



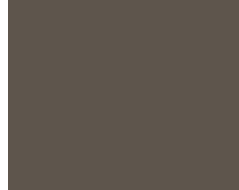




TDOT 25-YEAR LONG-RANGE TRANSPORTATION POLICY PLAN



DEMOGRAPHIC & EMPLOYMENT CHANGES & TRENDS POLICY PAPER



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1.0 INTRODUCTION

The purpose of this policy paper is to describe current and future anticipated socioeconomic conditions across the State of Tennessee (and within its separate regions) in order to develop an accurate depiction of current and future users of Tennessee Department of Transportation (TDOT) facilities, programs, services, and systems. The factors contributing to forecasted population and economic changes are described to provide the backdrop for how these characteristics and trends might impact future programs and policies of the Department in support of its mission to “provide a safe and reliable transportation system that supports economic growth and quality of life”. This policy paper relates the need for an accurate depiction of current and future system users to develop effective TDOT policies and programs that, when implemented, meet the needs and desires of those user groups and align with the Guiding Principles of the 25-Year Policy Plan.

1.1 POPULATION

Population growth over the next 25 years will not occur uniformly across the state, TDOT regions, or even within designated planning areas. Understanding population growth trends at state, region, and county levels will assist TDOT in effectively managing the system and support the Guiding Principles of TDOT’s 25-Year Policy Plan in the following ways:

- **Preserve and Manage the Existing System** – Analyzing population forecasts will assist in identifying where critical capacity enhancements will be needed allowing for increased system optimization in a cost effective manner.
- **Provide for the Efficient Movement of People and Freight** – Understanding where significant growth is expected to occur and where those population centers will likely travel to on a regular basis will allow for the proactive planning for transportation facilities that provide greater access to transportation services and create better connections among and between different modes of transportation.
- **Build Partnerships for Sustainable and Livable Communities** – It will be important for TDOT to be actively engaged with local communities so that decisions impacting TDOT transportation facilities receive a thorough review.
- **Maximize Safety and Security** – Future high population areas can anticipate an increase in demand for incident response and weather preparedness.
- **Emphasize Financial Responsibility** – By using the population forecasts to strategically direct investments to areas where they are most needed, TDOT can better select projects from identified regional needs and maximize use of transportation revenues.

1.2 EMPLOYMENT

Similar to population growth, increases in employment opportunities will not occur uniformly as urban centers for employment are expected to continue bringing commuters in from surrounding counties. Understanding these employment growth trends at state, region, and county levels will assist TDOT in effectively managing the system and support the Guiding Principles of TDOT’s 25-Year Policy Plan in the following way:

- **Provide for the Efficient Movement of People and Freight** – Understanding the relationship between employment and population centers will be a critical component of efficient movement because forecasts show that population growth and employment growth will not always occur in the same communities.
- **Support the State’s Economy** – Understanding where economic growth is occurring will allow TDOT to invest in infrastructure to support those industries and increase the state’s economic competitiveness in addition to providing increased access to goods and services within the state.

2.0 SUMMARY OF FINDINGS

The purpose of this policy paper is to describe current and future anticipated socioeconomic conditions across the State of Tennessee (and within its separate regions) in order to develop an accurate depiction of current and future users of Tennessee Department of Transportation (TDOT) facilities, programs, services, and systems.

Population

- By 2045, the population of Tennessee is projected to add over 1.4 million people. Of this growth:
 - Over 84% will occur in existing urban counties with the State's current top ten most populous counties seeing the lion's share of this growth.
 - Region 3 will see two thirds of the State's growth compared to other regions of the State.
 - By 2045, Region 1 will surpass Region 4 in terms of total population.
 - Regions 1 and 3 will see significantly more growth in their urban counties than their rural counties.
- Williamson and Rutherford Counties in TDOT Region 3 are expected to lead the state in terms of total population growth, resulting in a combined population of nearly 1 million people by 2045.
- By 2045, Sevier County's population is projected to exceed 100,000.
- While the majority of future population growth will occur in urban counties, the relative split between urban and rural population in the State will remain much like it is today (approximately 70% urban - 30% rural).
- Tennessee is projected to have a significant increase in its senior population (those 65 and over) resulting in nearly 550,000 more seniors across the State. Of this growth:
 - The majority of the State's senior population growth will occur in rural counties with the exception of senior population growth in Region 3, which will see more seniors in urban counties.
 - Region 3 will surpass Region 1 in having the largest senior population by 2045, with the highest regional increase of 79% for this age group.
- According to U.S. Census American Community Survey reports, approximately 33% of all households in Tennessee are home to a person with a disability. While the population with a disability is fairly equally distributed across the state, rural areas have slightly higher concentrations.
- The racial and ethnic composition of Tennessee's residents has been and is projected to continue changing over time. Today, the diversity of Tennessee residents varies by region. Though this trend is projected to continue, the state as a whole is projected to become more diverse in the future.

Employment

- By 2045, Tennessee is projected to add over 1.4 million more jobs. Of this growth:
 - Over 86% will occur in existing urban counties.
 - Region 3 will see 66% of the State's future employment growth compared to other regions of the State and by 2045 represent just under half of the State's employment base.
 - By 2045, Region 1 will surpass Region 4 in terms of total jobs.
 - Regions 1, 3 and 4 will see the greatest amount of their future employment growth (over 70%) in urban counties, whereas Region 2 will see a near even split between new jobs in urban and rural counties within its region.
- By 2045, employment growth in urban counties in Region 4 will outpace population growth in these same counties indicating a greater share of in-commuting for employment and the potential need for efficient regional connections.
- While the majority of future employment growth will occur in urban counties, the relative split between urban and rural employment growth in the State will remain much like it is today (approximately 80% urban - 20% rural). The data does suggest, however, that Tennessee's future employment growth is trending more towards urban counties as compared to projected future population growth.

Recommendations

- TDOT should partner with other State agencies to explore opportunities for leveraging resources and programs that support economic development, aging populations, health, people with a disability, and smart growth practices.
- TDOT should increase its efforts in working with city, county, and regional organizations relative to land use and transportation in order to proactively plan for and accommodate future transportation demands.
- TDOT should continue to make available the latest planning data and tools and provide these resources to its many planning partners (e.g., MPOs, RPOs, ECD, transit agencies, etc.)
- TDOT should evaluate its programs related to state-owned highway assets (e.g., signage, lighting, pavement markings, etc.) to accommodate projected growth in Tennessee's senior population.
- TDOT should place greater emphasis on projected needs (e.g., population and employment growth) when conducting a scoring/funding analysis of projects for inclusion in its 3-Year Plan in order to meet the needs of a changing population.

3.0 EXISTING TDOT POLICY, PLAN, AND DATA ANALYSIS

Multiple demographic data sets and projections were used to assess current and future TDOT system users. The data sets provide demographic analysis of not only Tennessee, but also neighboring and peer states, as well as the entire country. Comparison of Tennessee demographic data with those of peer states will help identify trends and enable TDOT to anticipate future challenges and learn from the successes of similar states in overcoming those challenges. The surrounding and peer states that have been identified for this purpose are Alabama, Arkansas, Florida, Georgia, Indiana, Kentucky, Minnesota, Mississippi, Missouri, North Carolina, Utah, Texas, Washington and Virginia. These states were selected based on similarities in population size and age distribution, growth rate, household size, vehicle ownership, physical geography, distribution of rural and urban areas, labor force, regional similarities, and other socioeconomic factors.

The demographic data sets used to examine Tennessee and its surrounding and peers states include:

- U.S. Census - Provides current demographic estimates for Tennessee, peer states, and the entire country. The 5-Year American Community Survey (ACS) estimates from 2014 to 2018 were the primary source for U.S. Census Bureau data.
- The University of Tennessee Center for Business and Economic Research (UTCBER) - Provides Tennessee population projections by age group and race to 2070. The UTCBER projections are instrumental in developing the State of Tennessee’s financial projections. UTCBER functions as the Lead Agency for the State Data Center program in Tennessee serving as the official source of demographic, economic, and social statistics, and redistricting data produced by the U. S. Census Bureau.
- Woods and Poole Economic, Inc., Projections - Provide insight on historical trends from 1980 to present and projections to 2045 regarding population and employment for each Tennessee County, as well as each county in the selected peer states. The Tennessee county-level data was summarized, where appropriate, to describe the four distinct TDOT regions, transportation planning areas [Metropolitan Planning Organization (MPO), Transportation Planning Organization (TPO), Rural Planning Organization (RPO), etc.], and statewide characteristics. Data for Tennessee and the selected peer states were summarized and examined for urban and rural population and employment trends.

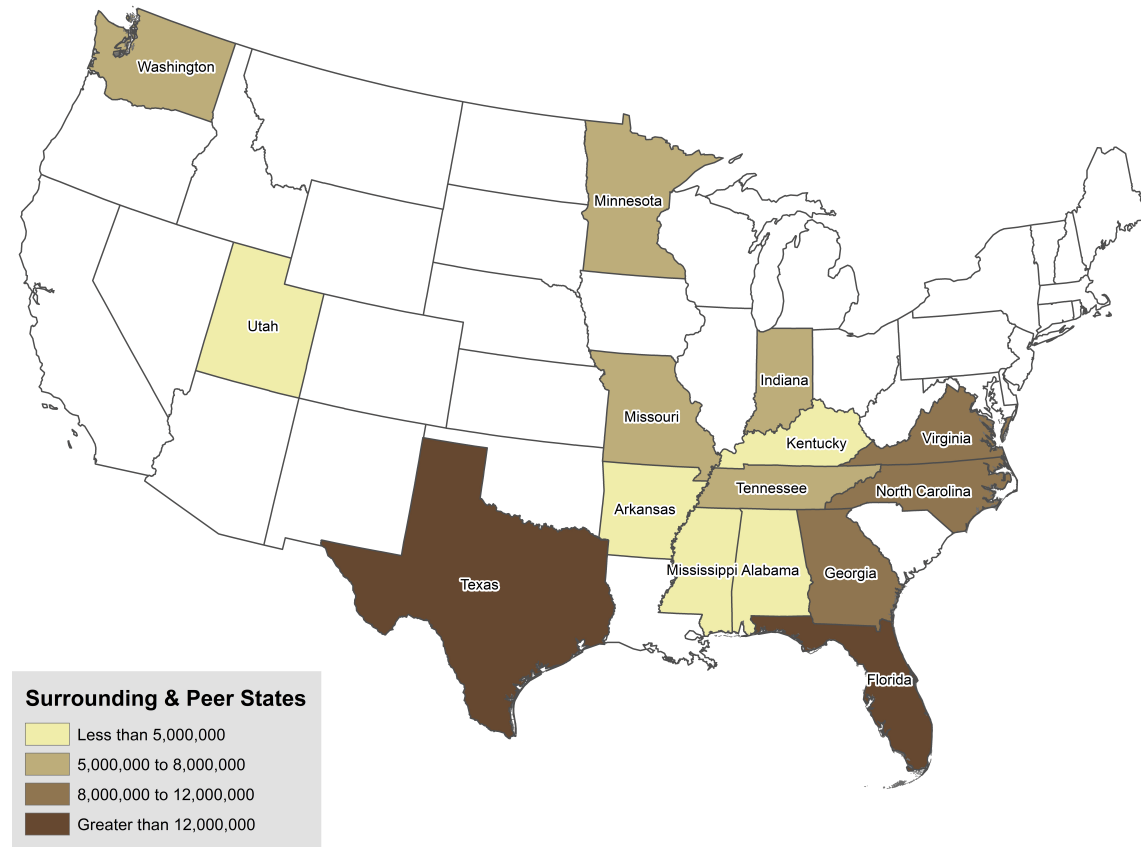
These sets of data each possess unique strengths and weaknesses depending on the desired application. Table 1 outlines these factors for comparison.

Table 1 Comparison of Sources of Demographic Data

Data Set	Strengths	Weaknesses	Best Application
U.S. Census – Decennial and American Community Survey (ACS) estimates	<ul style="list-style-type: none"> ▪ Historic and current population, vehicle availability, employment and related data. ▪ Easily mapped. ▪ Available at sub-county level geographies. ▪ ACS estimates available in 1-, 3-, and 5-year tabulations collected annually. 	<ul style="list-style-type: none"> ▪ Limited population projections. ▪ Updated every 10 years (decennial). ▪ Data reporting varies from census to census (decennial). ▪ ACS tabulations are estimates based on sample data. 	<ul style="list-style-type: none"> ▪ Describing current conditions at sub-county, county, region and state levels. ▪ Comparing demographics with peer states.
UTCBER	<ul style="list-style-type: none"> ▪ State-specific research on economic trends for UT, state agencies, and public and private organizations. ▪ Compatibility with other forecasts for TDOT 	<ul style="list-style-type: none"> ▪ Only offers population projections. ▪ No employment or job-level data, only industry-level. ▪ Frequency of update schedule varies. 	<ul style="list-style-type: none"> ▪ Understanding population dynamics within Tennessee.
Woods and Poole	<ul style="list-style-type: none"> ▪ Projections provided for several demographic and economic factors to the year 2045. ▪ Comprehensive historical county database and the integrated nature of the projection model. ▪ Projection for each county in the United States is done simultaneously so that changes in one county will affect growth or decline in other counties. ▪ Updated annually. 	<ul style="list-style-type: none"> ▪ Limited to county-level geographies. 	<ul style="list-style-type: none"> ▪ Demographic projections for Tennessee counties, MPOs & RPOs, TDOT regions, and peer states.

3.1 CURRENT POPULATION

It is important to understand current demographic trends in order to draw conclusions about future conditions and transportation needs. Growth rates, age, household size, and vehicle availability are all important factors that contribute to the use of a transportation system. Currently the total statewide population for Tennessee is over 6.7 million. Of the statewide population, 79% were age 16 and over, representing the potential driving population and labor force. Tennessee's 2018 population is compared with selected peer states in Figure 1.



Source: American Community Survey 5-year Estimates, 2014-2018

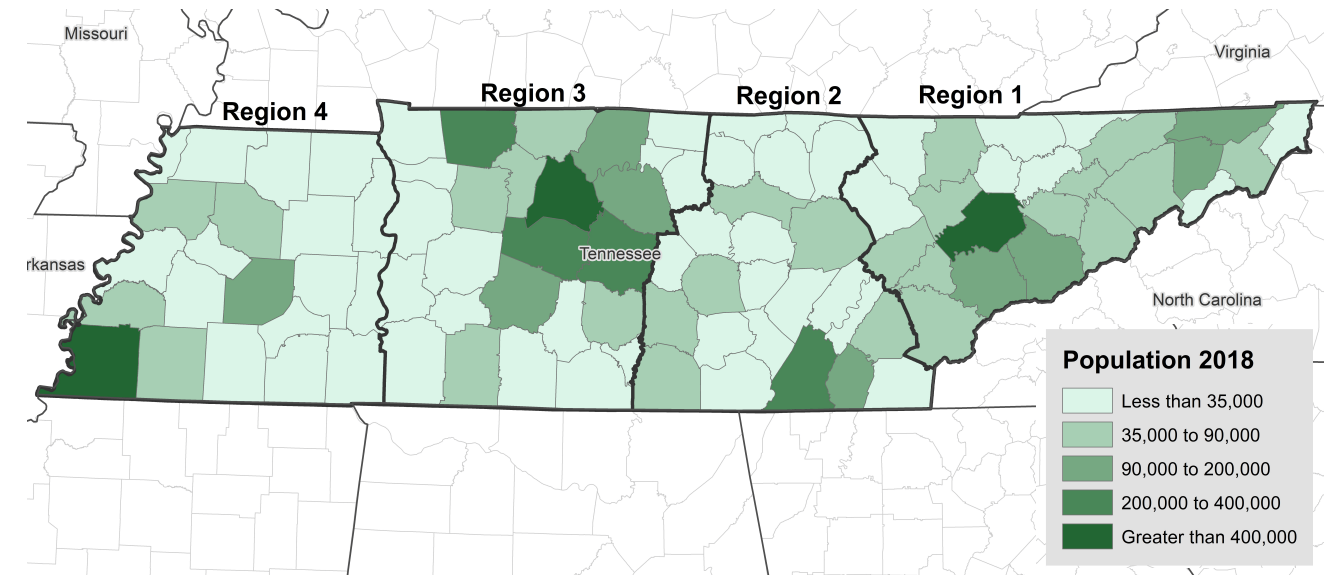
Figure 1 Surrounding and Peer State Populations (2018)

Tennessee, surrounding states, and the identified peer states share many socioeconomic factors that will influence future population and economic trends. These states share a mixture of environments that support both rural and urban living and industries. These states all depend on robust transportation systems that accommodate automotive, transit, air, water, and freight facilities to support the economy and residents of these states.

Tennessee is ranked fifth in terms of population among southeastern states behind Florida, Georgia, North Carolina, and Virginia. Data also illustrates that Tennessee, its surrounding states, and the peer states households have similar levels of access to private vehicles for their daily transportation needs as shown in Table 5 later in this section.

Figure 2 below shows the distribution of Tennessee's population by county. As expected, the urban areas in each TDOT Region contain the highest number of residents followed by suburban counties and then the rural areas of the state. This information is also presented in Table 2, which

gives a historical perspective on population growth from 1980 to 2018 in Tennessee's 10 most populous counties; the percent change in population over this time period is also shown and identifies multiple Region 3 counties as rapidly-growing counties. Table 3 continues to break down the state's population by TDOT's Regions as well as by the rural and urban areas. For purposes of this policy paper, urban counties were defined as those counties included in a MPO planning area; exceptions to this rule were Hawkins, Fayette, Unicoi, Roane, Sevier, and McMinn counties, where the majority of the county's population resides outside the MPO planning area. These counties were considered rural as were all other counties represented by RPOs. Counties considered urban in this policy paper include Anderson, Blount, Bradley, Carter, Davidson, Hamblen, Hamilton, Jefferson, Knox, Loudon, Madison, Maury, Montgomery, Robertson, Rutherford, Shelby, Sullivan, Sumner, Washington, Williamson, and Wilson.



Source: Woods & Poole

Figure 2 Population by Tennessee County (2018)

Table 2 Top 10 Tennessee Counties for Population (1980-2018)

County	1980	1990	2000	2010	2018	Percent Change (1980-2018)
Shelby	775,888	828,446	898,211	928,552	940,110	21%
Davidson	478,275	512,139	570,439	627,973	697,479	46%
Knox	320,932	336,707	382,887	432,972	466,217	45%
Hamilton	288,369	285,919	308,547	337,262	364,006	26%
Rutherford	84,784	119,847	183,600	263,747	323,873	282%
Williamson	58,525	81,789	128,134	184,130	232,454	297%
Montgomery	83,666	101,682	135,536	173,168	203,347	143%
Sumner	86,265	103,761	131,207	161,199	186,325	116%
Sullivan	144,388	143,886	152,995	156,755	157,574	9%
Washington	89,157	92,732	107,469	114,677	139,291	148%

Source: Woods & Poole

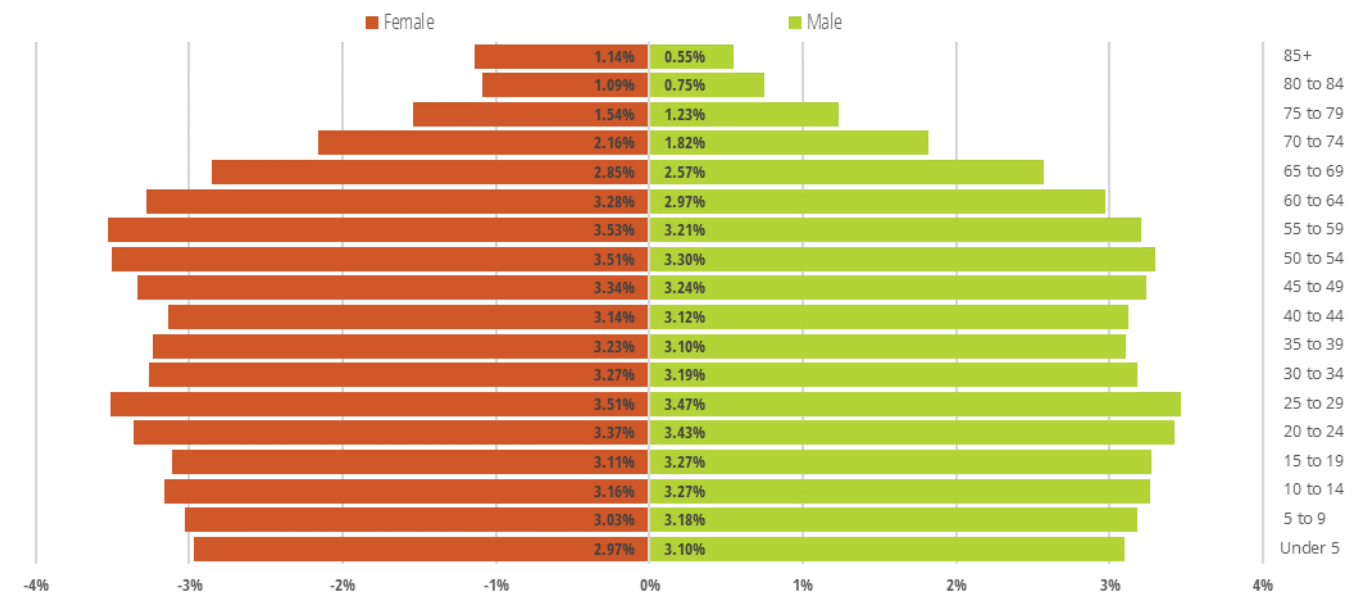
Table 3 Population Change in Tennessee (1980-2018)

Geography	Sum of 1980	Sum of 1990	Sum of 2000	Sum of 2010	Sum of 2018	Percent Difference (1980-2018)
Statewide	4,600,684	4,894,492	5,703,719	6,355,882	6,771,306	47%
Rural Counties	1,597,721	1,648,728	1,934,411	2,088,600	2,127,089	33%
Urban Counties	3,002,963	3,245,764	3,769,308	4,267,282	4,644,217	55%
Region 1	1,213,420	1,263,275	1,461,185	1,615,343	1,679,788	38%
Rural Counties	353,354	368,379	441,471	483,644	491,117	39%
Urban Counties	860,066	894,896	1,019,714	1,131,699	1,188,671	38%
Region 2	782,012	804,011	922,516	1,008,752	1,064,493	36%
Rural Counties	425,875	444,102	525,763	572,394	594,032	39%
Urban Counties	356,137	359,909	396,753	436,358	470,461	32%
Region 3	1,238,906	1,408,333	1,755,436	2,099,443	2,391,759	93%
Rural Counties	302,841	324,165	392,854	427,020	444,809	47%
Urban Counties	936,065	1,084,168	1,362,582	1,672,423	1,946,950	108%
Region 4	1,366,346	1,418,873	1,564,582	1,632,344	1,635,266	20%
Rural Counties	515,651	512,082	574,323	605,542	597,131	16%
Urban Counties	850,695	906,791	990,259	1,026,802	1,038,135	22%

Source: Woods & Poole

Age distribution within the current population is illustrated in Figure 3. Understanding age distribution can help identify the needs of current users of the transportation system. Age groups are organized youngest to oldest from the bottom of the graph to the top. In 2018, the graph widens to illustrate the large portions of the population between the ages of 5 to 9 and 40 to 44. The proportion of the population declines steadily as age increases beyond age 49. This hourglass-like pattern is comparable to the same data graphed at a national scale (Figure 4) and all of the peer states with the exception of Texas, whose population is relatively younger (Figure 5). This shape indicates that as demographic shifts occur over the next 25 years, an increasing portion of the state's population will be classified as seniors; transportation systems will need to recognize their unique needs and be designed with this demographic in mind.

