

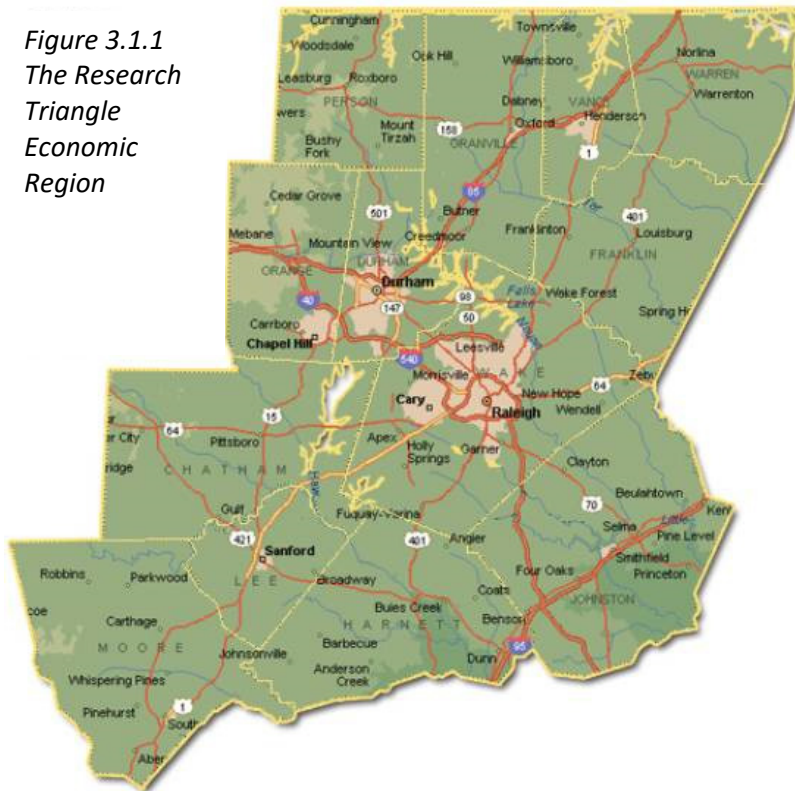
### 3. About Our Home

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, how they relate to each other and to nearby regions, and how they might change over the next generation.

#### 3.1 Our Region

The Research Triangle is a burgeoning sunbelt metropolitan region. Nine counties are defined by the Census Bureau as “metropolitan;” eight that are members of one or the other MPO plus Person County. More broadly,

**Figure 3.1.1**  
*The Research Triangle Economic Region*



the economic region covers about 13 counties, stretching from the Virginia border on the North to Harnett, Lee and Moore counties in the south. In 2020, the eight counties in the Durham-Chapel Hill and Raleigh-Cary MSAs were home to 2.1 million people and the 13-county economic region was home to 2.4 million people.

#### The Triangle Economic Region

##### Metropolitan Counties

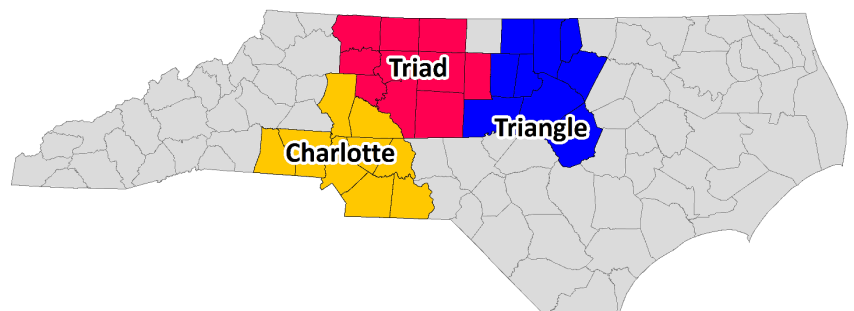
Chatham*	DCHC
Durham*	DCHC
Franklin**	CAMPO
Johnston**	CAMPO
Orange*	DCHC
Person*	
Wake**	CAMPO
Granville*	CAMPO
Harnett***	CAMPO

##### Nonmetropolitan Counties

Lee	
Moore	
Vance	
Warren	

\* Durham-Chapel Hill MSA  
\*\* Raleigh-Cary MSA  
\*\*\* Fayetteville MSA

As the MPOs plan for transportation, 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 regions – called “Combined Statistical Areas” -- along North Carolina’s Piedmont Crescent, together with the Triad and Charlotte. Each of these CSA regions has more than 1.7 million NC residents and, combined, account for 60% of the state’s population, 64% of its jobs and 69% of the value of all goods and services produced in North Carolina.

