TDOT 25-YEAR
LONG-RANGE TRANSPORTATION POLICY PLAN

DEMOGRAPHIC & EMPLOYMENT CHANGES & TRENDS
POLICY PAPER

TN TDOT
Department of Transportation

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The 25-Year Long-Range Transportation Policy Plan was developed prior to the passage of Fixing America's Surface Transportation Act (FAST Act) signed into law December 4, 2015.

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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 vision to become "The Best Multimodal DOT in the Nation." 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 2040, the population of Tennessee is projected to add over 2.1 million people. Of this growth:
    - Over 70% 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 more than half of the State's growth compared to other regions of the State.
    - By 2040, Region 1 will surpass Region 4 in terms of total population.
    - Region 1 will see a near equal share of growth between urban and rural counties whereas Region 2 is projected to see more growth in rural counties than urban.
- 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 over 1 million people by 2040.
- By 2040, four rural counties in the State (Sevier, Putnam, Maury, and Robertson) are projected to have over 100,000 in population.
- 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 (64% urban - 36% rural).
- Tennessee is projected to have a near doubling in its senior population (those 65 and over) resulting in nearly 800,000 more seniors across the State. Of this growth:
- Nearly as many seniors will reside in Region 3 as Region 1 by 2040.
- The majority of the State's senior population growth will occur in urban counties with the exception of senior population growth in Region 2, which will see more seniors in rural counties.
- According to U.S. Census American Community Survey reports approximately 29% of all households in Tennessee are home to a disabled person. While the disabled population is fairly equally distributed across the state, rural areas appear to 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. This trend is projected to continue; that said, the state as a whole is projected to become more diverse in the future. By 2040, projections indicate that nearly 1 million residents of Tennessee will be of Hispanic origin (roughly 1 in 10 Tennesseans).

Employment

- By 2040, Tennessee is projected to add over 1.9 million more jobs. Of this growth:
  - Over 60% will occur in existing urban counties.
  - Region 3 will see over 40% of the State's future employment growth compared to other regions of the State and by 2040 represent more than a third of the State's employment base.
  - By 2040, 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 2040, 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 (72% urban - 28% 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, health, the disabled, and smart growth practices.
- TDOT should increase its efforts in working with city, county, and regional organizations relative to land use & 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 National Historical Geographic Information System (Minnesota Population Center. National Historical Geographic Information System: Version 2.0. Minneapolis, MN: University of Minnesota 2011) was 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 from 2010 to 2064. 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 1970 to present and projections to 2040 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.

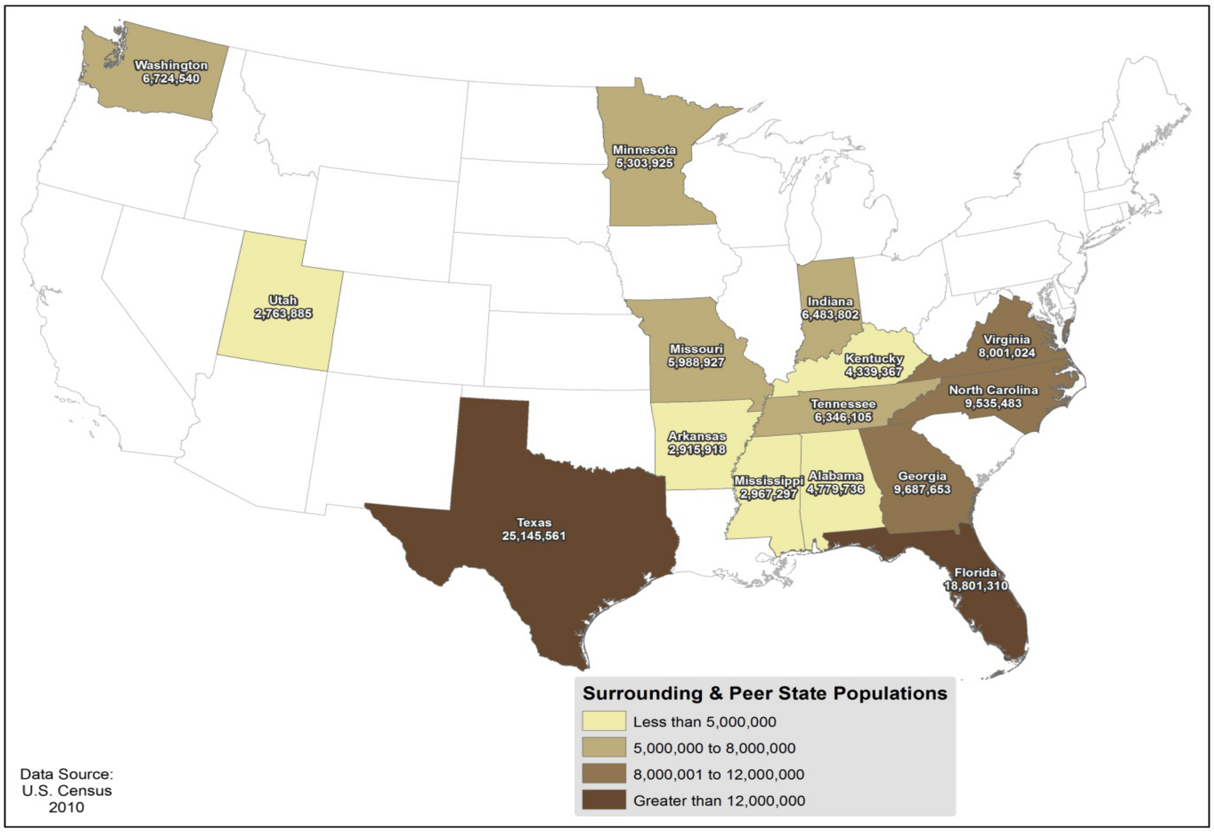
These sets of data each possess unique strengths and weaknesses depending on the desired application. Table 1 outlines these factors for comparison.

Table 1 Comparison of Sources of Demographic Data

Data Set	Strengths	Weaknesses	Best Application
U.S. Census – Decennial and American Community Survey (ACS) estimates	▪ 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.	▪ Limited population projections. ▪ Updated every 10 years (decennial). ▪ Data reporting varies from census to census (decennial). ▪ ACS tabulations are estimates based on sample data.	▪ Describing current conditions at sub-county, county, region and state levels. ▪ Comparing demographics with peer states.
UTCBER	▪ State-specific research on economic trends for UT, state agencies, and public and private organizations. ▪ Compatibility with other forecasts for TDOT	▪ Only offers population projections. ▪ No employment or job-level data, only industry-level. ▪ Frequency of update schedule varies.	▪ Understanding population dynamics within Tennessee.
Woods and Poole	▪ Projections provided for several demographic and economic factors to the year 2040. ▪ 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.	▪ Limited to county-level geographies.	▪ 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 6.3 million. Of the statewide population, 79% were age 16 and over, representing the potential driving population and labor force. Tennessee's 2010 population is compared with selected peer states in Figure 1.



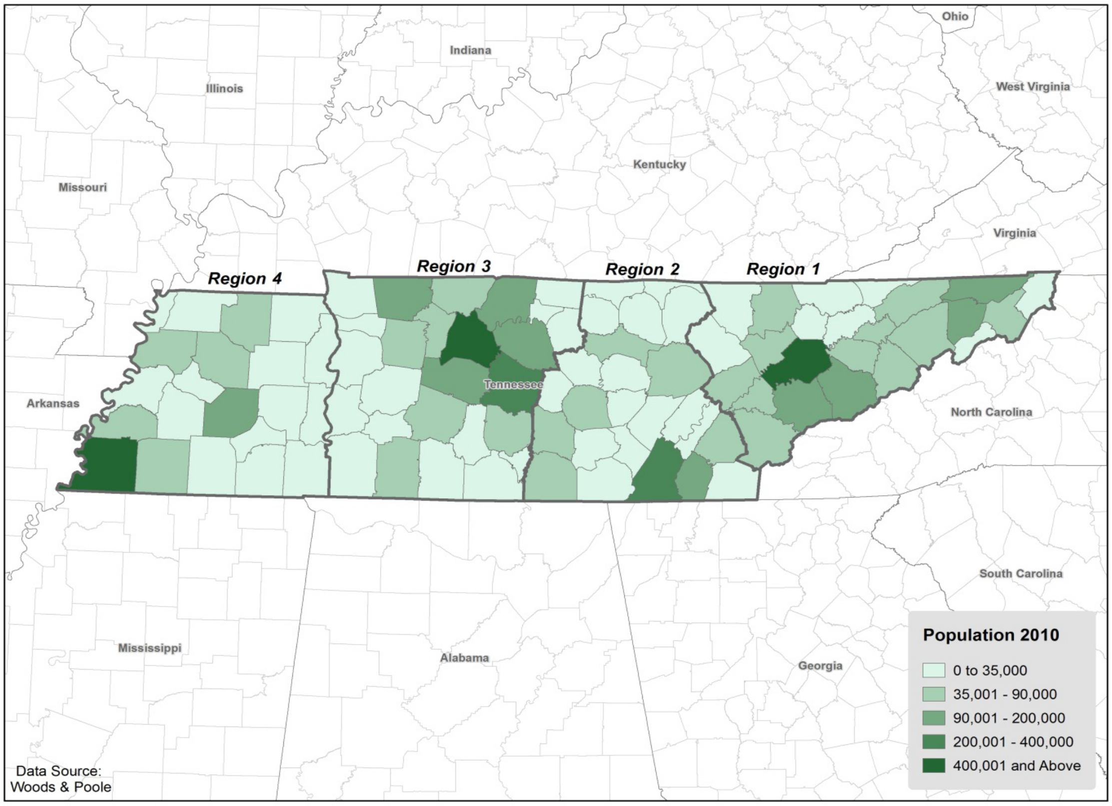
Source: U.S. Census (2010)

Figure 1 Surrounding and Peer State Populations (2010)

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 the fact 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 those 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 2010 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 as of 2013; exceptions to this rule were Hawkins, Unicoi, Fayette, Robertson, and Maury 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 Blount, Bradley, Carter, Davidson, Hamblen, Hamilton, Knox, Madison, Montgomery, Rutherford, Shelby, Sullivan, Sumner, Washington, Williamson, and Wilson.



Source: Woods & Poole

Figure 2 2010 Population by Tennessee County

section 3

Table 2 Top 10 Tennessee Counties for Population (1980-2010)

County	1980	1990	2000	2010	Percent Change (1980-2010)
Shelby	775,888	828,446	898,211	928,930	20%
Davidson	478,275	512,139	570,439	628,053	31%
Knox	320,932	336,707	382,887	433,110	35%
Hamilton	288,369	285,919	308,547	337,307	17%
Rutherford	84,784	119,847	183,600	263,769	211%
Williamson	58,525	81,789	128,134	184,080	215%
Montgomery	83,666	101,682	135,536	173,304	107%
Sumner	86,265	103,761	131,207	161,316	87%
Sullivan	144,388	143,886	152,995	156,855	9%
Washington	89,157	92,732	107,469	123,358	38%

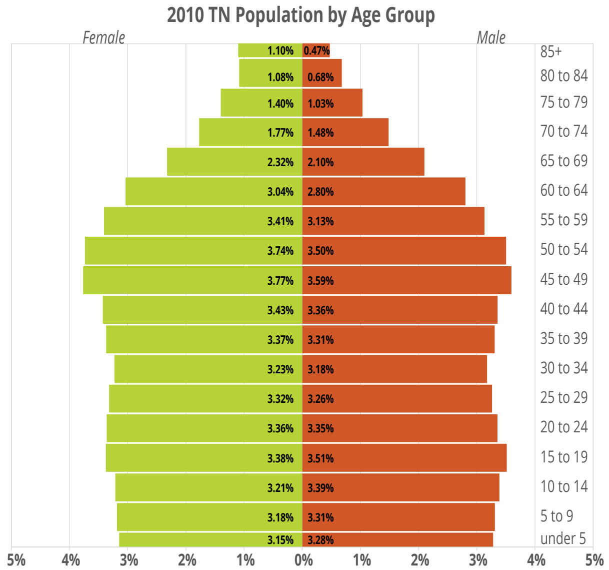
Source: Woods & Poole

Table 3 Population Change in Tennessee (1980-2010)

Geography	Sum of 1980	Sum of 1990	Sum of 2000	Sum of 2010	Percent Difference (1980-2010)
Statewide	4,600,684	4,894,492	5,703,719	6,357,436	38%
Rural Counties	1,813,707	1,878,549	2,214,008	2,412,213	33%
Urban Counties	2,786,977	3,015,943	3,489,711	3,945,223	42%
Region 1	1,268,051	1,319,265	1,524,266	1,684,265	33%
Rural Counties	535,648	557,259	659,703	727,811	36%
Urban Counties	732,403	762,006	864,563	956,454	31%
Region 2	782,012	804,011	922,516	1,009,135	29%
Rural Counties	425,875	444,102	525,763	572,697	34%
Urban Counties	356,137	359,909	396,753	436,438	23%
Region 3	1,238,906	1,408,333	1,755,436	2,100,053	70%
Rural Counties	391,164	421,096	517,300	574,972	47%
Urban Counties	847,742	987,237	1,238,136	1,525,081	80%
Region 4	1,311,715	1,362,883	1,501,501	1,563,983	19%
Rural Counties	461,020	456,092	511,242	536,733	16%
Urban Counties	850,695	906,791	990,259	1,027,250	21%

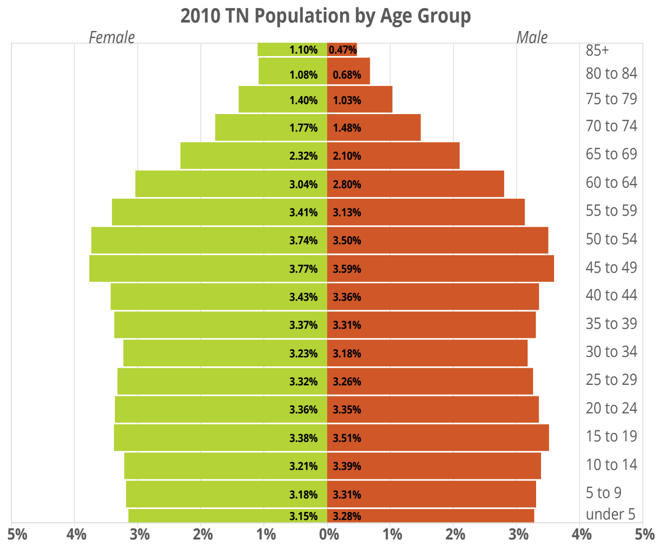
Source: Woods & Poole

Age distribution within the current population is illustrated in Figure 3 and Figure 4. Understanding which age groups are larger can help to 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 2010, the graph widens to accommodate 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 5) and all of the peer states with the exception of Texas, whose population is relatively younger (Figure 6). 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.



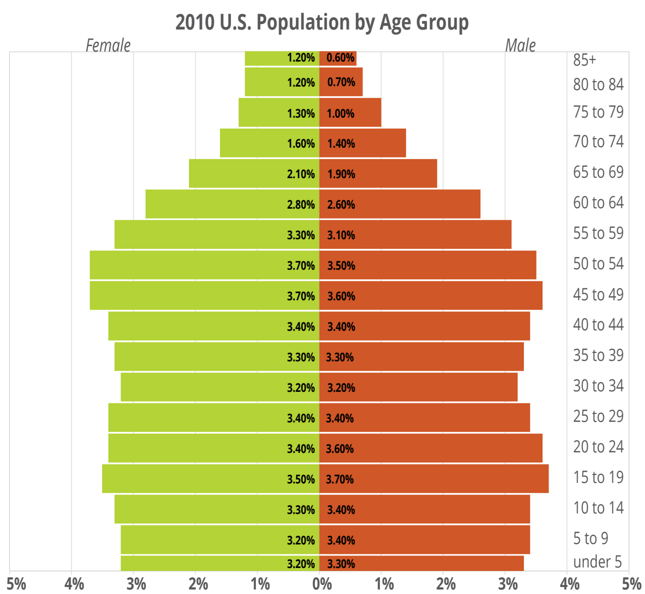
Source: Tennessee State Data Center, UTCBER, August 2013

Figure 3 Tennessee Population by Age Group



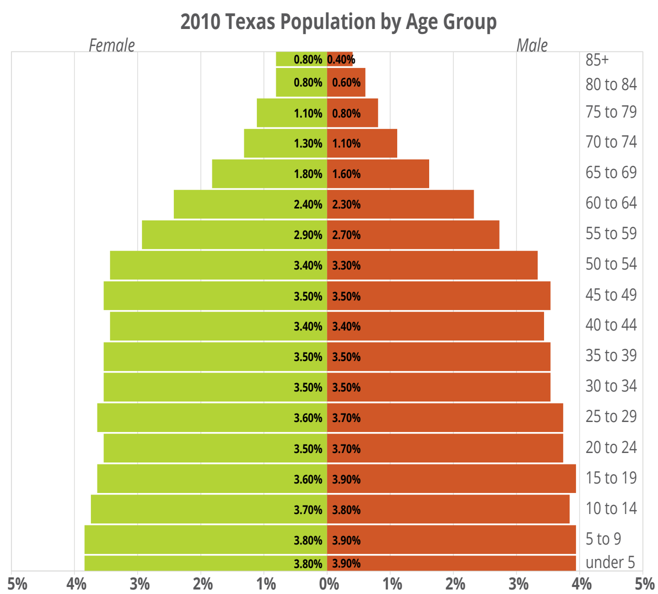
Source: Tennessee State Data Center, UTCBER, August 2013

Figure 4 Tennessee Population by Age Group



Source: U.S. Census

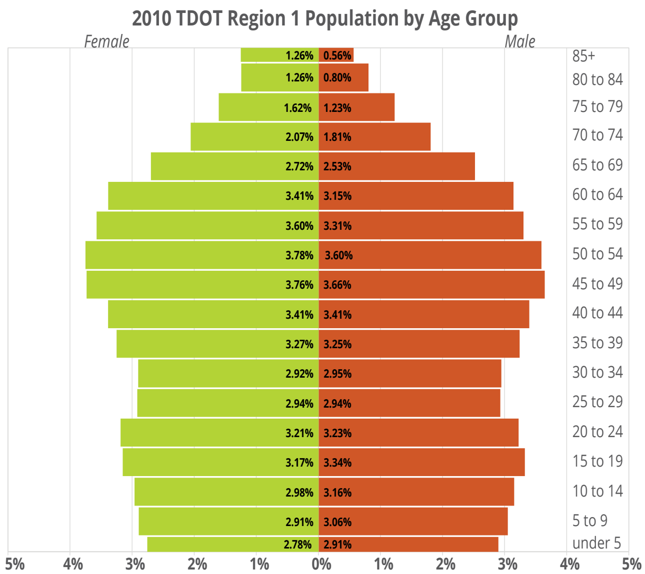
Figure 5 U.S. Population by Age Group



Source: U.S. Census

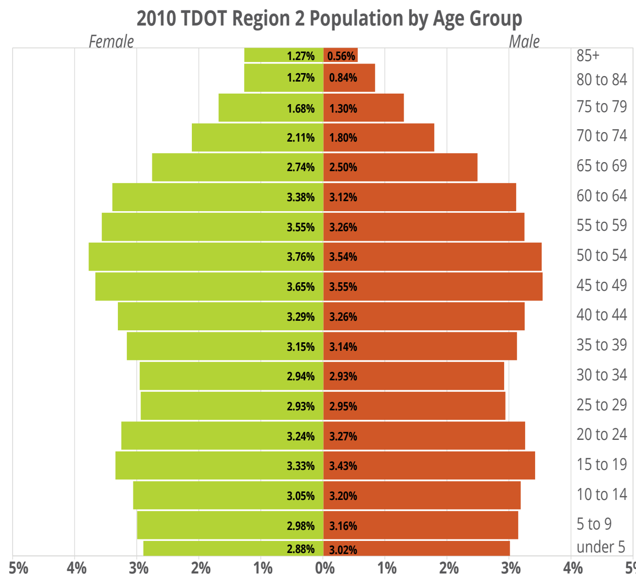
Figure 6 Texas Population by Age Group

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 less of a share of the total populations for those regions (Figure 7 and Figure 8). Regions 3 and 4 are relatively younger (Figure 9 and Figure 10).