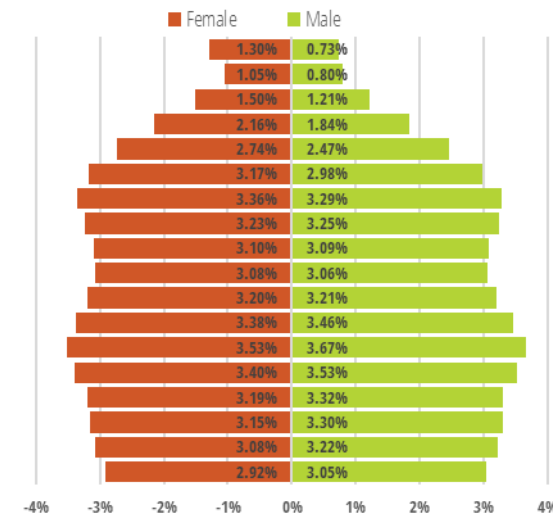
2018 TN Population by Age Group



Source: American Community Survey 5-year Estimates, 2014-2018

Figure 3 Tennessee Population by Age Group (2018)

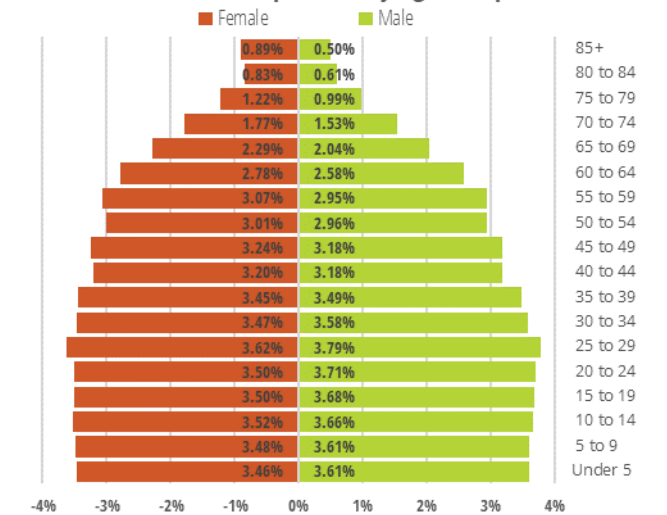
2018 US Population by Age Group



Source: ACS 5-year Estimates, 2014-2018

Figure 4 U.S. Population by Age Group (2018)

2018 Texas Population by Age Group

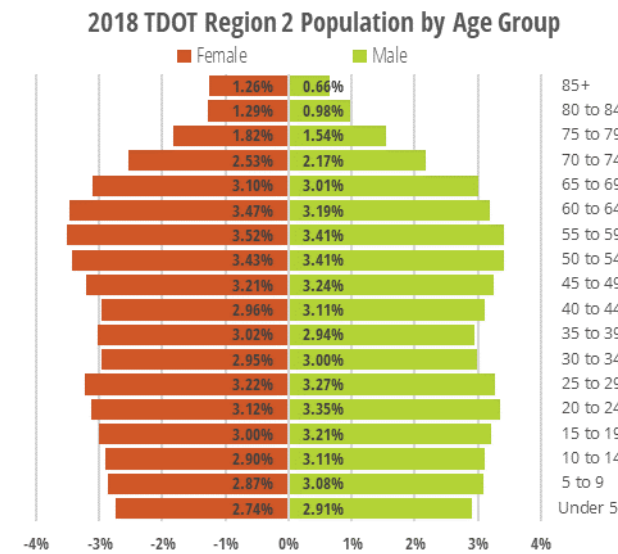
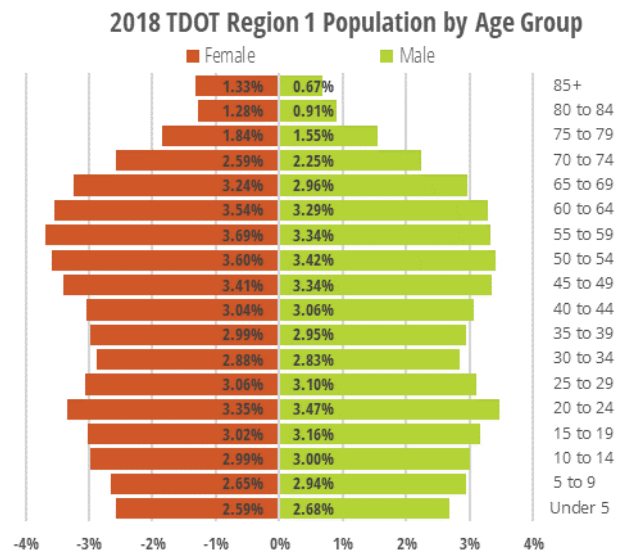


Source: ACS 5-year Estimates, 2014-2018

Figure 5 Texas Population by Age Group (2018)

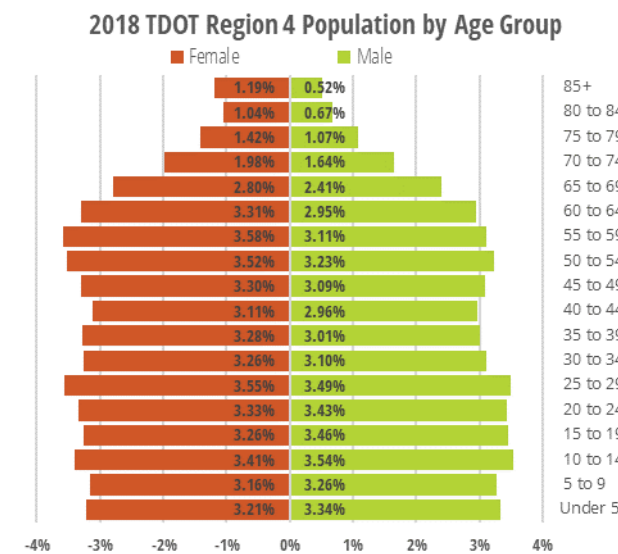
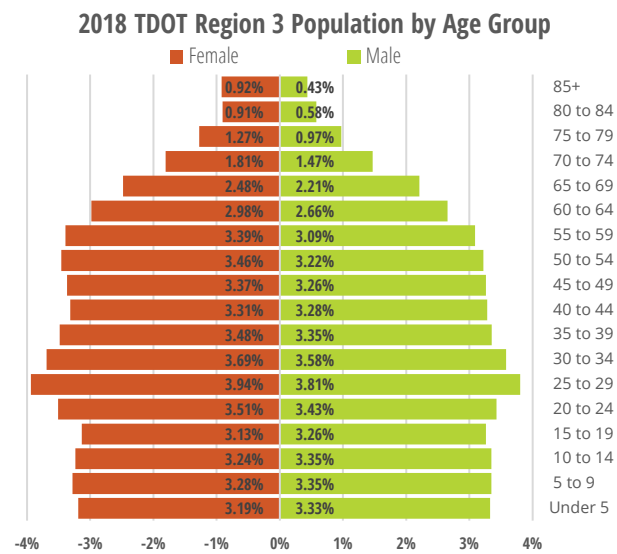
A similar age group analysis was performed for each of the four TDOT Regions with similar patterns emerging. TDOT Regions 1 and 2 displayed slightly more pronounced population segments between the ages of 40 to 65, with younger age groups holding a share of the total population for those regions (Figure 6 and Figure 7). Regions 3 and 4 are relatively younger (Figure 8 and Figure 9).

Age group distribution among urban counties is skewed toward younger ages from 20 to 29 years of age (Figure 10). Conversely, rural county populations are older on average with the largest portion being within the 50 to 59 age groups (Figure 11).



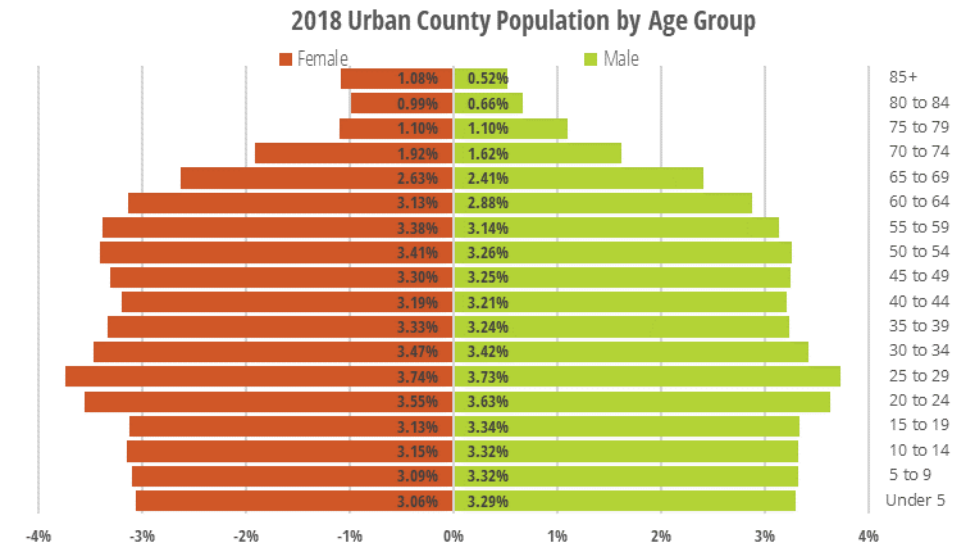
Source: ACS 5-year Estimates, 2014-2018
Figure 6 Region 1 Population by Age Group (2018)

Source: ACS 5-year Estimates, 2014-2018
Figure 7 Region 2 Population by Age Group (2018)

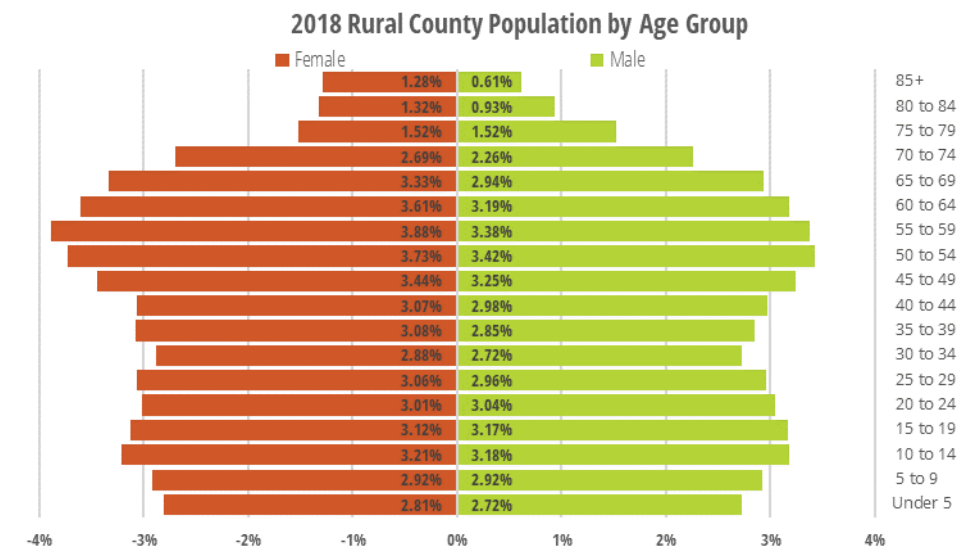


Source: ACS 5-year Estimates, 2014-2018
Figure 8 Region 3 Population by Age Group (2018)

Source: ACS 5-year Estimates, 2014-2018
Figure 9 Region 4 Population by Age Group (2018)

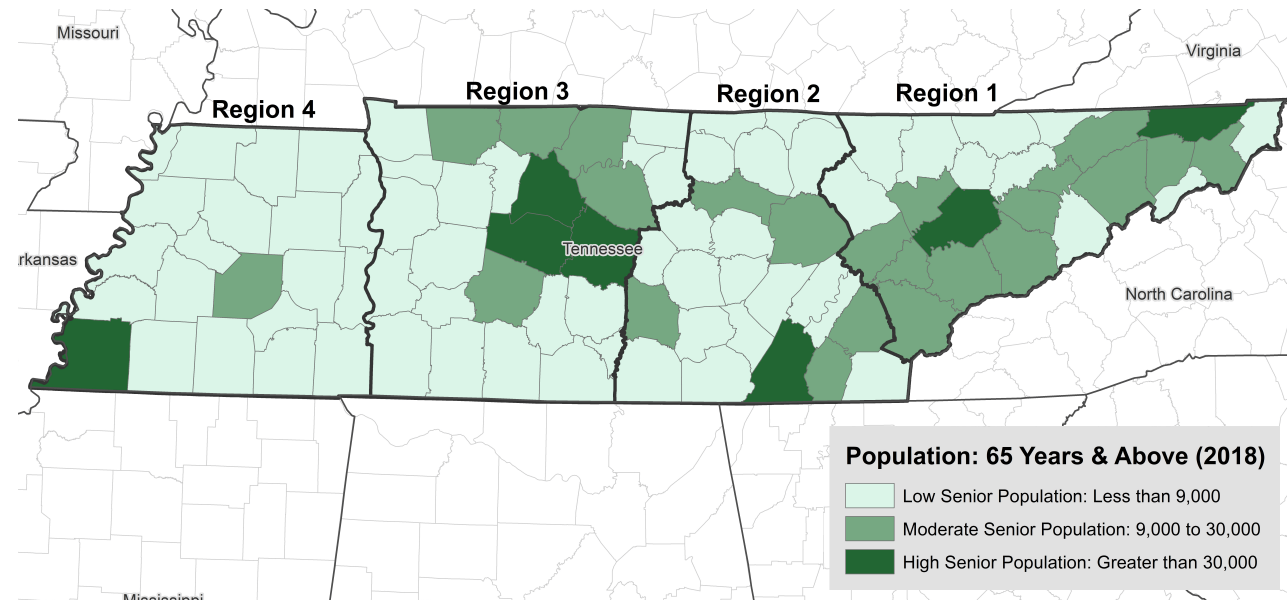


Source: American Community Survey 5-year Estimates, 2014-2018
Figure 10 Urban County Population by Age Group (2018)



Source: American Community Survey 5-year Estimates, 2014-2018
Figure 11 Rural County Population by Age Group (2018)

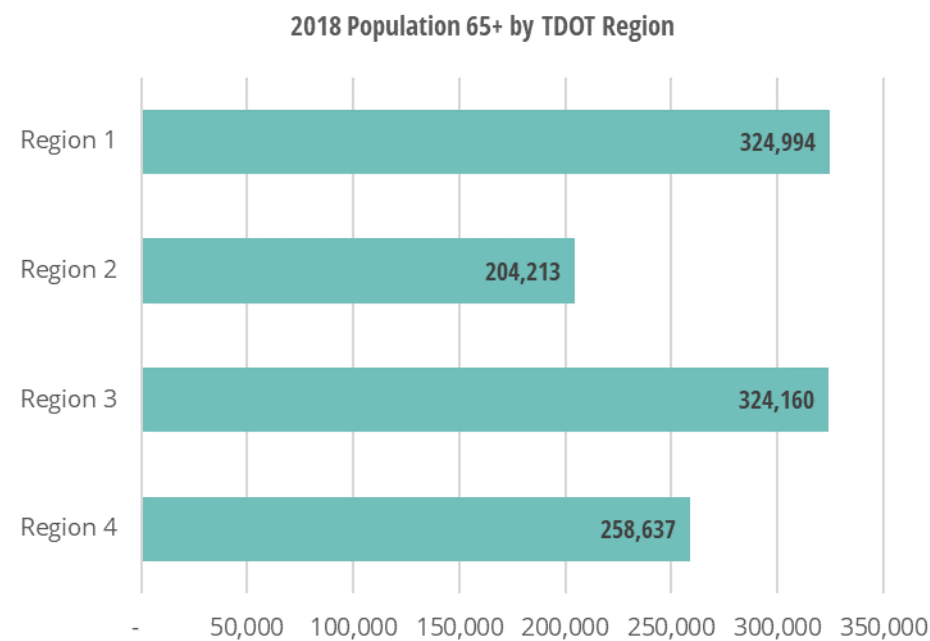
Senior populations, or those ages 65 and older, are a unique segment of the population when it comes to transportation needs. Individuals beyond 65 years of age are more likely to be retired and less likely to travel during peak commute hours. Many seniors also utilize urban and rural transit services in order to maintain their independence after they are no longer comfortable or physically able to drive. Within the State, urban centers have the highest number of seniors followed by suburban counties, as seen in Figure 12 of 2018 senior population data.



Source: Woods & Poole

Figure 12 Senior Population (65+) by Tennessee County (2018)

When senior populations across the state are compared at the TDOT Region level, Region 1 leads in 2018 with 324,994 residents in this age group followed by Region 3 with 324,160, Region 4 with 258,637 and Region 2 with 204,213 (Figure 13).

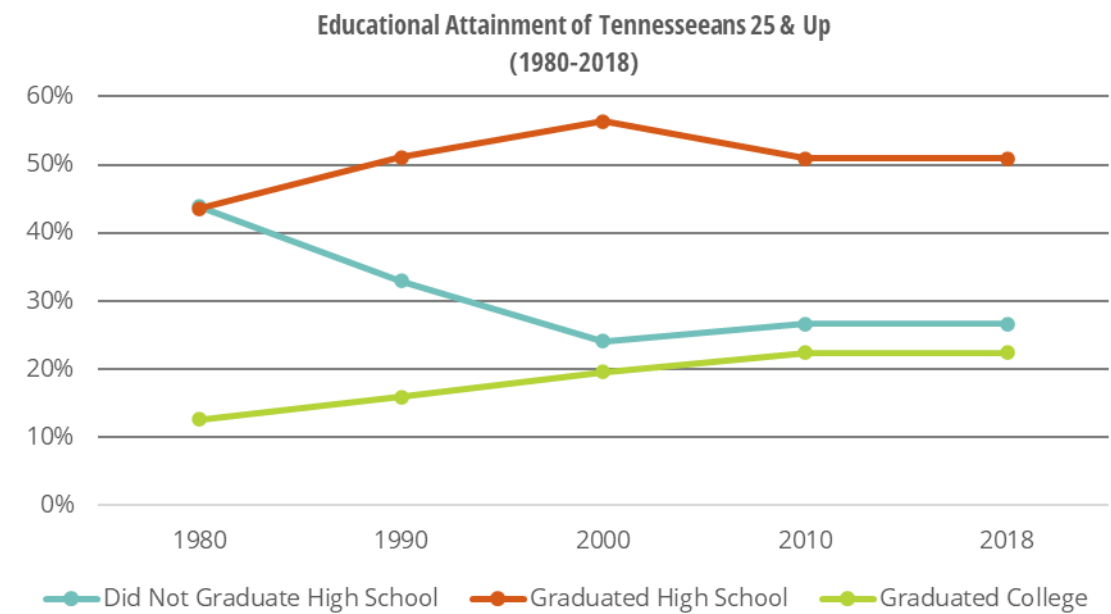


Source: Woods & Poole

Figure 13 Senior Population (65+) by TDOT Region (2018)

3.2 EDUCATION

Levels of education have increased steadily across the state since 1980. The percentage of those 25 and older that have not graduated high school has declined while the percentages of high school and college graduates have grown. Figure 14 illustrates this trend from 1980 to 2018. High school graduation rates have improved from 34% to 51% while graduation rates from four-year institutions have increased from 13% in 1980 to 22% in 2018. Table 4 shows the top 10 counties for educational attainment, all of which are in urban counties. It is important to note that the “Graduated High School” column in Table 4 does not include those who graduated high school and graduated college.



