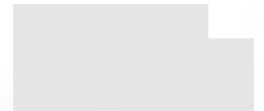
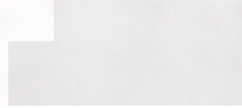


NorthEast Area Study

State of the Region | Summary Report | January 2014



A technical report describing the people, places, economies, and environmental resources available to the people of the Northeast Area

Capital Area Metropolitan Planning Organization

prepared by Stantec Consulting Services and J S Lane Company



State of the Region

Northeast Area Study

Our Future is

Mobility Choices

Preservation

Return on Investment

Job Creation

Community Gateways

Jobs-to-Housing Balance



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Imagine if we all came together for a while to talk about our ideas for making transportation choices great for us and our children, and along with it our vision of what we thought our place would look like; how we would preserve important places like farms, water supplies, and historic buildings; and what that would say to our children about what we thought was important to us?

Project Snapshot

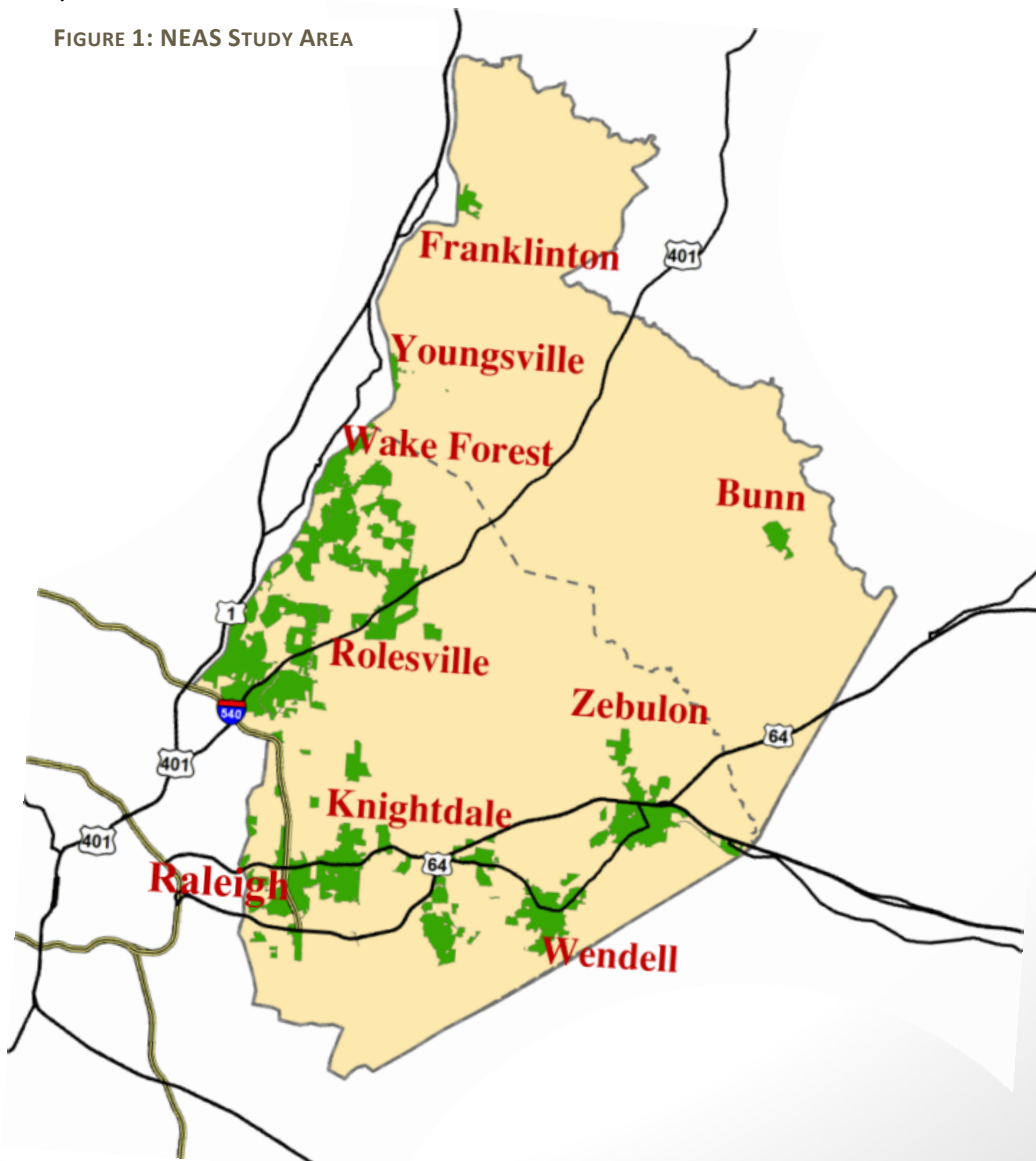
The Northeast Area Study (NEAS) focuses on an region that continues to be an attractive place for growth, development, recreation and environmental integrity. The growing communities of Wake Forest, Knightdale, Raleigh, Wendell, Zebulon, Rolesville, Bunn, Franklinton, and Youngsville surrounded by a network of farmland in Franklin and Wake Counties make up the NEAS study area.

The State of the Region showcases the existing conditions, context, and background on Livability, Health Assessment, Natural Environment, Economic Vitality, and Regional Multi-Modal Mobility. *Peek inside and get familiar with the communities.....*

Partners

The Capital Area Metropolitan Planning Organization (CAMPO) is conducting this study to identify a sustainable transportation strategy for the NEAS study area, shown in Figure 1. The process embraces an integrated approach that considers land use, development, environment, and transportation simultaneously. The future plan is being established in partnership with Bunn, Franklinton, Knightdale, Raleigh, Rolesville, Wake Forest, Wendell, Youngsville, and Zebulon as well as Wake and Franklin Counties, Triangle Transit, NCDOT, and other transportation and land regulatory stakeholders.

FIGURE 1: NEAS STUDY AREA



Communities

The NEAS study area encompasses a unique mix of small towns, suburbs and farming communities painted across a broad expanse of rural tapestry in both Wake and Franklin County. The area contains unique and diverse populations that enjoy their own communities without necessarily feeling strong ties to other parts of the planning area. Comprised of both emerging suburban communities such as Wake Forest and Knightdale, and rural areas such as Bunn and Franklinton, this study area presents a unique opportunity for future development and growth. In addition to geographic diversity, economic and cultural diversity also exists within the study area, with this section of Wake County having the highest instance of non-English speaking residents in the County.

Wake County

Wake County is the 9th fastest growing county in the US with nearly 1 million citizens. Wake County is part of the Research Triangle metropolitan region, which encompasses the country's largest industrial park for high-tech and biotech research as well as textiles.

Wake Forest

Wake Forest is located just north of Raleigh with a population of over 30,000 and growing. In 2007, the town was listed by Forbes magazine as the 20th fastest growing suburb in America, with a 73% increase in population between 2000 and 2006. Wake Forest is home to the Falls Lake State Recreation Area and many other parks, community centers, and is home to the Southeastern Baptist Theological Seminary.



Wake Forest



Knightdale



Raleigh



Rolesville



Wendell

Knightdale

Knightdale is a residential community just east of Raleigh with the population doubling in the past two decades to the current population of over 11,000. The town is very family-oriented with five public schools, community parks and retail shopping.

Raleigh

Raleigh is the capital of North Carolina and is part of the Research Triangle Park, in collaboration with Durham and Chapel Hill. The population is over 400,000 and growing. Only a small portion of Raleigh is located within the NEAS study area.

Rolesville

Rolesville began as a small farming town; however most of the family farms in Rolesville have been developed into residential or commercial subdivisions, allowing Rolesville to become one of the top three fastest growing communities in NC every year since 2005. The town is located in Wake County with a population approaching 4,000 citizens.

Wendell

Wendell is a growing small town in Wake County with approximately 6,000 residents. Wendell has a walkable downtown corridor with a variety of housing and options for recreation.



Zebulon

Zebulon

Zebulon is the easternmost town in Wake County with a population near 5,000 citizens. The town is home to the Carolina Mudcats minor league baseball team and offers a small town atmosphere.



Youngsville

Franklin County

Franklin County offers a relaxed rural and suburban lifestyle to approximately 60,000 residents. The county borders Wake County and is experiencing significant growth due to its resources and proximity to the adjacent employers in Wake County and specifically the Research Triangle.

Youngsville



Bunn

Youngsville is a growing town in southwestern Franklin County, rich in history with a population near 1,100 residents. The town is known for its rural charm and is a desired destination for families and businesses.

Bunn

Bunn is a small rural town in Franklin County with a population near 400 residents. The town is surrounded by farms, with acres of corn, tobacco, and soybeans.



Franklinton

Franklinton

Franklinton is a small town, approximately 2,000 citizens, located in Franklin County. The town is home to Novozymes North America Inc., the largest multi-purpose enzyme manufacturing plant in the United States.

Plans

The previous planning efforts for the State, Region, Counties, Municipalities, and Towns have been reviewed and are noted in each section. In addition, three technical memorandums are referenced. These are integral documents within the study that provide comprehensive analyses of specific planning issues. The technical memorandums noted include:

- **RAIL CROSSING TECHNICAL MEMORANDUM, SUMMER 2013,**
- **HOT SPOTS AND CONCEPT DESIGNS TECHNICAL MEMORANDUM, SUMMER 2013,**
- **PLAN AND POLICY REVIEW TECHNICAL MEMORANDUM, SPRING 2013,** and
- **MARKET PROFILE ASSESSMENT TECHNICAL MEMORANDUM, SPRING 2013.**

Livability & Health Assessment

Livability is about creating plans, programs and projects in support of a larger community vision and sustainable goals. It requires a cross-disciplinary approach that is customized to different scales and local community conditions – no single prototype or “livability solution” applies to all.

The land use and development opportunities of a community partnered with the destinations and character of the community are the pallet for creating a livable and healthy community.



Land Use & Development Status

Existing Conditions

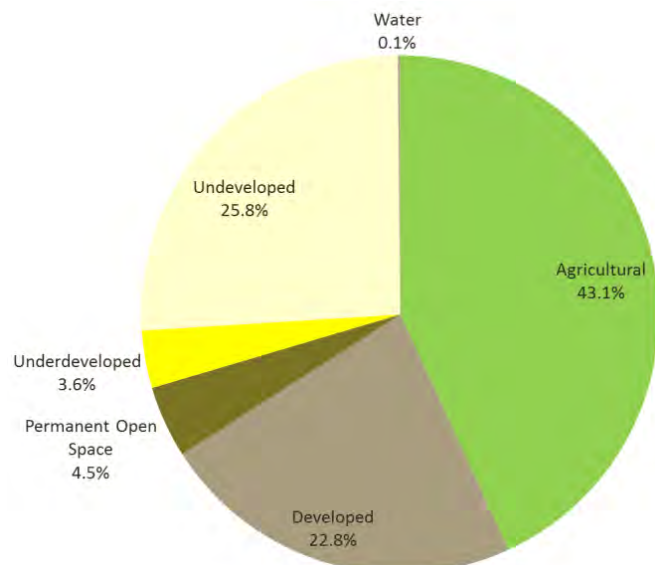
There are eleven jurisdictions in the NEAS study area: two counties and all or parts of nine municipalities. The NEAS study area covers approximately 230,000 acres (374 square miles) in northeastern Wake County and southern Franklin County.

This area of the Triangle Region has experienced rapid growth in recent years. Residential development is the primary driver of change in the area. An increasing number of people are moving into and around the small towns in the region. There were 20,724 homes built in the area between 2000 and 2010. New residents are drawn to the small town charm of historical downtowns, ever-increasing shopping and eating destinations, and the scenic countryside. Since 2000, the population of the NEAS study area has grown from 88,274 to 139,736 people, an increase of 51,462 residents. This represents an increase of 58%. In comparison, the state of North Carolina has grown by 15.7% between 2000 and 2010.¹

Projections from the Capital Area MPO Imagine 2040 planning process indicate that the NEAS study area will continue to experience significant growth. It is anticipated that there will be a demand for an additional 88,000 houses in the area between now and 2040. It is also anticipated that there will be more jobs in the region. New residents will increase demand for shopping, restaurants and services. It is also likely that new employers will locate in the area due to the high quality of life and the proximity to Raleigh, the Raleigh-Durham International Airport, and the Research Triangle Park.

Development Status and Existing Land Use

Despite recent growth, the area remains quite rural. Roughly a quarter of the land area is undeveloped (59,113 acres). Agricultural land comprises 43% of the study area. Tobacco, soybeans, and sweet potatoes make up the majority of the field crops, but strawberries and turf grass also support local farms. Developed areas, including residential and commercial properties, that are not likely to be redeveloped encompass 23% of the study area (52,181 acres). A small portion of the

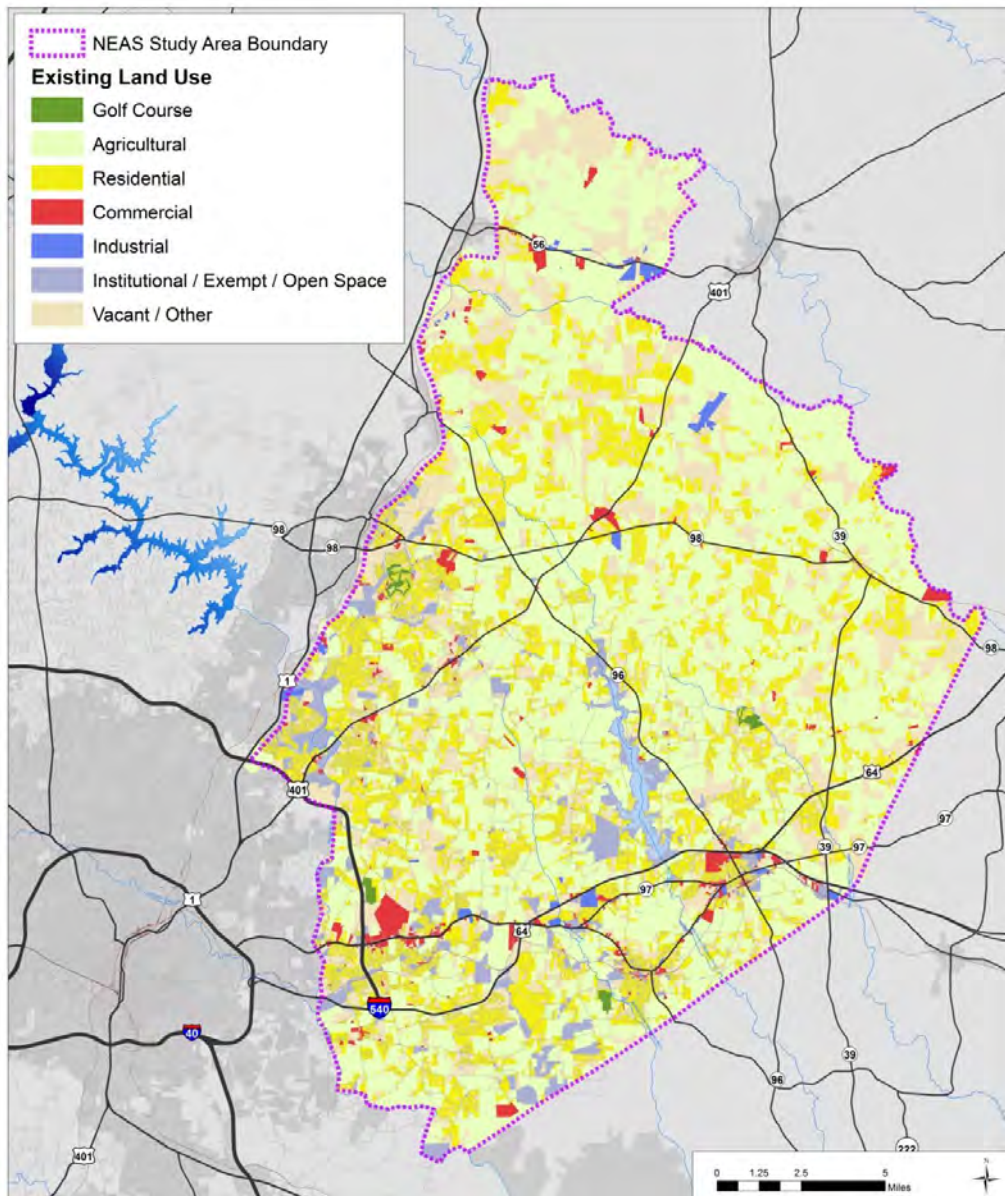


¹ <http://data.osbm.state.nc.us>

study area, though developed, is considered underdeveloped (approximately 4%) and may be suitable for redevelopment in the future. Of the developed land, the majority is comprised of residential uses as well as schools and other institutional uses. Commercial and industrial lands make up only 2.5% of the land area.

