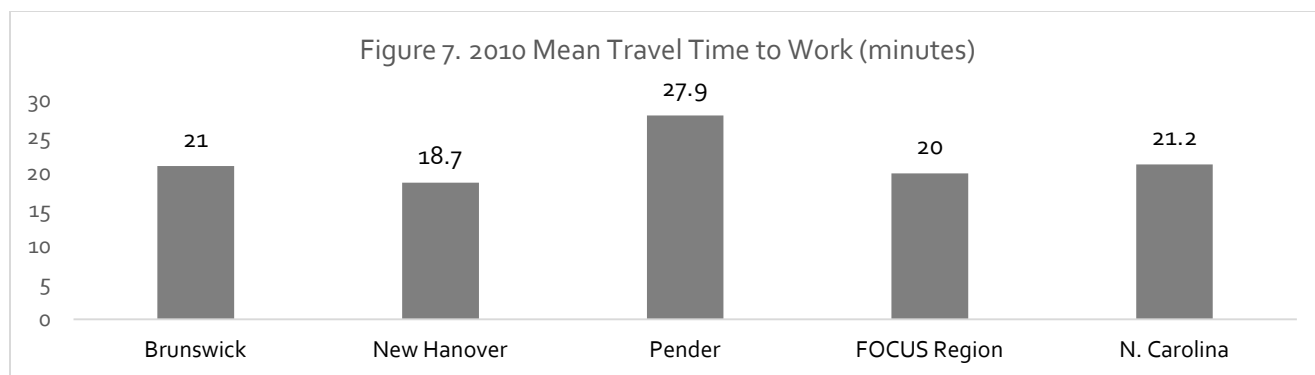


Source: US Census Bureau

Within the FOCUS region, the percentage of workers in New Hanover County who report using an active transportation mode as their means of travel to work is higher than Pender County or Brunswick County. This statistic is likely higher in New Hanover County due to the availability of fixed-route transit and more prevalent non-motorized transportation infrastructure or commute distances.



WAVE Transit fixed-route service is available to the majority of New Hanover County residents and some residents of Leland and Belville in Brunswick County (Image Source: HCP).

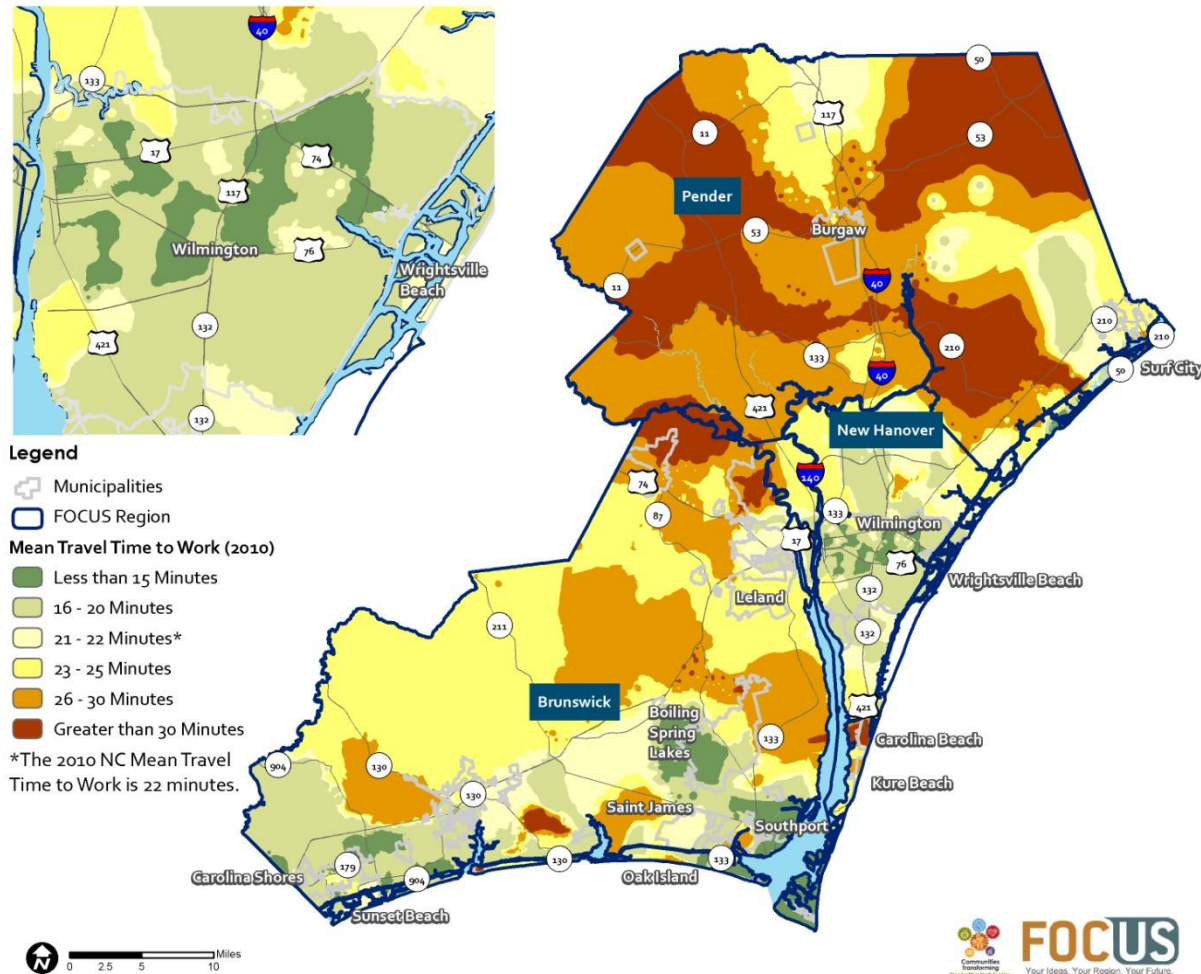


Source: US Census Bureau

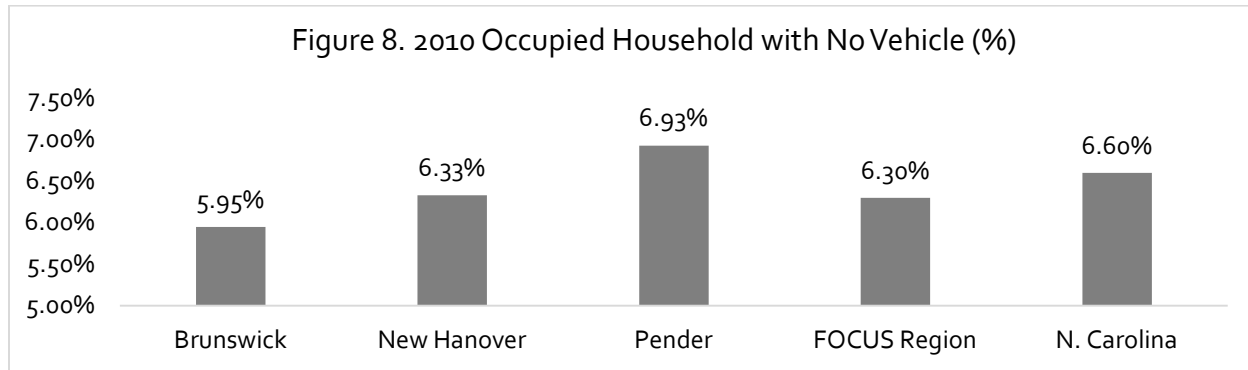
According to the 2010 Census, Pender County workers face the longest commute times within the FOCUS region (see Map 8). Overall the 2010 mean travel time to work for the region (20 minutes) is less than the statewide average of 22 minutes. New Hanover County residents commuting to work have shorter distances due to the availability of employment centers in and around Wilmington, and the small geographic area that makes up the county boundary. As such, New Hanover County has the largest number of incommuters (workers commuting to said county from another county) in the region with approximately 26,563 incommuters and the fewest number of outcommuters (workers leaving their county of residence for employment). The number of outcommuters in Brunswick County and Pender County is 15,441 and 12,411, respectively.



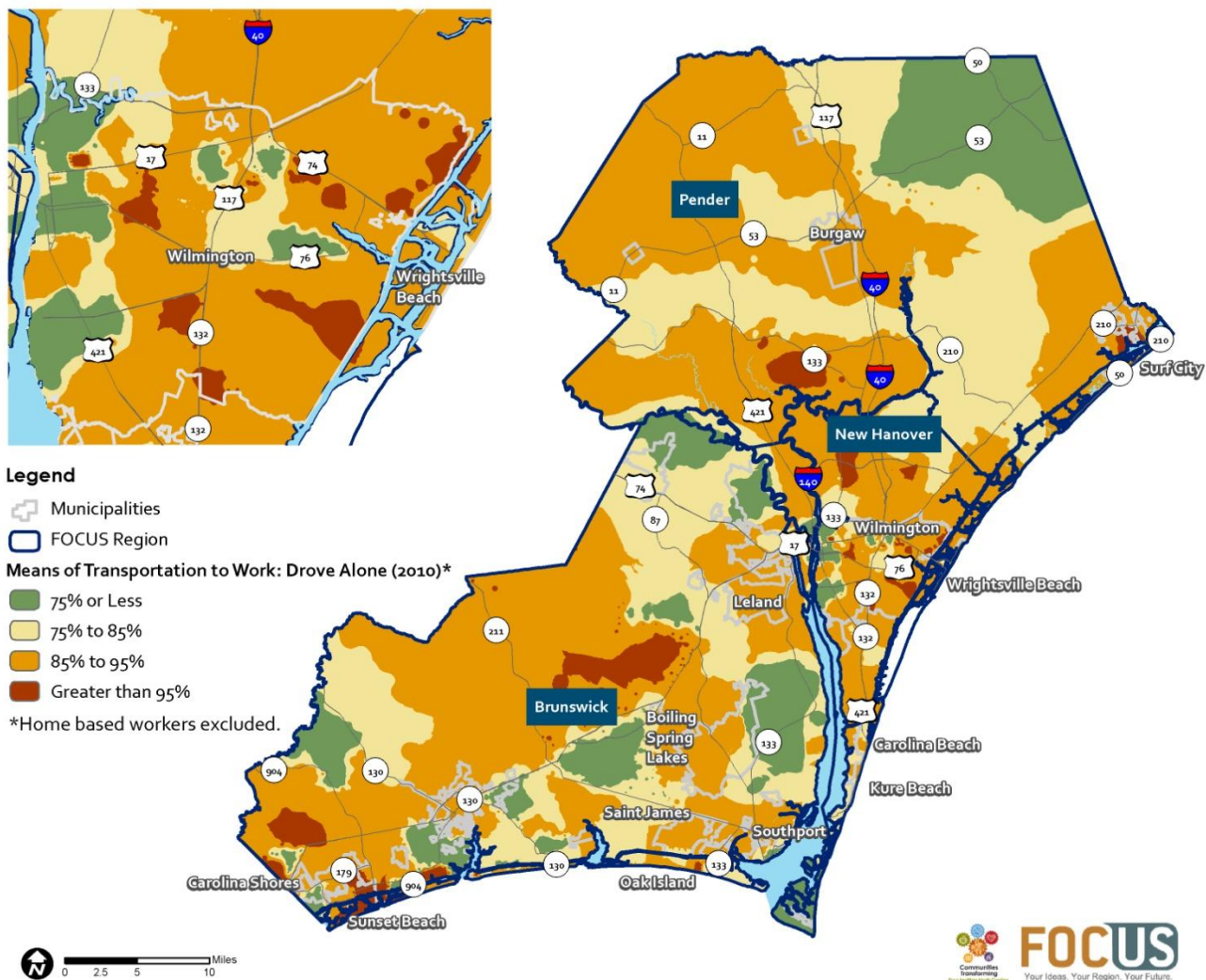
The vast majority of commuters in the region drive alone to work (see Map 9). Exclusive of those who work at home, approximately 86% of workers in the FOCUS region drive alone to their places of employment. This statistic is similar to the statewide average of 85.3% of workers that drive alone to employment.



Another statistic used to measure mobility is the availability of private vehicles by occupied households. In the FOCUS region, approximately 6.3% of households do not have access to a private vehicle. Thus, these households must rely on transit or a non-motorized means to get from place to place. The 6.3% figure is slightly lower than the statewide average of 6.6% of households without access to a private vehicle.



Source: US Census Bureau



## Housing

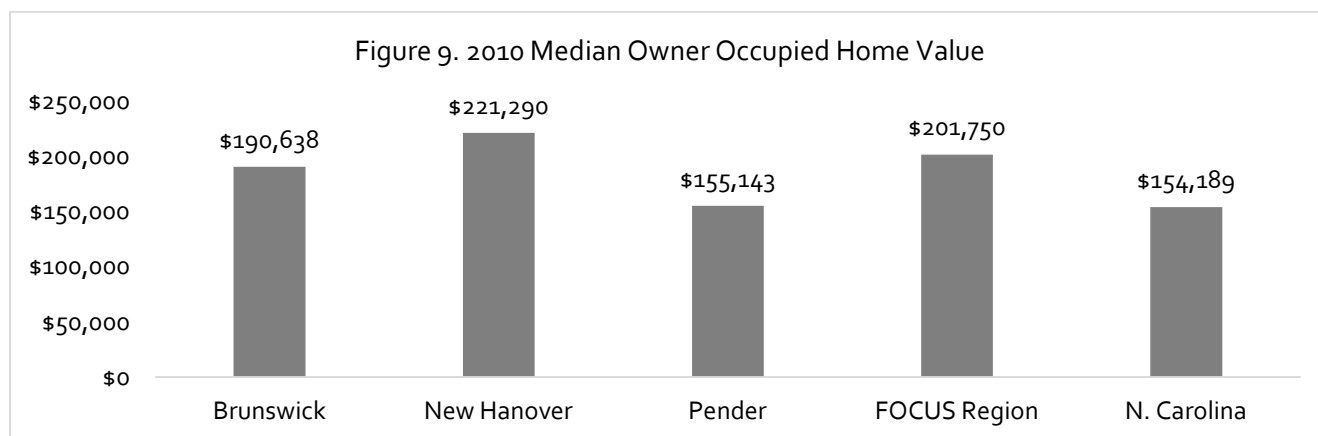
Affordable housing is an increasing public health concern. Recent studies show that families contributing a large percentage of their income to housing are less likely to provide sufficient funds for essential items like food, health care, and medical insurance<sup>6</sup>. In the FOCUS region, median home values are much higher than the statewide figure (see Table 3). This situation creates difficulties in locating reliable affordable housing, particularly within New Hanover County.

**Table 2. Owner Occupied Housing Units by Value**

	FOCUS Region	North Carolina
Median Value of Owner Occupied Housing Units	\$201,750	\$154,189

Source: US Census Bureau

Across the FOCUS region, the 2010 median housing value is approximately 30% higher than the statewide figure of \$154,189. According to the 2010 census, New Hanover County has the highest median home value at \$221,290. Housing values are significantly less in Pender County, where values are comparable to the statewide figure. It is important to note, however, that in all three counties, housing values are buoyed by the presence of coastal vacation homes. For example, within New Hanover County, the 2010 median home value in the City of Wilmington is \$235,700; whereas median home values for the coastal towns of Wrightsville Beach and Carolina Beach are \$989,000 and \$317,500, respectively.

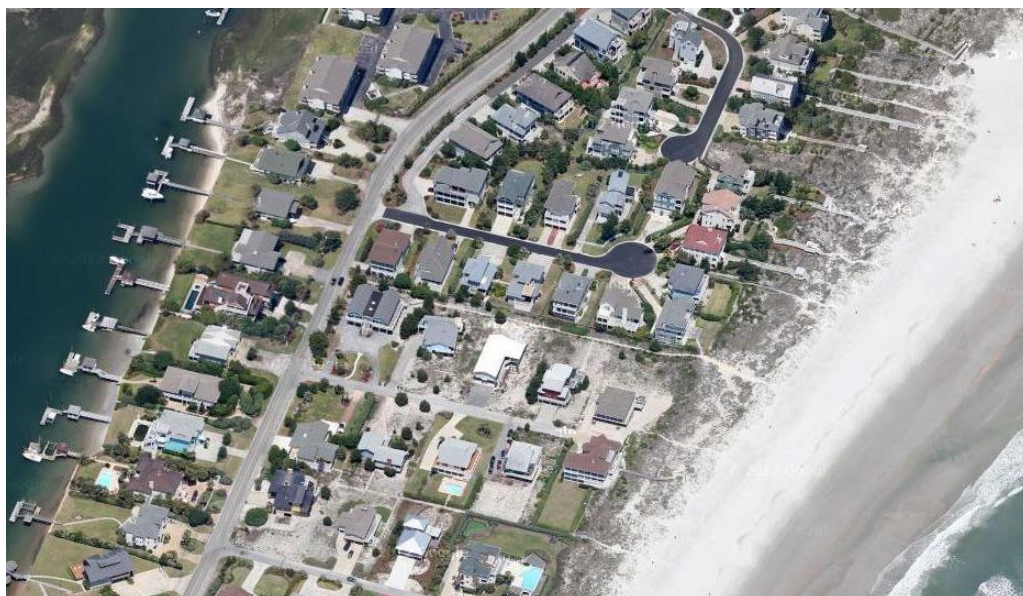


Source: US Census Bureau

<sup>6</sup>Lipman, Barbara J. 2005. Something's Gotta Give: Working Families and the Cost of Housing. Washington, D.C.: Center for Housing Policy; Lee, Wang, Eric Beecroft, Jill Khadduri, and Rhiannon Patterson. 2003.

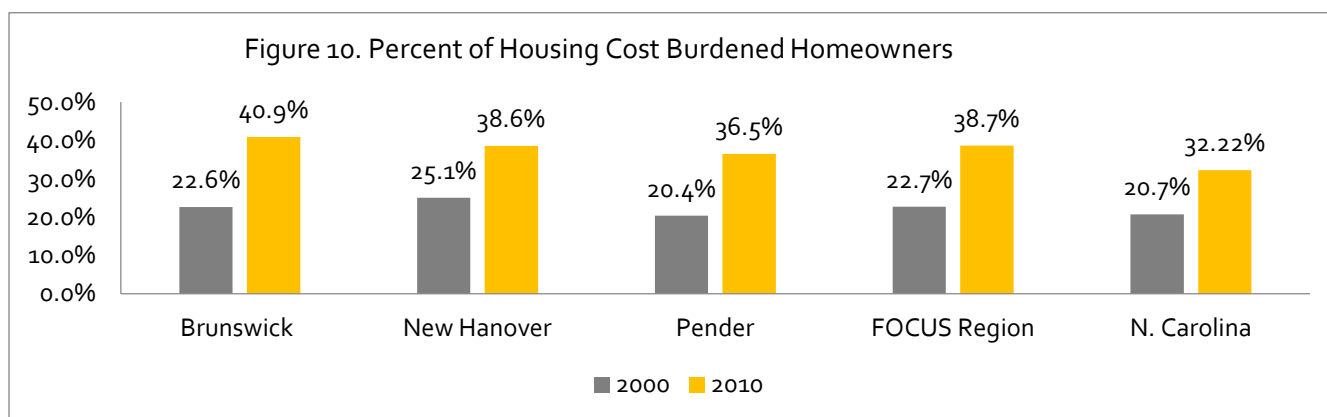


It is difficult to obtain a precise picture of housing affordability in any jurisdiction. However, most measures of housing affordability consider 30% of gross income an allowable/affordable expenditure for housing. For homeowners, the cost includes mortgage payments, taxes, insurance, and utilities. Approximately 39% of homeowners in the FOCUS region are burdened by housing costs in excess of 30% or more of their income.



Secondary coastal homes have an impact on median home values in the three-county FOCUS Region (Image Source: Google Maps).

According to the 2000 Census, less than a quarter of homeowners in the FOCUS region allocated that level of income to their home – representing a 70% increase in homeowners burdened by housing costs over the last decade (see Figure 10). Across the state, this trend held true as burdened homeowners increased from 20.7% to over 32%. Brunswick County homeowners burdened by significant housing costs experienced the most dramatic increase from 2000 to 2010, increasing by over 80%. This measure of housing affordability is striking, as many homeowners now contribute a large portion of their income to housing costs, while at the same time lessening their purchasing power for medical care and food items.



Source: US Census Bureau

## Section 3: FOCUS on Health and Wellness

### Introduction

A century ago in the United States, infectious diseases were the primary cause of death, but proper hygiene, environmental design, and immunization have led to the downfall of such cases. In current years, chronic disease, such as diabetes or heart disease, has become the most common disease in the US. Chronic diseases differ from infectious, or communicable diseases, in the way that the illness occurs in individuals. Infectious diseases occur because of contact with an affected host, while chronic diseases may occur solely because of lifestyle choices. Chronic diseases are also the most preventable disease, with obesity as one of the leading causes.

Obesity increases the risk for a variety of chronic diseases including heart disease, stroke, glucose intolerance, and some forms of cancer. It is not a direct cause of most diseases, but unfavorably alters the risk factor profile. For example, obesity may lead to increases in blood pressure and blood cholesterol, which in turn, can lead to cardiovascular disease and strokes. The design of the built environment plays a role in both chronic disease and obesity.

According to a study funded by the CDC and commenced from 2008-2009, adults who moved into denser, mixed use neighborhoods increased their levels of walking for both recreation and transportation<sup>1</sup>. For the study, the mixed use neighborhood included residential units, two small parks with office and retail space that included medical, dental, and financial offices, shops, restaurants, a grocery store, and large retail stores.

Public officials are beginning to recognize that the design of their communities—residential developments, streets and sidewalks, shops, businesses, and industry—all affect the health and wellness of the population. The choices we make for our settlement patterns can help improve the health and wellness of the population by providing improved access to care and opportunities for individuals to make choices to enhance their own health.



This mixed use community conceptual drawing provides residential areas, grocery stores, restaurants, and entertainment venues—all within walking distance.  
(Image Source: FOCUS)

<sup>1</sup> Mumford KG, Contant CK, Weissman J, Wolf J, Glanz K, *Changes in Physical Activity and Travel Behaviors in Residents of a Mixed-Use Development*. Am J Prev Med 2011; 4(5):504-507.

## Health & Wellness Issues

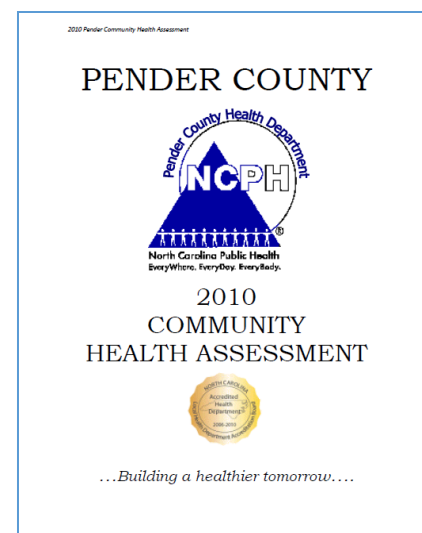
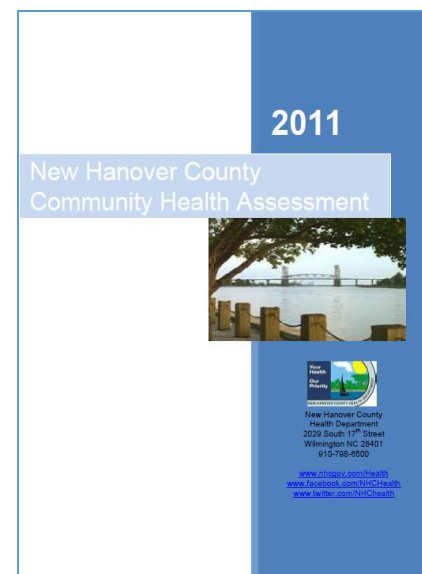
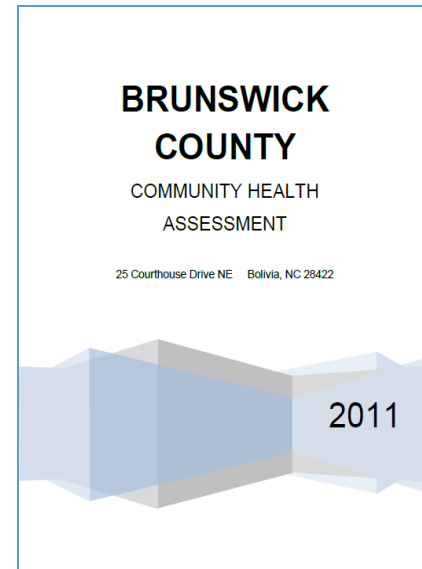
In an effort to improve the health and wellbeing of its citizens, North Carolina general statutes require each county to complete a Community Health Assessment every four years; although many county health departments complete the assessment every two years. According to the North Carolina Division of Public Health, a Community Health Assessment is the foundation for improving and promoting the health of community members. The role of the community assessment is to determine the general health of the local population, help identify the factors that affect the health of the community, and determine what resources are available within the community to adequately address these factors. It is a "systematic collection, assembly, analysis, and dissemination of information about the health of the community." Intermittently, each county must also complete a State of the County Health (SOTCH) Report. This report contains secondary data related to disease incidence, morbidity, and death rates.

The community health assessments provide valuable information for planning purposes as data related to primary causes of death, top health concerns and priorities, and a community-wide survey are all included. Information contained within each county's health assessment differs, but certain elements are included in each report. For the purposes of the FOCUS Gap Analysis, the following information from these key elements has been summarized:

- Top Three Health Concerns based on Community Surveys
- Top Three Leading Causes of Death
- Top Three Health Priorities for the applicable county health department.