Source: Woods & Poole

Figure 14 Educational Attainment Trends (1980-2009)

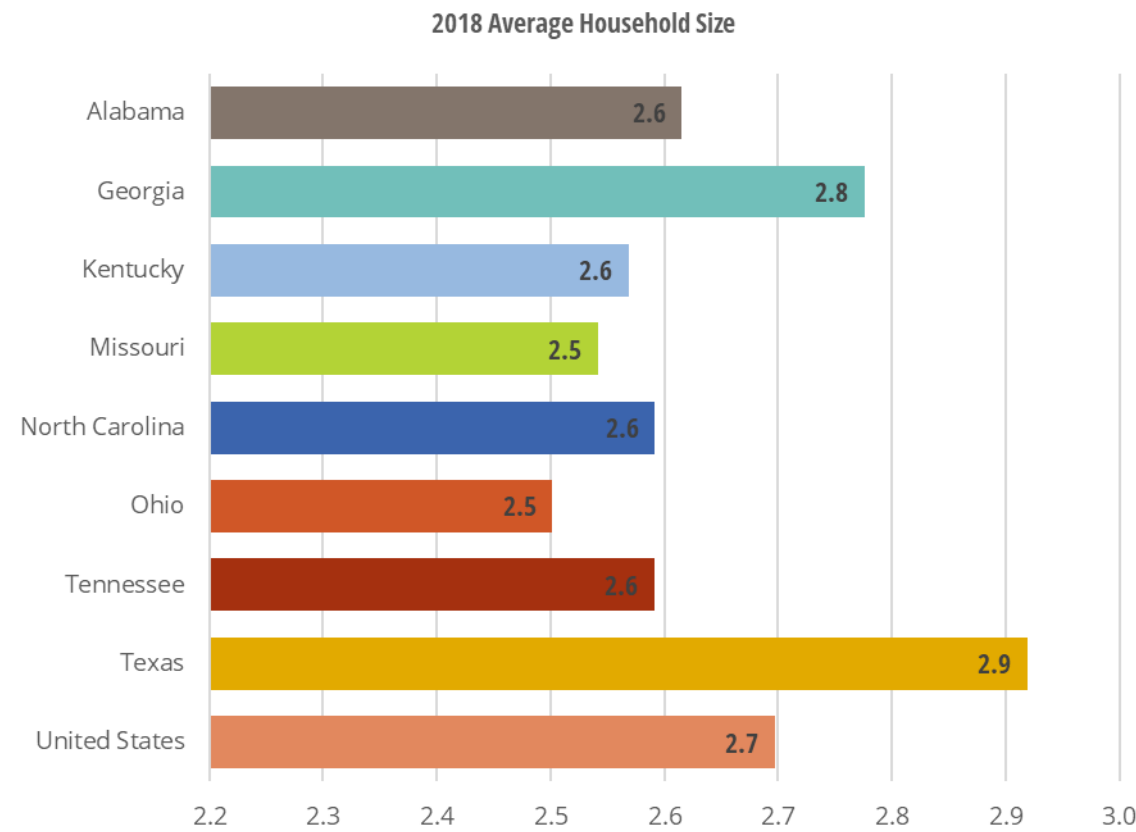
Table 4 Top 10 Tennessee Counties for Educational Attainment (2018)

County	Did Not Graduate High School	Graduated High School	Graduated College
Williamson	4%	14%	59%
Davidson	11%	23%	40%
Knox	9%	26%	37%
Washington	11%	29%	32%
Rutherford	9%	28%	32%
Hamilton	11%	27%	31%
Shelby	12%	28%	31%
Wilson	9%	30%	31%
Montgomery	8%	29%	27%
Sumner	10%	31%	27%

Source: Woods & Poole

3.3 HOUSEHOLDS

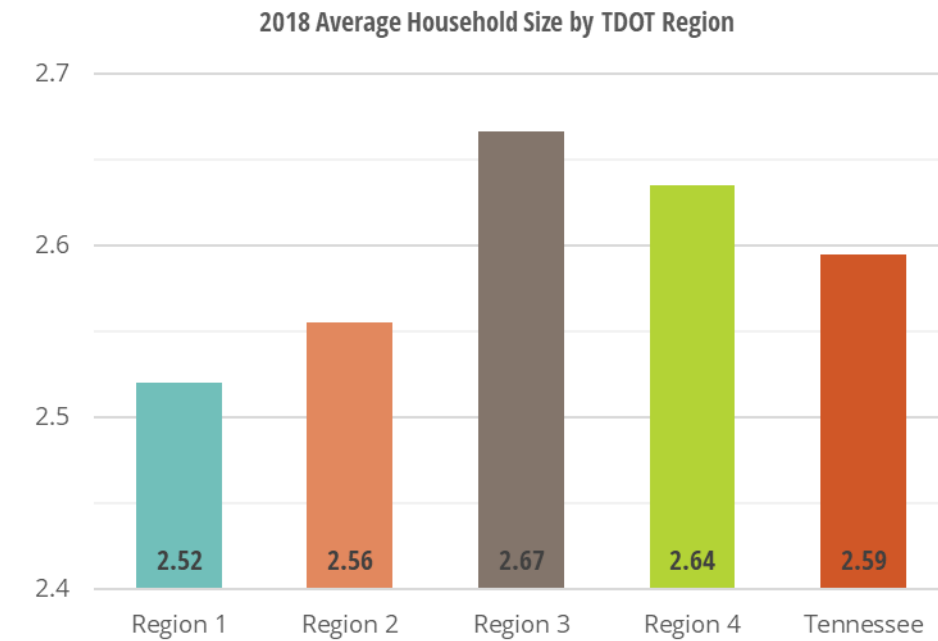
As of 2018 there were 6,651,089 occupied households in the state, which is an increase of 73,509 from the 2010 U.S. Census. Household size has not changed significantly since 2010 and averages 2.59 persons per dwelling unit. This number is slightly below the national average of 2.70 persons per dwelling unit but very comparable to the surrounding and peer states of Alabama, Kentucky, North Carolina, and Missouri (Figure 15).



Source: American Community Survey 5-year Estimates, 2014-2018

Figure 15 Average Household Size in Tennessee vs. Surrounding and Peer States (2018)

Across the four TDOT regions, household size varies little with Region 3 being slightly above the statewide average with 2.67 persons per household (Figure 16). Region 1 has the smallest average household size with 2.52 persons per household. Household sizes may influence the number of trips taken in a day per household. For example, a family of four with two adults and two children may need to make separate trips for work, school, after school activities, etc.

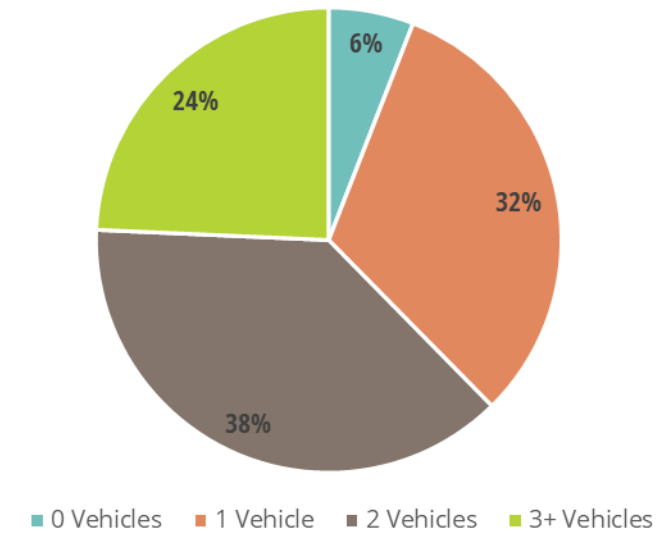


Source: American Community Survey 5-year Estimates, 2014-2018

Figure 16 Average Household Size by TDOT Region (2018)

According to the 2014-2018 American Community Survey, approximately 6% of Tennessee households did not have access to a vehicle for regular daily use (Figure 17). Surrounding and peer states report that 6 to 7% of households have no private vehicle of their own (Table 5).

Vehicle Availability of Tennessee Households



Source: American Community Survey 5-Year Estimates, 2014-2018

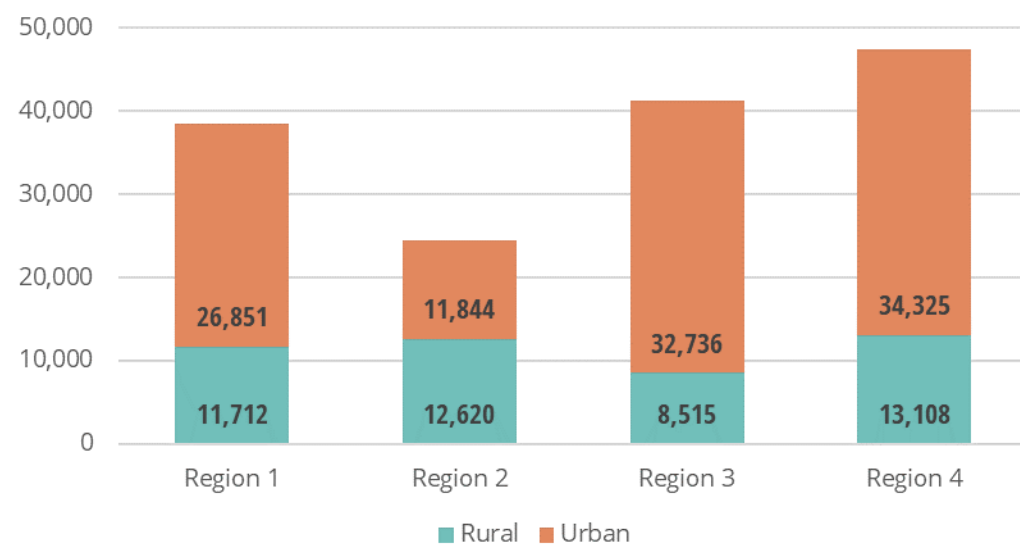
Figure 17 Vehicle Availability by Household (2018)

Table 5 Comparison of Surrounding and Peer State Households Without Access to a Private Vehicle (2018)

States	Total Number of Households	Households with No Available Vehicle	Percentage Without a Vehicle
Kentucky	1,728,681	128,588	7.4%
Missouri	2,396,271	167,384	7.0%
Minnesota	2,167,801	148,982	6.9%
Washington	2,800,423	192,165	6.9%
Georgia	3,709,488	245,063	6.6%
Indiana	2,553,818	166,509	6.5%
Mississippi	1,105,576	71,851	6.5%
Florida	7,621,760	493,915	6.5%
Arkansas	1,152,175	73,619	6.4%
Virginia	3,128,415	194,930	6.2%
Alabama	1,860,269	115,360	6.2%
North Carolina	3,918,597	231,826	5.9%
Tennessee	2,567,061	151,711	5.9%
Texas	9,553,046	512,772	5.4%
Utah	957,619	39,488	4.1%

Source: American Community Survey 5-Year Estimates, 2014-2018

Among the four TDOT Regions, Region 4 has the highest number of households without access to a vehicle, followed by Regions 3, 1, and 2 (Figure 18). Figure 18 also shows the urban and rural split of households in each region without access to a vehicle. Lack of access to an automobile is a strong indicator of the need for alternative transportation services.



Source: American Community Survey 5-year Estimates, 2014-2018

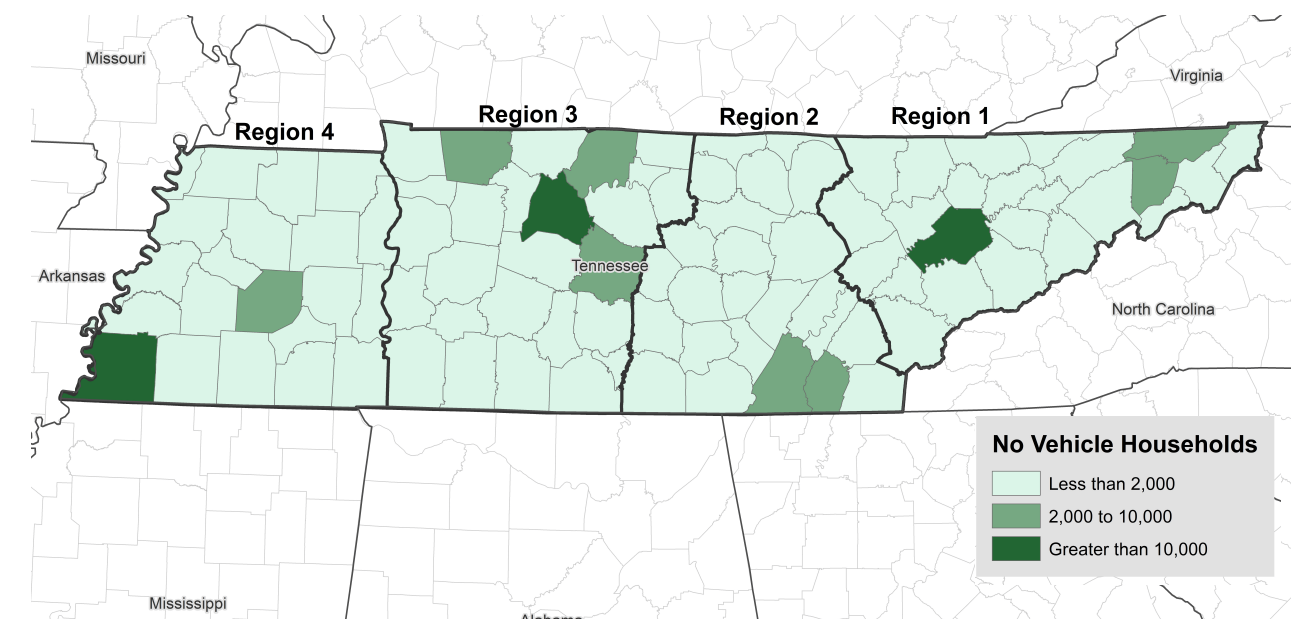
Figure 18 Households Without Access to a Vehicle by TDOT Region (2018)

When this data is mapped at the county level as seen in Figure 19, Shelby County stands out as containing the highest number of households that do not have access to a vehicle (31,081) followed by Davidson County (18,675), Knox County (11,283), and Hamilton County (9,676). The 10 counties with the highest number of households without access to a vehicle are listed in Table 6. Nearly 60% of all households in Tennessee without access to a vehicle are located within these 10 counties. This household characteristic may indicate communities that require additional mobility options, such as transit or active transportation facilities.

Table 6 Top 10 Tennessee Counties by Households Without Access to a Vehicle (2018)

County	TDOT Region	Number of Households	Households Without Access to a Vehicle
Shelby	4	350,260	31,081
Davidson	3	277,903	18,675
Knox	1	183,318	11,283
Hamilton	2	140,890	9,676
Sullivan	1	66,239	4,184
Washington	1	53,190	3,424
Madison	4	37,729	3,244
Rutherford	3	109,468	3,151
Montgomery	3	70,303	2,889
Sumner	3	65,645	2,475

Source: American Community Survey 5-year Estimates, 2014-2018

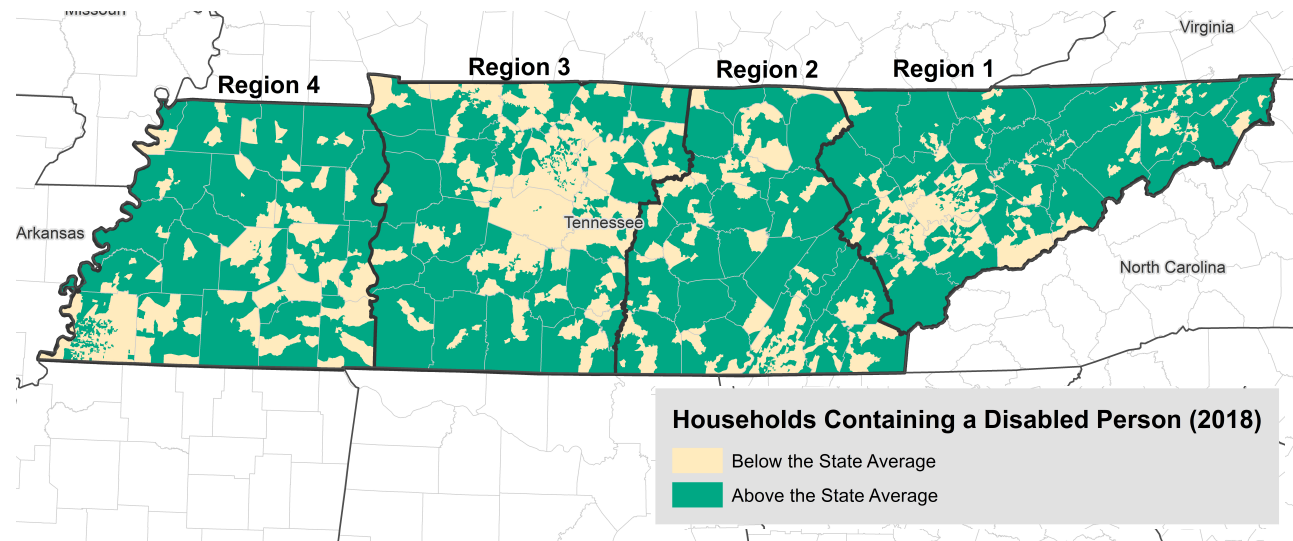


Source: American Community Survey 5-Year Estimates, 2014-2018

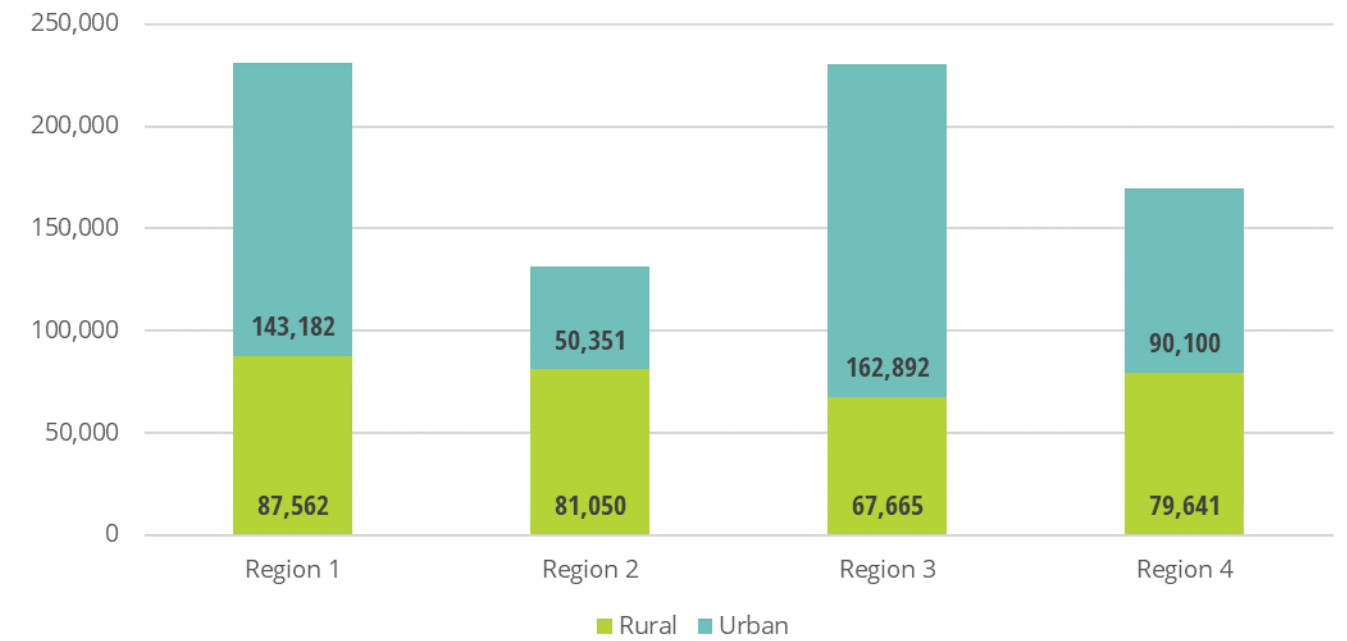
Figure 19 Vehicle Availability by Tennessee County (2018)

While vehicle availability greatly impacts the transportation needs of a household, the physical capabilities of household members impacts those needs as well, particularly if a member has a disability. While there are many ways that disability can be defined, disabilities can typically be classified into three groups: physical, communicative, or mental. Regardless of their designation, however, the American Community Survey reports that approximately 30% of all households in Tennessee are home to a person with a disability. Consequently, this population group has a significant impact on needs that must be met by the transportation system since many members of this group rely on their transportation choices to participate in society through independent travel.

Spatially, the population with a disability is distributed fairly equally across the state, although the rural areas appear to have slightly higher concentrations. Figure 20 shows the census block groups that have more households containing a person with a disability compared to the statewide average. Figure 21 and Table 7 show the distribution of households containing a person with a disability by TDOT Region as well as urban and rural counties. In Regions 1, 3, and 4 households with disabilities appear more in urban counties. However, Region 2 is an exception, where there are nearly twice as many homes containing a person with a disability in the rural counties as in the urban counties, and, conversely, Region 3 has over double the amount of households containing a person with a disability in urban counties than in rural.