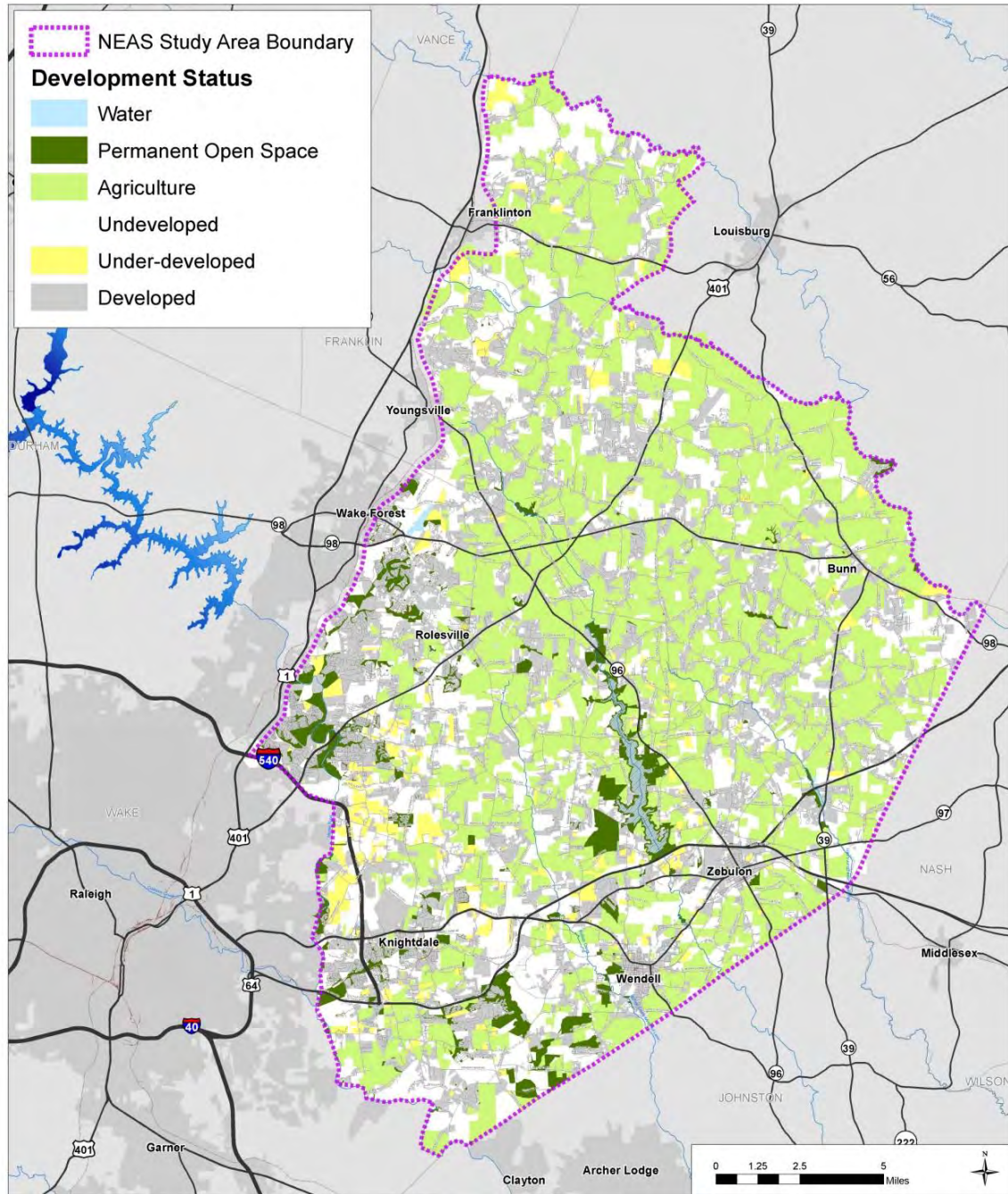
There are a few large employers in the area, but the majority of residents commute to Raleigh, the Research Triangle Park (RTP) or Durham. Non-residential land uses are mostly located near the historical centers of towns and along major highway corridors, including US 64, US 401, and US 1. A map of existing land use classifications, as derived from tax parcel records, is shown in Figure 2.

FIGURE 2: EXISTING LAND USE



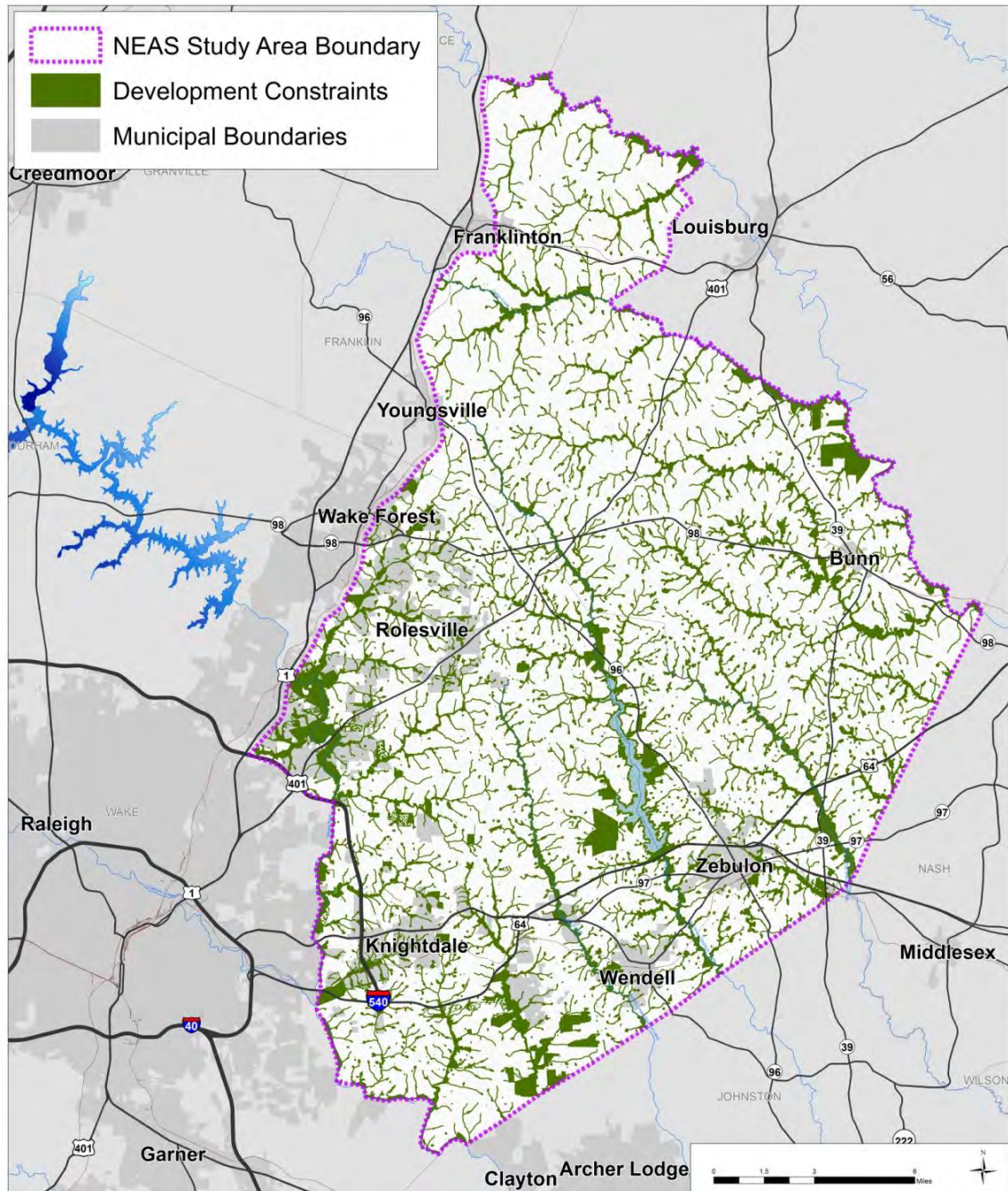
Permanent open space and surface water makes up the remainder of the land area. A map of development status is shown in Figure 3.

FIGURE 3: DEVELOPMENT STATUS



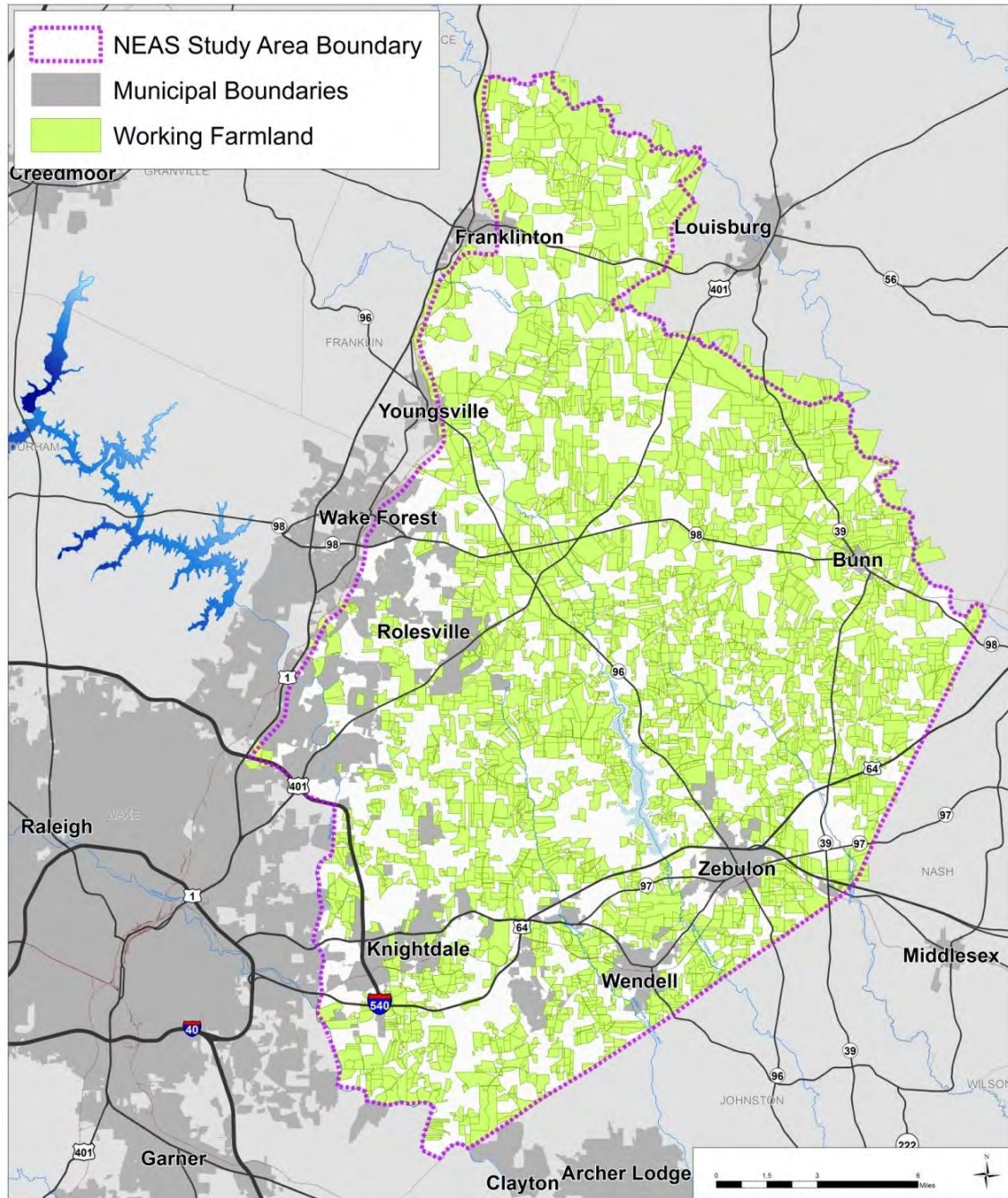
Approximately 36,000 acres (16%) of the study area is developmentally constrained, including surface water and regulated buffer areas, wetlands, floodplain and conservation lands as shown in Figure 4.

FIGURE 4: DEVELOPMENT CONSTRAINTS



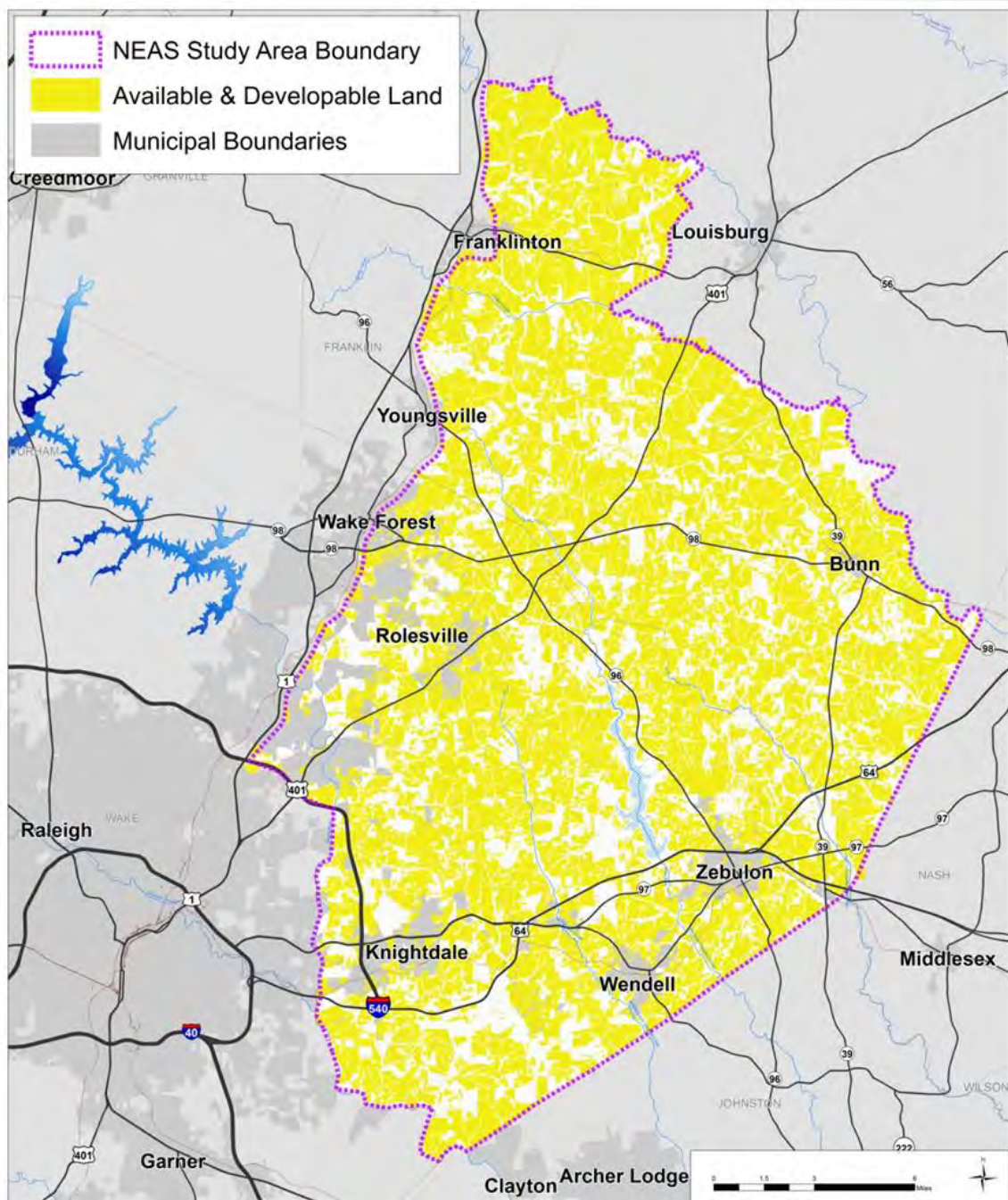
Working farms, including land enrolled in the Present Use Value (PUV) program constitute over 100,000 acres or 43% of the study area as shown in Figure 5.