Information pertaining to each element has been collected from the FOCUS region's health assessments, all of which are available online through each respective health department:

- 2011 Brunswick County Community Health Assessment
- 2011 New Hanover County Community Health Assessment
- 2010 Pender County Community Health Assessment





### Top Three Health Concerns

A total of 2,088 surveys were collected from Brunswick County residents after being distributed online via the internet and in paper at community focus groups, senior centers, Laundromats, and door-to-door. In New Hanover County, 2,250 surveys were collected from citizens of community organizations, service industries, faith groups, and healthcare professions and seven focus group meetings were held—each consisting of individuals from different populations to ensure comprehensive results. Pender County notified citizens of the community survey via the local newspaper, radio stations, and the health department website – over 500 surveys were collected. (Please note that Pender County is more rural and less densely populated than New Hanover or Brunswick County, leading to fewer completed surveys.)

The Top Three Health Concerns for each county are based on community input. The following table depicts the top three health concerns for each county.

**Table 4. Top Three Health Concerns**

<b>Brunswick County</b>	<b>New Hanover County</b>	<b>Pender County</b>
1. Chronic Disease	1. Chronic Disease	1. Obesity
2. Drug and Alcohol Abuse	2. Obesity	2. Aging
3. Obesity	3. Drug and Alcohol Abuse	3. Diabetes

*Source: 2011 Brunswick County Community Health Assessment, 2011 New Hanover County Community Health Assessment, & the 2010 Pender County Community Health Assessment*

### Leading Causes of Death

According to the Centers for Disease Control (CDC), chronic diseases are among the most costly of all health problems in the United States. The leading causes of death across the FOCUS Region are all considered chronic diseases. The primary cause of death for North Carolinians state-wide is cancer (22.8%) followed closely by heart disease (21.3%). These statistics are consistent with the leading causes of death within the FOCUS Region (see Table 5, below).

**Table 5. 2011 Leading Causes of Death**

<b>Brunswick County</b>	<b>New Hanover County</b>	<b>Pender County</b>
1. Cancer	1. Heart Disease	1. Cancer
2. Heart Disease	2. Cancer	2. Heart Disease
3. Chronic Lower Respiratory Disease	3. Cerebrovascular Disease	3. Cerebrovascular Disease

*Source: 2011 Brunswick County Community Health Assessment, 2011 New Hanover County Community Health Assessment, & the 2010 Pender County Community Health Assessment*

### Top Three Health Priorities

Each county's health department establishes the top priorities on which to focus their efforts for the upcoming years. County health department staff collaborates with local community partners to identify evidence-based interventions and potential resources to help address these priorities. These priorities require attention from other agencies as well as the citizenry within each county. Table 6, on page 3-4, contains the top three health priorities for each county in the FOCUS Region.

Table 6. Top Three Health Priorities

Top Three Health Priorities		
Brunswick County	New Hanover County	Pender County
1. Obesity Reduction Efforts—Especially in Schools	1. Obesity	1. Access to care
2. Diabetes Education and Support	2. Violence	2. Chronic Disease
3. Provide Health Screening Efforts in the Community Especially Schools.	3. Access to care	3. Obesity

Source: 2011 Brunswick County Community Health Assessment, 2011 New Hanover County Community Health Assessment, & the 2010 Pender County Community Health Assessment

All three counties note obesity prevention as one of their top health priorities. As such, collaborative efforts between municipal and county planning departments and health departments may reinforce prevention strategies.

### Community Health Assessment Key Findings

Among the data identified in the community assessment, several key findings, both good and bad, emerge for each county:

#### In Brunswick County

- The number of women who smoke while pregnant decreased from 28% in 2003 to 15.9% in 2011.
- Two thirds of adults are overweight or obese and childhood obesity has tripled since 2007.
- The need to work on childhood obesity has risen because of the adverse impact it has on the children as they grow older. This effort will involve multiple community groups who focus on children.

#### In New Hanover County

- Residents expressed the desire for continued community collaboration efforts, attention to youth violence and crime prevention initiatives, pedestrian safety improvements and community well-being.
- As of 2009, New Hanover County has a higher age-adjusted death rate for heart disease compared to North Carolina's rate (200.5 per 100,000 persons compared to 191.7 per 100,000 persons)
- Since 2007, New Hanover County continues to have higher percentages of heavy and binge drinkers than North Carolina according to the Behavioral Risk Factor Surveillance System.

#### In Pender County

- Diabetes is the fifth leading cause of death in the county. The death rate for African Americans from diabetes is over three times the death rate for whites.
- Access to care remains a problem in Pender County. The number of physicians available to Pender County residents is significantly lower than the statewide average.
- Since 1994, youth death rates (ages 0-17 years) have steadily increased and are higher than state rates. Thirty-three percent (33%) of all child deaths were related to motor vehicle accidents from 2004-2008.

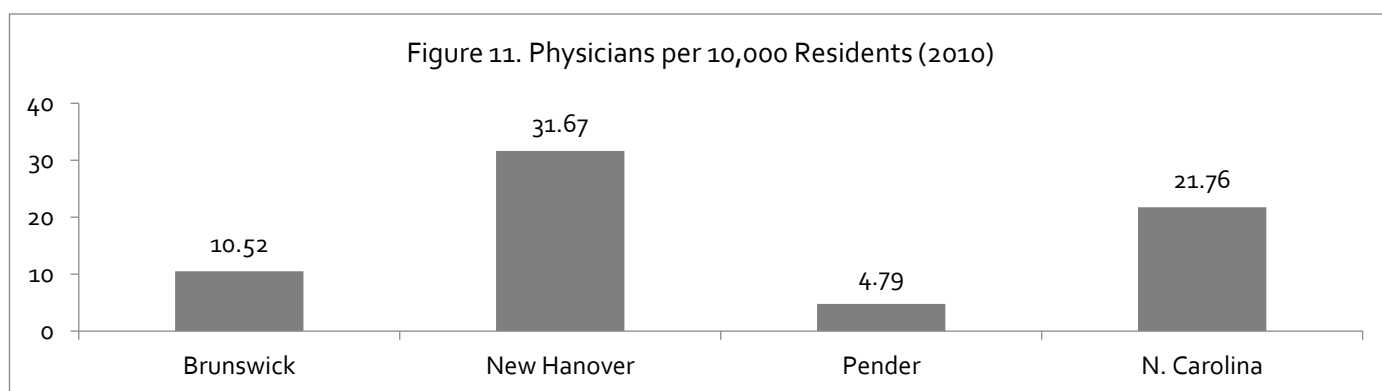


Obesity prevention is a top priority in the FOCUS region. (Image Source: [www.livestrongfitness.com](http://www.livestrongfitness.com))

## Access to Care

### Medical Care

Access to care was voiced as a concern by residents of each county. Proximity to healthcare providers and healthcare costs are often noted as barriers to preventive medical care. Within the FOCUS Region, Pender County residents have the fewest physicians available to provide care. Both Pender and Brunswick Counties lag significantly behind the statewide average—with physician availability six times lower than the statewide average in Pender County. According to the NC Department of Commerce, in 2010 the statewide average of physicians per 10,000 residents was 21.76. New Hanover county residents have over a thirty percent higher rate of physicians per 10,000 residents than the statewide average.



Source: NC Department of Commerce

Residents of Brunswick County and Pender County are also faced with long travel distances to receive medical care. Map 10 shows areas which are greater than five miles from a healthcare provider. Comparatively, a large percentage of New Hanover County residents are located within two miles of a healthcare provider. Similarly, the availability of registered nurses, pharmacists, and dentists is significantly less for Brunswick and Pender County residents than those of New Hanover County (see Table 7, on page 3-6).



New Hanover Regional Medical Center, located in Wilmington, NC, provides trauma support for Pender & Brunswick County Hospitals. (Image Source: New Hanover Regional Medical Center)

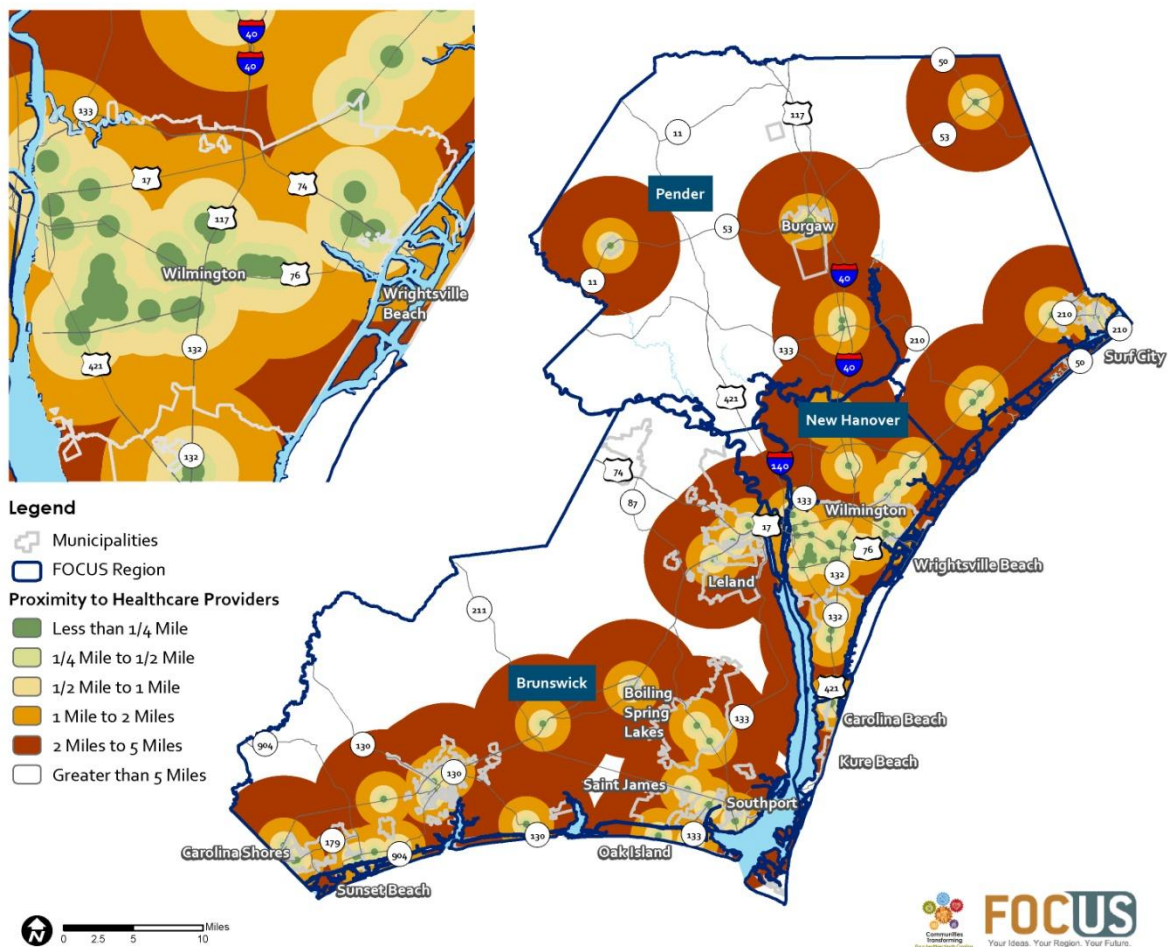
Many Brunswick and Pender County residents, however, are likely travel to New Hanover County to receive medical and dental care. New Hanover Regional Medical Center, considered a major hospital, is located within Wilmington and is one of only ten trauma centers operating at level two—with trauma surgeons available, including specialists such as neurosurgeons or orthopedic surgeons, a nurse specializing in trauma care, as well as highly sophisticated medical diagnostic equipment. Lower levels of trauma centers, usually found in rural areas, may only be able to provide initial care and stabilization of a traumatic injury and arrange for transfer of the victim to a higher level center for trauma care. New Hanover Regional Medical Center provides trauma

support and tertiary care to seven counties in southeastern NC, including Brunswick and Pender County.

Table 7. 2011 Health Professionals per 10,000 Residents

Location	Registered Nurses	Pharmacists	Dentists
Brunswick County	48.5	7.4	3.3
New Hanover County	138.5	11.6	7.1
Pender County	35.7	4.3	3.4
North Carolina	98.6	9.5	4.3

Source: NC Department of Commerce



Map 10: Proximity to Healthcare Providers

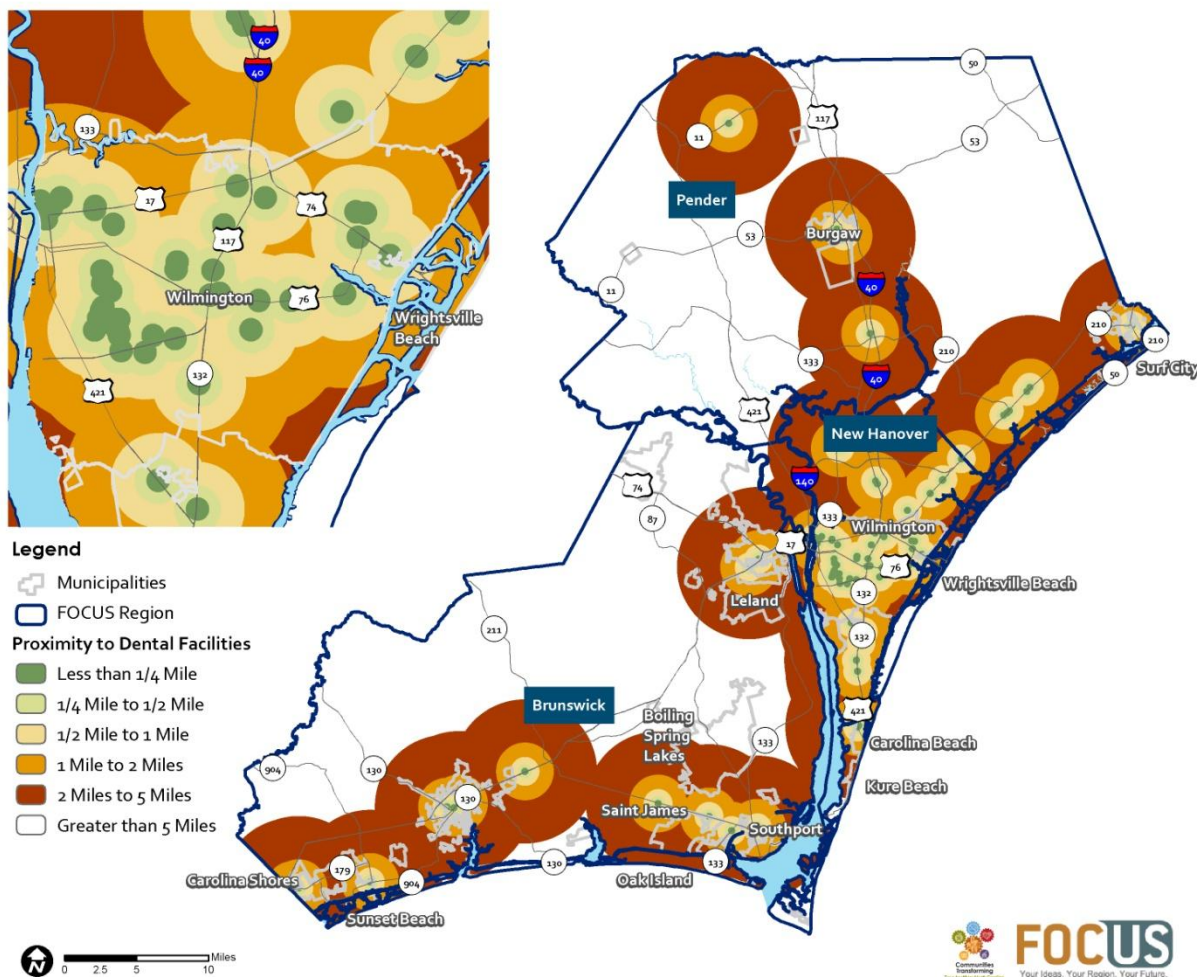


### Dental Care

North Carolina is ranked 47th in the nation for dentists per capita, having 4.3 dentists per 10,000 people. In fact, only eight North Carolina counties have dentist-to-patient ratios which exceed the national average of 6.0 dentists per 10,000 people (Wake, Durham, Orange, Alamance, Guilford, Forsyth, Mecklenburg, and New Hanover Counties). Seventy-nine North Carolina counties are recognized as federally designated dental shortage areas (areas in which residents have a shortage of access to health services), including both Brunswick and Pender Counties, which fall below the statewide average of dentists per capita. Similar to healthcare provider access, many residents of Brunswick and Pender County are located greater than five miles from the nearest dental facility (see Map 11).



Dental office located in Wilmington, NC.  
(Image Source: HCP, Inc.)



## Food & Nutrition

Encouraging consumption of fresh, healthy food and increasing access to the sources for healthy food are important ways to address chronic disease incidence and health care expenditures, particularly in underserved communities throughout the FOCUS Region. Food insecurity is present across the state, meaning that many individuals or families lack adequate and consistent access to the wholesome foods necessary to lead an active, healthy lifestyle. North Carolinians face a number of health challenges related to their food system, including the incidence of diet-related chronic diseases, such as obesity and diabetes, both of which are associated with the consumption of high-calorie, nutrient poor foods.



Lewis Farms' strawberry—freshly picked.  
(Image Source: HCP, Inc.)

Children's development, health, and wellbeing are also connected to nutrition, food security, and active living. Providing access to an ample quantity and variety of fruits and vegetables at home, at school, and in the community is critical. Access is especially important for school-age children, given that poor lifestyle and dietary habits in childhood can linger or worsen into the high school years and even further into adulthood.



Access to fresh fruits and vegetables is critical to healthy development for children. (Image Source: FOCUS)

### Fresh Food Access

Local or regional initiatives and programs, such as Feast Down East, are actively trying to enhance citizens' awareness of the availability of local food sources while striving to increase access to locally produced fresh fruits and vegetables. Feast Down East is part of the Southeastern North Carolina Food Systems Program, led by the University of North Carolina—Wilmington (UNCW). Its distribution center is located in Burgaw, NC, in Pender County. This initiative was established to create a fully integrated local, sustainable, food system—supporting local farmers and connecting them with consumers including individuals, restaurants, grocers, schools, and hospitals across the FOCUS Region.

Supporting local food initiatives has a variety of local benefits—providing better access to healthier, fresher foods for the consumer is just the beginning. The benefits of a local and sustainable food system include:

- Supplying healthy and affordable food for everyone,
- Financially supporting farmers, farm workers, and other members of the local food supply chain,
- Preserving farmland, open spaces, natural wildlife habitats, and enriching our soil's fertility,
- Creating local jobs, sustaining local business, and keeping tax dollars in our area,
- Conserving and protecting the quality of our water and air and safeguarding our biodiversity, and
- Minimizing fossil fuel consumption and greenhouse gas emissions (food doesn't have to travel as far)



The tables below show the location of several local farmers markets, roadside stands, and retail farm operations in the FOCUS Region.



Image Source: HCP, Inc.

**Table 8. Brunswick County Farmers Markets, Roadside Stands, & Retail Farm Operations**

Outlet Name	Address	Town/City
Little Family Farm	4580 Cox Road NW	Ash
Waccamaw River Farm & Nursery	6351 Kingtown Road, NW	Ash
Midway Farm	P.O Box 311	Bolivia
The Bolivia Brief: "A Farmers Market"	30 Government Center Drive	Bolivia
Indigo Farms	1542 Hickman Road	Calabash
Shelton Herb Farm	340 Goodman Road	Leland
Oak Island Farmers Market	4601 E. Oak Island Dr	Oak Island
Holden Brothers Farm	5600 Ocean Highway	Shallotte
Shallotte Farmers Market	HWY 130 & Main Street	Shallotte
Southport Waterfront Market	Bay St & Davis St	Southport

**Table 9. New Hanover County Farmers Markets, Roadside Stands, & Retail Farm Operations.**

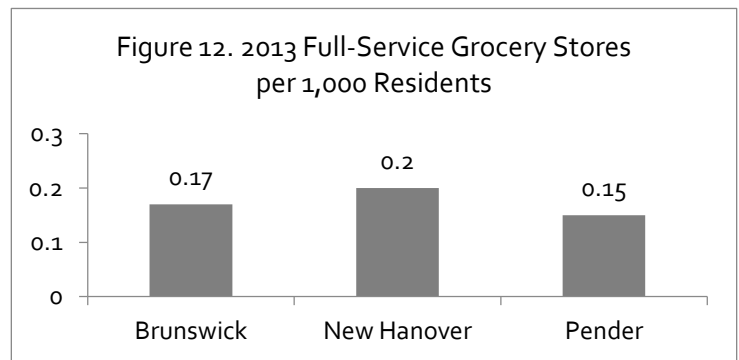
Outlet Name	Address	Town/City
Carolina Beach Farmers Market	Lake Park Blvd at Atlantic Ave	Carolina Beach
Kure Beach Farmer's Market	Beach Front Park & Pavilion	Kure Beach
Port City Produce (2 locations)	Market Street/Carolina Beach Rd	Wilmington
Rankin Terrace Farmers Market	10th & Rankin Street	Wilmington
Riverfront Farmers Market	Historic Downtown Riverfront	Wilmington
Lewis Nursery & Farms	6517 Gordon Road	Wilmington
Rabon's Farm	306 Pettigrew Drive	Wilmington
Red Beard Farm	3220 Castle Hayne Road	Wilmington
Wrightsville Beach Farmers Market	206 Causeway Drive	Wrightsville Beach

**Table 10. Pender County Farmers Markets, Roadside Stands, & Retail Farm Operations.**

Outlet Name	Address	Town/City
Thomas Produce Farm	3160 Hwy 53	Burgaw
Feast Down East Burgaw Location	Burgaw	Burgaw
Bannerman Vineyard	2624 Stag Park Road	Burgaw
Murray Blueberry Farm	180 Murray-Turner Farm Road	Burgaw
Burgaw Creek Farms LLC	1225 Stag Park Road	Burgaw
Murray Blueberry Farm	180 Murray-Turner Farm Road	Burgaw
Carol Sue Farm	18055 US 17	Hampstead
Farmer Mac's Blueberries	184 Berry Patch Road	Hampstead
Hampstead United Methodist Church	15395 US 17	Hampstead
Lewis Nursery & Farms, INC.	Hwy 210 & 17 Junction	Hampstead
Dogwood Farms	18108 NC Hwy 53E	Maple Hill
Sunny Rowe Farm Market	13538 NC Hwy 210	Rocky Point
Sweet Carolina Farms	15538 Hwy 210	Rocky Point
Eden's Produce	US 17	Poplar Grove
Poplar Grove Farmers Market	10200 US 17N	Wilmington

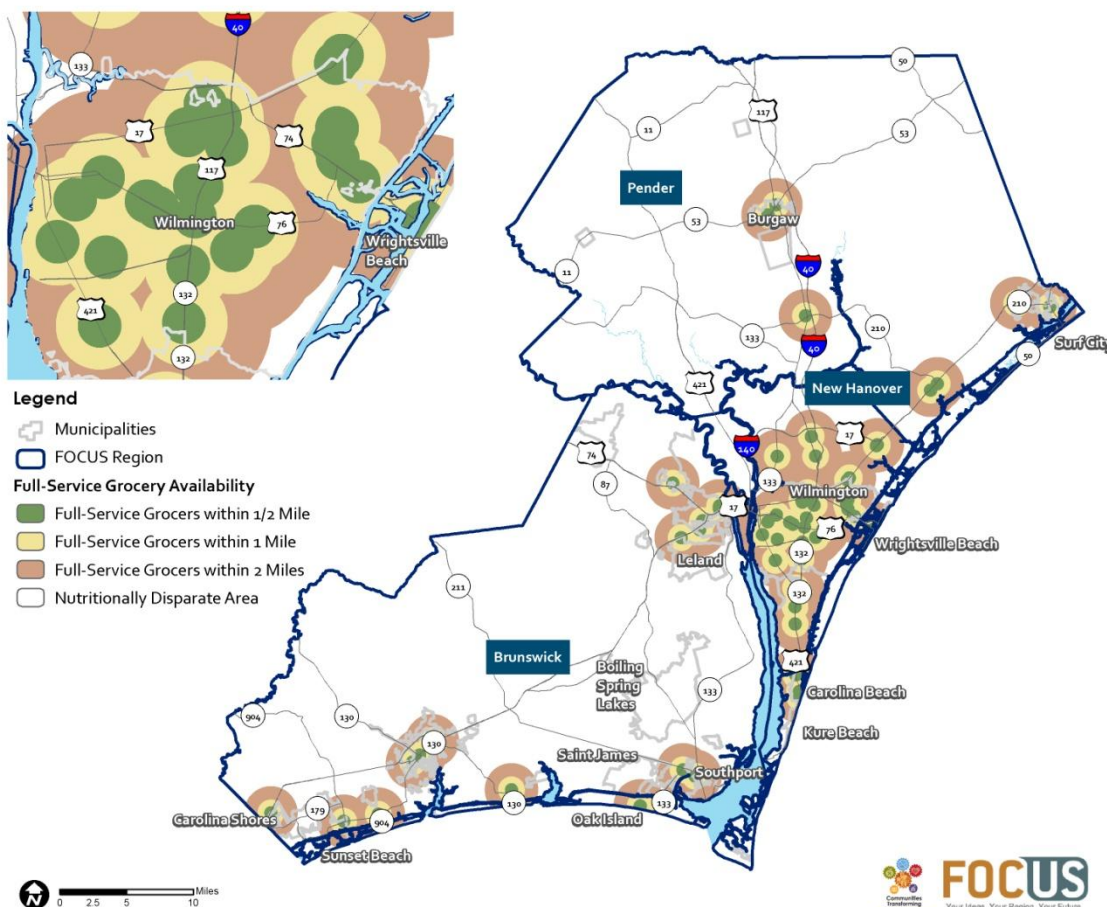
### Full-Service Grocery Access

In the FOCUS region, there are 61 establishments that offer full-service grocery services. For the purposes of this assessment, a “full-service grocery” is defined as an establishment that is open seven days a week, offers a variety of fresh fruits and vegetables at competitive prices, and accepts the Supplemental Nutrition Assistance Program (SNAP), Electronic Benefits Transfer (EBT), and Benefits for Women, Infants, and Children (WIC) methods of payment.