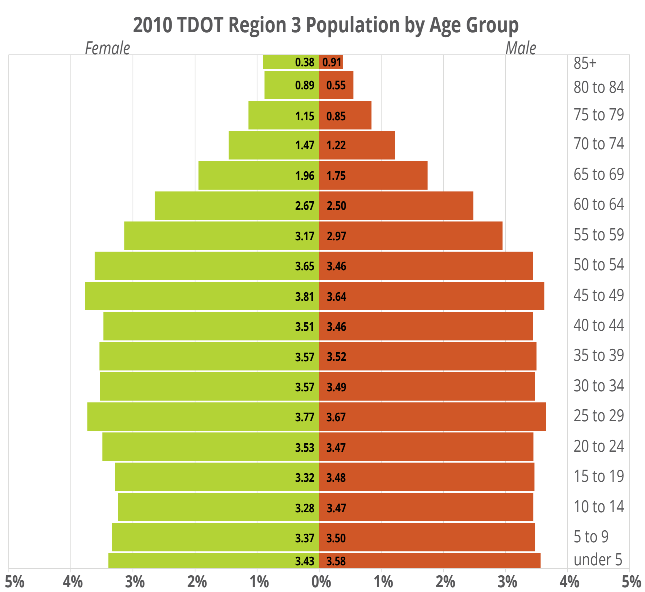
Source: Tennessee State Date Center, UTCBER, August 2013

Figure 7 TDOT Region 1 Population by Age Group



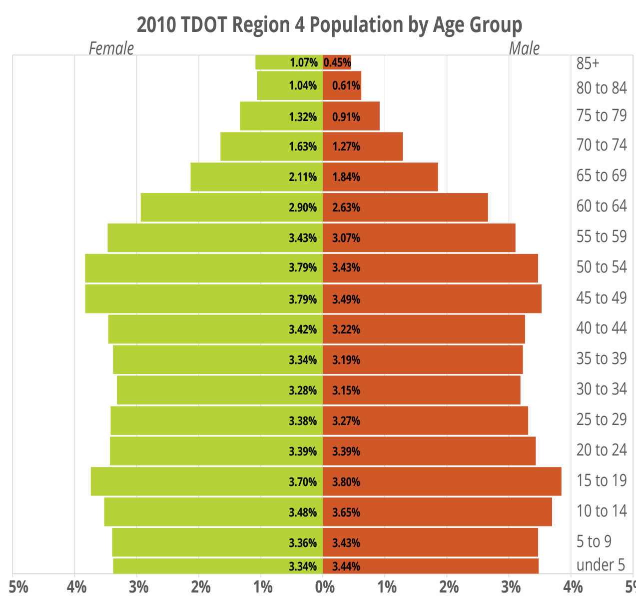
Source: Tennessee State Date Center, UTCBER, August 2013

Figure 8 TDOT Region 2 Population by Age Group



Source: Tennessee State Date Center, UTCBER, August 2013

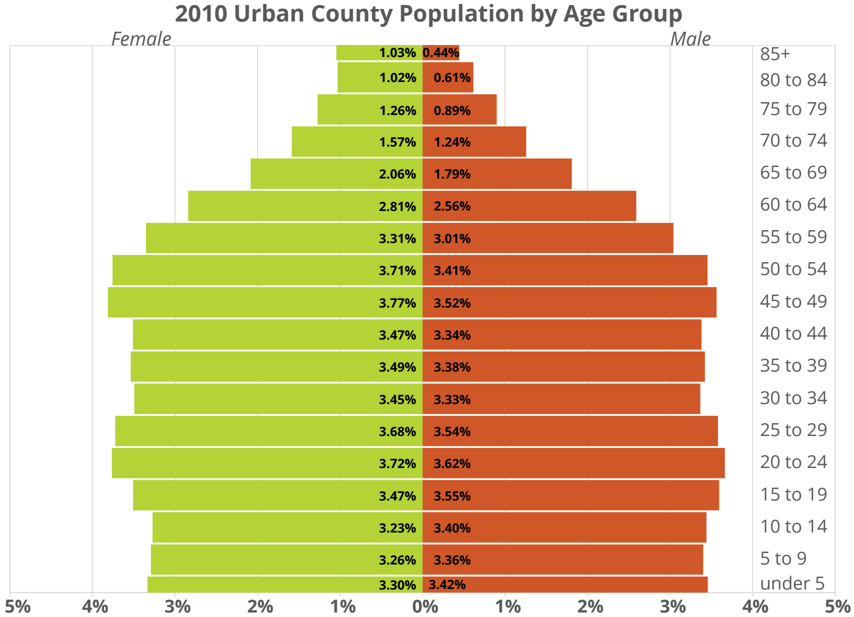
Figure 9 TDOT Region 3 Population by Age Group



Source: Tennessee State Date Center, UTCBER, August 2013

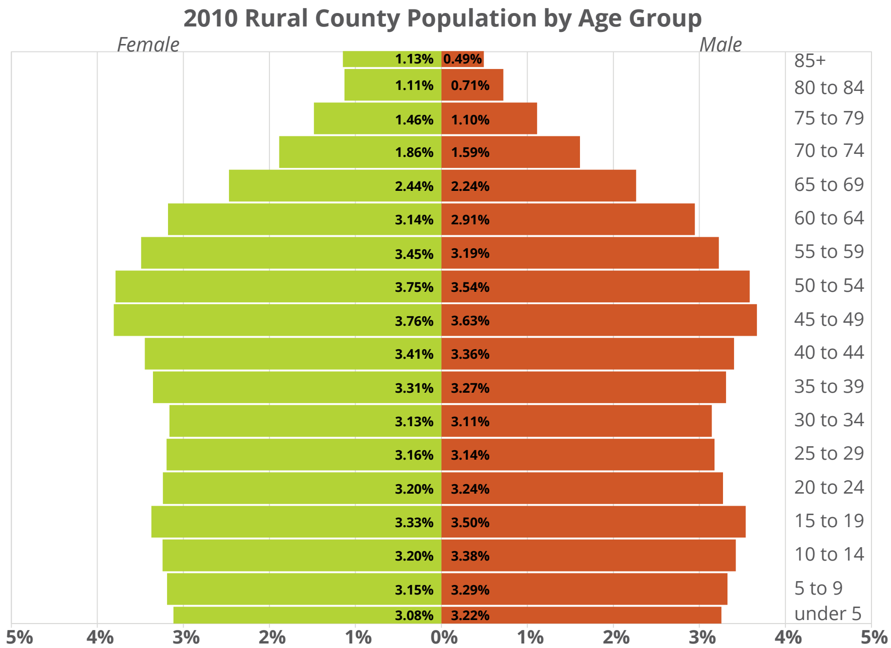
Figure 10 TDOT Region 4 Population by Age Group

Age group distribution among urban counties is skewed toward younger ages from 15 to 29 years of age (Figure 11). Conversely, rural county populations are older on average with the largest portion being within the 45 to 49 and 50 to 54 age groups (Figure 12).



Source: Tennessee State Data Center, UTCBER, August 2013

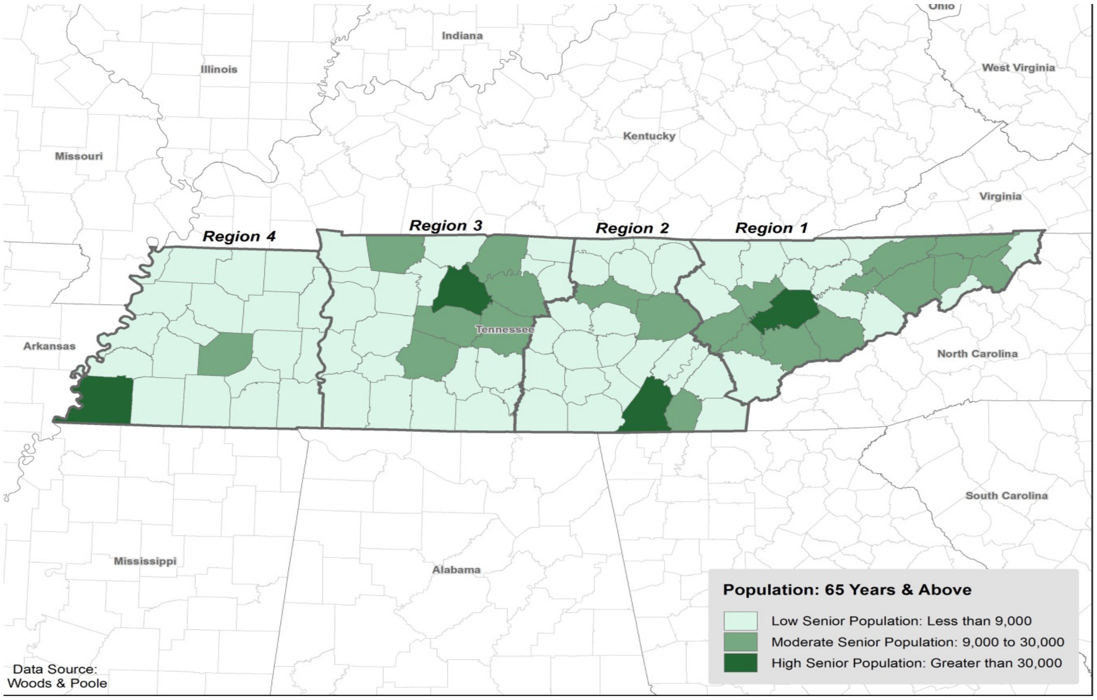
Figure 11 **Urban County Population by Age Group**



Source: Tennessee State Data Center, UTCBER, August 2013

Figure 12 **Rural County Population by Age Group**

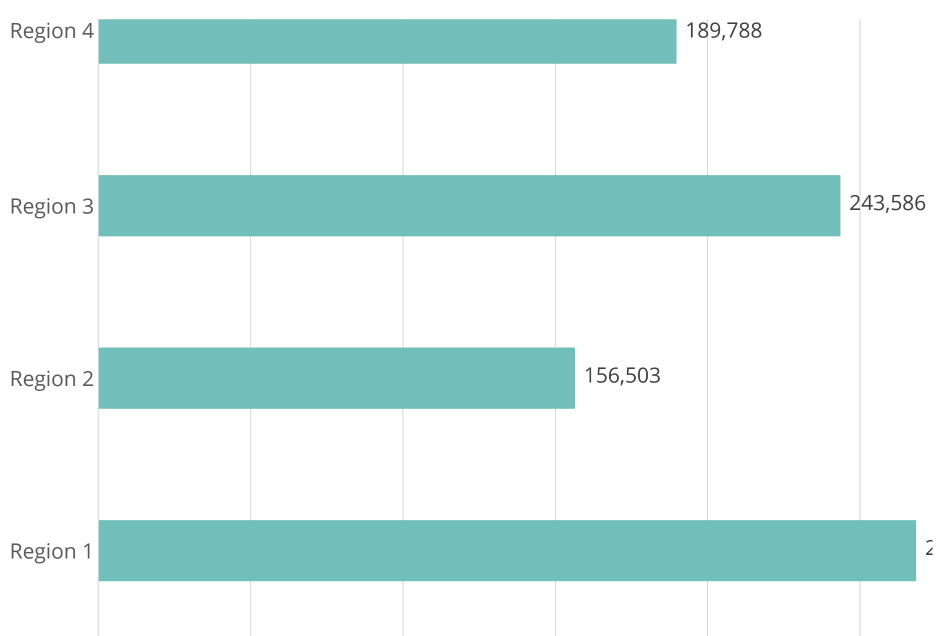
Senior populations, or those ages 65 and older, are a unique segment of the population when it comes to transportation needs. Individuals beyond 65 years of age are more likely to be retired and less likely to travel during peak commute hours. Many seniors also utilize urban and rural transit services 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 13 of 2010 senior population data.



Source: Woods & Poole

Figure 13 Senior Population (65+) by Tennessee County

When senior populations across the state are compared at the TDOT Region level, Region 1 leads in 2010 with 268,445 residents in this age group followed by Region 3 with 243,586, Region 4 with 189,788 and Region 2 with 156,503 (Figure 14).

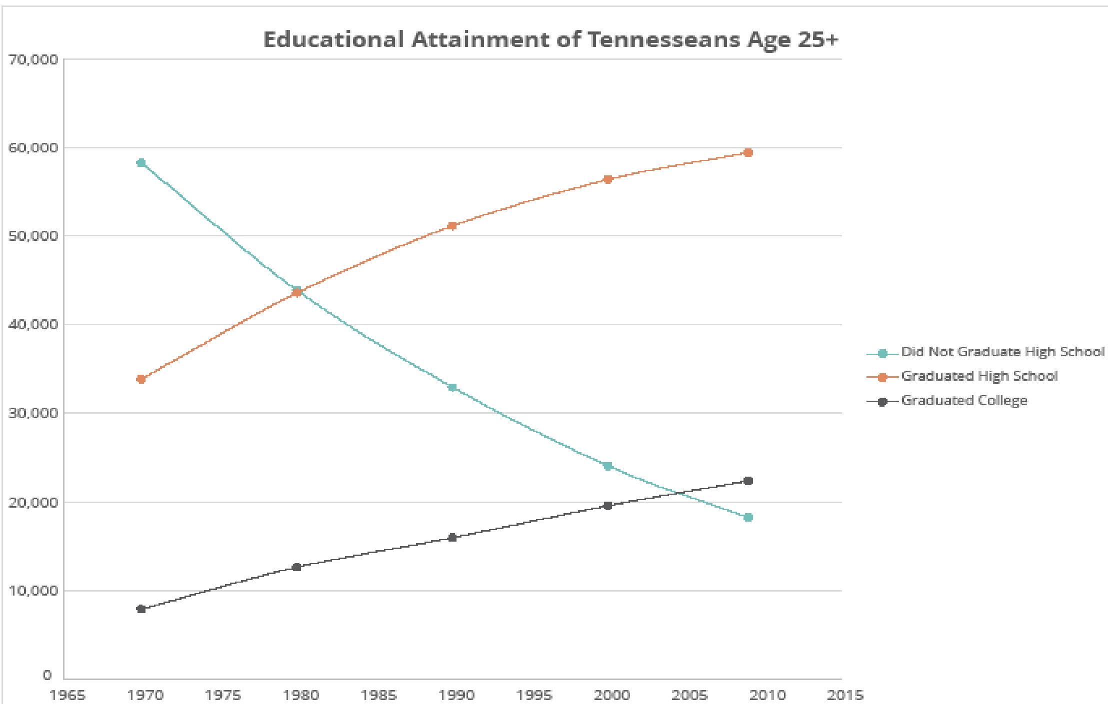


Source: Woods & Poole

Figure 14 Senior Population (65+) by TDOT Region

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 15 illustrates this trend from 1980 to 2009. High school graduation rates have improved from 44% to 59% while graduation rates from four-year institutions have increased from 13% in 1980 to 22% in 2009. 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 15 Educational Attainment Trends (1980-2009)

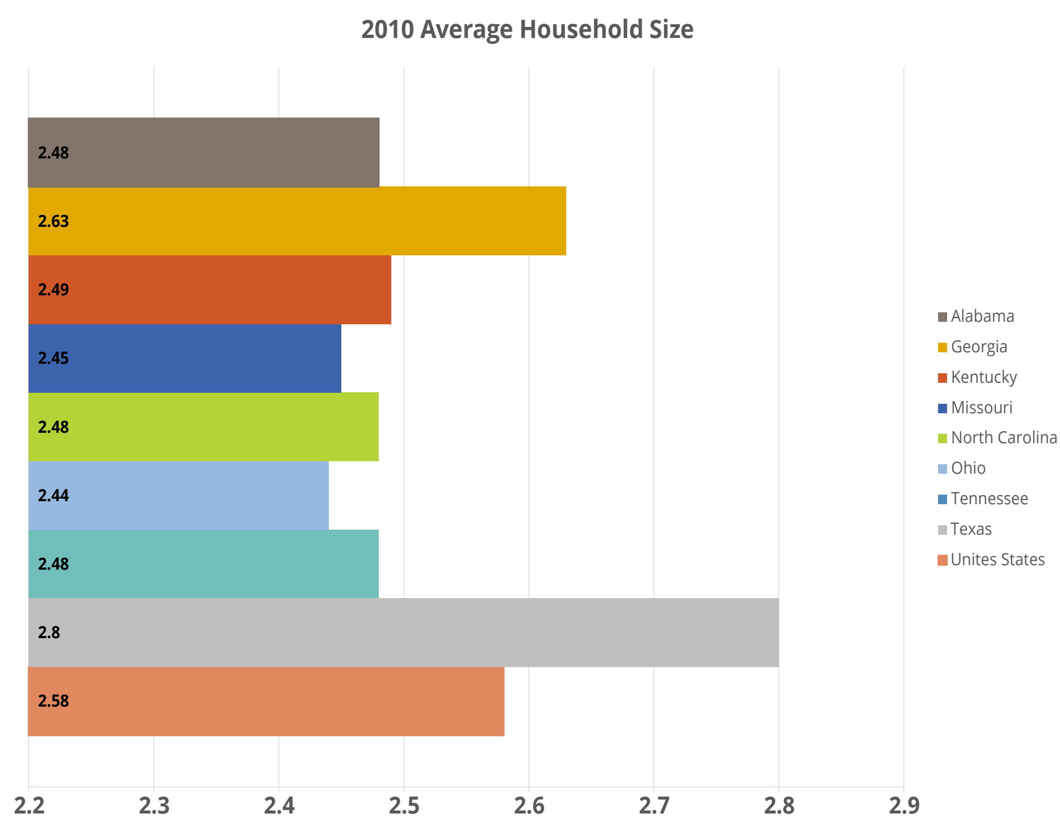
Table 4 Top 10 Tennessee Counties for Educational Attainment (2009)

County	Did Not Graduate High School	Graduated High School	Graduated College
Williamson	6%	44%	50%
Davidson	15%	51%	34%
Knox	12%	55%	33%
Shelby	15%	57%	28%
Hamilton	15%	58%	27%
Washington	16%	57%	27%
Rutherford	12%	61%	27%
Madison	16%	59%	25%
Wilson	13%	64%	23%
Montgomery	10%	67%	23%

Source: Woods & Poole

3.3 Households

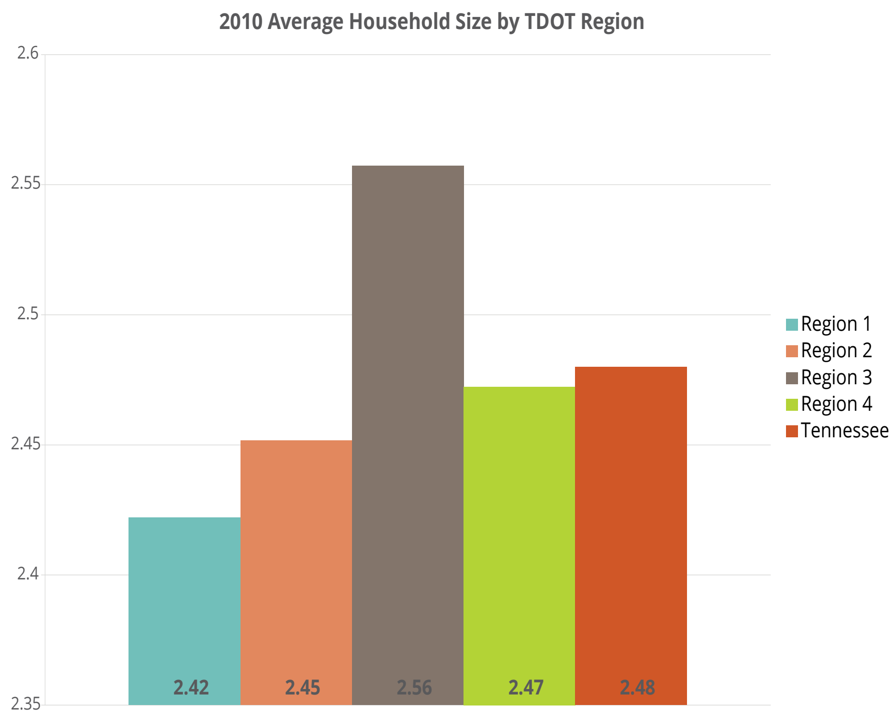
As of 2010 there were 2,493,552 occupied households in the state which is an increase of 260,647 from the 2000 U.S. Census. Household size has not changed since the 2000 and averages 2.48 persons per dwelling units. This number is slightly below the national average of 2.58 persons per dwelling unit but very comparable to the surrounding and peer states of Alabama, Kentucky, North Carolina, Florida, Arkansas, and Minnesota (Figure 16).