FIGURE 5: WORKING FARMLAND



Developable land without constraints, including agricultural, undeveloped, and underdeveloped is representative of 63% or 143,000 acres within the study area as shown in Figure 6.

FIGURE 6: AVAILABLE LAND



SUPPORTING PLANS/CONTEXT:

Each jurisdiction has locally adopted plans that guide land use policy that were reviewed and documented in the **PLAN AND POLICY REVIEW TECHNICAL MEMORANDUM**. The **PLAN AND POLICY REVIEW TECHNICAL MEMORANDUM** includes a matrix of locally-adopted plans and ordinances of the study area that influence land use decisions and the long-term functionality of the transportation system in the NEAS study area.

Socioeconomic Conditions

Existing Conditions

Since the millennium, the population of the NEAS study area has grown rapidly. The population increased from 88,274 in 2000 to 139,736 in 2010, accounting for a growth of slightly less than 59% over the ten years, or an annual growth rate of 5.8% per year. The US Census Bureau expects the growth rate to decrease slightly to approximately 4% between the years of 2010 to 2015.



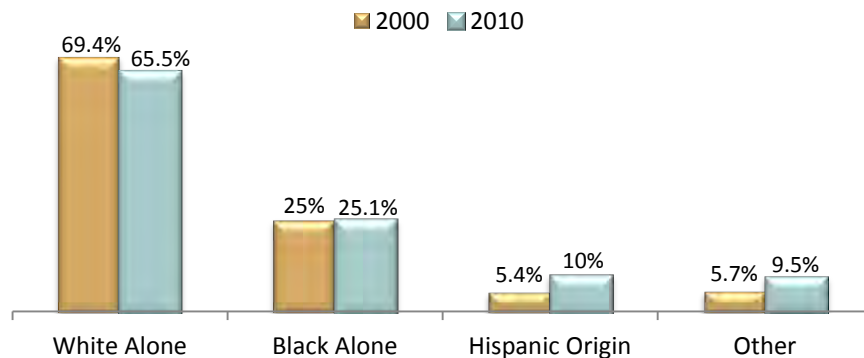
In terms of households and housing units, a similar trend is discernible between 2000 and 2010. The increase in households in the NEAS study area increased by 57.8% and housing units by 59.2%. Median home values increased by 32.4% from \$110,682 to \$146,607 during this time period as well. These statistics are shown in Figure 7.

FIGURE 7: POPULATION AND HOUSING TRENDS

	Population	Housing Units	Households	Median Home Values
2000	88,274	35,017	32,271	\$110,682
2010	139,736	55,741	50,924	\$146,607
Percent Change	58.30%	59.20%	57.80%	32.40%

With the population booming in the study area, it would be very unlikely that the racial composition of the area remained the same. The Hispanic population, in particular, has more than doubled in size in the NEAS study area during this period, accounting for only 5.4% (4,767) of the population in 2000 and reaching 10% (13,974) in 2010. Figure 8 provides more detail.

FIGURE 8: RACIAL COMPOSITION, 2000-2010

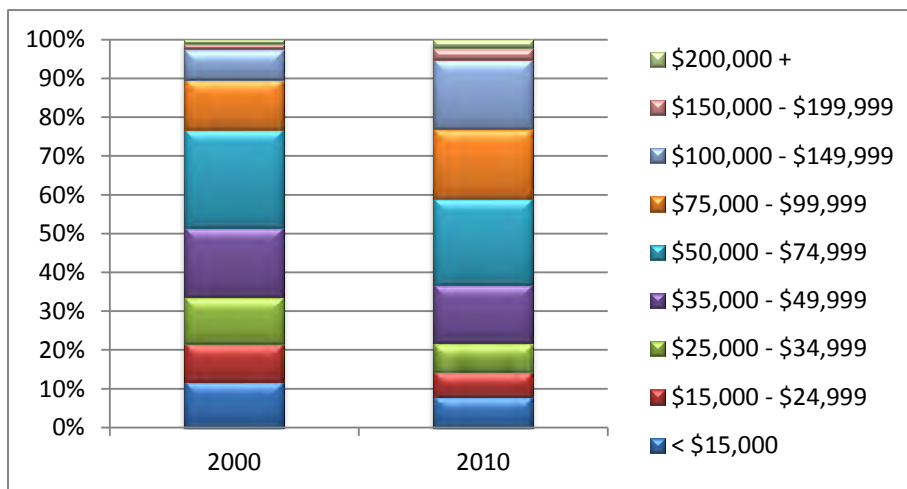


The Census estimates that the Hispanic population will continue to grow, though at a much slower rate, comprising 10.6% in 2015, while the White and African American population percentages change only slightly between 2000 and 2015.

Population and incomes have increased in the NEAS study area. Specifically, median household incomes have jumped from \$48,428 to \$63,578 between 2000 and 2010. While the population overall has increased substantially, the percentage of households that make more than \$100,000 per year has increased dramatically, from 10.3% in 2000 to 23% in 2010.

The same trend is observable on the other end of the spectrum. The percentage of those people making less than \$34,999 has decreased from 33.7% to 21.8% of all households between 2000 and 2010. Naturally, this does not equate to a reduction in the absolute number of people making less than \$34,999, but rather speaks volumes about the influx of people making greater than \$100,000 per year to the NEAS study area. Figure 9 presents this information graphically.

FIGURE 9: INCOME BRACKET DIFFERENCES IN THE NEAS STUDY AREA HOUSEHOLDS, 2000-2010



Overall, the NEAS study area is undergoing a rapid transition from an area characterized by rural and agricultural land uses to an area of suburban development with pockets of urbanity, trends that are clear in the population and income statistics. These trends are forecast to continue in the NEAS study area into the late 2010s, albeit at a slightly slower pace than in the previous decade. With these statistics in mind, a clear vision for the transportation system will be necessary to accommodate the continual growth in the NEAS study area.

Supporting Plans/Context:

The **NEAS MARKET PROFILE ASSESSMENT TECHNICAL MEMORANDUM** provides in-depth analysis of regional trends (population and employment), demographic information, location quotients, industry group comparisons, and electronics and internet market potential.

The information for the socio-economic state of the region is from The United States Census Bureau American Factfinder, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml> and ESRI Business Analyst, <http://bao.esri.com/>.

Health Assessment

Existing Conditions

The health of a community, both physical and mental, is affected by off- and on-road transportation facilities as well as perceived barriers. Highlights from facilitated work sessions with the area health officials and school health officers, a comprehensive review of the existing Community Health Assessment (CHA) documents and a field review are summarized below to provide a snapshot of the existing health assessment. This information will be incorporated into future scenario assessments as evaluation/prioritization criteria.



School-age children in Bunn walk home from school along highways where there are either no sidewalks or crosswalks.

Franklin County

Much of Franklin County's context in terms of land use, transportation systems and other aspects of the built environment is typified by a rural landscape dotted with small towns and crossroads communities. This context is traditional for the area but is planned to transition in the southern reaches to more suburban-style development as demand for housing in the Raleigh region stretches north.

Currently, the rural and small town nature of Franklin County within the study area offers both opportunities and challenges related to the health of residents. Opportunities exist to plan for future integration of land uses that provide increased mobility options to access to health care facilities and places that promote physical activities, such as parks, greenways, and recreation areas. The opportunity also exists to plan for a transportation system that promotes access to health-related land uses and destinations.

FRANKLIN COUNTY: AT A GLANCE

Health Priorities

- Access to care.
- Physical activity and nutrition, including chronic diseases and obesity.

Top 5 Leading Causes of Death

- Cancer (23.9%)
- Chronic respiratory diseases (6.0%)
- Cerebrovascular diseases (5.3%)
- Unintentional injuries (3.6%)

Area Characteristics

- Predominantly rural area with pockets transitioning to suburban development.
- Limited active transportation facilities (sidewalks, bike lanes and greenways) along rural routes or within small towns.
- Data indicates pockets for potential poor health of citizens in and around the Bunn area, south of Louisburg and near Franklinton, based on Census information.
- Childhood obesity rates increased from 25.9% to 34.6% of children, ages 5-11 (2000-2008).

North / Northeast Wake County

While Wake County consistently ranks as the healthiest County in North Carolina and one of the healthiest in the United States, the overall county ranking does not account for pockets of Wake County where data indicates poor health is more prevalent. Health professionals in Wake County have indicated that a lack of local area health data (e.g. at the town, community or Census tract level) limits their ability to identify areas where pockets of poor health reside.



Bicycle racks are located near the falls in Little River Park west of Zebulon. Connecting roads are lacking shoulders, sidewalks or bicycle lanes to attract park visitors to travel there by bike.

The rural areas of north and northeast Wake County are areas that have been identified as pockets where there is a higher prevalence of poor health indicators. The area is rapidly growing, particularly along the US 1, US 401 and US 64 corridors. Much of this growth is typified by small town center growth, suburban-level housing densities, and big box retail and associated commercial land uses.

The resources available to towns within the study area as a result of this growth have led to increased investment in parks and recreation facilities, greenways and trails, and sidewalks within residential subdivisions and in pockets along major highways.

WAKE COUNTY: AT A GLANCE

Health Priorities

- **Wake Forest, Rolesville, Lassiter area:** Overweight and Obesity; Lack of health insurance.
- **Zebulon, Wendell, Knightdale area:** Lack of health insurance; unemployment.

Top 5 Leading Causes of Death

- Cancer (25.9%)
- Heart Disease (19.9%)
- Cerebrovascular diseases (5.9%)
- Chronic respiratory diseases (4.9%)
- Unintentional injuries (3.6%)

Area Characteristics

- Rapidly transitioning area: rural to suburban development.
- Increasing number of active transportation facilities (sidewalks, bike lanes and greenways), primarily within towns and along the Neuse River.
- Data indicates pockets for potential poor health of citizens in and around the Knightdale, north of Wendell and Zebulon area, based on Census information.
- Childhood obesity rates increased from 16.7% to 26.1% of children, ages 5-11 (2000-2008).

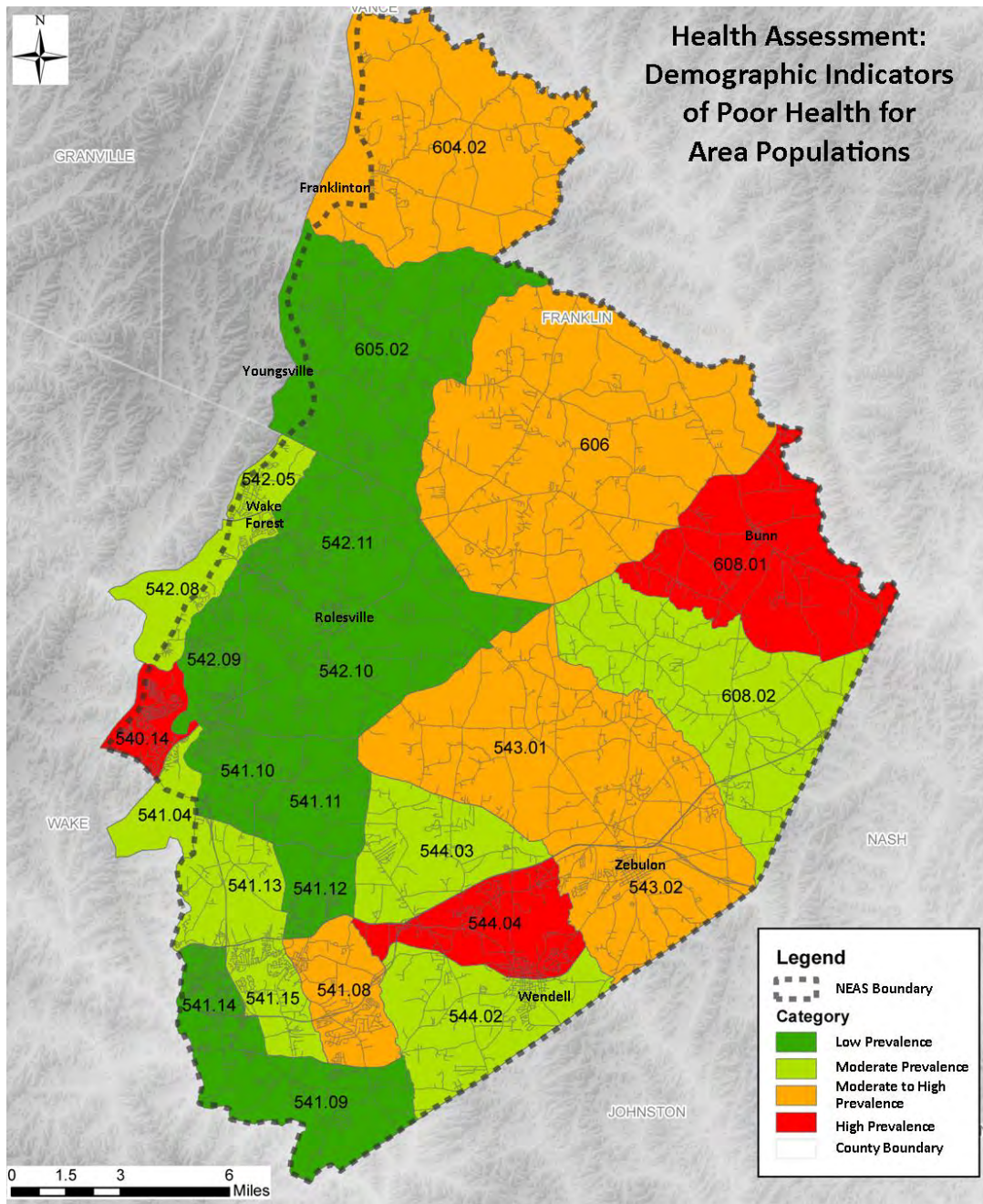
Demographic Health Assessment

The overall study area health was assessed using key indicators to provide a snapshot of the existing “health” of the region. The indicators for prevalence of poor health are based on Census tract data for demographics such as age, race and income, to name a few. These indicators have been

identified by health researchers as the Census-related data that is most pertinent to identifying pockets of poor health within a community.

The existing health assessment based on demographic indicators is presented in Figure 10. High prevalence indicates that over 60% of the demographic fields were higher than the area population average. The other indicators are divided as follows: Moderate-to-High (40%-60%), Moderate (20%-40%), and Low Prevalence (less than 20%).

FIGURE 10: HEALTH ASSESSMENT



The top three “high prevalence” areas include:

- the Town of Bunn and surrounding area (Census Tract 608.01),
- an area north of Wendell and west of Zebulon (Census tract 544.04) within an area bounded roughly by US 64, Wendell Boulevard, and Mack Todd Road, and
- an area within the city limits of Raleigh bounded by I-540, US 1, US 401 and Wake Forest town limits (Census tract 540.14)

More data is being compiled to align with this data as the NEAS study area progresses. These maps will be updated as that occurs.



Supporting Plans/Context:

Each County has completed a Community Health Assessment (CHA) within the past three years. Wake County is in the process of updating its 2010 CHA; Franklin County’s CHA was completed in 2011.

Natural Environment

The natural environment is essential in understanding the history, and the future opportunities of the study area.

