

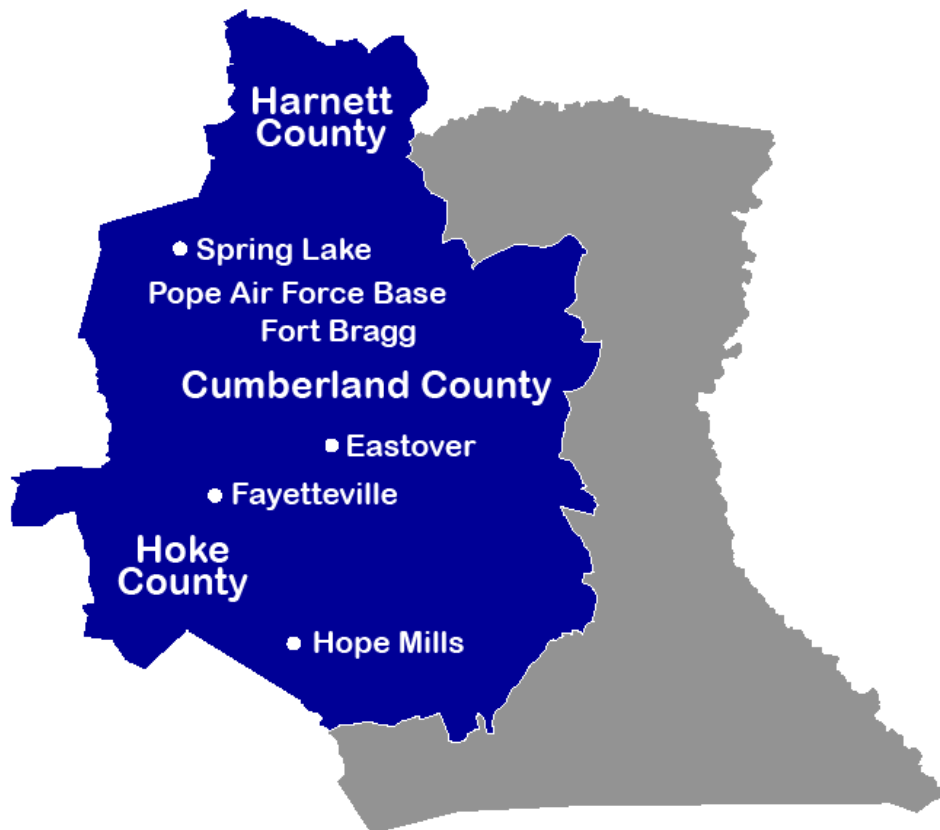
FAMPO

Fayetteville Area Metropolitan Planning Organization

POPULATION & ECONOMICS STUDY

2006-2035

Methodology and Appendix I



April 23, 2008

Continuing · Comprehensive · Cooperative · Transportation Planning

Overview of Data Collected

Data required for the Highway Plan Network Model:

1. Streets and Highway Inventory
 - a. Intersections
 - b. Speed Limits
 - c. Stop signs/ traffic signals
2. Total Housing units by TAZ
 - a. Trip Generation Category
 - b. Type of Unit
3. Workforce by TAZ, designated by SIC
 - a. Industrial: SIC 1-49
 - b. Retail: SIC 50-54
 - c. Highway Retail: SIC 55 and 59
 - d. Office: SIC 60-67 and 91-97
 - e. Service: SIC 70-76,78,79,80-89, and 99
4. Commercial Vehicles by TAZ
 - a. Small (Vans, pickups, two-axle trucks)
 - b. Large (Multi-Axle trucks, buses)
 - c. Off-Site Vehicles

Data Sources

1. Field Collection
2. 2000 FAMPO Population and Economics Study
3. Cumberland, Hoke, and Harnett County Tax Records
4. Fort Bragg Directorate of Public Works
5. N.C. Office of State Budget and Management
6. N.C. State Center for Health Statistics
7. United States Census Bureau
8. N.C. Department of Labor and Statistics

Base Year Estimates

2006 Housing Stock Estimate

A summary of the total housing units for each TAZ within the study area was created using data from the County GIS and tax departments combined with data from the 2000 P&E and information gathered in the field. Data for Ft. Bragg Census Designated Place (CDP) was provided by the Ft. Bragg Directorate of Public Works. Each residential unit in the study area was assigned to a housing category by type: single family, apartment, mobile home, or group quarters. These groupings were chosen to conform to census categories and to facilitate the assignment of housing units to trip generation categories. The occupancy rate and persons per household value for each county were taken from the 2006 American Community Survey.

