Transportation planning in the MPO cannot occur without understanding where and how residents travel. Staff from the MPO use a range of census, survey, and traffic count information to help identify current and future issues in the study area. The MPO is concerned with properly evaluating travel modes, as well as travel patterns, so the MPO also analyzes transit, bicycle, pedestrian, and carpooling behaviors in order to help meet the needs of residents using those modes.

**Household Travel Behaviors**

All of Gaston and Lincoln counties are included in the regional travel demand model, known as the Metrolina Model. The more populated southeastern parts of Cleveland County, including Shelby and Kings Mountain, are also included in the Metrolina Model. The Metrolina Region periodically conducts travel surveys to query area residents on travel behaviors, which is used to help calibrate the Model so it reflects local travel behaviors, such as trip generation rates, mode splits, and vehicular availability by household size. The most recent household travel survey, called the 2012 Metrolina Regional Household Travel Survey, was completed in mid-2012, and surveyed 4,331 households across the region.

The household travel survey indicated that only 1/8 (13.7%) of all trips in the Metrolina Region involve trips between a resident’s home and work. One-quarter (23.8%) of all trips are for things other than work, shopping, school or medical purposes, and an additional one quarter of trips do not begin or end from home. This information clearly shows that focusing all transportation funding on facilitating commuting will likely deliver sub-optimal benefits, since a minority of all household trips are for such purposes.

Vehicular availability, household size, and household income were each positively correlated with trip generation rates, which is to be expected. A one-person household generates 3.63 trips per day on average, while a four or more-person household generates 17.48 trips per day. Households with annual income in excess of $75,000 generated 10.26 trips per day. A household with an annual income of less than $15,000 generated 5.16 trips per day - half the number of trips generated by the highest income households.

Trip length is also of particular interest to transportation planners and for inputting into the Metrolina Model. Trip lengths directly correlate to the number of miles traveled on the network and corresponding traffic volumes. Trip length was provided in minutes, rather than miles. The average trip length for all trips in the region was 17 minutes, with nearly half (43%) of all trips being 10 minutes or less. Home-based work trips were the longest average trip type, at an average of 25 minutes. All other trip types varied from 15-17 minutes. The results for Cleveland, Gaston, and Lincoln counties were in line with the trends detailed above, although Cleveland and Lincoln counties had the highest percent of trips 61 minutes or longer (1.7% and 1.6%, respectively) in the region.

Vehicular occupancy varied significantly depending on the trip type. Since approximately 5/6 of all home-based work trips are made by people driving alone, the average vehicle occupancy rate of 1.04 persons per trip is to be expected. The mean occupancy for other trip types ranged from 1.4 to 1.49 persons per trip.

Trip mode information (whether a trip was made via single-occupant automobile, carpooling, bicycle, walking, or public transportation) was also a product of this household travel survey. Not surprisingly, driving a vehicle alone was the most common form of transportation, but it was only 2/3 (67.9%) of all trips. Approximately ¼ (24.7%) of all trips were made as a passenger in a private vehicle. Trips on school buses comprised more than half (4.4%) of the remaining 7.4% of trips. Public transportation only accounted for 0.6% of all trips, and walking and bicycling accounted for 2.2%. Even in households without vehicles, bicycling comprised 0.7% of all trips. Walking and transit were utilized more often, at 16.2% and 18.1% respectively.
Trips by time of day for the three counties in the MPO was consistent with regional trends, in that on an hourly basis, trip generation was fairly consistent between 6 AM and 6 PM, with between 5-7% of all daily trips beginning each hour in that period. The availability of vehicles per household influenced this distribution, with more vehicles correlated with a concentration of trips into the traditional AM and PM peak periods, as well as a concentration into the home-based work trip category.