Source: U.S. Census

Figure 16 Average Household Size of Tennessee vs. Surrounding and Peer States

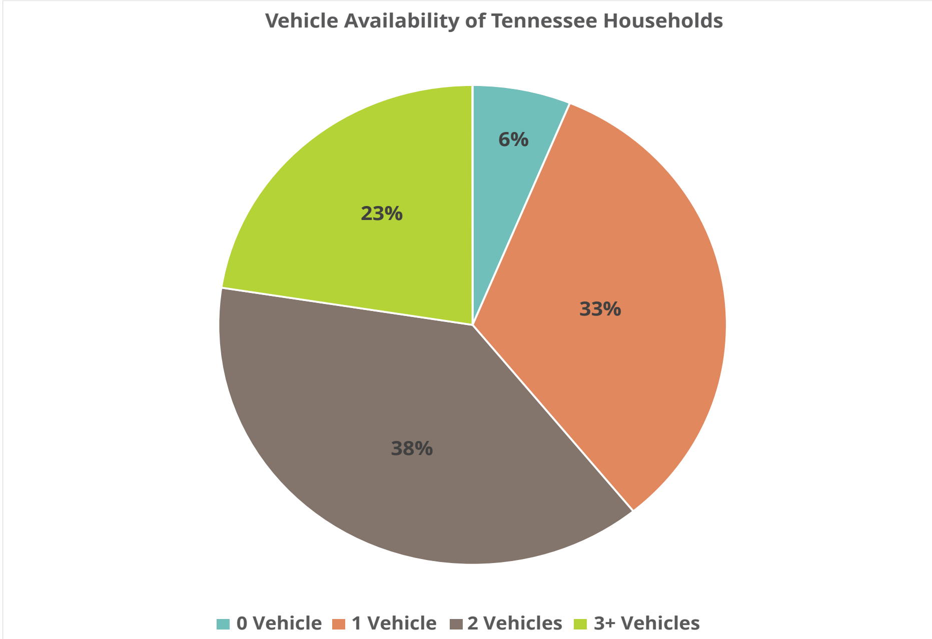
Across the four TDOT regions, household size varies little with Region 3 being slightly above the statewide average with 2.56 persons per household according to the 2010 U.S. Census (Figure 17). Region 1 has the smallest average household size with 2.42 persons per household. Household sizes may influence 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: U.S. Census

Figure 17 Average Household Size by TDOT Region

According to the 2008-2012 American Community Survey (ACS), approximately 6% of Tennessee households did not have access to a vehicle for regular daily use (Figure 18). Surrounding and peer states report that 5 to 8% of households have no private vehicle of their own (Table 5).



Source: American Community Survey 5-Year Estimates, 2008-2012

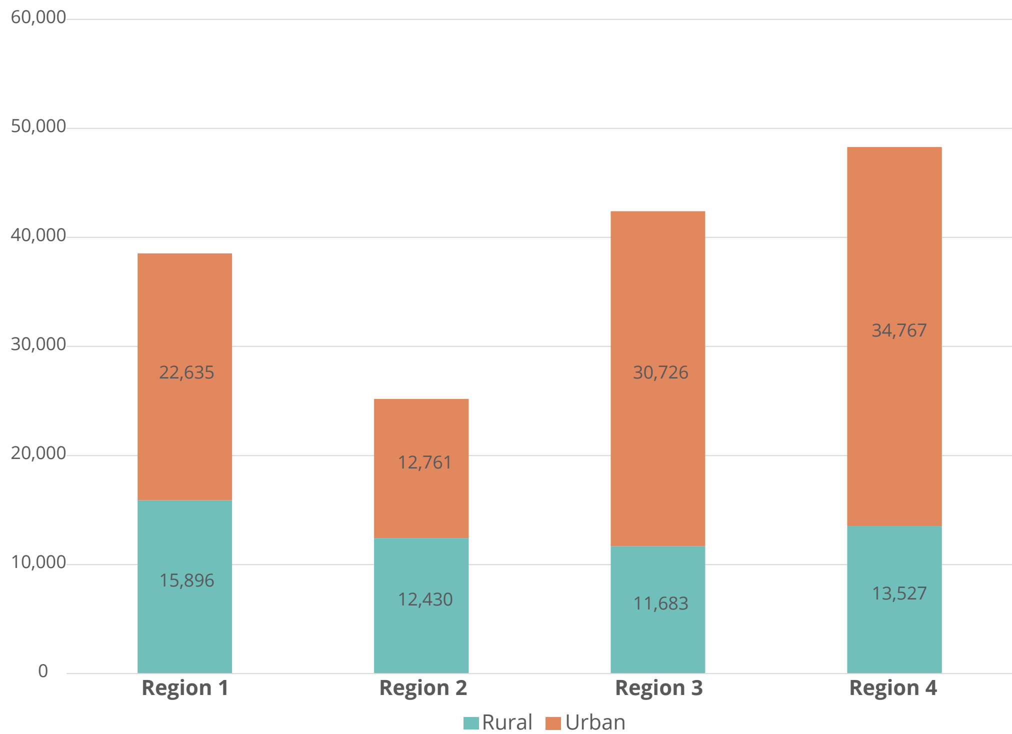
Figure 18 Vehicle Availability by Household

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

States	Total Number of Households	Households with No Available Vehicle	Percentage Without a Vehicle
Kentucky	1,691,716	132,605	8%
Florida	7,147,013	491,123	7%
North Carolina	3,693,221	241,438	7%
Georgia	3,508,477	236,401	7%
Washington	2,619,995	174,452	7%
Missouri	2,358,270	171,138	7%
Indiana	2,478,846	164,456	7%
Minnesota	2,101,875	148,725	7%
Mississippi	1,087,791	75,422	7%
Arkansas	1,128,797	73,623	7%
Texas	8,782,598	520,304	6%
Tennessee	2,468,841	154,425	6%
Alabama	1,837,576	118,707	6%
Virginia	880,873	39,828	5%
Utah	880,873	39,828	5%

Source: American Community Survey 5-Year Estimates, 2008-2012

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 19). Figure 19 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, 2008-2012

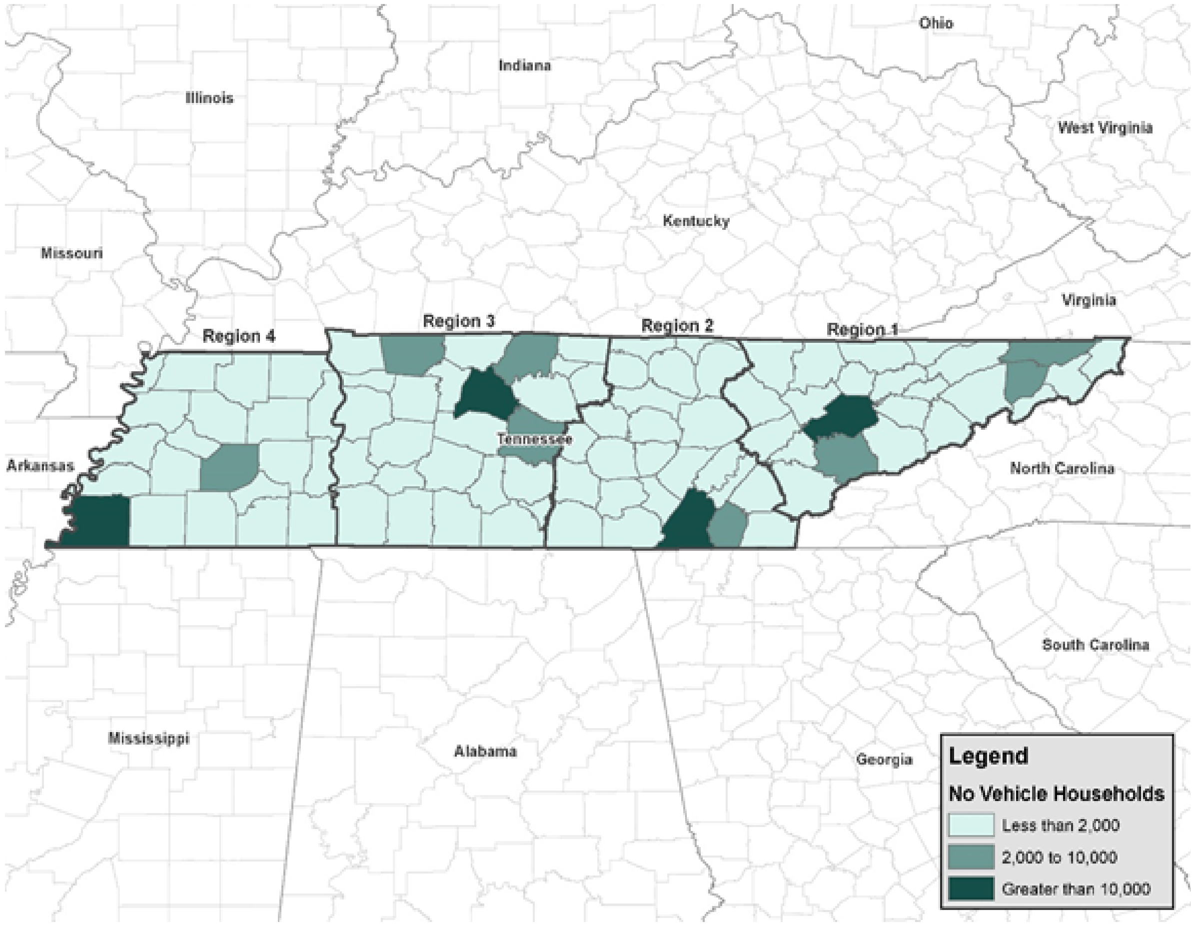
Figure 19 Households Without Access to a Vehicle by TDOT Region

When this data is mapped at the county level as seen in Figure 20, Shelby County stands out as containing the highest number of households that do not have access to a vehicle (32,327) followed by Davidson County (19,434), Knox County (10,711), and Hamilton County (10,628). The 10 counties with the highest number of households without access to a vehicle are listed in Table 6; and, within these top 10 counties, 7% of the total households have no vehicles available. Additionally, nearly 60% of all households in Tennessee without access to a vehicle are located within these top 10 counties. These households represent a transit dependent population in Tennessee's communities that require additional mobility options.

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

County	TDOT Region	Number of Households	Households Without Access to a Vehicle
Shelby	4	341,948	32,327
Davidson	3	255,887	19,434
Knox	1	181,120	10,711
Hamilton	2	134,737	10,628
Sullivan	1	66,595	3,963
Rutherford	3	95,347	3,117
Washington	1	51,260	3,042
Montgomery	3	63,062	2,799
Sumner	3	60,529	2,511
Madison	4	36,060	2,440

Source: American Community Survey 5-year Estimates, 2008-2012

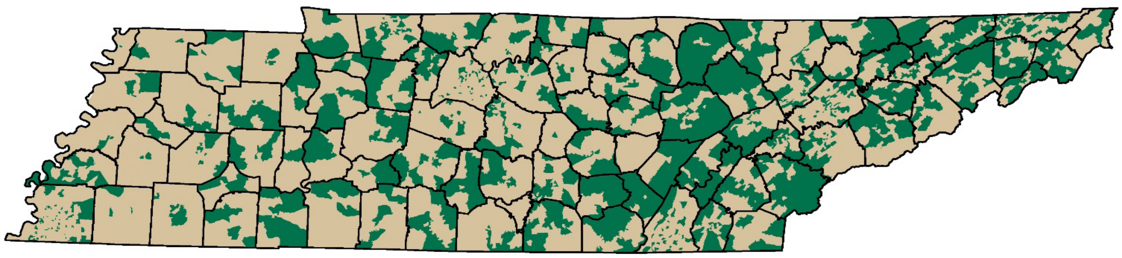


Source: American Community Survey 5-Year Estimates, 2008-2012

Figure 20 Vehicle Availability by Tennessee County

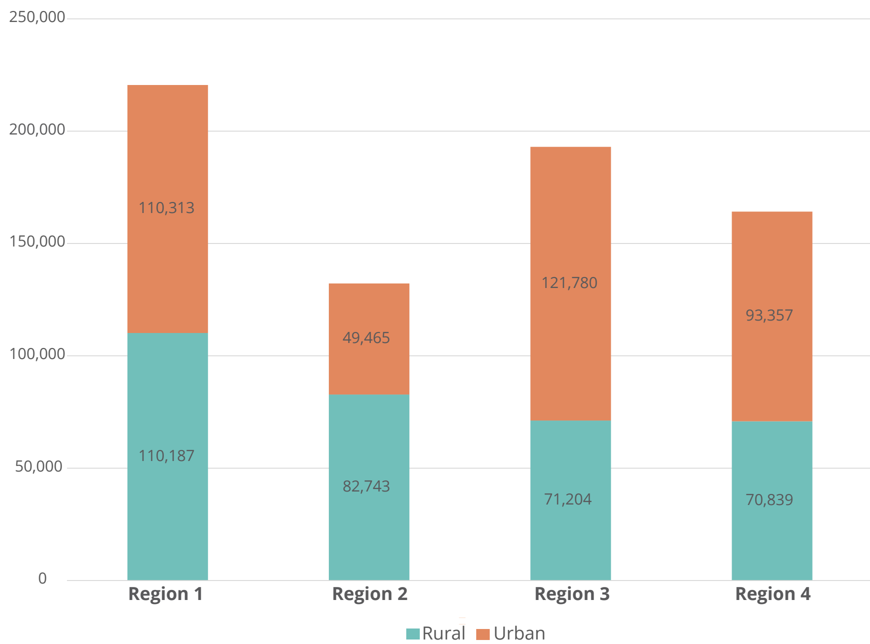
While vehicle availability greatly impacts the transportation needs of a household, the physical capabilities of household members impacts those needs as well, particularly if a member is disabled. While there are many ways that disability can be defined, disabilities can typically be classified into three groups: physical, communicative, or mental. Regardless of their designation, however, the American Community Survey reports that approximately 29% of all households in Tennessee are home to a disabled person. 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 disabled population is distributed fairly equally across the state, although the rural areas appear to have slightly higher concentrations. Figure 21 shows the census block groups that have a number of households with a disabled person that is above the statewide average. Figure 22 and Table 7 show the distribution of households with disabled persons by TDOT Region as well as urban and rural counties at the census block group level. In Regions 1 and 4, these households appear in approximately equal number in both urban and rural counties. However, Region 2 is an exception, where there are nearly twice as many homes with disabled persons in the rural counties as in the urban counties, and, conversely, Region 3 has significantly more households with disabled persons in urban counties than in rural.



Source: American Community Survey 5-Year Estimates, 2008-2012

Figure 21 Number of Households Containing a Disabled Person Above the State Average



Source: American Community Survey 5-Year Estimates, 2008-2012

Figure 22 Spatial Distribution of Households with a Disabled Person

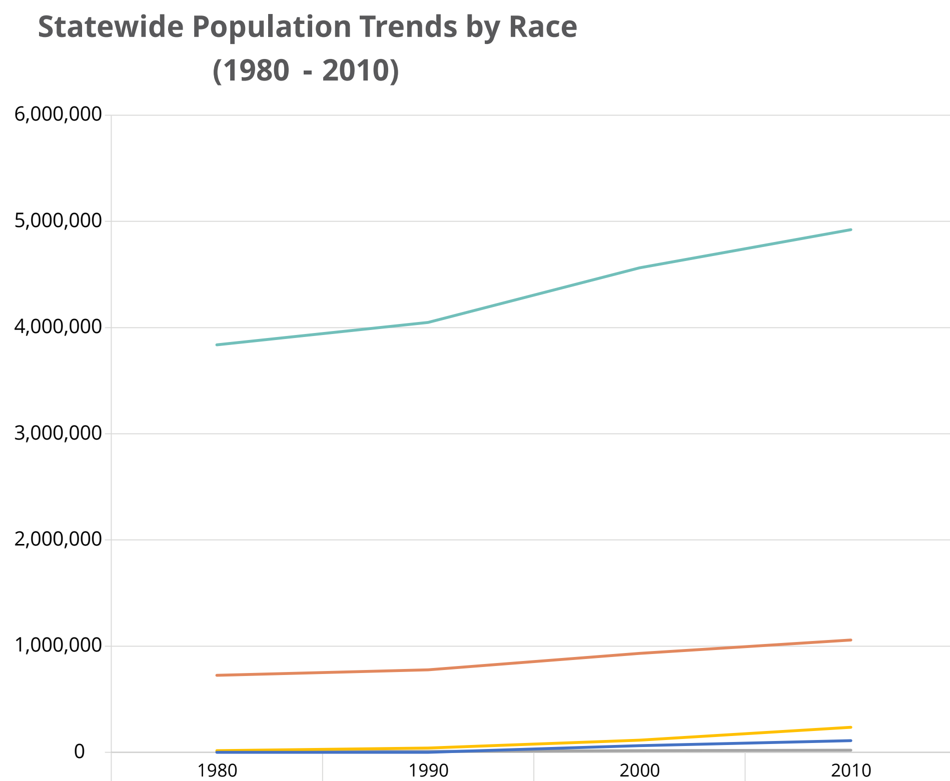
Table 7 Spatial Distribution of Households with a Disabled Person by TDOT Region

	Households with Disabled Persons		Percent of Households with Disabled Persons	
	Urban	Rural	Urban	Rural
Region 1	110,313	110,187	27.8%	34.5%
Region 2	49,465	82,743	28.7%	36.7%
Region 3	121,780	71,204	20.9%	32.6%
Region 4	93,357	70,839	24.7%	34.8%

Source: American Community Survey 5-Year Estimates, 2008-2012

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, individuals identifying as belonging to two or more races nearly doubled from 2000 to 2010. No data is available for this category prior to the 2000 U.S. Census. This data is shown in Figure 23 below. It is important to note that since race and Hispanic origin are two separate and distinct concepts, the US 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.

