

**TEXARKANA METROPOLITAN  
PLANNING ORGANIZATION**

**SOCIOECONOMIC &  
DEMOGRAPHIC DATA  
FORECAST UPDATE**

**SEPTEMBER 2018**



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# 1. INTRODUCTION



The Texarkana Metropolitan Planning Organization (MPO) is coordinating with the Texas Department of Transportation (TxDOT) in updating the travel demand model for the Texarkana region. This report summarizes the efforts to develop the socioeconomic base year data for the year 2013 and a process of allocating the forecast year socioeconomic data to the years 2018, 2023, 2028, 2045, and 2050.

The transportation decisions in the Texarkana Metropolitan Planning Organization area are determined through an evaluation of several different factors. In Texas, Arkansas, and across the nation, MPOs use travel demand modeling as a tool to assist in the transportation decision-making process. The travel demand model uses current mobility data to forecast the potential transportation impacts in the future. The split between different travel modes, number of lanes on existing roadways, and the location of future mobility connections are just a few of the outcomes of the travel demand model. Socioeconomic data is one of the primary inputs in the travel demand model.

The demographic data that is used for the base year and forecast year travel demand model assists in determining how many trips are generated, the destination of trips, and where trips are produced. The following documentation summarizes the efforts to develop the base year socioeconomic data and the methodology in determining the forecast year demographics.

## STUDY AREA

The Texarkana MPO travel demand model covers an area that includes parts of Bowie County, Texas and Miller County, Arkansas. The MPO modeling area and MPO boundary are shown in Figure 1. Within the Texarkana MPO travel demand model, traffic analysis zones (TAZs) are the geographic units that are used to develop socioeconomic data. TAZs are typically separated at key transportation, political, and/or environmental boundaries or features. The Texarkana MPO travel demand model consists of 437 unique TAZs.

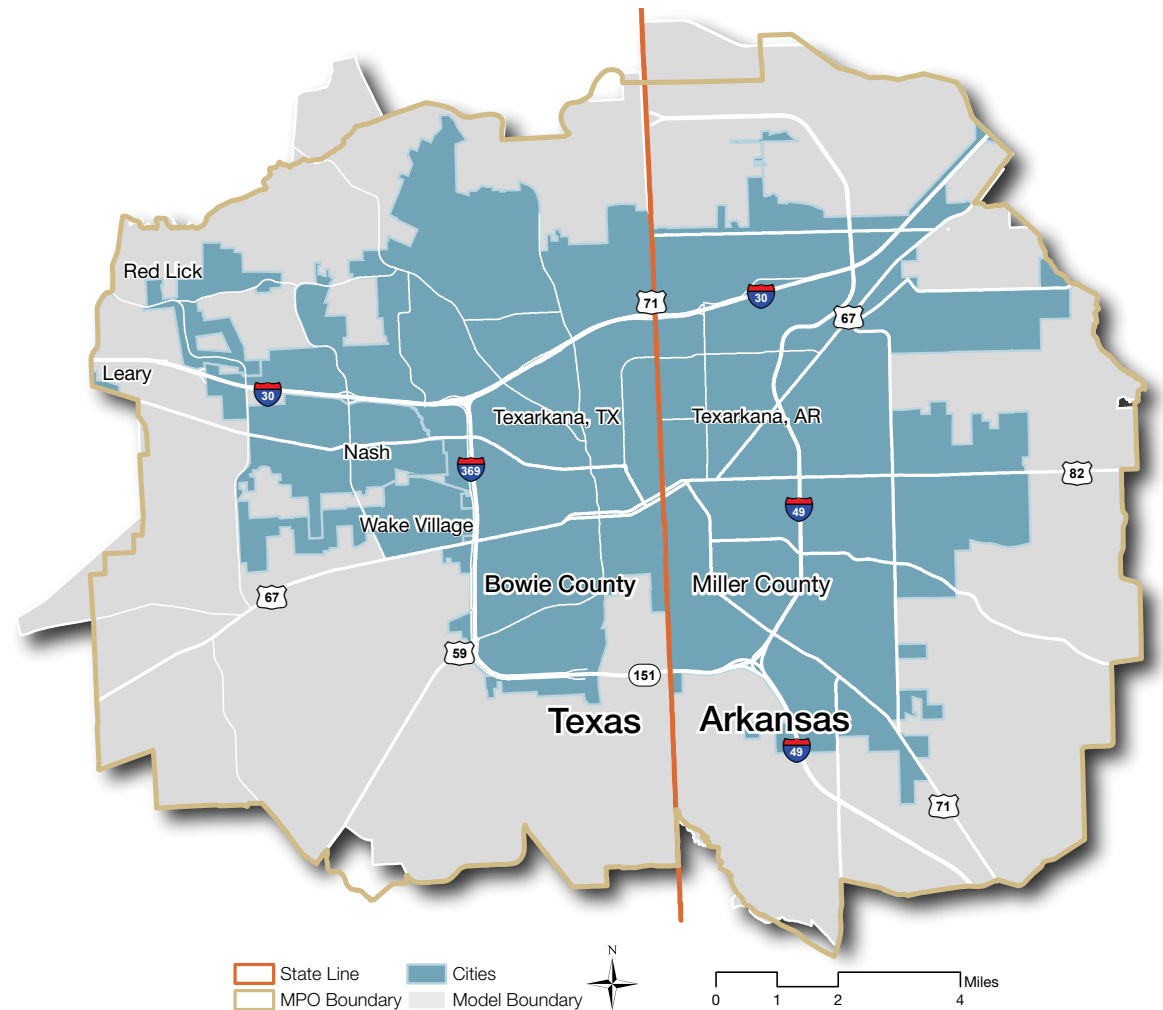


Figure 1: Texarkana MPO Modeling Area

## 2. BASE YEAR DEMOGRAPHICS



### APPROACH AND DATA ANALYSIS

Several sources were used to develop the base year demographics for the Texarkana MPO modeling area. These include the 2010 census (block, block group, and tract levels), 2006-2010 and 2009-2013 American Community Survey (ACS), 2013 InfoGroup business data, 2013 Texas Workforce Commission (TWC) data, the 2016 TxDOT Socio-Economic Guidelines document, 2013-2014 Texas Academic Performance Report (TAPR) from the Texas Education Agency (TEA), and the Texas Demographic Center (TDC) control totals document.

Figure 2 shows the Texarkana MPO modeling area, which covers parts of Bowie County in Texas and Miller County in Arkansas. The modeling area is comprised of 437 internal traffic analysis zones (TAZs) and 19 external zones. It is noteworthy that the Texas TAZs are between TAZs 1 and 253 and TAZ 484, whereas the Arkansas TAZs are between 301 and 483.

The following sections outline the procedures that were followed to update the travel demand model for the 2013 base year demographic data for the Texarkana MPO modeling area.

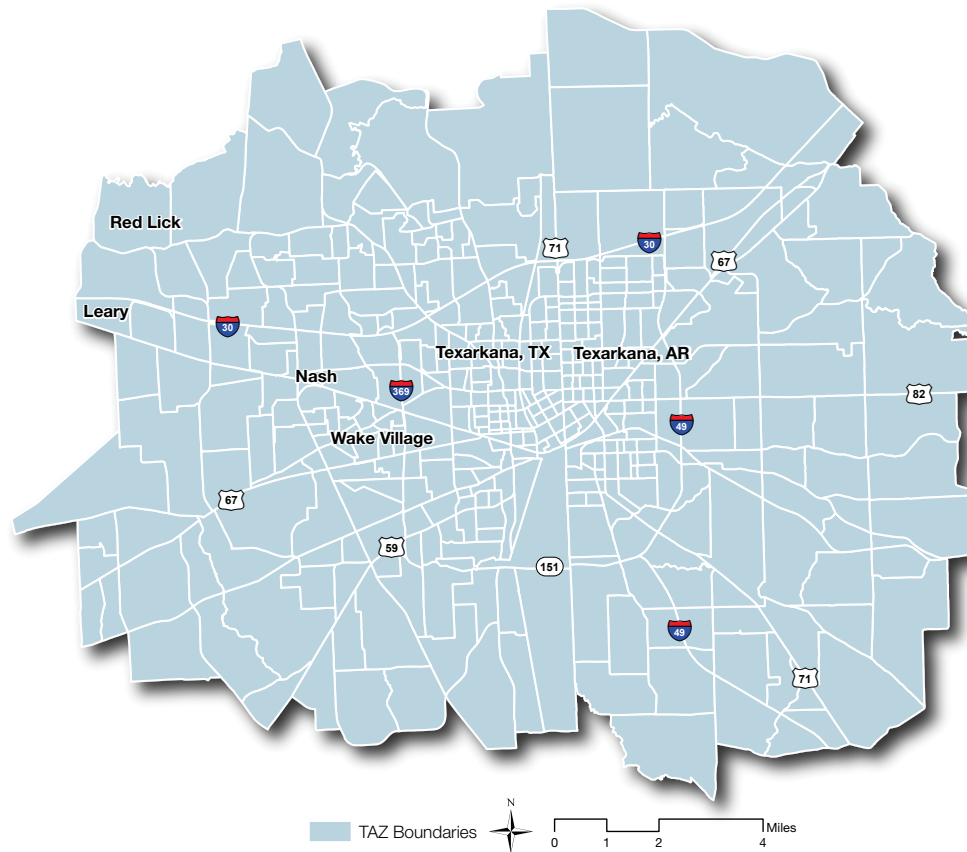


Figure 2: Texarkana MPO TAZs

## POPULATION

The 2010 census block population and housing data were used to obtain 2010 zonal population and housing data.

As evident from the small difference between the 2010 and 2013 population control totals in the TDC document (94,930 versus 98,333), there is little growth in the Texarkana MPO modeling area between 2010 and 2013. Consequently, the 2013 zonal population data is based on the 2010 zonal population distribution scaled to match 2013 control totals.

The resulting 2013 population using the TDC county control totals is 98,340, of which 63,277 are in Bowie County and 35,063 are in Miller County.

Figure 3 shows the 2013 population distribution in the Texarkana MPO modeling area.

The following sections outline the procedures that were followed to update the travel demand model for the 2013 base year demographic data in the Texarkana modeling area.

