

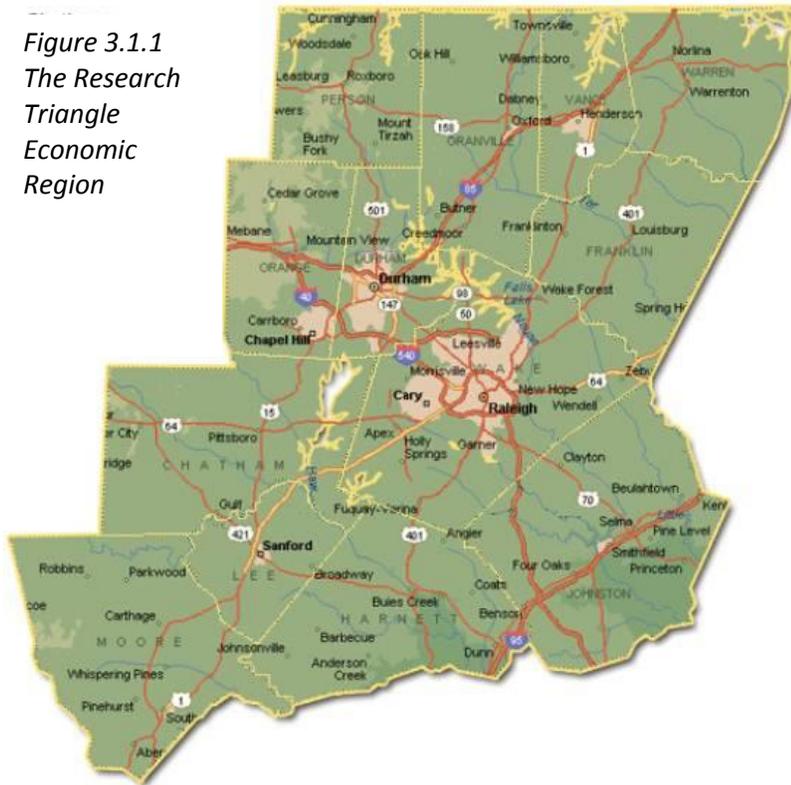
### 3. About Our Home

Transportation investments link people to the places where they work, learn, shop and play, and provide critical connections between businesses and their labor markets, suppliers and customers. So an important starting point for planning future investments is to understand the current state of our communities, and how they might change over the next generation.

#### 3.1 Our Region

The Research Triangle is a burgeoning sunbelt metropolitan region. As defined by the census bureau, the region's metropolitan areas cover seven counties; six that are members of one or the other MPO plus Person County. More broadly, the economic region generally covers about 13 counties, stretching from the Virginia border on the North to Harnett, Lee and Moore counties in the south. Today, the seven metropolitan counties are home to about 1.9 million people and the 13-county economic region is home to 2.3 million people.

Figure 3.1.1  
The Research Triangle Economic Region



#### The Triangle Economic Region Metropolitan Counties

Chatham	DCHC
Durham	DCHC
Franklin	CAMPO
Johnston	CAMPO
Orange	DCHC
Person	
Wake	CAMPO

#### Nonmetropolitan Counties

Granville	CAMPO
Harnett	CAMPO
Lee	
Moore	

As the MPOs plan their transportation networks, it is important to consider not only mobility within their boundaries, but also the connections to the wider economic region and other regions in North Carolina. The Triangle is one of three large, complex metro areas along North Carolina's Piedmont Crescent, along with the Triad and Charlotte. Each of these regions has more than 1.5 million people and together, these three regions account for 56% of the state's population, 60% of its jobs and 68% of the value of all goods and services produced in North Carolina.

