2. Piedmont Triad Overview

Executive Summary/Key Points

- This chapter provides context for the 2035 LRTP Update, including
  - An overview of the geography, demographics and economic characteristics of the region and the MPO;
  - A summary of local and regional land use planning efforts;
  - Methodology on the socioeconomic forecast and the regional travel demand model; and
  - Recommendations related to land use and transportation coordination; regional cooperation and coordination; and the regional travel demand model.
- The Triad region is projected to grow by over 400,000 people and the Winston-Salem MPO by over 150,000 people by 2035. Expanded housing and transportation choices will be needed to meet changing demand and demographics.
- By having a regional transportation organization and one regional council now in place, the Triad is positioned for cooperative planning and successful regional land use and transportation initiatives.

Map and Table References

Maps
- Piedmont Triad Region—Location
- Piedmont Triad Region—Geography
- Piedmont Triad Region—Major Roadways
- Piedmont Triad Metropolitan Planning Organizations
- Winston-Salem Urban Area Metropolitan Area Boundary
- Winston-Salem MPO Household Density 2009 and 2035
- Winston-Salem MPO Employment Density 2009 and 2035

Tables
- Table 2-1 Economic Characteristics of Forsyth County, the Region and North Carolina
- Table 2-2 Winston-Salem MPO Population, Households and Employment

2.1 Geographic Area

The Piedmont Triad is a geographically diverse 12-county region located in central North Carolina along the I-40/I-85 corridor between Raleigh and Charlotte. In addition to being located centrally in North Carolina, the Piedmont Triad has a central East Coast location, midway between New York and Miami; Washington, D.C. and Atlanta, and within 650 miles of more than half the U.S. population and major markets. See Map 2-1 Piedmont Triad Region—Location, Map 2-2 Piedmont Triad Region—Geography, and Map 2-3 Piedmont Triad Region—Major Roadways.

According to US Census definitions, 63% of the population of the Piedmont Triad Region lived in urbanized areas or clusters in 2000. In contrast, the land area in the Piedmont Triad is predominantly rural: 54% of the land area is rural (defined as less than 100 people per square mile) and an additional 23% of the land area is rural transition (defined as less than 250 people per square mile.)
Counties in the Piedmont Triad Region are: Surry, Stokes, Rockingham, Yadkin, Forsyth, Guilford, Alamance, Davie, Davidson, Caswell, Randolph, and Montgomery. The major cities in the Triad are: Winston-Salem, Greensboro and High Point.

The Triad includes four Metropolitan Planning Organizations (MPOs), Winston-Salem Urban Area, Greensboro Urban Area, High Point Urban Area and Burlington-Graham and two Rural Planning Organizations (RPOs), Northwest Piedmont and Piedmont Triad. See Map 2-4, Piedmont Triad Metropolitan Planning Organizations.

2.2 Demographics

The 12-county Piedmont Triad Region had a population of 1,646,059 in 2010, a 12% increase from 2000. According to the State Budget Office, the population of the Piedmont Triad is expected to exceed 2 million by 2030. Greensboro, Winston-Salem and High Point are the primary metropolitan centers of the region. Together, they rank 37th in size among U.S. cities, following Nashville at 36th.

The Winston-Salem Urban Area had an estimated population in 2009 of 393,018. The Winston-Salem MPO is the third most populous MPO in North Carolina, following the Mecklenberg-Union MPO (Charlotte) and the Capital Area MPO (Raleigh). As of the 2010 Census, Forsyth County was the fourth most populous county and Winston-Salem the fourth most populous city in North Carolina. Population, household and employment estimates and projections for the Winston-Salem Urban Area are included in section 2.5, Socioeconomic Forecast, below.

2.3 Economic Characteristics

The Piedmont Triad Region has a generally strong economic climate, compared to many other areas of the United States. Major industries include manufacturing, services, health care, logistics and distribution, and financial services. The region is home to eleven four-year colleges and universities and nine community colleges. The region’s central North Carolina and East Coast location, moderate climate, and educated workforce make it an attractive place to live and work.
Map 2-5 Winston-Salem Urban Area Metropolitan Planning Organization (WSMPO)
Economic statistics for the Piedmont Triad Region, including unemployment, educational attainment and income/poverty, are generally similar to those for the State as a whole. Economic statistics for Forsyth County, however, are generally stronger than those for the region or State. See Table 2.1 below.