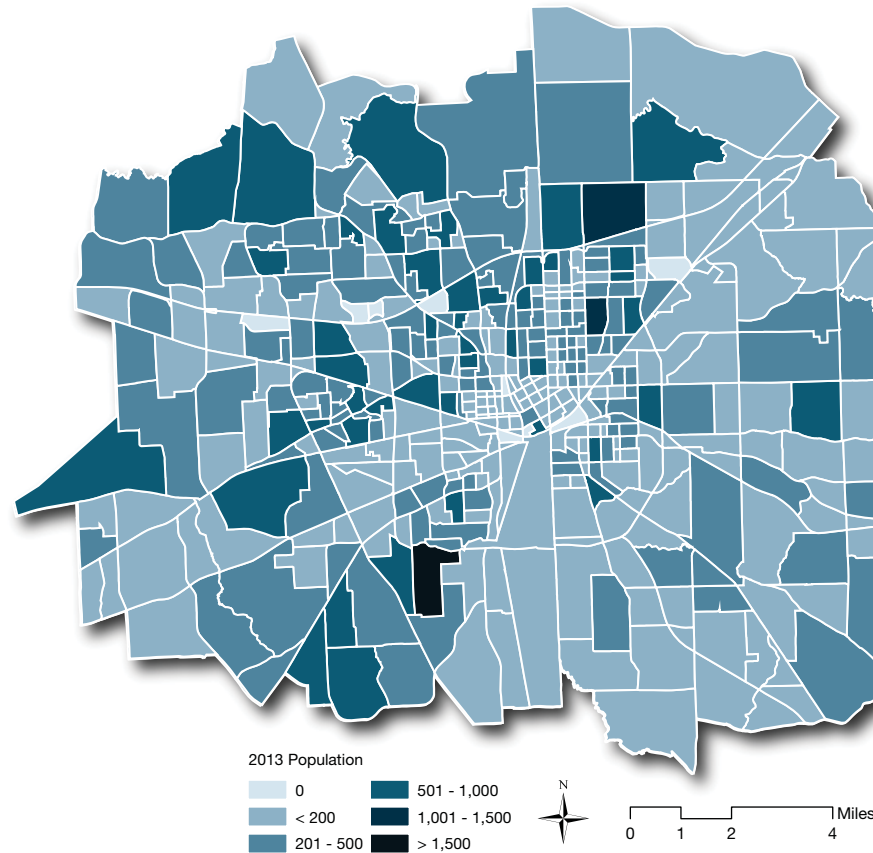


Figure 3: 2013 Population by TAZ

## HOUSEHOLDS

The 2010 census block data provides information on 2010 total housing, but not on tenure. Hence, the 2006-2010 ACS block group household data was used to determine occupancy rate for blocks. It was assumed that all blocks within a block group have the same occupancy rate as that block group. The zone would then have an average occupancy rate based on the blocks it contains. This transformed 2010 housing to 2010 households.

Similar to population growth, it does not seem that there is much growth in households in the Texarkana MPO modeling area between 2010 and 2013. Consequently, the 2013 zonal household data is based on the 2010 zonal household distribution scaled to match 2013 control totals.

The resulting 2013 households using the TDC county control totals is 37,307, of which 23,724 are in Bowie County and 13,583 are in Miller County

Figure 4 shows the 2013 household distribution in the Texarkana MPO modeling area.

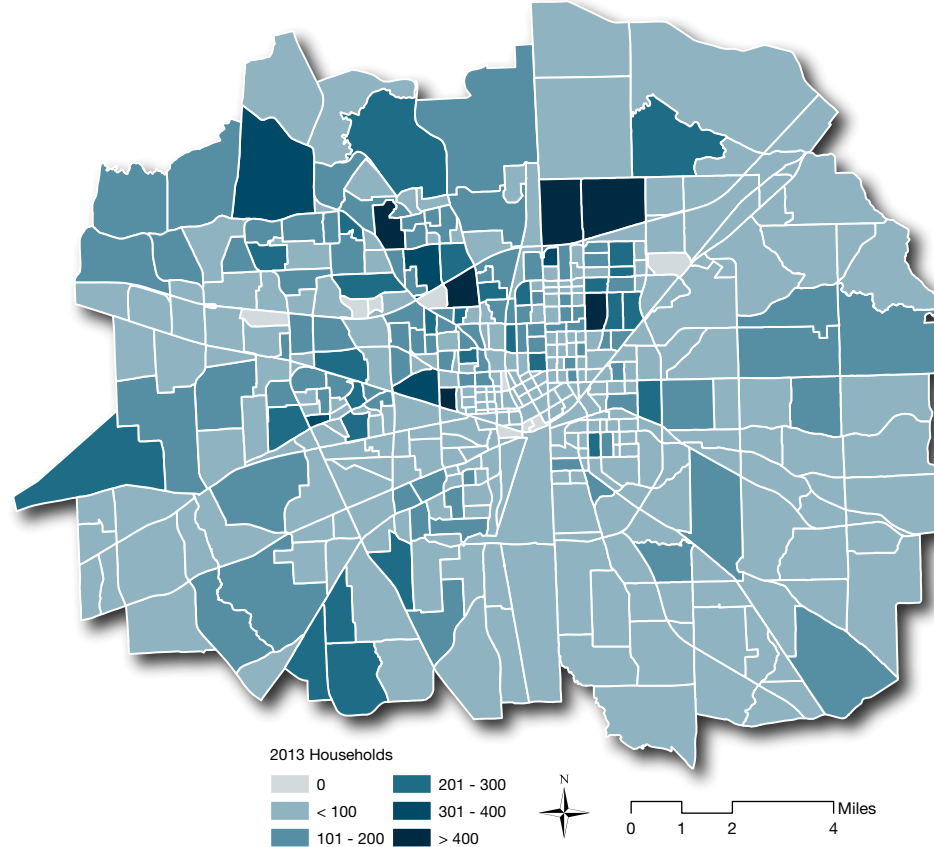


Figure 4: 2013 Households by TAZ

## GROUP QUARTER POPULATION

The 2010 census tract data provides information on institutionalized and non-institutionalized group quarter population in the Texarkana MPO modeling area. This, coupled with satellite imagery, yields zonal group quarter population information in 2010. The 2010 group quarter population was then scaled to match the 2013 TDC control totals.

The 2010 total group quarter population was 4,753. Major contributors to that population are Federal Prison Industries, Bowie County Jail, Southwest Arkansas Community Correction, and a handful of nursing centers and assisted living facilities.

The resulting 2013 group quarter population based on the TDC county control totals is 4,905, of which 3,425 are in Bowie County and 1,480 are in Miller County.

Figure 5 shows the group quarter population distribution in the Texarkana MPO modeling area.

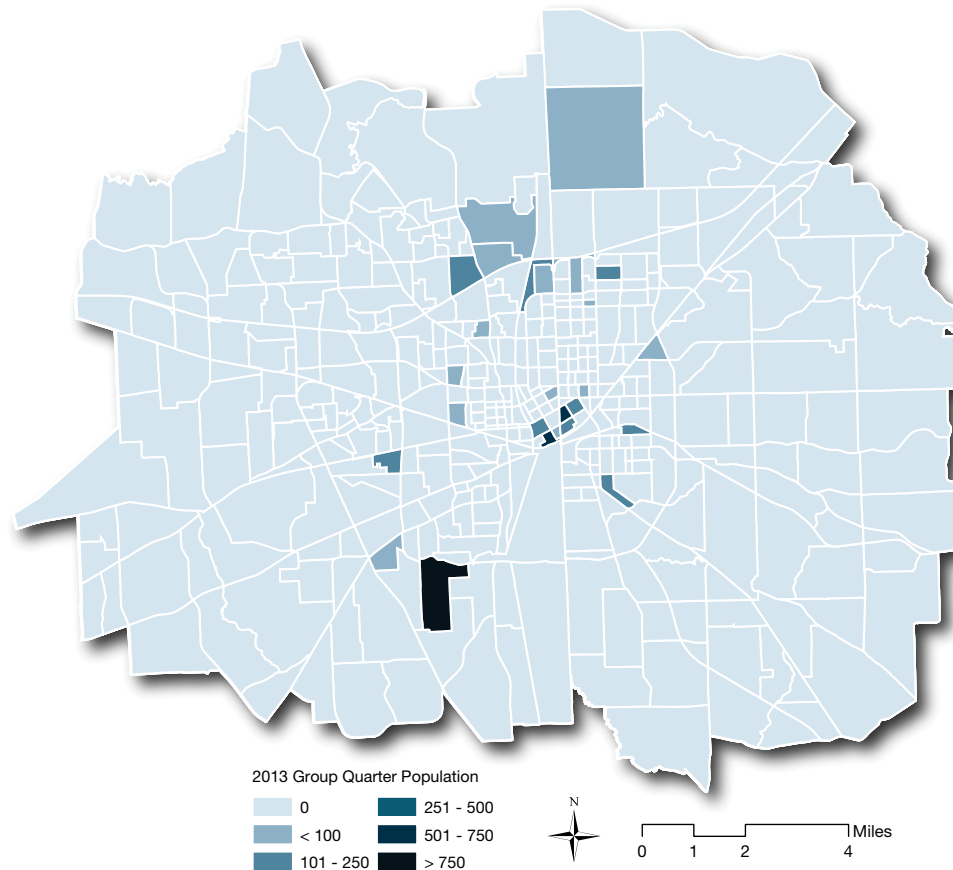


Figure 5: 2013 Group Quarters Population by TAZ

## HOUSEHOLD SIZE

Household size was calculated by subtracting group quarter population from total population, then dividing by the total number of households.

The resulting average household size is 2.50, which is slightly higher than 2.49 in the TDC control total document.

It is important to note that the household size in the geographic file reflects the simple division of zonal population by number of households. Larger household sizes can be indicative of the presence of group quarters.

## MEDIAN HOUSEHOLD INCOME

The 2009-2013 county-specific ACS block group income data were used to assign median income to zones contained within a block group. Zones which intersect multiple block groups are assigned an average median income. Median income is reported in 2013 dollars.

The resulting average median household income is \$45,562, which is slightly higher than \$43,139 in the TDC control total document. The Bowie County portion of the MPO has an average median household income of \$49,302, whereas the Miller County portion of the MPO has an average median household income of \$41,778.

Figure 6 shows the distribution of the 2013 median household income in the Texarkana MPO modeling area, with higher incomes concentrated to the North-West of the modeling area.

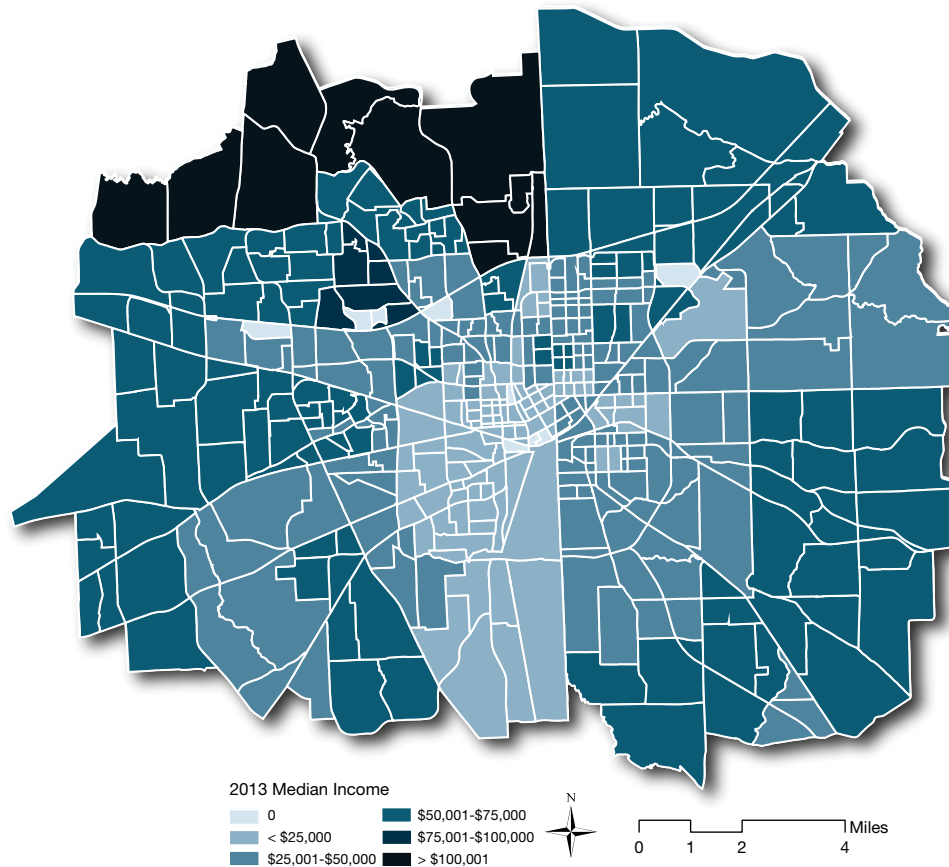


Figure 6: 2013 Median Household Income by TAZ

## EMPLOYMENT

The 2013 TWC employment dataset was used for the employment in the Texas side of the MPO. The 2013 InfoGroup business dataset was used for the employment in the Arkansas side of the MPO. The employment datasets were processed by removing duplicate employers and reassigning inaccurately geocoded establishments to the proper zones. It is noteworthy that the TWC dataset does not contain employment information for religious organizations, and tends to lump employment belonging to multiple locations at the headquarters. For example, school district employment is assigned to one zone rather than the individual schools. For that reason, the Texas Academic Performance Report from the Texas Education Agency was used to collect 2013-2014 employment data for the schools belonging to the Texarkana MPO school districts.