Source: American Community Survey 5-Year Estimates, 2014-2018
Figure 20 Households Containing a Person with a Disability in Tennessee (2018)



Source: American Community Survey 5-Year Estimates, 2014-2018
Figure 21 Spatial Distribution of Households Containing a Person with a Disability (2018)

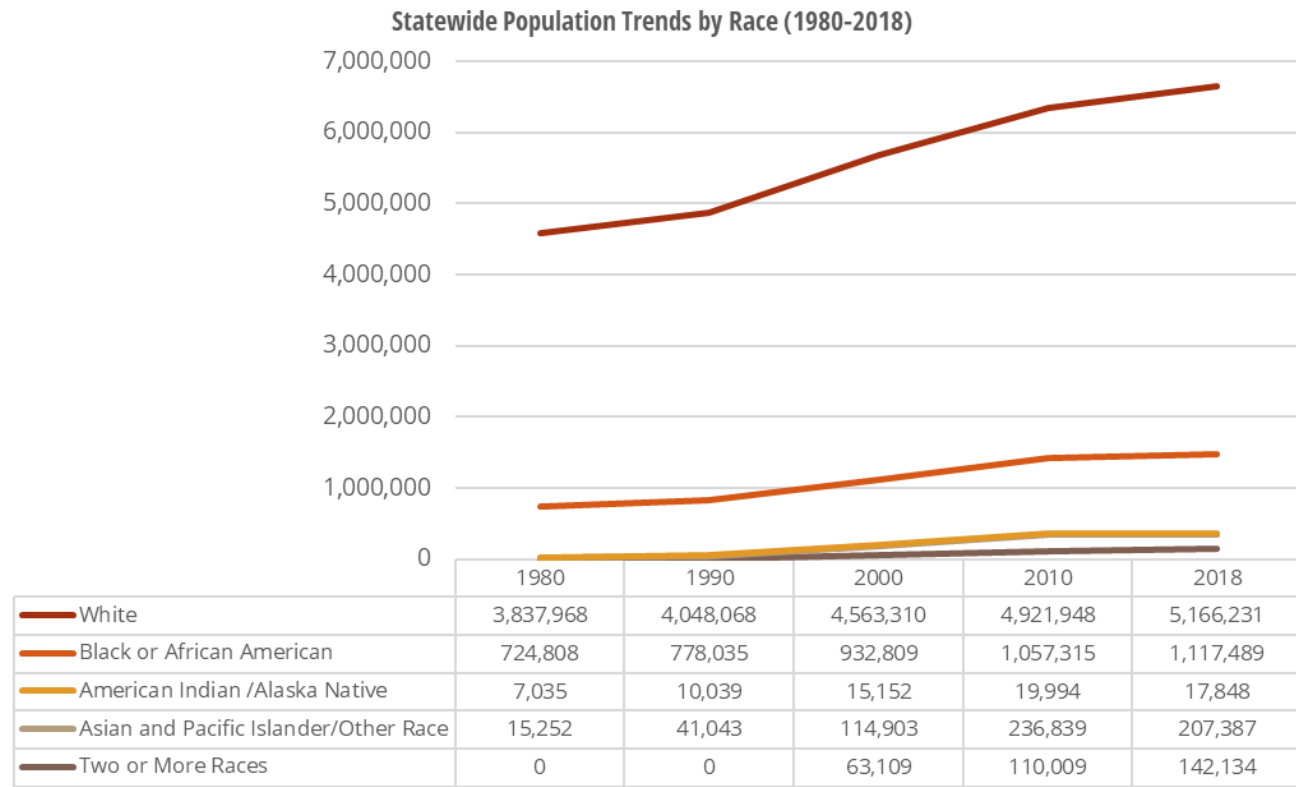
Table 7 Households Containing a Person with a Disability by TDOT Region (2018)

	Total Households Containing a Person with a Disability		Percent of Households Containing a Person with a Disability	
	Urban	Rural	Urban	Rural
Region 1	143,182	87,562	33%	41%
Region 2	50,351	81,050	30%	37%
Region 3	162,892	67,665	24%	41%
Region 4	90,100	79,641	17%	40%

Source: American Community Survey 5-Year Estimates, 2014-2018

3.4 RACE, ETHNICITY, AND ENVIRONMENTAL JUSTICE POPULATIONS

Growth has been observed in all major racial categories since 1980. While those identifying as Caucasians or White outnumber other races, growth has been documented in African American, American Indian, and Asian populations as well. Additionally, the number of individuals identifying as belonging to two or more races has increased 30% since 2010 and 125% since 2000. No data is available for this category prior to the 2000 U.S. Census. This data is shown in Figure 22 below. It is important to note that since race and Hispanic origin are two separate and distinct concepts, the U.S. Census Bureau reports do not include Hispanic population specifically in the race demographic data. For this reason, Hispanic population data is reported separately in this paper.

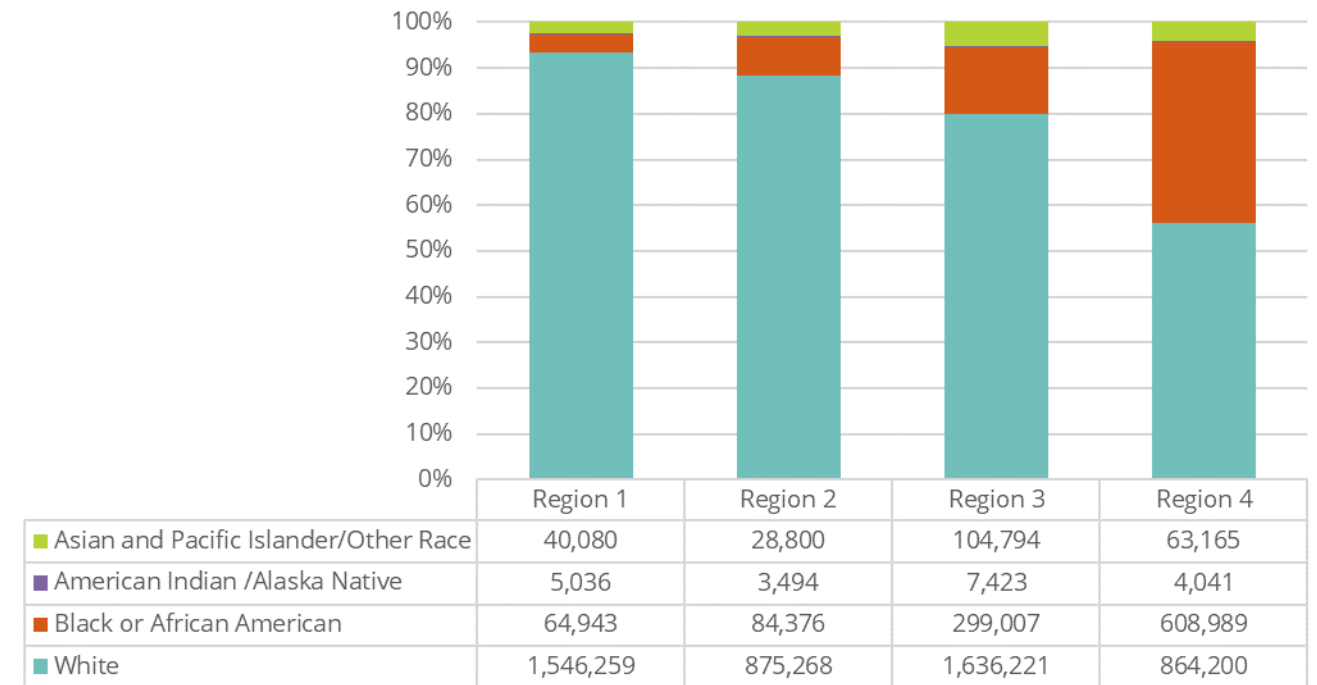


Source: American Community Survey 5-Year Estimates, 2014-2018

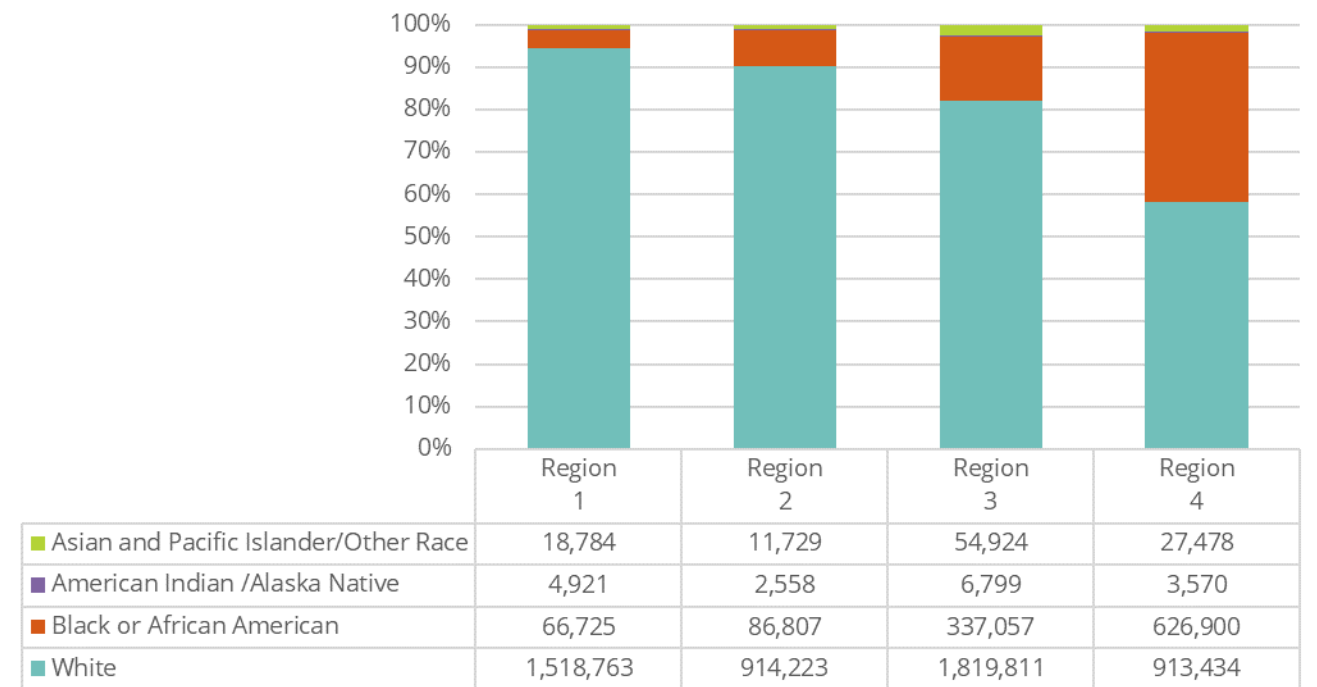
Figure 22 Tennessee Population Trends by Race (1980–2018)

The racial composition of TDOT regions varies significantly. For example, TDOT Region 1 is dominated by individuals that identify themselves as White with more than 90% of the region’s population falling into that category. This percentage declines from Region 1 to Region 4 where 55% identify as White (Figure 24). By comparing the 2018 data with the 1980 data, it is evident that TDOT Regions are becoming more diverse with larger populations that identify as Asian and Black or African American being reported in 2018 than in 1980.

Racial Composition of TDOT Regions (2010)



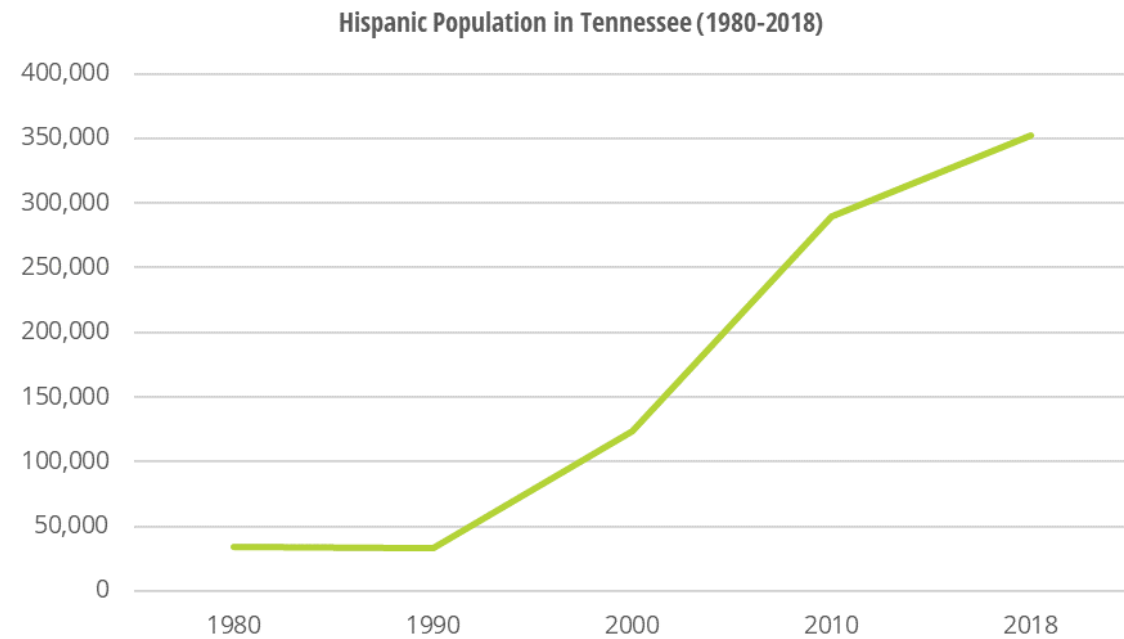
Racial Composition of TDOT Regions (2018)



Source: American Community Survey 5-Year Estimates, 2014-2018

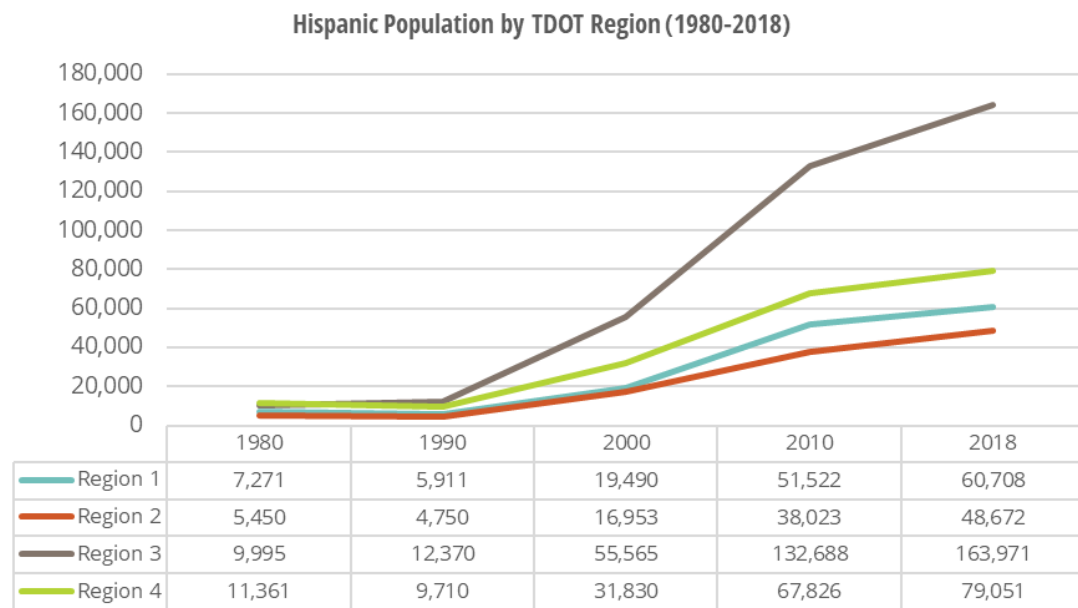
Figure 23 Racial Composition of TDOT Regions (2010 & 2018)

Hispanic, Latino, and Spanish origin ethnicities make up a growing segment of Tennessee’s population and have been increasing in Tennessee since 1980, as shown in Figure 24. This increase is observed across all four TDOT Regions; however, as of 2018, the greatest change has occurred in TDOT Region 3 (Figure 25) with 163,971 individuals reporting that they identify ethnically as Hispanic, Latino, or of Spanish origin. The Hispanic population of Region 3 is more than twice that of Region 4, which ranked second in 2018.



Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 24 Hispanic Populations in Tennessee (1980-2018)

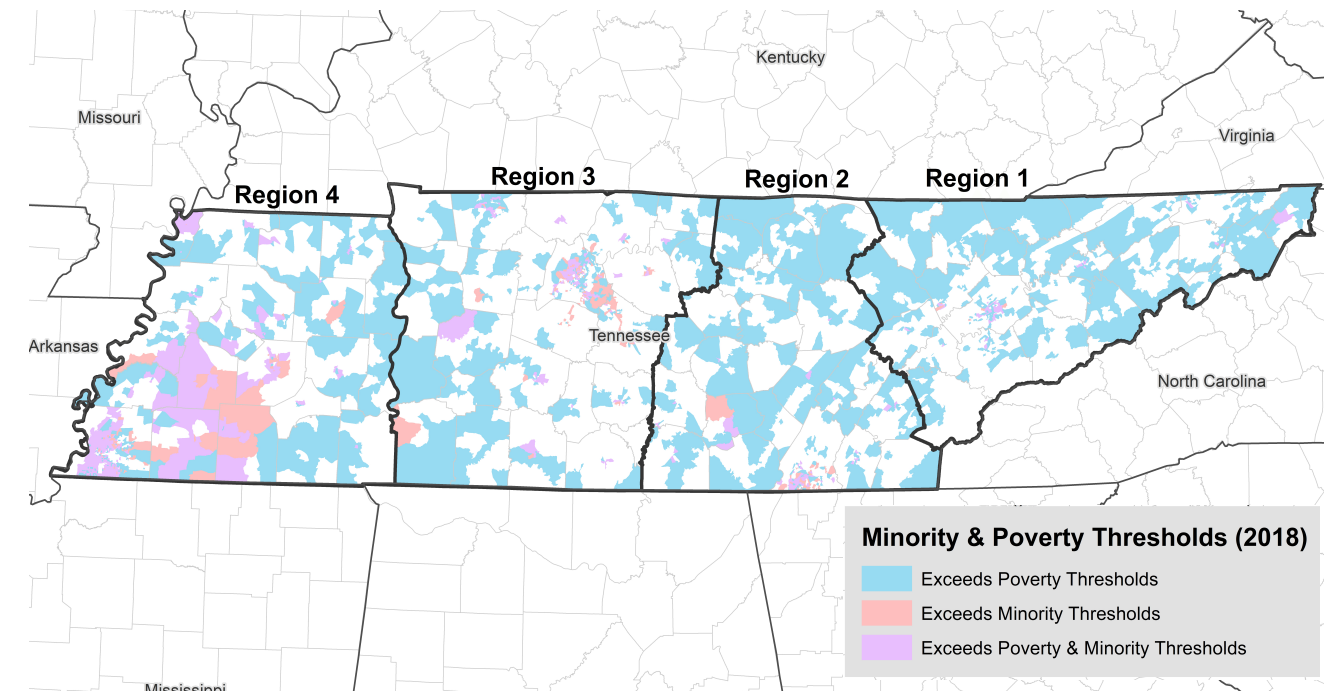


Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 25 Hispanic Populations by TDOT Region (1980-2018)

Environmental Justice (EJ) population areas are defined as areas where percentages of minorities and/or low income individuals are located in a defined geography at percentages significantly above the averages for that geography. According to ACS 2014-2018 5-Year Estimates at the Block Group level, minorities constituted approximately 21% of the State’s population and low income populations constituted 18% of the overall statewide population. EJ populations for the State of Tennessee are mapped by U.S. Census Block Groups in Figure 26 in three categories: areas exceeding minority thresholds of 21%; areas exceeding low-income thresholds of 16%; and areas exceeding both minority and low-income thresholds. Mapping this data illustrates regional differences regarding EJ populations. Impoverished populations occur more often than minority populations in TDOT Regions 1 and 2 while more frequent occurrences of minority populations are observed in the western portions of the state. Region 4 has the greatest proportion of Block Groups that exceed statewide averages for both low-income and minority populations.

Understanding these current socioeconomic trends and regional differences could allow TDOT to address the needs of minority and low-income populations by tailoring various programs. For instance, the data shows a high occurrence of areas in rural portions of the state where low-income populations are prevalent. Rural transit providers could potentially play an important role in the transportation system in these areas.



Source: American Community Survey 5 Year Estimates, 2014-2018

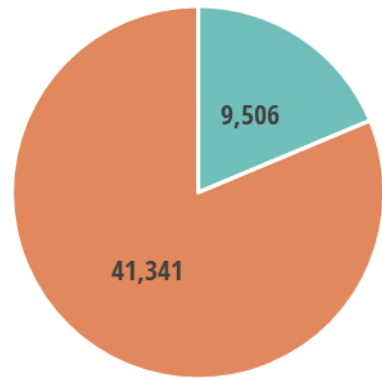
Figure 26 Tennessee Environmental Justice Communities (2018)

3.5 MIGRATION

Approximately 51,000 people moved to Tennessee in 2018. Eighty-one percent of the increase came from domestic migration while international migrants made up 19% of the growth (Figure 27). Net international migration includes the international migration of both native and foreign-born populations. Specifically, it includes: the net international migration of the foreign born, the net migration between the United States and Puerto Rico, the net migration of natives to and from the United States, and the net movement of the Armed Forces population between the United States and overseas. As shown in Figure 28, Tennessee's historical migration has been steadily increasing since 2010.