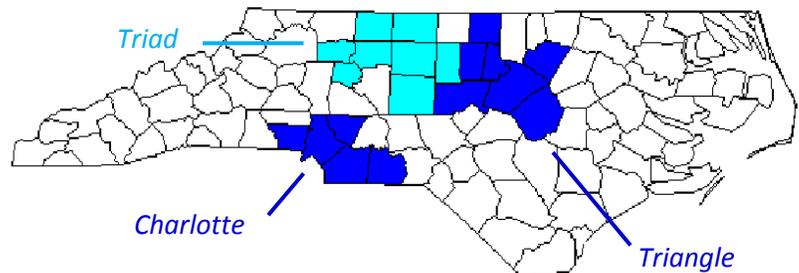
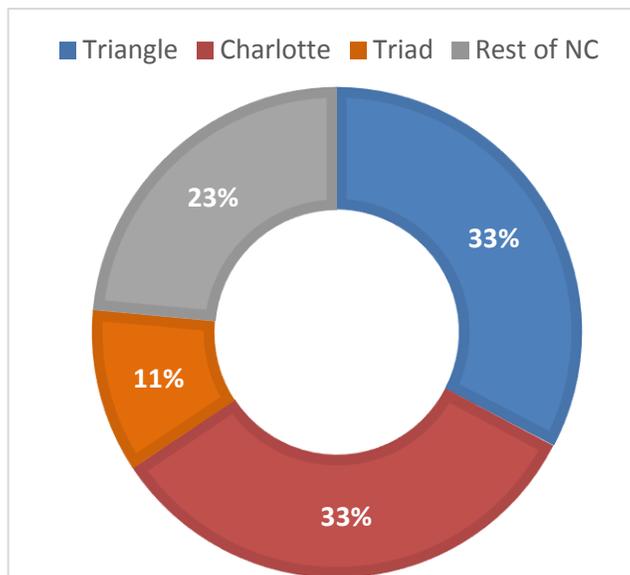


Figure 3.1.2 The "Big 3" Metro Regions

More importantly, as we consider future transportation investments, these three regions are expected to account for more than three-quarters of North Carolina's growth over the next generation, with the Triangle and Charlotte regions each absorbing 1/3 of North Carolina's growth.

This rapid population growth is part of a larger national trend, where over two-thirds of all population growth is expected to occur in a series of "megaregions," the fastest-growing of which are located in sunbelt areas like the Triangle. The Triangle, along with the Triad and Charlotte, are part of the Piedmont Atlantic Megaregion (PAM), stretching from Raleigh to Birmingham, and which is forecast to grow from 17.6 million people in 2010 to over 31 million people by 2050.

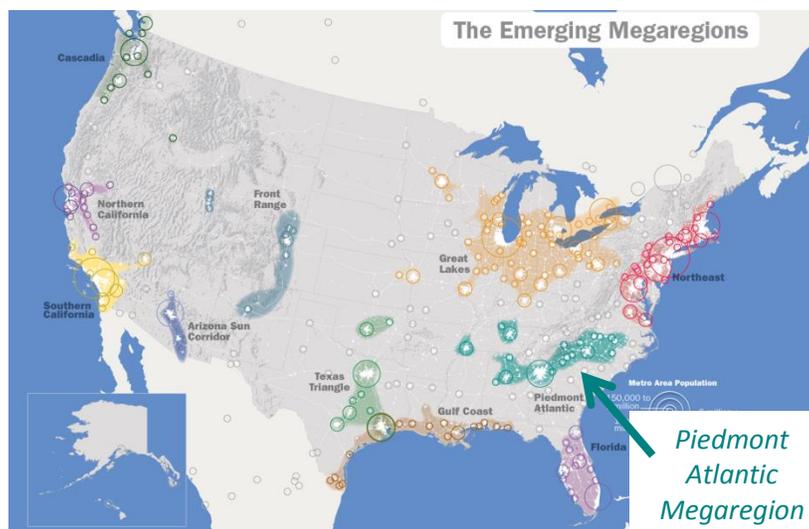
Figure 3.1.3 Where Future Population Will Locate in North Carolina (2015-2037)



### 3.2 Our People

As our region has grown and as we add 1.3 million new people over the span of this plan to the part of the region covered by our forecast, the composition of our population is changing in ways that can influence the types of transportation investments we may choose to make:

- By 2030, 20% of Triangle residents will be 65 or older, up from 10% in 2000.
- In 2010, 32,000 households in the Triangle had no vehicle available, up from 29,000 in 2000 and 27,000 in 1990.
- We are highly mobile: 8% of households lived in a different county a year ago and another 9% changed houses within their home county.
- Almost 370,000 households – roughly 60% of the total – are households with only one or two people, and close to 50,000 people live in group quarters such as university dormitories.
- Surveys report that about a quarter to a third of households today would prefer to live in a compact, walkable neighborhood with a mix of activities, the kinds of neighborhoods that can be effectively served by transit. This would suggest that by the Year 2045, as many as one million Triangle residents would select a compact, walkable, mixed-use neighborhood if that option is available for them.