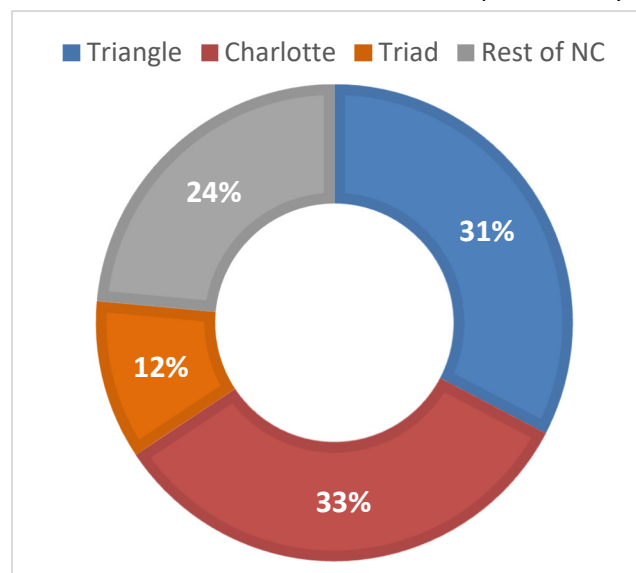


**Figure 3.1.2** *The “Big 3” Metro Regions (Census Combined Statistical Areas)*

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 future 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, AL, and which is forecast to grow from 17.6 million people in 2010 to over 31 million people by 2050.

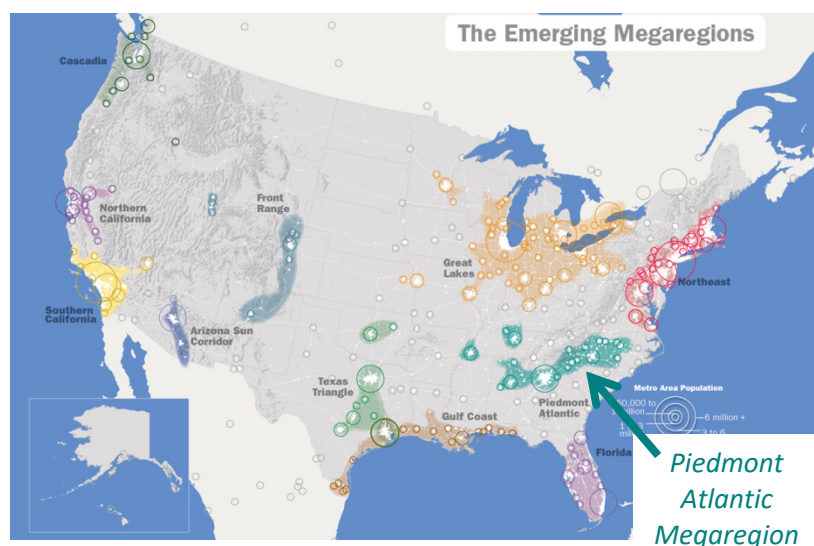
Figure 3.1.3 Where Future Population Will Locate in North Carolina (2020-2050)



## 3.2 Our People

As our region has grown and as we add 1.1 million new people over the span of this plan in the nine counties that make up the Raleigh-Durham-Cary CSA, the composition of our population is changing in ways that can influence the types of transportation investments we may choose to make:

- By 2030, 18% of Triangle residents will be 65 or older, up from 10% in 2010.
- In 2019, 40,000 households in the Triangle had no vehicle available, up from 37,000 in 2010.
- We are highly mobile: 9% of households lived in a different county, state, or country a year ago and another 8% changed houses within their home county.
- Almost 500,000 households – roughly 62% of the total – are households with only one or two people, and close to 56,000 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 2050, 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 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 full time and part time jobs of all types; the 9 counties in our Combined Statistical Area (CSA) have 1.3 million jobs, and the 13-county economic region has nearly 1.5 million jobs. Figure 3.3.1 shows the distribution of economic value by industry for our CSA, while Figure 3.3.2 shows the geographic distribution of jobs in the CSA.

