

Socio-Economic Data Forecasting Methodology for the Lenoir County CTP

In the development of the Lenoir County CTP, existing and anticipated deficiencies were determined through an analysis of the transportation system looking at both current and future travel patterns. For this CTP, the majority of travel demand in the north and central areas of Lenoir County, including the City of Kinston and the Town of La Grange, was projected from 2015 to 2045 using the computerized Kinston Travel Demand Model (TDM). This TDM was developed in 2011 and approved by the Lenoir County Commissioners in 2012 for use in evaluating alternatives to the Kinston Bypass as well as other projects within the area. The Kinston TDM was then updated in 2016 for use in the Lenoir County Comprehensive Transportation Plan. Travel demand models are developed to replicate travel patterns on the existing transportation system as well as to estimate travel patterns for 2045. Additionally, travel demand models require a broad range of socio-economic input data such as population and employment.

Travel demand outside the Kinston TDM area, including extreme northeast Lenoir County and Grifton, as well as southern Lenoir County and Pink Hill, was projected from 2015 to 2045 using a regression analysis model based on previous economic and traffic growth in the area.

Below is a description of the methodology used in the analysis.

Population

Before projecting the population data to the future year of 2045, the current population data must be determined. For the Lenoir County CTP planning area, the population was derived from 2010 census data obtained from the U.S. Census Bureau as well as the 2014 certified estimates from the North Carolina Office of State Budget Management (OSBM).

In order to project the base year population data, a target population needs to be determined for the design year of 2045. To do this, historic population data from the US Census Bureau and future projections from the North Carolina OSBM was gathered for Lenoir County. Population data is listed in Table 1 below with past population obtained from the US Census Bureau and future population projected by the North Carolina Office of State Budget and Management.

Table 1: Population Data

Location	1970	1980	1990	2000	2010
North Carolina	5,084,411	5,880,095	6,632,448	8,046,668	9,535,691
Lenoir County	55,204	59,819	57,274	59,619	59,495
Grifton	1,860	2,179	2,393	2,123	2,617
La Grange	2,679	3,147	2,805	2,844	2,873
Kinston	23,020	25,234	25,295	23,688	21,677
Pink Hill	522	644	547	562	552
Location	2014*	2020*	2030*	2035*	2045**
North Carolina	9,953,687	10,574,718	11,609,883	12,122,640	13,316,875
Lenoir County*	58,780	58,533	58,034	57,786	57,320
Grifton	2,656				
La Grange	2,843				
Kinston	21,212				
Pink Hill	529				

* Projections by the North Carolina Office of State Budget Management (Updated October 8, 2015).

** Extrapolated from 2014-2035 Growth Rates

A growth rate was determined with the following formula:

$$F = P (1+r)^N \text{ where: } \begin{array}{l} F = \text{Future Population} \\ r = \text{Rate of Growth} \end{array} \quad \begin{array}{l} P = \text{Present Population} \\ N = \text{Number of Years} \end{array}$$

Using this formula, growth rates and projections were established as shown in Tables 2 and 3 below:

Table 2: State, Lenoir County, and Municipality Historic Growth Rates

Growth Rates Per Year	1970-2010	1980-2010	1990-2010	2000-2010
North Carolina	1.58%	1.64%	1.85%	1.76%
Lenoir County	0.19%	-0.02%	0.19%	-0.02%
Grifton	0.86%	0.61%	0.45%	2.11%
La Grange	0.18%	-0.30%	0.12%	0.10%
Kinston	-0.15%	-0.23%	-0.77%	-0.88%
Pink Hill	0.14%	-0.51%	0.05%	-0.18%

Table 3: State and Lenoir County Projected Growth Rates

Projected Growth Rates Per Year	2014-2020	2020-2030	2030-2035	2035-2045	2014-2045
North Carolina	1.01%	0.94%	0.87%	0.94%	0.94%
Lenoir County	-0.07%	-0.09%	-0.18%	-0.08%	-0.08%

The Kinston Travel Demand Model (TDM), has a base year of 2011 and a future year of 2040.

Table 4 shows the population, household, and employment 2011 base year estimate and 2040 future year projection for north and central Lenoir County (taking out the extreme western portions of Craven and Jones Counties).

Table 4: Kinston TDM Population Projections in Lenoir County

Kinston TDM Projected Growth Rates (North and Central Lenoir County)	2011	2040	Growth/Year
Population	42,563	50,281	0.58%
Households	17,888	20,791	0.52%
Total Employment	29,369	38,538	0.94%

After comparing the past growth rates and projections, the past growth rates for the municipalities, and the Kinston TDM estimates and projections for north and central Lenoir County an overall growth rate of **0.5% per year** was agreed upon for the entire county and future year projections are calculated in Table 5 below:

Table 5: Lenoir County Population Projections

Population Projection	2015	2020	2030	2035	2045	Total Growth
Lenoir County	58,908	60,396	63,484	65,087	68,416	9,508

Housing

To determine future housing, the Lenoir County population developed above must be converted to dwelling units. To do this, past and projected persons/dwelling unit data for Lenoir County were graphed and a trend line was extended to the future year of 2045. Projected household data is displayed in Table 6 below:

Table 6: Lenoir County Household Data

Year	Total Household Population	Total Households	Persons/Dwelling Unit
1990	57,274	23,739	2.41
2000	59,619	23,862	2.50
2010	59,495	24,997	2.38
2020*	60,396	25,376	2.38
2030*	63,484	26,673	2.38
2035*	65,087	27,347	2.38
2045**	68,416	28,746	2.38
Total Growth (2015-2045)	9,508	3,995	

* Data projected by NC OSBM

** Data projected by NCDOT

Using the persons/dwelling unit data, the Kinston TDM households were calculated and is shown in Table 7 below:

Table 7: Kinston TDM Household Data

(North and Central Lenoir County) Year	Population	Total Households	Persons/Dwelling Unit
2011	42,563	17,888	2.38
2040	50,281	20,791	2.42

The Lenoir County Land Use Plan indicates which areas within the planning area should be developed for housing. Using this plan, houses above were distributed throughout the Lumberton planning area. When completing the housing distribution, it was kept in mind that there is a limited amount of land on which to build houses. As the zoning density is reached, zones of high growth will peak and stabilize, some houses will drop from high trip generators, and some houses will not last 30 years. This is why each traffic analysis zone (TAZ) within the planning area was considered on an individual basis.

Employment

Employment figures for 2015 in the planning area were compiled from Info USA data and local input resulting in a final total of 32,334 jobs. To determine the number of future jobs in the planning area, a ratio was taken with the present number of jobs over the present population.

$$2015 \text{ Employment} / 2015 \text{ Population} = 32,334 / 58,739 = 0.55$$

Comparing to previous studies and information, employment has held relatively steady while there has been a slight decrease in total population. This could be explained by the increasing amounts of employees commuting to Lenoir County from surrounding rural counties.

Assuming slow and continued growth, the employment to population ratio as well as the total future employment is shown in Table 8 below:

Table 8: Lenoir County Population to Employment Ratio

Year	Population	Employment	Employment/Population Ratio
2015	58,908	32,334	0.55
2020	60,396	33,822	0.56
2030	63,484	36,821	0.58
2035	65,087	38,401	0.59
2045	68,416	41,734	0.61
Total Increase	9,508	9,400	

The Kinston TDM area contains a very significant portion of both the population and employment in Lenoir County. Percentages from the North American Industry Classification System (NAICS) will be determined based on the existing employment types and the Lenoir County Land Use Plan recommendations and expectations for the future.