The housing stock estimates and the base year population estimate for the study area produced using these sources are:

2006 Housing Units

| Type of Unit | Cumberland (W/O Ft. Bragg) | Harnett* | Hoke* |
|---------------------|---------------------------------------|-----------------|--------------|
| Single Family | 98,717 | 2,668 | 5,608 |
| Apartment | 19,284 | 105 | 0 |
| Mobile Home | 15,174 | 1,682 | 500 |
| Total | 133,175 | 4,455 | 6,108 |

* portion within MPO planning area

2006 Population Estimate

Annual population estimates at the county level are published by the North Carolina Office of State Budget and Management (NC OSBM) and the U.S. Census Bureau American Community Survey (ACS). In addition to these sources, an estimate of 2006 area population was calculated using the above housing stock estimates in combination with the occupancy rate and persons per household numbers published by the U.S. Census. The 2006 population estimates and the estimated growth since the 2000 census are as follows:

2006 Housing Units and Population

| Area | Total Housing Units | Occupancy Rate** | Persons Per Household** | Population |
|-------------|------------------------------------|-----------------------------|------------------------------------|-------------------|
| Cumberland | 133,175 | 0.91 | 2.36 | 284,435 |
| Hoke* | 6,108 | 0.91 | 2.86 | 15,879 |
| Harnett* | 4,455 | 0.83 | 2.85 | 10,475 |

*portion within MPO Planning Area

**source: U.S. Census Bureau

FAMPO Population Growth 2000-2006

| Area | 2006 FAMPO Estimate | FAMPO Est. Growth Rate |
|------------|---------------------|------------------------|
| Cumberland | 320,272 | 5.71% |
| Hoke | 15,879* | 55.28%* |
| Harnett | 10,475* | 5.83%* |
| Study Area | 346,627 | 7.28% |

*portion within MPO Planning Area

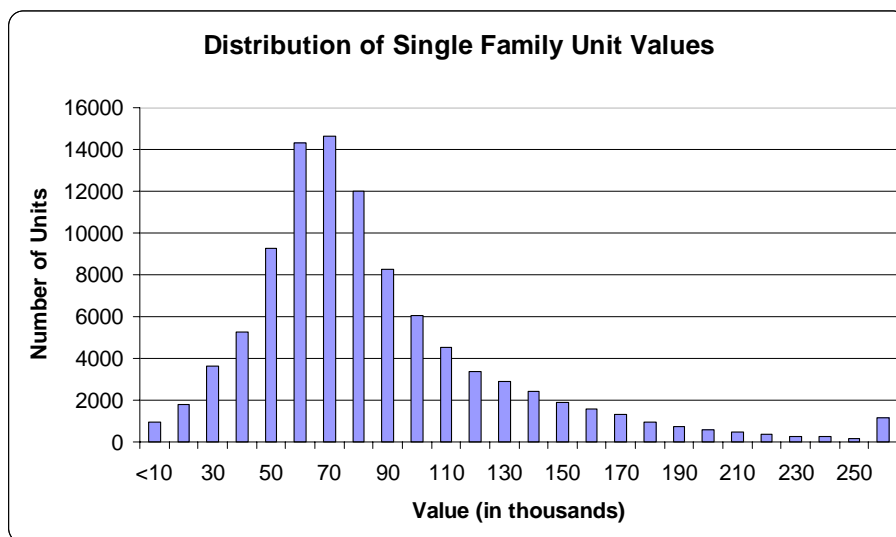
Population estimates for 2006 are also produced by the North Carolina State Office of Budget and Management (NC OSBM) and the U.S. Census Bureau American Community Survey (ACS).