Migration impacted county populations unevenly across the state in 2018. Figure 29 illustrates that while Rutherford, Williamson, Montgomery, and Knox Counties have experienced significant population gains from domestic migration, Davidson County saw the highest significant increase over the one-year period with international migration. Overall Davidson County had an international migration population of 3,511 people and domestic migration population of -4,601. Domestic migration typically outpaced international migration for all counties in 2018 except for Davidson and Shelby Counties, where this trend was reversed. Shelby County had the highest exiting migration population. Assuming these trends continue, Tennessee's urban counties will continue to become more diverse over time.

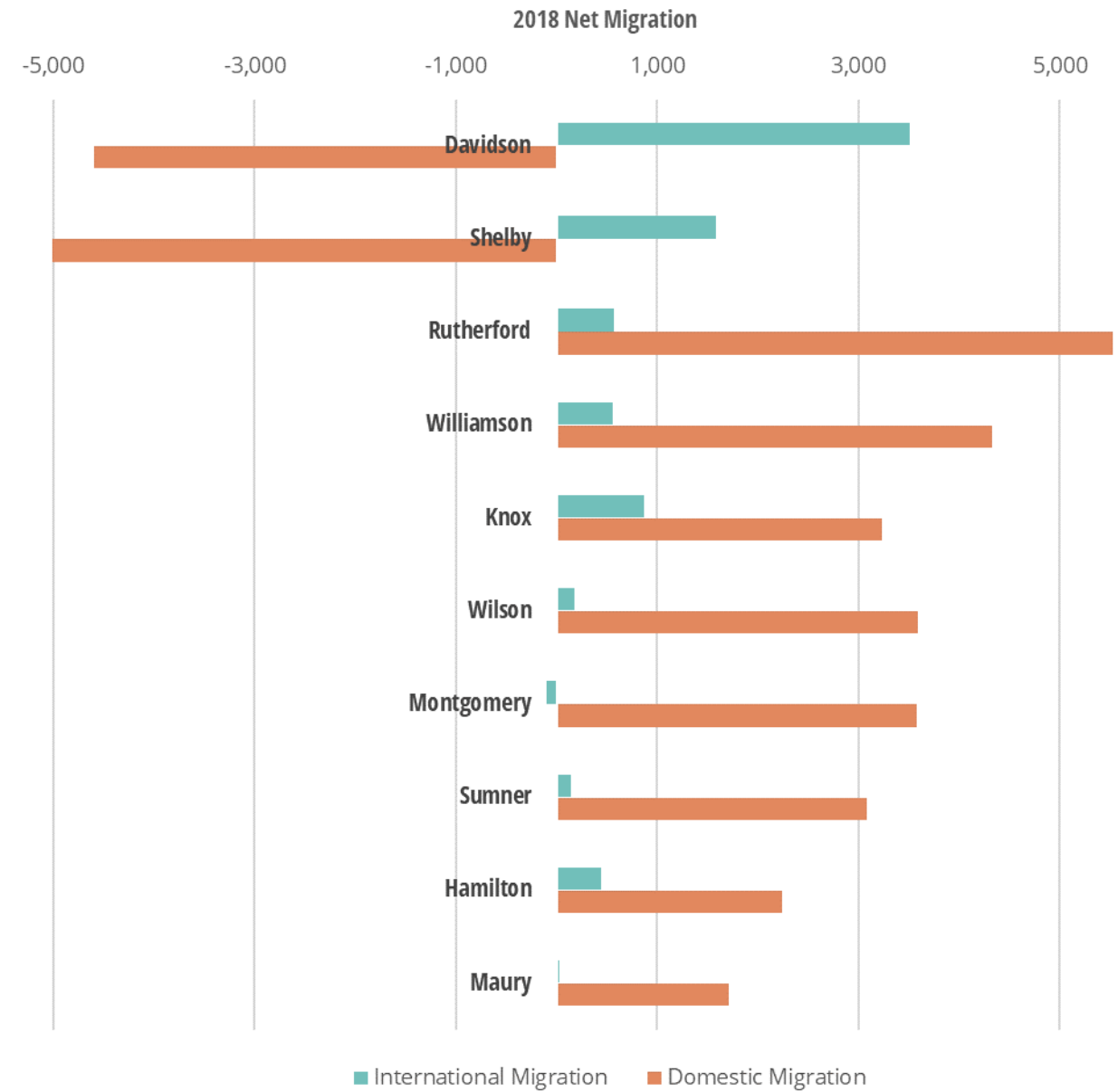
Annual Migration Estimates (2018)



■ International Migration ■ Domestic Migration

Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 27 Migration in Tennessee (2018)

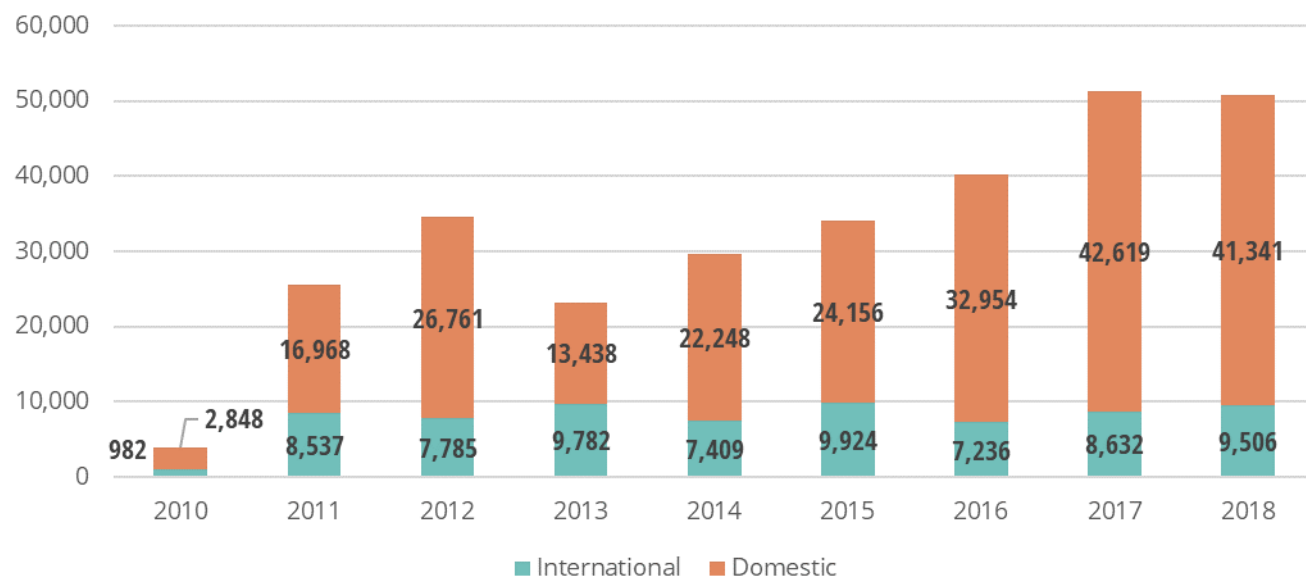


■ International Migration ■ Domestic Migration

Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 29 Top Ten Counties for International & Domestic Migration (2018)

Historical Migration to Tennessee (2010-2018)



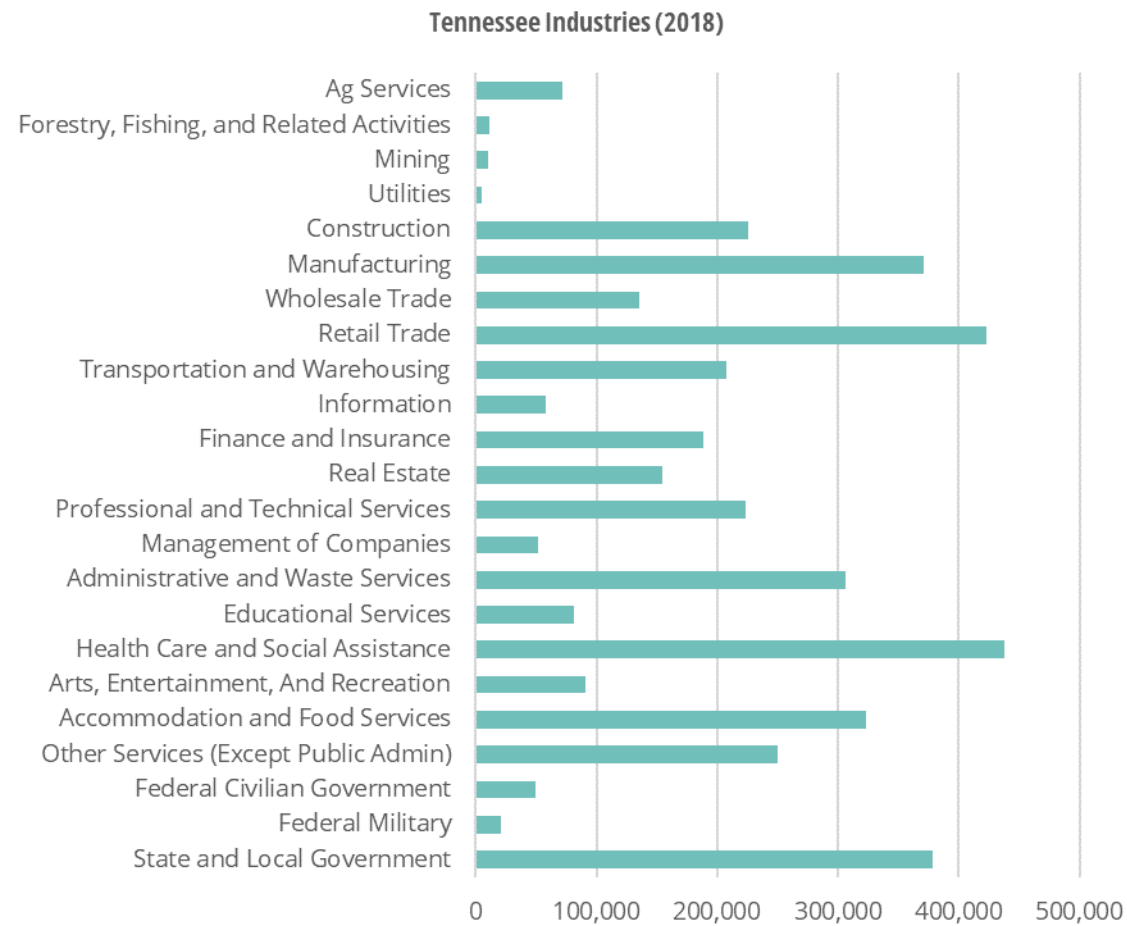
■ International ■ Domestic

Source: American Community Survey 5-Year Estimates, 2014-2018

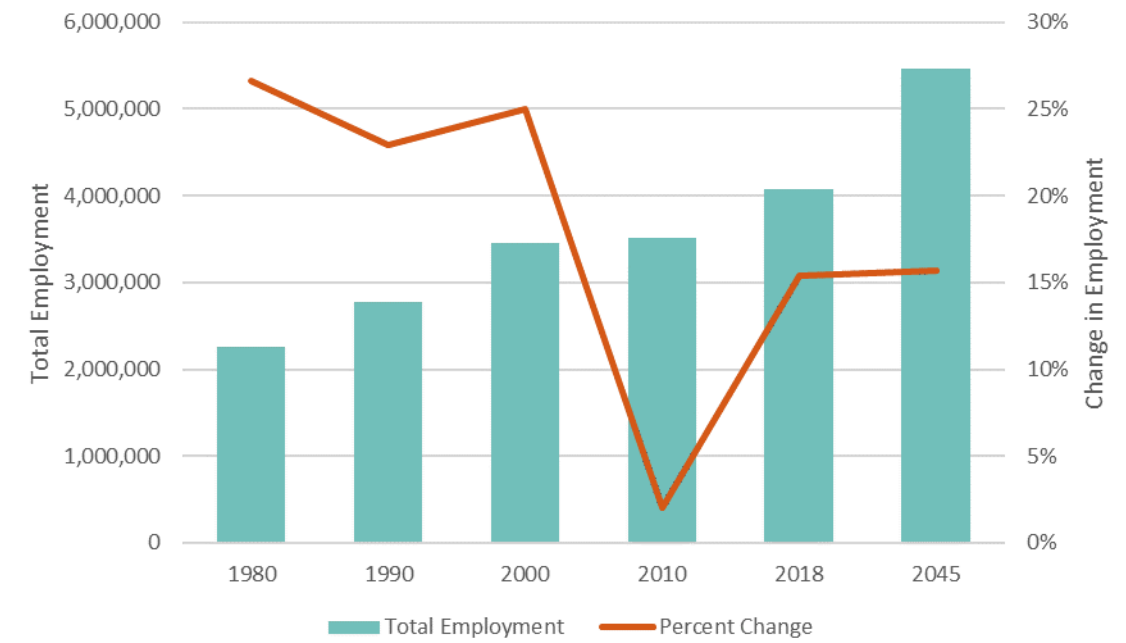
Figure 28 Population Gains from Migration (2018)

3.6 EMPLOYMENT

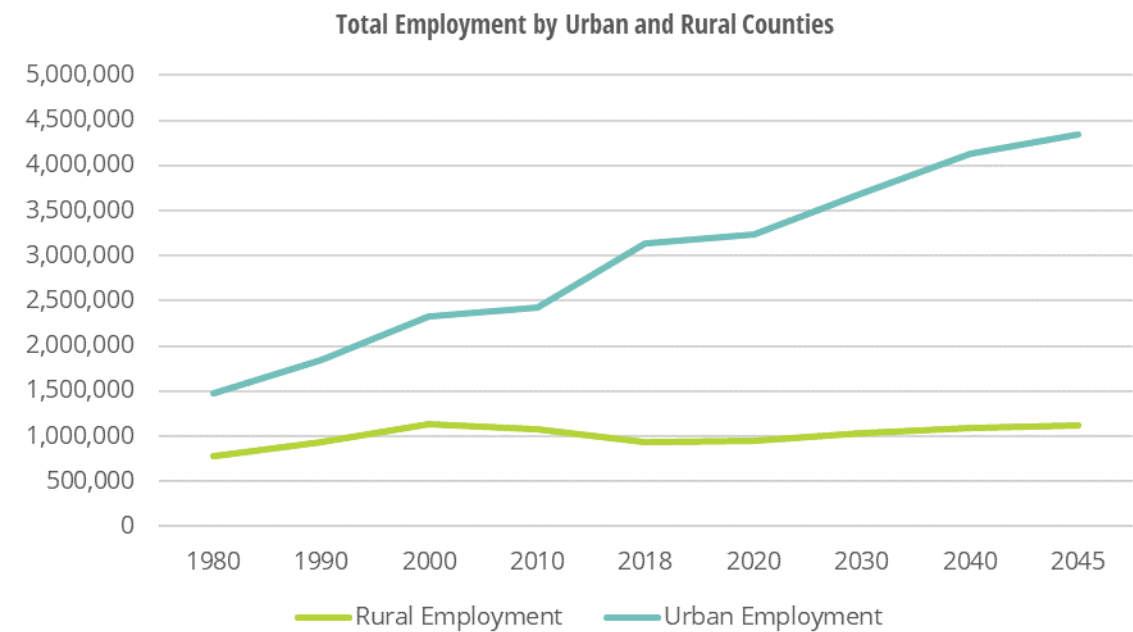
Woods and Poole reported total employment across all sectors of 4,073,406 for the State of Tennessee in 2018. Industry across the state is diverse, with retail trade and health care leading all other employment sectors (Figure 30). Figure 31 shows the percent change in overall employment for each decade across the State from 1980; the lower percent change in employment growth between 2000 and 2010 is due to the economic recession that impacted the entire country. Figure 32 shows the split between urban and rural employment in Tennessee; as expected, urban employment projections are growing at a faster rate than rural employment.



Source: Woods & Poole
Figure 30 Tennessee Industry Sectors (2018)

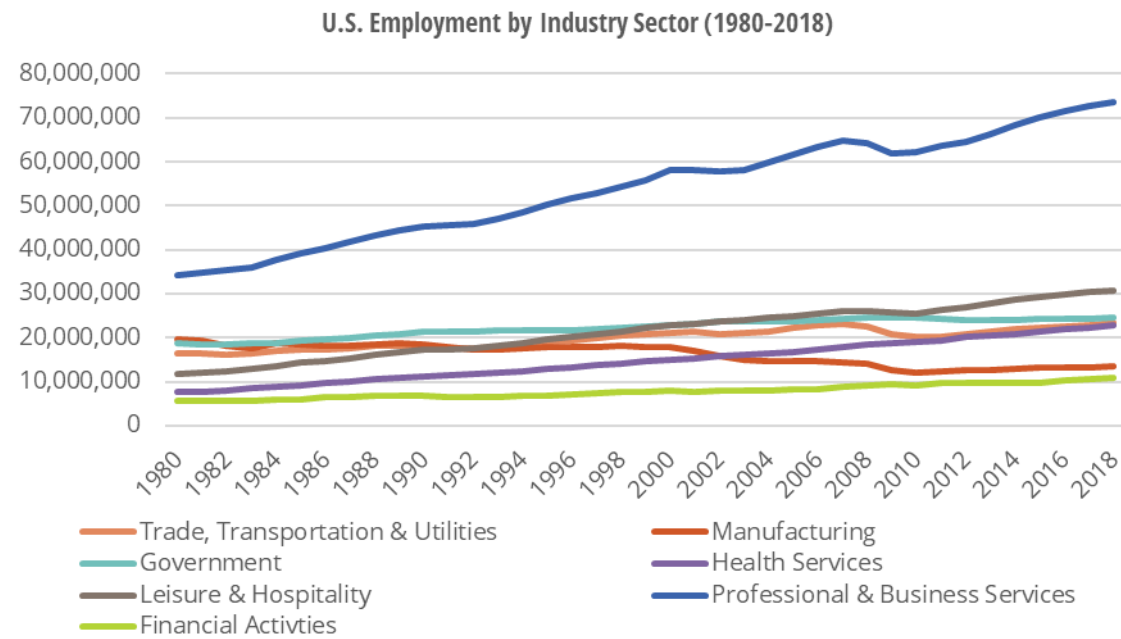


Source: Woods & Poole
Figure 31 Annual Employment Growth in Tennessee (1980-2045)



Source: Woods & Poole
Figure 32 Urban and Rural Employment Growth in Tennessee (1980-2045)

3.6. BASIC AND NON-BASIC EMPLOYMENT



Source: U.S. Bureau of Labor Statistics

Figure 33 U.S. Employment Trends (1980-2018)

One way to examine employment growth is to consider it in terms of basic and non-basic employment. Basic industries include manufacturing, farming/agriculture, mining, forestry, and fishing. Non-basic industries include retail, construction, services, government, wholesale, transportation and public utilities, and finance/insurance/real estate.

The growth in Tennessee’s employment has been primarily driven by non-basic industries as U.S. economy has shifted away from basic industries over the past 40 years. The same trend has been observed within Tennessee. Current U.S. trends are shown in Figure 33.

The current top 10 counties for employment in the Tennessee are listed in Table 8. Shelby and Davidson Counties top the list and include the two largest cities in the state, Memphis and Nashville. Knox and Hamilton Counties reflect the strong urban centers of Knoxville and Chattanooga in East Tennessee. Other counties in the top 10 include Rutherford and Williamson Counties, which surround Nashville, as well as Sullivan and Washington Counties, which are located in the Tri-Cities area of East Tennessee (Figure 34).

Table 8 Top 10 Tennessee Counties for Employment (1980-2018)

County	1980	1990	2000	2010	2018
Shelby	442,360	535,609	625,272	623,655	677,727
Davidson	323,841	417,237	530,465	515,898	649,947
Knox	177,207	218,870	268,808	288,226	322,890
Hamilton	171,380	193,040	236,504	231,799	264,189
Williamson	22,618	41,287	80,772	135,943	202,074
Rutherford	34,962	63,123	104,341	132,280	175,896
Sullivan	78,362	85,297	88,791	87,620	91,478
Sumner	29,156	41,997	57,327	65,029	87,467
Washington	47,360	59,319	73,909	77,624	82,305
Montgomery	27,590	34,985	56,027	63,874	77,415

Source: Woods and Poole

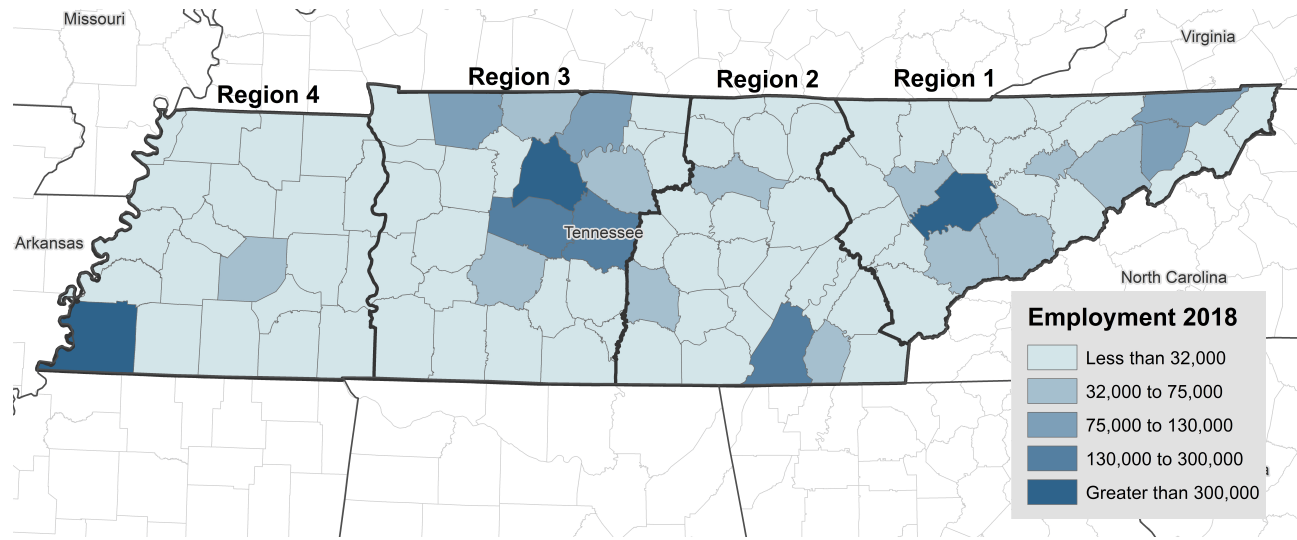
Between 1980 and 2018, Tennessee experienced employment growth of 80% to reach a total of 4,073,406 jobs. Employment growth in TDOT Region 3 outpaced other regions and most of those jobs have occurred in urban counties of the region. Statewide, employment growth has occurred at a higher rate in urban counties than in rural. A breakdown of employment growth since 1980 is provided in Table 9.