### 3.3 Our Economy

The cornerstones of the region’s economy are the major universities and their associated medical centers, the technology firms exemplified by the companies in the Research Triangle Park and state government. Employment is concentrated in the three core Triangle Counties: Wake, Durham and Orange Counties have over 1 million jobs; the 7 counties in our MSAs have 1.2 million jobs and the 13-county economic region has nearly 1.4 million jobs. Figure 3.3.1 indicates the distribution of economic value by industry for our two MSAs. Figure 3.3.2 shows the geographical distribution of employment within the 13-county economic region.

The Triangle’s economy has proven resilient in the past, and the size of the region’s economy is substantial: the metropolitan region accounted for 24% of the value of goods and services produced in North Carolina in 2016 and at more than \$120 billion in today’s dollars, surpassed the economic value produced by 17 states (Figure 3.3.3).

The concentration of employment in several specific areas -- most notably the downtowns of Raleigh and Durham, the Research Triangle Park area and the university/medical center areas associated with Duke University, UNC-Chapel Hill, NC State University and North Carolina Central University -- results in significant commuting across the MPO boundary.

Figure 3.3.1 Gross Product by Industry-Triangle MSAs

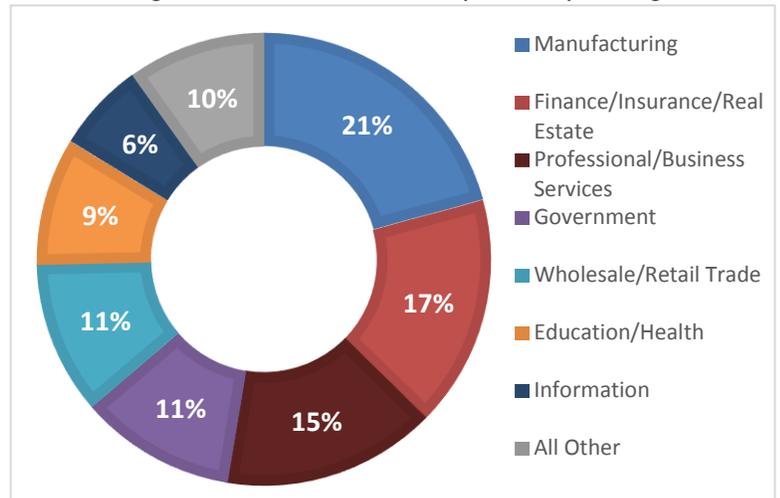


Figure 3.3.2 Employment by County

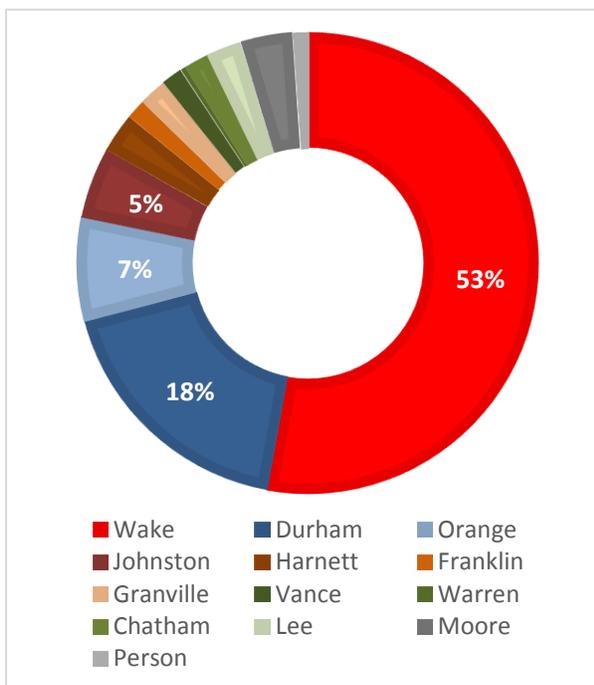


Figure 3.3.3 Gross Product: Value of Goods & Services Produced (in \$billions)