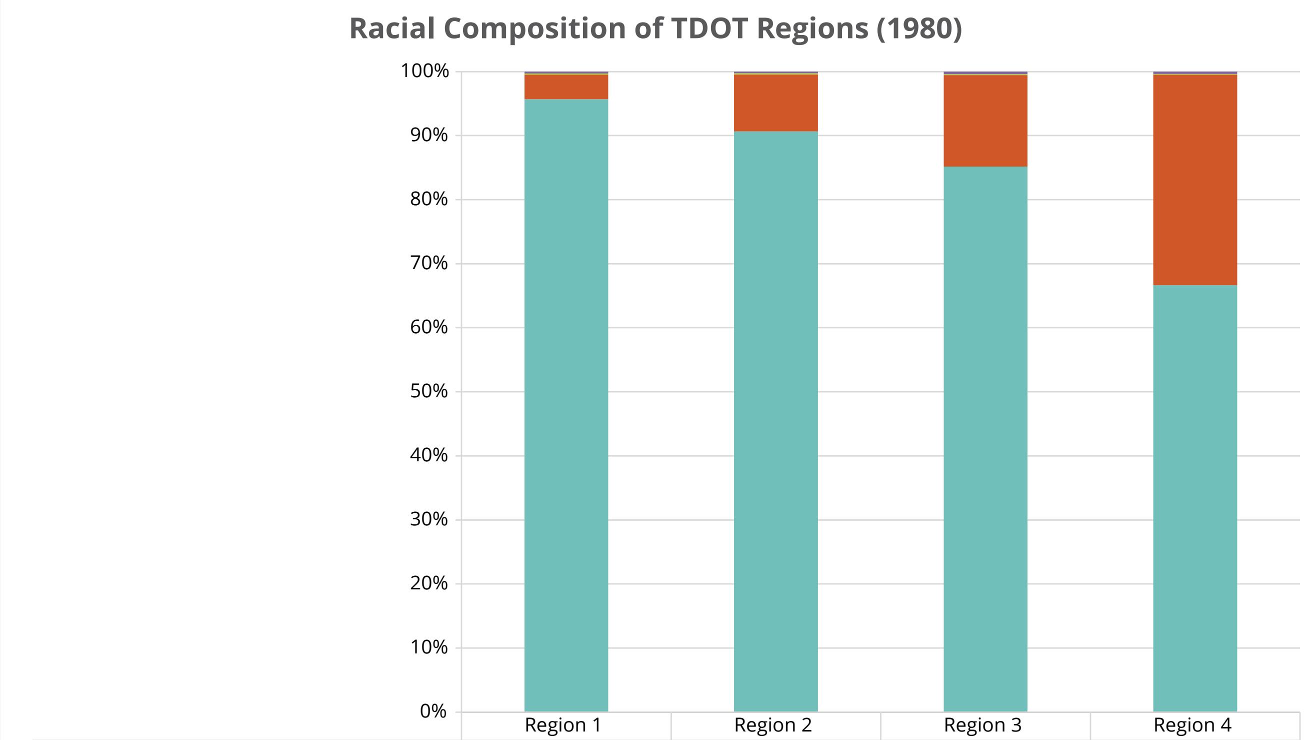


	1980	1990	2000	2010
White (single race)	3,837,968	4,048,068	4,563,310	4,921,948
Black or African American (single race)	724,808	778,035	932,809	1,057,315
American Indian and Alaska Native (single race)	7,035	10,039	15,152	19,994
Asian and Pacific Islander and Other Race (single race)	15,252	41,043	114,903	236,839
Two or More Races	0	0	63,109	110,009

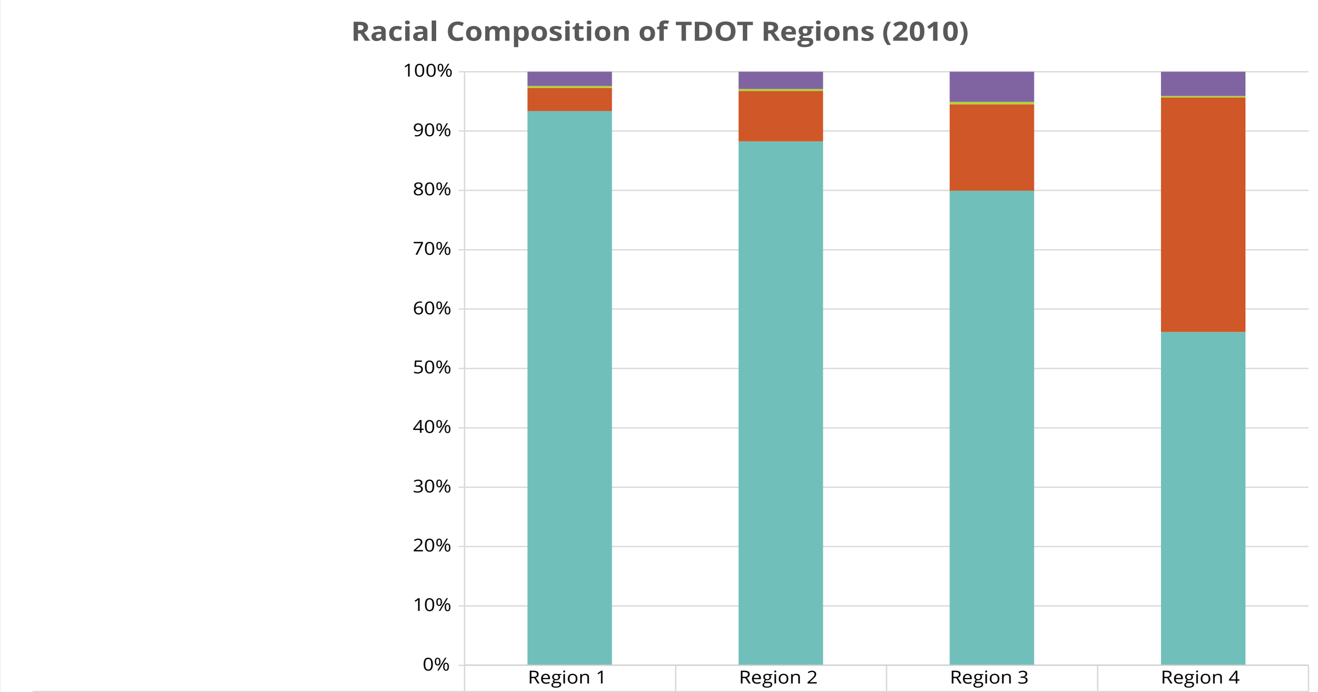
Source: U.S. Census 1980 – 2010

Figure 23 Tennessee Population Trends by Race (1980–2010)

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 trend declines from Region 1 to Region 4 where 55% identify as White (Figure 24). By comparing the 2010 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 2010 than in 1980.



	Region 1	Region 2	Region 3	Region 4
Asain Islander and Pacific Islander and Other (single race)	3,646	2,044	4,846	4,716
American Indian and Alaska Native (single race)	2,239	1,344	1,893	1,559
Black or African American (single race)	48,817	69,368	175,980	430,643
White (single race)	1,207,445	706,223	1,050,588	873,712

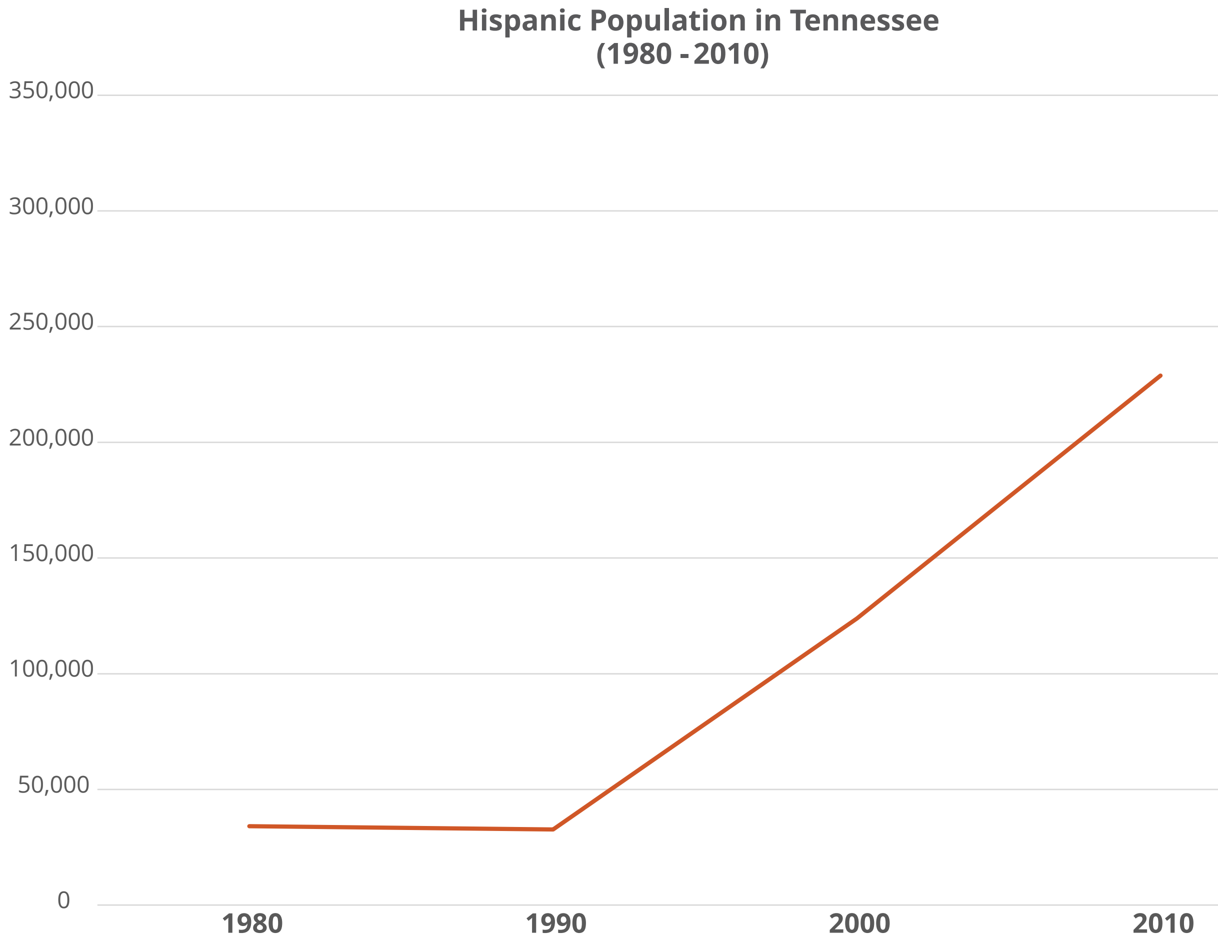


	Region 1	Region 2	Region 3	Region 4
Asain Islander and Pacific Islander and Other (single race)	40,080	28,800	104,794	63,165
American Indian and Alaska Native (single race)	5,036	3,494	7,423	4,041
Black or African American (single race)	64,943	84,376	299,007	608,989
White (single race)	1,546,259	875,268	1,636,221	864,200

Source: U.S. Census 2010

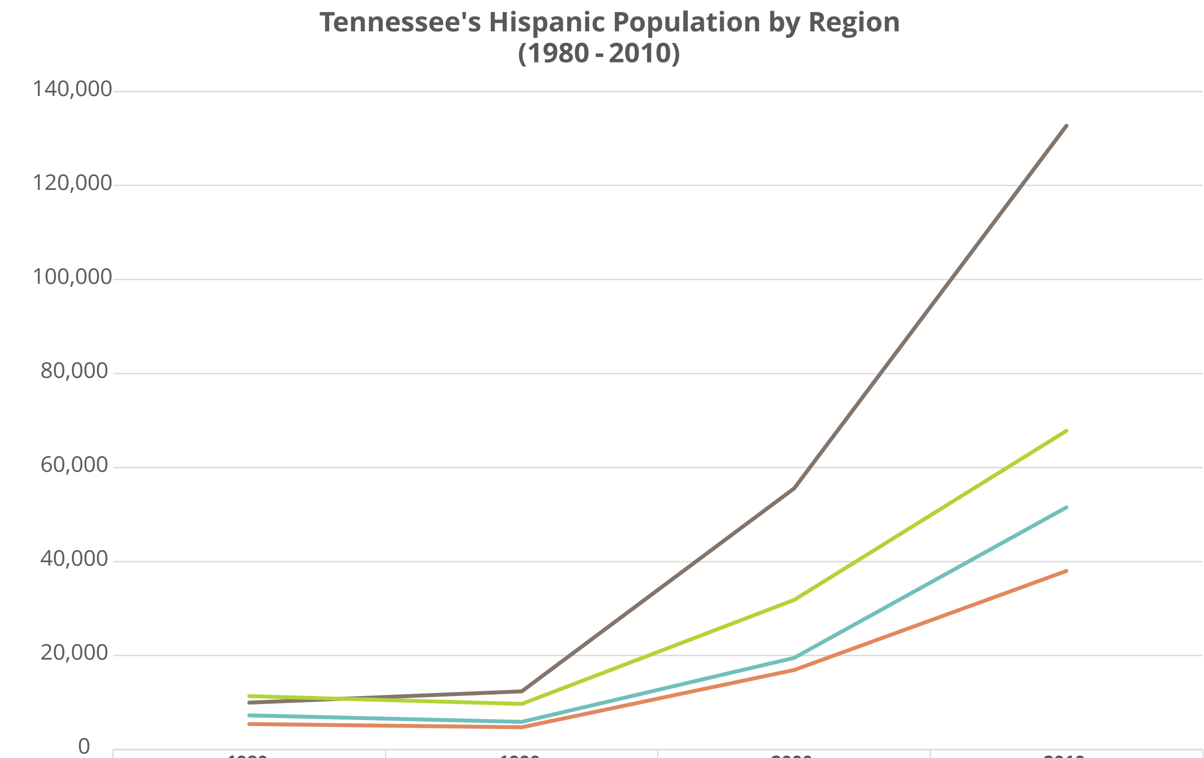
Figure 24 Racial Composition of TDOT Regions (1980 & 2010)

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 25. This increase is observed across all four TDOT Regions; however, as of the 2010 U.S. Census, the greatest change has occurred in TDOT Region 3 (Figure 26) with 132,688 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 2010.



Source: U.S. Census Bureau

Figure 25 Hispanic Populations in Tennessee (1980-2010)



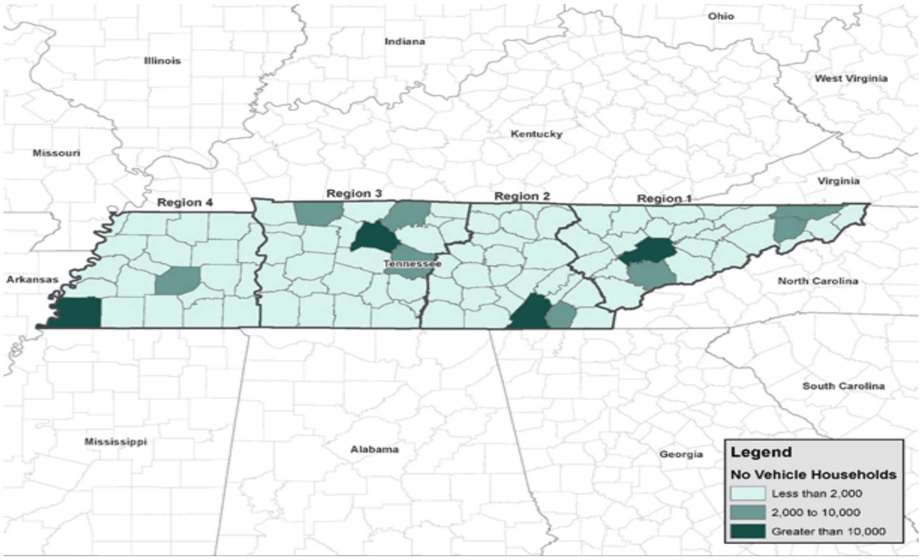
	1980	1990	2000	2010
Region 1	7,271	5,911	19,490	51,522
Region 2	5,450	4,750	16,953	38,023
Region 3	9,995	12,370	55,565	132,688
Region 4	11,361	9,710	31,830	67,826

Source: U.S. Census Bureau

Figure 26 Hispanic Populations by TDOT Region (1980-2010)

Environmental Justice (EJ) populations 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 2008-20125-Year Estimates at the Block Group level, minorities constituted approximately 23% of the State's population and low income populations constituted 17% of the overall statewide population. EJ populations for the State of Tennessee are mapped by U.S. Census Block Groups in Figure 27 in three categories: areas exceeding minority thresholds of 23%; areas exceeding low-income thresholds of 17%; 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 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 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.

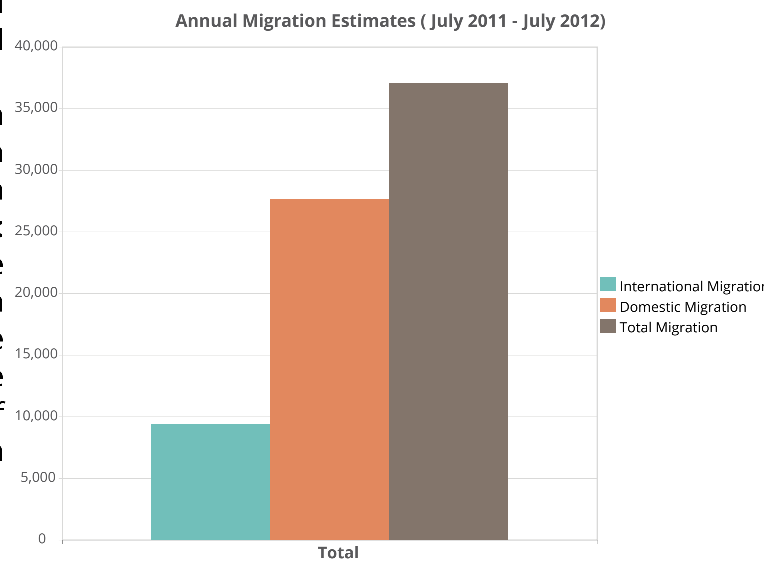


Source: American Community Survey 5 Year Estimates, 2008-2012

Figure 27 Tennessee Environmental Justice Communities

3.5 Migration

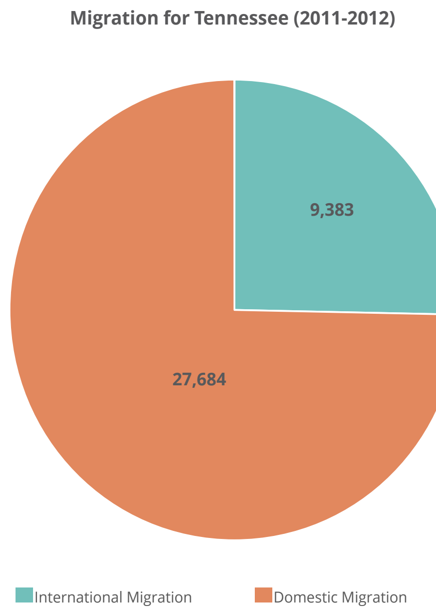
As shown in Figure 28, Tennessee realized a net population gain from domestic and international migration between 2011 and 2012. Net international migration includes the international migration of both native and foreign-born populations. Specifically, it includes: the net international migration of 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.