Source: USDA Food Environment Atlas

Of the three counties, New Hanover County has the greatest number of full-service grocery stores per 1,000 residents (see Figure 12). A significant number of New Hanover’s residents are located within two miles of a full-service grocer, with many of Wilmington’s residents located within a ten-minute walk (1/4 mile). Areas shown as white on Map 12 are located outside of a two-mile radius of a full-service grocery store. Low income and low socioeconomic status areas without ready access to full-service grocery stores include the Ash Community in western Brunswick County, Atkinson, and the Maple Hill community in unincorporated Pender County.

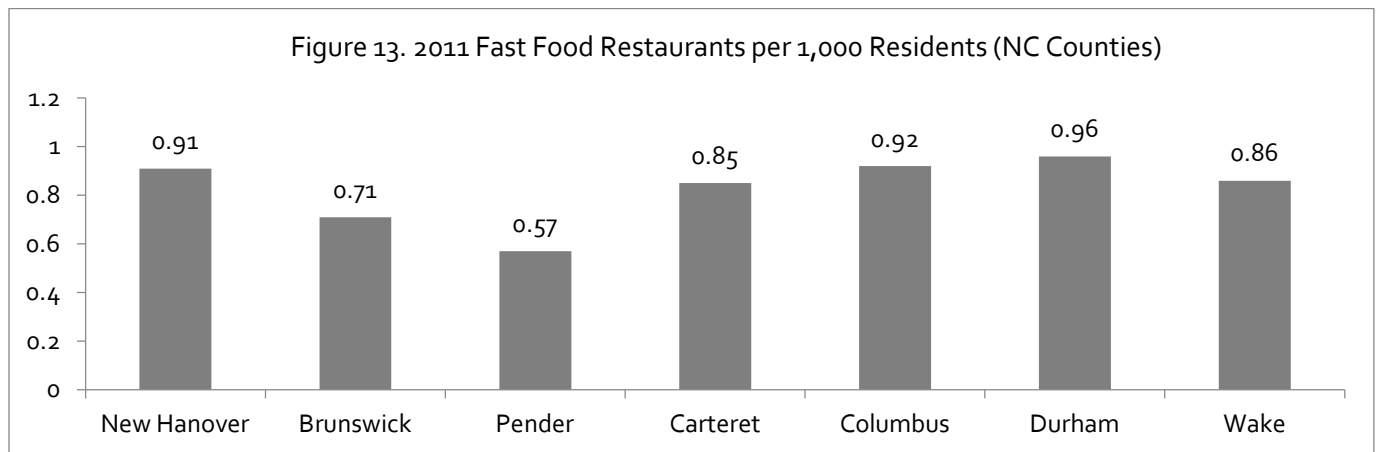




### Quick Service Restaurants

Quick Service Restaurants or Fast Food Restaurants are establishments that provide customers with a quick, consistent meal, with little or no table service. Quite often, these are chain restaurants with many locations in a given region. According to the USDA, fast food accounted for a 325% increase in the share of calories in the US diet from 1978 to 2008<sup>2</sup>. Figure 13 depicts the ratio of fast food restaurants per 1,000 residents for several counties in NC. For reference, figures for additional coastal and eastern NC counties are provided.

According to USDA Food Environmental Atlas, within the FOCUS region, New Hanover County has the greatest number of fast food restaurants per capita. Both New Hanover County and Brunswick County have significantly more fast food restaurants per capita than Pender County. Because these two counties have a larger influx of seasonal visitors than Pender County, this circumstance likely accounts for the difference in the number of fast food restaurants per capita.



Source: USDA Food Environment Atlas.

### Chronic Disease Factors

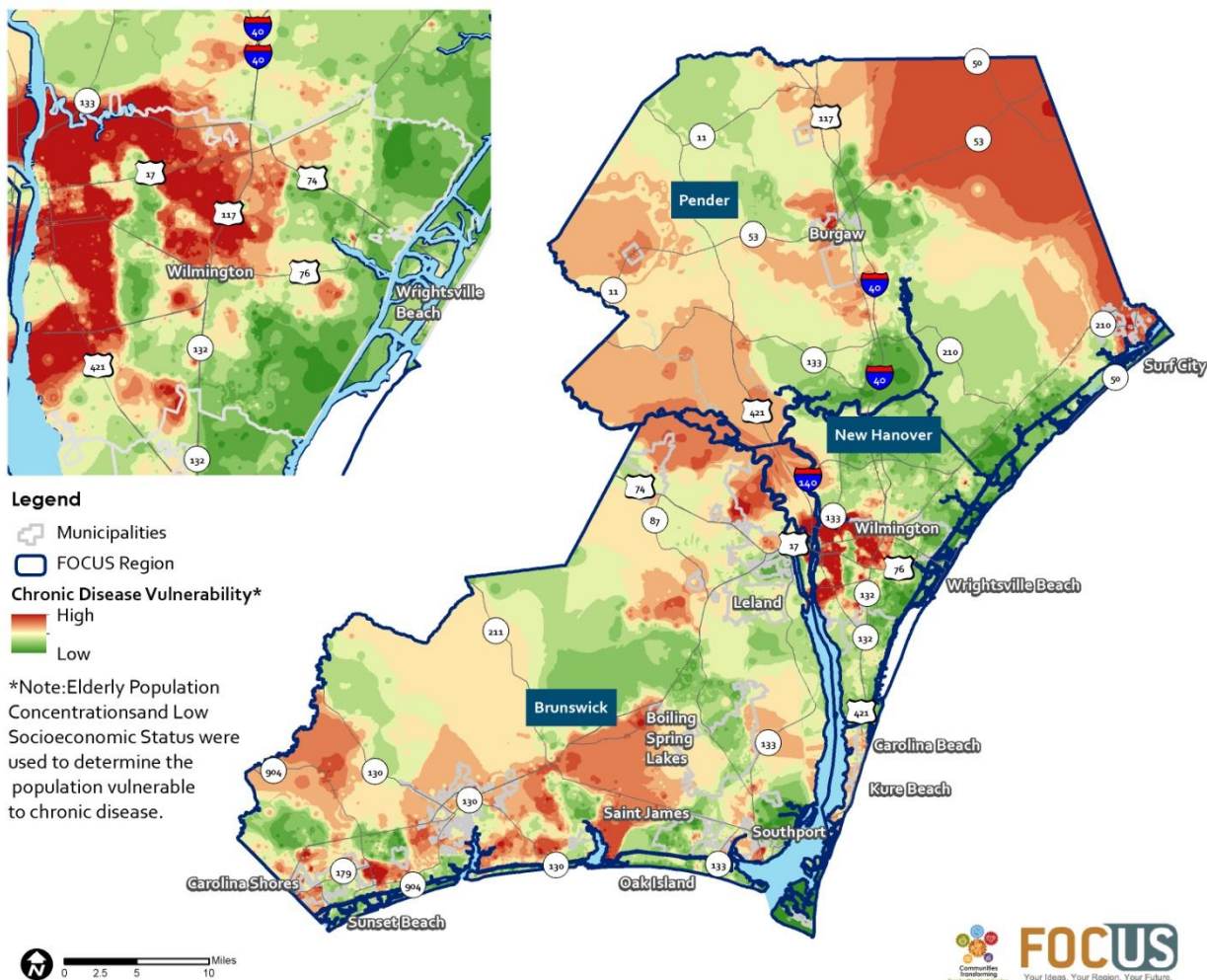
Whereas infectious diseases were the gravest health threats of an earlier era, the largest killers of our time have become chronic diseases such as heart disease and strokes, cancers, and diabetes, for which the leading risk factors are obesity, physical inactivity, poor diets, and smoking. In order to prioritize investment, it is important to spatially locate those areas that may be most vulnerable to chronic ailments. To do so, GIS analysis was used to combine socioeconomic status and concentrations of the elderly population (see Map 13).

**"Two of the four most common causes of chronic disease include lack of physical activity and poor nutrition. Both causes can be altered by lifestyle changes."**

Source: Centers for Disease Control

<sup>2</sup>USDA, Economic Research Service analysis using data from the 1977-1978 Nationwide Food Consumption Survey and the 2005-2008 National Health and Nutrition Examination Survey.

In general, the composite map showing Population Vulnerable to Chronic Disease is very similar to the Socioeconomic Status map. The most vulnerable populations are located in the community of Maple Hill in Pender County, mid-town and downtown Wilmington, and along US 17 in Brunswick County (see Map 13).



### Active Transportation Access

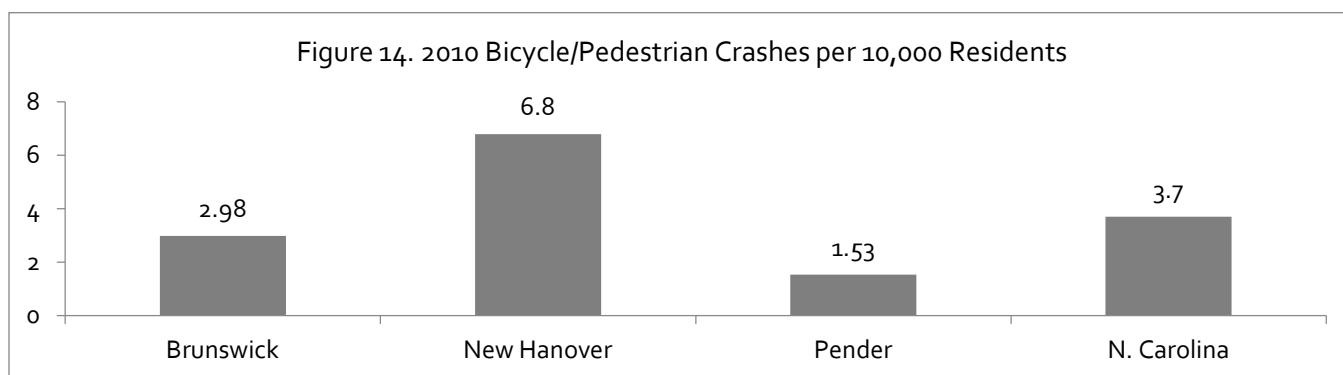
Active transportation options include travel modes that require an individual to expend energy to reach his or her destination. Bicyclists and pedestrians are the two most common modes recognized as active transport, but public transit riders may also fit into this category. Studies have shown that people who use public buses for travel are much more likely to meet their daily exercise requirement as walking to and from a transit stop makes public transportation a healthy and active travel option.

Investments in transportation infrastructure can either discourage or encourage use by non-motorized travelers. Research suggests that providing pedestrian and cyclist infrastructure will increase use of non-motorized facilities while also promoting physical activity and healthy lifestyles<sup>3</sup>. These investments also make non-motorized travel a safer and more viable transportation option. According to NCDOT crash data, the rate of non-motorized transportation vehicle related incidents in New Hanover County is nearly twice (6.8) that of the statewide average (3.7). Rates of bicycle and pedestrian crashes in Brunswick County and Pender County are both lower than the North Carolina average.



The daily exercise requirement can be achieved through unorganized activities, such as walking to work or to run errands. (Image Source: FOCUS)

In 2010, only 2% of residents in the three-county FOCUS Region listed walking as their primary means of transportation to work. That figure is significantly lower than the nationwide statistic, but is consistent with the statewide average. It is important to note however, that portions of this region are very rural, decreasing the ability to walk for utilitarian purposes such as to work or to run errands.



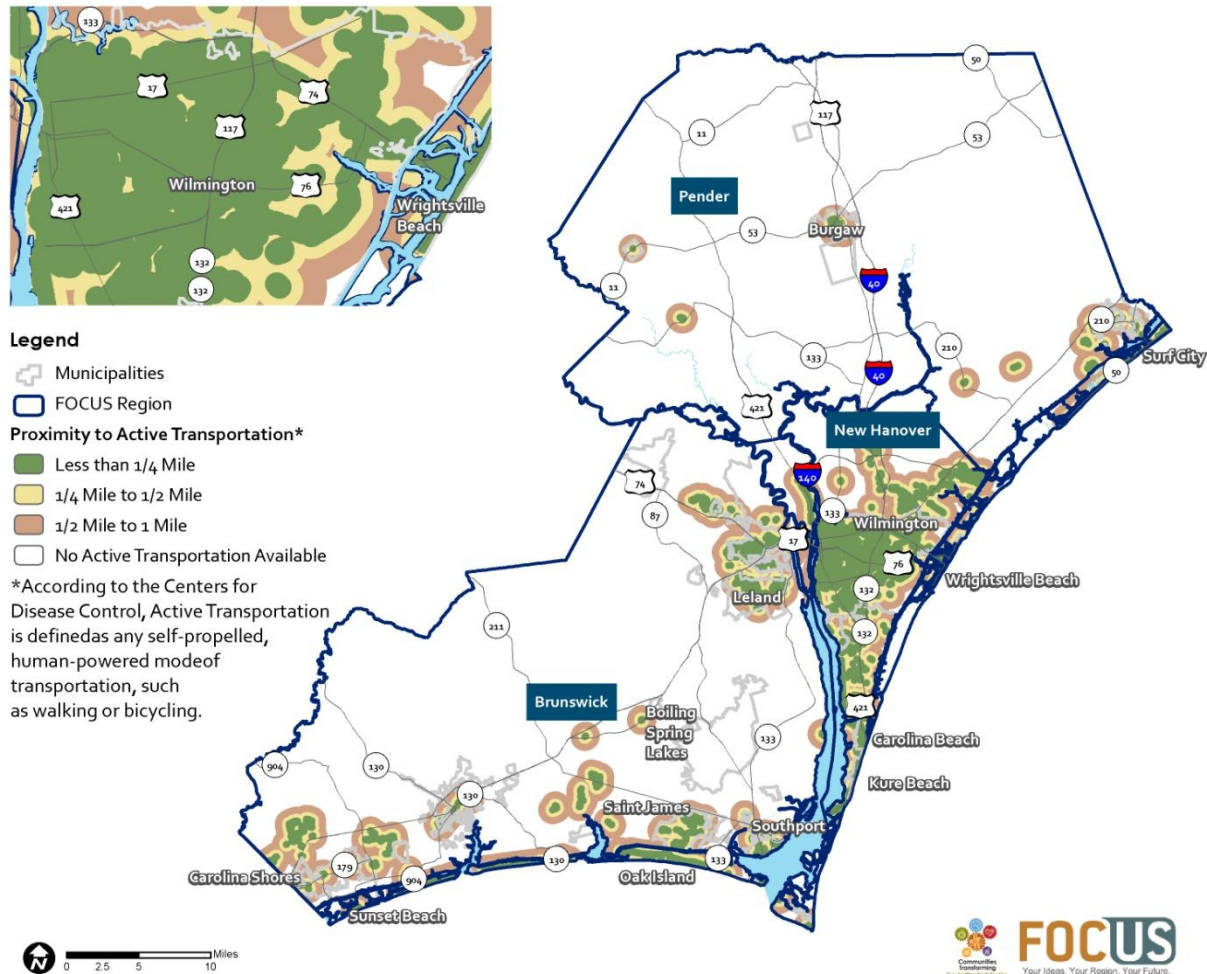
Source: NCDOT



Infrastructure can either discourage or encourage physical activity. (Image Source: HCP, Inc.)

Within the FOCUS Region, the majority of active transportation facilities are concentrated in New Hanover County, the beach towns of Brunswick and Pender Counties, and the Town of Leland in Brunswick County; however, the Town of Maple Hill recently installed a walking trail at the community center. Residents located in unincorporated areas of Pender and Brunswick Counties have few options for active transportation (see Map 14). In rural areas however, a lack of dedicated facilities may not directly correlate to a lack of activity, as significant options exist for unorganized activity in the form of gardening or farming, hiking, hunting, or bird watching.

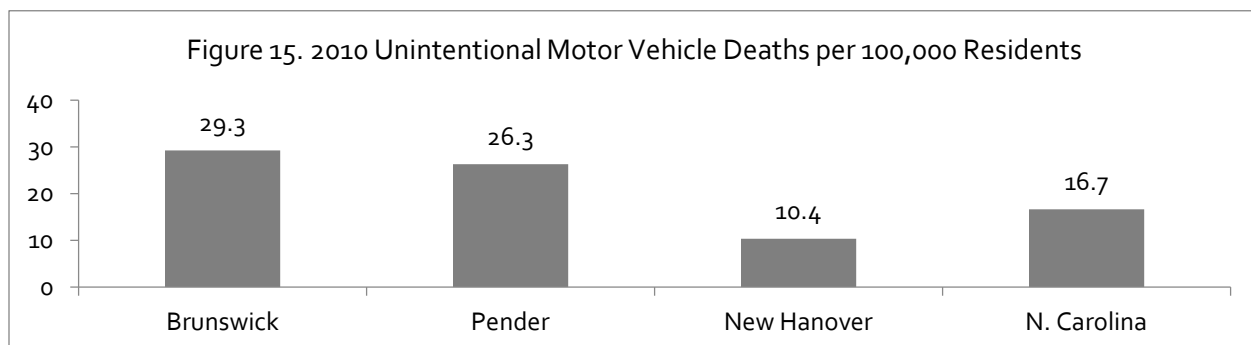
<sup>3</sup>Associations of Perceived Social and Physical Environmental Supports with Physical Activity and Walking Behavior. Addy, CL, DK Wilson, KA Kirtland. 2004, American Journal of Public Health, pp.440-443.



Map 14: Access to Active Transportation

## Motor Vehicle Deaths

Motor vehicle deaths are a recurring problem for Brunswick and Pender County residents. According to the North Carolina State Center for Health Statistics, motor vehicle deaths are approximately 75% and 57% higher than the statewide average, respectively. Rates of unintentional motor vehicle deaths in New Hanover County are less than the statewide average, however (see Figure 15).



Source: NC State Center for Health Statistics



## Elderly Transit Access

Presently, the overwhelming majority of the elderly populations in the United States reside outside of city centers. Much of this occurrence can be explained by people "aging in place" or choosing not to leave the residence in which they raised a family or worked for much of their adult life. While elderly urban populations have greater access to public transit than do their suburban or rural counterparts, many are still unable to take advantage of such service. Most note too great a distance to bus stops and a lack of reliable and consistent service as barriers to using public transit.

Safety among aging populations is an important factor when considering public, fixed-route transit prioritization. Drivers over the age of 65 are much more likely to be involved in accidents than younger drivers as a function of total miles driven. For drivers over the age of 85, the fatality rate is nine times higher than for drivers aged 25 to 69<sup>4</sup>. Within the FOCUS region, elderly transit access is determined by combining the elderly population concentrations and the proximity to existing WAVE bus stops.



Wilmington's Public Transit—WAVE Bus. (Image Source: HCP, Inc.)



Pender County Transportation Van, above. (Image Source: FOCUS)



WAVE Bus Stop in Brunswick County, above. (Image Source: FOCUS)

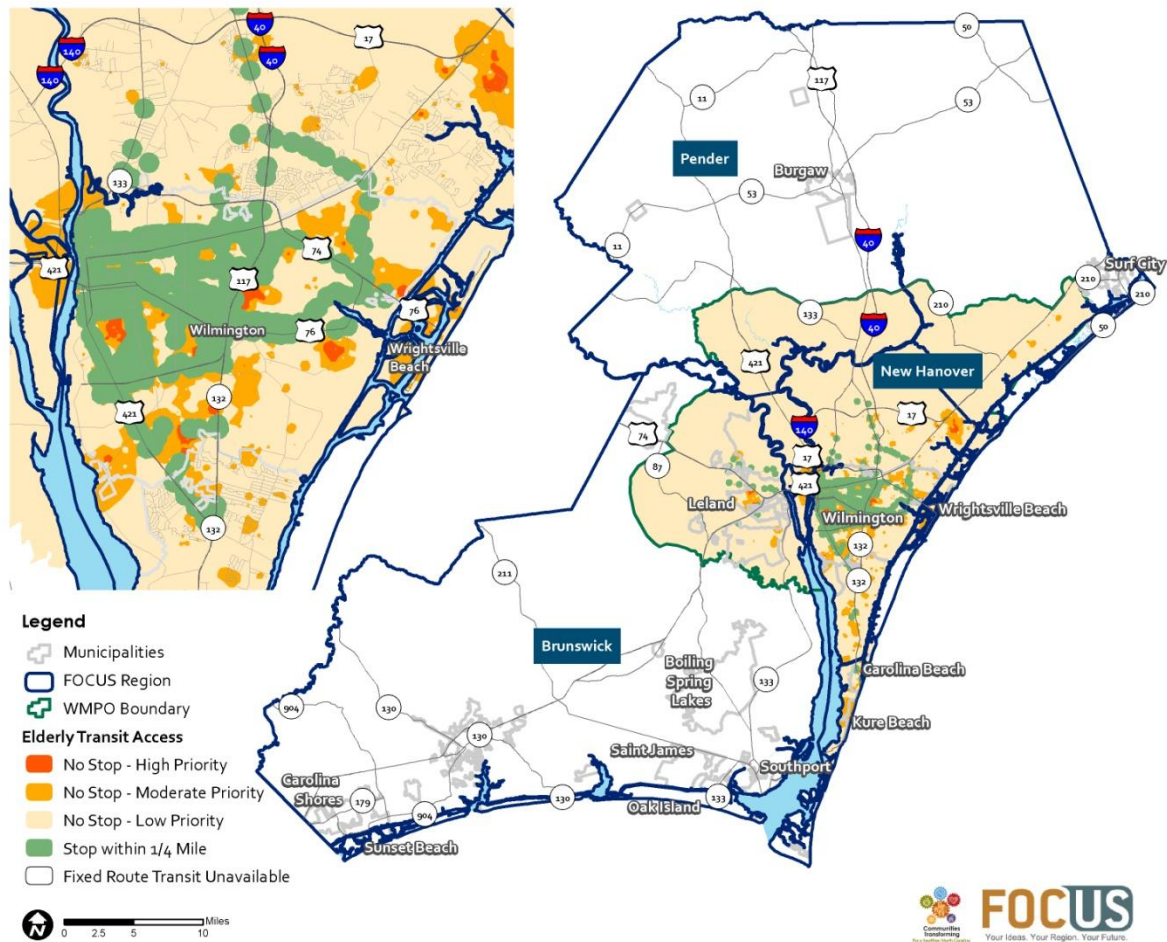
Analysis was completed for the Wilmington Urban Area Metropolitan Planning Organization (WMPO) boundary.

High priority is given to those areas with the greatest concentration of elderly and no access to public transportation. In the WMPO, concentrations of elderly population in need of transit access can be found on Map 15. WAVE Transit coordinates daily trips in cooperation with Pender County Transit to bring passengers from Pender County to the North Campus of Cape Fear Community College. Passengers can then transfer to another bus route.

Concentrations of elderly individuals without access to public transportation are located in the Porters Neck community and the Greenville Loop area of Wilmington. Areas with high concentrations of elderly, not included in the analysis and without access to fixed-route transit, include the Town of Carolina Shores and the Village of Saint James in Brunswick County.

<sup>4</sup> Center on Urban and Metropolitan Policy, The Mobility Needs of Older Americans: Implications for Transportation Reauthorization, Sandra Rosenbloom.

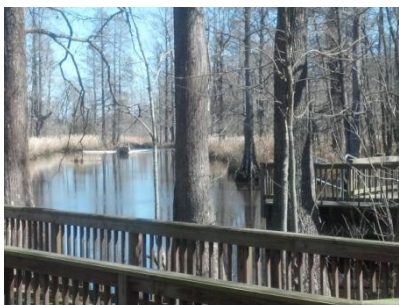




Map 15: Elderly Transit Access

## Access to Physical Activity and Recreation

Studies show one of the most effective ways to offset weight gain is through increased physical activity. Coincidentally, individuals looking to increase physical activity encounter barriers when access to recreational facilities is limited. In particular, parks without active transportation connections lessen the amount of physical activity an individual may experience when choosing to recreate. Further, those individuals without access to a private vehicle will be less inclined to visit parks and recreation facilities without non-motorized access.



An effective way to offset weight gain is through physical activity—such as free play or organized activities.  
(Image Sources: FOCUS & HCP, Inc.)

According to the Centers for Disease Control, the following is a list of items that can be accomplished through increased or regular physical activity:

- Weight control
- Reduced risk of cardiovascular disease
- Reduced risk of Type 2 Diabetes and metabolic syndrome
- Reduced risk of some cancers
- Stronger bones and muscles
- Improved mental health and mood
- Improved ability to do daily activities and prevent falls, for older adults
- Increased chances of living longer

In order to determine areas of the FOCUS Region lacking recreation access, all public open space and recreation facilities, senior centers, and beach/water access locations were geographically mapped. Analysis was completed to establish the relative proximity to each physical activity resource. Map 16 displays the proximity to physical activity facilities. Facilities within one (1) mile are accessible via a five-minute bicycle ride, while facilities within a quarter ( $\frac{1}{4}$ ) mile are approximately a five-minute trip by walking.