Table 9 Employment Change in Tennessee (1980-2018)

Geography	1980	1990	2000	2010	2018	Percent Difference (1980-2018)
Statewide	2,259,220	2,777,435	3,459,282	3,515,795	4,073,406	80%
Rural Counties	652,440	766,597	912,905	859,738	934,280	43%
Urban Counties	1,606,780	2,010,838	2,546,377	2,656,057	3,139,126	95%
Region 1	551,126	672,961	815,173	840,775	924,976	68%
Rural Counties	126,203	155,260	186,897	190,360	209,171	66%
Urban Counties	424,923	517,701	628,276	650,415	715,805	68%
Region 2	379,426	449,746	545,632	527,769	596,663	57%
Rural Counties	176,517	217,080	260,930	247,142	273,692	55%
Urban Counties	202,909	232,666	284,702	280,627	322,971	59%
Region 3	630,250	825,510	1,126,933	1,208,122	1,540,816	144%
Rural Counties	133,787	149,918	186,550	173,171	192,418	44%
Urban Counties	496,463	675,592	940,383	1,034,951	1,348,398	172%
Region 4	698,418	829,218	971,544	939,129	1,010,951	45%
Rural Counties	215,933	244,339	278,528	249,065	258,999	20%
Urban Counties	482,485	584,879	693,016	690,064	751,952	56%

Source: Woods and Poole

The locations of counties with high and low employment numbers are shown in Figure 34. Shelby, Davidson, and Knox Counties all stand out as employment centers followed by adjacent suburban counties and then by more rural counties beyond that.

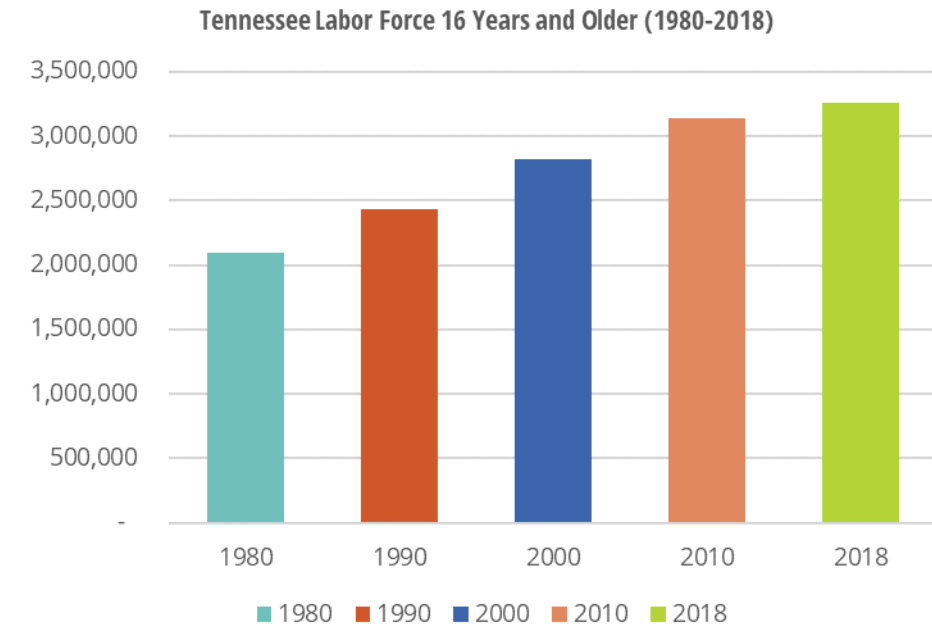


Source: Woods and Poole

Figure 34 Employment by Tennessee County (2018)

3.6 LABOR FORCE

The labor force has grown steadily across Tennessee since 1980 with current estimates at 3,257,398 members of the labor force over the age of 16 (Figure 35). The labor force is not distributed evenly across the State, as seen in Table 10; as an example, Davidson County in TDOT Region 3 has an estimated current labor force of 391,774 members of the population while Shelby County in TDOT's Region 4 leads the State with a labor force of 469,854.



Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 35 Tennessee Labor Force (1980-2018)

Table 10 Top 10 Tennessee Counties Labor Force (1980-2018)

County	1980	1990	2000	2010	2018
Shelby	362,285	416,085	440,141	468,525	469,854
Davidson	242,332	279,305	307,653	338,685	391,774
Knox	150,862	173,515	197,352	222,376	238,642
Hamilton	135,017	142,832	157,919	174,592	180,190
Rutherford	40,937	64,199	101,245	136,588	169,949
Williamson	28,391	42,578	67,362	89,449	114,252
Sumner	40,204	54,248	68,565	82,381	94,023
Montgomery	40,819	54,159	70,666	81,080	98,713
Sullivan	64,970	69,733	71,474	73,567	70,417
Wilson	26,790	35,980	48,584	57,650	68,910

Source: American Community Survey 5-Year Estimates, 2014-2018

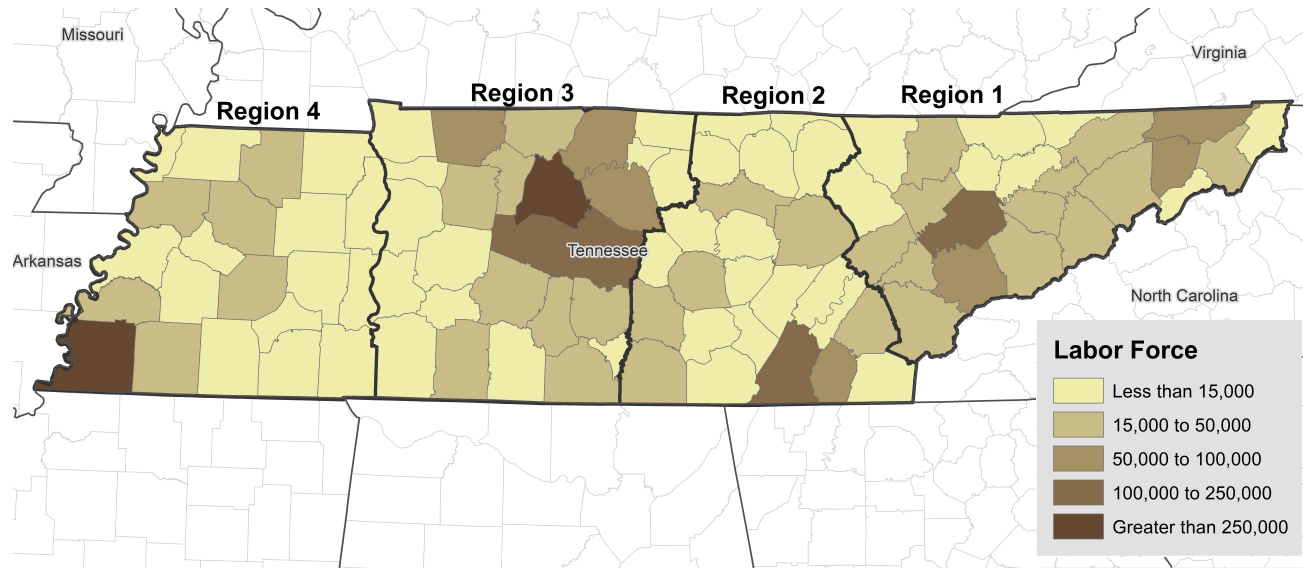
Labor force estimates for Tennessee counties are shown in Figure 36. It is clear that employment opportunities are most prevalent in urban counties with Shelby and Davidson topping the list. When compared with peer states, Tennessee's labor force is similar to the state of Missouri in terms of current size and growth over the last 40 years (Figure 36).

4.0 FUTURE GROWTH, TRENDS, AND TECHNOLOGY

Woods & Poole’s database contains more than 900 economic and demographic variables for every state, region, county, and Metropolitan and Micropolitan Statistical Area in the U.S. for every year from 1980 to 2045. Woods and Poole’s comprehensive database is updated annually and includes detailed population data by age, sex, and race, employment and earnings by major industry, personal income by source of income, retail sales by kind of business, and data on the number of households, their size, and their income. All of these variables are projected for each year through 2045.

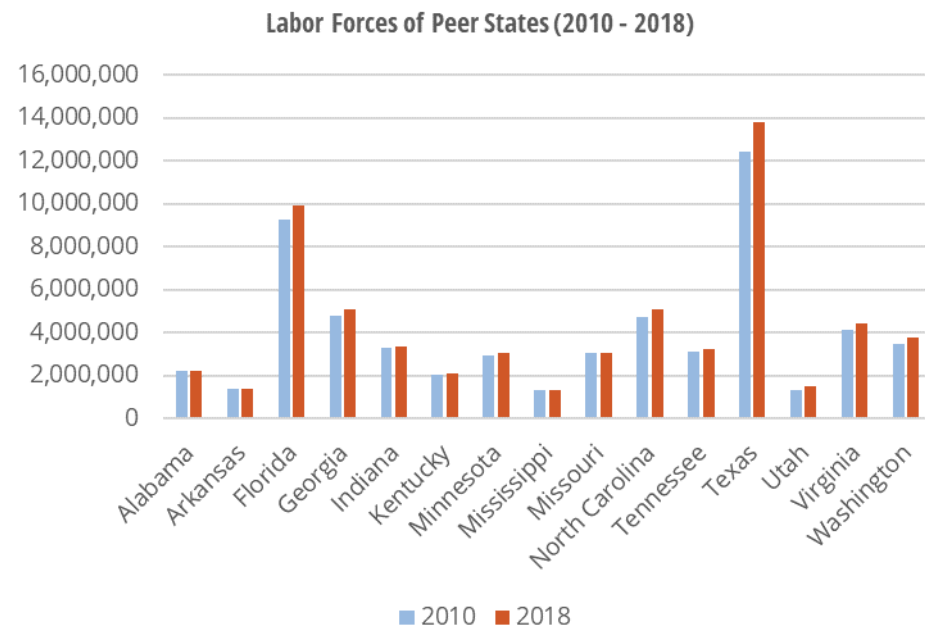
Based on the Department’s research, the Woods & Poole data provide the most reasonable forecasts for future growth in population and employment in Tennessee over the next 25 years. The formulas and algorithms used by Woods & Poole to generate these forecasts create county-level estimates for all states across the country. As with any forecasts, these numbers should be viewed as a general approximation of the projected total rather than the exact total in and of itself.

Throughout the following section, Tennessee is compared to its surrounding and peer states, which are shown below in Figure 38. As previously mentioned, this comparison includes Alabama, Arkansas, Georgia, Kentucky, Mississippi, Missouri, North Carolina, and Virginia as well as Florida, Indiana, Minnesota, Texas, Utah, and Washington. The peer states shown in Figure 38 were chosen to align with those identified as peers in TDOT’s 2013 Customer Survey, as they were similar to Tennessee in geographic size, demographics, growth trends, and/or DOT practices.



Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 36 Labor Force (Ages 16 & Over) by Tennessee County (2018)



Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 37 Labor Force Comparison of Surrounding and Peer States (2018)

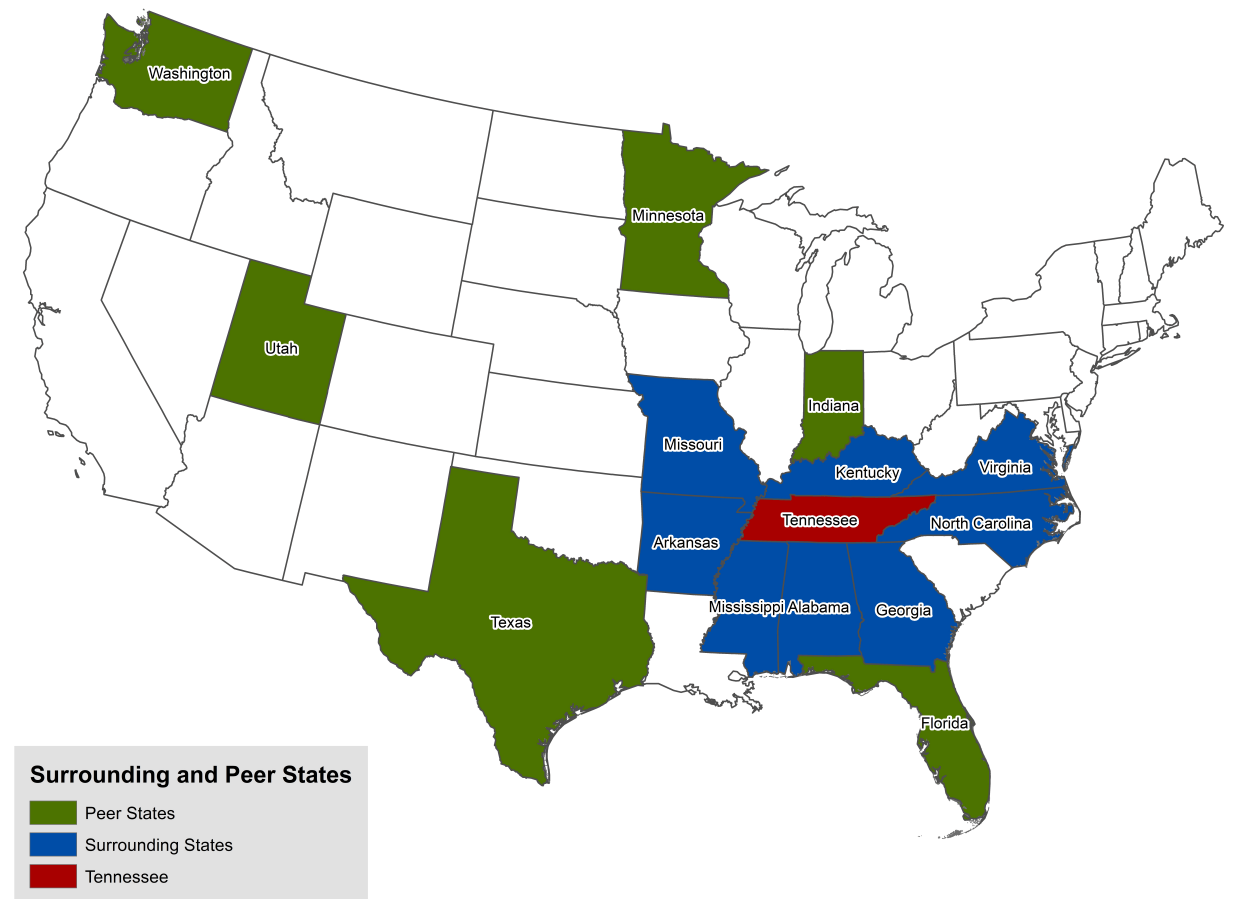
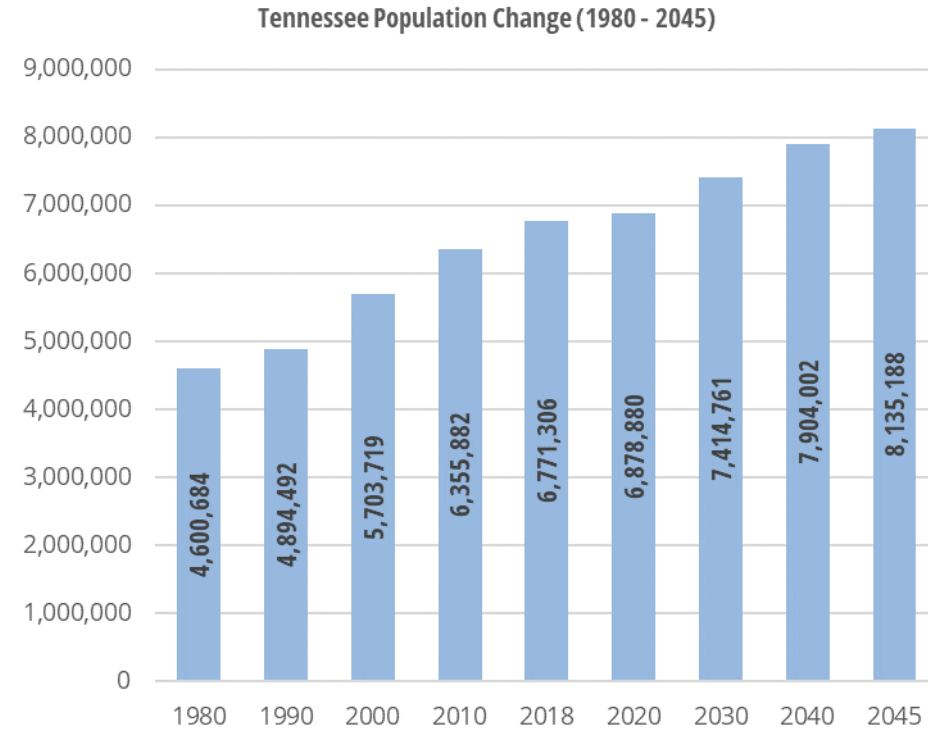


Figure 38 Surrounding and Peer States

4.1 STATEWIDE POPULATION PROJECTIONS

Tennessee’s projections follow some national trends that are further illustrated in this section. Along with other southeastern states, Tennessee is expected to see continued growth in terms of population over the next 25 years (Figure 39).

Tennessee’s population is projected to increase over 20% during the next 25 years from 6,771,306 in 2018 to 8,135,188 in 2045 (Table 11). The State’s percentage of population increase is in the middle of the pack when compared to surrounding states and peer states (Figure 40).