The Texas and Arkansas employments by type were scaled to match the corresponding control totals in the TDC control total document. Table 1 shows that the 2013 base year employment data by type matches those in the TDC control total document.

Table 1: 2013 Base Year Employment

<b>Employment Type</b>	<b>TDC Control Total Document</b>	<b>2013 Base Year Data</b>	<b>Bowie County in Modeling Area</b>	<b>Miller County in Modeling Area</b>
<b>Basic</b>	7,615	7,594	5,362	2,232
<b>Retail</b>	9,574	9,570	8,488	1,082
<b>Service</b>	19,922	19,900	13,998	5,902
<b>Education</b>	2,713	2,710	1,776	934
<b>Total</b>	39,824	39,774	29,624	10,150

## EMPLOYMENT TO POPULATION RATIO

It is generally recommended that employment to population ratio be between 0.3 and 0.5. The resulting employment to population ratio for the Texarkana MPO is 0.409.

Figure 7 through 11 show the scaled 2013 employment distribution by type in the Texarkana MPO modeling area.

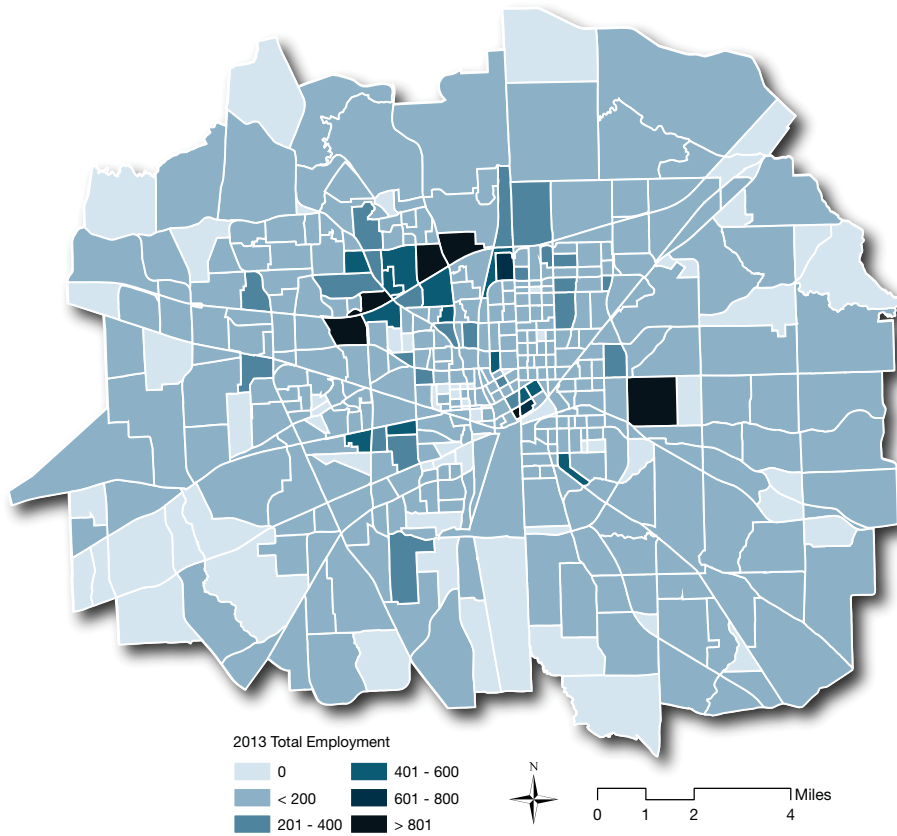


Figure 7: 2013 Total Employment by TAZ

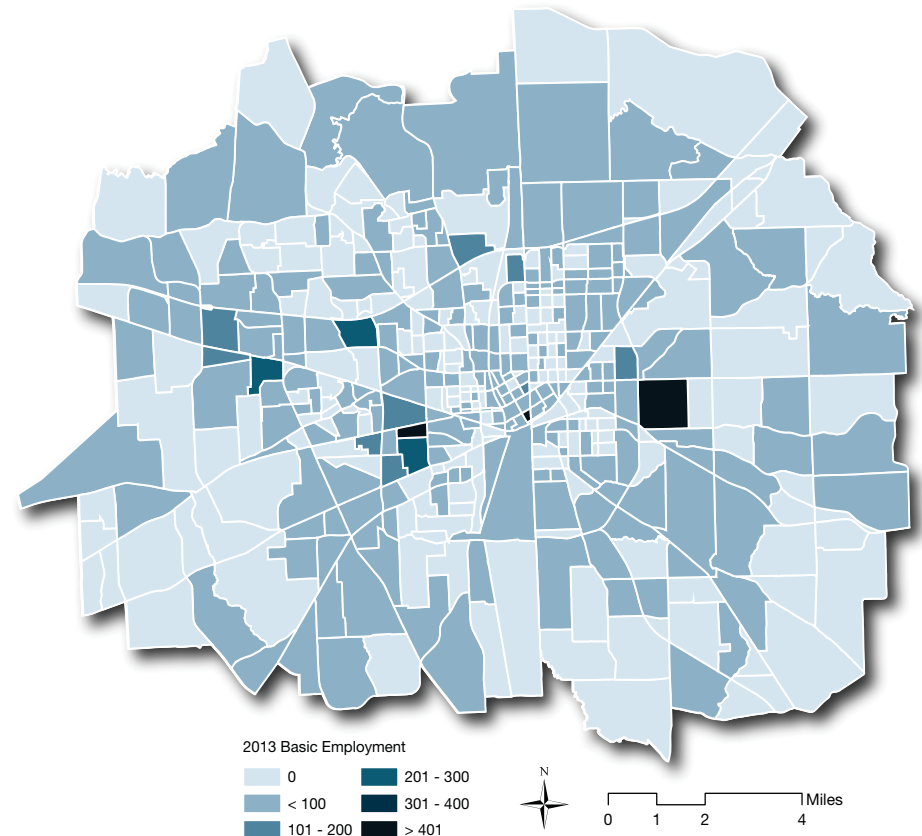


Figure 8: 2013 Basic Employment by TAZ

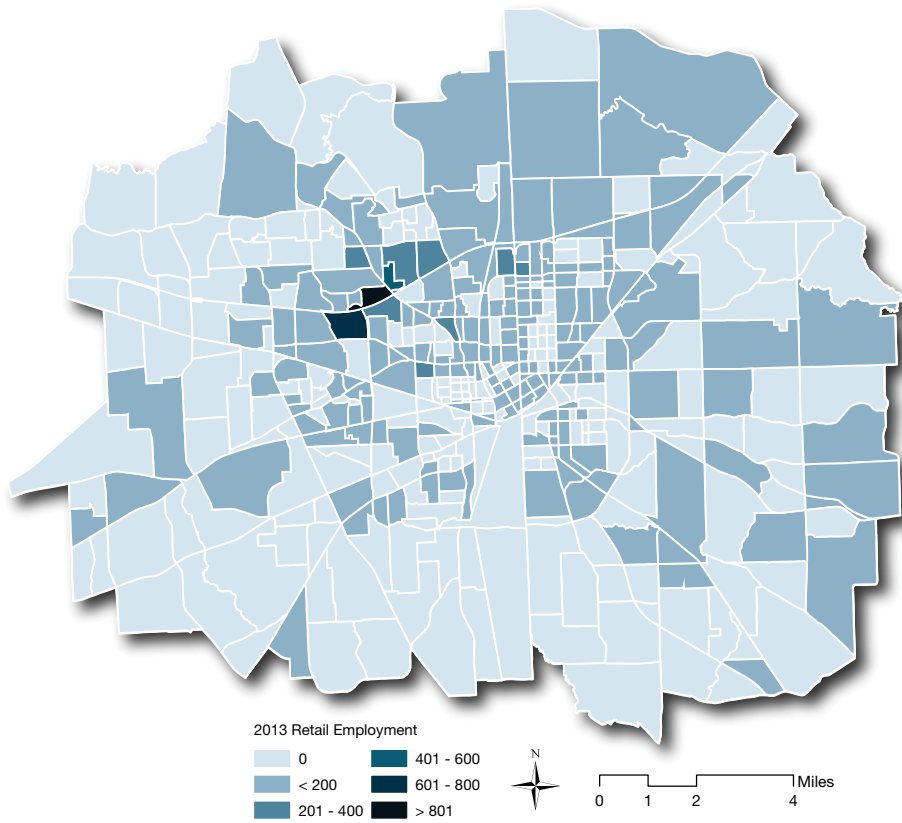


Figure 9: 2013 Retail Employment by TAZ

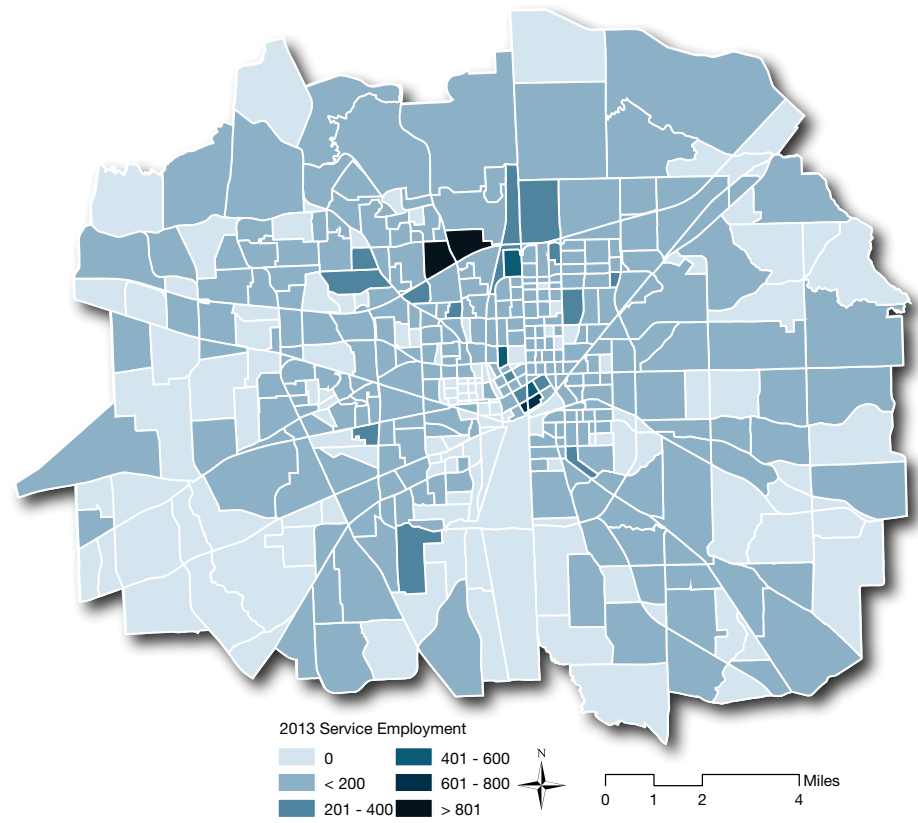


Figure 10: 2013 Service Employment by TAZ

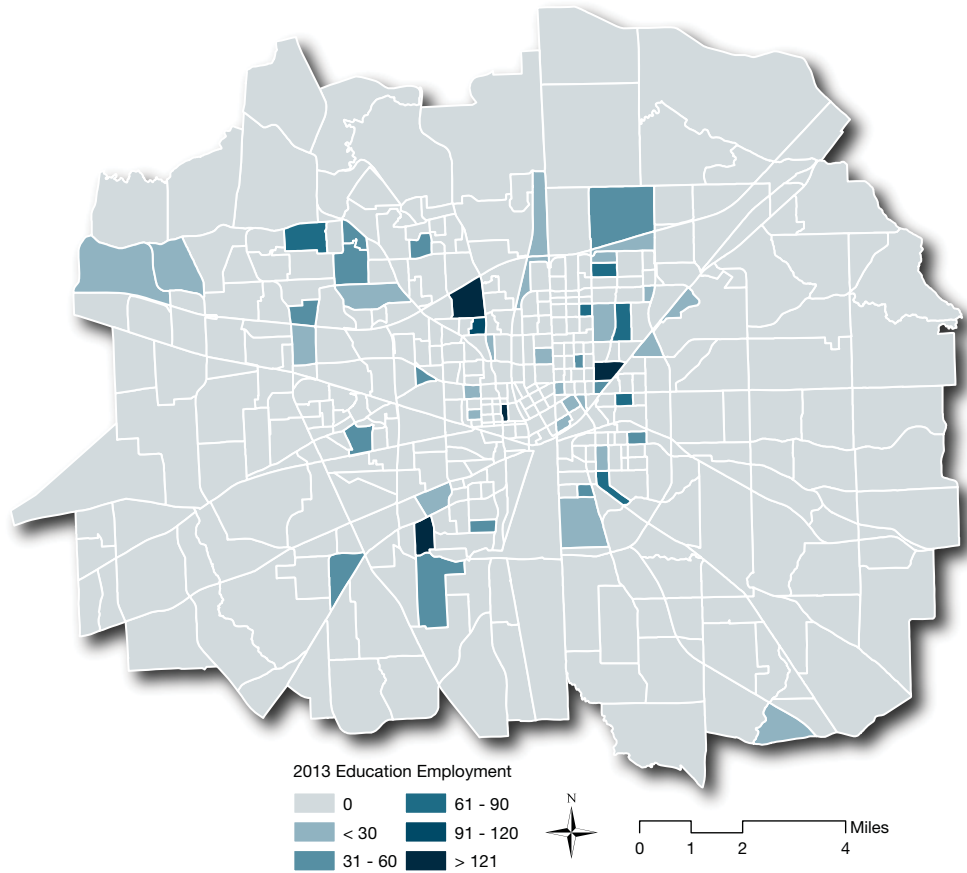


Figure 11: 2013 Education Employment by TAZ

## POTENTIAL SPECIAL GENERATORS

The employers in Table 2 are potential special generators based on the number of workers their employment type and size. These include educational institutions, a mall, and hospitals.

Table 2: Potential Special Generators

Employer Name	Employment	Employment Type	TAZ
Texarkana Regional Airport	206	Basic	424
Texarkana College	290	Education	90
Texas A&M University - Texarkana	169	Education	139
University of Arkansas Medical Sciences	68	Education	390
University of Arkansas Community College	17	Education	430
Central Mall	995	Retail	93
Wadley Regional Medical Center	779	Service	8
Christus St Michael Hospital	1961	Service	125

## AREA TYPES

Area type factors are calculated according to the formula below:

$$\text{Area type factor} = \frac{\text{Pop}_i + \left( \frac{\text{Regional Population}}{\text{Regional Employment}} \right) \times \text{Emp}_i}{\text{Acres}_i}$$

Where  $i$  is a TAZ in the study area.

The area type factors are then aggregated into four area types according to the cutoff points in Table 3.

Table 3: Area Type

Area Type	Range	Description
1	Historic-Manually Assigned	CBD
2	Area Type factor $\geq 8$	Urban
3	$1 \leq$ Area Type factor $< 8$	Suburban
4	Area Type factor $< 1$	Rural

Figure 12 shows the 2013 area class distributions in the Texarkana MPO modeling area.

## SUMMARY

The first section of this report described the process involved in developing the 2013 base year demographics for the Texarkana MPO modeling area. The base year data provides the information needed to create the forecast demographic database. This data is used as input into the Texarkana MPO travel demand model. The following section describes the process of developing the forecast year demographic dataset.

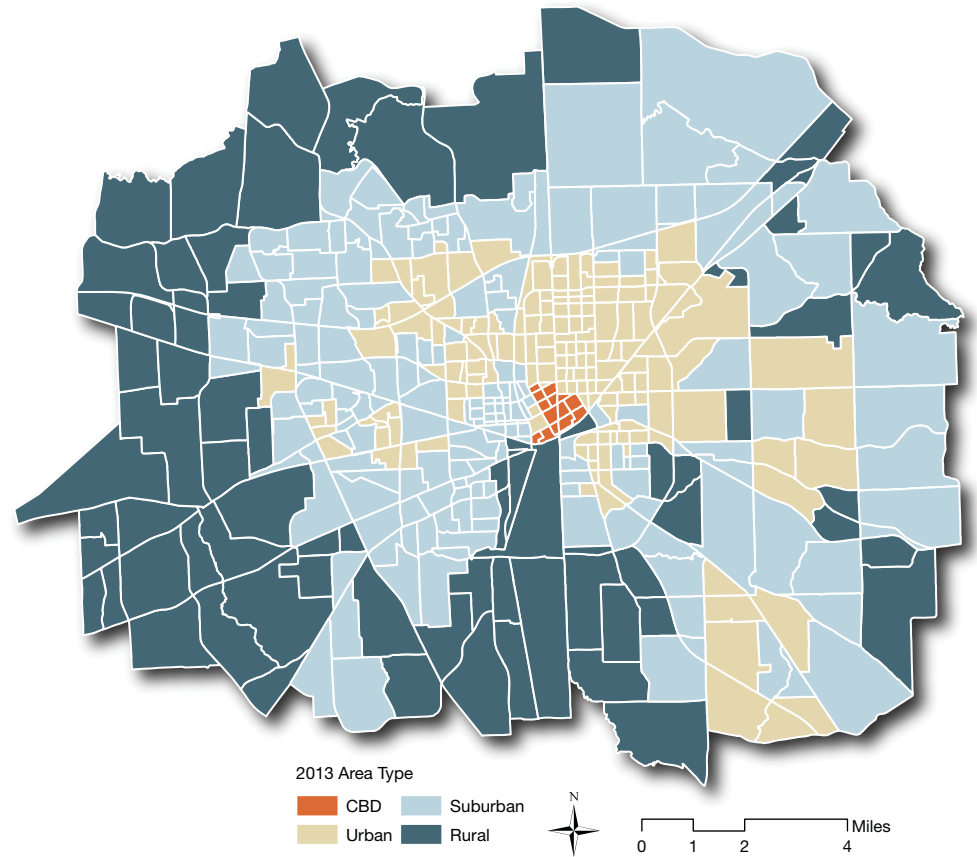


Figure 12: 2013 Area Type by TAZ