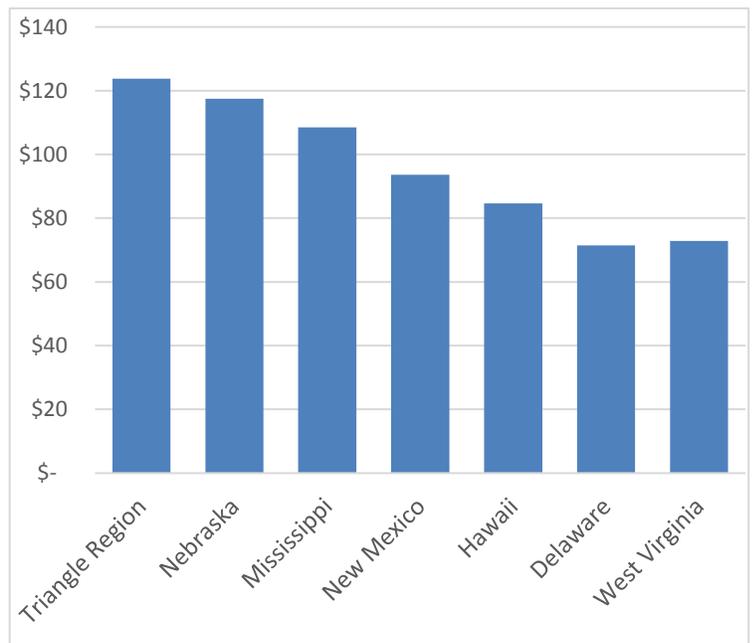


Figure 3.3.4 shows the growth in cross-county commuting in the region while Figure 3.3.5 shows commuting flows, with the largest flow consisting of 82,000 people who commute each day between Wake County on the one hand and Durham and Orange Counties on the other.

Figure 3.3.4 Total Cross-County Commuting

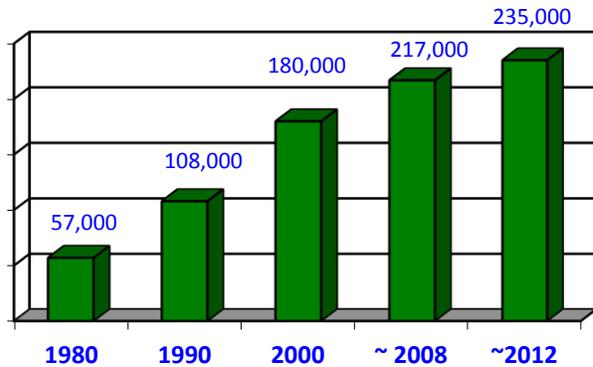
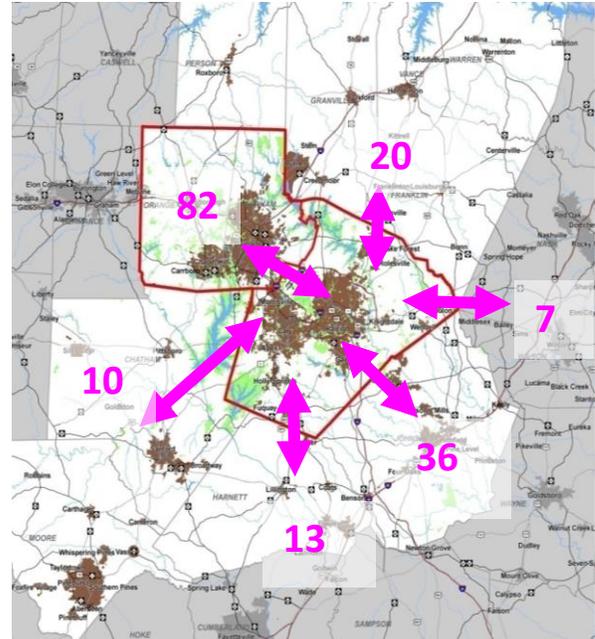


Figure 3.3.5 Daily Commuting Flows (in thousands of commuters)