The Triangle's economy has proven resilient in the past, and the size of the region's economy is substantial: the Triangle's CSA accounted for 26% of the value of goods and services produced in North Carolina in 2020 and at more than \$150 billion in today's dollars, surpassed the economic value produced by 17 states (Figure 3.3.3).

The concentration of jobs in several 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 2020 Gross Product by Industry-Triangle CSA

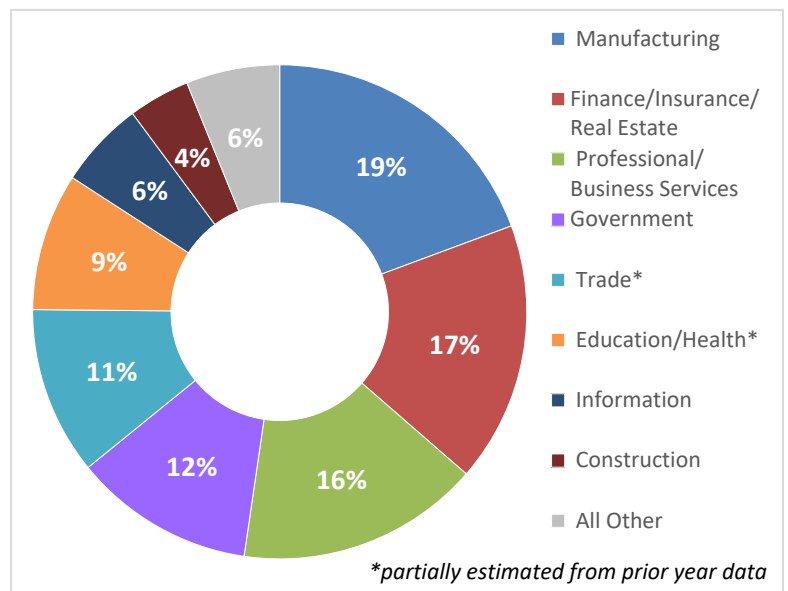


Figure 3.3.2 2020 Employment by County (BEA)

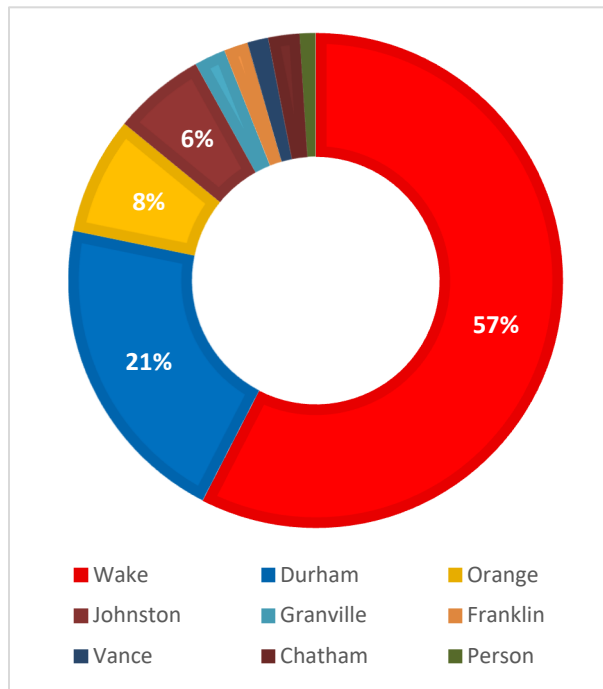


Figure 3.3.3 Gross Product: Value of Goods & Services Produced in the Triangle CSA (in \$2020 billions; BEA)