Census and N.C. OSBM Population Growth 2000-2006

| Area | 2000 Census | 2006 NC OSBM Estimate | NC OSBM Est. Growth Rate | 2006 ACS Estimate | ACS Est. Growth Rate |
|------------|-------------|-----------------------|--------------------------|-------------------|----------------------|
| Cumberland | 302,976 | 306,545 | 1.18% | 299,060 | -1.29% |
| Hoke | 33,646 | 42,202 | 25.43% | 42,303 | 25.73% |
| Harnett | 91,025 | 103,714 | 13.94% | 106,383 | 16.87% |

Trip Generation Categories

Each housing unit within the study area was assigned to a trip generation category according to the methodology described in previous P&E Studies. Building value is used as a surrogate for household income, which corresponds to household trip generation. The distribution of single family unit values for the study area, assigned to intervals of \$10,000, is shown below:



Based on this distribution, value ranges were determined for five trip generation categories. The final tax value ranges for the single family unit trip generation categories are:

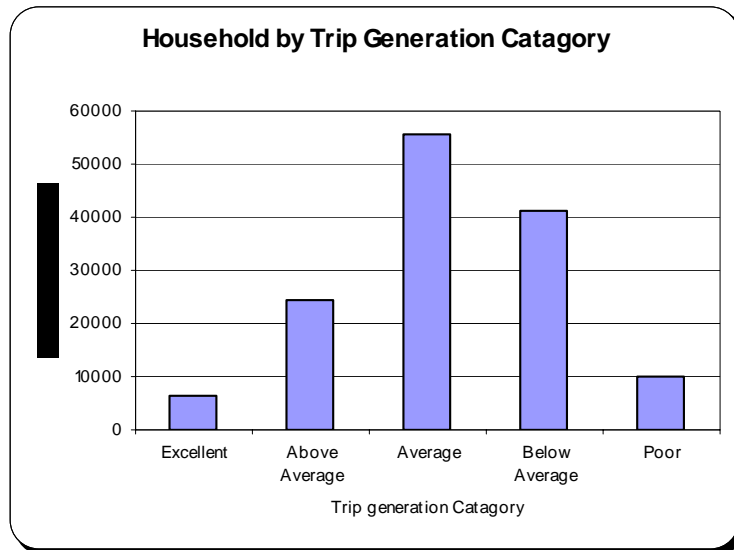
Trip Generation Categories

| Category | Tax Value Range |
|---------------|------------------|
| Excellent | > 159,500 |
| Above Average | 90,000 – 159,500 |
| Average | 55,500 – 90,000 |
| Below Average | 30,000- 55,500 |
| Poor | < 30,000 |

It should be noted that these values represent only the building value as recorded in county tax records. They do not include the value of the land or any extra features. The assessed value of real estate is often below the price for which property is sold. The building values used in this analysis do not match home sale prices.

Since apartments and mobile homes have no unit tax value, each unit was classified according to the methodology outlined in the 1991 Fayetteville Urbanized Area and Cumberland County P&E. This study states that apartments can only be categorized within the poor to above average category range. Public housing should be put into the poor category, and all other apartments should be put into the category of the majority of single family homes within the same TAZ. In zones where there is no overwhelming majority of single family units in any single category, apartments were put into a category based on immediately adjacent single family units. Mobile home units can only be assigned to either the poor or below average category, also based on the majority of single family units with the same TAZ.