Source: U.S. Census Bureau

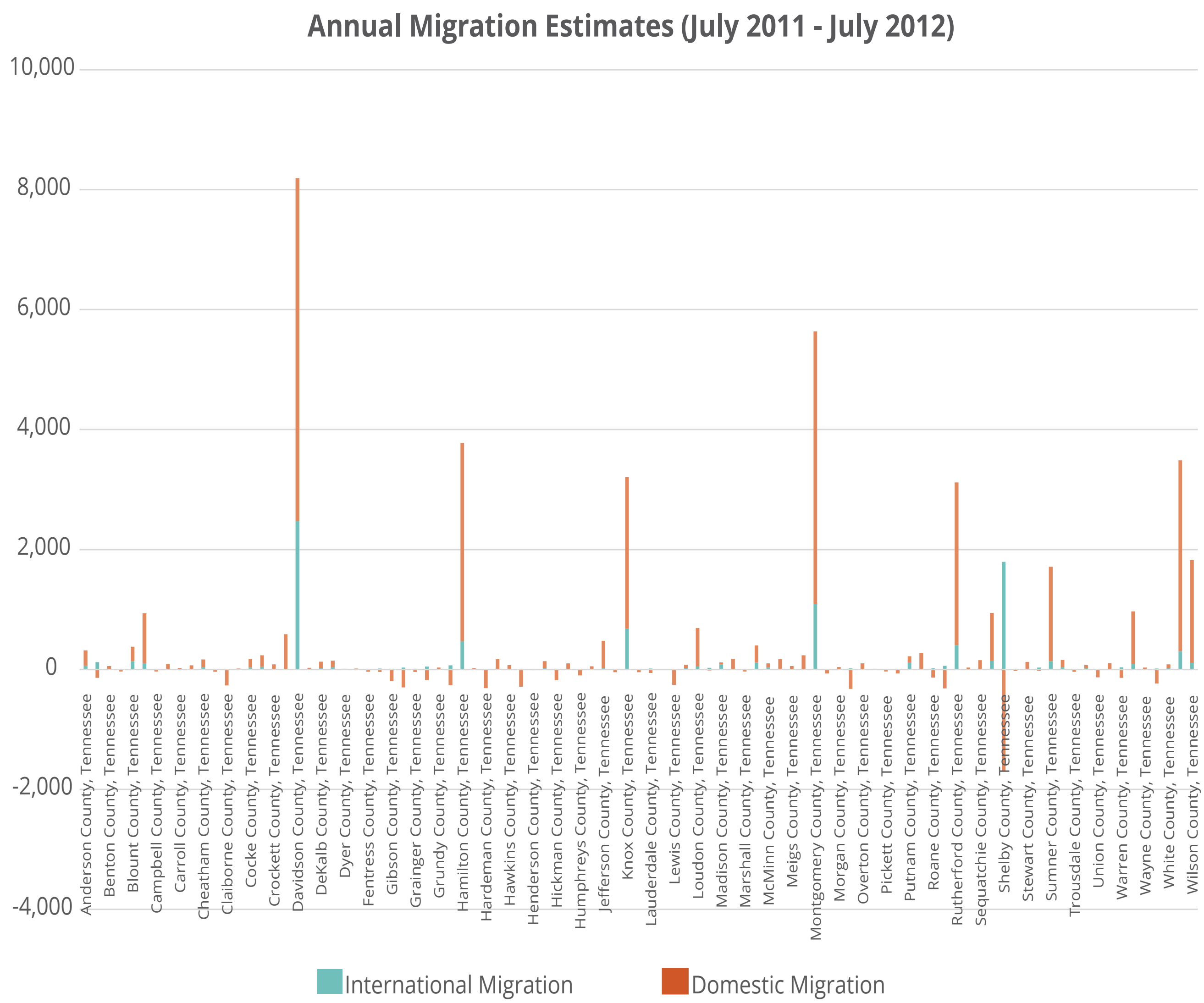
Figure 28 Population Gains from Migration

Approximately 75% of the increase came from domestic migration while international migrants made up 25% of the growth (Figure 29). However, migration has impacted county populations unevenly across the state. Figure 30 illustrates that while Davidson, Montgomery, and Hamilton counties have experienced significant population gains from domestic migration, Davidson County also saw a significant increase over the one-year period with international migration. Overall Davidson County had an international migratory population of 2,478 people and domestic migratory population of 5,716 people. Domestic migration typically outpaced international migration for all counties over the 2011-2012 timeframe except for Shelby County, where this trend was reversed. However, Shelby County lost 1,689 people due to domestic migration while 1,793 international migrants moved to the West Tennessee county. Assuming these trends continue, Tennessee's urban counties will continue to become more diverse over time.



Source: U.S. Census Bureau

Figure 29 International & Domestic Migration

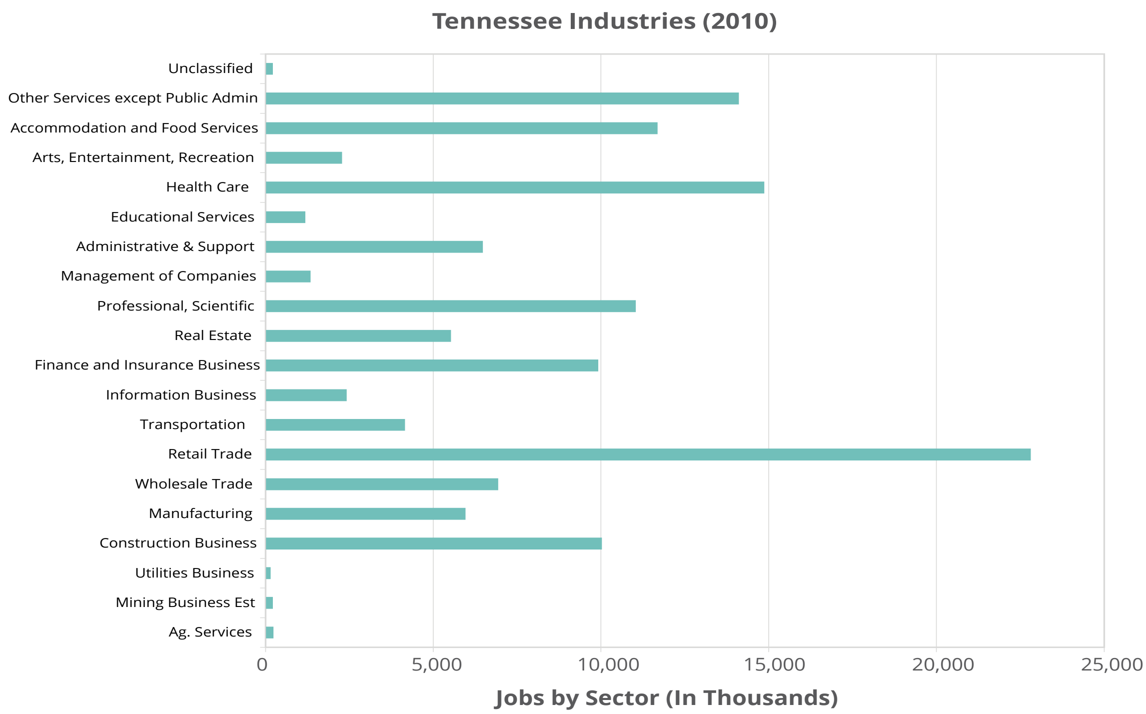


Source: U.S. Census Bureau

Figure 30 Net Migration by Tennessee County

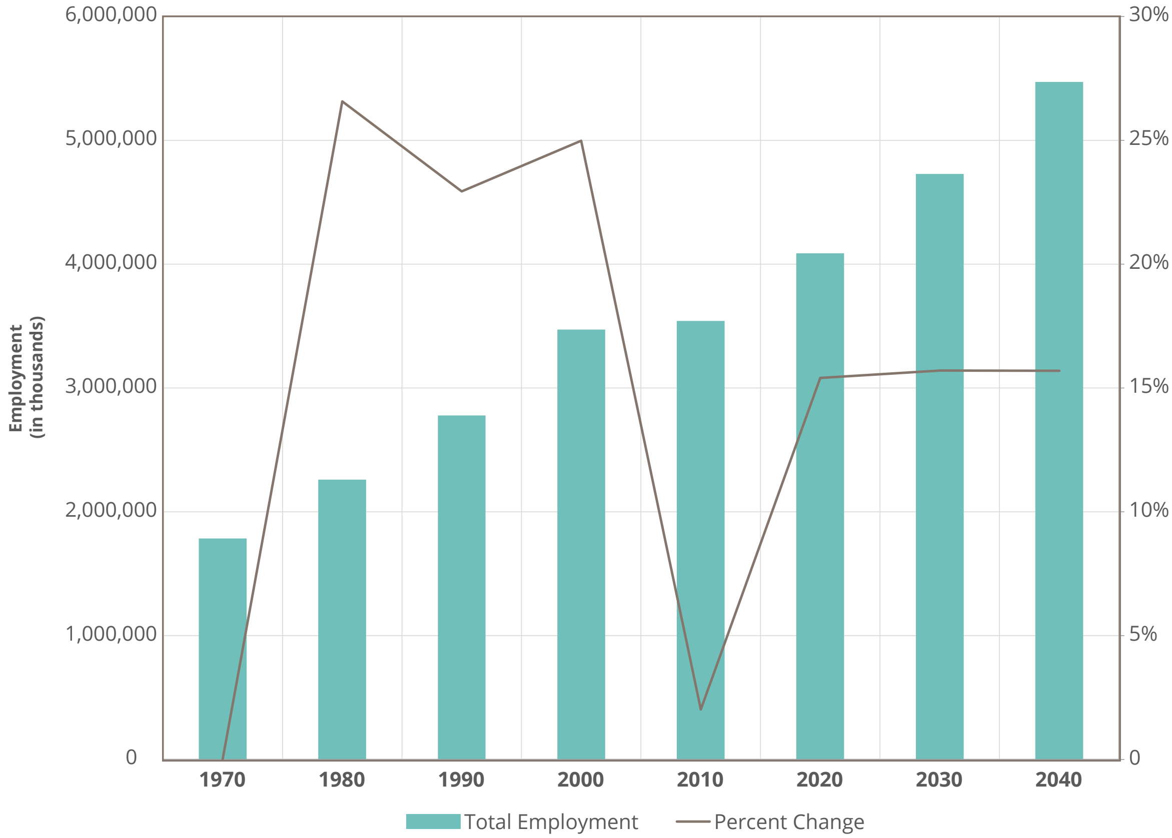
3.6 Employment

Woods and Poole reported total employment across all sectors as 3,541,416 for the State of Tennessee in 2010. Industry across the State is diverse with retail trade and health care leading all other employment sectors (Figure 31). Figure 32 shows the percent change in overall employment for each decade across the State from 1970; the percent change in employment growth between 2000 and 2010 is due to the economic recession that impacted the entire country. Figure 33 shows the split between urban and rural employment in Tennessee; as expected, urban employment projections are growing at a faster rate than rural employment.



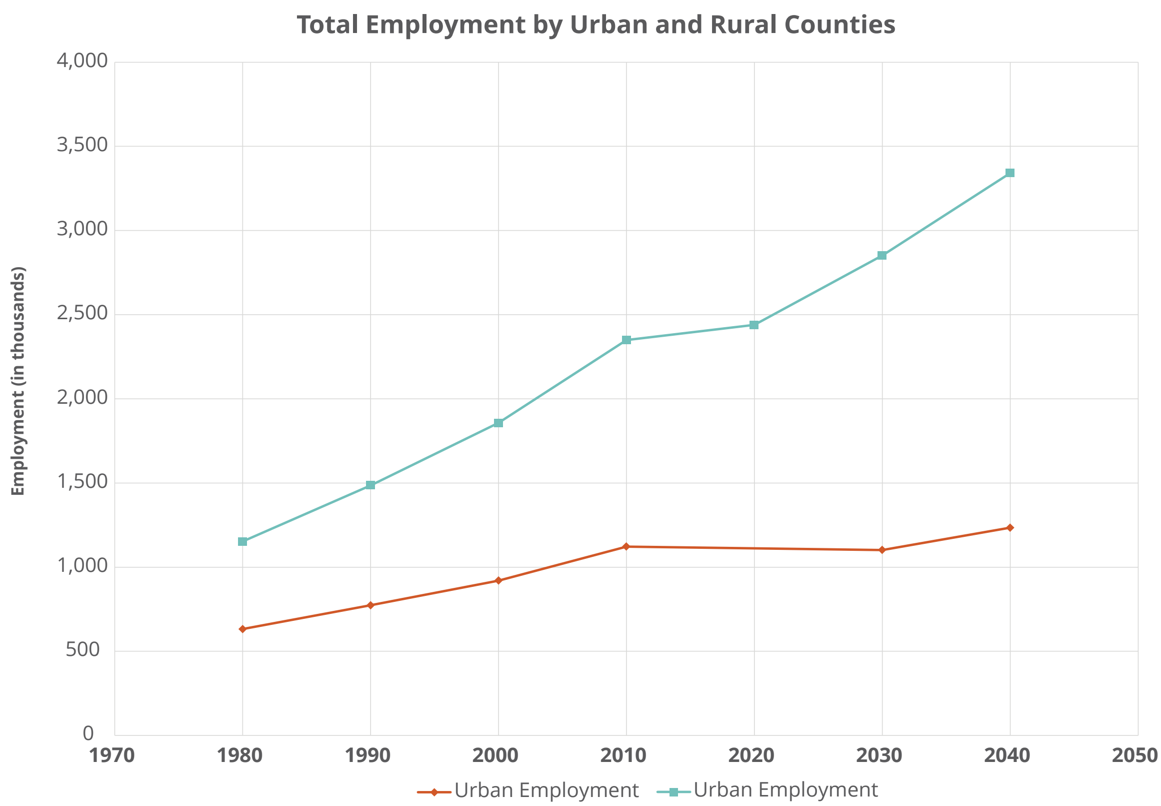
Source: Woods & Poole

Figure 31 Tennessee Industry Sectors (2010)



Source: U.S. Census; Woods & Poole

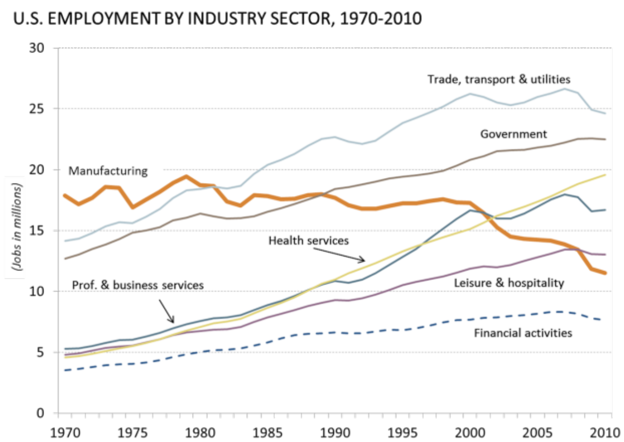
Figure 32 State of Tennessee Employment Growth (1970-2040)



Source: U.S. Census; Woods & Poole

Figure 33 State of Tennessee Urban and Rural Employment Growth (1970-2040)

3.6.1 Basic and Non-Basic Employment



Source: U.S. Bureau of Labor Statistics

Figure 34 U.S. Employment Trends (1970-2010)

One way to examine employment growth is to consider it in terms of basic and non-basic growth. 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. industry has shifted away from basic industries toward non-basic industrial activities over the past 40 years. The same trend has been observed within Tennessee's industrial composition. Current U.S. trends are shown in Figure 34.

The continuing national shift from a manufacturing economy to an increasingly service-oriented economy will enhance the role of non-basic jobs, markets, and activities in Tennessee to 2040.

The current top 10 counties for employment in the State of Tennessee are listed in Table 8. Shelby and Davidson Counties top the list and represent the two largest cities in the State, Memphis and Nashville. Knox and Hamilton Counties also represent the strong urban centers of Knoxville and Chattanooga in east Tennessee. Other counties in the top 10 include Rutherford and Williamson Counties that surround Nashville and Sullivan and Washington Counties which are located in the Tri-Cities area of East Tennessee (Figure 35).

Table 8 Top 10 Tennessee Counties for Employment (1980-2010) *Source: Woods and Poole*

County	1980	1990	2000	2010
Shelby	442,367	535,609	626,816	614,001
Davidson	323,844	417,236	532,062	535,261
Knox	177,211	218,869	269,736	295,429
Hamilton	171,379	193,045	237,145	234,341
Rutherford	34,965	63,121	104,710	130,798
Williamson	22,620	41,285	81,089	120,398
Sullivan	78,361	85,298	89,096	88,912
Washington	47,359	59,318	74,070	75,365
Madison	40,126	49,273	67,905	66,238
Montgomery	27,589	34,986	56,253	63,890

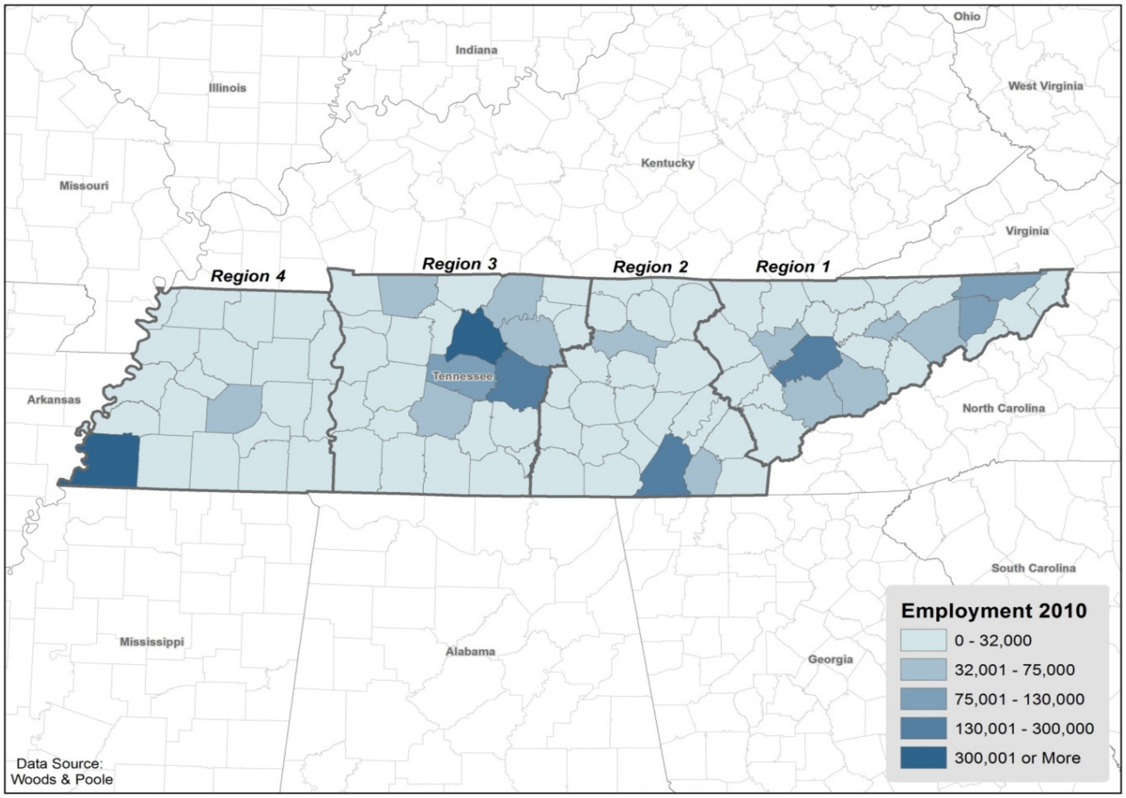
Between 1980 and 2010, Tennessee experienced employment growth of 57% to reach a total of 3,541,416 jobs. Employment growth in TDOT Region 3 outpaced other regions and most of those jobs have occurred in urban counties of the region. Statewide, employment growth has occurred at a higher rate in urban counties than in rural. A breakdown of employment growth since 1980 is provided in Table 9.