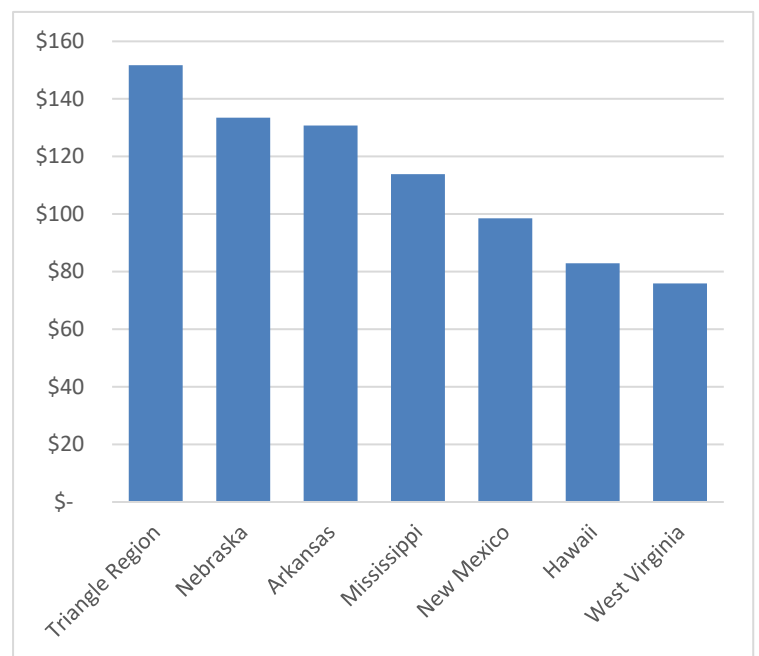
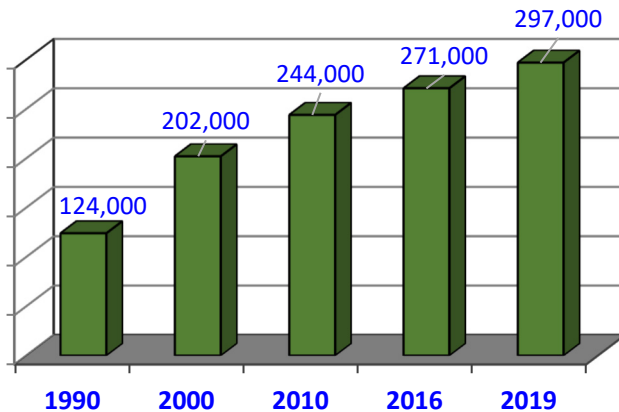




Figure 3.3.4 shows the growth in cross-county commuting for workers living in the Raleigh-Durham-Cary CSA while Figure 3.3.5 shows commuting flows in and out of Wake County, with the largest flow consisting of 116,000 people who commute each day between Wake County on the one hand and Durham and Orange Counties on the other.

Figure 3.3.4 Total Cross-County Commuting



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 3.3.5 Daily Commuting Flows (in thousands of commuters)

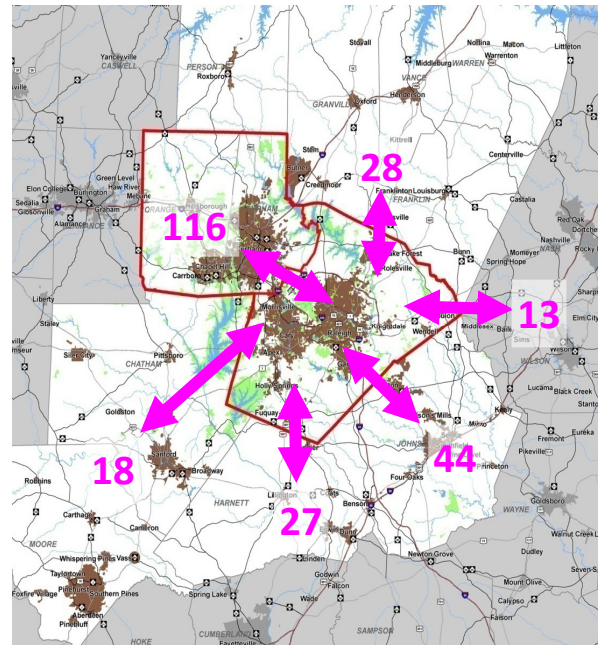
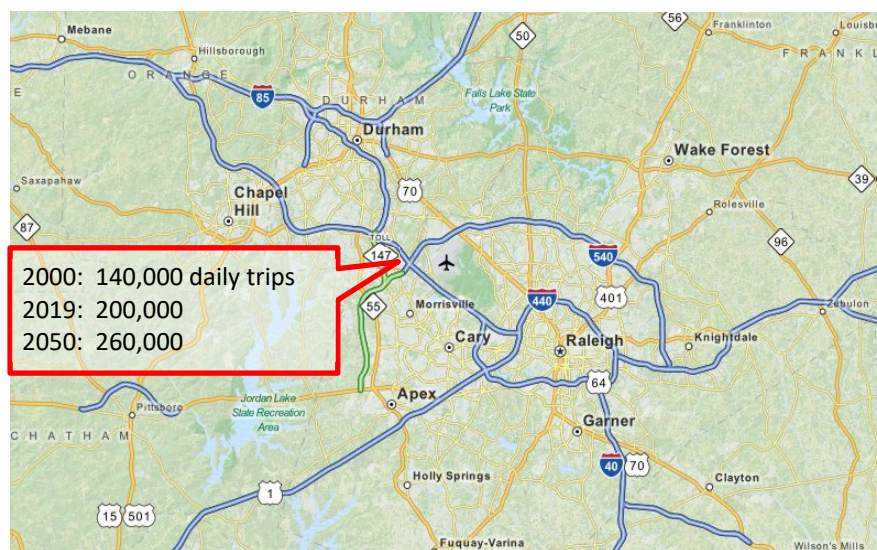