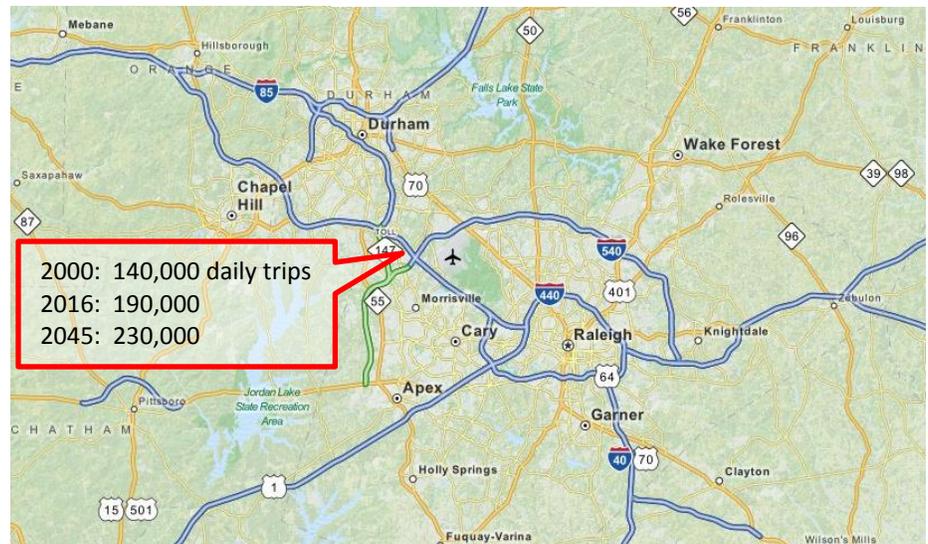


In fact, our most heavily traveled roadway is the section of I-40 near the Wake County-Durham County line, the border between our two Metropolitan Transportation Planning Organizations. Auto and truck traffic continues to grow at this location, and forecasts are that the trend will continue.

Figure 3.3.6 I-40 Traffic Volume west of I-540

### 3.4 Our Environment

Among the many environmental concerns in our region, land use, air quality and water resources are three that have critical connections to transportation investments. Land use is a particularly critical issue in a fast-growing region like the Triangle, since the pattern of future land use can have significant



influence on the efficiency and effectiveness of different transportation investments, especially transit services. Much of the Triangle Region is characterized by low-density development with different types of land uses, such as homes, offices and stores, separated from one another, a pattern commonly referred to as “sprawl.” According to a national study that carefully examined measures of density, land use mix, road connectivity and “centeredness,” the Triangle area ranked as the 3<sup>rd</sup> most sprawling among the 83 regions studied. The same study examined the environmental and social impacts of sprawl, concluding that persons in the most sprawling areas add many more miles of travel each day to their schedule, suffer more traffic deaths, and tend to endure worse air quality.

Air quality remains an important concern and is directly linked with the transportation system. Ozone is a strong oxidizer and irritant that has been shown to decrease lung function and trigger asthma attacks among the young, elderly, and adults who work or exercise outdoors.

Emissions from cars and trucks account for over one-half the emissions of nitrogen oxides (NOx) – the controlling pollutant in the formation of ground level ozone – in the Triangle Area. Given the serious health effects of ozone, the reduction of ozone emissions is an important goal of the MPO’s transportation investments.

The Environmental Protection Agency (EPA) has established standards for common air pollutants. A geographic area that meets or exceeds the standard for a particular air pollutant is called an “attainment area.” Likewise, an area that does not meet the standard is called a “non-attainment area.” Standards are set for a number of pollutants, including ozone, particulate matter and carbon monoxide. The Triangle area is currently in attainment, although in the previous three decades the area has been in non-attainment.

*Figure 3.4.1 Regional Measures of Sprawl (lower scores indicate more sprawl)*



Attainment status can directly affect a community’s economic development efforts, and federal funding for transportation improvements can be affected in non-attainment areas. New or expanded industrial developments proposing to emit air pollutants face stricter and more costly technology standards in non-attainment areas. For these reasons, the two MPOs continue to examine air quality impacts closely, although we are not required to do so.