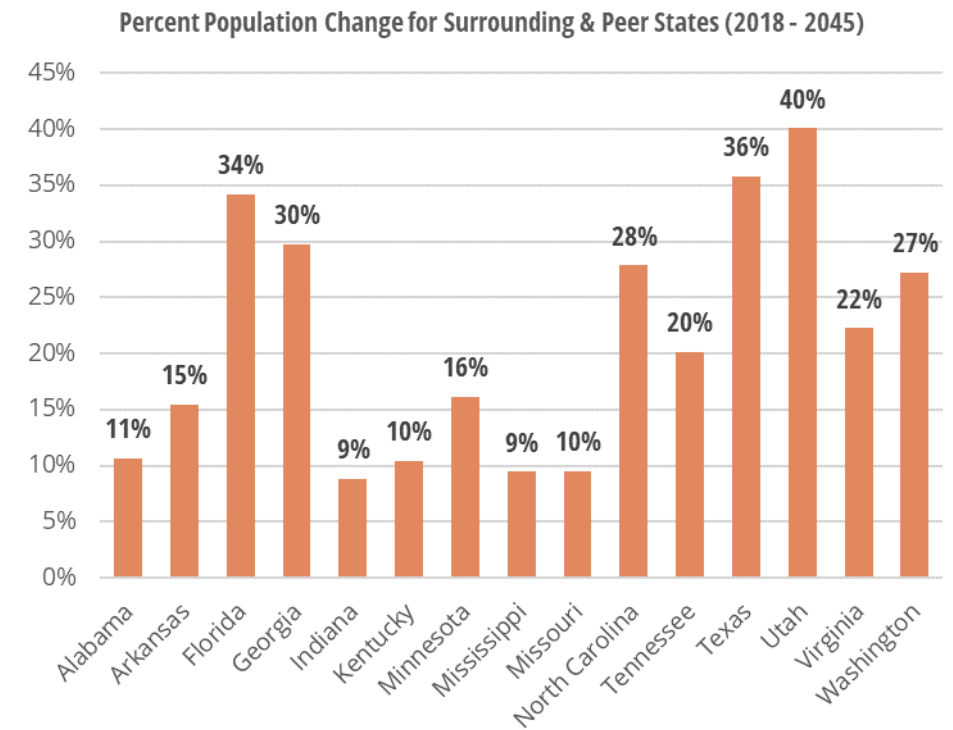
Source: Woods & Poole

Figure 39 Historic and Projected Population Change in Tennessee (1980-2045)

Table 11 Population Growth for Tennessee and Surrounding and Peer States (2018- 2045))

Geography	2018 Population	2045 Population	Percent Change
Alabama	4,899,778	5,419,404	10.6%
Arkansas	3,023,613	3,491,636	15.5%
Florida	21,244,024	28,501,734	34.2%
Georgia	10,544,089	13,681,478	29.8%
Indiana	6,696,855	7,284,866	8.8%
Kentucky	4,476,588	4,943,414	10.4%
Minnesota	5,615,579	6,523,052	16.2%
Mississippi	2,997,871	3,281,374	9.5%
Missouri	6,142,812	6,728,901	9.5%
North Carolina	10,381,413	13,272,420	27.8%
Tennessee	6,771,306	8,135,188	20.1%
Texas	28,665,029	38,928,187	35.8%
Utah	3,144,714	4,405,224	40.1%
Virginia	8,542,570	10,444,189	22.3%
Washington	7,482,735	9,520,878	27.2%

Source: Woods & Poole

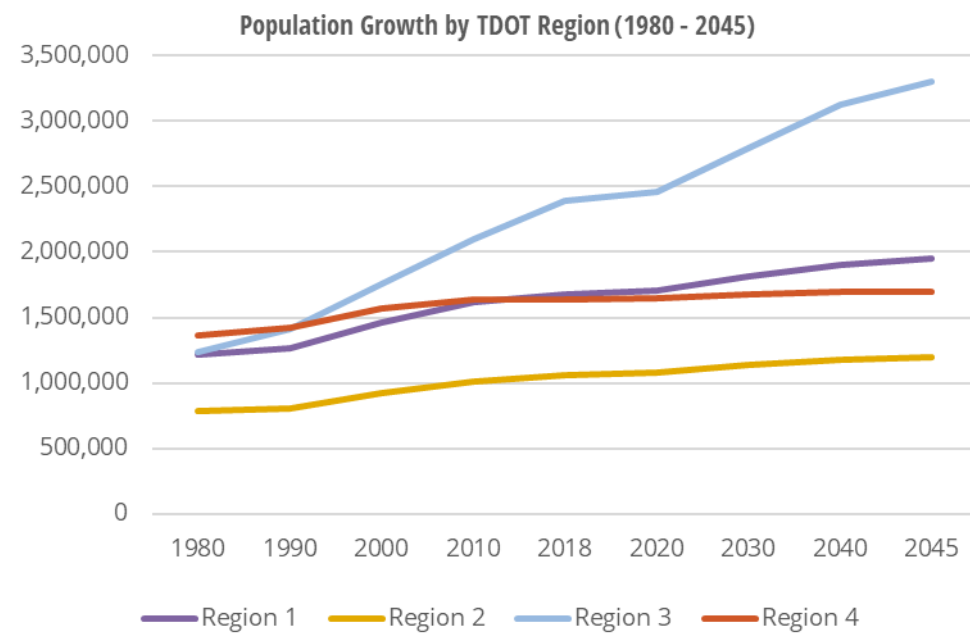


Source: Woods & Poole

Figure 40 Percent Population Change for Surrounding and Peer States (2018-2045)

4.2 POPULATION CHANGE BY TDOT REGION

Population by TDOT Region is projected to change significantly over the next 25 years (Figure 41). Region 4, which was the largest by population in 1980, falls to third behind Regions 3 and 1 in 2045. Region 3 is forecasted to grow at a much higher rate than other regions and by 2045 will contain roughly double the population of Region 4 (Table 12). Nearly 66% of the State’s future population growth is projected to occur in Region 3 with the vast majority being in urban counties of the region. The next highest growing region is Region 1 with nearly as many people moving to rural counties as urban counties within this region. Table 13 illustrates population growth within the State by TDOT region.



Source: Woods & Poole

Figure 41 Tennessee Population Growth by TDOT Region (1980-2045)

Table 12 Tennessee Population Change by TDOT Region (1980-2045)

Year	Region 1	Region 2	Region 3	Region 4	Statewide
1980	1,213,420	782,012	1,238,906	1,366,346	4,600,684
1990	1,263,275	804,011	1,408,333	1,418,873	4,894,492
2000	1,461,185	922,516	1,755,436	1,564,582	5,703,719
2010	1,615,343	1,008,752	2,099,443	1,632,344	6,355,882
2018	1,679,788	1,064,493	2,391,759	1,635,266	6,771,306
2020	1,702,125	1,076,808	2,455,580	1,644,367	6,878,880
2030	1,811,053	1,134,590	2,788,262	1,680,856	7,414,761
2040	1,904,674	1,180,408	3,125,825	1,693,095	7,904,002
2045	1,946,802	1,199,285	3,297,383	1,691,718	8,135,188

Source: Woods & Poole

4.3 POPULATION CHANGE BY TENNESSEE COUNTY

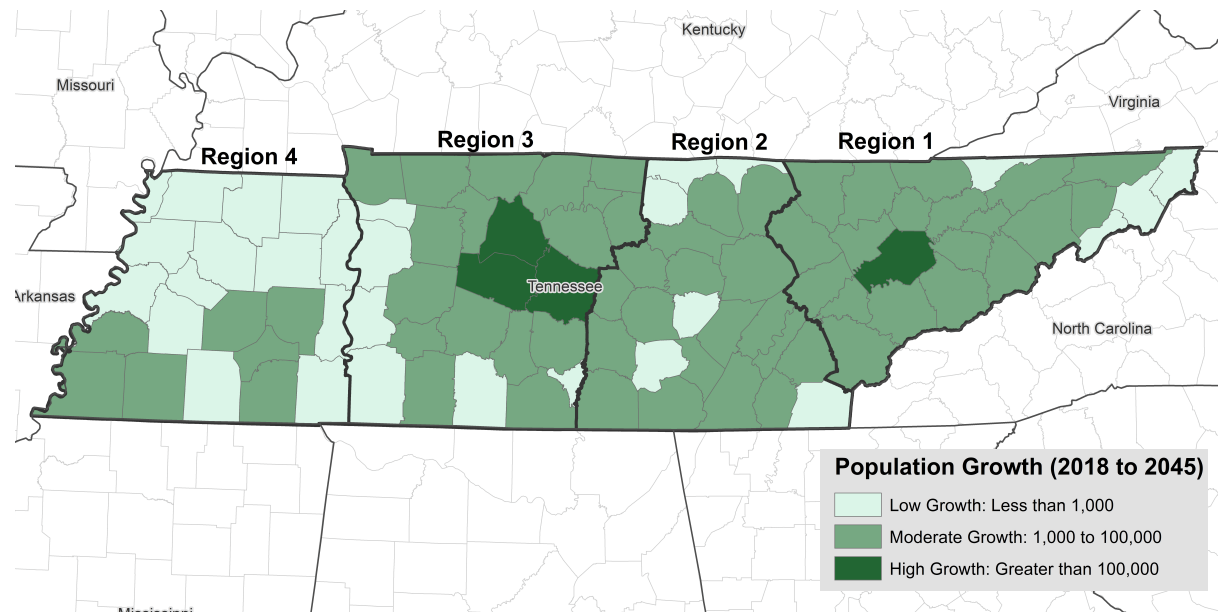
Projections estimate that Tennessee’s population will grow by 1,363,882 between 2018 and 2045. Population change is illustrated in Figure 42 at the county level. Based on projections from Woods & Poole, Davidson, Rutherford, Williamson, and Knox Counties will see the greatest amount of population growth, and many rural counties will grow at under half the amount as urban counties from 2018 to 2045. While the relative share of the State’s population living in urban and rural counties is projected to remain about the same over the next 25 years (69% to 71% urban and 31% to 29% rural), 84% of the projected population growth is forecasted to occur in urban counties.

Table 13 Tennessee Population Growth Forecast (2018-2045)

Geography	2018	2020	2030	2040	2045	Total Population Change (2018-2045)	Percent Change (2018-2045)
Statewide	6,771,306	6,878,880	7,414,761	7,904,002	8,135,188	1,363,882	20%
Rural Counties	2,127,089	2,145,957	2,237,051	2,315,276	2,350,375	223,286	10%
Urban Counties	4,644,217	4,732,923	5,177,710	5,588,726	5,784,813	1,140,596	25%
Region 1	1,679,788	1,702,125	1,811,053	1,904,674	1,946,802	267,014	16%
Rural Counties	491,117	496,319	522,280	546,252	557,681	66,564	14%
Urban Counties	1,188,671	1,205,806	1,288,773	1,358,422	1,389,121	200,450	17%
Region 2	1,064,493	1,076,808	1,134,590	1,180,408	1,199,285	134,792	13%
Rural Counties	594,032	600,161	629,926	656,356	668,470	74,438	13%
Urban Counties	470,461	476,647	504,664	524,052	530,815	60,354	13%
Region 3	2,391,759	2,455,580	2,788,262	3,125,825	3,297,383	905,624	38%
Rural Counties	444,809	449,394	471,931	492,669	502,460	57,651	13%
Urban Counties	1,946,950	2,006,186	2,316,331	2,633,156	2,794,923	847,973	44%
Region 4	1,635,266	1,644,367	1,680,856	1,693,095	1,691,718	56,452	3%
Rural Counties	597,131	600,083	612,914	619,999	621,764	24,633	4%
Urban Counties	1,038,135	1,044,284	1,067,942	1,073,096	1,069,954	31,819	3%

Source: Woods & Poole

The top 10 counties in terms of growth are listed in Table 14. These projections illustrate that counties adjacent to traditional urban centers will continue to be areas of focused growth. These suburban counties may continue to generate heavy commuter demands into regional urban centers. For example, growth in Williamson, Rutherford, Wilson, and Sumner could impact commutes into Nashville. Similarly, residential growth in Sevier County may increase commuter activity into Knoxville. Additionally the projected population growth of these top 10 counties accounts for nearly 75% of the State’s projected population growth over the next 25 years illustrating the significance of these urban areas relative to the State’s economy. Three counties are anticipated to cross the threshold of 100,000 in population by 2045; these counties are Maury, Madison, and Sevier.



Source: Woods & Poole

Figure 42 Population Growth by Tennessee County (2018-2045)

Williamson County, located in Region 3 and south of Davidson County, is forecasted to almost double in population by 2045 and rank as the fastest growing county in terms of percent change and absolute growth. Rutherford County, located southeast of Davidson County, is projected to increase 64% over the same span of time.

Table 14 Top 10 Tennessee Counties for Population Growth (2018-2045)

County	Population Change	Percent Change	TDOT Region
Williamson	217,107	93%	3
Rutherford	207,877	64%	3
Davidson	131,345	19%	3
Knox	104,135	22%	1
Wilson	87,610	63%	3
Montgomery	86,266	42%	3
Sumner	74,375	40%	3
Hamilton	42,013	12%	2
Sevier	37,609	38%	1
Blount	32,848	25%	1

Source: Woods & Poole

4.4 AGE GROUP DISTRIBUTION CHANGE

Over the next 25 years, Tennessee will see an increase in the percentage of the population over the age of 65 as shown in Figure 44 and Figure 45. In addition to Tennessee's current population, which is aging, this increase may occur in part because retirees are relocating to Sunbelt States due to low costs of living, access to medical care, and warmer than average weather. Table 15 shows that senior population growth will be significant in rural and urban counties. The TDOT Region with the most seniors by 2045 is forecasted to be Region 3 with 578,737, an increase of 79% from 2018. Region 3 would pass Region 1 in having the largest senior population.

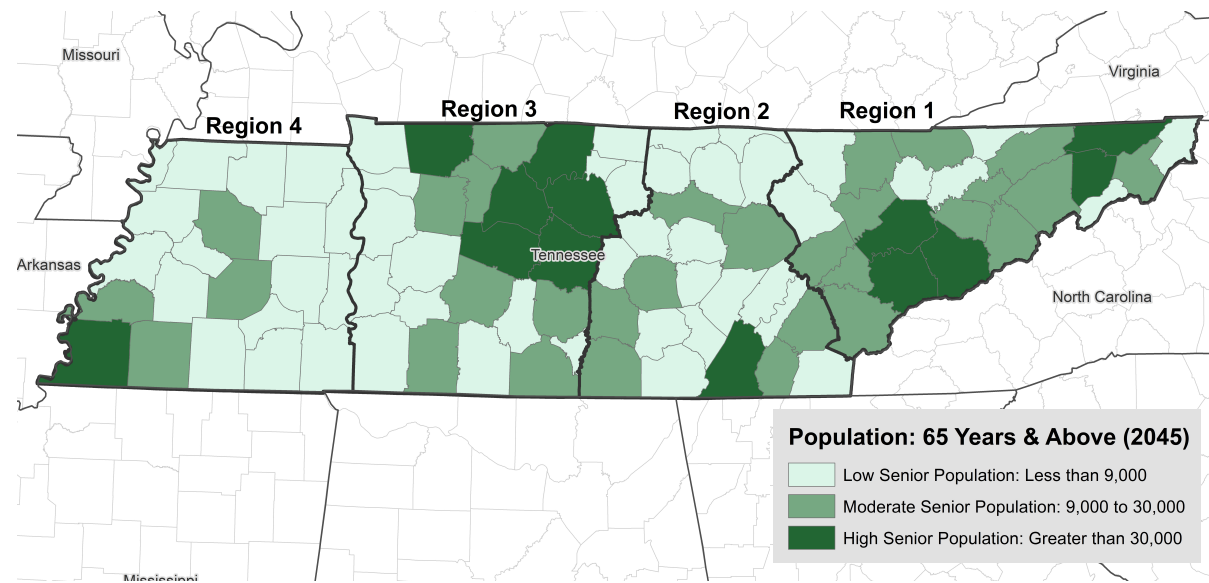
It is also important to recognize that the segment of the population between 15 and 24 years of age will have the largest share of the population. This age group represent new drivers, college students, as well as those entering the workforce (Figure 45).

Table 15 Tennessee Senior Population (65+) Change (2018-2045)

Geography	2018	2020	2030	2040	2045	Senior Population Change (2018-2045)	Percent Change (2018-2045)
Statewide	1,112,004	1,183,235	1,508,658	1,640,191	1,657,966	545,962	49%
Rural Counties	417,762	441,091	544,434	582,623	579,726	161,964	39%
Urban Counties	694,242	742,144	964,224	1,057,568	1,078,240	383,998	55%
Region 1	324,994	344,367	435,940	483,470	489,747	164,753	51%
Rural Counties	101,560	107,935	136,169	152,506	154,429	52,869	52%
Urban Counties	223,434	236,432	299,771	330,964	335,318	111,884	50%
Region 2	204,213	215,836	264,772	279,564	277,973	73,760	36%
Rural Counties	122,107	128,818	157,285	167,359	166,280	44,173	36%
Urban Counties	82,106	87,018	107,487	112,205	111,693	29,587	36%
Region 3	324,160	350,758	483,131	555,313	578,737	254,577	79%
Rural Counties	78,217	82,863	104,758	112,319	111,404	33,187	42%
Urban Counties	245,943	267,895	378,373	442,994	467,333	221,390	90%
Region 4	258,637	272,274	324,815	321,844	311,509	52,872	20%
Rural Counties	115,878	121,475	146,222	150,439	147,613	31,735	27%
Urban Counties	142,759	150,799	178,593	171,405	163,896	21,137	15%

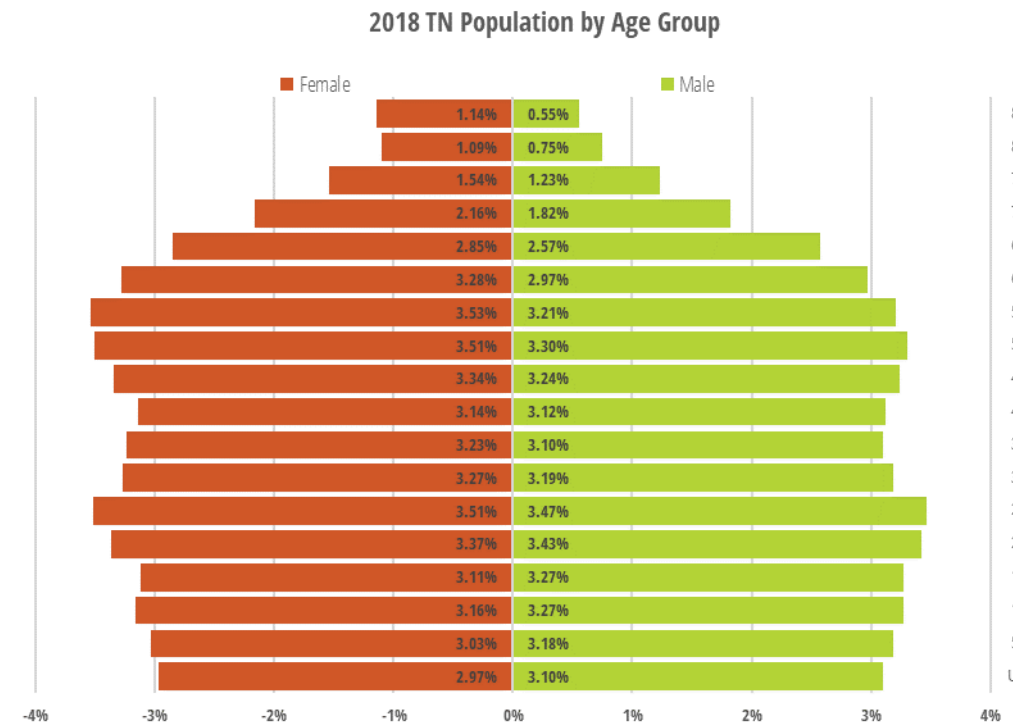
Source: Woods & Poole

By comparing the 2018 and 2045 population pyramids, it is evident that senior populations will make up a larger portion of the state's population in the future. The State's transportation policies and programs may need to identify this group's unique needs and accommodate those needs going forward.



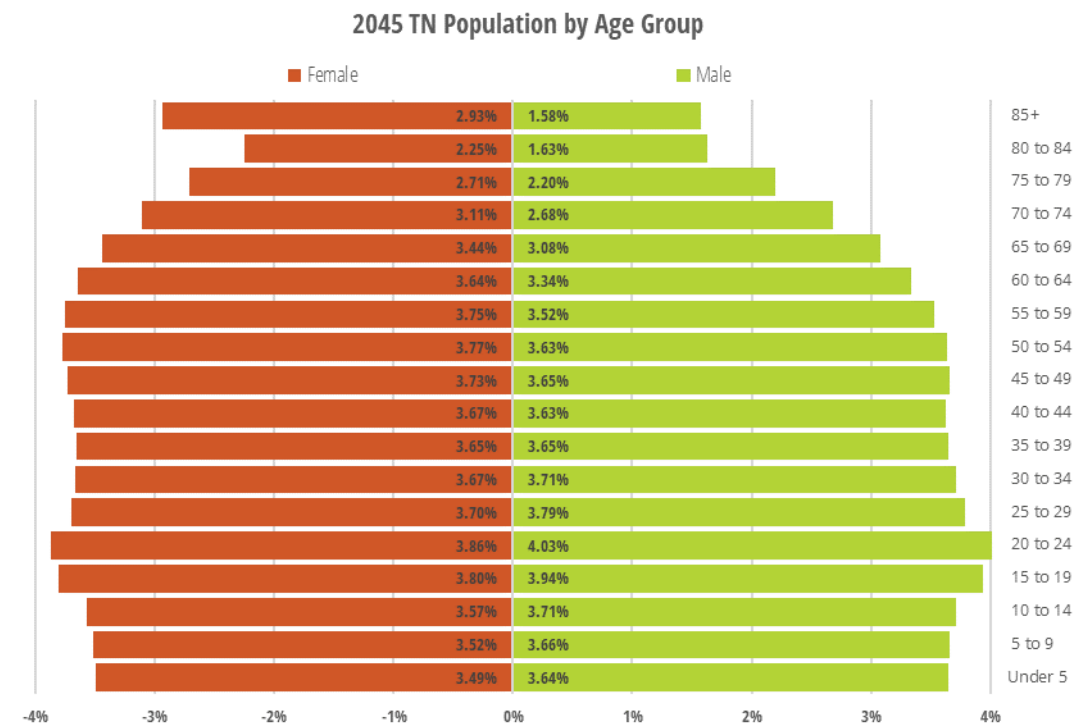
Source: Woods & Poole

Figure 43 Senior Population (65+) by Tennessee County (2045)



Source: American Community Survey 5-Year Estimates, 2014-2018

Figure 44 Tennessee Population by Age Group (2018)



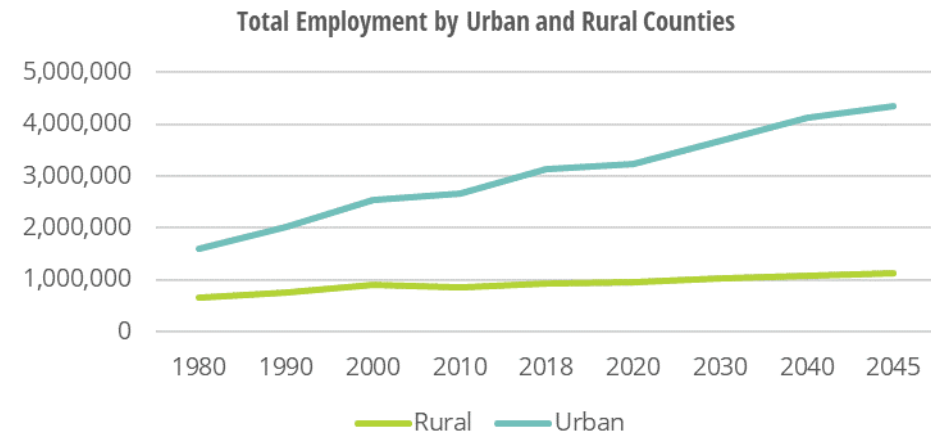
Source: Tennessee State Data Center, UTCBER, January 2020

Figure 45 Tennessee Population by Age Group (2045)

4.5 STATEWIDE EMPLOYMENT PROJECTIONS

Employment is also expected to grow within Tennessee and within each of the four TDOT regions. However, employment growth in urban areas is anticipated to outpace employment growth in rural portions of the state (Figure 46, Figure 47, and Table 16).