### 3. FORECAST YEAR DEMOGRAPHICS



#### APPROACH AND DATA ANALYSIS

The development of forecast year demographics involves a much different process than the development of the base year data. While the base year data revolves around information collected through surveys, geographic data, aerial photography, and the U.S. Census; forecast data is determined based on anticipated growth trends and planning efforts.

The forecast year demographics for the Texarkana MPO were developed using a sophisticated model that anticipates the future growth potential based on socio-geographic factors along with the amount of available area for development or redevelopment. This section summarizes the methodology to develop the forecast year demographics for the Texarkana MPO travel demand model.

#### CONTROL TOTAL DEVELOPMENT

The Texas Demographic Center (TDC) estimates and forecasts future population growth for every county in the State of Texas. The TDC uses different factors including fertility rates, mortality rates, and migration rates to determine multiple demographic scenarios for each county. For the Texarkana region, however, there are many different complexities to estimate the control totals to be used in the travel demand model. With the help of the TDC, population and employment projections were developed for the modeling area of the Texarkana region.

Using the data provided by the TDC, control totals were developed for the Texarkana MPO model area for the forecast years of 2020, 2025, 2030, 2045 and 2050. The population and employment control totals are summarized in Table 4. Table 5 provides the employment control totals by percentage of each category.

Table 4: Population & Employment Control Totals

	2013	2018	2023	2028	2045	2050
Bowie Population	63,511	64,302	65,085	66,028	67,392	7,803
Miller Population	35,054	36,441	37,785	38,925	42,688	43,923
<b>Total MPO Population</b>	<b>98,565</b>	<b>100,743</b>	<b>102,869</b>	<b>104,952</b>	<b>110,080</b>	<b>111,726</b>
Bowie Employment	29,655	30,743	31,872	33,042	37,349	38,720
Miller Employment	10,169	10,542	10,929	11,330	12,807	13,278
<b>Total MPO Employment</b>	<b>39,824</b>	<b>41,286</b>	<b>42,801</b>	<b>44,372</b>	<b>50,157</b>	<b>51,998</b>

Table 5: Employment Percentage

	Basic	Retail	Service	Education
MPO Area	19%	24%	50%	7%

## CARRYING CAPACITY ANALYSIS

A carrying capacity analysis of the Texarkana region was developed to estimate the area of land available for future development or redevelopment and the capacity of the land based on several assumptions or characteristics.

### DEVELOPABLE AREAS

The areas in the region with the potential for development were initially determined by aggregating the parcel data from each of the county appraisal districts into one shapefile. Parcels that contained an existing structure on it and smaller than five acres within any city limits were determined to be developed, while any parcel without an existing structure were considered undeveloped. Additionally, areas with focused planning efforts were determined to have redevelopment potential and therefore, specific parcels were selected as having redevelopment potential.

In addition to determining the developed and undeveloped parcels in the region; areas of constraint were removed from the carrying capacity analysis. Factors that were considered as constraints were waterbodies and floodways. Figure 13 identifies the areas considered in the carrying capacity analysis.