**Total Travel**

Vehicles traveling in and through the three counties add up to over 11 million miles per day. Approximately 40 percent of this traffic takes place on I-85, US 321 north of I-85, and US 74 west of I-85. These totals have been stable for the past five years, primarily due to the 2008-2009 recession and higher fuel prices reducing the growth in travel despite an increasing population. The Metrolina Model does project increasing VMT in the MPO through 2040, with approximately 44 percent more VMT per day from 2010 to 2040. This is a larger increase than the 36 percent more people and 33 percent more jobs projected between 2010 and 2040. Comparisons with future years were made between 2010 and 2040, as both totals are outputs of the Metrolina Model.

As shown by the graphs below, the impact of having an interstate in a county dramatically impacts where travel occurs. In Gaston County approximately 1/3 of all travel occurs on I-85, while approximately 1/6 occurs on local roads (arterials and collectors). Lincoln County, which does not have an interstate, has a larger amount of travel occurring on local roads. Cleveland County, by virtue of having US 74 coded as partial expressway and arterial, has a much higher percent of its traffic on expressway and principal arterial roads. Since only the southeastern 2/3 of Cleveland County is actually in the Metrolina Model, the totals for Cleveland County do not represent all travel in the county.
Commuting Patterns

Commuting trips are a distinct minority (13.7%) of all trips generated, but do represent the focus of data collection through the Census Bureau, which reports a wide range of information on origins and destinations, mode, time, and demographics of commuters. What is most important for the GCLMPO to consider is, “where are workers travelling for work?” From Figure 8-6 & 8-7, the answer is, “mainly by themselves and within their own counties.” The map in Figure 8-11 shows that travel time is highest for those areas near the edge of feasible commutes to the jobs centers in Mecklenburg County. Cleveland County has the lowest average commute time at 22.5 minutes, and is also furthest from Mecklenburg County, with only 2,280 residents working in Mecklenburg County. Transit usage for commuting to work in Mecklenburg County peaked at approximately 125,000 trips in 2008 before the recession cut jobs in central Mecklenburg County. Since then the express bus route from Lincoln County has been terminated and ridership on the express bus route from Gastonia is at approximately 67% of pre-recession levels. 2013 ridership for Gastonia Transit is stable compared to 2008, although the system is used for a range of trip types, so not all trips can be attributed to commuting.

The results of these travel demands are apparent on the congestion map on page 8-5. This map (Figure 8-9) depicts 2010 congestion levels in the three counties on all NC, US, and Interstate routes. In total, 4.3%, or 21.5 miles, of the 501 mile network is considered extremely congested. 7.8%, or 38.8 miles, of the network is considered moderately congested. The remaining 88%, or 441 miles, of the network is considered uncongested. These percentages are higher than for the state as a whole, as only 3.1% of roads are considered extremely congested, and 4.4% considered moderately congested. These definitions were developed by the NCDOT and likely under represent the congestion that local residents encounter at specific intersections due to combinations of poor access management, lack of turn lanes, and geometric deficiencies.

All data is from 2000 Census and 2006-2010 American Community Survey.
The most congested corridors are I-85 through Gaston County, US 74 through Shelby, NC 27 through Lincolnton, and NC 16 and NC 73 in eastern Lincoln County. The congestion shown for NC 16 is no longer current as the new NC 16 has since been completed through NC 150 and has resulted in significantly lower traffic volumes on the now “Business” NC 16. The most congested sections of each of the three remaining corridors are each identified for capacity improvements through 2040, with the Shelby Bypass (R-2707) already under construction. Congestion along the I-85 corridor is to be addressed through a combination of building the Garden Parkway and widening the I-85 corridor between Belmont and the US 74 split in Kings Mountain. The congestion along NC 73 east of NC 16 is to be addressed with the widening of NC 73 into Mecklenburg County, including a widened bridge across the Catawba River. The two projects to build a southern bypass around Lincolnton to connect NC 27 with NC 73 did not score high enough to be included in the 2040 fiscally-constrained plan, owing to their high cost and relatively low traffic volumes.