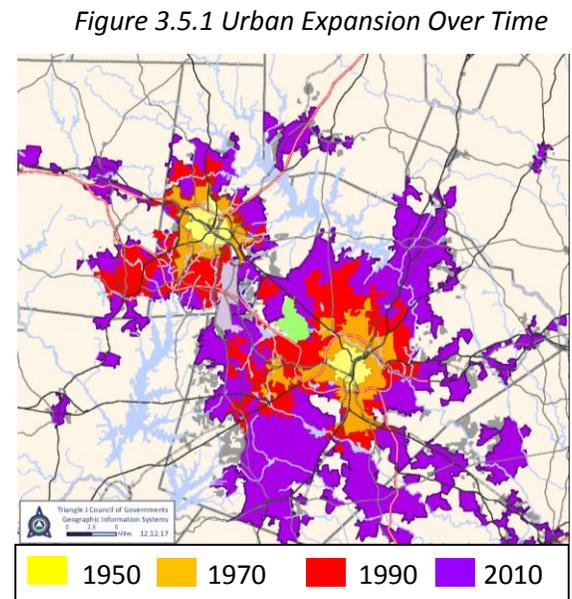
Water quality is a regional concern as well. The Triangle Region is divided into two major drainage basins, both of which supply water for the Region’s drinking water reservoirs. The southern/western part of the Region drains into Jordan Reservoir and the Cape Fear River basin. The northern/eastern part of the Region drains into the Falls of the Neuse Reservoir and the Neuse River basin. All of the major watercourses in the Region drain to water supply reservoirs and affect the quality of their waters. The NC Division Water Quality (DWQ) classifies streams according to their best intended uses. Intended uses could include water supply, aquatic life protection and swimming or other recreation. Using water quality data and field assessments, the DWQ has determined that several streams throughout the region are impaired either because they have poor water quality or do not support their intended uses. These streams include the New Hope, Third Fork and Northeast Creeks in the Cape Fear basin; and Ellerbe, Little Lick and Lick Creeks in the Neuse basin (among others).

The municipalities and counties in the region often apply special development standards for the purposes of water supply watershed protection. These standards often prohibit certain types of development in sensitive watershed areas, limit the intensity of development to minimize pollution from stormwater runoff, limit the amount of impervious surfaces allowed in new developments, and limit the disturbance of naturally vegetated areas on each side of most streams. Transportation plans must take into account the impact that new or widened roadways might directly have on water quality, and the indirect effects that transportation investments might have in spurring future development that could adversely impact water quality.

### 3.5 Our Future

The part of the Research Triangle Region covered by our forecast is anticipated to add 1.3 million people over the span of this plan, more than the current *combined* population of the seven largest cities and towns within our MPO boundaries: Raleigh, Durham, Cary, Chapel Hill, Apex, Wake Forest and Holly Springs.

Forecasts suggest that much of this future growth will continue to extend outwards from the urbanized area as it was most recently defined following the 2010 Census. Figure 3.5.1 shows how the urbanized areas around Durham and Raleigh have grown over the years. The Census defines urbanized areas as areas with more than 500 residents per square mile and strong commuting ties to a central city with more than 50,000 people.



Our future involves more than just growth; we also face rapidly evolving and technologies that could significantly shape the nature of travel. The advent of autonomous and connected vehicles could influence the designs of our streets, our need for parking, the relationship between our land uses and transportation network, and car ownership, all in as-yet-unknown ways.

### 3.6 Our Challenge

These characteristics of our home -- a rapidly growing population and economy, continuing risks to air and water quality, a propensity to disperse growth outwards, and disruptive technologies, create transportation challenges. More commuters are traveling longer distances, and the single-occupant automobile continues to dominate how we travel. And although we tend to focus on commuter travel, travel for such purposes as school, business, shopping, and social engagements constitute increasing shares of travel. These conditions have produced increasing demands on our transportation network, which in terms of “vehicle miles traveled” and other demand measures is experiencing a growth rate that is greater than that of our population. The consequences have been rising traffic congestion, increasing transportation infrastructure costs, and further pressure on our air, water, open space, and other environmental assets. Our region’s quality of life, a key attraction for professional and skilled workers and business investment to our region, may ultimately become threatened by the consequences of our patterns of growth and inadequate transportation infrastructure.

These consequences create many challenges for us, for example:

- How do we find the resources to invest in our transportation infrastructure, and to what extent does this demand for resources compete with other needs such as schools, water and waste treatment facilities, affordable housing, protection of green space and social services?
- As we expand our roadway network to meet growing travel demand, how can we minimize the negative impacts on our travel times, air and water quality, and open spaces?
- How do we design a transportation network that serves 1) the needs of different types of places, from downtowns to small towns to suburban areas to rural communities, 2) a range of socioeconomic groups and 3) our economic and environmental values?

Figure 3.6.1 Major Highway Projects Added Since 1995

One of the largest challenges facing our region is that despite major investments in road projects, congestion levels are increasing due to extensive population growth, increased travel within the region and large amounts of “pass-through” traffic on our interstate highways.