Existing Conditions

Hydrology

The NEAS study area is divided into two river basins. Wake County drains south and east into the Neuse River. Though areas in Franklin County that border Wake County are also located in the Neuse River Basin, the remainder of the county drains east to the Tar River which forms the northeastern boundary of the study area. The Neuse River enters the study area between Raleigh and Wake Forest and forms the western boundary of the study area south of I-540. Poplar Creek, Marks Creek and the Little River are the main water courses in Wake County. Cedar Creek, Crooked Creek and Moccasin Creek are the main streams in Franklin County. At approximately 18,757 acres and 19,333 acres, respectively, wetlands and floodplains present a minor constraint for development in the area. These development constraints are depicted on Figure 11.

There are four water supply watersheds located in the area: the Tar River, Little River, Smith Creek and Fantasy Lake. This designation, which encompasses approximately 94,291 acres of land, limits the density of development in order to protect local water supplies. While they are constraints to development, they have been displayed separately on Figure 11.

There are 28 Significant Natural Heritage Areas (SNHA) in the study area. There are some rare areas of exposed granite that support unique plant and animal habitats. Mitchell's Mill State Natural Area contains some of these Granitic Flatrocks; others are located near Lake Mirl, Pulleytown Road, Hodges Mill Creek and Fowlers Mill Creek. The remaining key environmental features are associated with hydrological features. The Middle Tar River and the Little River, for example, provide highly significant aquatic habitat. Significant Natural Heritage Areas are also shown in Figure 11.

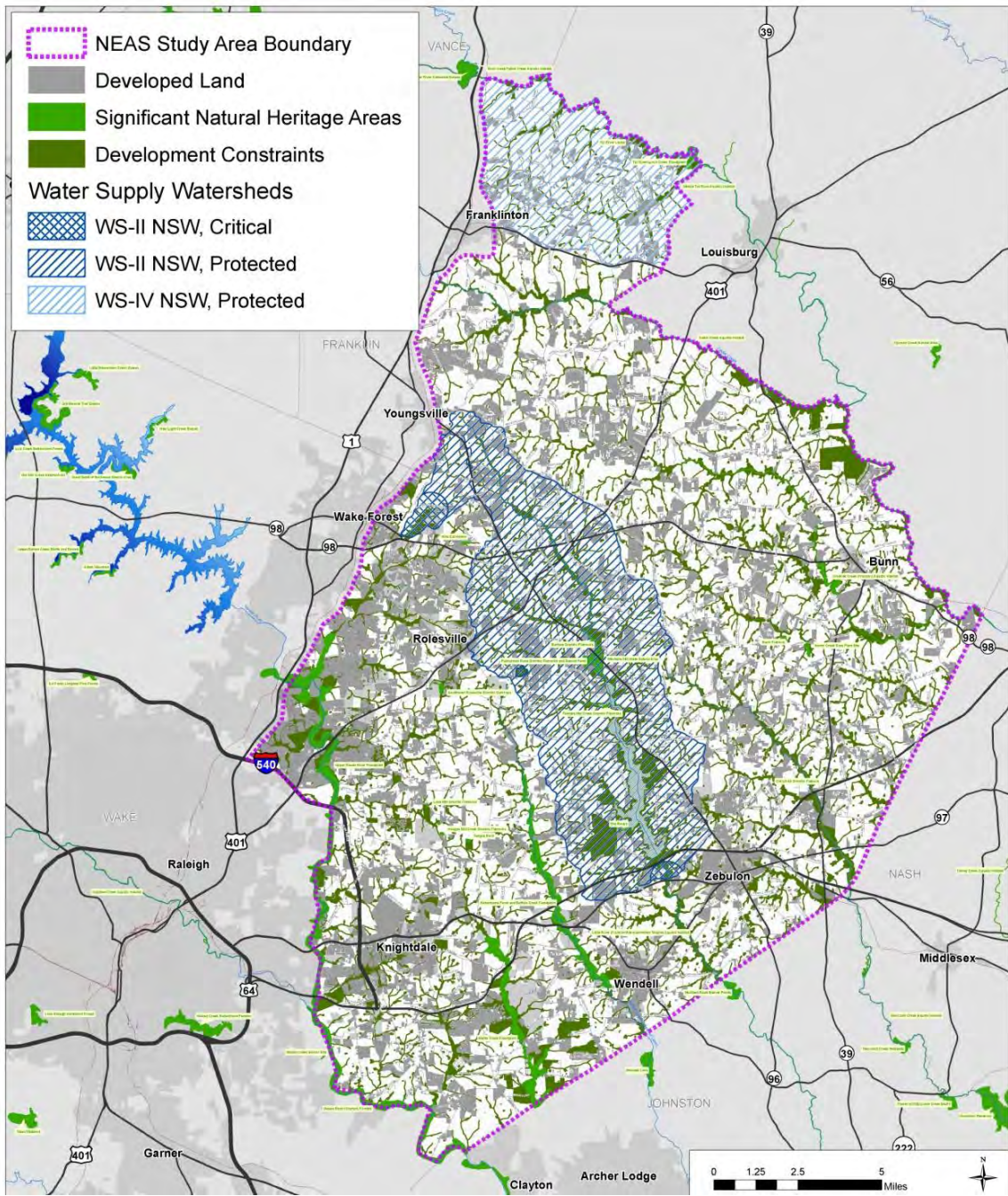


Soils

The majority of soils in the study area (75%) are classified as "Prime Farmland", "Farmland of Statewide Importance", or "Farmland of Local Importance" by the Natural Resource Conservation Service (NRCS). Hydric soils, defined as those that under natural conditions are either saturated or inundated during the growing season, pose a minor constraint for development. Soils that are considered hydric or partially hydric make up 19% of the study area (45,000 acres). The majority of these soils are located in low lying areas adjacent to streams and wetlands. The NRCS classifies the septic tank absorption capacity of 50% of the soils in the area as "Very Limited". This indicates that the soil has attributes that may result in poor septic tank performance and high maintenance costs.



FIGURE 11: NATURAL RESOURCES



Economic Vitality

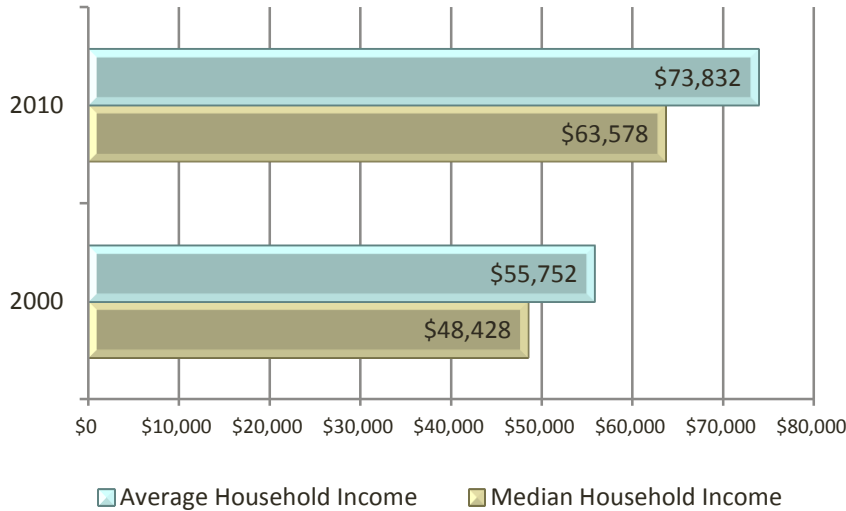
Existing Conditions

The economic vitality of the region is strong with more than 25 companies/entities employing over 1,000 people in Wake and Franklin Counties. In Wake County, the education and health service businesses occupy four of the top six employers, while seven of the top ten are or are related to public institutions. Notably, the Wake County Public Schools system and NC State University occupy the top spots in terms of employment numbers. In Franklin County, only four of the top ten employers are publicly funded. The only entity that employs more than 1,000 people in the county is the Franklin County School system.

In terms of industry, the NEAS study area produces more building materials than are locally demanded, but does not have a surplus of any other industry sector. The area lacks non-store retailers, electronics, appliances, furniture and home furnishing stores in the area.

The average household income in the NEAS study area is \$73,832, an increase of 32.4% between 2000 and 2010 and is shown in Figure 12. The increase is likely a function of the transition in resident employment from blue collar rural and industrial to high-tech and business employment outside the study area. As the study area transitions away from an agricultural and rural based economy towards a suburban “bedroom-community” economy, income rates continue to increase. Ninety percent (90%) of people living in the study area work outside of the study area.

FIGURE 12: INCOME STATISTICS



Detailed information on economic vitality is presented in the **NEAS MARKET ASSESSMENT TECHNICAL MEMORANDUM**. The memorandum presents a basis for understanding what types of amenities are lacking in the study area, illustrates regional trends, estimates future trends, and address commuting patterns.



Regional Mobility

Roadway

Existing Conditions

The NEAS study area, which encompasses northeastern Wake County and southern Franklin County, is mostly comprised of two-lane roadways with speed limits of 55 miles per hour. There are a few major corridors and state routes that cross the area. All AADT (Average Annual Daily Traffic) counts were collected by NCDOT in 2011. AADT's are measured in vehicles traveled per day (vpd) in both directions. This synopsis details the location of the highest AADT on major corridors in the study area.

I-540: I-540 is an interstate route that makes the southwestern border of the study area. It is a 6-lane controlled access facility with direct access to both US 64 and US 64 Business in Knightdale and a 70 mph speed limit. AADT: 55,000 vpd (near Buffalo Road).

US 64/264: US 64/264 is an east-west route from Raleigh to Zebulon. It is a 6-lane controlled access facility from I-440 to US 64 Business near Wendell. From Wendell to the east, it is a 4-lane controlled access facility. The speed limit is 70 mph and the road forms the high-speed corridor backbone for the southern section of the study area as it connects Raleigh to Knightdale, Wendell, and Zebulon and points east. US 64 and US 264 split just east of Zebulon. AADT: 63,000 vpd (near Smithfield Road).

US 64 Business: This roadway connects Raleigh to Knightdale, Wendell, and Zebulon and parallels US 64/264. Through Knightdale, it is both a 4-lane and 6-lane divided highway with 45 mph speed limit. It crosses US 64/264 just west of Wendell and then narrows to a 2-lane downtown route in both Wendell and Zebulon. AADT: 28,000 vpd (near I-540).

US 401: US 401 is a northeast-southwest route that connects northeast Raleigh to Rolesville and southern Franklin County and the Town of Louisburg. US 401 is somewhat in a state of transition and has many different roadway types along its length within the area. US 401 is a 6-lane divided highway from I-540 to Mitchell Mill Road with a 50mph speed limit. From Mitchell Mill to Louisburg Road just south of Rolesville, it is a 4-lane divided highway with 55 mph speed limit. At that point, US 401 is a 2-lane roadway with a 35 mph speed limit through Rolesville and then a 55 mph speed limit to the northern border of the area. The Rolesville bypass (TIP R-2814B) is currently under construction and will be a continuation of the 4-lane highway that will reconnect with existing US 401 just north of NC 96. Besides NC 96, US 401 connects with NC 98 just east of Wake Forest and NC 39 in Louisburg. US 401 is one of driving forces behind economic development in the region. AADT: 39,000 vpd (near Mitchell Mill Road).

NC 98: NC 98 is an east-west roadway that connects Wake Forest to Bunn and other points east of the study area. A portion of the NC 98 Wake Forest Bypass is included in the area. This section is a 4-lane divided highway with 55 mph speed limit from US 1 to the east to Jones Dairy Road. From this intersection, NC 98 is a 2-lane highway with 55 mph speed limit



outside of town limits. NC 98 connects with NC 39 in Bunn and has both 35 mph and 20 mph sections within Bunn. AADT: 19,000 vpd (near NC 98 Business and Jones Dairy Road).

NC 96: NC 96 is a major corridor through the region as it connects many of the communities. NC 96 runs northwest-southeast and connects Youngsville, Wake Forest, and Zebulon. It connects to both NC 98 and US 401 east of Wake Forest and both US 64 and NC 97 in Zebulon. NC 96 also is the main north-south corridor through Zebulon and is currently under study by the Town for improvements. Most of this corridor is a 2-lane highway with varying speed limits. Approximately 20% of the total volume on NC 96 is truck traffic, at the Youngsville Railroad crossing at NC 96 and Main Street. AADT: 18,000 vpd near US 64/264) and 11,000 (Downtown Youngsville).

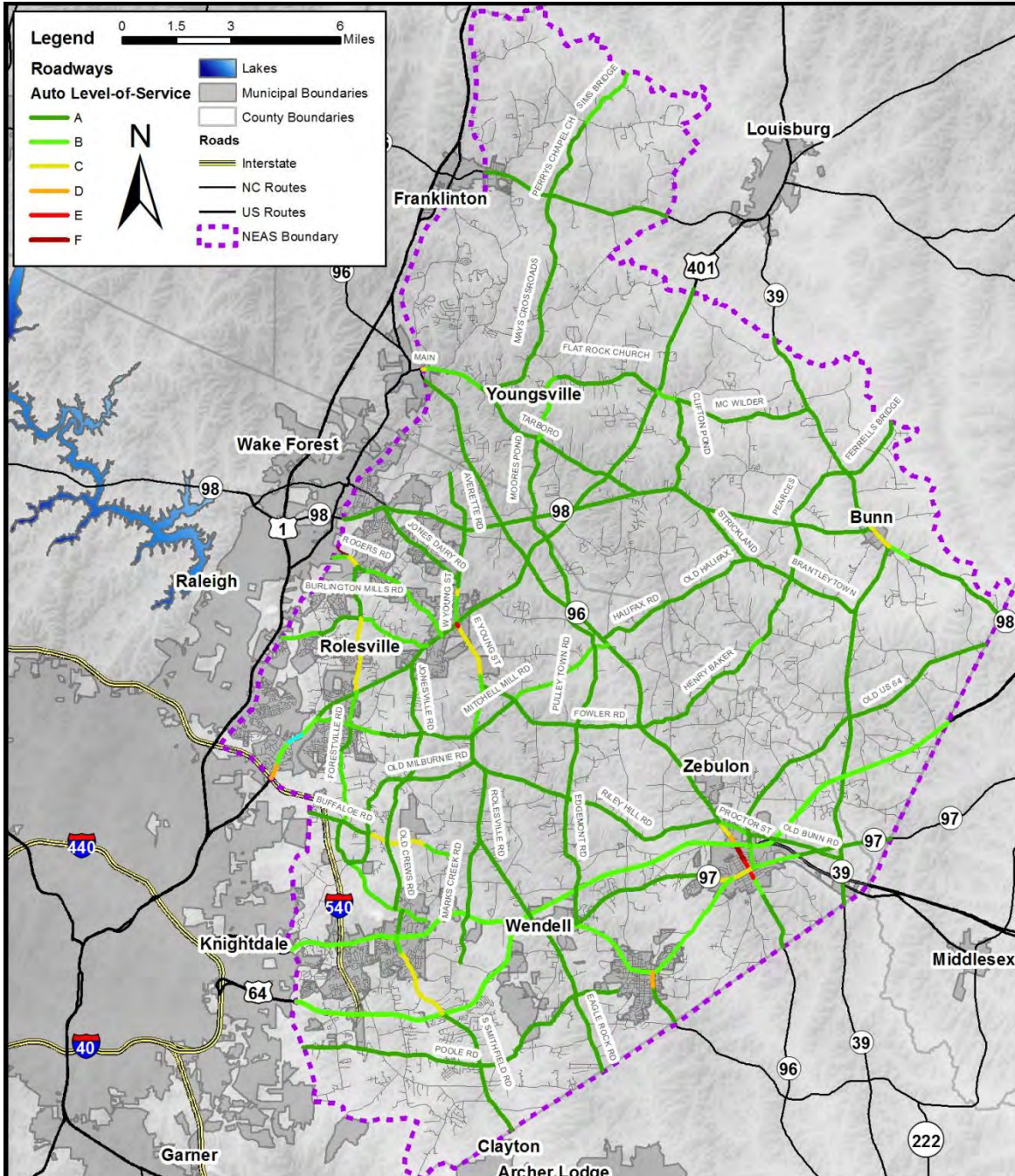
NC 39: NC 39 runs north-south from Zebulon to Bunn and then to Louisburg. NC 39 connects with US 64, US 264, and NC 97 east of Zebulon and connects with NC 98 in Bunn. Most of NC 39 is a 2-lane highway with 55 mph speed limit. AADT: 5,500 vpd (near Cedar Creek crossing and study limit).