The distribution of housing units by trip generation category is:



2006 Employment Estimates

The survey of employment and commercial activity was accomplished by staff field work, based on the data collected from several sources. Land use records from Cumberland, Hoke, and Harnett counties were used to create a database of possible commercial properties, which was combined with the database of commercial establishments created for the 2000 P&E. These properties were then checked in the field by staff. The information recorded for each business was:

1. Location
2. Name
3. Standard Industrial Code
4. Number of Employees

5. Number of company vehicle
 - a. Small (vans, cars, pickups)
 - b. Large (multi – axle trucks, buses)
 - c. Offsite

Base year and projected employment data for Ft. Bragg was provided by the Ft. Bragg Directorate of Public Works. At the time of the 2000 P&E the area of Hoke County now within the metropolitan area boundary was not considered a part of the FAMPO planning area. 2000 employment data for this area is not available.

Projections

Population Projections

State Government Projections

Population projections in 5-year periods are published by the North Carolina Office of State Budget and Management. At the time of writing, these projections were available until the year 2030. The NC OSBM projections are:

N.C. OSBM Population Projections

| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|------------|---------|---------|---------|---------|---------|------|
| Cumberland | 311,777 | 321,941 | 330,759 | 340,035 | 347,460 | N/A |
| Hoke | 48,162 | 55,781 | 63,034 | 71,430 | 79,427 | N/A |
| Harnett | 111,676 | 123,734 | 135,012 | 147,679 | 159,155 | N/A |

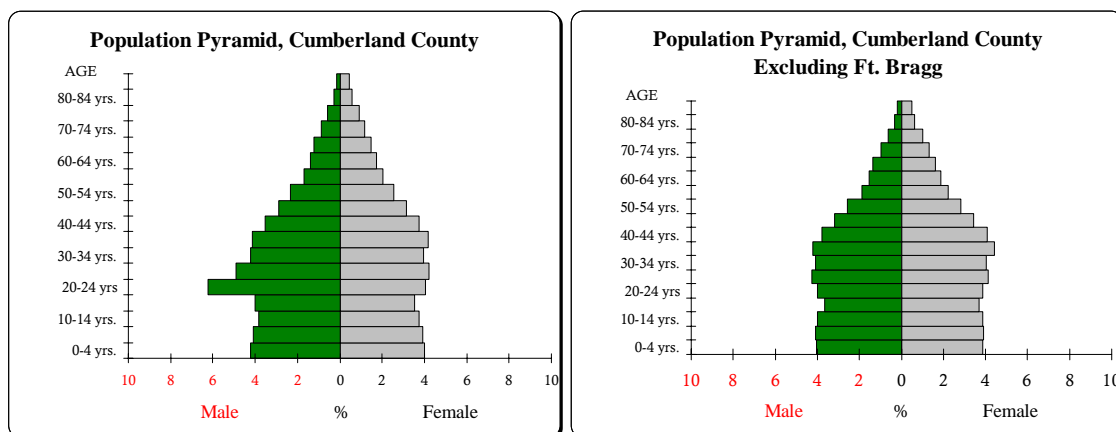
Cohort Survival

The Cohort Survival method uses the formula:

$$Population[t+1] = Population[t] + Natural\ Increase + Net\ Migration$$

where t = the beginning time interval and $t+1$ = the next time interval. For this study the calculation was done at five year intervals beginning in 2005 and ending in 2035. 2005 age and gender population figures came from the NC OSBM. Birth and death statistics used to calculate the natural increase came from the NC Department of Health and Human Services.

During initial analysis, it was found that the presence of Ft. Bragg causes irregularity in the population cohorts of Cumberland County as compared to the United States as a whole. Specifically, there is a much larger population of males in the 20-25 and 25-30 age cohort than is normally expected. When the population of the Ft. Bragg Census Designated Place (CDP) is subtracted from the total population of Cumberland County, the population distribution is more normal as shown by the following population pyramids:



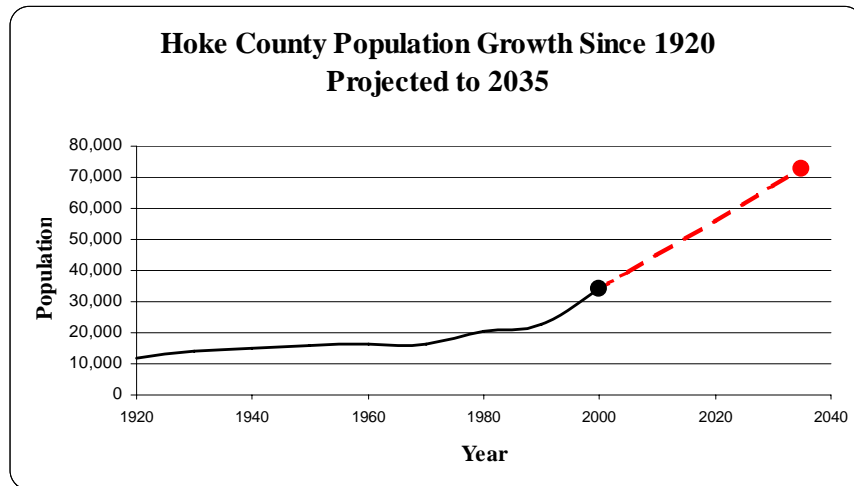
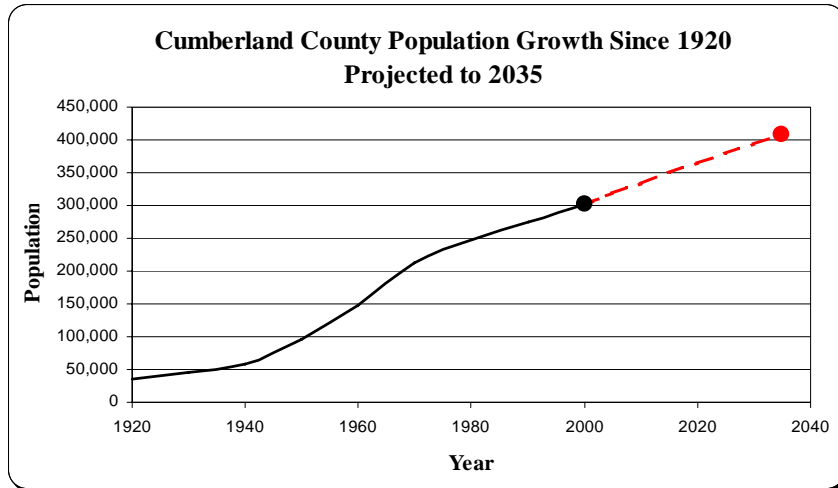
Because of the irregular age and gender distribution of the Cumberland County population caused by Ft. Bragg, the cohort survival method was run twice, using the total population (shown as Cumberland 1), and holding the population of Ft. Bragg constant (shown as Cumberland 2). For Hoke and Harnett counties, the cohort survival calculations were done using the entire county populations. The results of the cohort survival method are:

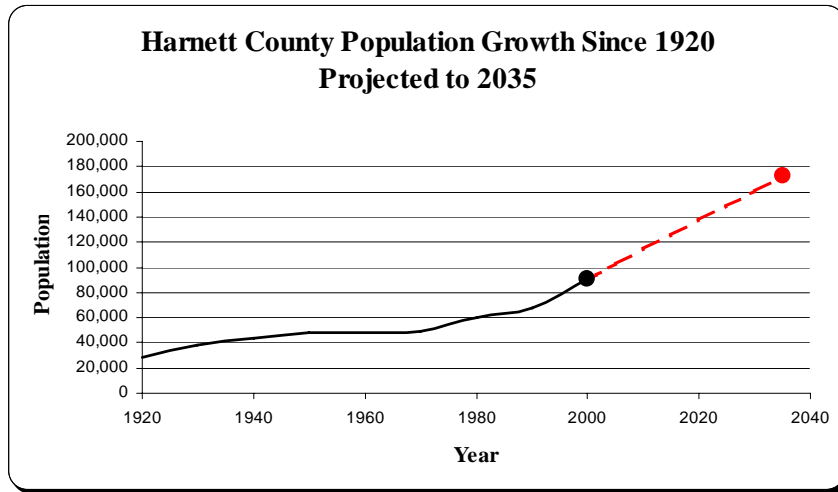
Cohort Survival Method Population Projections

| | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|--------------|---------|---------|---------|---------|---------|---------|---------|
| Cumberland 1 | 304,380 | 323,610 | 341,545 | 365,290 | 387,844 | 414,544 | 441,782 |
| Cumberland 2 | 304,380 | 328,443 | 346,377 | 368,422 | 389,539 | 412,875 | 437,473 |
| Hoke | 40,428 | 49,519 | 60,179 | 73,268 | 88,608 | 106,974 | 127,653 |
| Harnett | 101,486 | 113,248 | 125,356 | 139,102 | 152,212 | 165,432 | 176,948 |

Trend Analysis

The second method used to produce population projections was a trend analysis. This method uses historical growth to forecast future growth. The result of the trend analysis graphs for each county is shown below:





Trend Analysis Population Projections Summary

| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2006-2035 Growth Percentage |
|------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| Cumberland | 334,225 | 349,233 | 364,242 | 379,250 | 394,259 | 409,267 | 28% |
| Hoke | 44,982 | 50,514 | 56,045 | 61,577 | 67,108 | 72,640 | 72% |
| Harnett | 114,302 | 125,922 | 137,542 | 149,162 | 160,782 | 172,402 | 66% |

The full tables that accompany these graphs are shown in Appendix I.

Allocation of 2035 Population to TAZ

Housing Units Possible

In allocating new population to TAZ, two different methods were used to determine the number of housing units possible in each TAZ. One method used was an analysis of vacant land using the Cumberland County 2010 Land Use Plan along with the Stedman, Eastover, Spring Lake, North Fayetteville, and Wade Detailed Land Use Plans and the Cumberland Road Study to determine possible future development. The existing density for each residential land use category was calculated, and these densities were applied to the vacant acreage in each TAZ to determine the possible number of future housing units. The densities determined for use in used in this calculation are:

Existing and Allowed Density by Residential Zone

| Category | Units per Acre Allowed | Units per Acre Existing |
|----------------------|-------------------------------|--------------------------------|
| Low Density | 2-6 | 1.92 |
| Medium Density | 6-15 | 3.65 |
| High Density | > 15 | 6.07 |
| Suburban Density | 2 | 0.30 |
| One Acre Residential | 1 | 0.29 |

The second method was conducted by The City of Fayetteville Planning Department, and provides estimates of number of units expected by TAZ within the city limits and the proposed Fayetteville Municipal Influence Area. The methodology used by City Planning was to identify vacant or developable acreage in lots five acres or larger that fall within the proposed primary sewer boundary. The number of units expected for each lot was then calculated using the maximum number of units allowed under the current land zoning.

Housing Units Needed

The number of units needed in each TAZ was calculated by applying the percentage of expected growth to the 2006 estimated population of each TAZ. The occupancy rate and the persons per household rate used in the 2006 estimates were then applied to calculate the number of units that would be necessary to accommodate the new population. Then the number of new units needed in each TAZ was compared to the number of new units possible, calculated according to the two methods described above. Based on available land, zoning, the 2010 Land Use Plan, aspects of the proposed 2030 Vision Plan, past development patterns, and the professional opinions of local planners, the units needed were then distributed by TAZ.

Employment Projections

Employment projections for the study area were based on the projections done in the 2000 P&E Study. Projections for Ft. Bragg were provided by the Directorate of Public Works and include the expected growth from Base Closure and Realignment

(BRAC). All TAZs were assumed to retain the base year employment numbers at minimum.

Industrial Employment Projections

Industrial Employment was distributed to Cumberland County's industrial parks, and to areas which currently contain high numbers of industrial employees.

Retail Employment Projections

Retail Employment was distributed to areas defined as heavy commercial in the land use plan. The projections assume that current retail centers will grow, and that new retail centers will be established in areas of new population growth.