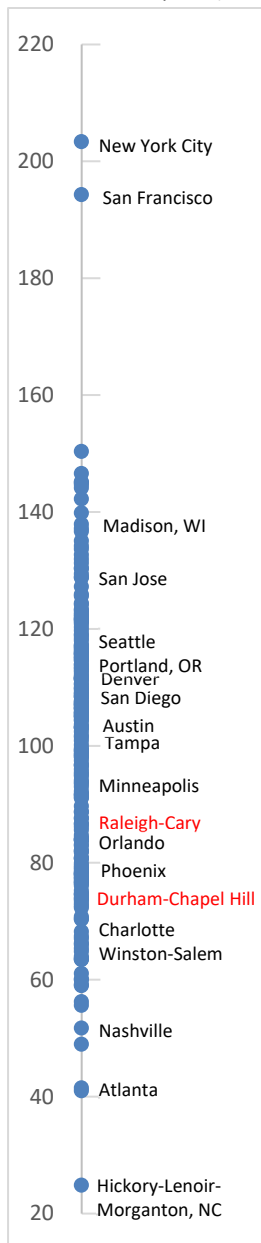
Figure 3.3.6 I-40 Traffic Volume west of I-540

### 3.4 Our Environment

Among the many environmental concerns in our region, land use, air quality and greenhouse gas emissions 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 one national study that examined measures of density, land use mix, road connectivity and "centeredness," both the Raleigh-Cary and Durham-Chapel Hill MSAs ranked in the bottom 30% of the most sprawling among the 220 regions studied. Similar studies 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.



**Figure 3.4.1 Sprawl Index** (lower scores indicate more sprawl)



Air quality remains an important concern and is directly linked with the transportation system. Ozone is an 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, controlling 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 better the standard for a pollutant is called an “attainment area.” An area that does not meet a 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, has been in non-attainment in previous decades.

Attainment status can affect a community’s economic development efforts, and federal funding for transportation projects can be affected in non-attainment areas. New or expanded industries that 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, and we are required to demonstrate that our transportation plans and programs comply with federal air quality conformity processes.

In addition to conventional air pollutants, greenhouse gas emissions from vehicles and their contribution to climate change are a growing concern. Although climate change is a global issue, its impacts and the activities that cause climate change happen at the local level. These activities are influenced by the decisions of local and state officials: land use development and pricing decisions that affect how and how much we travel, roadway and transit and active transportation investments that set the travel choices we have, and vehicle and refueling infrastructure expenditures that determine how polluting are travel will be.

Although the focus of a Metropolitan Transportation Plan is on the specific transportation facilities and services that are fiscally reasonable and can serve changing travel markets, the *Connect2050* plan links these investments to broader energy use and greenhouse gas issues, principally in three ways: (i) on-going efforts to designate and implement alternative fueling infrastructure along key regional corridors, (ii) support for continued conversion of transit vehicle fleets to the use of alternative fuels, and (iii) closer alignment

of work among MPOs and NCDOT and regional efforts like the Department of Energy (DOE)-supported Triangle Clean Cities Coalition.