| Table 2.1 Economic Characteristics of Forsyth County, the Region, and North Carolina |
|-----------------------------------------------|----------------|----------------|----------------|
|                                | Forsyth County | Piedmont Triad Region | North Carolina |
| Unemployment Rate (Annual 2011)                  | 10.0%          | 10.7%             | 10.5%          |
| Educational Attainment-- % at least HS Graduate* | 86.9%          | 82.4%             | 83.6%          |
| Educational Attainment – % at least Bachelors Degree* | 31.2%          | 23.7%             | 26.1%          |
| Per Capita Income (projected 2011)              | $26,223        | $23,996           | $23,955        |
| % Population below Poverty Level                 | 15.3%          | 15.8%             | 15.5%          |

*of population 25 and older

2.4 Land Use and Development

Regional
The Piedmont Triad has a history of both fragmented and cooperative planning for land use and transportation. Fortunately, we currently have many cooperative efforts underway in a wide range of areas, including economic development, transportation, and sustainable growth.

Piedmont Authority for Regional Transportation: The Piedmont Authority for Regional Transportation (PART) was created through State enabling legislation in 1997 (GS 160A-630). Its members include the four Triad MPOs (Burlington-Graham, Greensboro, High Point, and Winston-Salem), the counties of Alamance, Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry, and Yadkin; and numerous cities, including Burlington, Greensboro, High Point and Winston-Salem.

PART’s goal is to improve transportation through regional cooperation and its mission is to enhance the quality of all forms of transportation for each of our citizens through efficient use and protection of our natural, economic and human resources. In addition to providing regional transit service, PART provides travel demand management services, including ridesharing, van pools, awareness programs, and employer consultations, and has coordinated many regional transportation planning and land use efforts. PART serves as the conduit for coordinated transportation planning in the Piedmont Triad. Operating under Memorandums of Understanding and other agreements with local jurisdictions and State governments departments, PART facilitates planning activities that impact multiple jurisdictions. PART serves as the custodian for regional travel demand transportation model, the Piedmont Triad Regional Model (PTRM) and as the coordinating agency for Air Quality Conformity Determination efforts that must be undertaken by area MPOs and NCDOT. (See discussion below)

PART is authorized to operate transportation services and systems, but has limited taxing authority. PART may levy a vehicle registration and/or a passenger vehicle rental fee in perpetuity subject to an initial authorization by affected Boards of County Commissioners. PART presently receives funds from a 5% vehicle rental tax in Davidson, Forsyth, Guilford, Stokes, Surry, and Yadkin Counties. PART also receives a vehicle registration fee for registered vehicles in Randolph County. NCDOT and Federal Transit Administration (FTA) grants have also been awarded for studies and services that are currently underway.
Piedmont Triad Regional Council: Since 1979, the Piedmont Triad region has been served by two regional councils of government. However, in 2011, the Northwest Piedmont Council of Governments and the Piedmont Triad Council of Governments joined to create the Piedmont Triad Regional Council (PTRC). By having a regional transportation organization (PART) and one regional council (PTRC), the Triad is now positioned for successful regional initiatives and expanded cooperative planning efforts.

Regional Planning Efforts: Important recent regional planning efforts include:
- Regional Travel Demand Model and Air Quality Conformity Analysis (1990s-present) See discussion below.
- Triad Urban Land Use Project (TULUP) Growing Together in the Triad (late 1990s)
- PART’s Regional Transit System (1998-present) See Chapter 4 of this plan.
- Piedmont Triad Seamless Mobility Study (2008)
- Regional Commuter Rail Alternatives Analysis (2009)
- Piedmont Triad Aerotropolis Initiative (2009-present)
- Heart of the Triad Study (2009-10)
- Piedmont Together: the Piedmont Triad Sustainable Communities Planning Project (PTSCPP) (2010-present) See discussion below.

Piedmont Together: the Piedmont Triad Sustainable Communities Planning Project: For the past two years, the Piedmont Triad Region has pulled together and is planning for a more resilient future across a broad spectrum of elements. In October 2010, the region has awarded a Regional Sustainable Communities Planning Grant from the Department of Housing and Urban Development. The grant has enabled the region to embark on a process to look at the relationship between jobs, housing and transportation. The planning effort is referred to as the Piedmont Together, the Piedmont Triad Sustainable Communities Planning Project (PTSCPP). After 16 months of study and input from 12 community forums, the project team developed a list of regional strengths and challenges. The five top strengths identified were: education; farming and viticulture; health care; scenic and recreational resources; and small town charm. The five top challenges identified were: lack of transportation choices; participating in the “new” economy; abandoned mills and employment centers; capitalizing on and supporting existing businesses; and, healthy community design.

Using these strengths and challenges and data about our region, seven Reasons to Care have been drafted and are being validated or revised through a series of public forums. The Reasons to Care will be used as a framework to develop a list strategies and recommendations to strengthen our region.