NC 97: NC 97 starts at US 64 Business just west of Wendell and runs east-west to study area boundary near NC 39. NC 97 is the main east-west route through downtown Zebulon and is mostly a 2-lane highway with varying speed limits. AADT: 12,000 vpd (Downtown Zebulon).

Vehicular Level of Service

Vehicular level of service (LOS) of all major roadways within the study area was determined using ARTPLAN 2012, software developed by the Florida Department of Transportation (FDOT), and comprehensive field inventory. Existing planning level roadway LOS is illustrated in Figure 13.

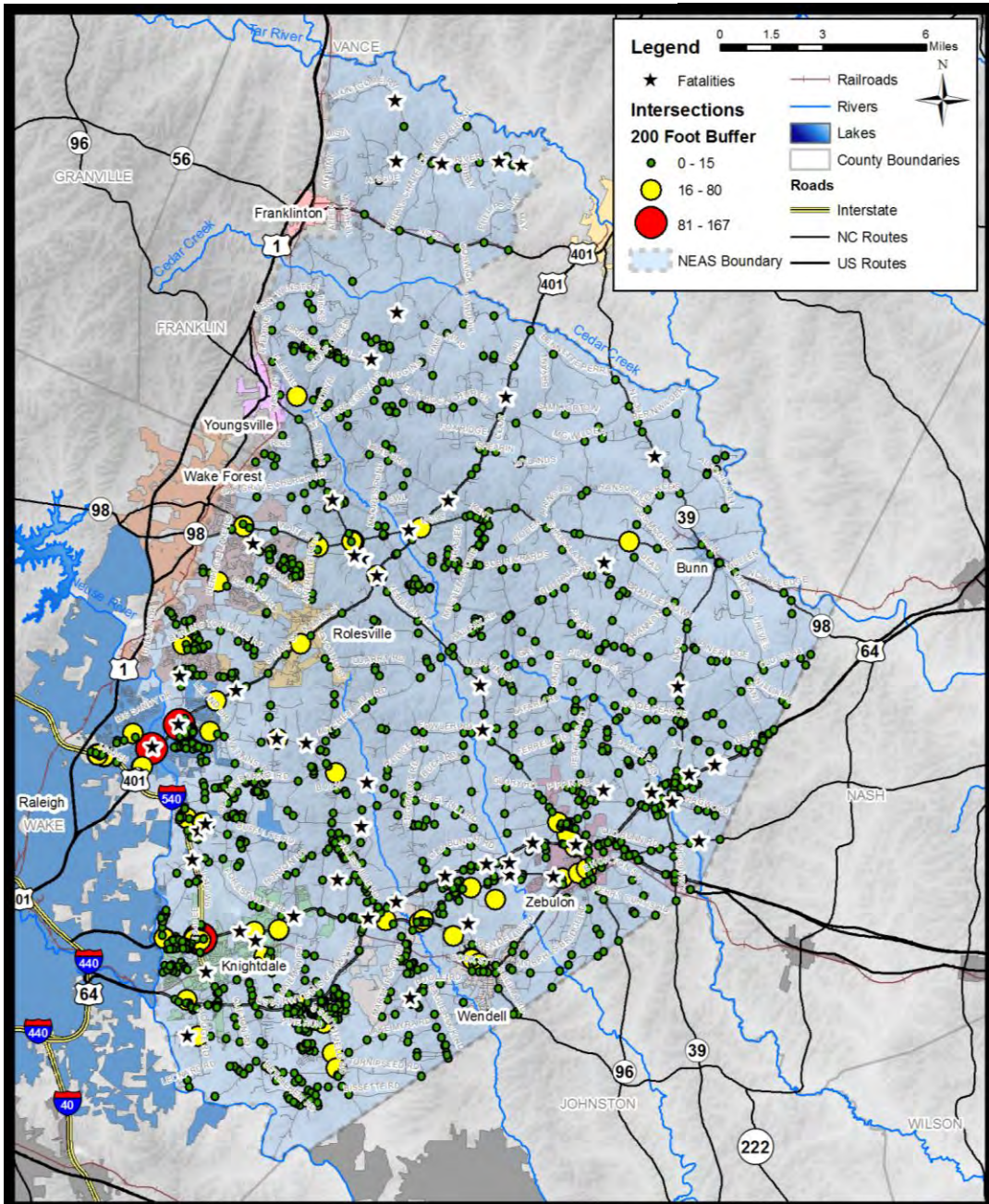
FIGURE 13: VEHICLE LEVEL OF SERVICE



Corridor Operations - Safety

The majority of crashes that occurred between 2008 and 2012 in the NEAS study area were rear end crashes, followed by collisions with animals or fixed objects. Most of the crash history is located along the major routes in the study area. Crash locations are illustrated in Figure 14.

FIGURE 14: VEHICULAR CRASH LOCATIONS 2008-2012



Of the crashes occurring in the NEAS study area between 2008 and 2012, very few resulted in severe injuries or fatalities. In total, less than 2% could be categorized as fatalities or serious injuries, while evident injuries and possible injuries made up 9% and 19% of the total crashes, respectively. The vast majority of crashes resulted in only property damage, representing 68% of all crashes in the area.

Figure 15 provides the crash severity comparison of the study area to the overall state of North Carolina statistics for 2008-2012. It is interesting to note that the percentages by type are very similar to the state average.

FIGURE 15: CRASH SEVERITY COMPARISON, 2008-2012

Crash Severity	NEAS Study Area 2008-2012		State of North Carolina 2007-2011	
	Crashes	Percent	Crashes	Percent
Killed	57	0.61%	6,449	0.6%
Fatal Injury	78	0.83%	10,487	1.0%
B Injury (Evident Injury)	797	8.46%	93,644	8.7%
Possible Injury	1784	18.94%	250,291	23.4%
Property Damage Only	6404	67.99%	677,373	63.3%
No Information	299	3.17%	32,198	3.0%
Total	9419	100.00%	1070442	100.0%

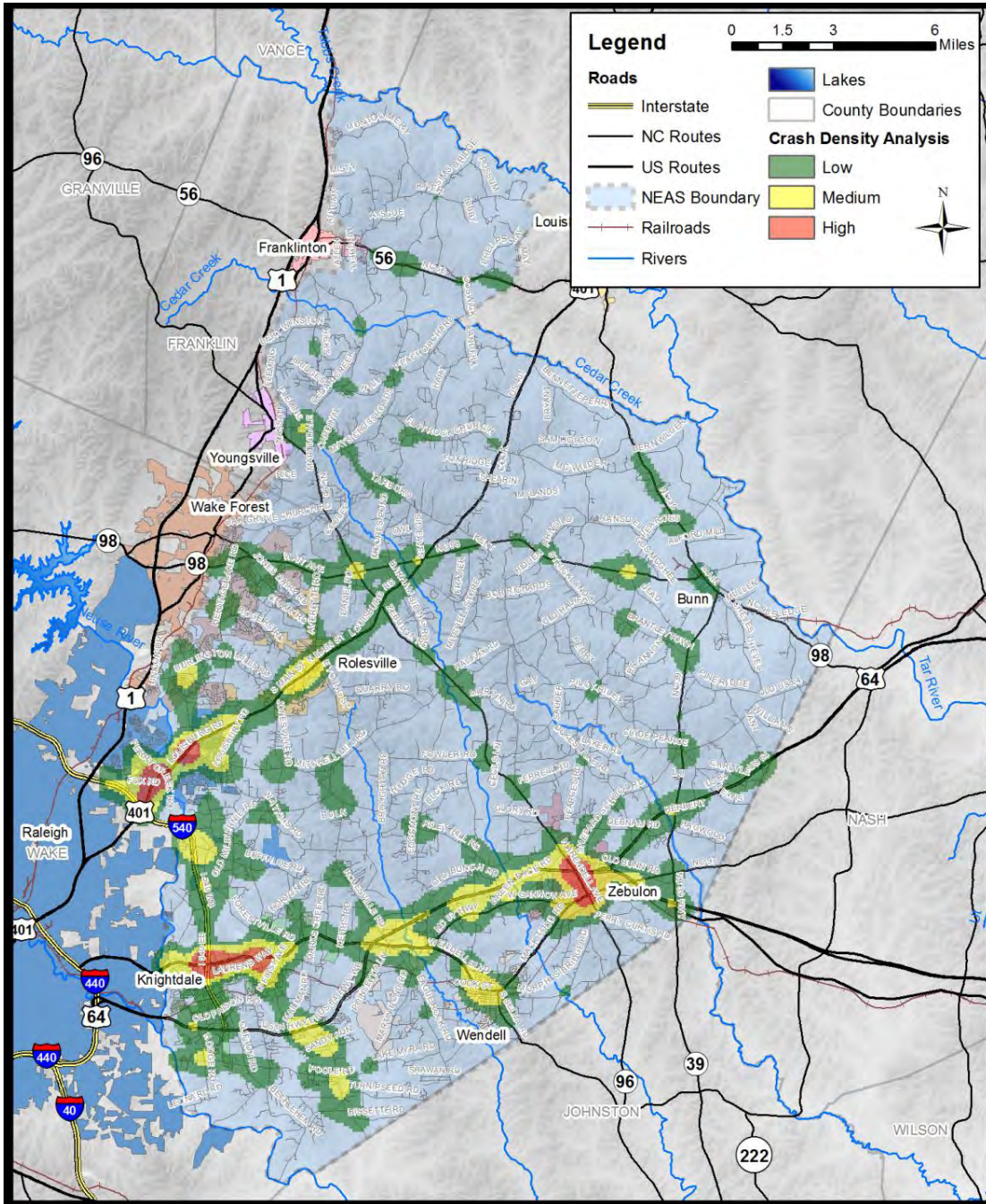
Figure 16 provides an overview of the top ten (10) intersections with highest number of crashes within a 200 foot buffer of the intersection centroid. The total number of crashes that occurred at each intersection is shown as a percentage of total crashes that occurred in the study area during 2008-2012, with almost 2% of all crashes occurring at I-540 and Knightdale Boulevard.

FIGURE 16: HIGH VEHICULAR CRASH LOCATIONS, 2008-2012

Intersection	Number of Crashes	Percent of Total Crashes
I-540 and US 64 Business (Knightdale Boulevard)	167	1.8%
US 401 and Perry Creek Road	129	1.4%
US 401 and Ligon Mill Road	89	0.9%
US 64 Business and North Smithfield Road	79	0.8%
I-540 and Buffalo Road	50	0.5%
I-540 and US 401	50	0.5%
US 64 Business and Old Milburnie Road	41	0.4%
US 64 and Arendell (NC 96)	41	0.4%
Zebulon Road (NC 96) and Wait Avenue (NC 98)	39	0.4%
US 401 and NC 98	39	0.4%
Total	9420	100.0%

The crash density data shown in Figure 17 provides an overview of the detailed data presented and illustrates high, medium and low crash density locations.

FIGURE 17: CRASH DENSITY ANALYSIS

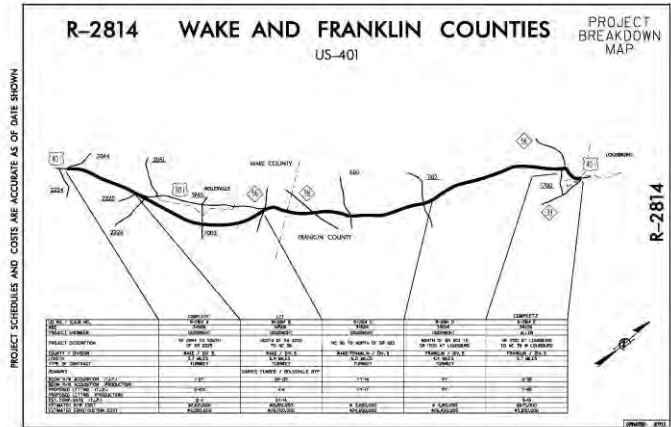


Supporting Plans/Context:

Many community and county plans pertaining to future transportation plans provide detailed recommendations for connectivity, design, policy, and new infrastructure. The regional roadways recommended in these plans provide the foundation for all roadway recommendations in this study. They also provide policy and design ideas that will be shared and applied regionally in scenario planning, policy guidance, and final recommendations.

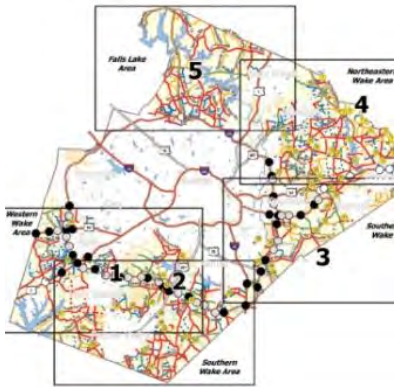
STATE TRANSPORTATION IMPROVEMENT PROGRAM PROCESS (STIP)

There are several projects ongoing and programed for the NEAS study area. The US 401 widening and Rolesville Bypass are the only capacity-adding roadway projects listed in the NCDOT project work plan (R-2814). The bypass section is currently under construction. Section C is scheduled to be completed in 2019 and section D does not yet have a scheduled completion date.



WAKE COUNTY

WAKE COUNTY TRANSPORTATION PLAN (2003)



The Wake County Transportation Plan represents a synthesis of the programmed State Transportation Improvement Plan (TIP) projects, the adopted CAMPO Transportation Plan, and addresses mobility needs in unincorporated areas. Recommendations include new/upgraded roadway classifications, improved connectivity, roadway standards, median type/openings, and signal spacing.

WAKE FOREST TRANSPORTATION PLAN UPDATE (2010)

The plan evaluated the transportation network over the next 25 years and presented future recommendations to balance the transportation network with strategic investments in pedestrian, bicycle, and transit projects.

WAKE FOREST COMMUNITY PLAN (2009)

The Wake Forest Community Plan addresses pressing issues through policy recommendations and a growth strategy map. The document highlights that efficient, multi-modal transportation infrastructure, access management, and design standards are paramount in the growing community.



NC 98 BYPASS CORRIDOR MASTER PLAN (2003)

The NC98 Bypass Corridor Master Plan provides guidance for incorporating the planned NC 98 Bypass into the transportation network and the surrounding community and environment.

TOWN OF KNIGHTDALE, 2027 COMPREHENSIVE PLAN (2011)

The Transportation Master Plan component of the plan addresses the regional and local network needs. The recommendations include improved roadway connectivity, safety, and efficient congestion mitigation for the future growth.

ROLESVILLE THOROUGHFARE PLAN (2002)



The Rolesville Thoroughfare Plan contains design criteria, a thoroughfare plan, and renderings that assist the Town in managing growth. Roadway widening, new roadways, and potential roundabout locations are proposed in the plan.

TOWN OF ZEBULON COMPREHENSIVE PLAN (2008)

Providing mode choices is a significant focus of the plan as well as overall safe and efficient mobility. The document recommends developing a streetscape and gateway plan to enhance major entries in the Town, including but not limited to NC Highway 96, US Highway 64, and NC Highway 97.

TOWN OF WENDELL, COMPREHENSIVE PLAN (2007)

The plan highlights the need to implement the Collector Street Plan that was developed in 2006, coordinate with adjacent communities, and improve connectivity, access, and safety. There are long-range projects documented in this plan from the CAMPO 2030 Long Range Transportation Plan including: Upgrading Poole Road from 4-5 lanes (completion date 2030), Transportation System Management (TSM) on Eagle Rock Road (completion date 2030), TSM on Old Zebulon Road (completion date 2020), two to three lane new location on Old Zebulon Road west to US 64 (completion date 2020), and Upgrade Wendell Boulevard (completion date 2040).



Franklin County



FRANKLIN COUNTY COMPREHENSIVE TRANSPORTATION PLAN (2011)

The Franklin County Comprehensive Plan promotes safe, efficient, reliable, environmentally-sound, and economically feasible transportation within the County. Access management, roadway connectivity, roadway standards, and multi-modal infrastructure are

recommended. The County specifically supports the construction of NC 56 from Franklinton to Louisburg; US 401 from Louisburg to Rolesville; and the NC 96 Youngsville Bypass.