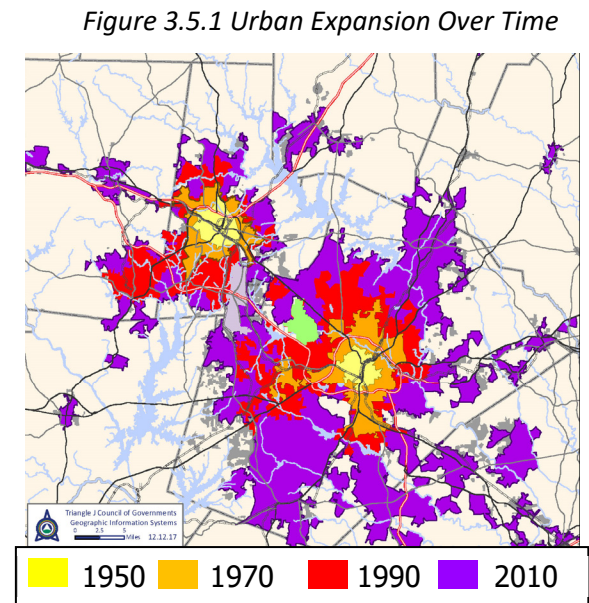
The recent designations of the I-85, I-95 and I-40 corridors in the region by the National Electric Highway Coalition for the installation of fast charging stations by the end of 2023 is one example of transportation investments designed to address greenhouse gas emissions.



### 3.5 Our Future

The part of the Research Triangle Region covered by our forecast is anticipated to add 1.2 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-unclear 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 1990-2020

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 30 years or are nearing completion. **Red** lines are highways with interchanges, while **purple** lines are streets with intersections.