Table 9 Employment Change in Tennessee (1980-2010)

Geography	1980	1990	2000	2010	Percent Difference (1980-2010)
Statewide	2,259,219	2,777,431	3,471,267	3,541,416	57%
Rural Counties	744,424	884,796	1,071,253	1,085,180	46%
Urban Counties	1,514,795	1,892,635	2,400,014	2,459,236	62%
Region 1	578,190	706,010	855,925	883,365	53%
Rural Counties	206,902	257,272	310,309	346,566	68%
Urban Counties	371,288	448,738	545,616	536,799	44%
Region 2	379,416	449,755	547,672	539,229	42%
Rural Counties	176,506	217,086	262,179	257,626	39%
Urban Counties	202,910	232,669	285,493	281,603	39%
Region 3	630,256	825,520	1,131,086	1,207,073	92%
Rural Counties	172,152	199,174	256,902	249,478	45%
Urban Counties	458,104	626,346	874,184	957,595	109%
Region 4	671,357	796,146	936,584	911,749	36%
Rural Counties	188,864	211,264	241,863	231,510	23%
Urban Counties	482,493	584,882	694,721	680,239	41%

Source: Woods and Poole

The locations of counties with high and low employment numbers are shown in Figure 35. Shelby, Davidson, and Knox Counties all stand out as employment centers followed by adjacent suburban counties and then by more rural counties beyond that.

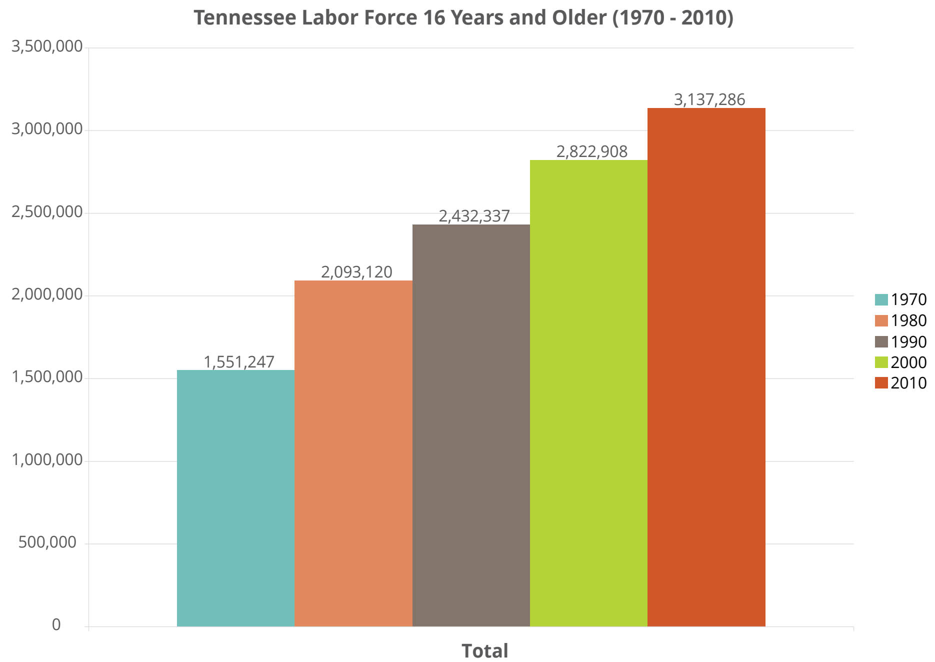


Source: Woods and Poole

Figure 35 2010 Employment by Tennessee County

3.6.2 Labor Force

The labor force has grown steadily across Tennessee since 1970 with current estimates at 3,137,286 members of the labor force over the age of 16 (Figure 36). The labor force is not distributed evenly across the State as seen in Figure 35; as an example, Davidson County in TDOT Region 3 has an estimated current labor force of 348,250 members of the population while Shelby County in TDOT's Region 4 leads the State with a labor force of 472,055 (Figure 37).



Source: U.S. Census Bureau and American Community Survey

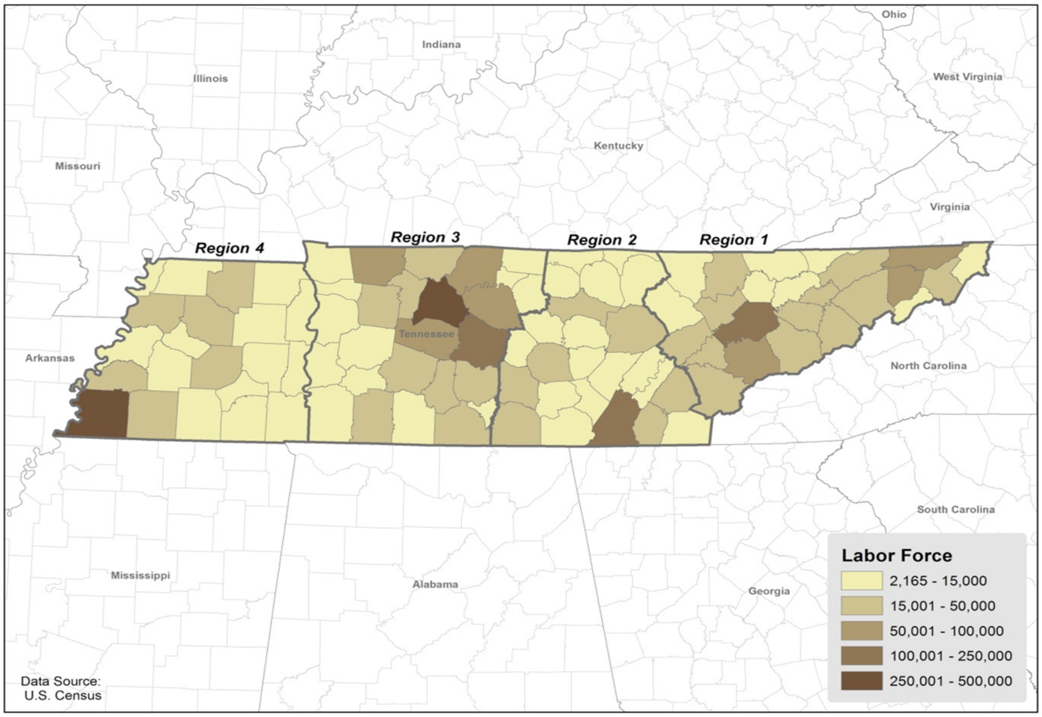
Figure 36 Tennessee Labor Force (1970-2010)

Table 10 Top 10 Tennessee Counties Labor Force (1980-2012)

County	1980	1990	2000	2012
Shelby	362,285	416,085	440,141	472,055
Davidson	242,332	279,305	307,653	348,250
Knox	150,862	173,515	197,352	226,871
Hamilton	135,017	142,832	157,919	175,398
Rutherford	40,937	64,199	101,245	143,509
Williamson	28,391	42,578	67,362	94,647
Montgomery	40,819	54,159	70,666	87,483
Sumner	40,204	54,248	68,565	83,203
Sullivan	64,970	69,733	71,474	72,825
Blount	33,985	41,934	52,693	61,206

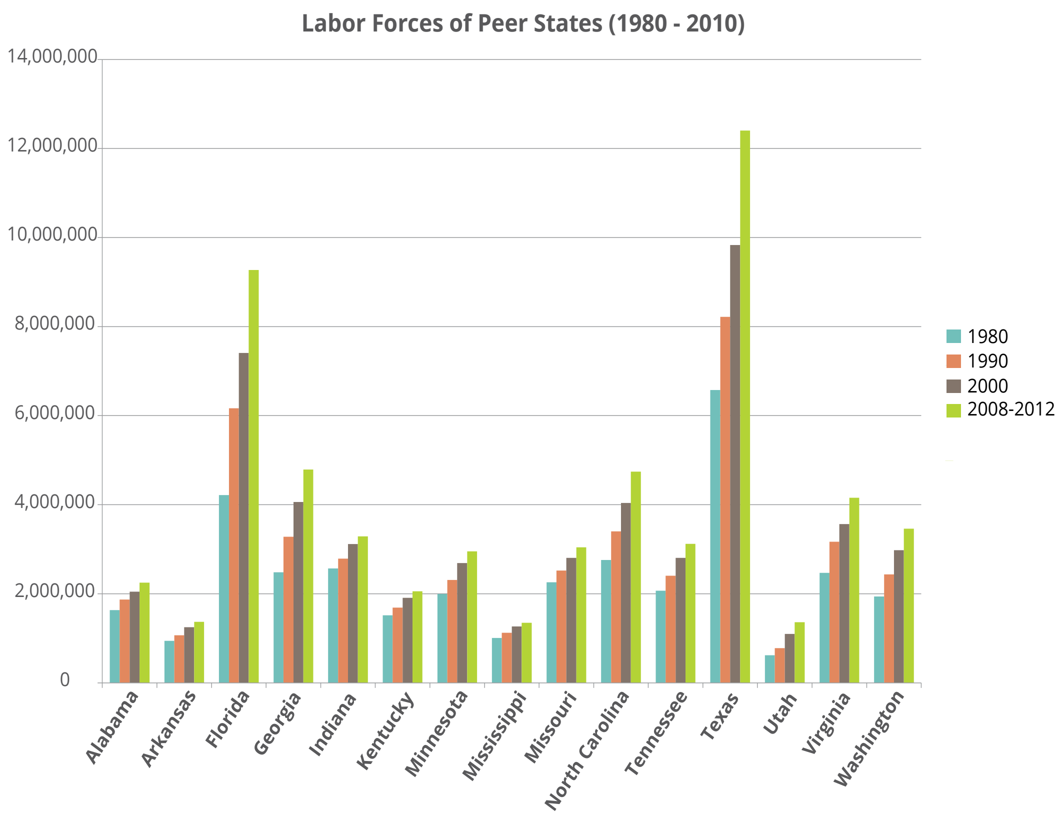
Source: U.S. Census Bureau and American Community Survey

Labor force estimates for Tennessee counties are shown in Figure 37. 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 38).



Source: U.S. Census Bureau

Figure 37 2008-2012 Labor Force (Ages 16 & Over) by Tennessee County



Source: U.S. Census and American Community Survey

Figure 38 Labor Force Comparison of Surrounding and Peer States

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 Area in the U.S. for every year from 1970 to 2040. 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 2040.

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 39. 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 39 were chosen to align with those identified as peers in TDOT's 2013 Customer Survey, as they were similar to Tennessee in the areas of geographic size, demographics, growth trends, and/or DOT practices.

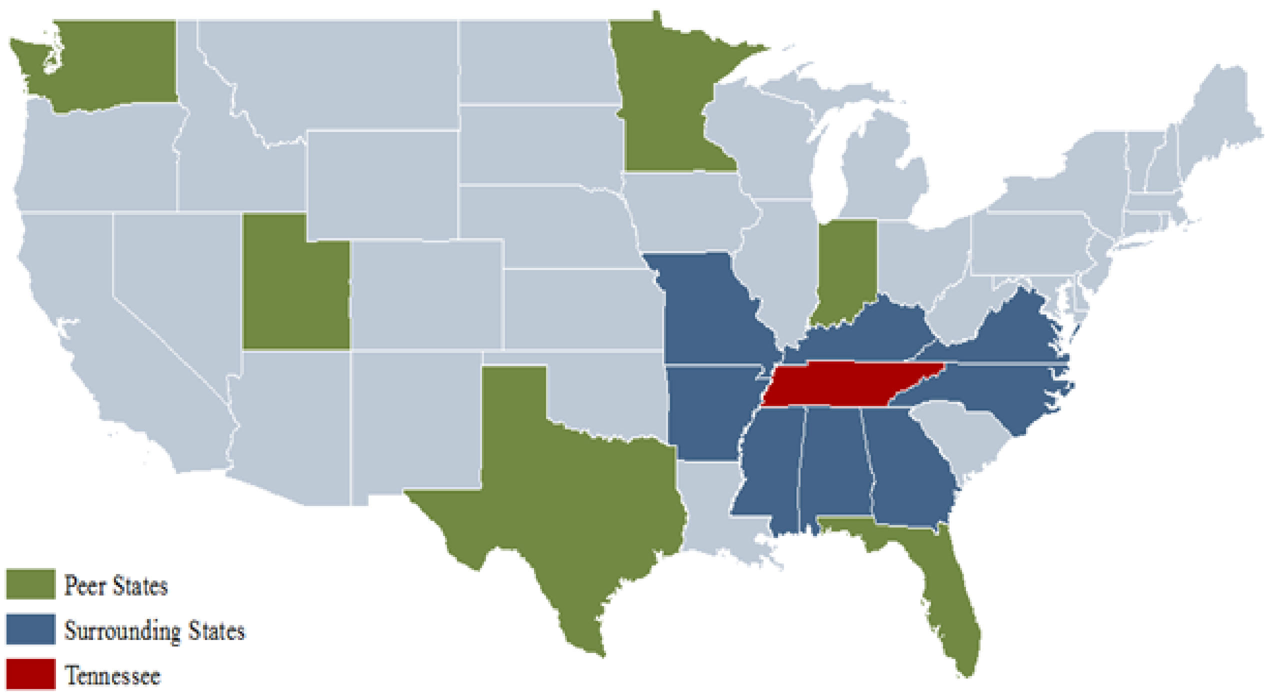


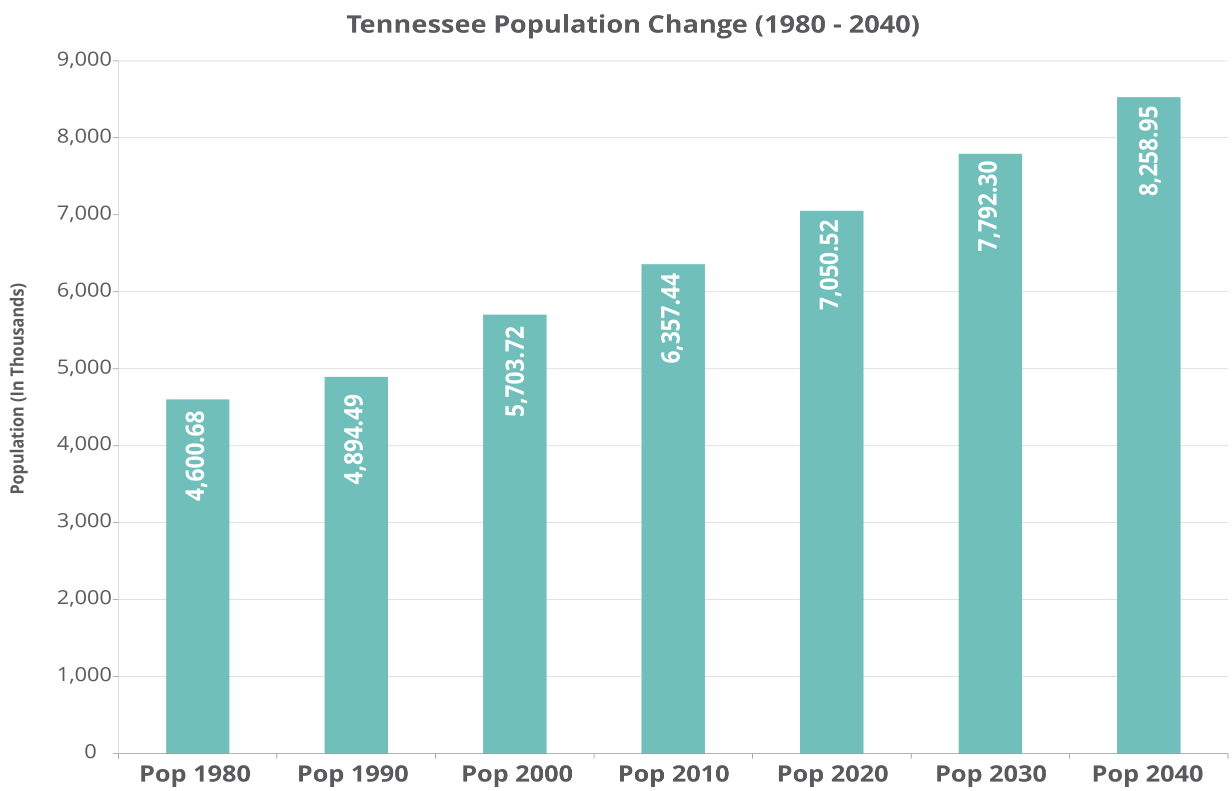
Figure 39 Surrounding and Peer States

section 4

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 and employment over the next 25 years (Figure 40).

Tennessee's population is projected to increase over 34% over the next 25 years from 6,357,436 in 2010 to 8,528,963 in 2040 (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 41). Of interesting note is that Tennessee's population is projected to exceed Indiana's population in 2040 even though Indiana had a higher population than Tennessee in 2010.