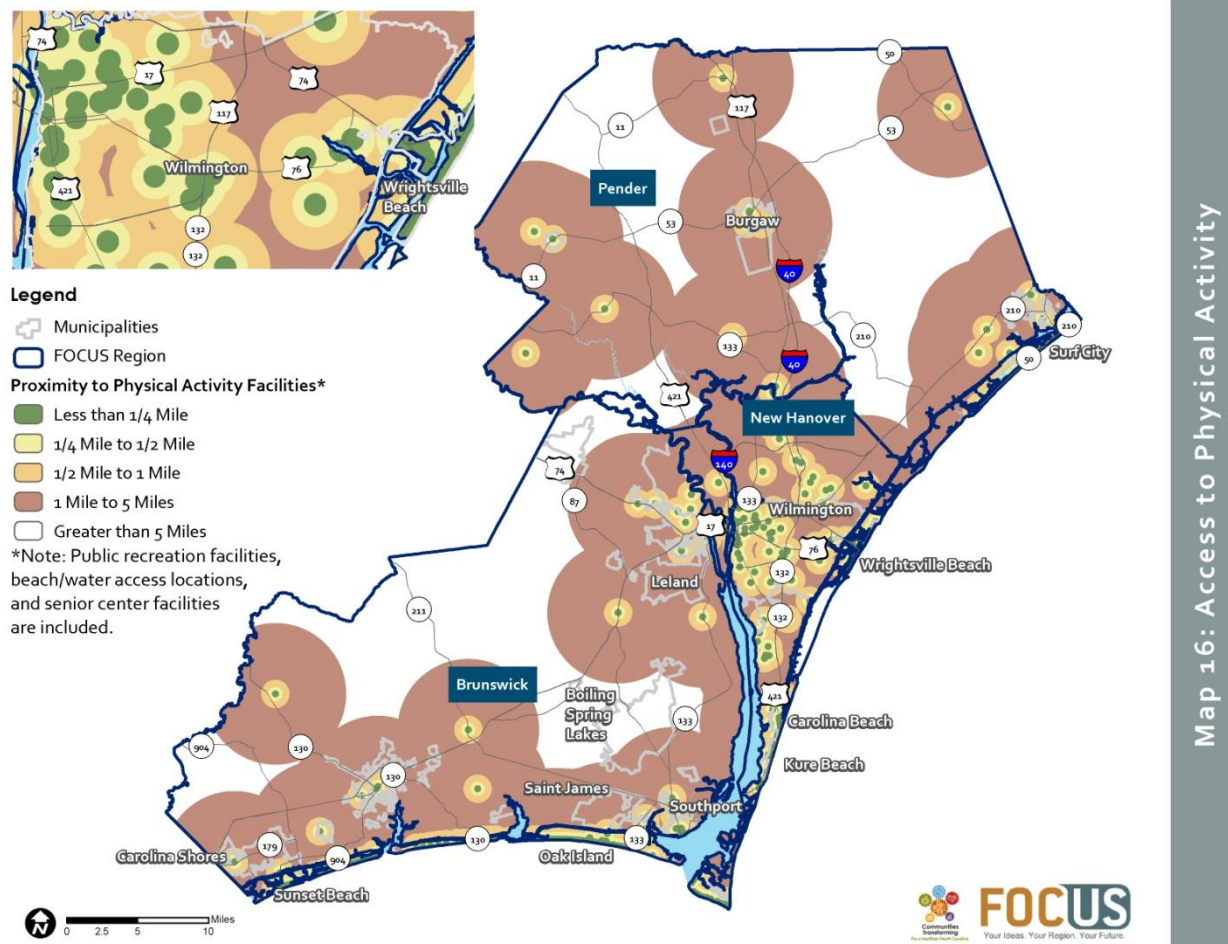
Physical activity resources located more than a mile from an individual's place of employment or residence generally require vehicular access. Areas shown as white on Map 16, are located greater than five miles from the nearest physical activity facility. Portions of Brunswick County and Pender County lack ready, or easy, access to physical activity facilities, while all New Hanover County residents are located within five miles of a facility. It should be noted, however, that rural portions of Brunswick and Pender Counties include uninhabited lands that may consist of wetlands or conservation lands. Please see Appendix 5: FOCUS Region – Wetlands/Conservation Areas.



Beach/water access locations were included as physical activity locations.

*Top: Carolina Beach, NC Public Access  
(Image Source: HCP, Inc.);*

*Bottom: Brunswick River Park, Belville, NC  
(Image Source: FOCUS)*



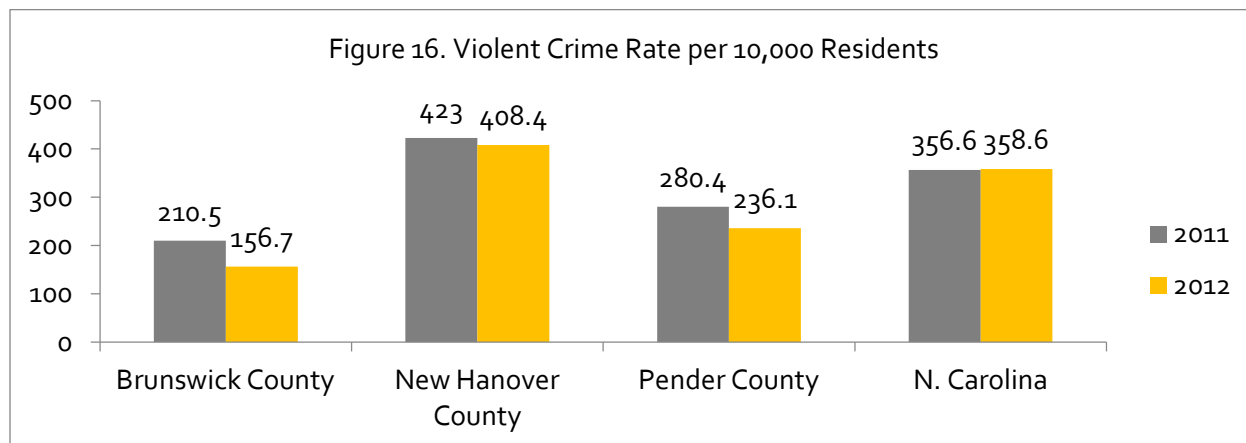
## Neighborhood Safety

Neighborhood safety and perception of crime are consistently cited in studies as a barrier to walking or physical activity. Low socioeconomic (SES) areas often report higher perceptions of neighborhood crime, unattended dogs, and untrustworthy neighbors. Perception of lower neighborhood safety and social disorder are also significantly associated with less recreational physical activity.

Figure 16 below recounts violent crime rates for Brunswick County, New Hanover County, and Pender County. Violent offenses include crimes of murder and non negligent manslaughter, negligent manslaughter, forcible rape, robbery, and aggravated assault and property crimes including burglary, larceny-theft, motor vehicle theft, and arson. Violent crime rates for New Hanover County are significantly higher than the neighboring counties of Brunswick and Pender. In fact, New Hanover County's 2012 violent crime rate is more than double that of Brunswick County, and approximately 73% higher than the Pender County rate. However, the violent crime rate in all three counties decreased from 2011 to 2012.

Substandard housing and vacant or deteriorated structures also lead to a less relative sense of safety in neighborhoods and may foster criminal activity. Violent crimes or crimes against a person are those that instill a sense of fear in individuals. Such crimes may lessen the likelihood of travel by foot or bicycle to the grocery

store, bus stop, or local recreation facility. Statistics related to these criminal instances are available through the North Carolina Uniform Crime Reporting Program.



Source: NC Uniform Crime Reporting Program





## Section 4: Health and Wellness Priority Areas

### Introduction

The analysis completed in Section 3 composes the baseline data that was used to create the Health and Wellness Priority Areas Map. The process is similar to what urban planners use to create a land suitability analysis map. At its most basic, the land suitability analysis map is a composite overlay of factors that make land more or less suitable for certain types of development. To complete the Health and Wellness Priority Areas Map, the same methodology has been utilized; however, various social determinants of health and risk factors comprise the layers of the overlay (further detail can be found in “Appendix 2: GIS Data Collection & Spatial Analysis Methodology”). The outcome is a composite map displaying geographic areas that cope with more dire health and wellness concerns.

### Goals

Eight goals have been drafted as part of the health and wellness priority areas analysis. Each goal pertains to a particular health indicator that has been analyzed as part of the process. The goals are provided below.

1. *Explore strategies to decrease commute times.* This goal may be accomplished through incentivizing compact development, lessening sprawling growth, and linking existing and future housing development through employment center nodes and opportunities in the FOCUS region.
2. *Increase access to healthcare providers.* Lessen the barriers to receiving medical care through increased fixed-route service, paratransit service, or community/non-profit ride-sharing programs. In addition, explore economic development incentives and grants to encourage medical practices to locate in underserved communities.
3. *Increase access to dental facilities.* See “Increase access to healthcare providers,” above.
4. *Increase social cohesion and provide health education.* Social cohesion is often defined in terms of “social capital” – the processes between people that establish networks, norms, and social trust and facilitate coordination and cooperation for mutual benefit. Social cohesion should be enhanced through improved neighborhood safety, housing quality, and increased open space. Health education should supplement efforts to increase social cohesion.
5. *Increase access to full-service grocery stores.* Provide incentives for full-service grocery stores to locate in underserved areas. Strategies to enhance demand for nutritionally vigorous foods should accompany efforts to increase access to facilities through such efforts as educational cooking programs and community seminars on local produce.
6. *Increase access to active transportation facilities.* Active transportation facilities include pedestrian infrastructure, bicycle networks such as greenways/multi-use paths, and transit routes/stops. Increasing the availability of pedestrian and bicyclist facilities will increase use. Transit stops should be

outfitted with amenities that cater to pedestrians and bicyclists. In addition, decreased transit route headways (the average interval of time between vehicles moving in the same direction on the same route) will encourage a greater number of users.

7. *Increase elderly transit access.* Facilitate transit routes and stops that will accommodate elderly residents. Identify programs to aid the elderly and aging in place residents without access to a private vehicle.
8. *Increase access to physical activity facilities.* Pursue funding opportunities to construct and maintain physical activity facilities. Explore strategies to increase use of existing facilities through marketing, community programming, and organized events.

The level of priority, or importance, in implementing each goal is indicated for each identified health disparate population by low, moderate, or high. Determination of need is established based on spatial analysis conducted for each health indicator. For example, if a particular location is categorized as a “High Priority” for “Increased Access to Physical Facilities,” then that community is significantly lacking in the availability of such facilities.

### Health and Wellness Priority Areas

Health indicators created as part of the planning process were combined in a weighted overlay analysis based on 2010 Census data, built environment amenities, and proximity to facilities that support healthy lifestyles. Each of these health indicators were weighted by the Health & Wellness Advisory Committee based on the indicators’ impact on health outcomes. Socioeconomic Status (SES) was ranked as the most significant factor in determining health outcomes throughout the region. A Health and Wellness Priority Areas Map was created for each county in the FOCUS region. On each map, three specific priority areas are chosen based upon their need for services.

**Table 11. Health Indicators Average Ranking by Committee**

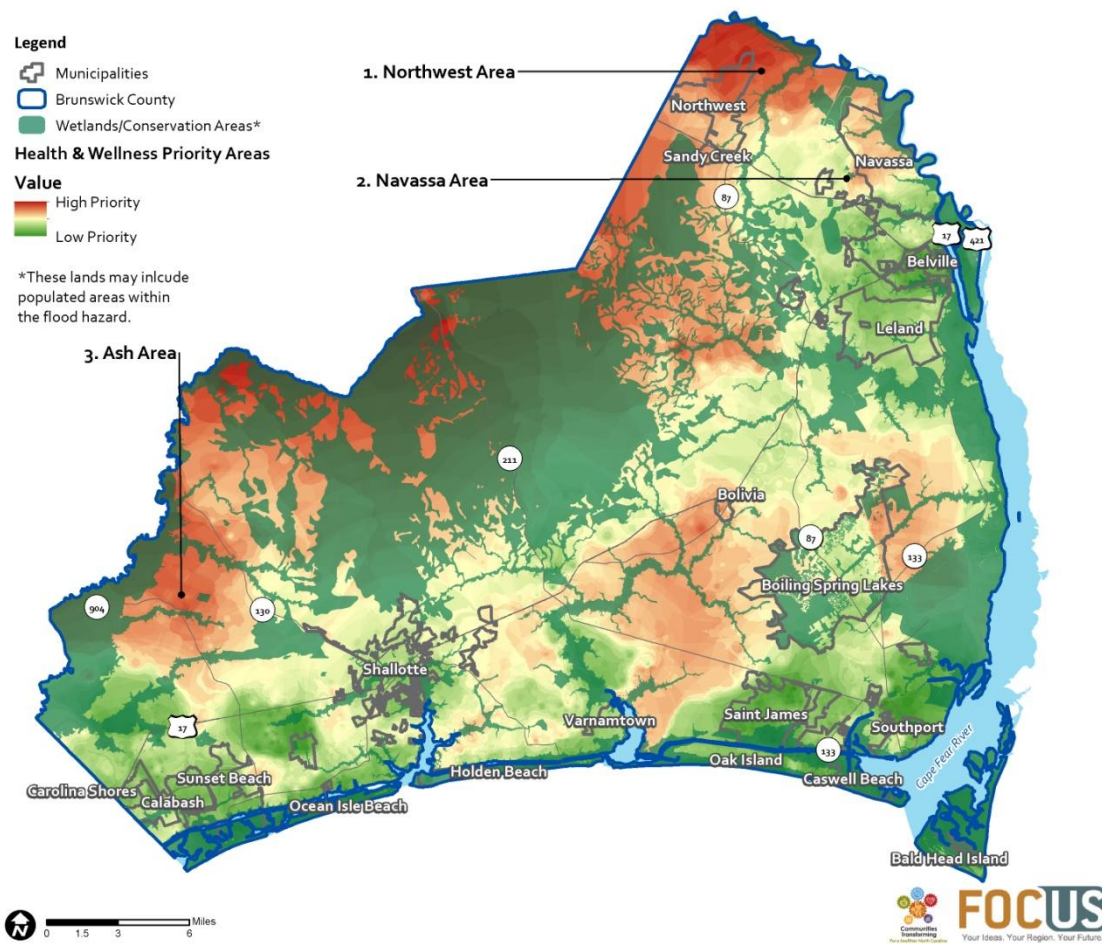
Health Indicators	Average Ranking (1 = most important)
Socioeconomic Status (Income, Education, Employment)	1.8
Proximity to Full Service Grocery	3.8
Proximity to Healthcare Provider	4.2
Access to Active Transportation	4.4
Access to Physical Activity Facilities	4.6
Concentration of Elderly (65+)	5.8
Proximity to Dental Facility	6.6
Transit Access (Elderly)	6.6
Travel Time to Work	7.2

### Brunswick County Health & Wellness Priority Areas

Specific areas of concern in Brunswick County include the Northwest area, Navassa, and Ash communities and their immediate vicinities (see Map 17, page 4-3). All three areas exhibit low socioeconomic status and lack access to several health and wellness services. Areas along the northern border of the county, though sparsely populated, also lack access to amenities and community facilities available to communities on the coast.

Due to the primarily rural nature of Brunswick County, the key health and wellness issues are increasing access to amenities and establishing opportunities to foster healthier lifestyles. While increasing access to certain health supporting facilities is vital, it is important to note that mere access alone will not substantially alter

health outcomes of the population in the county. An increase in the demand for physical activity and healthy eating opportunities must complement an increase in access. It is the shared responsibility of the local governments, planning departments, and the health department in the county to nurture such a demand.



Map 17: Health and Wellness Priority Areas - Brunswick

Table 12. Brunswick County Health &amp; Wellness Priority Areas

Goal	Northwest Area	Navassa Area	Ash Area
1) Explore strategies to decrease commute times.	●	●	◐
2) Increase Access to Healthcare Providers	●	◐	●
3) Increase Access to Dental Facilities	●	◐	●
4) Increase Social Cohesion and Provide Health Education	●	●	●
5) Increase Access To Full-Service Grocery Stores	●	○	●
6) Increase Access To Active Transportation Facilities	●	○	●
7) Increase Elderly Transit Access	N/A	○	N/A
8) Increase Access to Physical Activity Facilities	●	○	◐

Table 12 Legend	
Low Priority	○
Moderate Priority	◐
High Priority	●

### New Hanover County Health & Wellness Priority Areas

Within New Hanover County, potentially health disparate populations are located primarily within the city-center and its traditional core. Three areas were identified as primary locations of concern—the Northside neighborhood, the Creekwood community, and the Southside neighborhood corridor. Although the population of New Hanover County has ready access to many facilities that may aid in their overall health and wellness, these isolated pockets of low socioeconomic status are the more pressing issue in the county.

The county citizenry, in general, is healthier than both Brunswick County and Pender County, likely due to the higher socioeconomic status that New Hanover County maintains. The county is also much denser and more urban than the other FOCUS region counties. Thus, identifying strategies to increase the use of active transportation and physical activity facilities is a viable recommendation. While many such facilities exist in the county, particularly within high priority health areas, barriers may exist in the form of unsafe roadways and/or perception of criminal activity. Strategies and policies to reduce such barriers should also be explored from a health perspective.



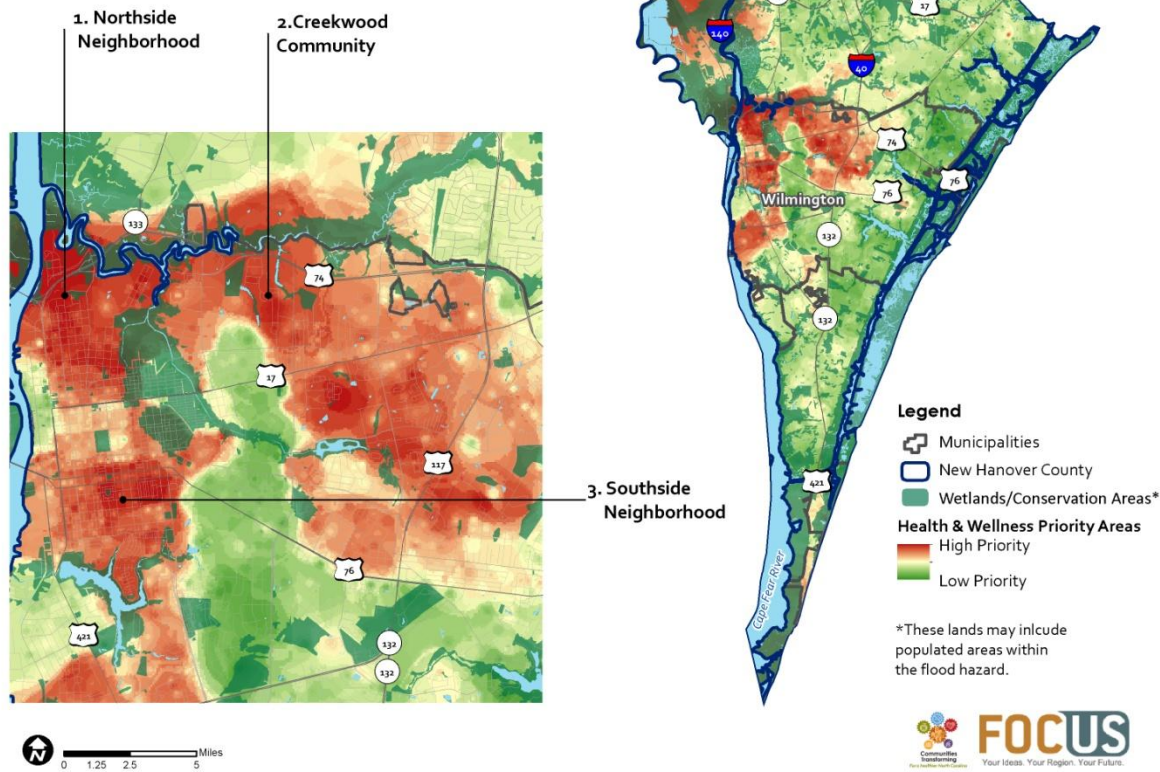


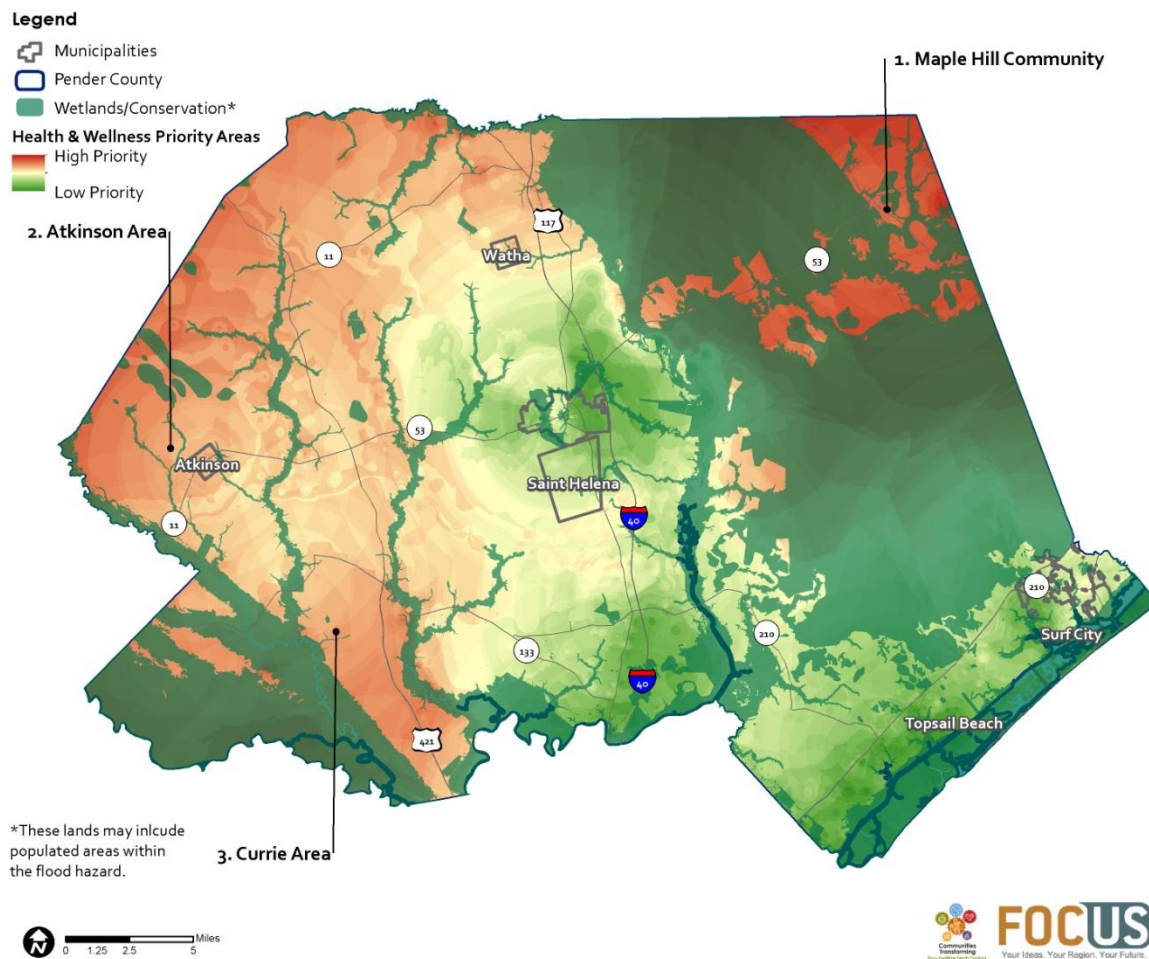
Table 13. New Hanover County Health & Wellness Priority Areas

Goal	Northside Neighborhood	Creekwood Community	Southside Neighborhood
1) Explore strategies to decrease commute times.	○	○	○
2) Increase Access to Healthcare Providers	○	●	○
3) Increase Access to Dental Facilities	○	○	○
4) Increase Social Cohesion and Provide Health Education	●	●	●
5) Increase Access To Full-Service Grocery Stores	●	○	○
6) Increase Access To Active Transportation Facilities	○	○	○
7) Increase Elderly Transit Access	○	○	○
8) Increase Access to Physical Activity Facilities	○	○	○

Table 13 Legend	
Low Priority	○
Moderate Priority	◐
High Priority	●

### Pender County Health & Wellness Priority Areas

Similar to Brunswick County, Pender County remains a rural but growing coastal landscape. Areas along the coast have access to a greater number of facilities that support healthy lifestyles. Residents of these more populated coastal areas belong to a higher socioeconomic status than the rural communities in other areas of the county. The three primary areas of concern in Pender County are the Maple Hill community, the Atkinson area, and Currie. All three areas lack quick access to facilities such as grocery stores or medical providers.



Access to facilities is the primary concern for high priority areas identified in Pender County. For example, the residents of Maple Hill must travel to Burgaw or Jacksonville to shop at a full-service grocery store, equating to a minimum drive of 15 miles east or west. Moreover, opportunities to increase physical activity are limited as there are few facilities within close proximity to the health and wellness priorities areas. However, increasing access must accompany an increase in demand for activities that will foster healthier lifestyles. Such demand can be fostered from constructing facilities like the newly installed walking trail at the Maple Hill Community Center.

Table 14. Pender County Health &amp; Wellness Priority Areas

























Goal	Maple Hill Community	Atkinson Area	Currie Area
1) Explore strategies to decrease commute times.			
2) Increase Access to Healthcare Providers			
3) Increase Access to Dental Facilities			
4) Increase Social Cohesion and Provide Health Education			
5) Increase Access To Full-Service Grocery Stores			
6) Increase Access To Active Transportation Facilities			
7) Increase Elderly Transit Access	N/A	N/A	N/A
8) Increase Access to Physical Activity Facilities			

Table 14 Legend	
Low Priority	
Moderate Priority	
High Priority	

## Next Steps

This analysis serves as a general guide for health professionals, planners, citizens, and decision makers to provide opportunities for increasing positive health outcomes within the region. The purpose of this report is to provide community insights gained through geographically visualizing data rather than in tabular or textual format. Such visualizations should supplement the discussion of prioritization of needs within identified health disparate populations for policy, strategies, and capital improvements.

Significant differences exist in planning for public health in rural and urban areas. In urban areas, a greater focus can be placed on increasing active transportation infrastructure because the population density is there to support it. By contrast, in rural areas, it may be more important to identify healthy eating options and relate the significance of the local food movement to agricultural preservation while also taking steps to increase the demand for healthy eating opportunities.