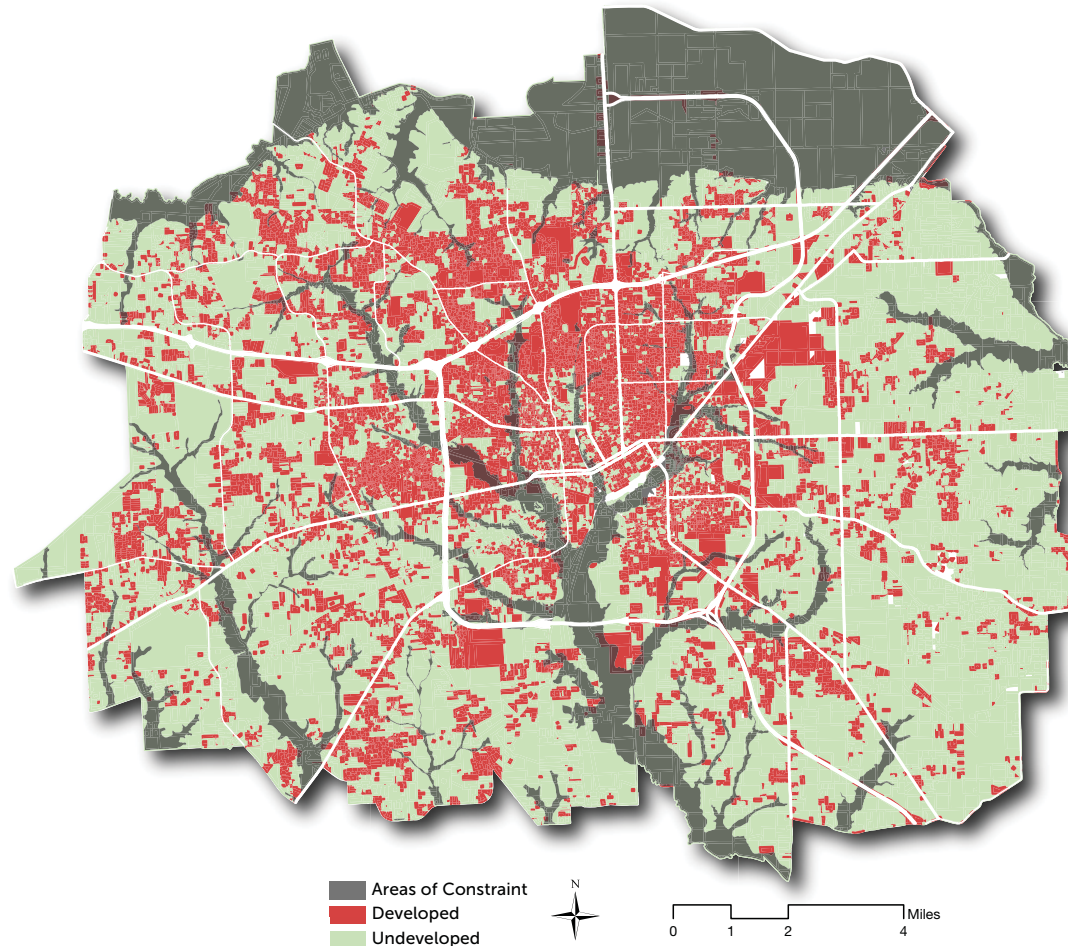


Figure 13: Development Status & Areas of Constraint

## REGIONAL PLACETYPES

Placetypes were developed for the Texarkana MPO area to represent current and future development patterns. Placetypes represent more than just land use and zoning and consider other implications such as building types, household size, or number of employees. Each placetype developed for this study considers unique characteristics such as residential density, floor-area ratio, and percent residential versus non-residential. These characteristics or assumptions assist in the development of the potential carrying capacity of each developable parcel or area. Each placetype category and their related development assumptions are summarized.

### Agricultural/Rural Living



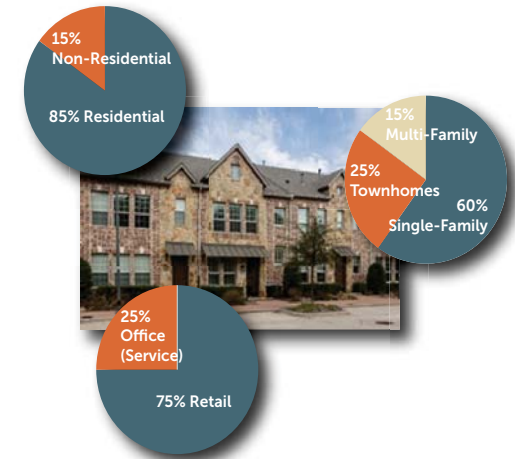
Agricultural areas are categorized by substantial farming or ranching and are primarily located in rural areas of the MPO area. Although work is generated through farming and ranching in this placetype, only residential numbers are represented in this placetype. The residential density in this placetype is very low, on average one unit per 10 acres. Rural living areas are characterized by very large lots, abundant open space and a high degree of separation between buildings. City water and sewer services can be provided, however, in most cases, homes are served through localized water and septic systems. Residential home sites are located randomly throughout the countryside, which helps to maintain the rural character, scale, and scenic views.

### Suburban Neighborhood



Suburban neighborhoods are the most common residential placetype in the region. Most new residential developments are built in a suburban form. Suburban neighborhoods have access to municipal water and sewer services and are in close proximity to schools and commercial services. Gross residential density in these neighborhoods are on average 5 units per acre.

### Urban Neighborhood



Urban neighborhoods support a mix of low to medium density housing options. These neighborhoods are relatively compact and walkable. The design and scale of the development in an urban neighborhood encourages active living with a complete and comprehensive network of walkable streets.

## Commercial District



A commercial district is characterized by retail stores or multi-tenant commercial centers located in a centralized area. Commercial districts are primarily accessible by automobile. Buildings are typically set back from the road to provide large surface parking lots at the storefront, with little or no connectivity between adjacent businesses.

## Business Campus/Industrial Park



Areas with business campuses provide a high concentration of service employment in the region. Densities in this placetype can vary, however 1 employee for every 300–500 square feet of building floor area is typical. Common uses include professional offices, corporate campus, research and development and technology centers. Industrial parks provide basic employment and keep people in the city during normal work hours. They typically locate near major transportation corridors and may include manufacturing centers or transportation hubs.

## Urban Core



Urban core is the hub of employment, shopping, entertainment, civic, and cultural activities, with a mix of housing types and common open space for active living. The compact, walkable environment and a mix of residential and nonresidential uses in an urban core support multiple modes of transportation.

## Neighborhood Retail



## Suburban Activity Center



## Mixed Use



Neighborhood retail placetypes are a mix of low density residential in a suburban form with focused employment at primary intersection roadway intersections. Employment characteristics can include both neighborhood retail and neighborhood services.

Suburban activity centers are a low density mix of land uses in a focused area. The development of these areas can be anchored by a shopping mall, movie theatre, or other activity. These regional centers include a variety of housing types, as well as having a retail component that serves the region.

Mixed-use neighborhoods offer residents the ability to live, shop, work, and play in one community. They include a mixture of housing types and residential densities within close proximity to the goods and services residents need on a daily basis. The design and scale of the development in a mixed-use neighborhood encourages active living, with a complete and comprehensive network of walkable streets.

## GEOSPATIAL ASSIGNMENT OF PLACETYPES WITHIN THE REGION

Determination of the total carrying capacity of the Texarkana MPO modeling area required assignment of specific placetypes to the entire study area, whether a parcel had development potential or not. The entire MPO modeling area was overlaid with a 10 acre square grid to use as the base geographic unit for the analysis. The 10 acre grid throughout the region was then split along county lines and along TAZs. Splitting the grid along these boundaries provided a simple transition to TAZ boundaries at the end of the forecast allocation.

Within each municipality, placetypes were assigned to the 10 acre grid based on available future land use and zoning plans. This ensured that the placetypes assigned to each grid cell matched the planning efforts currently in place by cities within the MPO modeling area.

Outside of the municipalities and their respective extra-territorial jurisdiction (ETJ), placetypes were assigned based on existing land use conditions and aerial imagery. Figure 14 demonstrates the assignment of placetypes across the Texarkana MPO modeling area.

## CARRYING CAPACITY SUMMARY

After the developable land is assessed and the placetypes are assigned, the population and employment carrying capacity can be determined in the region. This capacity gives the projected build out based on the assumptions within each placetype and the distribution of placetypes throughout the region.

The potential developable land and the placetype distribution are the primary factors to determine the future amount of population and employment that can be accommodated in the region. Table 6 summarizes that the potential new capacity in the MPO planning area is 170,942 people and 93,693 employment capacity in build out for the region as summarized within the MPO modeling area.

In future updates, the potential build out or carrying capacity can be adjusted by redistributing the placetypes or by changing the assumptions within each placetype.

Although the carrying capacity seen in Table 6 indicates a high number of potential population and employment, the actual growth projections are not specified between the base year and the forecast year(s).

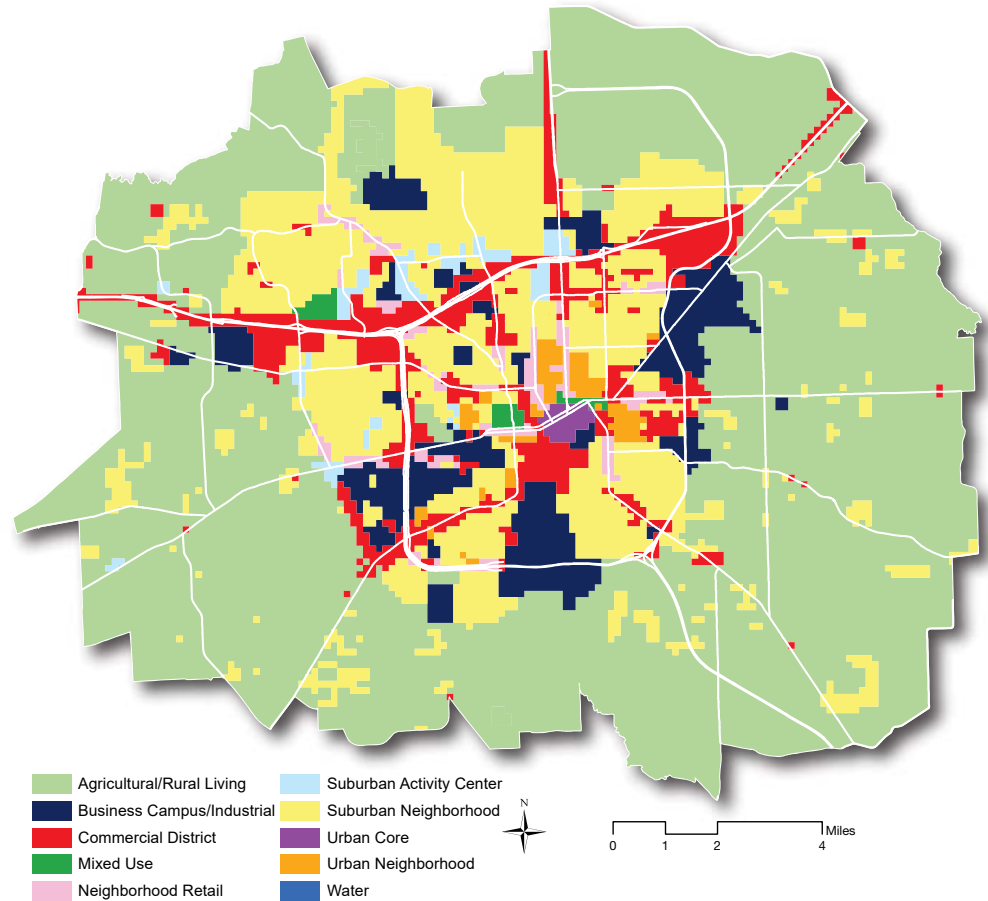


Figure 14: Placetypes

Table 6: Carrying Capacity or Build Out Summary

	2013 Demographics	2050 Control Total	Total Build Out Capacity	Difference (Capacity - 2050 Control Total)
<b>Households</b>	37,306	42,330	64,648	22,318
<b>Population</b>	98,565	111,726	170,942	59,216
<b>Employment</b>	39,824	51,998	93,693	41,695
<b>Basic Employment</b>	7,386	9,821	29,737	19,916
<b>Retail Employment</b>	8,568	12,220	23,512	11,292
<b>Service Employment</b>	17,154	23,241	40,444	17,203
<b>Education Employment</b>	2,183	2,602	N/A	N/A