The data collected to date shows a strong connection between the location of housing and job opportunities, and the transportation choices linking the two. 51% of the people reside in Forsyth and Guilford counties, but 63% of the region’s jobs are located in these counties. The average family in the region spends over 50% of their income on the cost of housing and transportation. People are seeking housing in a more compact, walkable environment. In addition, over 20% of the region’s population will be over 60 years of age by 2030. Unfortunately, there is a mismatch between the current supply and the future needs for both housing and transportation choices.

Over the past three decades extensive investments in roadway improvements and new highways has benefited the Piedmont Triad. The region is a transportation hub for freight movement and travelers, with little current traffic congestion. The region must protect this investment – but more investment at the State and local level need to be focused on other transportation modes. The region’s future
investments in transportation should be directed to future needs, including sidewalks, bikeways, vanpools and transit, in addition to roadways.

Regional cooperation and coordination in all areas, particularly transportation, is critical to the future economic prosperity of the region. There are MPO plans, RPO plans, and city/town plans, but no regional plan. From the state level down to the local level there are over 40 agencies, entities, divisions and departments dealing the various aspects and modes of transportation in our region.

Related to transportation, there are three likely recommended outcomes from Piedmont Together:
1) Continue to improve coordination and cooperation among all transportation entities, including the development of a regional transportation vision;
2) Study the consolidation of various entities or elements to a more regional level; and
3) Develop more local funding sources for transportation investments.

Our region will grow by 400,000 people by 2030. To maintain a high quality of life and convenient access to jobs, housing, and services, we need to work together to develop a safe, reliable and efficient regional multimodal transportation network.

Local
The dominant development pattern in the Winston-Salem Urban Area over the past fifty years has been scattered, sprawling suburban development, built at low densities and spreading farther into the countryside. When combined with zoning ordinances that require separation of employment, shopping and services from residential areas, the result is more and longer trips and an almost total dependence on the automobile.

Until recently, active transportation options were given little emphasis and transit, bicycling and walking are not viable choices for most trips. Dispersed development patterns make it harder for our public transit systems to provide good service, attract riders and be cost-effective and efficient. Those who don’t or can’t drive, such as children, the elderly and the disabled, are totally dependent on others for transportation.

Our spread-out development patterns and dependence on the automobile has had its price. More cars on the road cause create more accidents, account for lost time and productivity, and increase air pollution. Increased traffic requires new roads and the widening and maintenance of existing roads at a cost that we may no longer be able to afford. Ultimately, our traffic problems will reduce the quality of life in our community.

Recently, citizens and public decision makers have begun to link transportation and land use planning, recognizing that we must alter our land use and development patterns to create a more efficient transportation system and make active transportation choices viable. Plans to guide the growth and development of a community go by a variety of names, including comprehensive plan, general development guide, land use or land development plan, and growth strategy. No matter what title is used, these plans traditionally are general, long-range policy guides for decisions concerning the overall growth and development of the community. Plans in place in jurisdictions in the Winston-Salem Urban Area include:

- Forsyth County: Forsyth County and all its municipalities, including the City of Winston-Salem, adopted the Legacy Development Guide in 2001 to serves as a general development plan. Legacy includes a growth management plan and an extensive transportation chapter. In 2011, staff began working with the community to update Legacy. The Legacy 2030 Update was approved by the City-County Planning Board in August 2012 and by the Tobaccoville Village Council and the Winston-Salem City Council in November 2012. The plan was considered by the Forsyth County Commissioners in late November 2012 and then by all other municipalities in the county. In addition to the county-wide plan, most of the municipalities have adopted more detailed community or area plans, including a transportation component.
• **Davidson County**: The *Davidson County Land Development Plan*, adopted in 2009, serves as a guide to help the community make land use decisions and to provide for the orderly growth and development of the county. The policies are included to serve as basis for future decisions regarding land use and development, transportation, and capital improvements.

• **Davie County**: In 2010, Davie County adopted the *Davie County Growth Enhancement Strategy* to encourage quality, sustainable growth, to accommodate new growth while preserving heritage and rural resources, and to maintain a healthy balance between economic viability and livability by recognizing the direct connection between development and quality of life. The Town of Bermuda Run adopted a comprehensive plan in 2012 to guide land use and growth, transportation, community character/identity, and public investment decisions.

• **Stokes County**: Stokes County has adopted *Stokes County: A Land Development Guide* to help manage its future growth. The City of King has not recently updated their Land Development Plan.