Highway Retail Projections

Highway retail growth was distributed along major thoroughfares and in the activity nodes designated along I-95 and the future Fayetteville Outer Loop. It was assumed that highway retail would follow the growth of retail centers, and would mostly take place in areas of new population growth.

Office Employment Projections

Office growth was distributed to areas where office employment is currently clustered, especially in the Cape Fear Health Center area. New growth is also projected in Spring Lake and Hope Mills, and at the edge of Ft. Bragg.

Service Employment Projections

The service sector is the largest employment sector in the area and is expected to continue a fast rate of growth. New service sector employers are projected to be located along major thoroughfares and centered on activity nodes. Service employment is also expected to grow in the areas of new population growth.

Appendix I:

Historical and Projected Population Growth Trends

Cumberland County Population Growth Trend

| Year | Population | Population Change | Percent Change |
|-------------|-------------------|--------------------------|-----------------------|
| 1920 | 35,064 | | |
| 1930 | 45,219 | 10,155 | 28.96% |
| 1940 | 59,320 | 14,101 | 31.18% |
| 1950 | 96,006 | 36,686 | 61.84% |
| 1960 | 148,418 | 52,412 | 54.59% |
| 1970 | 212,042 | 63,624 | 42.87% |
| 1980 | 247,160 | 35,118 | 16.56% |
| 1990 | 274,566 | 27,406 | 11.09% |
| 2000 | 302,963 | 28,397 | 10.34% |
| 2005 | 319,217 | 16,254 | 5.36% |
| 2010 | 334,225 | 15,008 | 4.70% |
| 2015 | 349,233 | 15,008 | 4.49% |
| 2020 | 364,242 | 15,008 | 4.30% |
| 2025 | 379,250 | 15,008 | 4.12% |
| 2030 | 394,259 | 15,008 | 3.96% |
| 2035 | 409,267 | 15,008 | 3.81% |

Hoke County Population Growth Trend

| Year | Population | Population Change | Percent Change |
|------|------------|-------------------|----------------|
| 1920 | 11,722 | | |
| 1930 | 14,244 | 2,522 | 21.52% |
| 1940 | 14,937 | 693 | 4.87% |
| 1950 | 15,756 | 819 | 5.48% |
| 1960 | 16,356 | 600 | 3.81% |
| 1970 | 16,436 | 80 | 0.49% |
| 1980 | 20,383 | 3,947 | 24.01% |
| 1990 | 22,856 | 2,473 | 12.13% |
| 2000 | 33,919 | 11,063 | 48.40% |
| 2005 | 39,451 | 5,532 | 16.31% |
| 2010 | 44,982 | 5,532 | 14.02% |
| 2015 | 50,514 | 5,532 | 12.30% |
| 2020 | 56,045 | 5,532 | 10.95% |
| 2025 | 61,577 | 5,531 | 9.87% |
| 2030 | 67,108 | 5,532 | 8.98% |
| 2035 | 72,640 | 5,532 | 8.24% |

Harnett County Population Growth Trend

| Year | Population | Population Change | Percent Change |
|------|------------|-------------------|----------------|
| 1920 | 28,313 | | |
| 1930 | 37,911 | 9,598 | 33.90% |
| 1940 | 44,239 | 6,328 | 16.69% |
| 1950 | 47,605 | 3,366 | 7.61% |
| 1960 | 48,236 | 631 | 1.33% |
| 1970 | 49,667 | 1,431 | 2.97% |
| 1980 | 59,570 | 9,903 | 19.94% |
| 1990 | 67,822 | 8,252 | 13.85% |
| 2000 | 91,062 | 23,240 | 34.27% |
| 2005 | 102,682 | 11,620 | 12.76% |
| 2010 | 114,302 | 11,620 | 11.32% |
| 2015 | 125,922 | 11,620 | 10.17% |
| 2020 | 137,542 | 11,620 | 9.23% |
| 2025 | 149,162 | 11,620 | 8.45% |
| 2030 | 160,782 | 11,620 | 7.79% |
| 2035 | 172,402 | 11,620 | 7.23% |