## LAND SUITABILITY ANALYSIS

Land suitability uses spatial analysis to score the desirability of geographic units within the region. The suitability scoring for the Texarkana MPO model used the same revised 10 acre grid as described in the previous section. The desirability of each unit was used to help determine the areas of the region that are more or less suitable for new development. Two suitability analyses were conducted for this study: one for residential demographic allocation and one for non-residential demographic allocation. Each geographic unit within the Texarkana MPO modeling boundary was given a score between 0 and 100 based on a number of different weighted factors to demonstrate relative suitability.

Several unique factors were used to assist in the development of the suitability scoring. These factors were developed from geographic data and input from MPO staff and Technical Advisory Committee members. 15 suitability factors were used and weighted in the analysis to score land desirability in the region. In April 2018, a workshop was held in which participants were asked create their own growth scenarios and indicate where they would like to see growth in the region as well as new roadways, bike and transit facilities. The following describes each suitability factor in detail and their respective weighting.

### Proximity to Highways

Highways connect commerce in both states and provide access to employment and for customers to businesses. Distance from Interstate 49, Interstate 369, Interstate 30, U.S. Highway 82, U.S. Highway 67, and U.S. Highway 71 were used as a suitability factor.



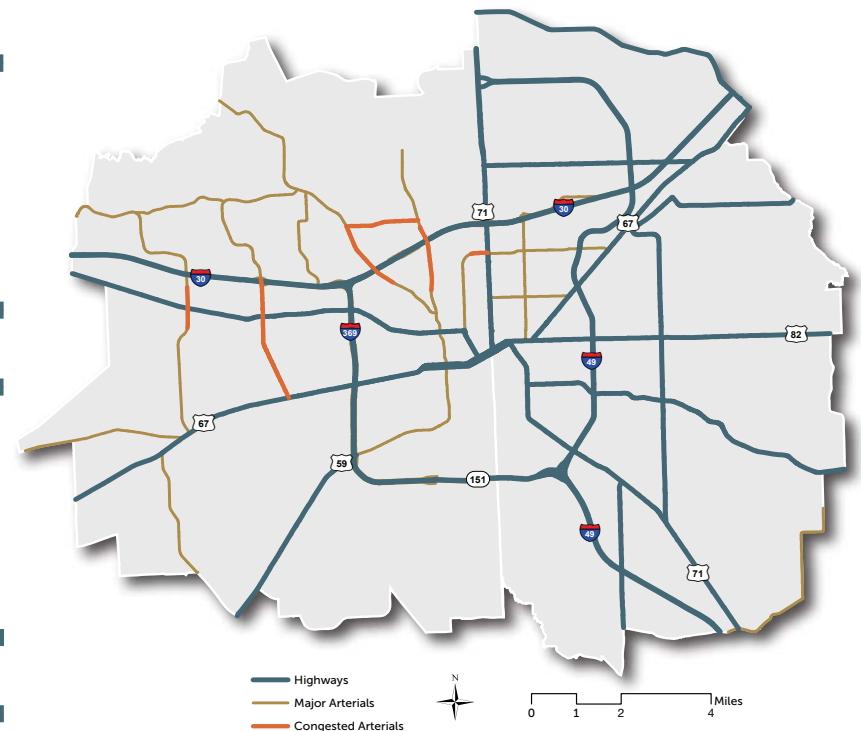
### Proximity to Major Arterials

Major arterials provide the access from homes to businesses throughout the region. Businesses enjoy being located on major arterials because of the visibility of pass-by traffic and to make access easier for customers and employees. Properties close to major arterials were provided a higher suitability factor.



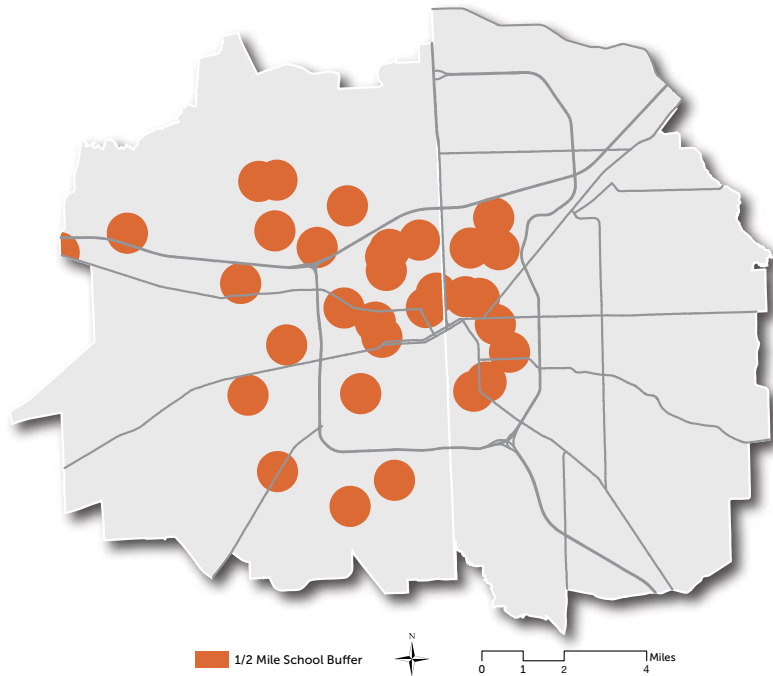
### Proximity to Congested Arterials

Congestion is often perceived negatively among transportation users, but businesses enjoy being located on busy, high volume corridors. Properties located close to these congested corridors were given a higher suitability score.



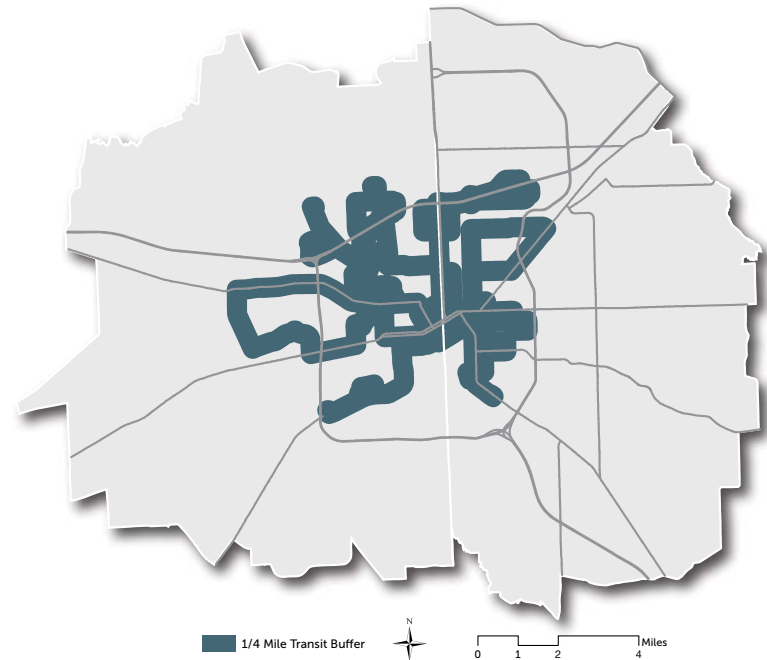
## Proximity to Schools (Elementary, Middle, and High Schools)

Proximity to existing schools is one of the most important factors influencing where people choose to live. Areas within a half mile radius of elementary schools, middle schools, and high schools were scored due to the proximity factor. Residential suitability was scored higher based on these factors, however non-residential was scored lower based on proximity so schools.



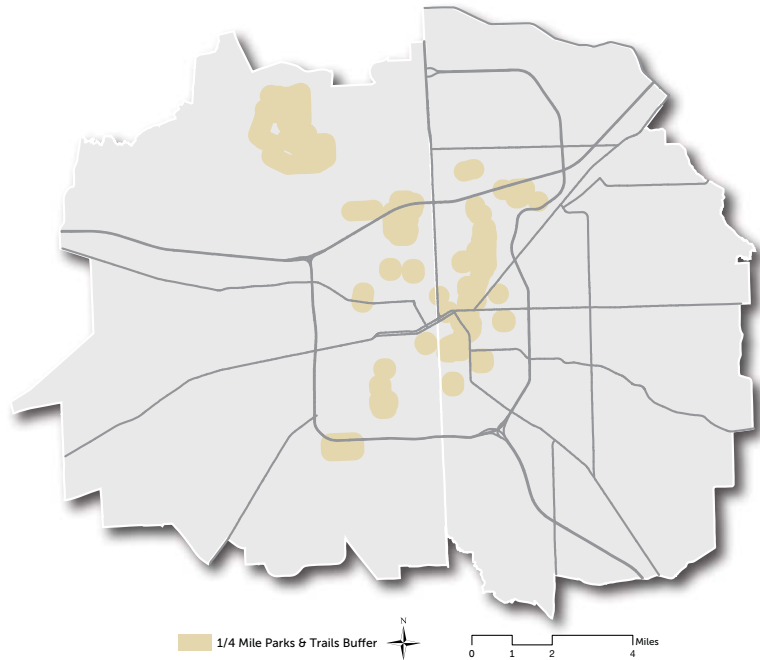
## Transit

Transit service in the Texarkana region is important to help people travel from their homes to school and employment. Locating homes and businesses close to transit provides additional travel options. This suitability factor gives areas closer to transit service higher scores.



## Trails and Parks

Trails and parks provide excellent recreational opportunities and amenities that benefit both residential and non-residential uses. Businesses and homebuyers continue to locate in close proximity to these amenities. This suitability factor gives areas a higher score that are within 1/4 mile of an existing or future trail or existing park.