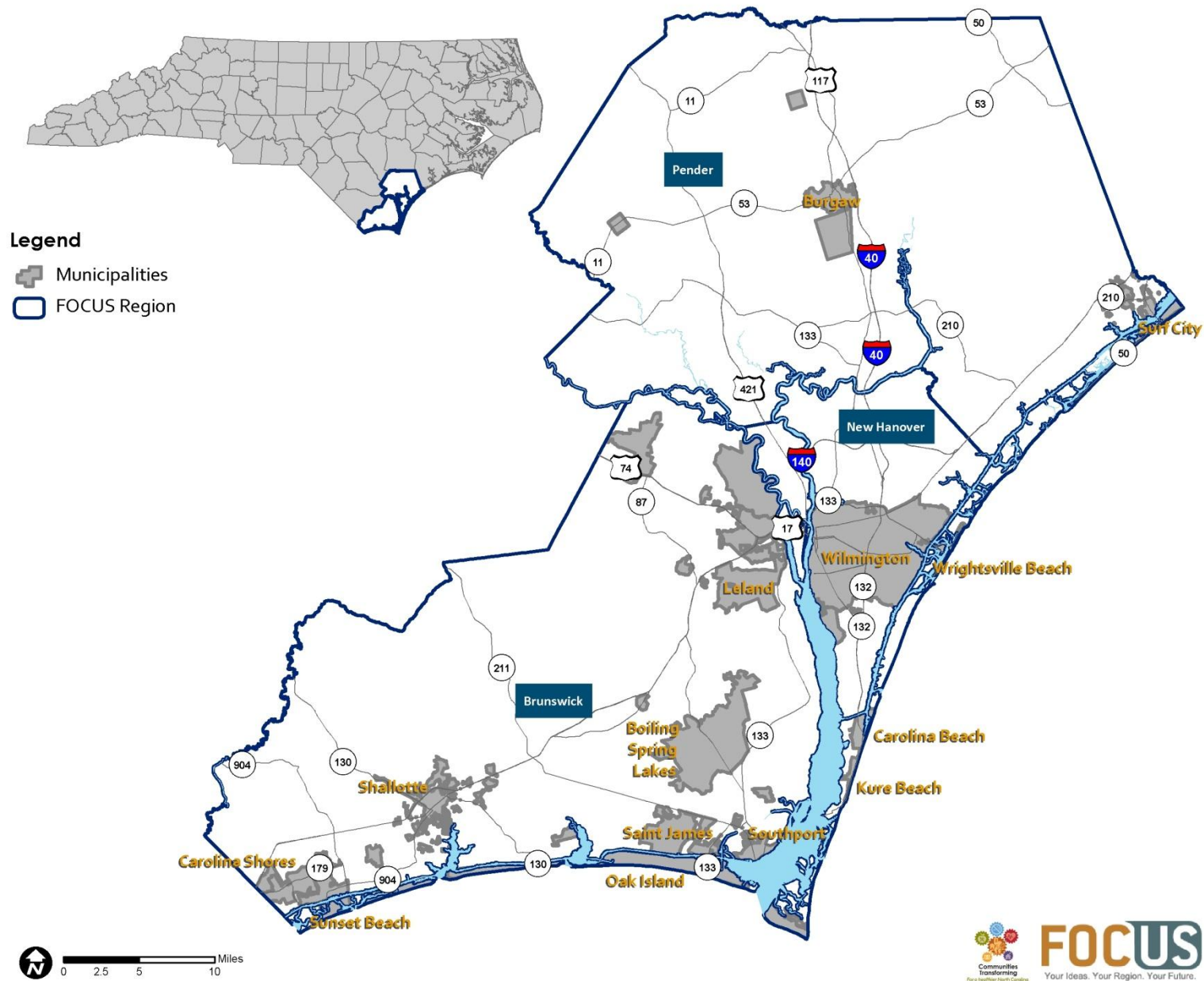
Jurisdictions within the FOCUS region will benefit from this analysis and the inclusion of geographic health indicators, or social determinants of health, as part of their comprehensive plans, long-range transportation plans, non-motorized transportation plans, parks and recreation plans, and/or community health assessments. Mapped health indicators can assist localities within the region by providing strategies for prioritizing capital improvements that may have a positive impact on health outcomes of the citizens. Such capital improvements may include, but are not limited to, sidewalks, parks and/or recreation facilities, farmer's markets, public transit stops, or multi-use trails.

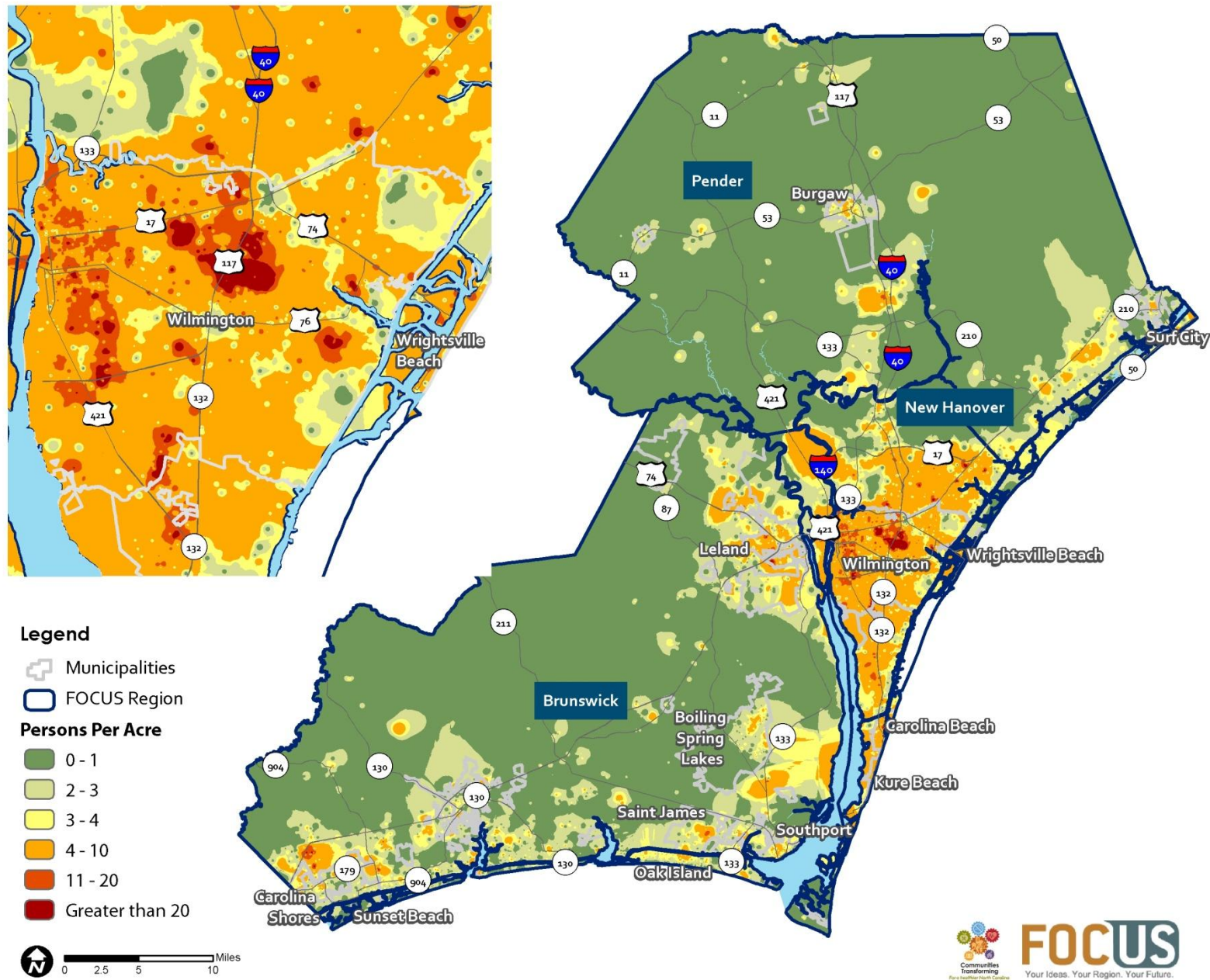
Health concerns within the FOCUS region vary according to the specific factors identified throughout this process. These differences require a customized approach by each local entity. Each locality has the ability to utilize these health concerns and incorporate strategies for improvement into the planning process – but the process and solutions for accomplishing results will be unique to each community.

## Appendix 1: Full Size Maps



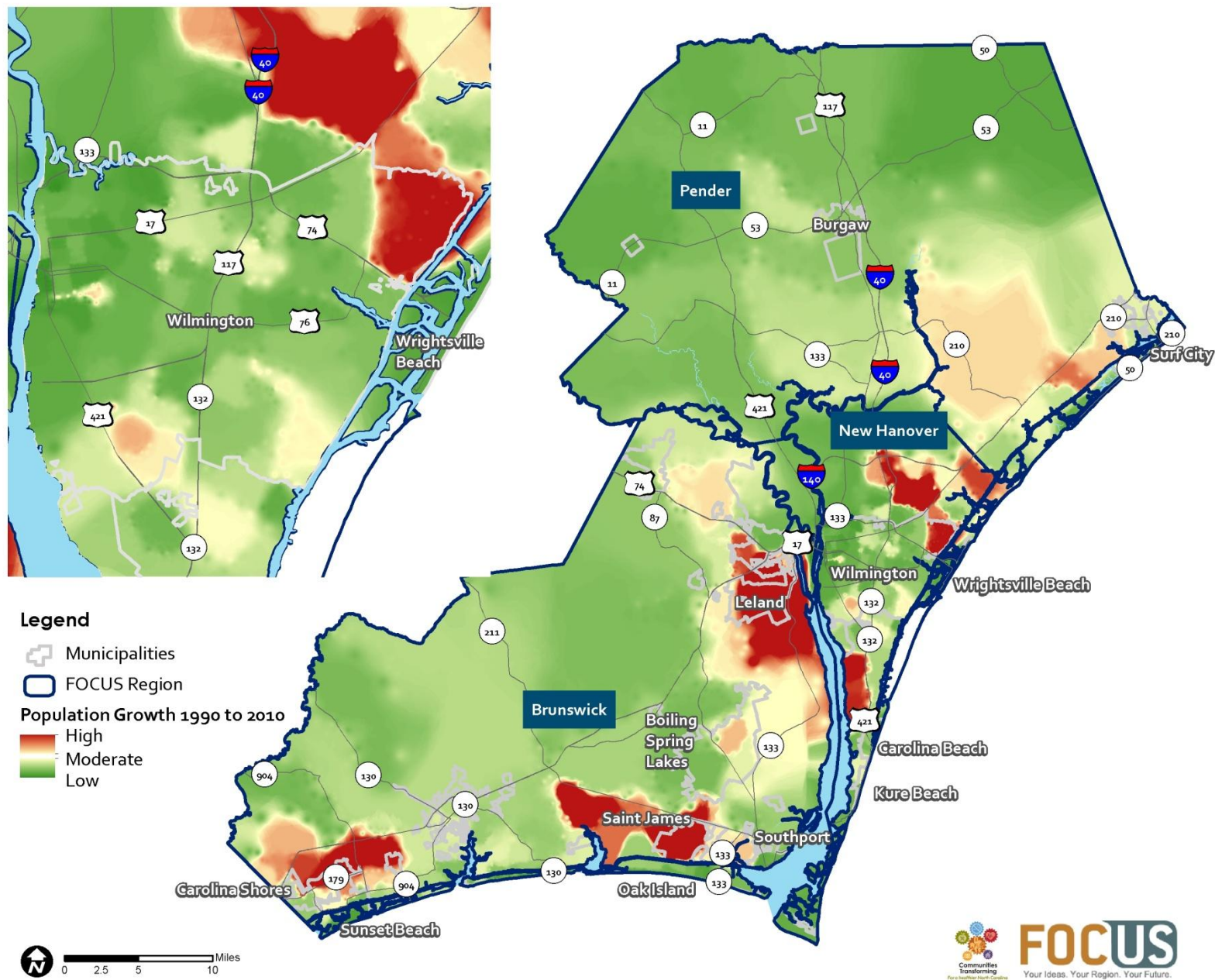




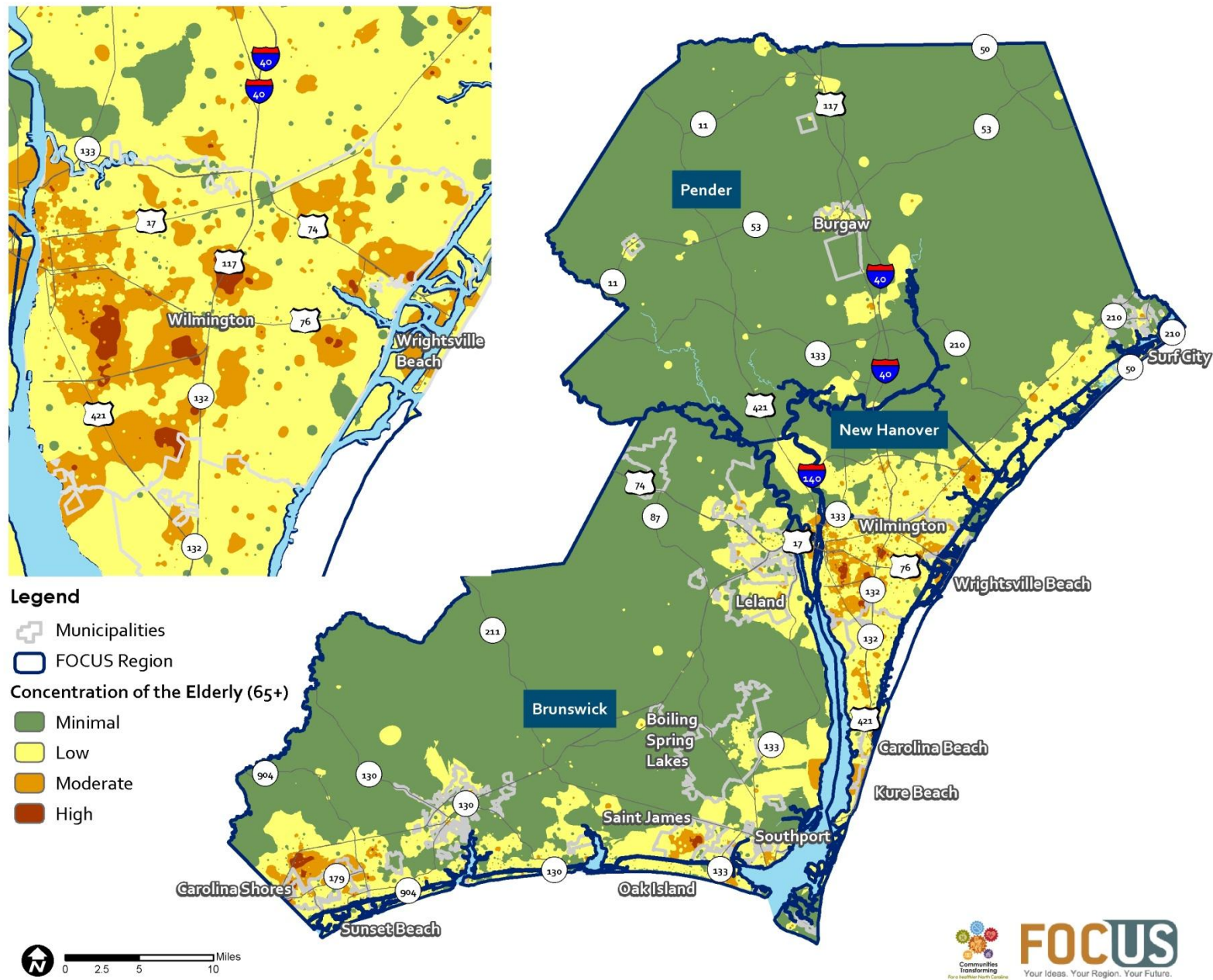


Map 2: 2010 Population Density

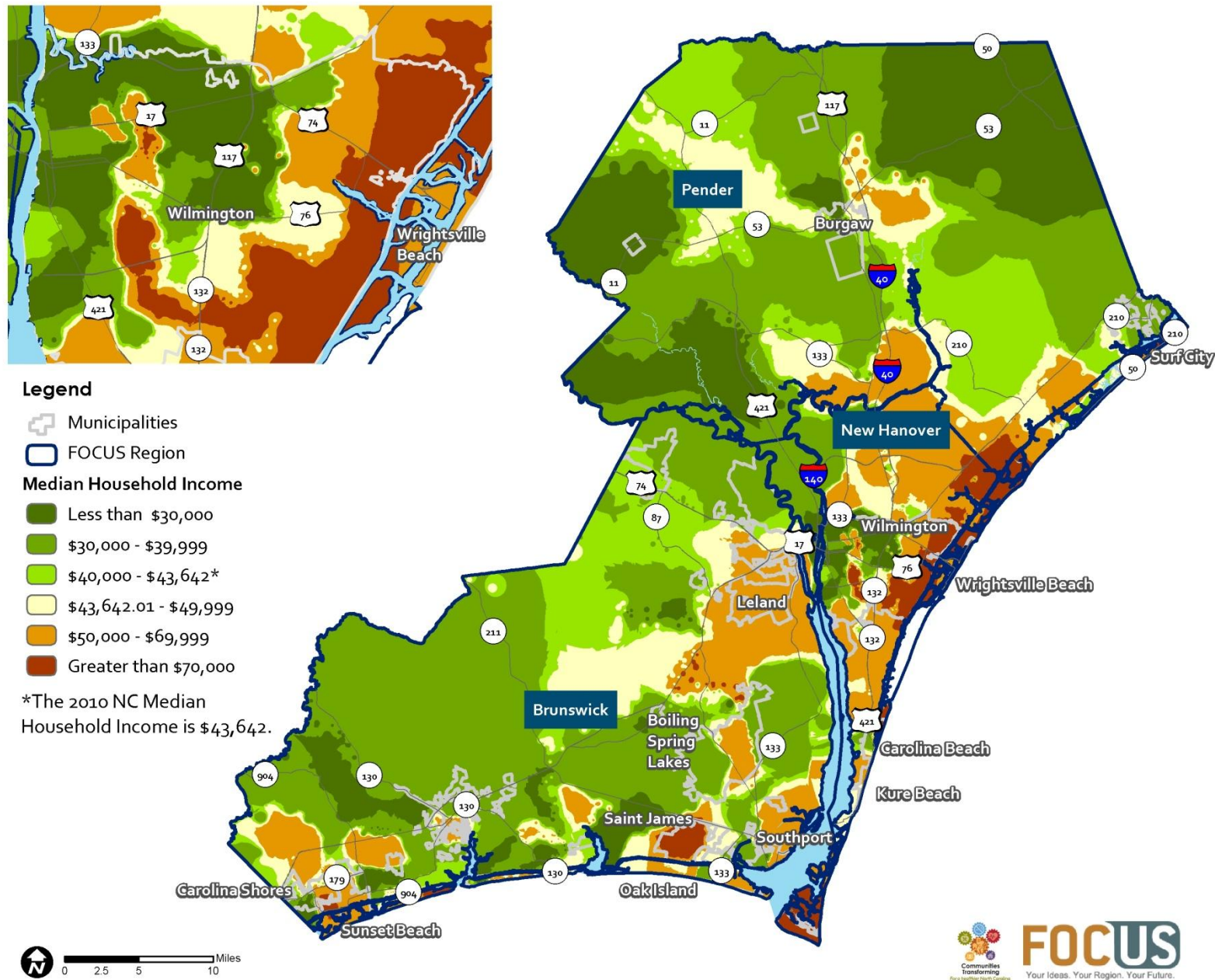




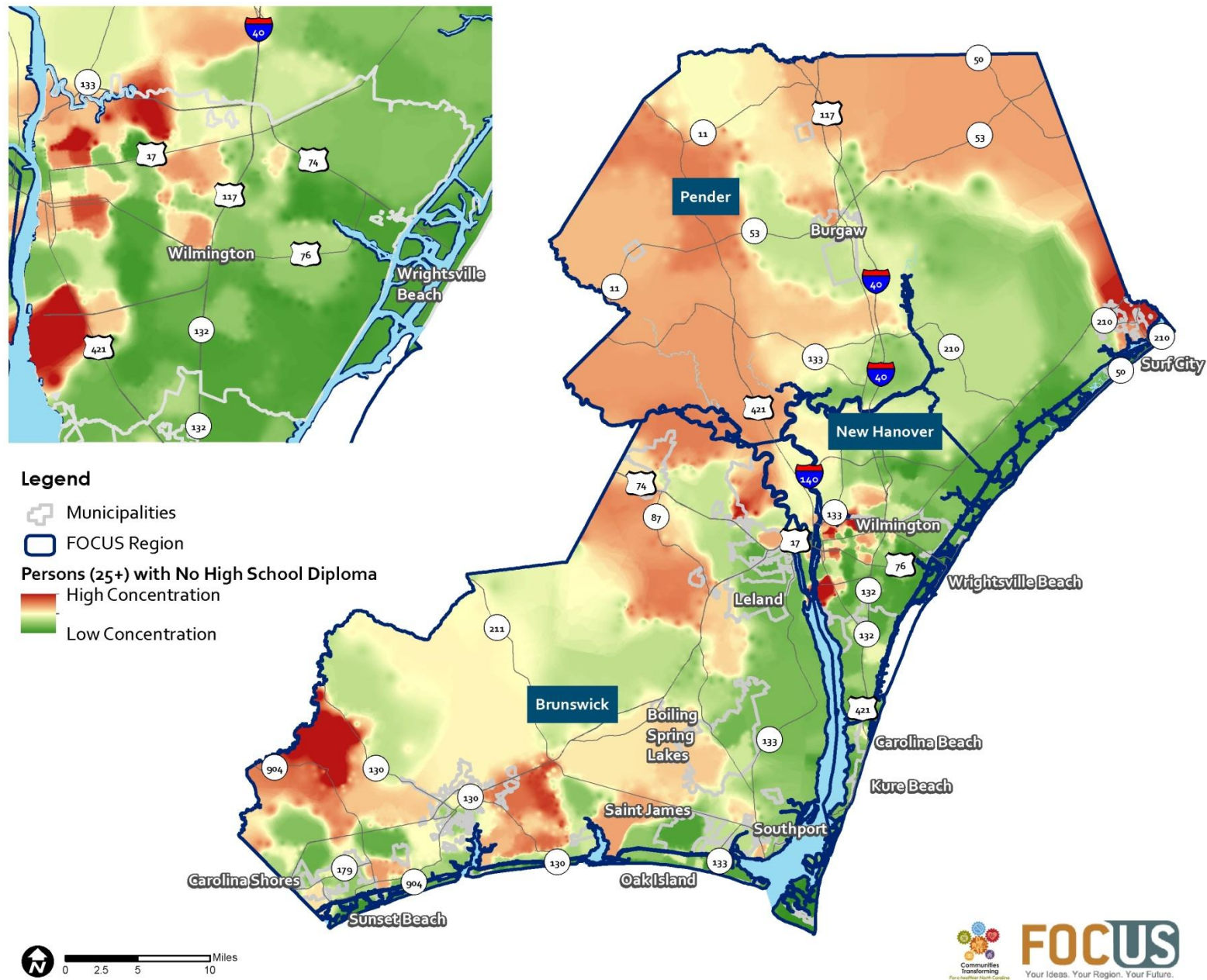




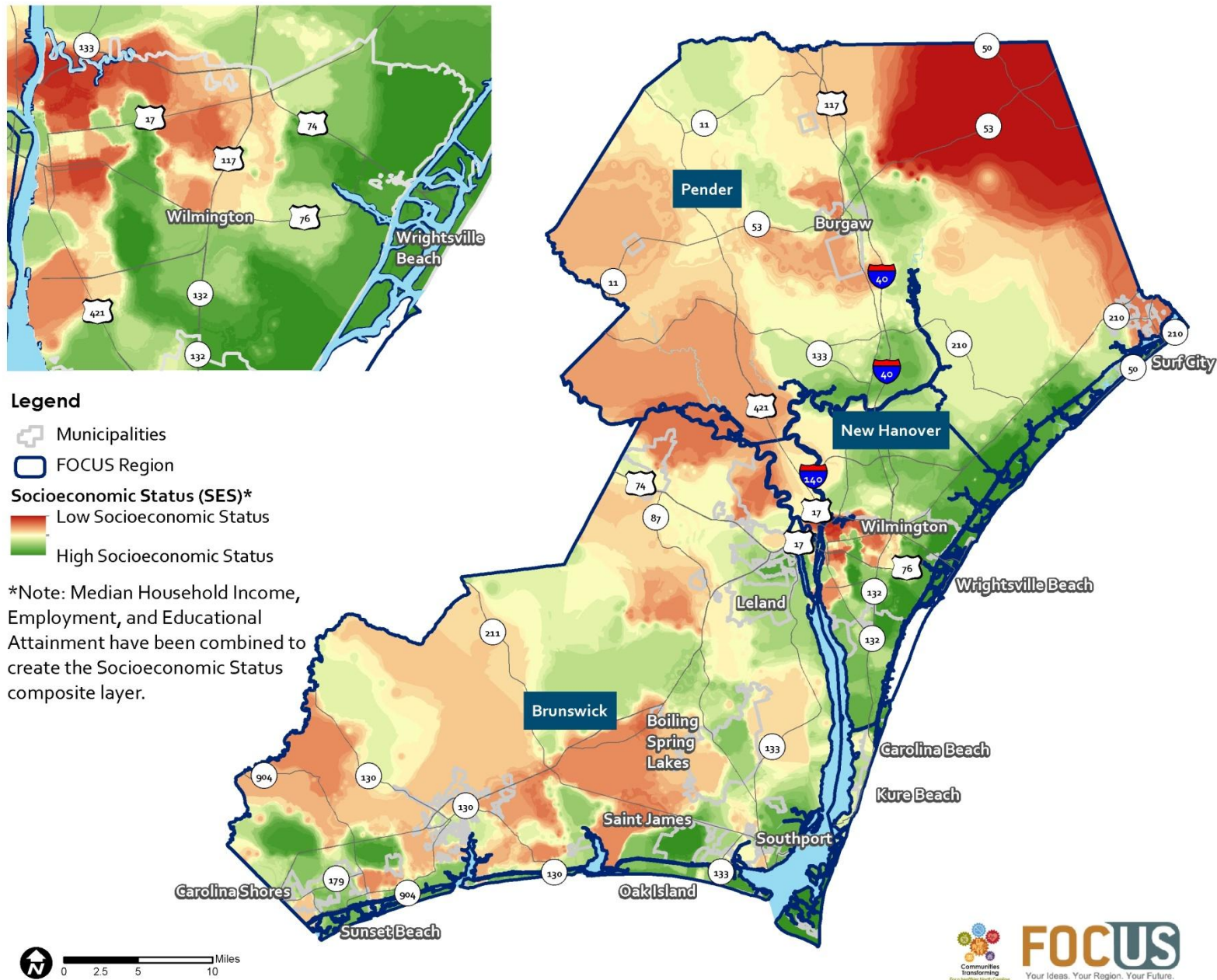
Map 4: 2010 Elderly Concentration (65+)