While the types of plans in the Winston-Salem Urban Area differ, they do share some common visions. Preserving the character and quality of the area, while accommodating anticipated growth and development, is a common theme among the localities. Important objectives in plans of Winston-Salem Urban Area jurisdictions include:

- Accommodate growth and development while preserving the area’s quality of life, heritage, character and natural environment.
- Coordinate land use, transportation and capital investment decisions to efficiently and cost effectively provide public facilities and services.
- Create more compact and efficient patterns of development by increasing the overall density and intensity of residential and commercial development in areas with public sewer, good roads and other urban services.
- Reduce dependence on the automobile by providing convenient and attractive choices including transit, walking and bicycling. Locate higher density developments at activity centers and along transit corridors to make transit viable; create attractive commercial developments close to neighborhoods; and invest in sidewalks, greenways and bikeways that connect neighborhoods to jobs, shopping centers and services.
- Create vibrant village centers and downtowns with safe, clean, high quality public spaces, restaurants and specialty shops, and entertainment, sports and cultural events that attract people downtown to live, work, and shop.
- Attain a more balanced pattern of development by giving priority to public expenditures in slow growth areas for such things as improved roads, schools, libraries and other facilities and services.
- Prioritize re-use of vacant land and abandoned buildings over greenfield development.
- Retain farmland and open space by directing urban and suburban growth to existing developed areas. Assure that development in rural areas enhances rural character.

### 2.5 Socioeconomic Data Forecast

A key means of linking land use (current and future) to transportation planning is through the socioeconomic data projections used in the region travel demand model. Socioeconomic data (estimates and projections of population, households and employment) is first forecast at the aggregate level (typically by state, region and/or county) and then allocated to smaller and smaller geographies, down to the traffic analysis zone (TAZ) level. TAZ level data is used in the regional travel demand model to estimate trip attractions and trip productions.

The socioeconomic data forecasts for the local travel demand model, the Piedmont Triad Regional Model (PTRM), were developed by Parsons Brinckerhoff (PB) in consultation with the model team and local jurisdiction staff. Data sets were originally developed in 2004-05 and were updated in 2009-10.

In 2004-05, the base year was 2002, with a horizon year of 2035 and interim years of 2015 and 2025. The consultants, the model team and local jurisdictions undertook an extensive process to develop...
the region and county level forecasts and to allocate data down to the TAZ level. They used different approaches, including top-down, bottom-up, and build-out methods and based their assignments on a wide variety of factors, including available land analysis, local land use and transportation plans, and verified employment and school data.

For this 2035 LRTP Update, 2009 was used as the new base year, with a horizon year of 2035 and interim years 2015 and 2025. Unfortunately, 2010 Census data was not available in time to be used in the model update to meet the federally established deadline of early 2013 for Triad MPOs to adopt updated Long Range Transportation Plans.

The first step in updating the socioeconomic data was to establish county level control totals for population and employment for the base year and for horizon years. Regional/jurisdictional socioeconomic forecasts from public and private sources were gathered to help develop these control totals. Sources used include:

- N.C. State Data Center (SDC) – The SDC has county-level population estimates and projections to the year 2029.
- Woods and Poole (W&P) – W&P is an independent firm that specializes in long-term county economic and demographic projections. W&P has estimates and projections to the year 2040.
- Bureau of Labor Statistics (BLS) – BLS has current county level employment estimates by industry.
- Bureau of Economic Analysis (BEA) – BEA also has current county level employment data that can be used to help establish base year estimates.
- Census Bureau (Census) – The Census has population and household estimates at the county level that can be compared to the SDC and other sources.

Population and Households: Following the review of the data, all jurisdictions agreed to use Woods and Poole (W&P) or State Data Center (SDC) data for population control totals for the base, interim, and horizon years. Winston-Salem requested that data from the State Data Center (SDC) be used, so SDC population data was used for Forsyth, Davie, and Stokes counties. The county level totals were then distributed to subareas and to TAZs using trend line analysis of the values developed for the socioeconomic data forecast in 2004-5. The number of households was calculated by using population data and estimated current and projected household size. See the map – Winston-Salem Urban Area Household Density Comparison by Traffic Analysis Zone (TAZ).

Employment: For county level employment control totals for the 2009 base year, the model team agreed to use W&P data. To distribute the 2009 county level employment down to the subarea and TAZ levels, three methods were used. Local jurisdictions reviewed the estimates and selected the values they deemed most accurate. For county level projections (for 2015, 2025 and 2035), all jurisdiction selected W&P data, except Guilford County. The consultants provided jurisdictions with a variety of options to distribute the county level projections to subareas. Local jurisdictions reviewed the subarea data distribution options and selected the scenario that best reflected the anticipated level of growth in their areas. See the map – Winston-Salem Urban Area Employment Density Comparison by Transportation Analysis Zone (TAZ).