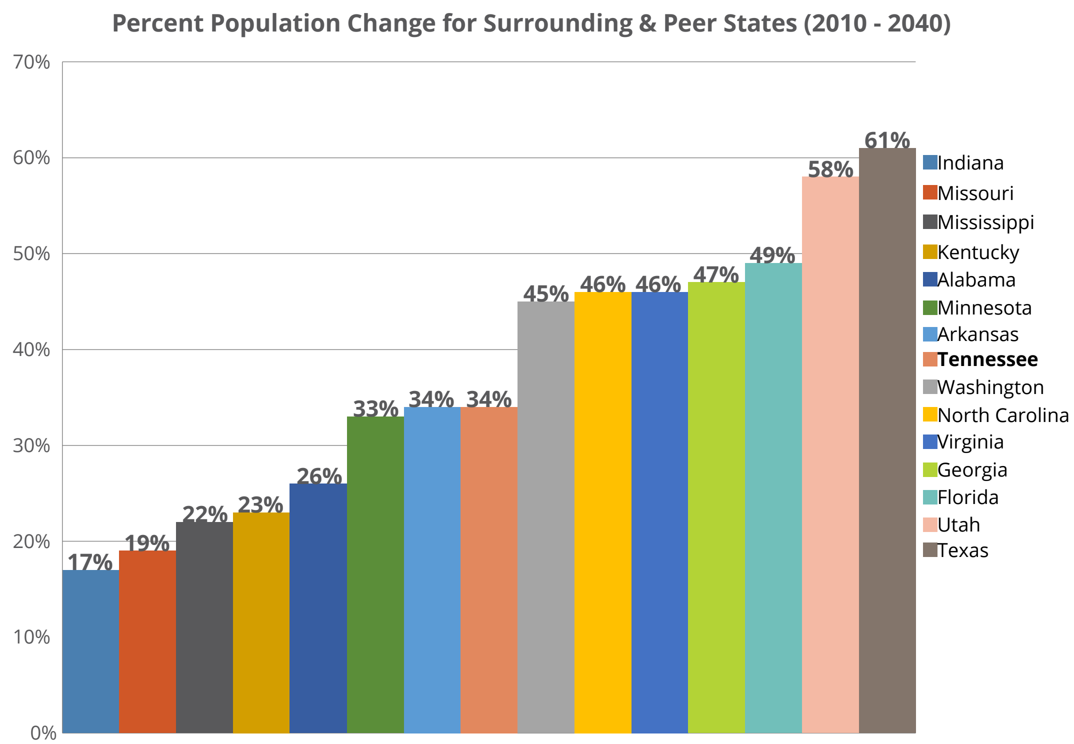
Source: Woods & Poole

Figure 40 Historic and Projected Population Change in Tennessee (1980-2040)

Table 11 Population Growth for Tennessee and Surrounding and Peer States

Geography	2010 Population	2040 Population	Percent Change
Alabama	4,785,401	6,036,359	26%
Arkansas	2,921,588	3,920,913	34%
Florida	18,838,613	28,142,123	49%
Georgia	9,712,157	14,250,586	47%
Indiana	6,490,622	7,623,635	17%
Kentucky	4,347,223	5,334,001	23%
Minnesota	5,310,658	7,042,883	33%
Mississippi	2,970,072	3,609,760	22%
Missouri	5,995,715	7,159,350	19%
North Carolina	9,560,234	13,974,924	46%
Tennessee	**6,357,436**	**8,528,963**	**34%**
Texas	25,253,466	40,649,303	61%
Utah	2,775,479	4,397,135	58%
Virginia	8,023,953	11,737,611	46%
Washington	6,742,950	9,774,191	45%

Source: Woods & Poole

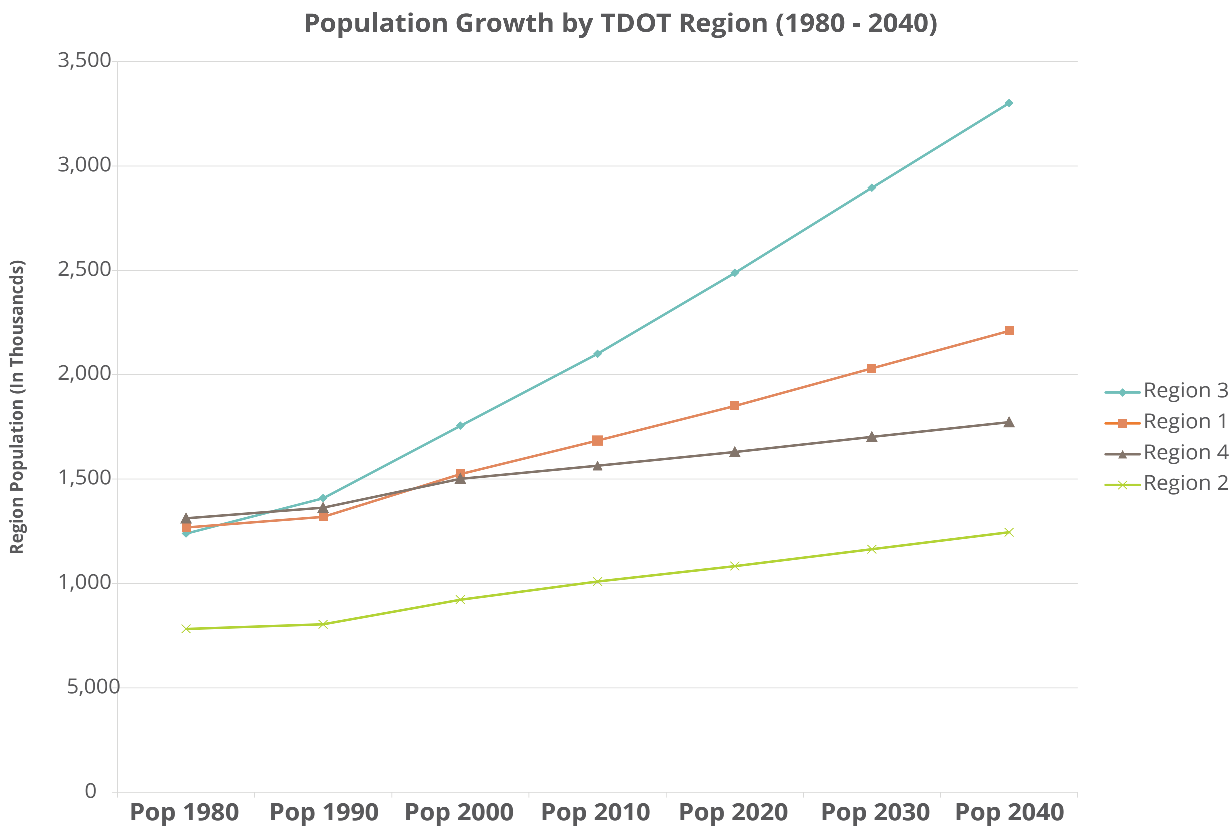


Source: Woods & Poole

Figure 41 Percent Population Change for Surrounding and Peer States (2010-2040)

4.2 Population Change by TDOT Region

Population by TDOT Region is projected to change significantly over the next 25 years (Figure 42). Region 4, which was the largest by population in 1980, falls to third behind Regions 3 and 1 in 2010. Region 3 is forecasted to grow at a much higher rate than other regions and by 2040 will be more populous then Regions 2 and 4 combined (Table 12). Nearly 55% 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 42 Tennessee Population Growth by TDOT Region (1980-2040)

Table 12 Tennessee Population Change by TDOT Region (1980-2040)

Year	Region 1	Region 2	Region 3	Region 4	Statewide
1980	1,268,051	782,012	1,238,906	1,311,715	4,600,684
1990	1,319,265	804,011	1,408,333	1,362,883	4,894,492
2000	1,524,266	922,516	1,755,436	1,501,501	5,703,719
2010	1,684,265	1,009,135	2,100,053	1,563,983	6,357,436
2020	1,850,183	1,083,127	2,487,566	1,629,646	7,050,522
2030	2,030,770	1,163,967	2,895,816	1,701,746	7,792,299
2040	2,209,713	1,245,208	3,301,492	1,772,550	8,528,963

Source: Woods & Poole

4.3 Population Change by Tennessee County

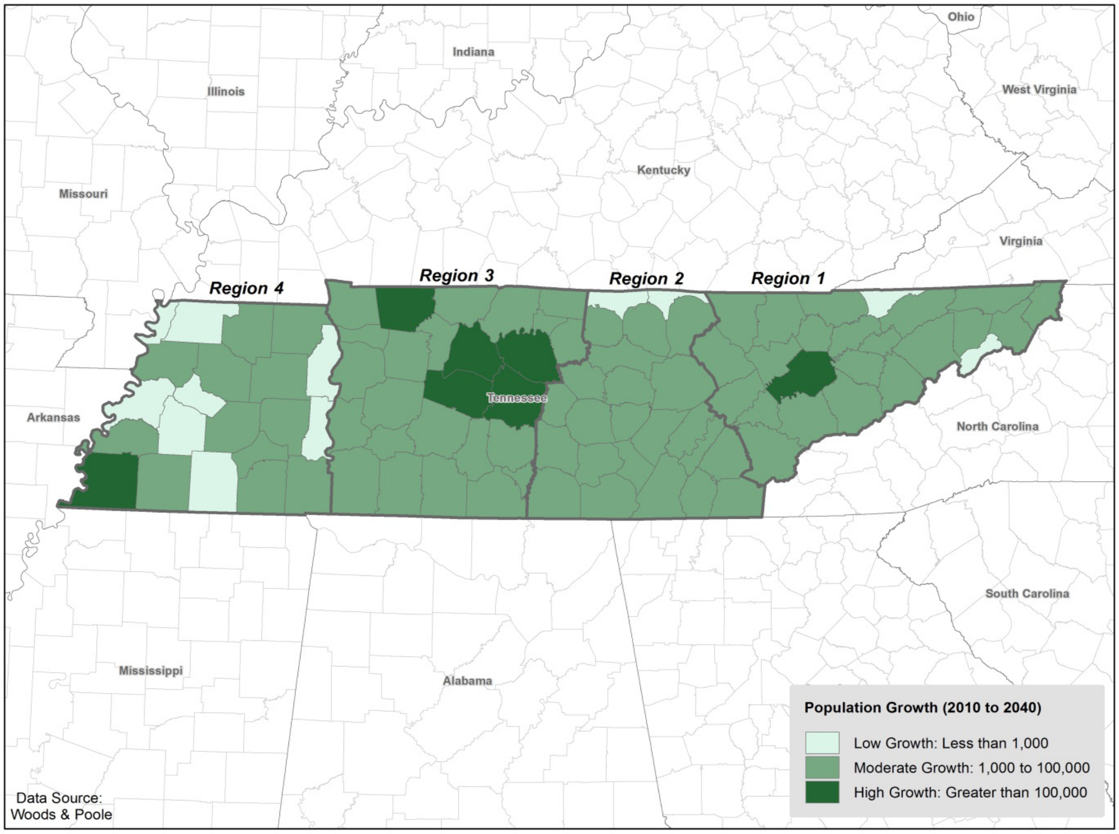
Projections estimate that Tennessee's population will grow by 2,171,527 between 2010 and 2040. Population change is illustrated in Figure 43 at the county level. Based on projections from Woods & Poole, Shelby, Davidson, Rutherford, and Knox Counties will see the greatest amount of population growth and many rural counties will grow at about half the rate as urban counties from 2010 to 2040. 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 (62% to 64% urban and 38% to 36% rural), 70% of the projected population growth is forecasted to occur in urban counties.

Table 13 Tennessee Population Growth Forecast (2010-2040)

Geography	2010	2020	2030	2040	Total Population Change (2010-2040)	Percent Change (2010-2040)
Statewide	6,357,436	7,050,522	7,792,299	8,528,963	2,171,527	34%
Rural Counties	2,412,213	2,603,864	2,820,594	3,035,434	623,221	26%
Urban Counties	3,945,223	4,446,658	4,971,705	5,493,529	1,548,306	39%
Region 1	1,684,265	1,850,183	2,030,770	2,209,713	525,448	31%
Rural Counties	727,811	802,010	884,645	966,556	238,745	33%
Urban Counties	956,454	1,048,173	1,146,125	1,243,157	286,703	30%
Region 2	1,009,135	1,083,127	1,163,967	1,245,208	236,073	23%
Rural Counties	572,697	623,476	680,561	737,426	164,729	29%
Urban Counties	436,438	459,651	483,406	507,782	71,344	16%
Region 3	2,100,053	2,487,566	2,895,816	3,301,492	1,201,439	57%
Rural Counties	574,972	622,119	674,903	727,176	152,204	26%
Urban Counties	1,525,081	1,865,447	2,220,913	2,574,316	1,049,235	69%
Region 4	1,563,983	1,629,646	1,701,746	1,772,550	208,567	13%
Rural Counties	536,733	556,259	580,485	604,276	67,543	13%
Urban Counties	1,027,250	1,073,387	1,121,261	1,168,274	141,024	14%

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 account for nearly 70% 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. In addition to growth within urban areas of Tennessee, there are four rural counties that are anticipated to cross the threshold for 100,000 in population by 2040; these counties are Maury, Putnam, Robertson, and Sevier.



Source: Woods & Poole

Figure 43 2010-2040 Population Growth by Tennessee County

Williamson and Rutherford Counties, located in Region 3 and south of Davidson County, are forecasted to more than double in population by 2040 and rank as the fastest growing counties in terms of percent change and absolute growth. Wilson County, located directly east of Davidson County is projected to nearly double over the same span of time.

Table 14 Top 10 Tennessee Counties for Population Growth (2010-2040)

County	Population Change	Percent Change	TDOT Region
Williamson	296,007	161%	3
Rutherford	271,240	103%	3
Knox	169,108	39%	1
Davidson	167,278	27%	3
Montgomery	129,515	75%	3
Shelby	114,198	12%	4
Wilson	107,930	94%	3
Sumner	77,195	48%	3
Sevier	64,262	71%	1
Hamilton	49,576	15%	2

Source: Woods & Poole

4.4 Age Group Distribution Change

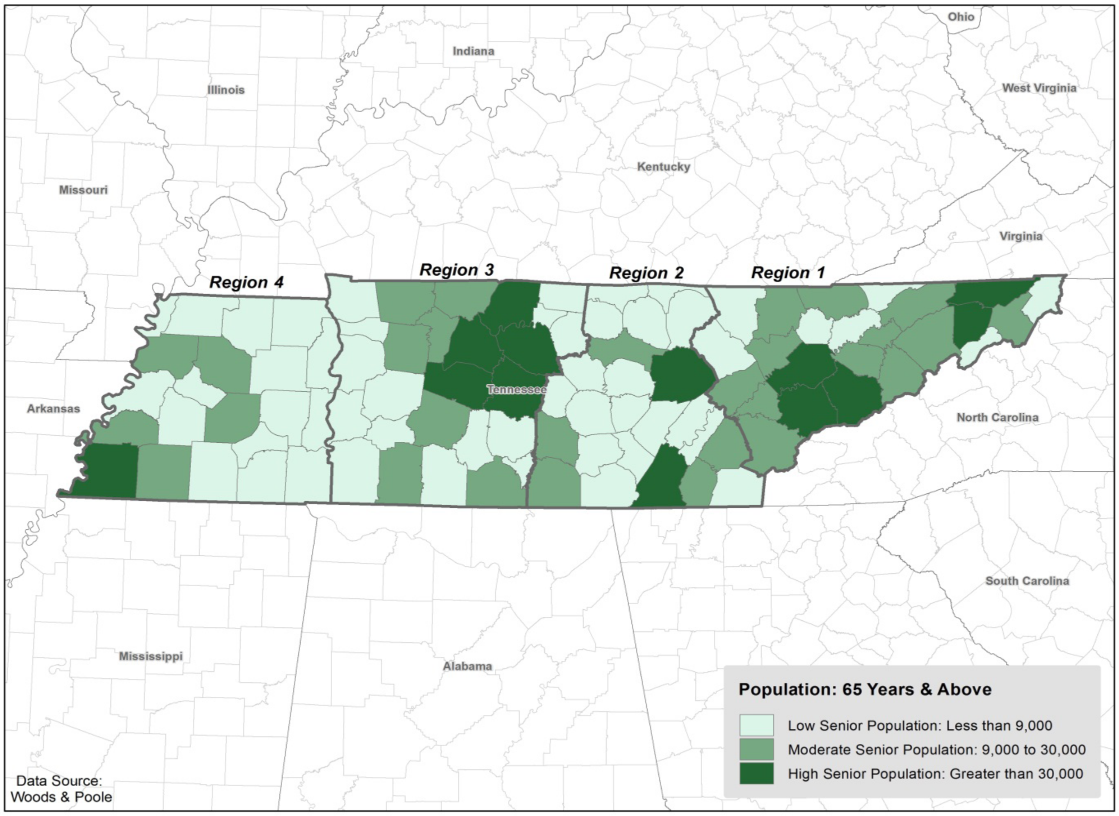
Over the next 25 years, Tennessee will see an increase in the percentage of the population over the age of 65 as shown in Figure 44, Figure 45, and Figure 46. In addition to Tennessee's current population, which is aging, this increase may occur, in part because retirees are relocating to Sunbelt States. Bankrate.com recently listed Tennessee as the top state for retirees 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 is forecasted to be Region 3 with 521,749. This would be an increase of 122% from the 2010 senior population of Region 3. This means that 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. These age groups represent new drivers, college students, as well as those entering the workforce (Figure 46).

Table 15 Tennessee Senior Population (65+) Change (2010–2040)

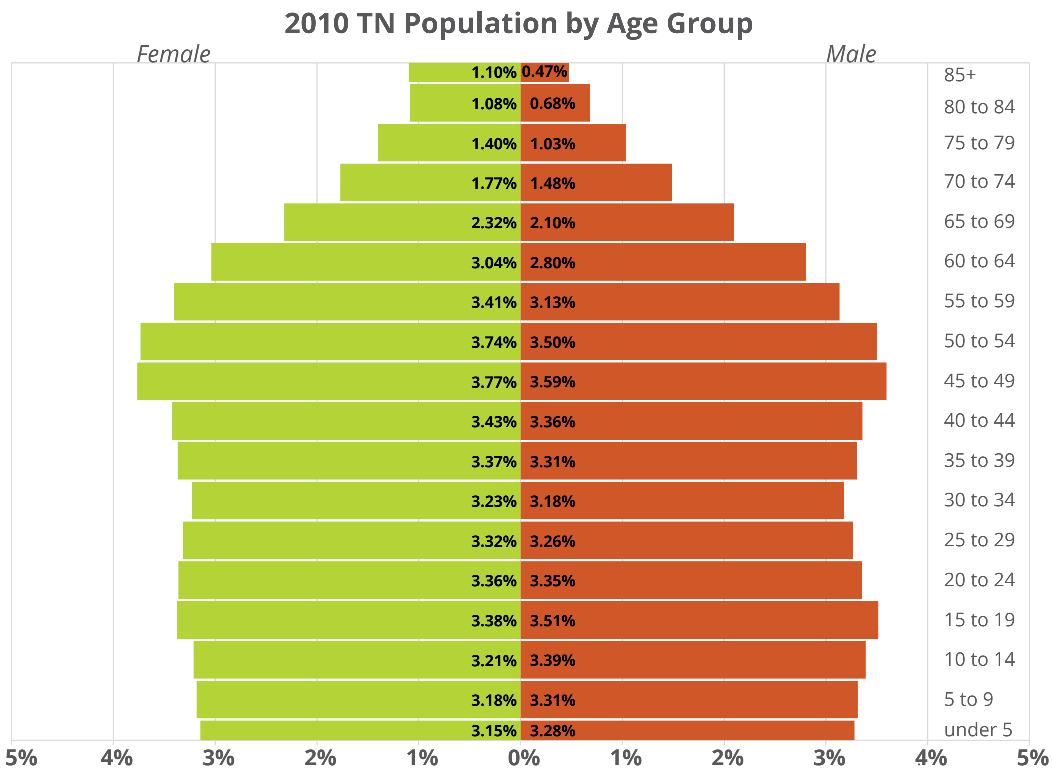
Geography	2010	2020	2030	2040	Senior Population Change (2010-2040)	Percent Change (2010-2040)
Statewide	858,322	1,166,514	1,488,370	1,633,586	775,264	90%
Rural Counties	395,863	526,500	654,506	709,939	314,076	79%
Urban Counties	462,459	640,014	833,864	923,647	461,188	100%
Region 1	268,445	363,689	460,523	517,943	249,498	93%
Rural Counties	123,713	171,848	219,109	249,703	125,990	102%
Urban Counties	144,732	191,841	241,414	268,240	123,508	85%
Region 2	162,693	214,872	263,374	284,083	121,390	75%
Rural Counties	98,972	130,950	158,771	170,308	71,336	72%
Urban Counties	63,721	83,922	104,603	113,775	50,054	79%
Region 3	234,976	339,869	461,554	521,749	286,773	122%
Rural Counties	81,149	107,260	134,027	140,581	59,432	73%
Urban Counties	153,827	232,609	327,527	381,168	227,341	148%
Region 4	192,208	248,084	302,919	309,811	117,603	61%
Rural Counties	92,029	116,442	142,599	149,347	57,318	62%
Urban Counties	100,179	131,642	160,320	160,464	60,285	60%