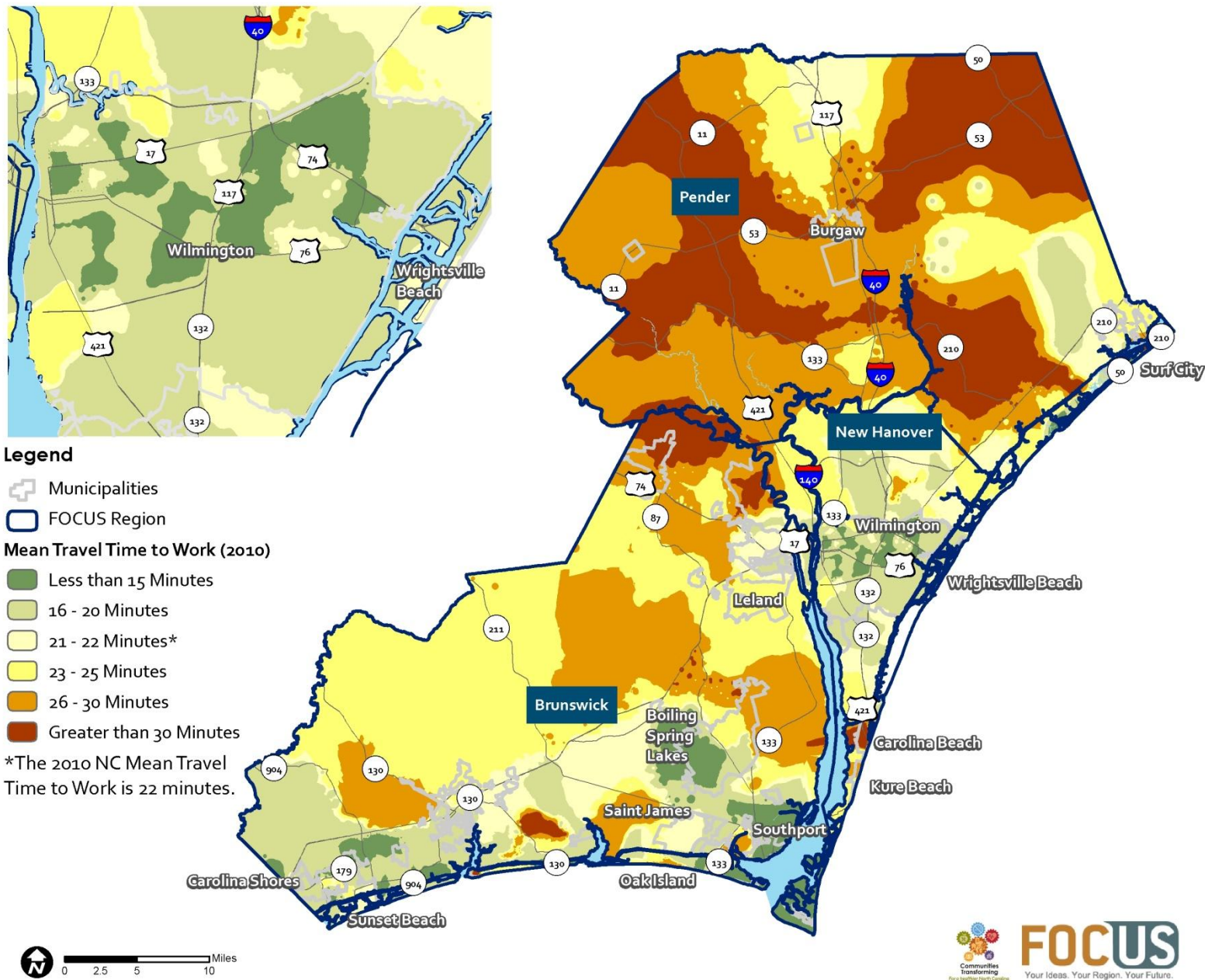


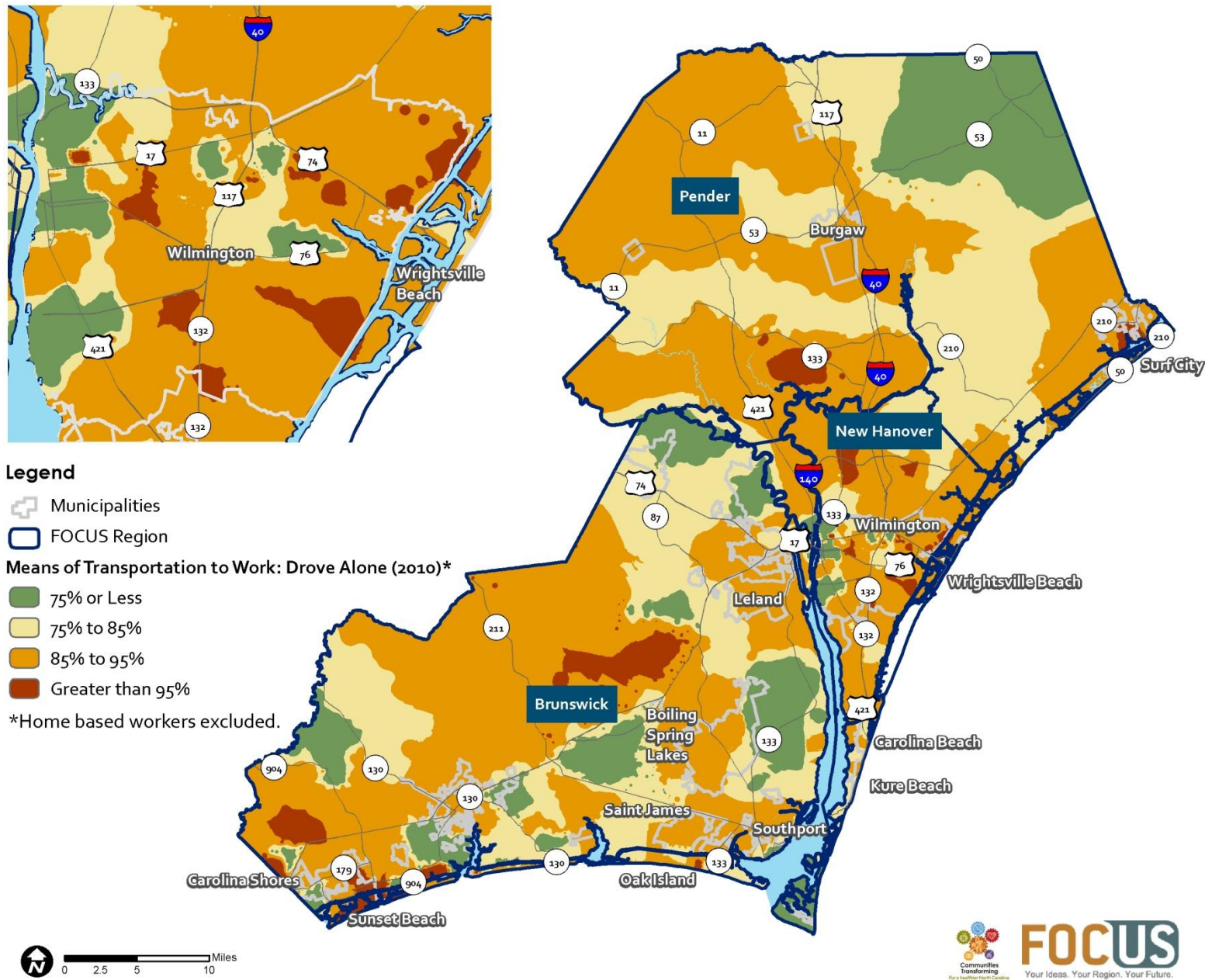


Map 6: 2010 Persons (25+) with No High School Diploma

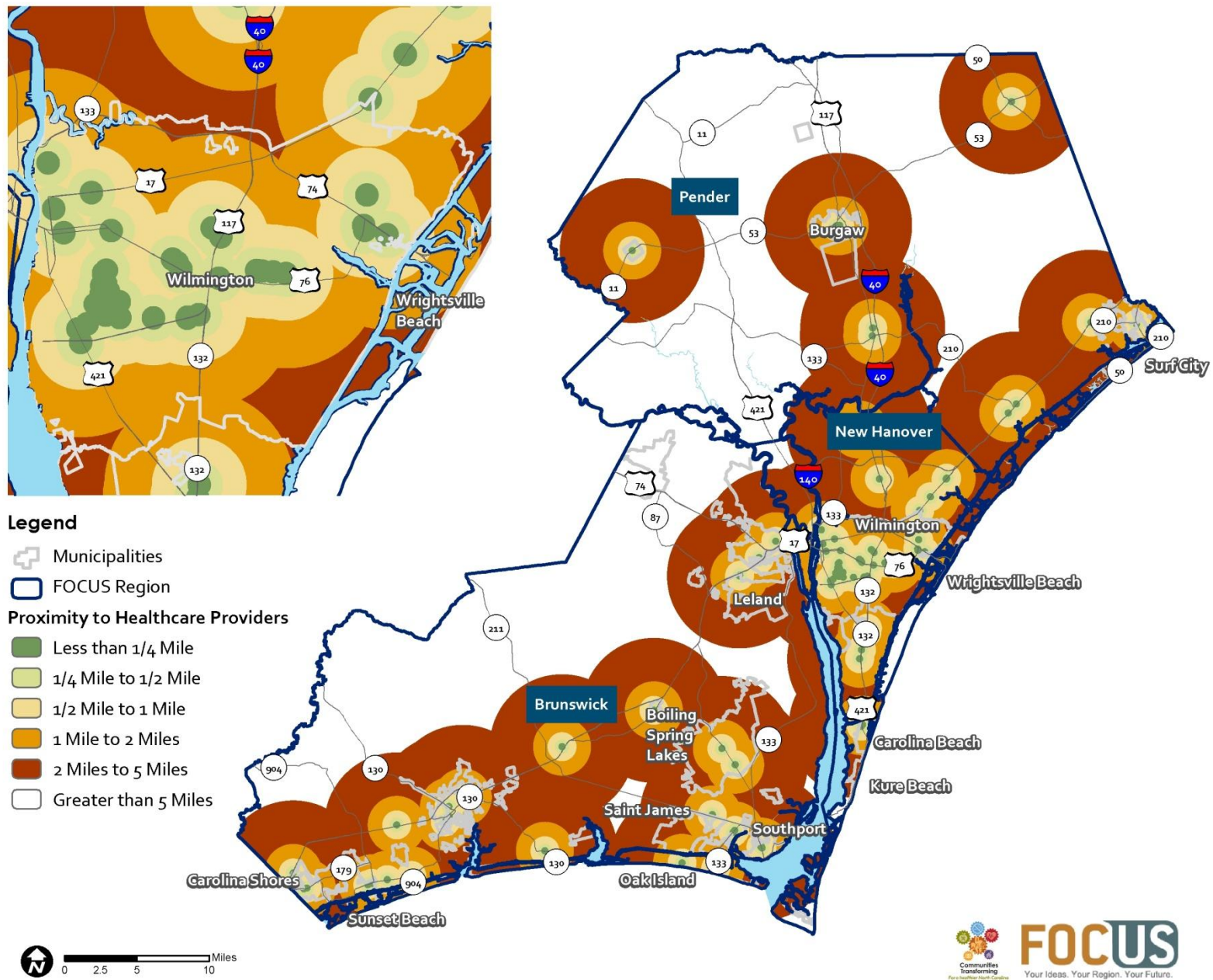


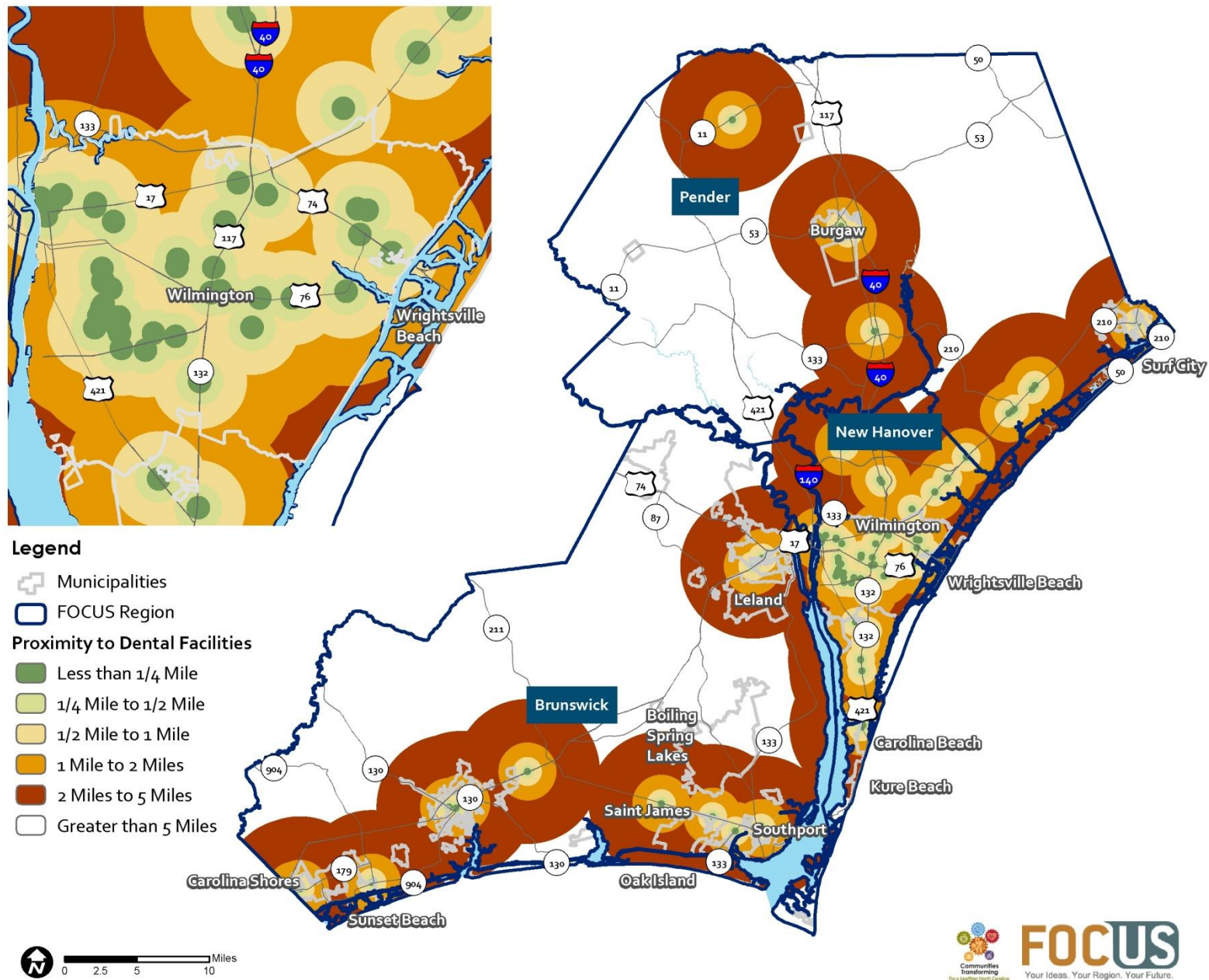




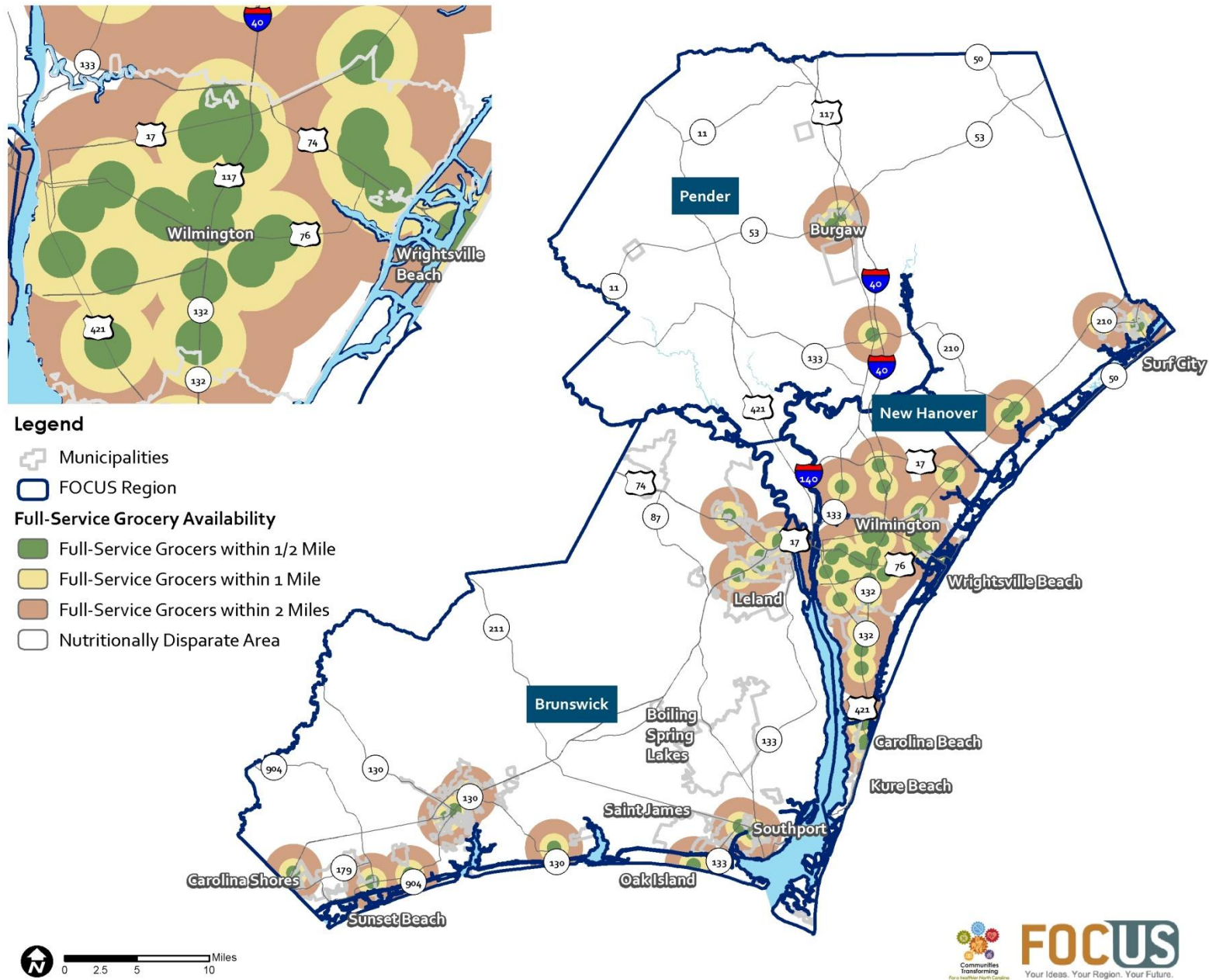




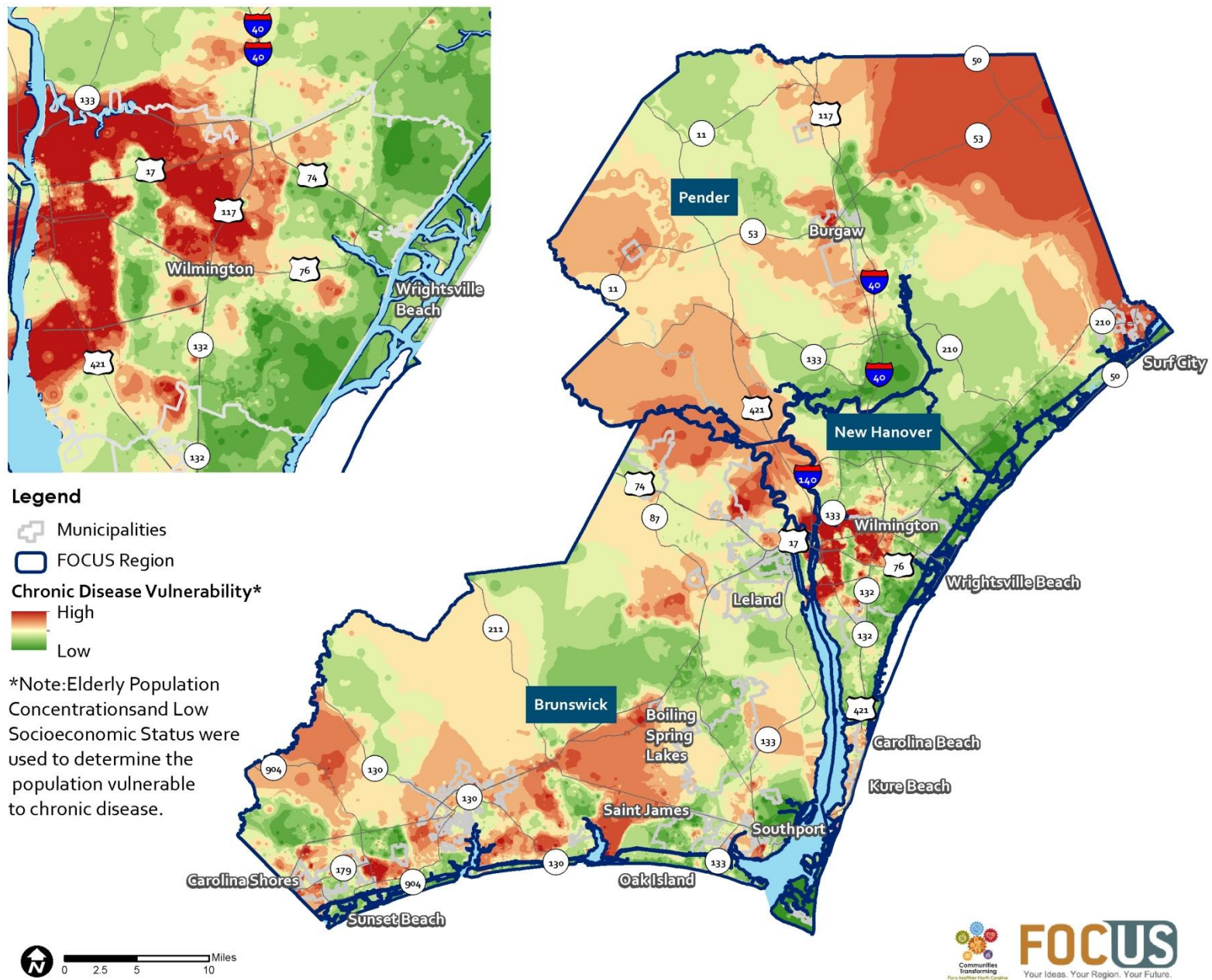






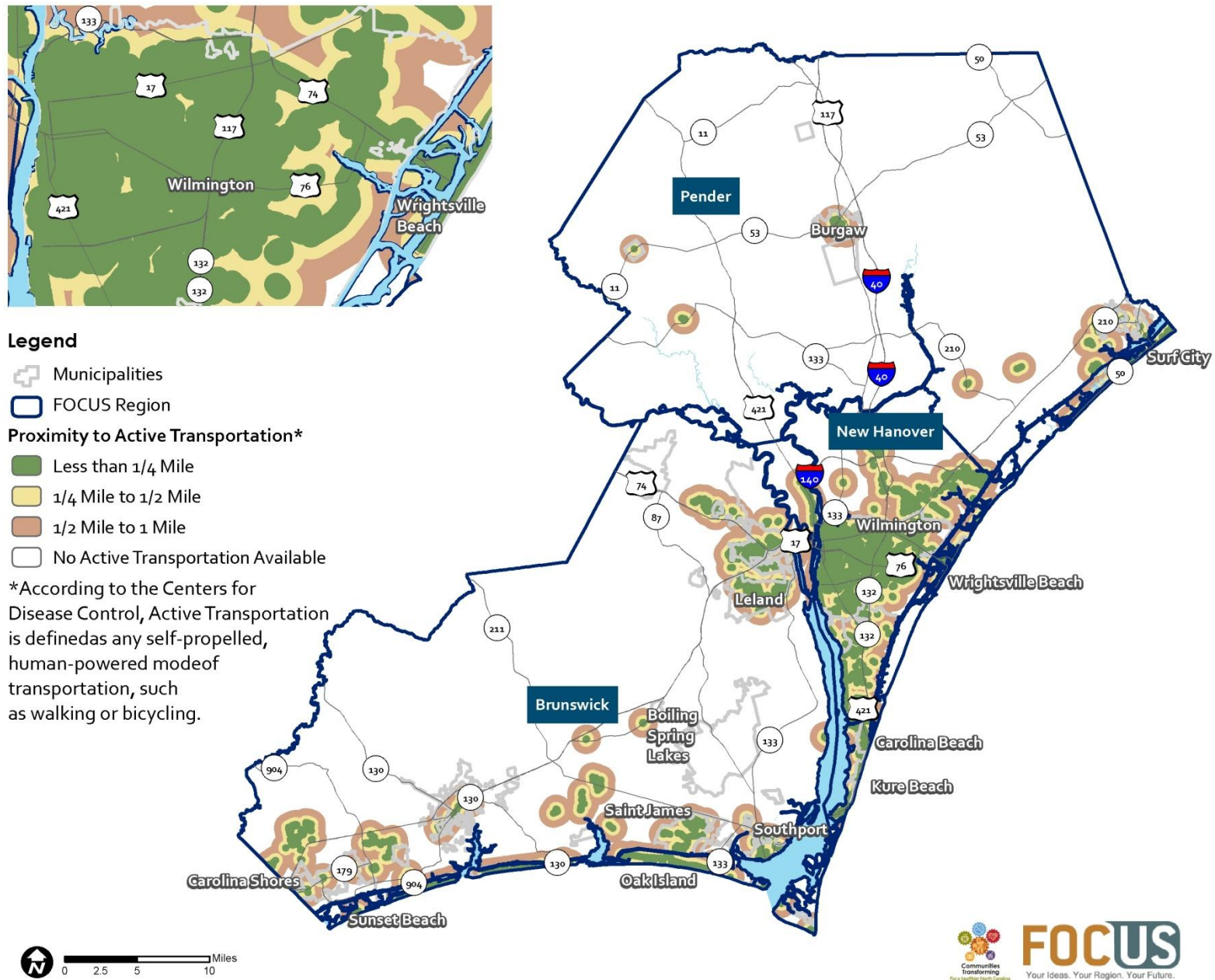


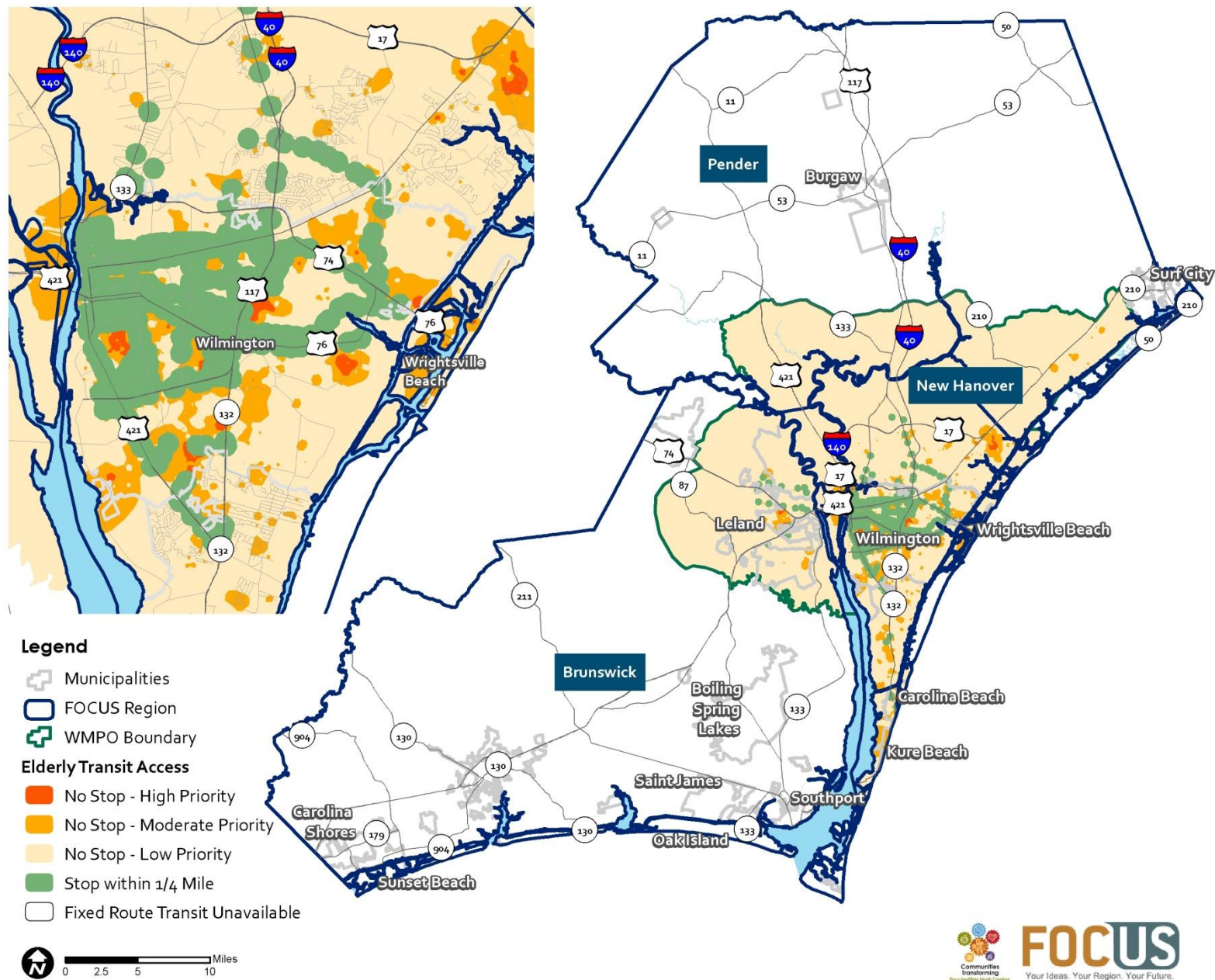
Map 12: Access to Full-Service Grocery Stores



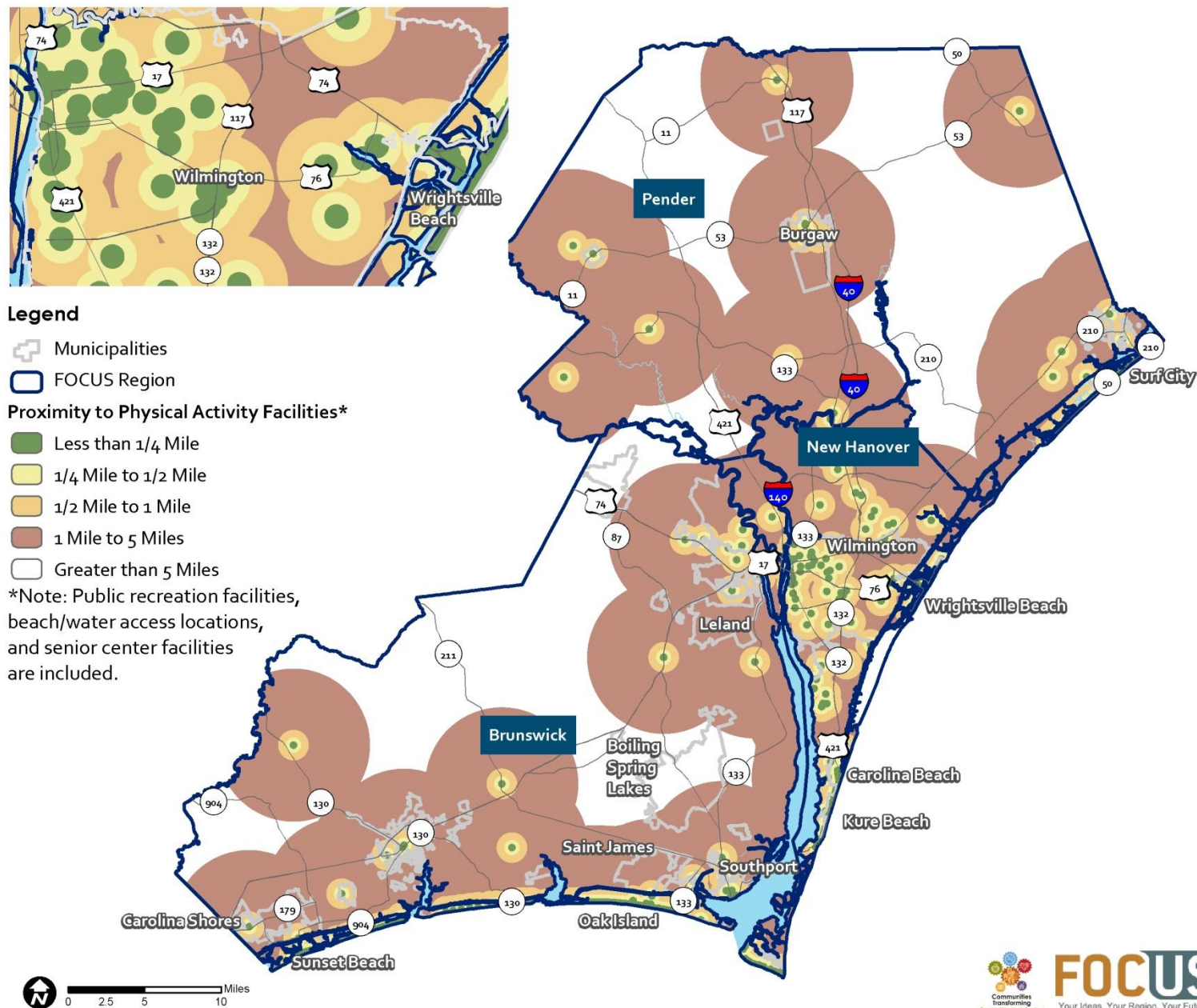
Map 13: Population Vulnerable to Chronic Disease



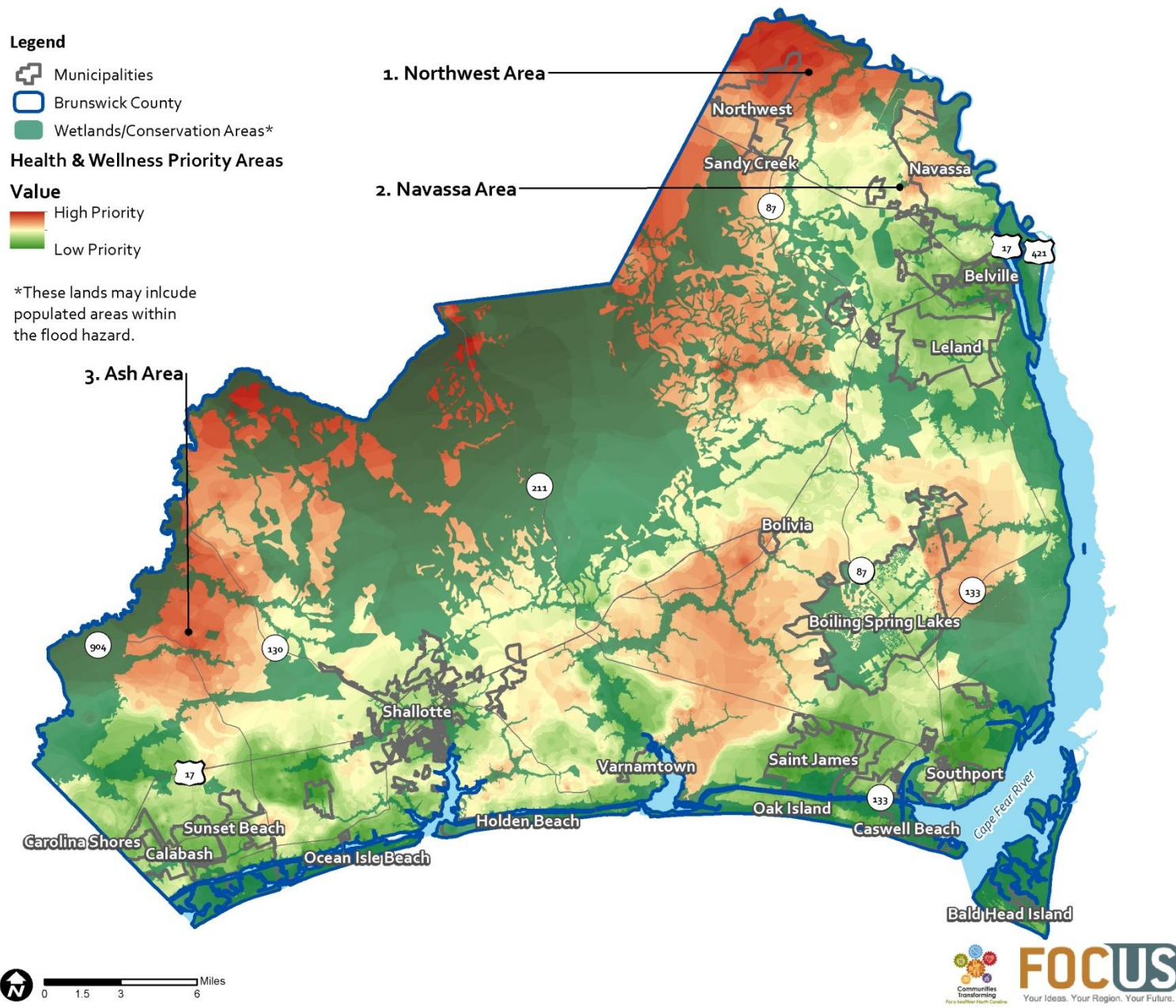






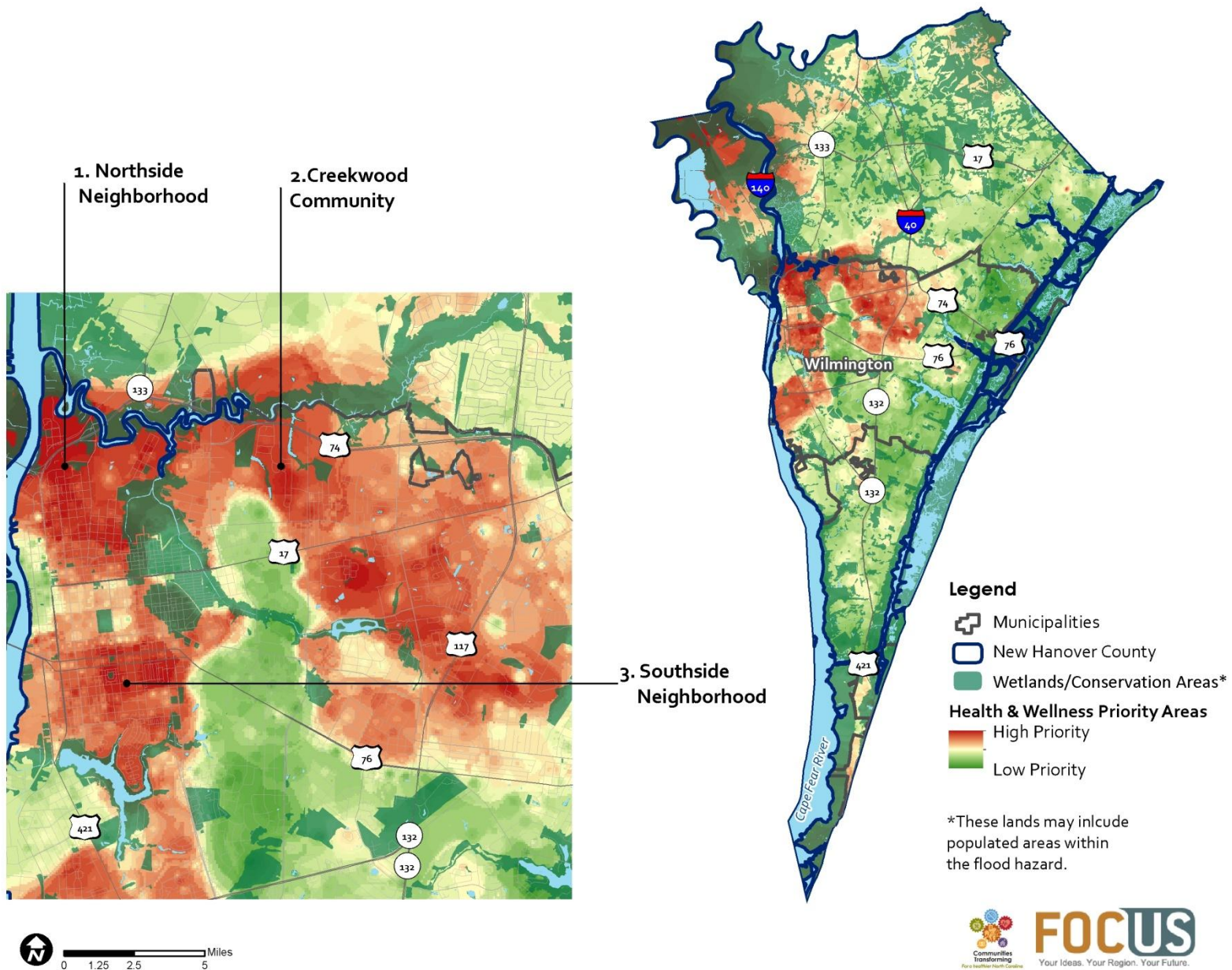


Map 16: Access to Physical Activity



Map 17: Health and Wellness Priority Areas - Brunswick





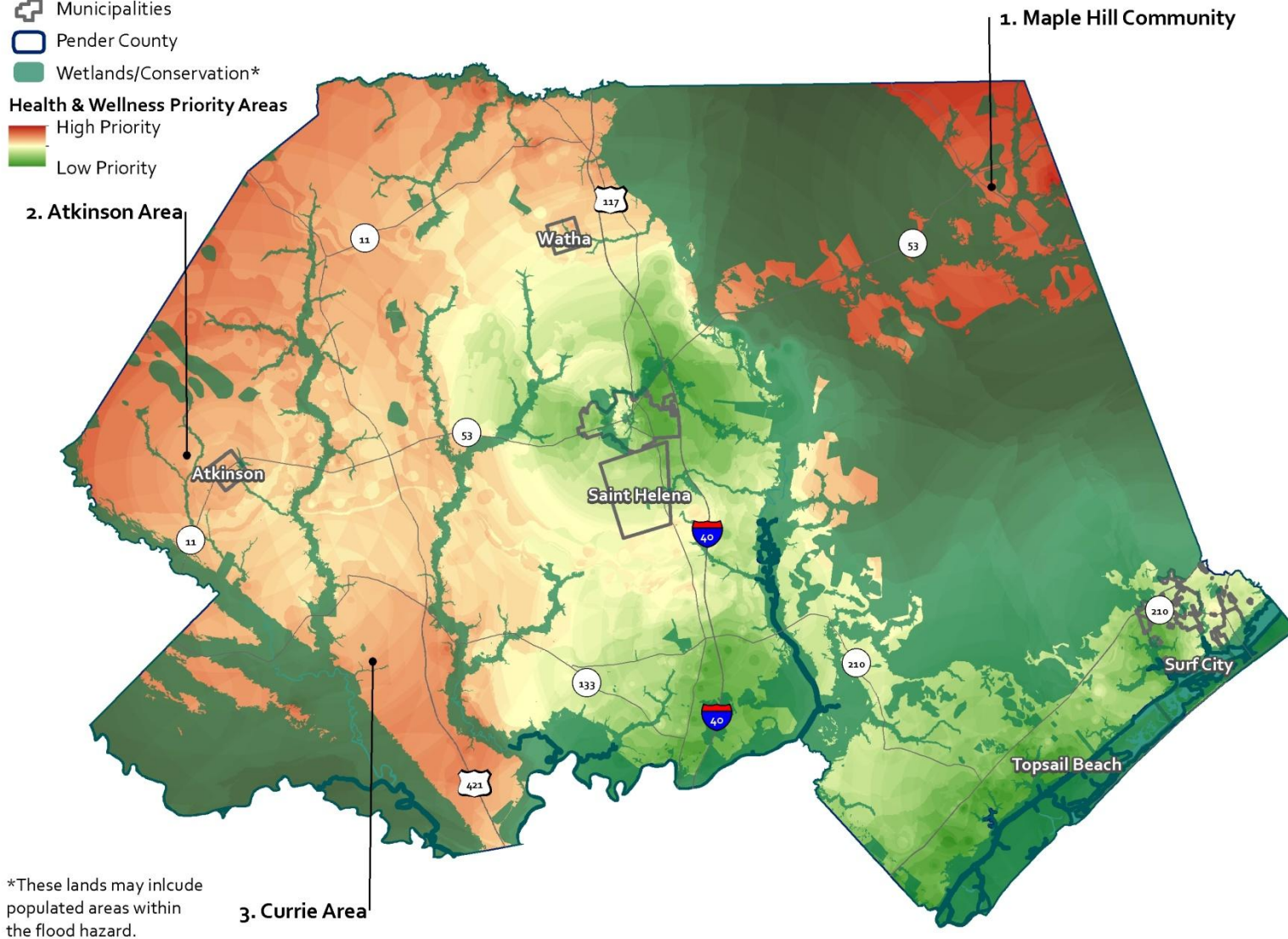
Map 18: Health & Wellness Priority Areas - New Hanover

**Legend**

-  Municipalities
-  Pender County
-  Wetlands/Conservation\*

**Health & Wellness Priority Areas**

-  High Priority
-  Low Priority



Map 19: Health and Wellness Priority Areas - Pender





## Appendix 2: GIS Data Collection & Spatial Analysis Methodology

### Geographic Information Systems (GIS) Data Collection

An extensive component of the regional analysis of health disparities included the collection and creation of various geographic data. Both demographic and physical environment data types were collected and/or created as part of the process. A list of data created or collected and the method for establishment is provided below. The list is provided by data contained within each map in the document, in numerical order.

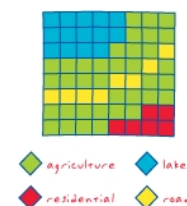
The majority of data created has been established using the following processes (definitions are provided below for terms shown in bold print). Demographic data sourced from 2010 US Census blocks, such as population density, median income, and educational attainment, has been **Interpolated (1)** to **Raster Data (2)** utilizing the **Inverse Distance Weighted (3)** method. Point, linear, and polygon data such as grocery stores, sidewalks, and parks/recreation facilities has been manually digitized and/or automatically created using **Geocoding (4)** based on online research and fieldwork. Proximity analysis has been conducted through the **Euclidean Distance (5)** function. Composite layers such as Socioeconomic Status (SES), Population Vulnerable to Chronic Disease, Elderly Transit Access, and the Health & Wellness Priority Areas has been created through a **Weighted Sum (6)** and/or **Combine (7)** function of **Reclassified (8)** raster data.

### GIS Analysis Definitions

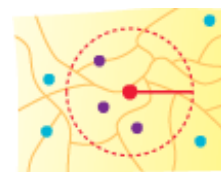
1. **Interpolation (source – ESRI):** The estimation of surface values at unsampled points based on known surface values of surrounding points. Interpolation can be used to estimate elevation, rainfall, temperature, chemical dispersion, or other spatially-based phenomena. Interpolation is commonly a raster operation, but it can also be done in a vector environment using a surface model.