BUNN 2020 LAND USE PLAN

Developing and maintaining adequate roadway infrastructure for the future growth is a primary focus of the plan. The community survey reported that “poor streets and sidewalks” was the top priority by the citizens surveyed in Bunn. Development of an access management plan, level

of service thresholds and multi-modal infrastructure are recommended for the community.

Bicycle and Pedestrian

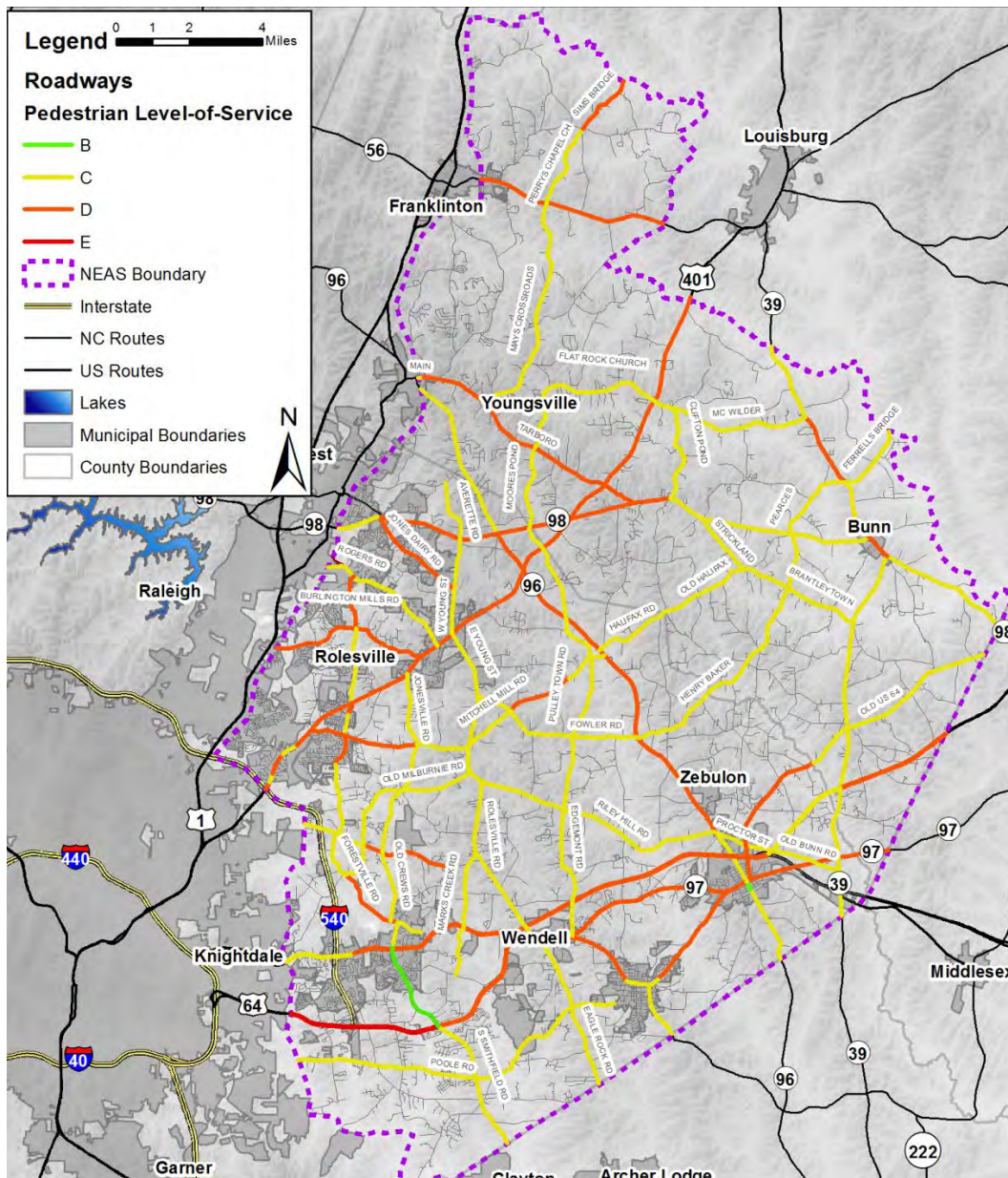
Existing Conditions

Conditions for bicyclists and pedestrians vary greatly across the NEAS study area. Pedestrian and bicycle level of service (LOS) within the study area were calculated using ARTPLAN 2012, a software developed by the Florida Department of Transportation (FDOT).

Pedestrian LOS were calculated by a step-wise regression model that takes into account the four variables with relative importance: existence of a sidewalk, lateral separation of pedestrians from motorized vehicles, motorized vehicle volume, and motorized vehicle speeds. Pedestrian LOS results are illustrated in Figure 18.

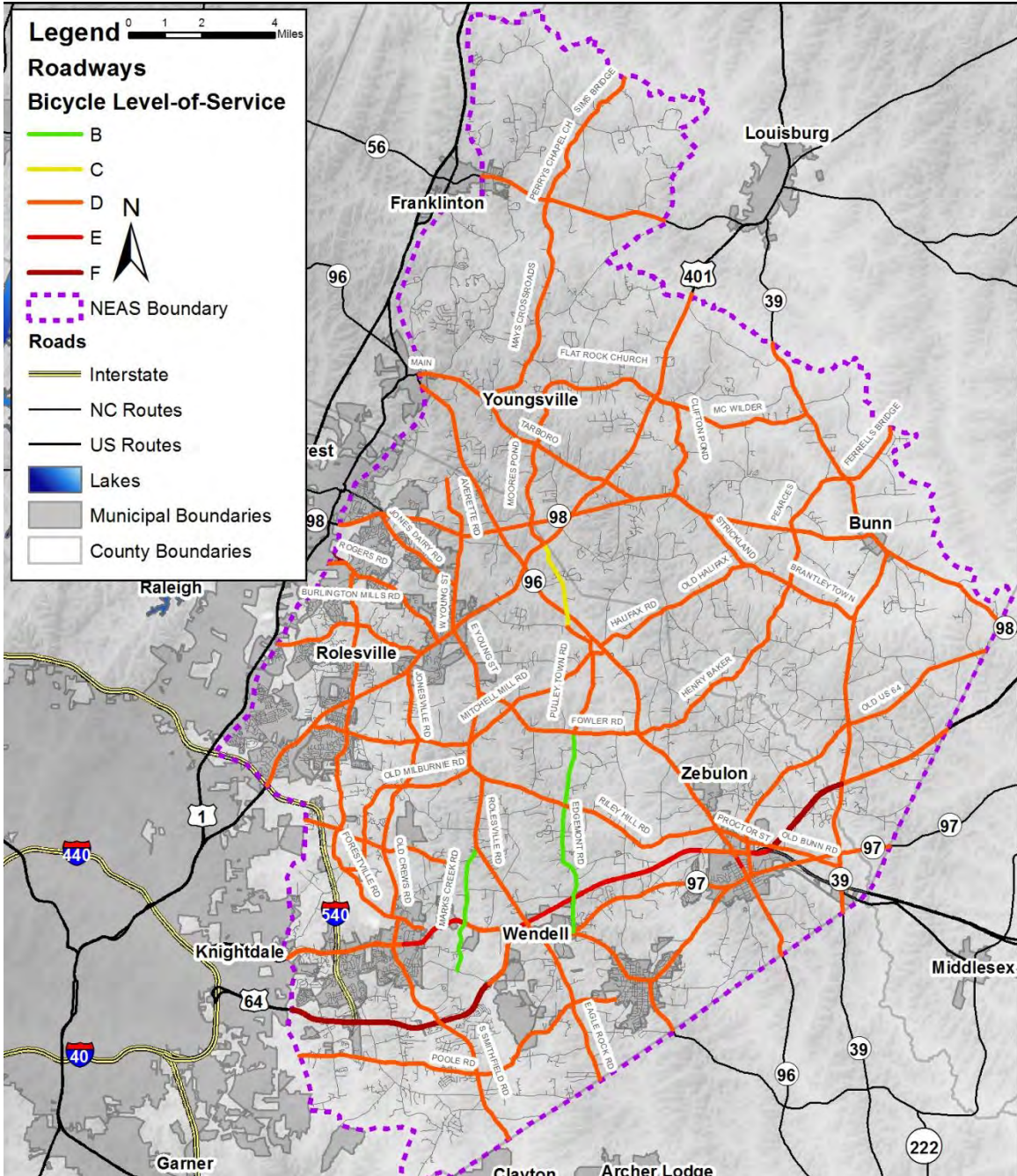


FIGURE 18: PEDESTRIAN LEVEL OF SERVICE



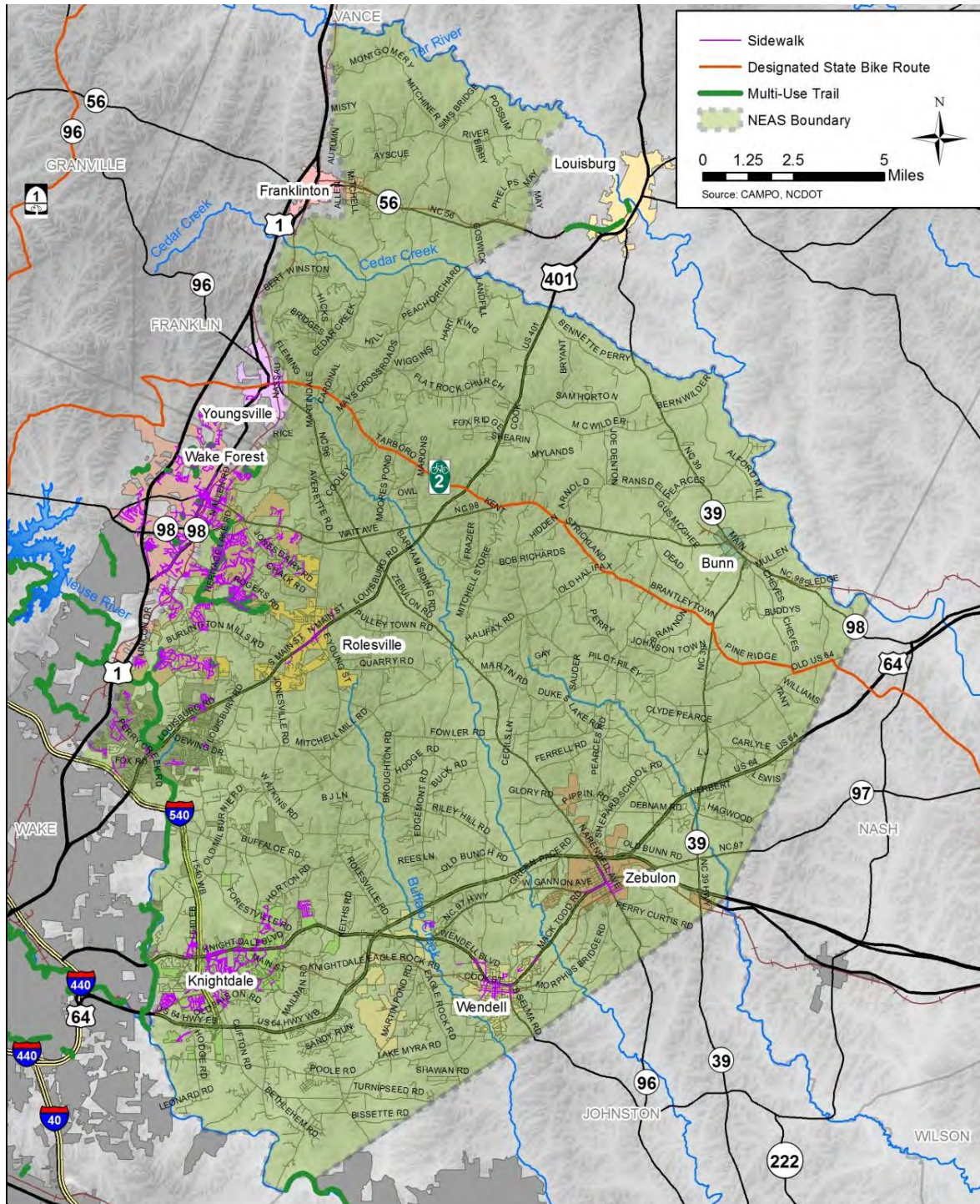
Bicycle LOS are based on five variables with relative importance as follows: average effective width of the outside thru lane, motorized vehicle volumes, motorized vehicle speeds, heavy vehicle (truck) volumes, and pavement conditions. Bicycle LOS results are illustrated Figure 19.

FIGURE 19: BICYCLE LEVEL OF SERVICE



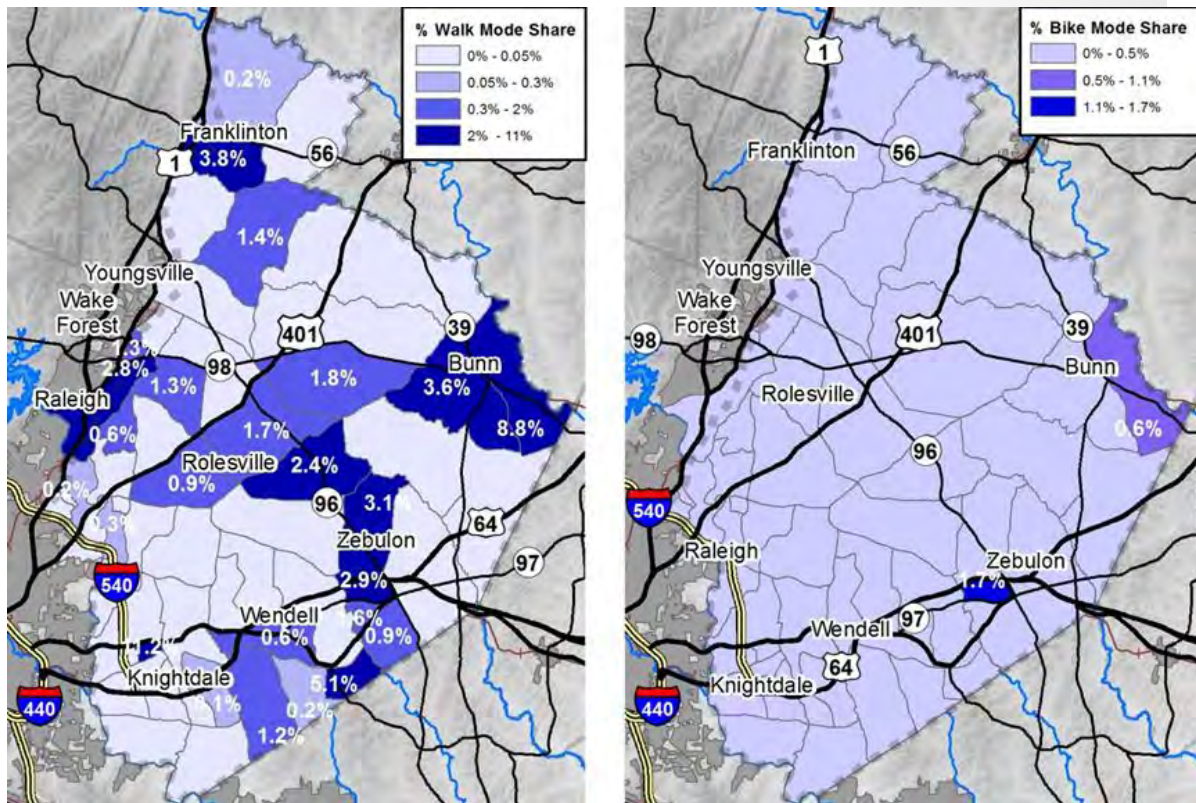
Historic town centers, such as those in Wendell and Zebulon, offer pedestrian-friendly environments, while many commercial corridors located in suburban areas pose barriers to bicyclists and pedestrians alike. Wake Forest offers many miles of greenways, while rural Franklin County features low-traffic rural roadways preferred by advanced cyclists. Existing sidewalks, designated state bicycle routes, and multi-use trails are illustrated in Figure 20.