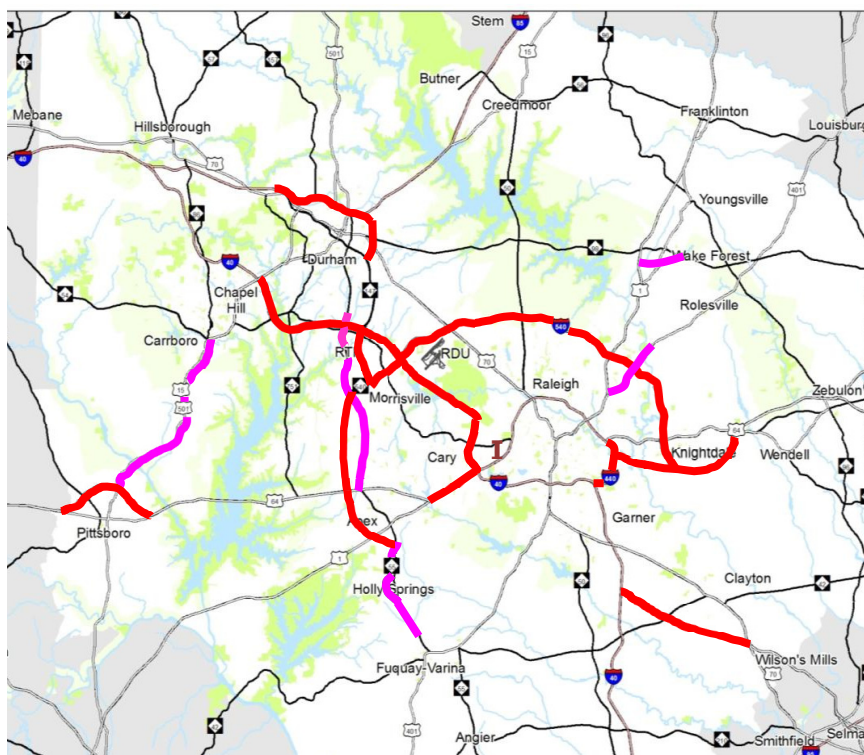
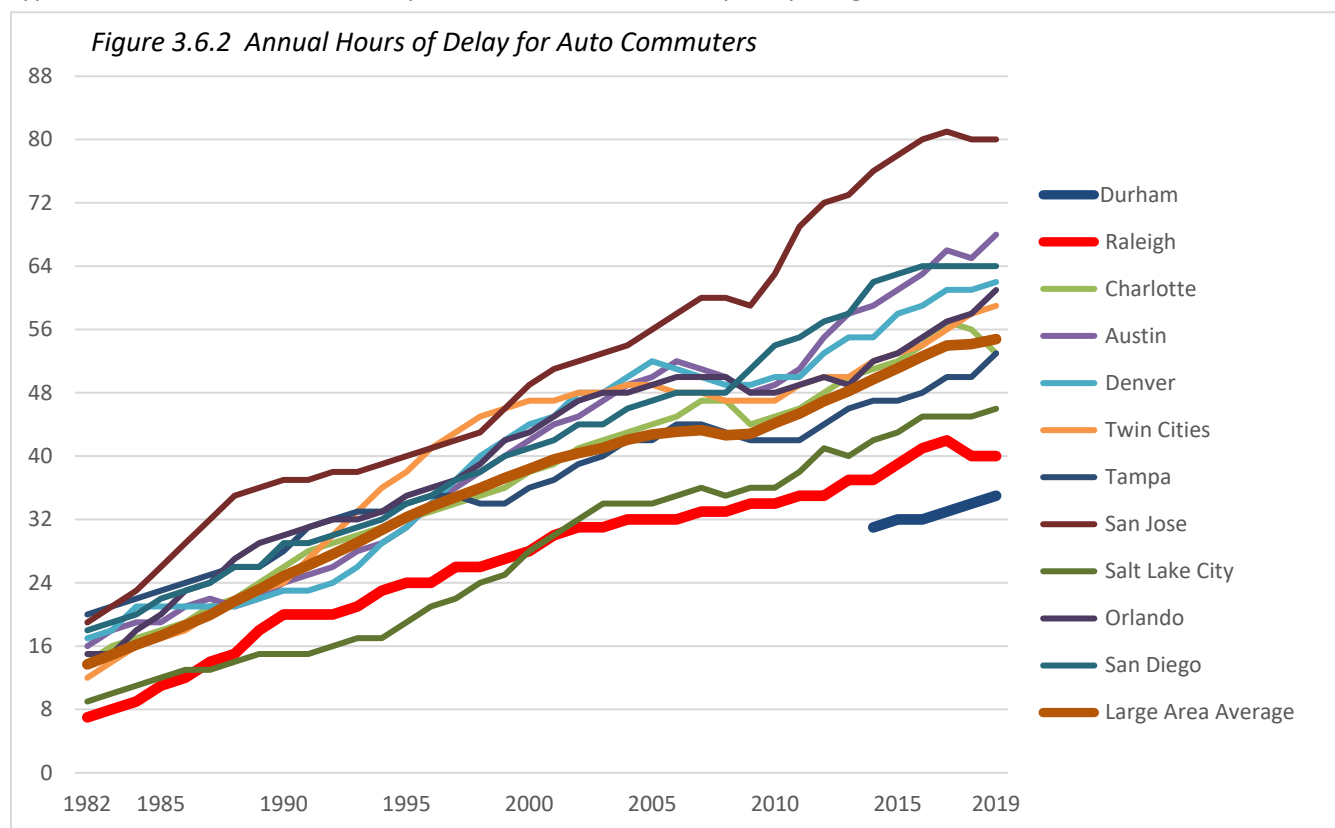


Figure 3.6.2 shows how auto commuters have experienced delays in the Triangle, in many of the regions with which we compete and for all large regions in the US. The graph shows that although the Triangle has comparatively less delay than peer regions, delay consistently rises over time and that economically successful, fast-growing regions have not been able to “build their way out of congestion.” The graph shows that in the early 1980s, a typical Raleigh auto commuter spent one full workday per year (8 hours) delayed by congestion, and that by 2019 that had risen to one full week (40 hours). The typical San Jose auto commuter spent two work weeks delayed by congestion in 2019.



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 2050, 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.
- Like many regions that had the majority of their growth after World War II, the Triangle is a sprawling region and projections are for continued outward growth and infill development in selected locations, most notably in the central parts of Raleigh and Durham and the area between them. 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 – and the changing nature of work post-COVID – may significantly affect travel, but the nature and scale of these impacts remains highly uncertain, and may affect travel markets only in the long-term stages 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, and the commute interchange between Durham and Wake Counties is by far the largest of any two counties in North Carolina. Our MPO plans should recognize the mobility needs of residents and businesses that transcend our MPO and county borders.