Table 2.2 shows estimated and projected population, households and employment for 2002, 2009 and 2035 prepared for the socioeconomic forecast and used in the PTRM for this LRTP Update.

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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>356,297</td>
<td>393,018</td>
<td>10%</td>
<td>552,867</td>
<td>41%</td>
</tr>
<tr>
<td>Households</td>
<td>143,558</td>
<td>167,760</td>
<td>17%</td>
<td>234,292</td>
<td>40%</td>
</tr>
<tr>
<td>Employment</td>
<td>189,730</td>
<td>244,079</td>
<td>29%*</td>
<td>333,040</td>
<td>36%</td>
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</tbody>
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*2002 employment was based on data from InfoUSA, which does not include all employment. The 2009 employment number was developed based on Woods &Poole data and is more representative of total employment; therefore, 2002 and 2009 employment numbers are not directly comparable and the 29% increase in employment is likely overstated.
2.6 Piedmont Triad Regional Model (PTRM)

The Piedmont Authority for Regional Transportation (PART) serves as the custodian for the regional travel demand transportation model, the Piedmont Triad Regional Model (PTRM). This regional project includes annual updating of the PTRM data attributes, and special studies of the region that are used to enhance the performance characteristics of the PTRM. Attributes of the model include, but are not limited to, the street and highway network, traffic speeds and volumes, and socioeconomic data (see discussion above.)

The PTRM completely covers the Metropolitan Area Boundaries (MABs) for the Winston-Salem MPO (Forsyth, Davidson, Stokes, Davie), the High Point MPO (Davidson, Guilford and Forsyth), the Greensboro MPO (Guilford) and the Burlington-Graham MPO (Alamance, Guilford and Orange). Alamance, Guilford and Forsyth counties are completely within the Piedmont Triad Regional Model (PTRM) boundary. Stokes, Davie and Davidson Counties are partially covered by the PTRM. The remainder of Davidson County is covered using the NCDOT NMAA spreadsheet, a methodology based on estimating VMT for non-modeled areas according to population percentages for those portions of non-attainment counties. This methodology has been used to demonstrate conformity in other areas and received approval from the interagency partners.

The PTRM estimates the probability of selecting the entire range of travel modes (excluding freight) for each potential origin and destination in the region, as defined by the regional network and zone system. The mode split model uses a logit formulation to estimate the probability of choosing a particular mode. For the PTRM, a total of 23 model alternatives (travel modes) are considered. While not all of these modes are allowed for each purpose, and some await data for calibration, the model structure is designed to accommodate a full range of potential alternatives. The primary or top level alternatives are auto, non-motorized, transit and school bus. Within each of the primary alternatives considered there are separate nest created for alternative travel patterns; thus creating a total of 23 alternatives.

The PTRM includes the following trip purposes: home-based work, home-based school, home-based shopping, home-based other, non-home-based work, non-home-based other, home-based college/university, and airport traveler trips. Socioeconomic data (discussed above) is used in the model as the basis for trip productions and trip attractions.

Triad MPOs and NCDOT are required by federal regulations (23 CFR 134 and 40 CFR Parts 51 and 93) to make an air quality conformity determination on any newly adopted or amended fiscally-constrained LRTP and TIP. Outputs from the PTRM feed into the air quality model used to prepare the required Air Quality Conformity Determination Report (see Chapter 8.) The purpose of the determination report is to document compliance with the provisions of the Clean Air Act Amendments of 1990 (CAA) and the Transportation Equity Act for the 21st Century (TEA-21). The conformity determination for the 2007–2013 Transportation Improvement Program (TIP) is based on a regional emissions analysis that utilized the transportation networks in adopted and conforming Long Range Transportation Plans (LRTPs) and the emissions factors developed by the North Carolina Department of Environment and Natural Resources (NCDENR). All regionally significant federally funded projects in areas designated by the United States Environmental Protection Agency (USEPA) as air quality nonattainment or maintenance areas must come from a conforming LRTP and TIP. A history of air quality in the Winston-Salem and the Triad Region prepared by the Forsyth County Office of Environmental Assistance and Protection is included in Appendix C of Chapter 7.
Winston-Salem Urban Area Employment Density Comparison by Traffic Analysis Zone (TAZ)

Employment per Acre by Traffic Analysis Zone

- 0.0 - 0.1
- 0.1 - 1.0
- 1.0 - 10.0
- 10.0 - 100.0
- 100.0 +

2009

2035