Source: Woods & Poole



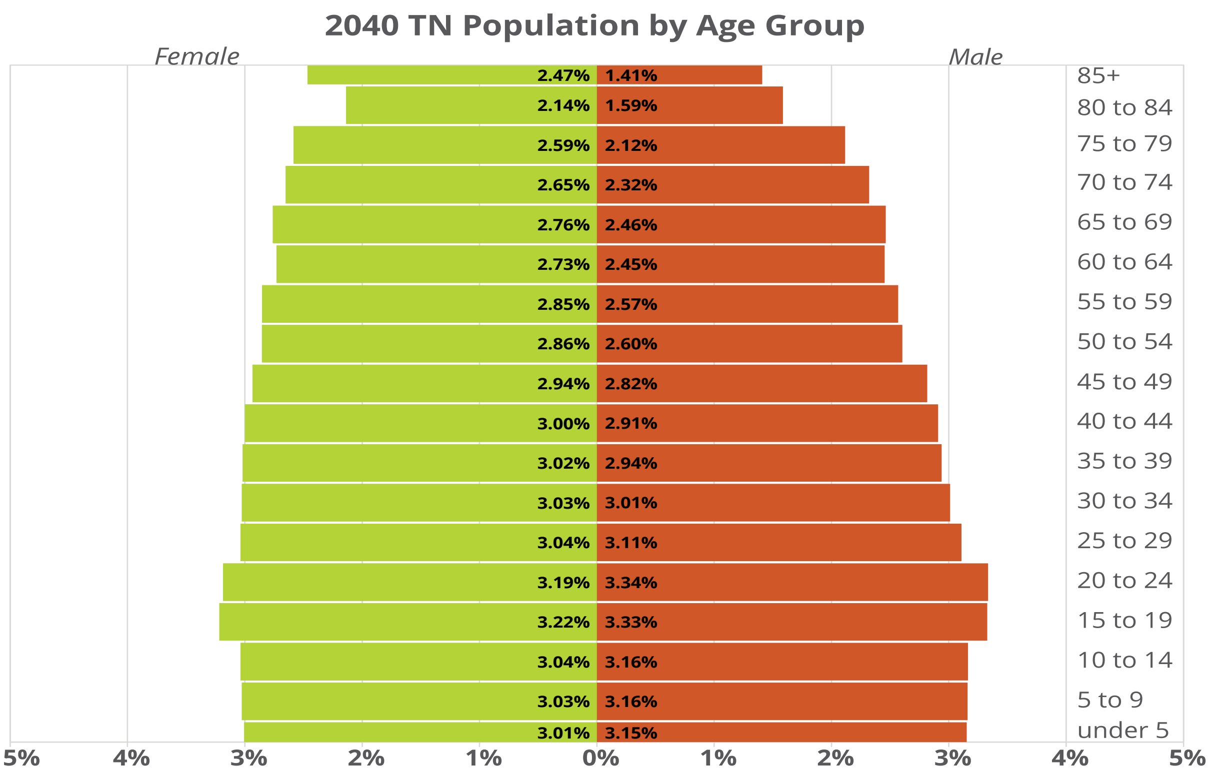
Source: Woods & Poole

Figure 44 2040 Senior Population (65+) by Tennessee County



Source: Tennessee State Data Center, UTCBER, August 2013

Figure 45 2010 Tennessee Population by Age Group



Source: Tennessee State Data Center, UTCBER, August 2013

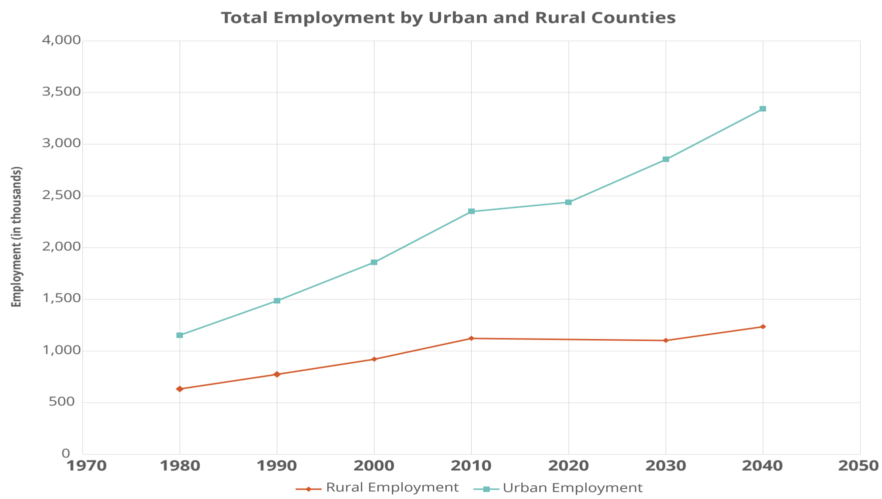
Figure 46 2040 Tennessee Population by Age Group

By comparing the 2010 and 2040 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.

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 47, Figure 48, and Table 16).

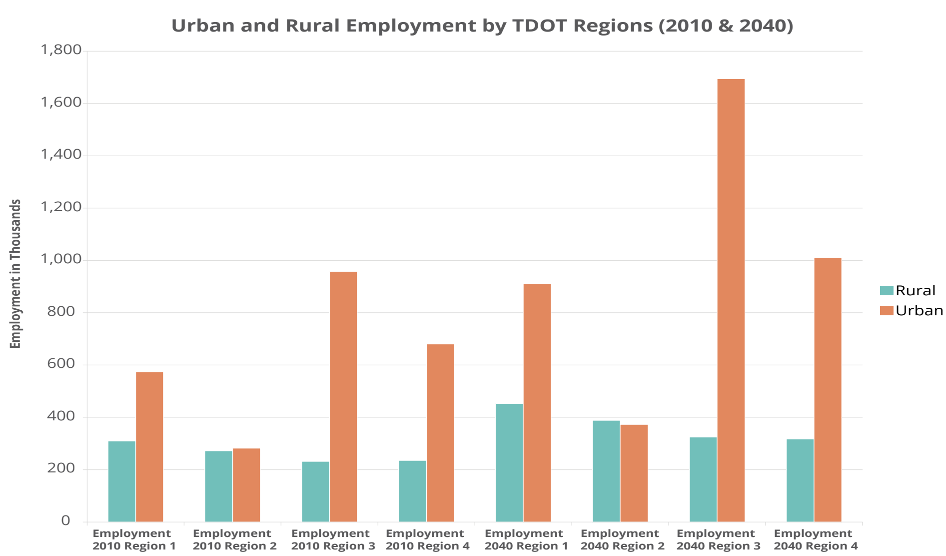
When viewed at the level of TDOT Regions and at a Metropolitan Planning Area (i.e. MPO planning area), it becomes evident that while employment growth is occurring statewide, there are focused areas of higher growth. The area of greatest growth is focused in the counties around Davidson County as shown in Figure 49.



Source: Woods & Poole

Figure 47 Historic and Projected Total Employment by Tennessee Urban and Rural Counties

Table 17 shows the top 10 counties in Tennessee for future employment growth.The employment growth in TDOT Region 1 can be attributed to the urban counties in the Knoxville area. An interesting difference is evident with TDOT Region 2 that shows a greater amount of employment growth in rural areas than urban. Region 2 is perhaps the least urbanized of the TDOT Regions.



Source: Woods & Poole

Figure 48 Urban and Rural Employment by TDOT Region (2010-2040)

section 4

Table 16 Tennessee Employment Growth Forecast (2010-2040)

Geography	2010	2020	2030	2040	Percent Difference (2010-2040)
Statewide	3,541,416	4,086,873	4,728,765	5,470,861	54%
Rural Counties	1,085,180	1,213,684	1,361,637	1,531,980	41%
Urban Counties	2,459,236	2,873,189	3,367,108	3,938,881	60%
Region 1	883,365	1,019,560	1,177,517	1,363,412	54%
Rural Counties	346,566	391,169	442,061	501,822	45%
Urban Counties	536,799	628,391	735,456	861,590	61%
Region 2	539,229	600,486	666,810	739,595	37%
Rural Counties	257,626	291,174	327,122	367,109	42%
Urban Counties	281,603	309,312	339,688	372,486	32%
Region 3	1,207,073	1,435,839	1,712,312	2,042,936	69%
Rural Counties	249,478	279,235	311,878	348,349	40%
Urban Counties	957,595	1,156,604	1,400,434	1,694,587	77%
Region 4	911,749	1,030,988	1,172,126	1,324,919	45%
Rural Counties	231,510	252,106	280,576	314,700	36%
Urban Counties	680,239	778,882	891,550	1,010,218	49%

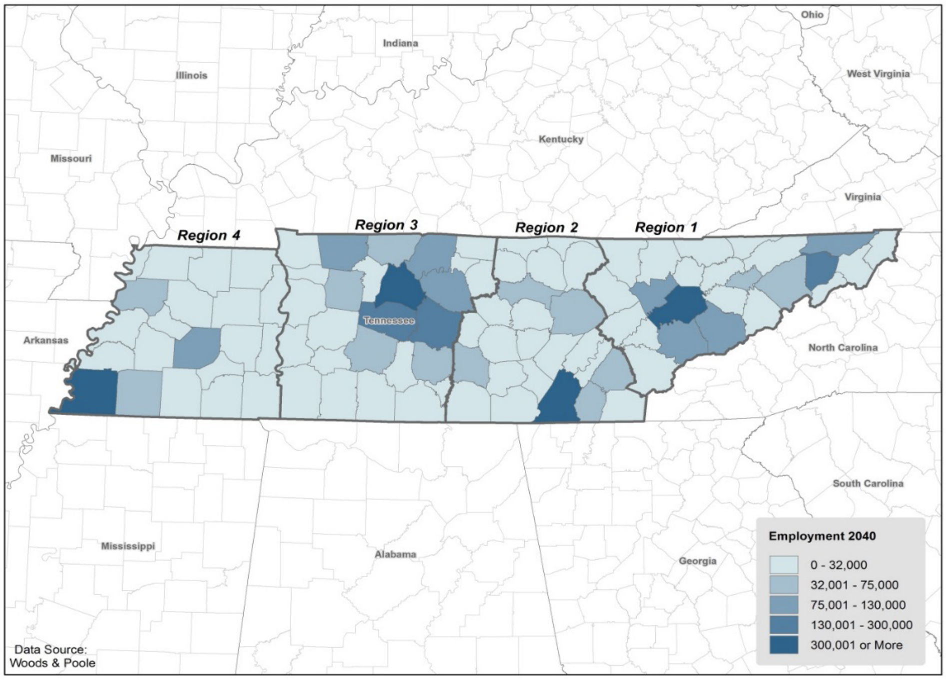
Source: Woods & Poole

Table 17 Top 10 Tennessee Counties for Employment Growth (2040)

County	2010	2020	2030	2040	Absolute Difference (2010-2040)	Percent Difference (2010-2040)
Williamson	120,398	159,365	215,165	289,297	168,899	140%
Wilson	52,417	65,364	81,665	102,059	49,642	95%
Rutherford	130,798	163,000	202,933	251,526	120,728	92%
Montgomery	63,890	76,931	94,886	116,614	52,724	83%
Washington	75,365	89,524	109,787	135,765	60,400	80%
Knox	295,429	352,130	416,664	491,883	196,454	66%
Davidson	535,261	627,282	730,397	847,692	312,431	58%
Shelby	614,001	704,826	808,293	917,549	303,548	49%
Hamilton	234,341	256,849	280,182	305,196	70,855	30%
Sullivan	88,912	96,530	104,380	112,548	23,636	27%

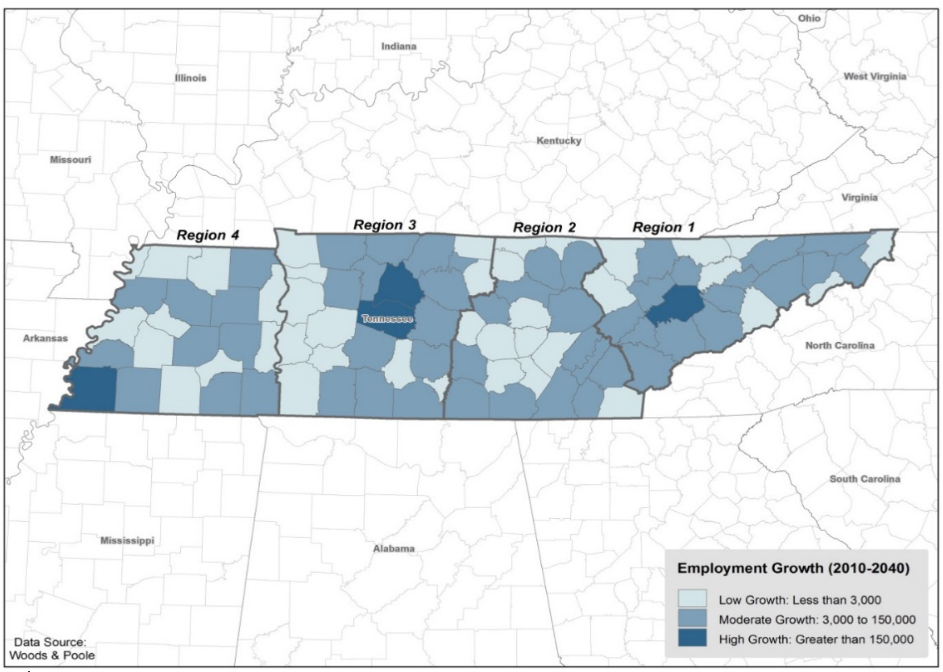
Source: Woods & Poole

Absolute employment growth from 2010 to 2040 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 positions. These counties are Shelby, Williamson, Davidson, and Knox. Figure 50 shows the change in employment for each county over this same time period.



Source: Woods & Poole

Figure 49 Tennessee Employment 2040



Source: Woods & Poole

Figure 50 Employment Change (2010-2040)

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 2010 and 2040. This balance refers to the distribution of employment relative to the distribution of workers 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 of the state and the urban area of Region 3 will have more population growth than economic 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

	2010		2040		Change in Population	Change in Employment	Jobs per Person Change
	Population	Employment	Population	Employment			
Statewide	6,357,436	3,541,416	8,528,963	5,470,861	2,171,527	1,929,445	0.89
Rural Counties	2,412,213	1,085,180	3,035,434	1,531,980	623,221	446,800	0.72
Urban Counties	3,945,223	2,459,236	5,493,529	3,938,881	1,548,306	1,479,645	0.96
Region 1	1,684,265	883,365	2,209,713	1,363,412	525,448	480,047	0.91
Rural Counties	727,811	346,566	966,556	501,822	238,745	155,256	0.65
Urban Counties	956,454	536,799	1,243,157	861,590	286,703	324,791	1.13
Region 2	1,009,135	539,229	1,245,208	739,595	236,073	200,366	0.85
Rural Counties	572,697	257,626	737,426	367,109	164,729	109,483	0.66
Urban Counties	436,438	281,603	507,782	372,486	71,344	90,883	1.27
Region 3	2,100,053	1,207,073	3,301,492	2,042,936	1,201,439	835,863	0.70
Rural Counties	574,972	249,478	727,176	348,349	152,204	98,871	0.65
Urban Counties	1,525,081	957,595	2,574,316	1,694,587	1,049,235	736,992	0.70
Region 4	1,563,983	911,749	1,772,550	1,324,919	208,567	413,170	1.98
Rural Counties	536,733	231,510	604,276	314,700	67,543	83,190	1.23
Urban Counties	1,027,250	680,239	1,168,274	1,010,218	141,024	329,979	2.34

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 public transportation 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 counties of Davidson and Shelby. The concentration of employment opportunities in urban counties such as these will likely impact daily commutes from adjacent communities.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Understanding this forecasted scenario, 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 2.1 million people over the next 25 years, growth which will bring 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.

As illustrated, Tennessee's 2040 population will be comprised of a great portion of system users over the age of 65, meaning that their mobility needs may be different than other groups of the population. 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. The American Association of Retired Persons (AARP) report "How the Travel Patterns of Older Adults Are Changing" states that older travelers will ultimately change the landscape of transportation in the years to come and concludes that transportation planners and policymakers must adapt to this shift.

In addition to the older population, the younger population aged 16 to 34 will also have an impact on the desired services, particularly in urban areas where these system users often choose to reside. Oftentimes, younger generations share some transportation preferences with their older counterparts as they may seek alternative modes of transportation beyond the automobile. The U.S. Public Interest Research Group reported in a publication titled "Transportation and the New Generation" that among the 16 to 34 year old age group, vehicle miles traveled by driving was down 23% nationally from 2001 to 2009. During the same time span, the number of bicycle trips for this age group increased by 24%. 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 desire 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.

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.

To accompany the expected population growth, employment is also expected to increase within Tennessee by approximately 1.9 million more jobs by 2040. Similar to population growth, all counties and areas of the state will not see the economic benefits of these job opportunities. Most the employment growth is expected to occur within Regions 3 and 4 surrounding Nashville and Memphis.

One of the key issues that TDOT will be faced with in 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 will likely be faced with addressing increased congestion of the interstate system which, in turn, could result in changing commuting patterns.

Not only will automobile traffic increase with increased employment opportunity, but also with regard to 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 looking 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 situations for the Department as it tries to accommodate increased capacity demands on the infrastructure, continued and increasing maintenance of Tennessee's highway system, the expected safety of its users, and the efficient movement of freight. Innovative solutions to address these issues such as public-private partnerships, and multimodal investments, among others will likely be necessary moving forward.

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

Population

- By 2040, the population of Tennessee is projected to add over 2.1 million people. Of this growth:
    - Over 70% 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 more than half of the State's growth compared to other regions of the State.
    - By 2040, Region 1 will surpass Region 4 in terms of total population.
    - Region 1 will see a near equal share of growth between urban and rural counties whereas Region 2 is projected to see more growth in rural counties than urban.
- 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 over 1 million people by 2040.
- By 2040, four rural counties in the State (Sevier, Putnam, Maury, and Robertson) are projected to have over 100,000 in population.
- 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 (64% urban - 36% rural).

- Tennessee is projected to have a near doubling in its senior population (those 65 and over) resulting in nearly 800,000 more seniors across the State. Of this growth:
    - Nearly as many seniors will reside in Region 3 as Region 1 by 2040.
    - The majority of the State's senior population growth will occur in urban counties with the exception of senior population growth in Region 2, which will see more seniors in rural counties.
- According to U.S. Census American Community Survey reports approximately 29% of all households in Tennessee are home to a disabled person. While the disabled population is fairly equally distributed across the state, rural areas appear to 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. This trend is projected to continue; that said, the state as a whole is projected to become more diverse in the future. By 2040, projections indicate that nearly 1 million residents of Tennessee will be of Hispanic origin (roughly 1 in 10 Tennesseans).

Employment

- By 2040, Tennessee is projected to add over 1.9 million more jobs. Of this growth:
    - Over 60% will occur in existing urban counties.
    - Region 3 will see over 40% of the State's future employment growth compared to other regions of the State and by 2040 represent more than a third of the State's employment base.
    - By 2040, 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 2040, 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 (72% urban - 28% 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, health, the disabled, and smart growth practices.
- TDOT should increase its efforts in working with city, county, and regional organizations

relative to land use & 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.