Figure 3.6.1 shows \$2.8 billion in major road projects that were completed in the past 20 years or are underway. **Red** lines are highways with interchanges, while **purple** lines are streets with intersections.

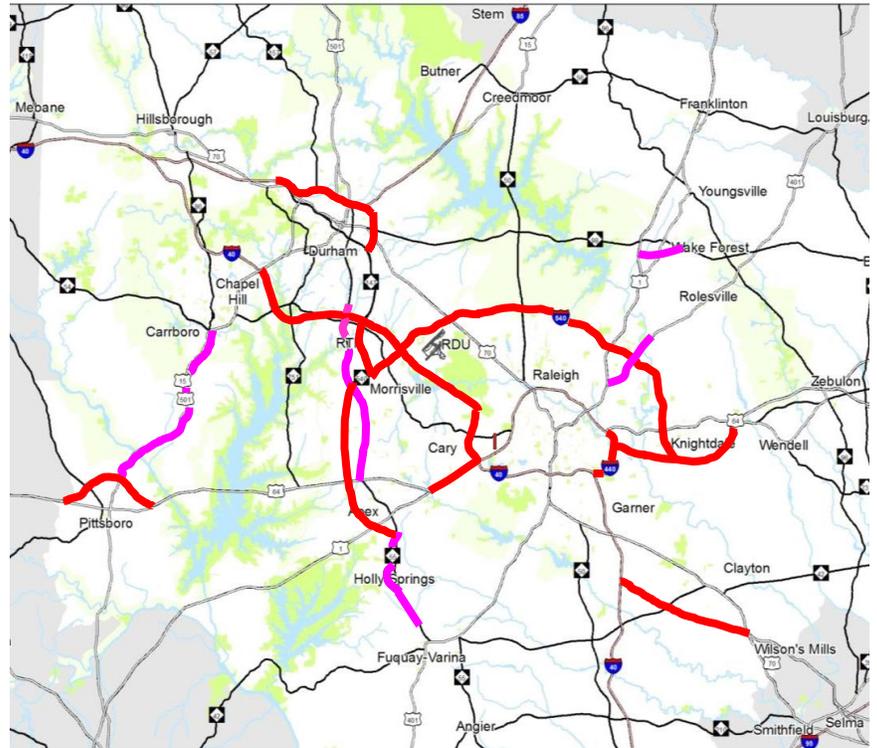
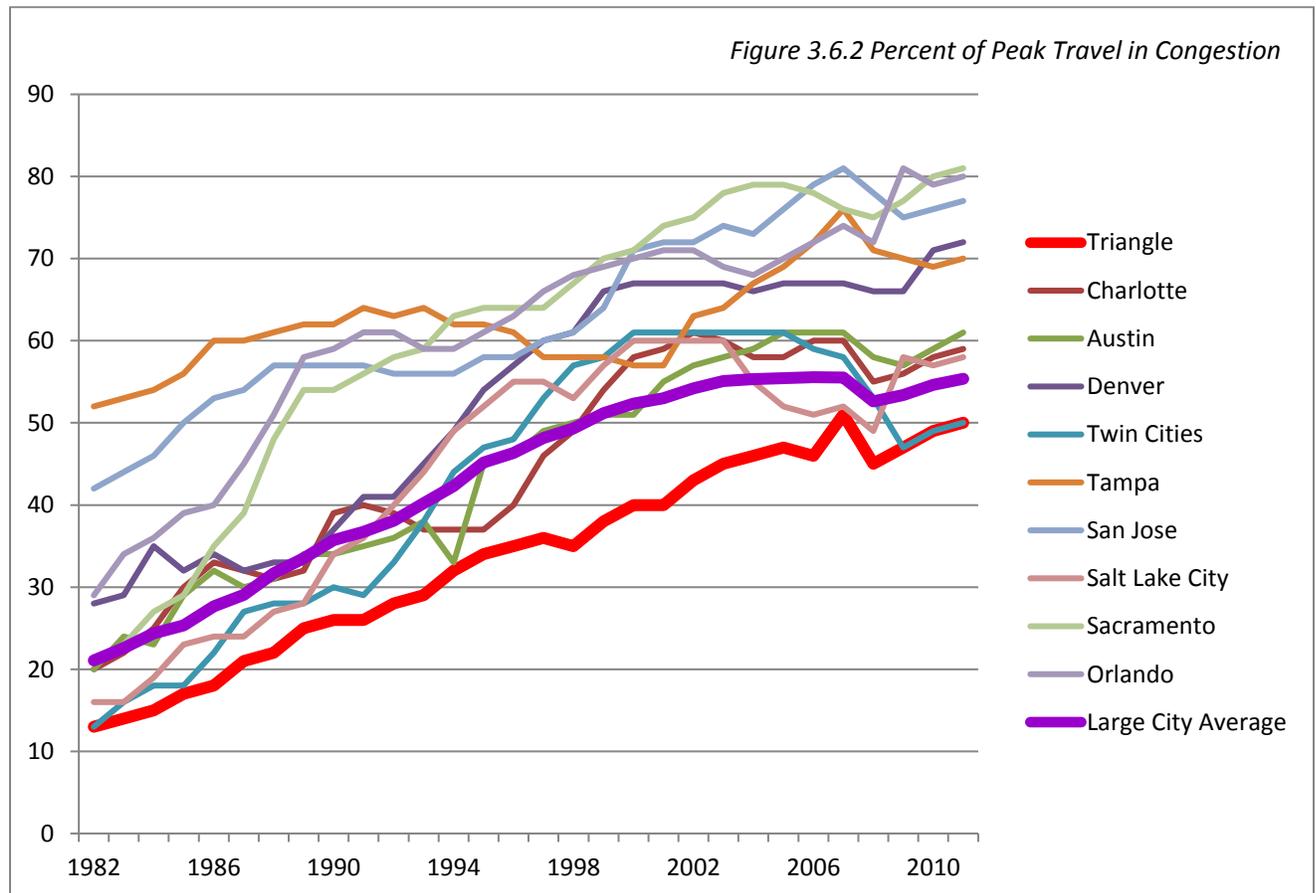