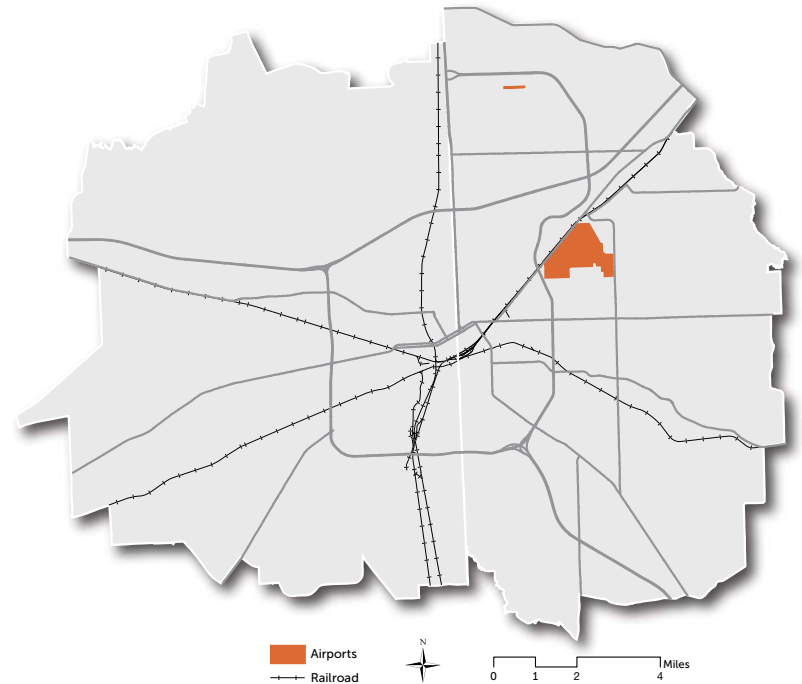
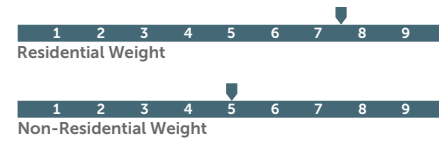
## Airport

For residential development, airports can be loud throughout the day. However, some businesses rely on airports for daily commerce and travel. For this suitability factor, residential suitability is negatively affected by its proximity to the airports and non-residential suitability is positively affected to its proximity to the airports.



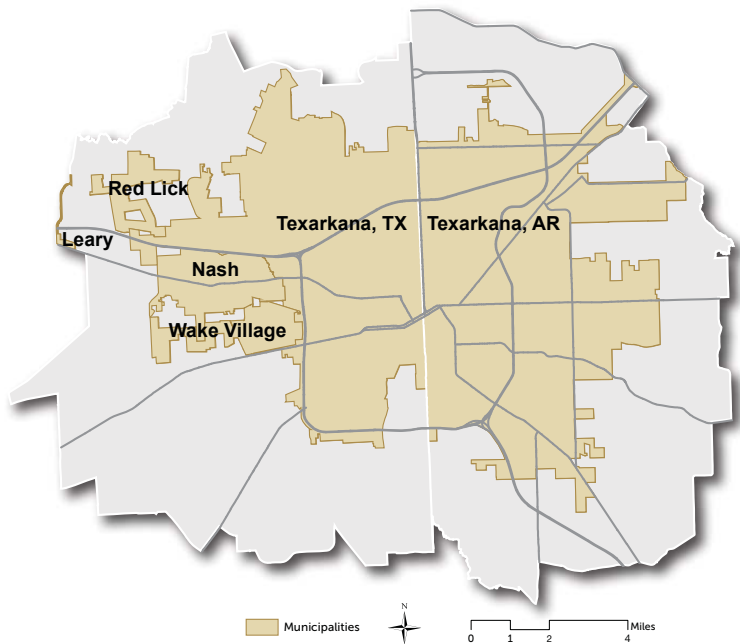
## Rail

Freight rail service in the region is an important logistics element for businesses and proximity is necessary. Residential development typically is located further away from freight rail because of safety and noise and therefore residential suitability has a negative relationship.



## Within Municipal Boundaries

Areas within existing municipal boundaries provide a benefit of proximity and increases services to that new development. This suitability factor scores areas within the region higher if they are within the municipal boundary.



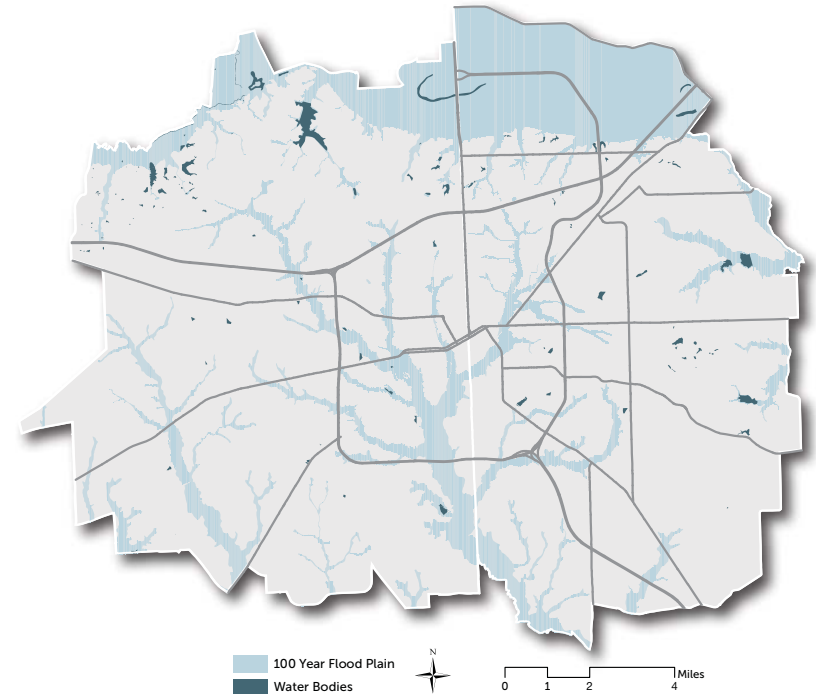
## Within Floodway

Floodways are areas of beauty; however, they are prone to hazards such as flooding. Development in these areas are typically restricted and incur higher insurance costs. This suitability factor scores areas lower that are within floodways in the region.



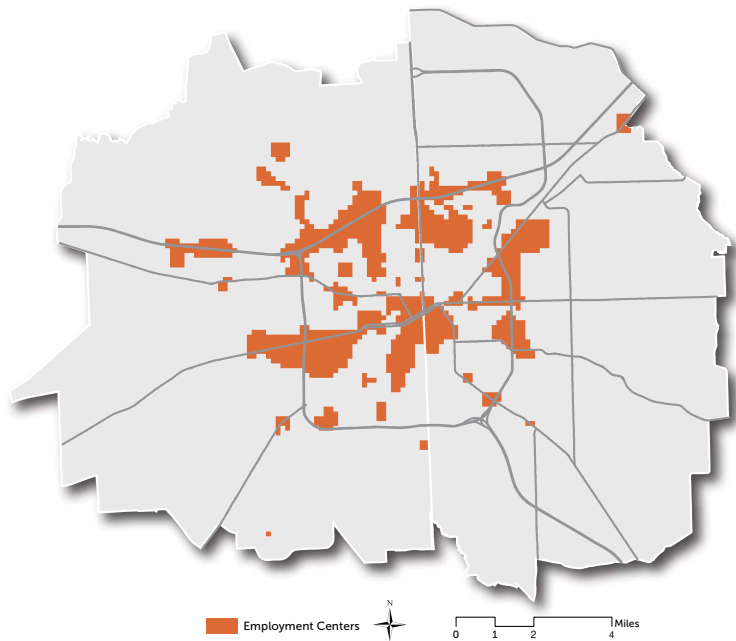
## Proximity to Water Features

Although it is difficult to develop in a floodway, location in close proximity to lakes and other water features are desired in the Texarkana region. Residential and non-residential were given higher suitability scores in closer proximity to water features.



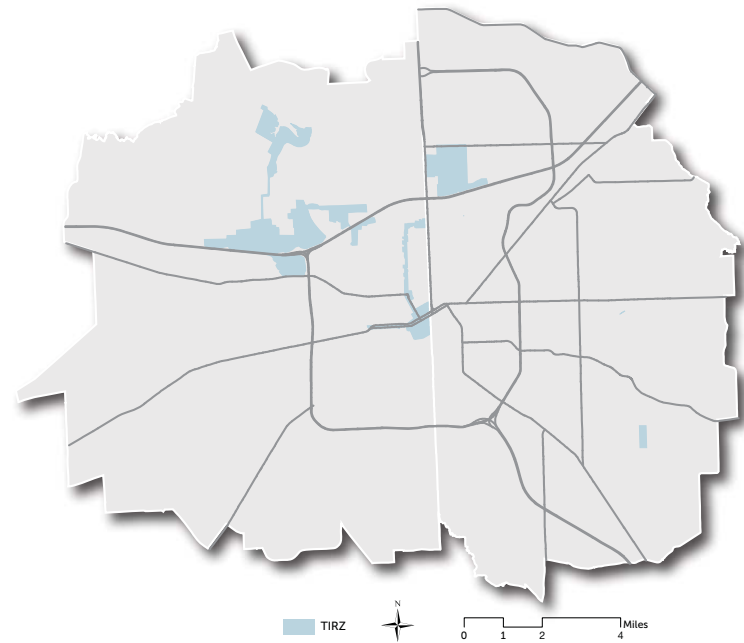
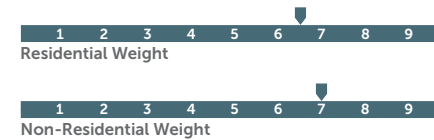
## Employment Areas

Employment areas include both current and future areas with a concentration of employment based on the future land use plans in the region. Areas with current or future employment tend to attract more jobs as employment is needed in the future. Downtown areas are a perfect example of this type of growth.



## TIRZ/TIF Districts

Tax increment reinvestment zones (TIRZ) in Texas and tax increment financing (TIF) districts in Arkansas are locations in the region that receive special funding from property tax increases to help spur growth in strategic locations. These areas can be considered as focus areas that result from comprehensive planning efforts. Areas that are within each TIRZ or TIF score higher for this suitability factor.



## Stakeholder Input (Low and High)

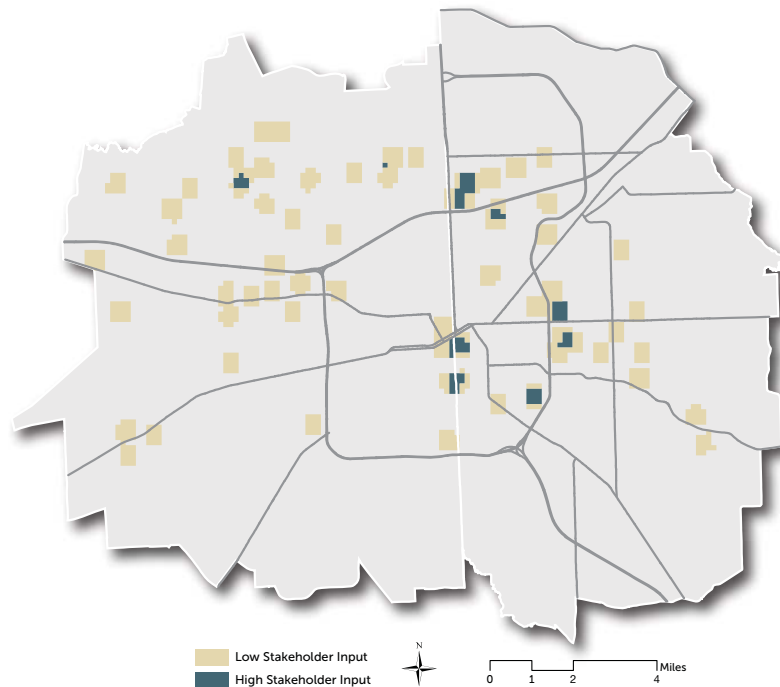
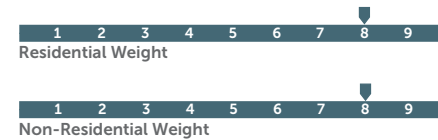
On April 5, 2018 a meeting was held to gather feedback on growth potential in the Texarkana region. During a mapping exercise, participants were asked to work in groups to develop a vision for future growth using stickers to the map. From this exercise, two maps were developed by different groups that represented their version for growth potential.