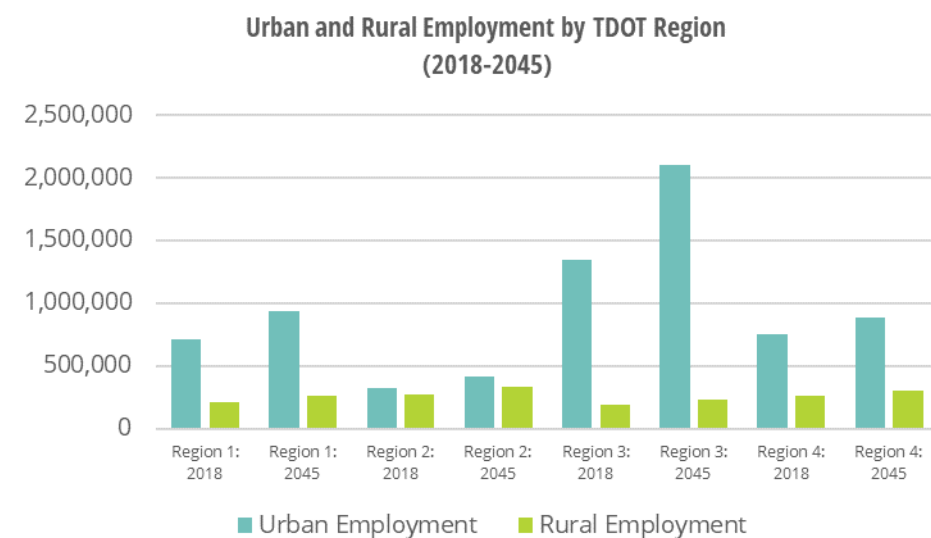
When viewed by TDOT Region and urban/rural status it becomes evident that while employment growth is occurring statewide, there are focused areas of higher growth. The area of greatest growth is focused in the counties around Davidson County as shown in Figure 49.



Source: Woods & Poole

Figure 46 Historic and Projected Employment by Urban and Rural Areas (1980-2045)

Table 17 shows the top 10 counties in Tennessee for future employment growth. Williamson County is expected to see the greatest increase in employment in terms of absolute growth and percent increase from 2018. Projections for Davidson County include a 236,616, or 36%, increase in the workforce.



Source: Woods & Poole

Figure 47 Urban and Rural Employment by TDOT Region (2018-2045)

Table 16 Tennessee Employment Growth Forecast (2018-2045)

Geography	2018	2020	2030	2040	2045	Percent Change (2018-2045)
Statewide	4,073,406	4,181,361	4,716,906	5,219,445	5,463,549	34%
Rural Counties	934,280	951,178	1,028,025	1,092,394	1,123,528	20%
Urban Counties	3,139,126	3,230,183	3,688,881	4,127,051	4,340,021	38%
Region 1	924,976	947,670	1,058,053	1,156,780	1,204,241	30%
Rural Counties	209,171	213,707	235,758	255,974	266,459	27%
Urban Counties	715,805	733,963	822,295	900,806	937,782	31%
Region 2	596,663	609,117	667,993	718,336	741,269	24%
Rural Counties	273,692	278,692	301,351	319,695	328,032	20%
Urban Counties	322,971	330,425	366,642	398,641	413,237	28%
Region 3	1,540,816	1,595,888	1,883,021	2,179,981	2,334,375	52%
Rural Counties	192,418	195,748	210,335	222,421	228,339	19%
Urban Counties	1,348,398	1,400,140	1,672,686	1,957,560	2,106,036	56%
Region 4	1,010,951	1,028,686	1,107,839	1,164,348	1,183,664	17%
Rural Counties	258,999	263,031	280,581	294,304	300,698	16%
Urban Counties	751,952	765,655	827,258	870,044	882,966	17%

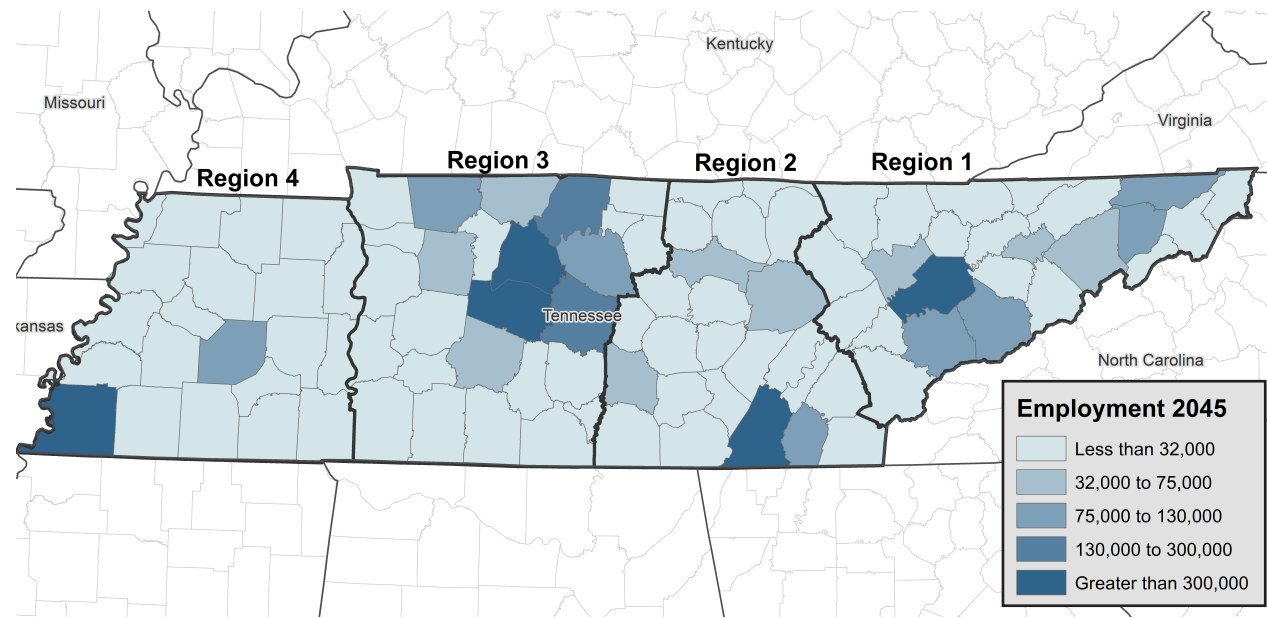
Source: Woods & Poole

Table 17 Top 10 Tennessee Counties for Employment Growth (2045)

County	2018	2020	2030	2040	2045	Absolute Difference (2018-2045)	Percent Difference (2018-2045)
Williamson	202,074	215,553	293,091	386,959	440,461	238,387	118%
Fayette	15,759	16,530	20,904	26,381	29,682	13,923	88%
Moore	3,335	3,479	4,283	5,292	5,903	2,568	77%
Wilson	69,807	73,069	90,434	109,888	120,706	50,899	73%
Rutherford	175,896	183,046	220,864	261,153	282,852	106,956	61%
Sumner	87,467	91,035	109,749	129,670	140,364	52,897	60%
Sevier	64,052	66,341	78,769	91,941	99,392	35,340	55%
Robertson	35,666	37,040	44,034	51,355	55,244	19,578	55%
Montgomery	77,415	80,328	95,655	111,257	119,427	42,012	54%
Pickett	2,340	2,417	2,802	3,233	3,483	1,143	49%

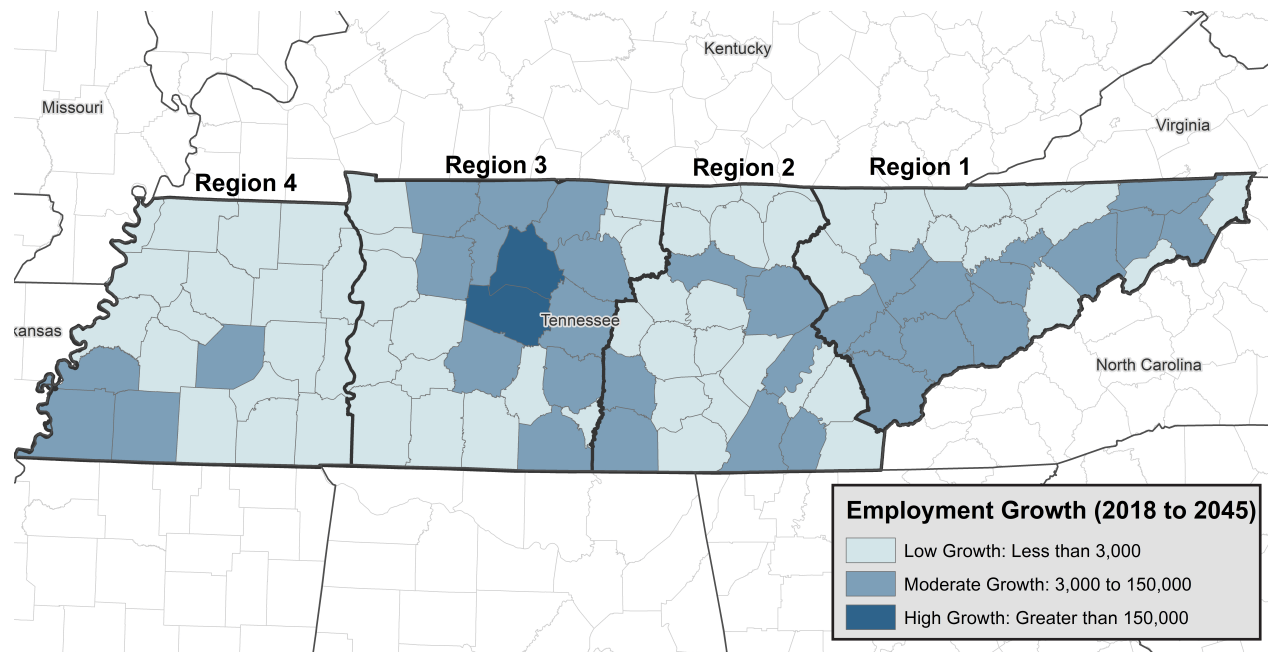
Source: Woods & Poole

County level employment in 2045 is shown in Figure 48, while absolute employment growth from 2018 to 2045 is mapped in Figure 49. Counties with high employment growth are defined as those counties that are forecasted to increase employment by more than 150,000 jobs. These counties are Shelby, Williamson, Davidson, Hamilton, and Knox.



Source: Woods & Poole

Figure 48 Tennessee Employment (2045)



Source: Woods & Poole

Figure 49 Employment Change (2018-2045)

Table 18 below shows the job-population balance in each of the TDOT Regions as well as the urban and rural counties throughout the state for 2018 and 2045. This balance refers to the distribution of employment relative to the distribution of population within an area. If a given area is predicted to have a greater growth in employment than population, indicated by a ratio greater than one, workers will commute in from other areas. An area with a greater growth in residents than employment, indicated by a ratio less than one, is likely to result in workers commuting out of an area in search of employment. Urban areas within Regions 1, 2, and 4 are predicted to have more employment growth than population growth, meaning that employees will likely be commuting in to fill excess jobs. Conversely, the rural areas in Regions 1, 2, and 3 will have more population growth than employment growth. It is important to note, however, that the population figures also include those residents who may not be in the work force, resulting in lower job-population ratios. Nonetheless, TDOT will continually be faced with the challenge of providing efficient transportation services for those employees in all areas of the state looking for work outside of their area of residence.

Table 18 Job-Population Balance for Tennessee (2018 & 2045)

	2018		2045		Change in Population	Change in Employment	Jobs per Person Change
	Population	Employment	Population	Employment			
Statewide	6,771,306	4,073,406	8,135,188	5,463,549	1,363,882	1,390,143	1.02
Rural Counties	2,127,089	934,280	2,350,375	1,123,528	223,286	189,248	0.85
Urban Counties	4,644,217	3,139,126	5,784,813	4,340,021	1,140,596	1,200,895	1.05
Region 1	1,679,788	924,976	1,946,802	1,204,241	267,014	279,265	1.05
Rural Counties	491,117	209,171	557,681	266,459	66,564	57,288	0.86
Urban Counties	1,188,671	715,805	1,389,121	937,782	200,450	221,977	1.11
Region 2	1,064,493	596,663	1,199,285	741,269	134,792	144,606	1.07
Rural Counties	594,032	273,692	668,470	328,032	74,438	54,340	0.73
Urban Counties	470,461	322,971	530,815	413,237	60,354	90,266	1.50
Region 3	2,391,759	1,540,816	3,297,383	2,334,375	905,624	793,559	0.88
Rural Counties	444,809	192,418	502,460	228,339	57,651	35,921	0.62
Urban Counties	1,946,950	1,348,398	2,794,923	2,106,036	847,973	757,638	0.89
Region 4	1,635,266	1,010,951	1,691,718	1,183,664	56,452	172,713	3.06
Rural Counties	597,131	258,999	621,764	300,698	24,633	41,699	1.69
Urban Counties	1,038,135	751,952	1,069,954	882,966	31,819	131,014	4.12

Source: Woods & Poole

4.6 TDOT'S FUTURE USERS

Considering these projections, an image of TDOT's future users begin to emerge. There will be a higher percentage of travelers over the age of 65 and younger than 34 years of age that may prefer alternative modes for daily travel needs. A greater percentage of Tennesseans will live in urban areas than before where employment opportunities are more numerous. As urban areas grow at a faster rate than rural communities, public transit may become a more important role in the daily lives of those Tennesseans.

Others however, will choose to live in counties outside of the largest urban centers. This relationship between housing and workplace locations may fuel an increase in commute times, a change in commuters' travel mode, or some combination of the two. Rural counties may need to identify new and special transportation services for aging populations who want to remain in their home, but are no longer comfortable driving.

Employment growth, following national trends, will be greatest in the non-basic sector where income is produced at the local level through retail and service professions. Employment growth will be greatest in the urban Williamson County. The concentration of employment opportunities in urban counties such as these will likely impact daily commutes from adjacent communities.

5.0 CONCLUSIONS AND RECOMMENDATIONS

There are many implications of changing demographic and employment trends that TDOT must take into consideration. For example, when planning for transportation investments, the Department will need to consider increased demand for a growing population, the needs and desires from its changing residents, as well as the impacts of new job opportunities on aspects such as freight, system maintenance, and commuting patterns. The following section details pieces of the puzzle that will need to be addressed as Tennessee continues to grow and prosper.

5.1 SUMMARY OF FINDINGS

Tennessee is expected to grow by 1.4 million people over the next 25 years, growth which will place increased demands on the transportation system in various forms. Many of these demands will be a result of the changing demographic compositions within Tennessee's urban and rural areas.

There will be a higher percentage of travelers over the age of 65 and younger than 34 years of age that may prefer public transportation for daily travel needs. Oftentimes, younger generations share some transportation preferences with their older counterparts as they may seek alternative modes of transportation beyond the automobile. Trends among American millennials show increased use of commuting to work by public transit, particularly in urban areas where these system users often choose to reside. Reasons given for selecting an alternative mode of transportation over driving included protecting the environment, graduated driver's licensing requirements, higher gas prices, and the ability to stay connected socially through smartphones and similar technology. Differing modal preferences may be indicative of a changing opinion within the urban areas in Tennessee. While the private automobile is likely to remain the most popular mode of choice among most Tennesseans, it is fair to expect an increase of multimodal needs, especially within rapidly growing urban areas.

As illustrated, 21% of Tennessee's 2045 population will be comprised of system users over the age of 65 and their mobility needs may be different than other groups. If current transportation trends persist, future Tennesseans that are reaching retirement age may prefer to use public transportation. Using public transportation allows older Tennesseans to maintain their independence without fear of being limited by their diminishing abilities to operate a vehicle. In addition to absolute growth, this group may change the transportation needs particularly in rural areas of the state as many of Tennessee's rural counties are projected to continue aging in place, which may increase the need for the presence of rural transit services.

These increased and changing demands also present issues with regard to safety. The more vehicles on the road, the more likely crashes will occur. Additionally, residents who choose to use alternative modes may become more vulnerable as pedestrian and bicycle conflicts increase with increasing traffic volumes.

Accompanying the projected population growth, employment is expected to increase within Tennessee by approximately 1.4 million more jobs by 2045. Similar to population growth, all counties and areas of the state will not see the economic benefits of these job opportunities. Over half the employment growth is expected in Region 3's urban counties and only 14% of the state's projected employment opportunities will occur in rural counties.

One of the key issues that TDOT face within the coming years is the commuting implications resulting from economic growth. Projections show that economic growth will not only occur within the urban cores, but also in the suburban counties surrounding these areas of intense growth. In response to this sprawling expansion of urban areas, the Department need to address increased congestion on the interstate system which, in turn, could result in changing commuting patterns.

Not only will traffic increase with growing employment opportunities, but also from freight traffic. The more people residing in Tennessee, the more consumption of goods and services will occur in the state; likewise, more employment within the state is likely followed by an increased production of goods. These increases in production and consumption will likely increase the number of large trucks on Tennessee's highway system, a fact that has safety as well as maintenance implications for the Department going forward.

As with all of these issues, the financial resources to address them are limited and do not appear to be changing very rapidly. The growth expected in population and employment present unique challenges to the Department as it tries to accommodate increased capacity demands on infrastructure, continued and increasing maintenance of Tennessee's highway system, the expected safety of users, and the efficient movement of freight. Innovative solutions to address these issues will likely be necessary moving forward.

In conclusion, the following summarizes the findings of this policy paper.

Population

- By 2045, the population of Tennessee is projected to add over 1.4 million people. Of this growth:
 - Over 84% will occur in existing urban counties with the State's current top ten most populous counties seeing the lion's share of this growth.
 - Region 3 will see two thirds of the State's growth compared to other regions of the State.
 - By 2045, Region 1 will surpass Region 4 in terms of total population.
 - Regions 1 and 3 will see significantly more growth in their urban counties than their rural counties.
- Williamson and Rutherford Counties in TDOT Region 3 are expected to lead the state in terms of total population growth, resulting in a combined population of nearly 1 million people by 2045.
- By 2045, Sevier County's population is projected to exceed 100,000.
- While the majority of future population growth will occur in urban counties, the relative split between urban and rural population in the State will remain much like it is today (approximately 70% urban - 30% rural).

- Tennessee is projected to have a significant increase in its senior population (those 65 and over) resulting in nearly 550,000 more seniors across the State. Of this growth:
 - The majority of the State's senior population growth will occur in rural counties with the exception of senior population growth in Region 3, which will see more seniors in urban counties.
 - Region 3 will surpass Region 1 in having the largest senior population by 2045, with the highest regional increase of 79% for this age group.
- According to U.S. Census American Community Survey reports, approximately 33% of all households in Tennessee are home to a person with a disability. While the population with a disability is fairly equally distributed across the state, rural areas have slightly higher concentrations.
- The racial and ethnic composition of Tennessee's residents has been and is projected to continue changing over time. Today, the diversity of Tennessee residents varies by region. Though this trend is projected to continue, the state as a whole is projected to become more diverse in the future.

Employment

- By 2045, Tennessee is projected to add over 1.4 million more jobs. Of this growth:
 - Over 86% will occur in existing urban counties.
 - Region 3 will see 66% of the State's future employment growth compared to other regions of the State and by 2045 represent just under half of the State's employment base.
 - By 2045, Region 1 will surpass Region 4 in terms of total jobs.
 - Regions 1, 3 and 4 will see the greatest amount of their future employment growth (over 70%) in urban counties, whereas Region 2 will see a near even split between new jobs in urban and rural counties within its region.
- By 2045, employment growth in urban counties in Region 4 will outpace population growth in these same counties indicating a greater share of in-commuting for employment and the potential need for efficient regional connections.
- While the majority of future employment growth will occur in urban counties, the relative split between urban and rural employment growth in the State will remain much like it is today (approximately 80% urban - 20% rural). The data does suggest, however, that Tennessee's future employment growth is trending more towards urban counties as compared to projected future population growth.

5.2 RECOMMENDATIONS

In conclusion, the following recommendations are proposed as they relate to demographic and employment changes and trends in Tennessee.

- TDOT should partner with other State agencies to explore opportunities for leveraging resources and programs that support economic development, aging populations, health, people with a disability, and smart growth practices.
- TDOT should increase its efforts in working with city, county, and regional organizations relative to land use and transportation in order to proactively plan for and accommodate future transportation demands.
- TDOT should continue to make available the latest planning data and tools and provide these resources to its many planning partners (e.g., MPOs, RPOs, ECD, transit agencies, etc.)
- TDOT should evaluate its programs related to state-owned highway assets (e.g., signage, lighting, pavement markings, etc.) to accommodate projected growth in Tennessee's senior population.
- TDOT should place greater emphasis on projected needs (e.g., population and employment growth) when conducting a scoring/funding analysis of projects for inclusion in its 3-Year Plan in order to meet the needs of a changing population.