Figure 3.6.2 shows how levels of congested peak period travel have increased in the Triangle, in many of the regions with which we compete and for all large regions in the US. The graph shows that although the Triangle has comparatively less congestion, congestion levels consistently rise over time and that economically successful, fast-growing regions have not been able to “build their way out of congestion.”

Figure 3.6.2 Percent of Peak Travel in Congestion



We are undertaking the update of our long-range transportation plan to help ensure that we are able to meet the significant challenges we face. We must plan now for the roadways, transit services, and bicycle and pedestrian facilities that will be needed in 2045, if we expect to meet the travel demands of the place we will become. Our communities have opportunities to create and maintain a strong, growing economy, high quality of life, affordable housing market, culturally diverse populace, and sustainable environment. Our ability to anticipate and meet the challenges in planning, designing, and building an efficient and effective transportation network is a key element for ensuring that we can make the most of these opportunities.

Key points from this section:

- The MPO areas covered by this plan are part of a larger economic region. Transportation investments should consider the mobility needs of this larger region and links to the other large metro regions of North Carolina and throughout the Southeast.
- The Triangle Region is expected to accommodate a phenomenal amount of future growth, part of a larger national trend of growth in sunbelt “megaregions;” we need to plan for the region we will become, not just the region we are today.
- The Triangle is one of the most sprawling regions in the nation and current forecasts project both continued outward growth and infill development in selected locations, most notably in the central parts of Raleigh, Durham and Chapel Hill. A key challenge for our transportation plans is to match our vision for how our communities should grow with the transportation investments to support this growth.
- No region has been able to “build its way” out of congestion; an important challenge for our transportation plans is to provide travel choices that allow people to avoid congestion or minimize the time they spend stuck in it. Emerging, potentially disruptive technologies associated with autonomous and connected vehicles may significantly affect travel, but the nature and scale of these impacts remains highly uncertain, and may achieve substantial market penetration only in the long-term stage of this plan.
- Our population is changing. The population is aging, more households will be composed of single-person and two-person households without children, the number of households without cars is increasing, and more people are interested in living in more compact neighborhoods with a mix of activities. Our plans must provide mobility choices for our changing needs.
- Our MPOs are tied together by very strong travel patterns between them; our largest commute pattern and heaviest travel volumes occur at the intersection of the MPO boundaries. Our MPO plans should recognize the mobility needs of residents and businesses that transcend our MPO borders.