2. **Raster Data (source – ESRI):** A spatial data model that defines space as an array of equally sized cells arranged in rows and columns, and composed of single or multiple bands. Each cell contains an attribute value and location coordinates. Unlike a vector structure, which stores coordinates explicitly, raster coordinates are contained in the ordering of the matrix. Groups of cells that share the same value represent the same type of geographic feature.



3. **Inverse Distance Weighting (source – ESRI):** An interpolation technique that estimates cell values in a raster from a set of sample points that have been weighted so that the farther a sampled point is from the cell being evaluated, the less weight it has in the calculation of the cell's value.



4. **Geocoding (source – ESRI):** A GIS operation for converting street addresses into spatial data that can be displayed as features on a map, usually by referencing address information from a street segment data layer.

5. **Euclidean Distance (source – ESRI):** The straight-line distance between two points on a plane. Euclidean distance, or distance "as the crow flies," can be calculated using the Pythagorean Theorem.
6. **Weighted Sum (source – ESRI):** Overlays several rasters, multiplying each by their given weight and summing them together.
7. **Combine (source – ESRI):** The Combine tool assigns a new number to each unique combination of input values to the VALUE item in the attribute table of the output raster. Additional items are added to the output rasters' attribute table—one for each input raster. The names of the input rasters are assigned to the item names. Each of these items carries the unique input combination of values from the input rasters that produce the output value. These items retain the parentage that was used to produce the values for the output raster.
8. **Reclassification (source – ESRI):** The process of taking input cell values and replacing them with new output cell values. Reclassification is often used to simplify or change the interpretation of raster data by changing a single value to a new value, or grouping ranges of values into single values—for example, assigning a value of 1 to cells that have values of 1 to 50, 2 to cells that range from 51 to 100, and so on.



#### Data Creation/Source by Map Reference:

- Map 1 Regional Location
  - Political boundaries obtained from <http://www.nconemap.com/>
- Map 2 Population Density
  - Persons per Acre: Layer created from interpolated US Census block points by using the inverse distance weighed method. Data based upon persons per acre calculation.
- Map 3 Population Growth 1990-2010
  - Population growth 1990 to 2010: Layer created from interpolated US Census block points by using the inverse distance weighted method. Data based upon calculating the percent change in total population from 1990 to 2010.
- Map 4 Elderly Concentration (65+)
  - Concentration of the Elderly (65+): Layer created from interpolated US Census block points by using the inverse distance weighed method. Data based upon calculating the population density of the persons over the age of 65.
- Map 5 2010 Median Household Income
  - Median Household Income: Layer created from interpolated US Census block points by using the inverse distance weighed method. Data based upon the 2010 median household income.