FIGURE 20: EXISTING BICYCLE AND PEDESTRIAN FACILITIES



The current volume of bicycle and pedestrian trips across the region varies along with the quality of infrastructure. Non-automobile commuting rates offer one proxy for bicycle and pedestrian activity. Commuting across the region is summarized in Figure 21.

FIGURE 21: BICYCLE AND PEDESTRIAN MODE SHARE

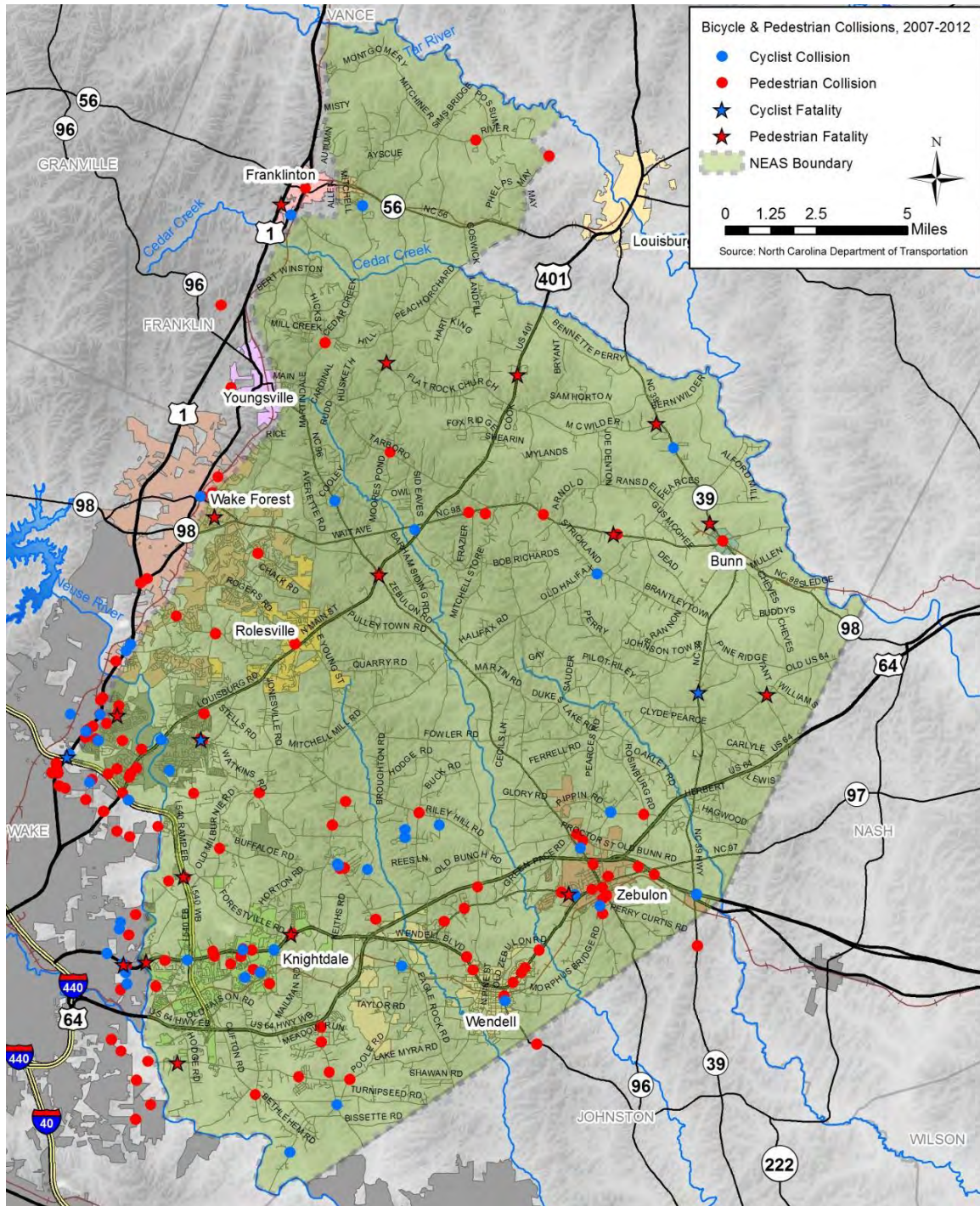


Source: American Community Survey, 2007-2011 5-Year Estimates

The commuting characteristics shown in Figure 21 indicate that pedestrian activity is more prevalent than biking activity, and is highest around the historic town centers. This is consistent with state-level data. Commuting data does not account for all pedestrian and bicycle activity, however, and therefore provides a limited picture of activity across the region. Recreational trips as well as utilitarian trips to stores and other destinations are observed across the region. Data is not currently available to quantify these trips.

Pedestrian and bicycle collision data provides further understanding of the location of current bicycle and pedestrian activity, as well as locations of safety concern. The locations of crashes between 2005 and 2012 are shown on Figure 22: Bicycle and Pedestrian Incident Map. The greater number of pedestrian crashes relative to bicycle crashes is likely explained by a greater amount of pedestrian activity. This data provides valuable information regarding pedestrian and bicycle activity; however, it is understood that a large number of pedestrian and bicycle incidents go unreported.

FIGURE 22: BICYCLE AND PEDESTRIAN INCIDENT MAP



A disproportionate amount (relative to population) of the bicycle and pedestrian collisions that have occurred in this region in recent years took place in rural areas. These crashes often occur on two-lane roads with minimal shoulders. Nineteen (approximately 11%) of all reported bicycle and pedestrian crashes were fatal. Sixteen (16) of the fatalities were pedestrian collisions. Collision distribution across the region summarized by the severity and type of the injury is shown in Figure 23.

FIGURE 23: BICYCLE AND PEDESTRIAN COLLISIONS, 2005-2012

Location	A-Injury (Disabling)	B-Injury (Evident)	C-Injury (Possible)	Fatal (Killed)	Property Damage Only	Total
Bicycle		23	13	3	5	44
Franklinton		2				2
Knightdale		4	1			5
Raleigh		2	7	1	3	13
Wake Forest		1				1
Wendell		1				1
Zebulon		2	1		1	4
Wake County		9	4	1		14
Franklin County		2		1	1	4
Pedestrian	5	57	32	16	13	123
Bunn			1			1
Franklinton			1	1		2
Knightdale		4	3	2		9
Raleigh	1	22	14	3	6	46
Rolesville					1	1
Wake Forest		5		1		6
Wendell		1	2		3	6
Zebulon	1	3	3	1	1	9
Wake County	3	17	6	2	1	29
Franklin County		5	2	6	1	14
Grand Total	5	80	45	19	18	167

Figure 24 summarizes crash data per capita to demonstrate differences between communities and in comparison to the state. These rates include all collisions within each jurisdiction, not just those that occurred within the study area, and are shown for the year 2010.

FIGURE 24: GEOGRAPHIC COMPARISON OF COLLISION RATES, 2010

Location	Pedestrian Collisions per Capita	Bicycle Collisions per Capita
Bunn	0.0	0.0
Franklinton	0.0	0.0
Knightdale	0.3	0.0
Raleigh	0.5	0.2
Wake Forest	0.0	0.0
Wendell	0.2	0.0
Youngsville	0.0	0.0
Zebulon	0.2	0.5
Wake County	0.3	0.2
Franklin County	0.1	0.0
North Carolina	0.3	0.1

With the variation in rural and urban challenges and opportunities, the existing conditions are best summarized by their landscape as presented below.

Challenges in Rural Areas

Challenges in rural areas include the following:

- Minimal shoulders combined with higher speed limits
- Lack of crossing facilities around destinations

Opportunities in Rural Areas

Rural landscapes offer low-traffic roadways and scenic vistas. These characteristics tend to attract long-distance, recreational cyclists. Rural areas also offer a 'clean slate' for the incorporation of best practices when future development takes place. Opportunities to build on these characteristics include the following:

- Add paved shoulders in resurfacing projects
- Set policies to include bicycle and pedestrian facilities upon development



Smithfield Road, south of US 64, has seen the highest number of bicycle and pedestrian crashes in the region in recent years.

Challenges in Historic Town Centers

While historic towns like Wendell, Zebulon, and downtown Wake Forest offer attractive walkable environments, they are also the most constrained when it comes to redevelopment. Challenges include the following:

- Right-of-way constraints to roadway widening for on-road bicycle facilities or new off-road facilities
- Limited resources for additional infrastructure investments

Opportunities in Historic Town Centers

Dense, historic town centers offer the best environment for walking and biking in the region today. Destinations are within short distances of residences in these areas and Main Streets offer street trees, sidewalks, and storefronts. Additional opportunities exist to build on these existing assets:

- Wide room exists for restriping of on-road bicycle facilities
- Improved way-finding could direct visitors to downtown streets and other destinations



Main Street in Wendell offers an attractive walking environment.



The Neuse River Trail, bordering the southern end of the region, will extend 28 miles along the Neuse River when complete.

Challenges in Suburban Areas

Suburban areas across the region pose the greatest challenge to walking and biking. These areas have developed transportation systems focused primarily on the automobile. Challenges include the following:

- Separation of land uses creates the need for long trips and reduces the viability of walking and biking for transportation
- Commercial corridors with wide crossings and extensive driveways act as barriers to cyclists and pedestrians
- Large parking areas lack pedestrian facilities

Opportunities in Suburban Areas

Despite the challenges listed above, suburban areas also contain the most mileage of multi-use trails in

the region. See the Figure 20: Existing Bicycle and Pedestrian Facilities, for the location of current infrastructure, where data was available. The following conditions offer opportunities to establish a safe and well-used bicycle and pedestrian environment:

- Sidewalks and greenways exist in many areas, providing the skeleton for a network if crossings and connections are improved
- Residents have expressed a desire for recreational opportunities, emphasizing trails in community surveys



Intersections along commercial corridors, like this crossing of Knightdale Boulevard and Smithfield Road, are difficult for both cyclists and pedestrians to navigate.

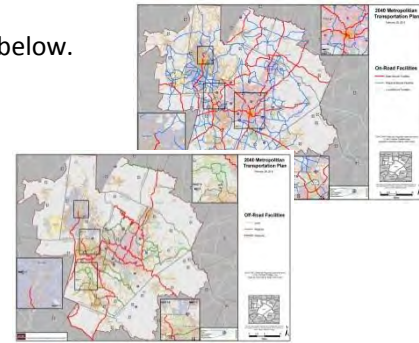
Supporting Plans/ Context:

Many plans for communities across the region already provide detailed recommendations for bicycle, pedestrian, and greenway infrastructure. These plans differentiate facility types and emphasize a regional vision by including connections across jurisdictional boundaries. The regional network collectively recommended by these plans will provide the starting point for pedestrian and bicycle facility recommendations in this study. They also provide policy and program ideas that can be shared and applied regionally through this study, along with other best practices from around the state.

Existing plans covering bicycle and pedestrian issues are discussed below.

2040 METROPOLITAN TRANSPORTATION PLAN

The 2040 Metropolitan Transportation Plan for the Capital Area region recommends on-and off-road bicycle and pedestrian facilities to be built in the next 30 years.



TOWN OF BUNN 2020 LAND USE PLAN

This plan is the long range growth management plan for the Town of Bunn. The top reported issue on a community needs survey for the plan was “Poor condition of streets and sidewalks.” The #2 issue was “Lack of recreation facilities.” One of its key objectives is to promote a pedestrian-friendly network that provides citizens access to work, shopping, and recreation. A policy recommendation was to maintain sidewalk and traffic control measures that promote safe pedestrian travel.



FRANKLIN COUNTY COMPREHENSIVE PLAN

The plan recognizes that “locating stores, offices, residences, schools, and recreation spaces within walking distance of each other in compact neighborhoods with pedestrian-oriented streets” is an important element of smart growth. One of its implementation strategies is to “provide pedestrians and bicyclists with shortcuts and alternatives to travel along high-volume streets.” The Plan also recommends its Unified Development Ordinance be revised to support multi-modal streets, transit/bike/pedestrian connectivity (block-length measures, sidewalk requirements, etc.) and pedestrian friendly streetscapes.

KNIGHTDALE PEDESTRIAN PLAN (2013)

The Plan provides recommendations for major corridors as well as “spot” improvements. Corridors identified for pedestrian improvements include Knightdale Boulevard, Smithfield Road, Connections across I-540, and Old Knight Road. Design guidelines are also provided to create an integrated and cohesive town in functionality and aesthetic appearance.



KNIGHTDALE 2027 COMPREHENSIVE PLAN (2011)

The Plan includes an open space and greenway master plan that identifies the Neuse River Greenway, Mingo Creek Greenway, and Mark's Creek Greenway as the major greenway priorities. As part of the transportation plan within this overall plan, it includes on-road bike/ped facility recommendations.



KNIGHTDALE PARKS, RECREATION, AND OPEN SPACE MASTER PLAN (2010)

The Plan includes recommendations for specific greenways including Mingo Creek, Beaverdam Creek, Mark's Creek, Poplar Creek, and Clark's Branch. The Plan establishes a goal of having 1.1 miles of hard surface trail per 1,000 population and 0.9 miles of soft surface trails per 1,000 population (over the next 20 to 30 years, this equals 55 miles of hard surface trails and 45 miles of soft surface trails). As part of this Plan, a survey was conducted and "waking and hiking" were identified as the #1 recreational activities.

CITY OF RALEIGH PEDESTRIAN PLAN (2013)

The Raleigh Pedestrian Plan builds upon previous work from the 1992 ADA Transition Plan, 1993 Sidewalk Priority Funding Program, 2030 Comprehensive Master Plan, and the Unified Development Ordinance update. It is intended to serve as a companion plan to the 2009 Raleigh Bicycle Transportation Plan. The plan identifies the City's key pedestrian needs and makes recommendations to guide future investment in sidewalks and crossings to better connect the citywide pedestrian network. It also identifies ways to increase pedestrian safety and awareness.

RALEIGH BICYCLE TRANSPORTATION PLAN (2009)

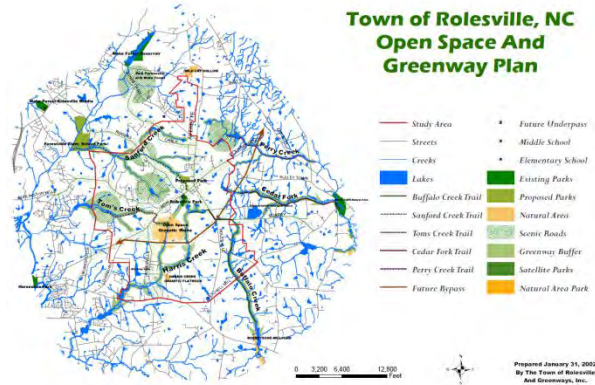
This plan updates and adds to the 1991 Raleigh Bicycle Plan and includes standards and guidelines for the development of bicycle facilities, a prioritized list of bicycle facility improvements, and recommendations for bicycle programs, operations, facility maintenance, and project funding. The plan includes recommendations to connect to the planned greenway network. Bicycle lane restriping and new bicycle lane construction is recommended for several roads in Northeast Raleigh to connect to the planned Neuse River Greenway and NC 98 multi-use sidepath, and to the existing Durant Trail, Falls River Trail, and Wakefield Trail.

ROLESVILLE BICYCLE PLAN DRAFT (2013)

This plan draft was released in 2013 and outlines a vision for improving bicycling conditions and connections in Rolesville for both transportation and recreation. Contained in the plan is a listing of prioritized on-road and off-road bicycle project recommendations to connect bicyclists to downtown, schools, parks, shopping centers, neighborhoods, and other important destinations. Proposed improvements include a greenway connecting to Main Street Park and a sidepath along Burlington Mills Road.

TOWN OF ROLESVILLE COMMUNITY PLAN (2007)

The Plan outlines a community vision for Rolesville and recognizes the importance of greenways despite not containing specific greenway recommendations. One of its goals is to site schools within reasonable distances of Rolesville residents with convenient access to a pedestrian and greenway network.