- Map 6 2010 Persons (25+) with No High School Diploma
  - Persons (25+) with No High School Diploma: Layer created from interpolated US Census block points by using the inverse distance weighed method. Data based upon to percent of individuals over the age of 25 not completing high school.
- Map 7 Socioeconomic Status
  - Socioeconomic Status (SES): Layer created through an equal weighted sum function composed of median household income, persons (25+) with no high school diploma, and unemployment percentage. Data based upon interpolated US Census block points.
- Map 8 2010 Mean Travel Time to Work
  - Mean Travel Time to Work (2010): Layer created from interpolated US Census block points by using the inverse distance weighed method. Data based upon the 2010 mean travel time to work.
- Map 9 2010 Means of Transportation to Work—Drove Alone
  - Means of Transportation to Work – Drove Alone (2010): Layer created from interpolated US Census block points by using the inverse distance weighed method. Data based upon the 2010 means of transportation to work category “drove alone”. Home-based workers are excluded from the analysis.
- Map 10 Proximity to Healthcare Providers
  - Proximity to Healthcare Providers: Layer created using the Euclidean distance function. Data based upon manually digitized and/or geocoded sources.
- Map 11 Proximity to Dental Facilities
  - Proximity to Dental Facilities: Layer created using the Euclidean distance function. Data based upon manually digitized and/or geocoded sources.
- Map 12 Access to Full-Service Grocery Stores
  - Full-Service Grocery Availability: Layer created using the Euclidean distance function. Data based upon manually digitized and/or geocoded sources.
- Map 13 Population Vulnerable to Chronic Disease
  - Chronic Disease Vulnerability: Layer created through an equal weighted sum function composed of concentration of the elderly and socioeconomic status. Data based upon interpolated US Census block points.
- Map 14 Access to Active Transportation
  - Proximity to Active Transportation: Layer created using the Euclidean distance function. Data based upon manually digitized and/or geocoded sources in addition to information collected from WAVE Transit.



- Map 15 Elderly Transit Access
  - Elderly Transit Access: Layer created using the Euclidean distance and combine function. The output was reclassified to reflect level of priority. Data based upon the concentration of elderly and WAVE Transit stops.
- Map 16 Access to Physical Activity
  - Access to Physical Activity Facilities: Layer created using the Euclidean distance function. Data based upon manually digitized, existing, and/or geocoded sources.
- Map 17 Health and Wellness Priority Areas – Brunswick County
  - Health and Wellness Priority Areas: Layer created using the weighted sum function based upon values established by the Health and Wellness Advisory committee.
- Map 18 Health and Wellness Priority Areas – New Hanover County
  - Health and Wellness Priority Areas: Layer created using the weighted sum function based upon values established by the Health and Wellness Advisory committee.
- Map 19 Health and Wellness Priority Areas – Pender County
  - Health and Wellness Priority Areas: Layer created using the weighted sum function based upon values established by the Health and Wellness Advisory committee.

## Appendix 3: Full-Service Grocery Stores

Name	SNAP	EBT	WIC	Fruits/ Vegetables	Telephone	Street #	Dir	Street Name	Street Type	Address 2	City	Zip	County
Food Lion of Calabash	Y	Y	Y	Y	910-579-8807	9869	W	Ocean Highway	Hwy		Calabash	28467	Brunswick
Food Lion of Holden Beach	Y	Y	Y	Y	910-842-4911	1100	SW	Sabbath Home	Rd		Holden Beach	28462	Brunswick
Food Lion of Leland	Y	Y	Y	Y	910-383-1467	1735		Reed	Rd		Leland	28451	Brunswick
Food Lion of Leland	Y	Y	Y	Y	910-343-1997	103		Village	Rd		Leland	28451	Brunswick
Food Lion of Oak Island	Y	Y	Y	Y	910-278-7291	5901	E	Oak Island	Dr		Oak Island	28465	Brunswick
Food Lion of Shallotte	Y	Y	Y	Y	910-754-6444	301	S	Willis	Dr		Shallotte	28470	Brunswick
Food Lion of Southport	Y	Y	Y	Y	910-457-9099	4930	SE	Long Beach	Rd		Southport	28461	Brunswick
Food Lion of Sunset Beach	Y	Y	Y	Y	910-579-8395	1680		Seaside	Rd		Sunset Beach	28468	Brunswick
Harris Teeter - Waterford Commercial Center	Y	Y	Y	Y	910-371-3944	2021		Old Regent	Way		Leland	28451	Brunswick
Hills Super Market	Y	Y	Y	Y	910-754-3636	5001		Main	St		Shallotte	28470	Brunswick
IGA - Surf City Super Market	N	Y	N	Y	910-328-3961	106	S	Topsail	Dr		Surf City	28445	Brunswick
Island Market	N	N	N	Y	910-579-0815	430	S	Sunset Beach	Blvd		Sunset Beach	28468	Brunswick
Lowes Foods of Leland	Y	Y	Y	Y	910-371-5544	1152	E	Cutlar	Xing		Leland	28451	Brunswick
Lowes Foods of Ocean Isle Beach	Y	Y	Y	Y	910-579-9311	6278		Beach	Dr	Unit 5	Ocean Isle Beach	28469	Brunswick
Lowes Foods of Shallotte	Y	Y	Y	Y	910-754-8225	5051-3		Main	St		Shallotte	28459	Brunswick
Lowes Foods of Southport	Y	Y	Y	Y	910-457-0657	4967	SE	Long Beach	Rd		Southport	28461	Brunswick
Maritime Market	N	N	N	Y	910-457-7450	8		Maritime	Way		Bald Head Island	28461	Brunswick
Piggly Wiggly - Leland	Y	Y	Y	Y	910-371-2253	112 A		Village	St		Leland	28451	Brunswick

Name	SNAP	EBT	WIC	Fruits/ Vegetables	Telephone	Street #	Dir	Street Name	Street Type	Address 2	City	Zip	County
Walmart Supercenter - Leland	Y	Y	Y	Y	910-383-1769	1112		New Pointe	Blvd		Leland	28451	Brunswick
Walmart Supercenter - Shallotte	Y	Y	Y	Y	910-754-2880	4540		Main	St	B 3079	Shallotte	28459	Brunswick
Walmart Supercenter - Southport	Y	Y	Y	Y	910-454-9909	1675	N	Howe	St		Southport	28461	Brunswick
Country Fresh Produce	Y	Y	Y	Y	910-763-6122	2069		Carolina Beach	Rd		Wilmington	28401	New Hanover
Everybody's Super Market	Y	Y	Y	Y	910-763-4444	1022		Greenfield	St		Wilmington	28401	New Hanover
Food Lion of Carolina Beach	Y	Y	Y	Y	910-458-5410	1401	N	Lake Park	Blvd		Carolina Beach	28428	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-452-4192	6400-1		Carolina Beach	Rd		Wilmington	28412	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-791-0339	3905		Independence	Blvd	Unit A	Wilmington	28412	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-395-2676	3600	S	College	Rd		Wilmington	28412	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-794-8138	2432	S	17th	St		Wilmington	28401	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-762-3269	1929		Oleander	Dr		Wilmington	28403	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-256-3137	1319		Military Cutoff	Rd		Wilmington	28405	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-343-1997	45	S	Kerr	Ave		Wilmington	28403	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-793-1635	6932		Market	St	Suite A	Wilmington	28411	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-251-7885	2601-A		Castle Hayne	Rd		Wilmington	28401	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-686-2492	8207		Market	St		Wilmington	28405	New Hanover
Food Lion of Wilmington	Y	Y	Y	Y	910-790-9938	3211		Enterprise	Dr		Wilmington	28405	New Hanover
Harris Teeter - Beau Rivage Marketplace	Y	Y	Y	Y	910-796-3091	5920		Carolina Beach	Rd		Wilmington	28412	New Hanover

Name	SNAP	EBT	WIC	Fruits/ Vegetables	Telephone	Street #	Dir	Street Name	Street Type	Address 2	City	Zip	County
Harris Teeter - College Rd Location	Y	Y	Y	Y	910-452-9242	820	S	College	Rd		Wilmington	28403	New Hanover
Harris Teeter -Hanover Center	Y	Y	Y	Y	910-343-4216	3501		Oleander	Dr	Unit 18	Wilmington	28403	New Hanover
Harris Teeter - Long Leaf Mall	Y	Y	Y	Y	910-791-4505	2800	S	College	Rd		Wilmington	28412	New Hanover
Harris Teeter - Lumina Commons	Y	Y	Y	Y	910-256-2015	1940		Eastwood	Rd		Wilmington	28403	New Hanover
Harris Teeter - Mayfaire	Y	Y	Y	Y	910-256-1071	6805		Parker Farm	Rd		Wilmington	28405	New Hanover
Harris Teeter - Oak Landing Shopping Center	Y	Y	Y	Y	910-681-0571	8260		Market	St		Wilmington	28411	New Hanover
Harris Teeter - Ogden Plaza	Y	Y	Y	Y	910-392-2154	6840	N	Market	St		Wilmington	28405	New Hanover
La Huerta Fresh Market	N	N	N	Y	910-799-6167	830	S	Kerr	Ave		Wilmington	28403	New Hanover
Lowes Foods of Wilmington	Y	Y	Y	Y	910-796-8330	805		Pine Grove	Dr		Wilmington	28403	New Hanover
Lowes Foods of Wilmington	Y	Y	Y	Y	910-796-9616	341	S	College	Rd	Unit 37	Wilmington	28403	New Hanover
Lowes Foods of Wilmington	Y	Y	Y	Y	910-392-7230	2316	N	College	Rd		Wilmington	28405	New Hanover
Lowes Foods of Wilmington (Monkey Junction)	Y	Y	Y	Y	910-790-5335	5309		Carolina Beach	Rd		Wilmington	28412	New Hanover
Roberts Market	N	N	N	Limited	910-256-2641	32	N	Lumina	Ave		Wrightsville Beach	28480	New Hanover
Saigon Market Oriental Grocery	Y	Y	Y	Y	910-793-9911	4507		Franklin	Ave		Wilmington	28403	New Hanover



Name	SNAP	EBT	WIC	Fruits/ Vegetables	Telephone	Street #	Dir	Street Name	Street Type	Address 2	City	Zip	County
Sea Merchants Food Store	Y	Y	Y	Y	910-458-7409	257		Cape Fear	Blvd		Carolina Beach	28428	New Hanover
Target	Y	Y	Y	Y	910-395-5057	4711		New Centre	Dr		Wilmington	28405	New Hanover
The Fresh Market	Y	Y	Y	Y	910-256-3524	1060		International	Dr		Wilmington	28405	New Hanover
The Veggie Wagon	Y	Y	Y	Y	910-805-3014	608 B	S	Lake Park	Blvd		Carolina Beach	28428	New Hanover
Tidal Creek Co-Op	Y	Y	Y	Y	910-799-2667	5329		Oleander	Dr		Wilmington	28403	New Hanover
Trader Joe's	Y	Y	N	Y	910-395-5173	1437	S	College	Rd		Wilmington	28403	New Hanover
Walmart Supercenter - Monkey Junction	Y	Y	Y	Y	910-452-0944	5135		Carolina Beach	Rd		Wilmington	28412	New Hanover
Walmart Supercenter - Wilmington	Y	Y	Y	Y	910-392-4034	5226		Sigmon	Rd		Wilmington	28403	New Hanover
Whole Foods	Y	Y	Y	Y	910-777-2499	3804		Oleander	Dr		Wilmington	28403	New Hanover
Food Lion of Burgaw	Y	Y	Y	Y	910-259-5058	602	N	US Hwy 117	Hwy		Burgaw	28425	Pender
Food Lion of Hampstead	Y	Y	Y	Y	910-270-9703	14564		US Hwy 17	Hwy		Hampstead	28443	Pender
Food Lion of Rocky Point	Y	Y	Y	Y	910-675-2156	8057	S	US Hwy 117	Hwy	Unit 11	Rocky Point	28457	Pender
Food Lion of Surf City	Y	Y	Y	Y	910-329-1163	13601		NC Hwy 50	Hwy		Surf City	28445	Pender
Harris Teeter - Surf City Crossing	Y	Y	Y	Y	910-329-0711	203		Alston	Blvd		Hampstead	28443	Pender
Lowes Foods of Hampstead	Y	Y	Y	Y	910-270-6300	17230		US Hwy 17	Hwy		Hampstead	28443	Pender
Piggly Wiggly - Burgaw	Y	Y	Y	Y	910-259-3373	103	S	Dudley	St		Burgaw	28425	Pender

## Appendix 4: Recreational Opportunities

<u>Parks &amp; Recreational Facilities</u>	<u>County</u>	<u>Address</u>
Alvin C Caviness Park	Brunswick	Owens Street, Southport
Bird Island	Brunswick	40th Street and West Main Street, Sunset Beach
Brunswick Nature Park	Brunswick	2601 River Road (NC 133), Winnabow
Brunswick River Park	Brunswick	580 River Road, Leland
Calabash Community Park	Brunswick	868 Persimmon Road, Calabash
Cedar Grove Park	Brunswick	750 Grove Trail Southwest, Supply
Dutchman Creek Park	Brunswick	4750 Fish Factory Rd SE, Southport
Ferry Landing Park	Brunswick	Shallotte Blvd & 7th Street, Ocean Isle Beach
Franklin Square Park	Brunswick	105 E Moore Street, Southport
Keziah Park	Brunswick	Moore and Lord Street, Southport
Kingsley Street Park	Brunswick	Kingsley Street, Southport
Leland Community Park	Brunswick	1490 Village Road NE, Leland
Leland Municipal Park	Brunswick	102 Town Hall Drive, Leland
Lockwood Folly District Park	Brunswick	430 Green Swamp Road, Supply
Lowe-White Memorial Park	Brunswick	Leonard Street and Willis Drive, Southport
Malcolm Register Park	Brunswick	NE 52nd Street, Oak Island
Middleton Park	Brunswick	4700 E Oak Island Drive, Oak Island
Navassa Park	Brunswick	800 Park Avenue, Navassa
Northwest District Park	Brunswick	1937 Andrew Jackson Hwy NE, Leland
Oak Island Nature Center & Register Park	Brunswick	5202 E Yacht Drive, Oak Island
Oak Island Skate Park	Brunswick	SE 49th Street, Oak Island
Ocean Isle Beach Park	Brunswick	6483 Old Georgetown Road, Ocean Isle Beach
Riverside Park	Brunswick	Hwy 130 and Main Street, Shallotte

<u>Parks &amp; Recreational Facilities</u>	<u>County</u>	<u>Address</u>
Shallotte District Park & Dog Park	Brunswick	5550 Main Street, Shallotte
Smithville District Park	Brunswick	8340 River Rd SE, Southport
Sturgeon Creek Park (under construction)	Brunswick	844 Appleton Way, Leland
Sunset Beach Waterfront Park	Brunswick	Sunset Blvd, Sunset Beach
Tidalwaves Canoe Dock	Brunswick	SE 31st Street, Oak Island
Town Creek District Park	Brunswick	6420 Ocean Hwy East, Winnabow
Waccamaw Park	Brunswick	5855 Waccamaw School Rd NW, Ash
Waterfront Park	Brunswick	Bay Street, Southport
Westgate Nature Park	Brunswick	1260 Westgate Drive, Leland
William "Bill" Smith Park & Salty Dog Park	Brunswick	4410 Fish Factory Road, Oak Island
1898 Park	New Hanover	1018 N 3rd Street, Wilmington
4th Street Park	New Hanover	4th Street & Nixon Street, Wilmington
Airlie Gardens	New Hanover	300 Airlie Road, Wilmington
Alderman Park	New Hanover	3800 Canterbury Road, Wilmington
Anne McCrary Park	New Hanover	4000 Randall Parkway, Wilmington
Archie Blue Community Park	New Hanover	1306 Stanley Street, Wilmington
Arrowhead Park	New Hanover	720 Arnold Road, Wilmington
Bailey Park	New Hanover	20 N Front Street, Wilmington
Beaumont Park	New Hanover	101 Wayne Drive, Wilmington
Bicentennial Park	New Hanover	206 N 5th Street, Wilmington
Bijou Park	New Hanover	209 N Front Street, Wilmington
Blair-Noble Park	New Hanover	6510 Market Street, Wilmington
Blue Clay Bike Park	New Hanover	3840 Juvenile Center Road, Castle Hayne
Bullock Park	New Hanover	2013 Market Street, Wilmington

<u>Parks &amp; Recreational Facilities</u>	<u>County</u>	<u>Address</u>
Cameron Park	New Hanover	245 Southern Blvd, Wilmington
Cape Fear Optimist Park	New Hanover	3222 North Kerr Avenue, Wilmington
Flemington Soccer Complex	New Hanover	205 Sutton Steam Plant Road, Wilmington
Carolina Beach Lake Park	New Hanover	Atlantic Avenue & S Lake Park Blvd, Carolina Beach
Carolina Beach State Park	New Hanover	1010 B Road, Carolina Beach
Carolina Courtyard Park	New Hanover	201 North 3rd Street, Wilmington
Castle Hayne Park	New Hanover	4700 Old Avenue, Wilmington
Causeway Drive Park	New Hanover	Causeway Drive, Wrightsville Beach
Church & Nun Park	New Hanover	1922 Nun Street, Wilmington
Claude Howell Park	New Hanover	200 S Water Street, Wilmington
Dram Tree Park	New Hanover	602 Surry Street, Wilmington
Empie Park & Dog Park	New Hanover	3405 Park Avenue, Wilmington
Fort Fisher State Recreation Area	New Hanover	1000 Loggerhead Road, Carolina Beach
Godwin Park	New Hanover	215 Shipyard Blvd, Wilmington
Greenfield Park & Skate Park	New Hanover	1739 Burnett Blvd, Wilmington
Greensboro Street Park	New Hanover	West Greensboro Street, Wrightsville Beach
Halyburton Memorial Park	New Hanover	4099 S 17th Street, Wilmington
Hanover Heights Park	New Hanover	801 Adelaide Drive, Wilmington
Hemenway Park	New Hanover	507 McRae Street, Wilmington
Hugh McRae Athletic Complex	New Hanover	4305 Shipyard Boulevard, Wilmington
Hugh McRae Park	New Hanover	314 Pine Grove Drive, Wilmington
Independence Park (Planning Stages)	New Hanover	3800 Canterbury Road, Wilmington
Innis Park	New Hanover	102 N 3rd Street, Wilmington
Island Drive Mini Park	New Hanover	Island Drive, Wrightsville Beach



<u>Parks &amp; Recreational Facilities</u>	<u>County</u>	<u>Address</u>
James EL Wade Park	New Hanover	3500 Bethel Road, Wilmington
Joe Eakes Park	New Hanover	Avenue K, Kure Beach
John & Ruth Burnett Natural Area (Future Park)	New Hanover	6500 River Road, Wilmington
Kennedy Park	New Hanover	2108 Plaza Drive, Wilmington
Kings Grant Park	New Hanover	5027 Lord Byron Road, Wilmington
Kure Beach Ocean Front Park	New Hanover	Avenue K & Atlantic Avenue, Kure Beach
Lee's Nature Park	New Hanover	Causeway Drive, Wrightsville Beach
Legion Sports Complex	New Hanover	2139 Carolina Beach Road, Wilmington
Love Grove	New Hanover	1601 Wynnwood Drive, Wilmington
Maides Park	New Hanover	1101 Manly Road, Wilmington
MarStella Park	New Hanover	202 Marstellar Street, Wilmington
Mary Bridgers Park	New Hanover	1925 Chestnut Street, Wilmington
Middle Sound Park (Future Park)	New Hanover	7217 Dunbar Road, Wilmington
Mike Chappell Park	New Hanover	501 Dow Rd S, Carolina Beach
Monterey Heights Park	New Hanover	401 Cathay Road, Wilmington
Mothers Community Park	New Hanover	3210 Camden Circle, Wilmington
Northside Park	New Hanover	610 Bess Street, Wilmington
Nunalee Park	New Hanover	416 S 17th Street, Wilmington
Ogden Park - Gordon Road Fields & Picnic Area	New Hanover	615 Ogden Park Drive, Wilmington
Ogden Park - Market Street Fields	New Hanover	225 Ogden Park Drive, Wilmington
Olsen Park	New Hanover	6017 Murrayville Road, Wilmington
Optimist Park	New Hanover	1650 Front Street, Wilmington
Parkwood Recreational Area	New Hanover	4827 Canetuck Road, Wilmington
Piney Ridge Nature Preserve (Alderman Park)	New Hanover	3800 Canterbury Road, Wilmington

<u>Parks &amp; Recreational Facilities</u>	<u>County</u>	<u>Address</u>
Rankin Park (Portia Mills Hines Park)	New Hanover	40 N 10th Street, Wilmington
River Road Park	New Hanover	6500 River Road, Wilmington
River Side Park	New Hanover	6710 Old Bridgesite Road, Wilmington
Riverfront Park	New Hanover	5 N Water Street, Wilmington
Robert Strange Park	New Hanover	401 S 8th Street, Wilmington
Seagate Park (Future Park)	New Hanover	118 Hinton Avenue, Wilmington
Smith Creek Park	New Hanover	633 Shenandoah Street, Wilmington
Snows Cut Park	New Hanover	9420 River Road, Wilmington
South Channel Mini Park	New Hanover	South Channel Drive, Wrightsville Beach
Southgate Park	New Hanover	201 Pershing Court, Wilmington
Sunset & Adams Park	New Hanover	Sunset Ave & Adams Street, Wilmington
Thomas B Lilly Park	New Hanover	502 Forest Hills Drive, Wilmington
Tower Park	New Hanover	910 Wooster Street, Wilmington
Trails End Park	New Hanover	613 Trails End Road, Wilmington
Tree Garden @ Greenfield Lake	New Hanover	1702 Burnett Blvd, Wilmington
Veterans Park	New Hanover	835 Halyburton Memorial Parkway, Wilmington
Wallace Park	New Hanover	2110 Market Street, Wilmington
Wrightsboro Park	New Hanover	3091 Castle Hayne Road, Wilmington
Wrightsville Beach Arboretum	New Hanover	US 74, Wrightsville Beach
Wrightsville Beach Park	New Hanover	98 Bob Sawyer Drive, Wrightsville Beach
Wynn Plaza Waterfront Park	New Hanover	Wrightsville Beach
Hampstead Kiwanis Park	Pender	586 Sloop Point Loop Road, Hampstead
Hampstead Intracoastal Waterway Access	Pender	Hampstead
Hankins Park	Pender	310 North Walker Street, Burgaw

<u>Parks &amp; Recreational Facilities</u>	<u>County</u>	<u>Address</u>
Harrell Memorial Park	Pender	108 East Ashe Street, Burgaw
Hoggard Park	Pender	N Rankin Street & E Church Street, Atkinson
Johnson Park	Pender	South Walker Street & East Hayes Street, Burgaw
Kenneth Batts Family Park	Pender	South Topsail Drive, Surf City
Millers Pond Park	Pender	12762 US Hwy 117, Rocky Point
Moores Creek National Battlefield	Pender	40 Patriots Hall Drive, Currie
Nelva R Albury Recreation Area	Pender	Highway 210 and Broadway Street, Surf City
Pender Memorial Park	Pender	601 South Smith Street, Burgaw
Rotary Park	Pender	Industrial Drive, Burgaw
Soundside Park	Pender	Roland Avenue, Surf City

<u>Pools</u>	<u>County</u>	<u>Address</u>
Legion Pool	New Hanover	2131 Carolina Beach Road, Wilmington
Robert Strange Pool	New Hanover	410 S 10 <sup>th</sup> Street, Wilmington
Northside Pool & Splash Pad	New Hanover	750 Bess Street, Wilmington

<u>School Physical Activity Locations</u>	<u>County</u>	<u>Address</u>
Anderson Elementary School	New Hanover	455 Halyburton Memorial Parkway, Wilmington
Ashley High School	New Hanover	555 Halyburton Memorial Parkway, Wilmington
Bradley Creek Elementary School Soccer Fields	New Hanover	6211 Greenville Loop Road, Wilmington
Eaton Elementary Soccer Fields	New Hanover	6701 Gordon Road, Wilmington
Hoggard High School Fields	New Hanover	4305 Shipyard Boulevard, Wilmington
Laney High School Tennis Courts	New Hanover	2700 North College Road, Wilmington
Murray Middle School	New Hanover	655 Halyburton Memorial Parkway, Wilmington
Myrtle Grove Middle School Park/Athletic Fields	New Hanover	901 Piner Road, Wilmington
Roland-Grise Middle School Soccer Field	New Hanover	4412 Lake Avenue, Wilmington
Trask Middle School Park/Athletic Fields	New Hanover	2900 South College Road, Wilmington

<u>Community Centers</u>	<u>County</u>	<u>Address</u>
Boxing & Physical Fitness Center	New Hanover	302 S 10th Street, Wilmington
MLK Community Center	New Hanover	401 S 8th Street, Wilmington
Maides Park Community Center	New Hanover	1101 Manly Road, Wilmington
Fit for Fun Center	New Hanover	302 S 10th Street, Wilmington
Hemenway Community Center	New Hanover	507 McRae Street, Wilmington
Canetuck Community Center	Pender	6098 Canetuck Road, Currie
Caswell Community Center	Pender	Slocum Trail Road, Atkinson
Edgecombe Community Center	Pender	Highway 17, Hampstead
Joint Community Outreach Center	Pender	17808 Highway 210, Rocky Point
Maple Hill Resource Center	Pender	Maple Hill School Road, Maple Hill
Surf City Community Center	Pender	201 Community Center Drive, Surf City
Willard Outreach Organization	Pender	9955 NC Hwy 11, Willard



<u>Senior Centers</u>	<u>County</u>	<u>Address</u>
Leland Senior Center	Brunswick	1490 Village Road, Leland
Shallotte Senior Center	Brunswick	5040 Main Street, Shallotte
Southport Senior Center	Brunswick	1513 N Howe Street, Suite 1, Southport
Katie B Hines Senior Center	New Hanover	308 Cape Fear Blvd, Carolina Beach
NHC Senior Resource Center	New Hanover	2222 S College Road, Wilmington
Heritage Place	Pender	901 S Walker Street, Burgaw
Topsail Senior Center	Pender	20959 US Hwy 17, Hampstead

## Legend

-  Municipalities
-  FOCUS Region
-  Wetlands/Conservation Areas\*

\*These lands may include populated areas within the flood hazard.