TOWN OF ROLESVILLE OPEN SPACE AND GREENWAYS PLAN (2002)

The Plan identifies and proposes six stream buffer zones, natural and pedestrian use greenway corridors, and bike routes.

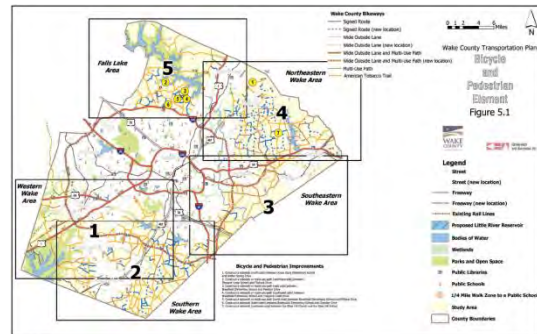
WAKE COUNTY COMPREHENSIVE PARKS & RECREATION MASTER PLAN (2008)



Two of the seven goals of this plan relate to greenway development. The plan includes a map of existing and proposed trails within Wake County, which was created by compiling municipal greenway plans. The only existing regional trail operated by Wake County is the American Tobacco Trail. The County plans to partner with municipalities to create two other regional trails: the Swift Creek Greenway and Neuse River Greenway.

WAKE COUNTY TRANSPORTATION PLAN (2003)

The Wake County Transportation Plan provides a vision of transportation improvements for the next 30 years. The plan includes a couple of specific recommendations for greenways and greenway connections to be included in roadway improvements. The plan states that “the construction of sidewalk and greenway connections throughout the county between neighborhoods and schools, libraries, parks, and other county and community facilities should be made a high priority.” In addition, the plan describes the important link between on-road bikeways and off-road trail and greenway facilities, and includes bikeway improvement recommendations.



WAKE FOREST OPEN SPACE AND GREENWAYS PLAN (2009 UPDATE)

This plan is an update of the 2002 Open Space and Greenways Plan for Wake Forest. It makes detailed recommendations for a comprehensive open space and greenways network and outlines priority projects, discusses acquisition and funding strategies, and provides action steps for implementation. The plan reviews each of these corridors in detail and provides specific trail recommendations for Smith Creek, Dunn Creek, Richland Creek, Tom’s Creek, and Sanford Creek.



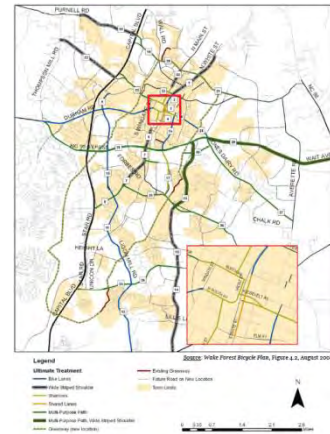
NC 98 BYPASS CORRIDOR MASTER PLAN (2003)

The NC98 Bypass Corridor Master Plan provides guidance for incorporating the planned NC98 Bypass into the transportation network and the surrounding community and environment. The plan recommends a 10-foot-wide paved trail along each side of the Bypass to create north-south connections between other planned greenways, with detailed specifications for trail alignment. Also recommended

are grade-separated crossings at major greenway trail connections and intersections with the Bypass.

WAKE FOREST TRANSPORTATION PLAN (2010)

This plan provides a vision of how Wake Forest sees itself growing and developing through 2025, focusing in particular on transportation recommendations to achieve this vision. The Transportation Plan also makes its own recommendations related to greenways, including: “Increase annual funding for the greenways, pedestrian, and bicycle programs,” and “Create a design guide for pedestrian, greenway, bikeway, and bus stop improvements.” The plan also recommends updating design-related town ordinances to clarify guidance for greenways and reviewing land development and redevelopment applications to identify opportunities to connect greenways with adjacent development and nearby destinations.



WAKE FOREST COMMUNITY PLAN (2009)

The Wake Forest Community Plan supports the development of greenways throughout the town and connecting to the surrounding region. One of the nine policy recommendations set forth in the plan is, “A network of planned walkways, bikeways and greenways should continue to be implemented as an integral part of town growth and development. Sidewalks, bikeways and greenways should be required as part of the necessary infrastructure for new development.” The plan sets a policy for the Town to work with neighborhood residents to support the provision of greenways, bikeways, and walkways within existing neighborhoods, as well as having new neighborhoods recognize bike routes and greenways at the time of development.



WAKE FOREST BICYCLE PLAN (2008) AND WAKE FOREST PEDESTRIAN PLAN (2007)

The two plans, both funded by NCDOT, provide specific recommendations for bike/ped network facilities, programs, and policies. Both on-road and off-road facilities were recommended that, when integrated with the proposed greenway network, would provide connectivity throughout Wake Forest.



THE TOWN PLAN OF WENDELL (2007)

The Town Plan of Wendell outlines the community values and vision that the Town aims to promote for the future and the actions needed to maintain and reach these. The Transportation section of the plan mentions greenways as part of the pedestrian network in the suburban and rural areas of the Town but does not include specific greenway recommendations.

ZEBULON COMPREHENSIVE PLAN (2008)

This plan provides guidance for the physical growth and development of the Town of Zebulon through its anticipated build-out by 2025. This includes goals and policy recommendations for the development of a greenway network within Zebulon. The first environment goal listed in the plan is to “Implement recommendations set forth in the

currently adopted Zebulon Open Space & Greenway Master Plan which relate to the protection of existing natural resources and open space for ecological, aesthetic, and recreational purposes.”

The Plan also recommends bikeways and greenways to better accommodate pedestrians and bicyclists. An improved pedestrian network is also listed as a key concept: “Develop and maintain a pedestrian circulation system, including sidewalks and greenway trails that provide direct, continuous, and safe movement within Town by linking neighborhoods to activity centers, transit stops, schools, parks, and other neighborhoods, and where possible connections to other communities.” The plan also mentions planned extensions to existing greenway corridors that would connect the downtowns of Zebulon and Wendell.

ZEBULON MULTIMODAL TRANSPORTATION PLAN (2001)



This plan identifies multiple greenways and bikeways that would connect to a larger network outside of Zebulon’s limits. The plan proposes greenways along Beaver Creek, north along Debnam Road, and east towards the proposed Moccasin Creek Greenway.

ZEBULON NC 96 (ARENDELL AVENUE) ACCESS MANAGEMENT PLAN (2009)

The NC 96 Access Management Plan identifies potential options to provide for destination access along the corridor while also preserving its efficiency as a regional roadway. The Plan's recommendations include adding crosswalks, pedestrian lighting, ADA-compliant pedestrian facilities, and audible **PEDESTRIAN** crosswalk signals along the corridor.

ZEBULON NC 96 (ARENDELL AVENUE) ENGINEERING REPORT (2012)

This study presents a plan and design guidelines for making Arendell Avenue a gateway corridor into Zebulon. The plan involves widening Arendell to a four-lane divided facility with 14-foot wide outside lanes and 5-foot sidewalks on both sides to accommodate bicyclists and pedestrians. At intersections, the plan calls for ADA-accessible curb ramps, pedestrian push buttons, and countdown signal heads. These improvements are proposed to make the Arendell Avenue corridor more attractive and accessible to all road users. No greenway or sidepath recommendations made.

ZEBULON AND WENDELL OPEN SPACE AND GREENWAY MASTER PLAN (2002)

This plan identifies opportunities for land acquisition for and development of a greenway network for the towns of Zebulon and Wendell. The plan targets multiple corridors for greenway development, including Little River Greenway, the Zebulon-Wendell Greenway, Mark's Creek Greenway, and Buffalo Creek Greenway. The Plan emphasizes greenway connectivity to neighboring municipalities and greenway requirement policies.

Transit

Existing Conditions

Triangle Transit in partnership with Capital Area Transit (CAT) provides transit service to Wake Forest, Knightdale, Zebulon and Wendell. Transit service is provided along three key corridors: New Bern/Knightdale Boulevard, Highway US 264/64, and the east side of US 1. The development patterns along these corridors have recently achieved a housing-to-job-ratio of two dwellings and one job per acre thresholds to support Express Bus service.



The following summarizes the transit routes within the study area:

Wake Forest

Transit service in Wake Forest began in 2008 and today offers two bus services the Wake Forest Express and the Wake Forest Circulator. The Wake Forest Express route connects Wake Forest to downtown Raleigh, operating 10 trips per day, average trip taking 60 minutes with 3 stops en route. The circulator operates to key destinations within Wake Forest. These transit services costs the local government \$150,000 annually.



Knightsdale

Transit service in Knightsdale began in 2010. The Knightsdale Express Route connects Knightsdale to downtown Raleigh, operating 10 trips per day, average trip is 30 minutes with 6 stops en route. This transit service costs the local government approximately \$30,000 annually.

Zebulon/Wendell

Transit service in Zebulon and Wendell began in 2009. The Zebulon/Wendell Express Route connects these communities to downtown Raleigh, operating 8 trips per day, average trip is 40 minutes with 5 stops en route. This transit service costs the local government of both Wendell and Zebulon \$17,000 annually.



Community transit services, in addition to the fixed transit routes, include demand-response service provided by Wake County Coordinated Transit System and KARTS in Franklin County.

Supporting Plans/Context:

There are numerous community plans that support transit and confirm the need and importance of transit to the vitality and quality of life in a community. The Wake County Transit Plan below provides an overview of future recommendations that address the needs, vision, and goals of the growing communities.

WAKE COUNTY TRANSIT PLAN (2012)(DRAFT)

The Wake County Plan recommends significant improvements to bus service in Northeast Wake County. Recommendations include new and expansion of the commuter and local transit services. These services directly tie into expansion of the Triangle Town Center and New Hope Road Transit hubs that are located just outside of the study area near Raleigh.



New and expanded Commuter Service recommendations are briefly described below:

Wake Forest to Triangle Town Center –expanded commuter service

- 12 new trips per day (30 minutes instead of 1 hour between busses)
- Adds 1,500 hours of service at a cost of \$150,000 a year
- Add park and ride location at Capital and Burlington Mills
- Adds 1 Bus to accommodate constant rotation on 10 mile round trip

Knightsdale to Downtown Raleigh–expanded commuter service

- 12 new trips per day (30 minutes instead of 1 hour between busses)
- Adds 1,960 hours of service at a cost of \$194,000 a year
- 2 Buses to service the 19 mile round trip

Zebulon/ Wendell to Raleigh –expanded commuter service

- 6 new trips per day (30 minutes instead of 1 hour between buses)
- Adds 3,750 hours of service at a cost of \$375,000 a year
- Park and Ride Wendell Falls
- 3 Buses to service the 49 mile round trip

Rolesville to Triangle Town Center–new commuter service

- 12 new trips per day
- Adds 1,660 hours of service at a cost of \$165,000 a year
- Transfer Station in Rolesville
- Add 2 Buses to service the 17 mile round trip

New Circulator Transit Service recommendations are briefly described below:

Wake Forest / Wakefield to Triangle Town Center – new circulator transit service

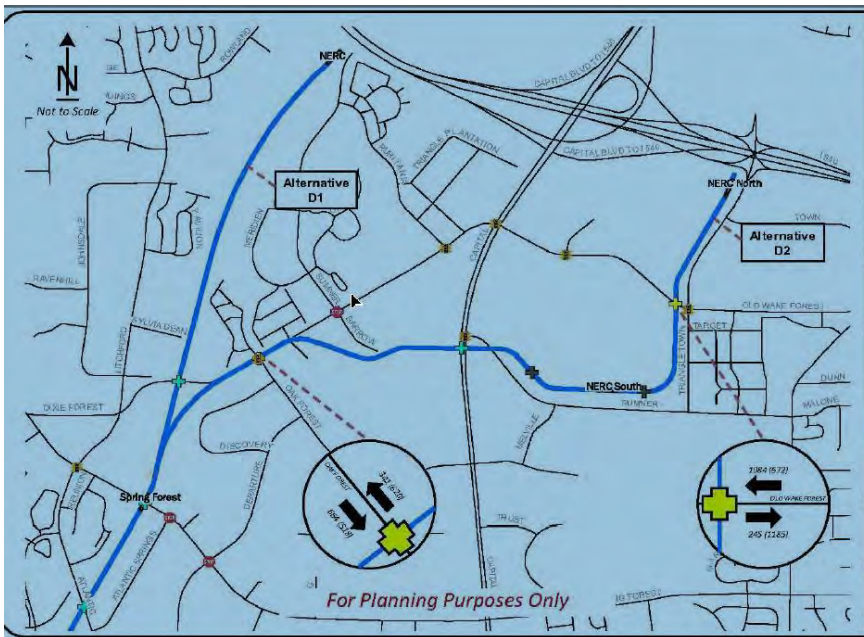
- 17 new trips a day
- Adds 8,820 hours of service at a cost of \$785,000 a year
- Wake Forest and Wake Field Transfer Points
- 4 Buses to service the 28 mile round trip

Rolesville / Wake Forest – new circulator transit service

- 17 new trips a day
- Adds 8,820 hours of service at a cost of \$785,000 a year
- Wake Forest Transfer Point

In addition to bus transit service, the Wake County Transit Plan included future plans for light rail transit (LRT). The Regional LRT project (which is now under review as a Federal Transit Administration New Starts candidate project) has two alignments under review. Both alignments terminate just outside of the study area south of I-540. Alignment D1 and D2 are illustrated below in Figure 25.

FIGURE 25: LIGHT RAIL TRANSIT ALTERNATIVE ALIGNMENTS



Wake County Corridor Alternatives Analysis, Volume 5: Traffic Analysis, FIGURE 2 no-build sheet 13/13, July 2011

Rail

Existing Conditions

The Norfolk Southern owned rail line runs from Raleigh to Wilson and is currently leased by Carolina Coastal Railway. The rail line has crossings within the study area in Knightdale, Wendell, and Zebulon. Approximately 3-4 trains per week use the line to deliver goods between Wilson and Raleigh.



Most of the railroad right-of-way is 100 feet; however, it reduces to 60 feet in downtown corridors. There are both grade separated crossings and at-grade crossings. The at-grade crossings have a variety of treatments including overhead signals, gates, crossbucks, and warning signs.

A comprehensive evaluation of these crossings will be presented in the **NEAS RAIL CROSSING TECHNICAL MEMORANDUM**. The evaluation will be determined based on safety, crash history, sight distance, roadway volumes, and pedestrian connections at the at-grade crossings. In the downtown areas of Wendell and Zebulon, there are multiple crossings for bicycle and pedestrian traffic that will be addressed in detail in the technical memorandum.

Supporting Plans/Context:

There are numerous plans that support multi-modal mobility and many facets that relate to heavy rail in the region. Two key rail plans are noted below and the **RAIL CROSSING TECHNICAL MEMORANDUM PROVIDES** a comprehensive rail analysis and supporting documentation.

WAKE COUNTY TRANSIT PLAN (2011)

The Wake County Transit Plan recommends upgrades to the Norfolk and Southern Rail Line to allow faster travel speeds for commuter rail to Zebulon, Wendell and Knightdale. The plan notes that Initial commuter rail could be operational in 2015 from Garner-Raleigh-RTP if funding was available. The subsequent commuter rail phase shows a connection from Raleigh to Wake Forest (this is beyond the horizon of the 2011 Wake County Transit Plan). An even later phase shows a connection from Raleigh to Knightdale, Wendell and Zebulon via upgrades to the Norfolk and Southern Rail Line to allow faster travel speeds for commuter rail. Effective peak hour service for Commuter Rail is recommended to be every 15 minutes.

Eastrans Commuter Rail Study (2004)

Eastrans Commuter Rail Alliance in partnership with the Town of Knightdale conducted a study to assess the feasibility of implementing commuter rail from Knightdale to Raleigh. The study concluded that commuter rail is a viable option for long-range transportation and should be considered in future planning projects. Commuter rail was envisioned to use the existing freight tracks and require double tracking with additional improvements for safety and mobility. There are 58 at-grade crossings between Wilson and the Boylan Wye in Downtown Raleigh.