Following the exercise, the two maps were geo-coded to determine the frequency and location of where the placetype stickers were placed for these two suitability factors. Areas in the region that had one sticker placed or two overlapping stickers from multiple maps were categorized as Low Stakeholder Input suitability factor. Areas in the region that had overlapping stickers were categorized as High Stakeholder Input suitability factor. Including a factor with more overlapping placetypes identifies areas in the region with strong support from the participants that growth will be focused in those locations in the future.

Low Input:



High Input:



## LAND SUITABILITY SUMMARY

The land suitability analysis combines the results of all of these different factors and considers the weighting impact as was developed through staff input to determine the land suitability score. A suitability score was developed for residential growth and a separate score was developed for non-residential growth. The weighting of each factor differed for each suitability analysis. Figures 15 and 16 display the resulting suitability score in the region for residential and non-residential suitability.

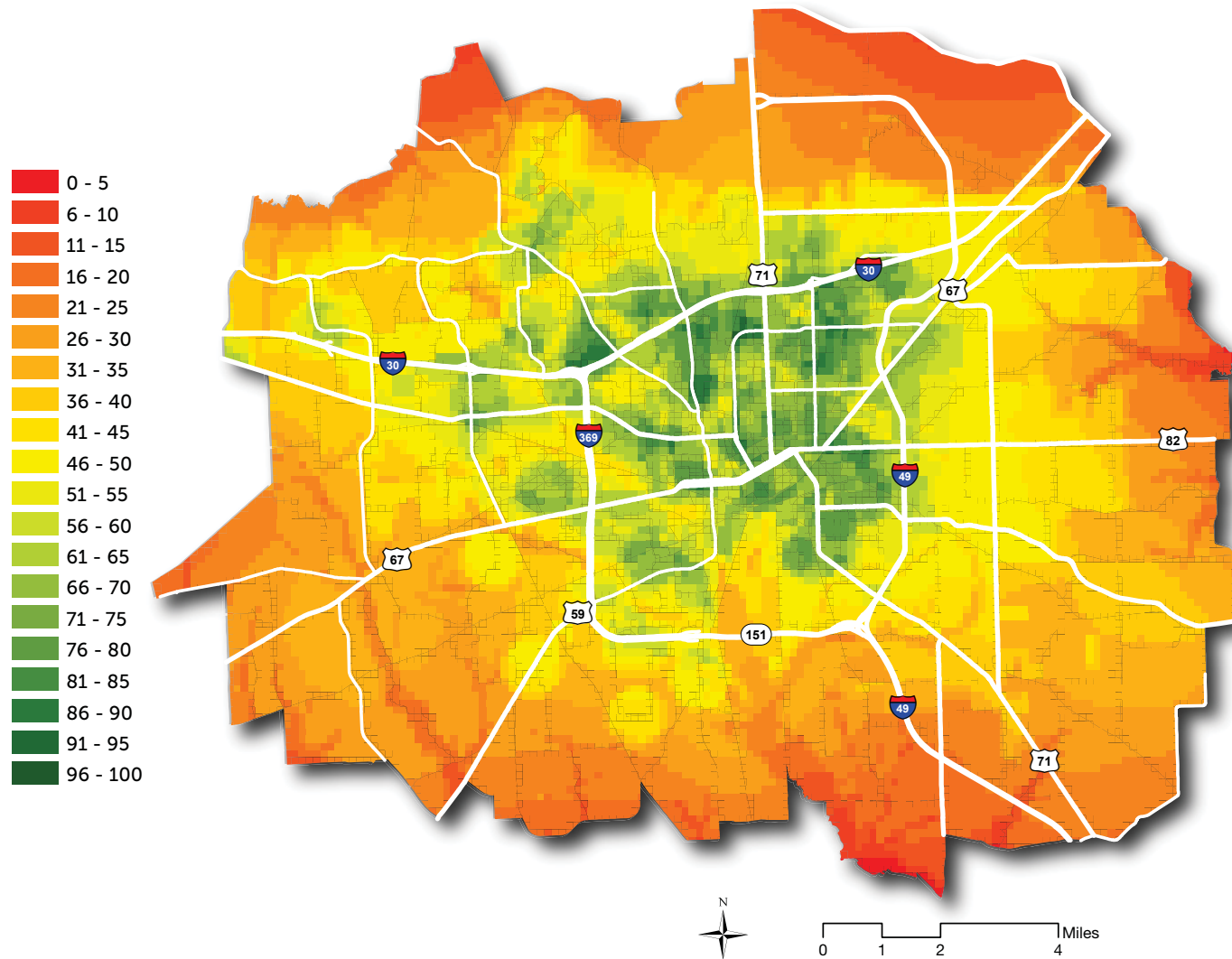


Figure 15: Residential Suitability

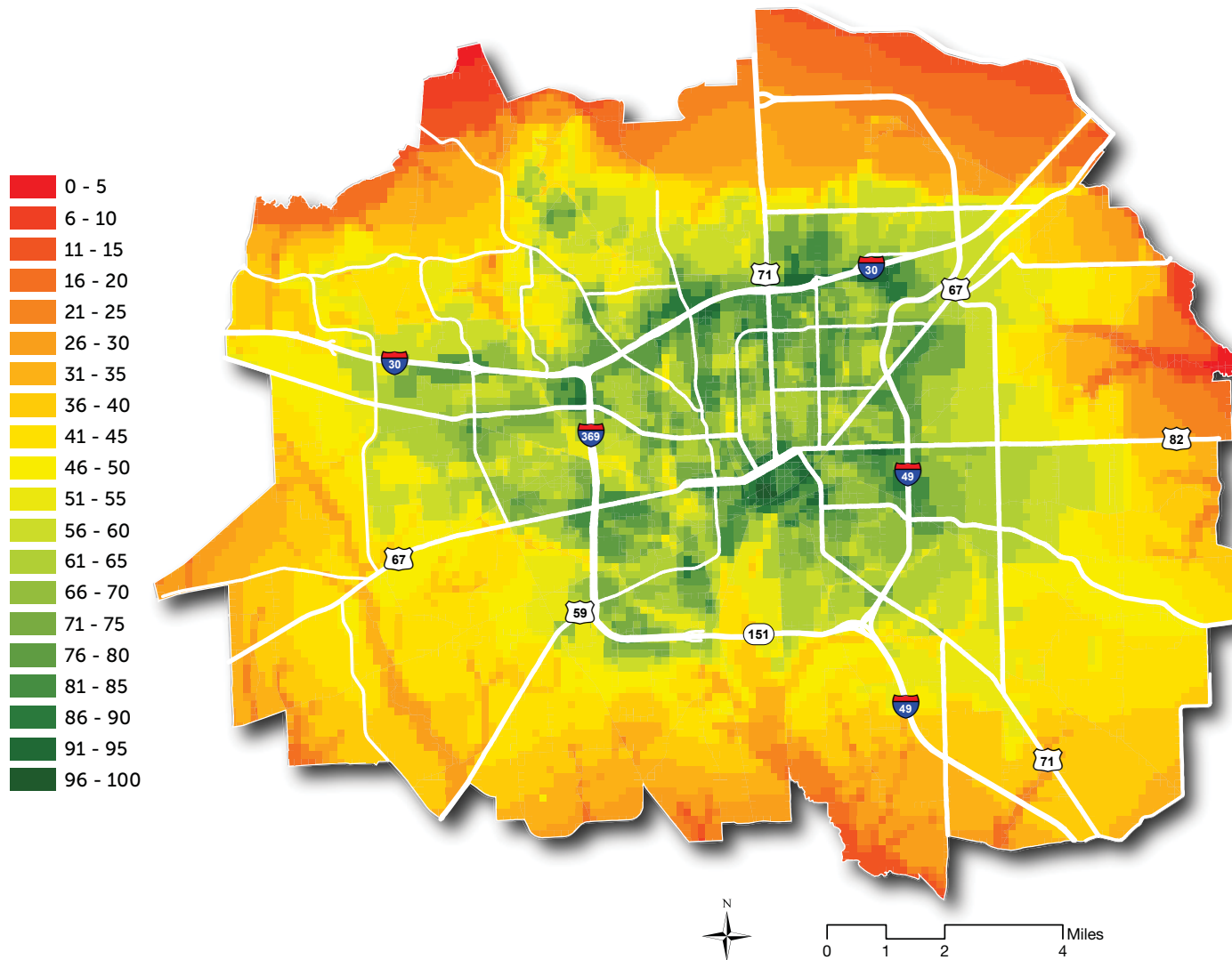


Figure 16: Non-Residential Suitability

## FORECAST DEMOGRAPHIC ALLOCATION

The development of the carrying capacity and the land suitability scoring provided the opportunity to begin the final task of allocating the forecast population and households to the TAZ level within the region. This allocation was an iterative process that used the CommunityVIZ model to assign the forecast demographics by each control total for population and employment. In addition, the relative suitability scoring placed the population and employment increment from the base year in the most desirable areas of the region first.

The model forecast years of 2018, 2023, 2028, 2045, and 2050 were all allocated to the TAZs based on their desirability score and their carrying capacity. This process allowed for each successive forecast year to add to the previous forecast year growth, while subtracting the potential capacity from each geographic unit. This process ensured that no TAZ had more potential growth than the actual capacity based on the future land use plans of the cities within the Texarkana MPO area. The allocation was calculated separately for both counties in the MPO.

The following section summarizes the allocation, however only the 2045 results are provided in the figures. For maps of the additional forecast years, refer to Appendix A.

### **Population and Households**

Using the data generated from the suitability analysis, the population forecast was distributed throughout the region. The largest increase in population was allocated in the northwest portions of the region. The allocation in the northwest portion of the region was a result of high desirability of the area and the development patterns that are currently occurring. Modest growth was projected in other areas of the region and high population concentrations were maintained in the north central and south central regions of the Arkansas side of the region.

The number of households were calculated based on the average household size developed for the 2013 base year demographics. In some instances, the 2013 data set did not include household size information for TAZs that did not have population. However, as the growth occurred in the forecast years in those same TAZs without existing population, a household size is required. Thus, the household size for those TAZs without population in 2013 were determined based on the household size of adjacent TAZs and U.S. Census data in proximity to those TAZs.

### **Median Income**

The median income attributes for each forecast year are based on constant dollars using 2013 as the base year. For the Texarkana region, there is an anticipation that median income will not encounter any significant changes. Thus, the forecast year median income values remained consistent with the base year data.

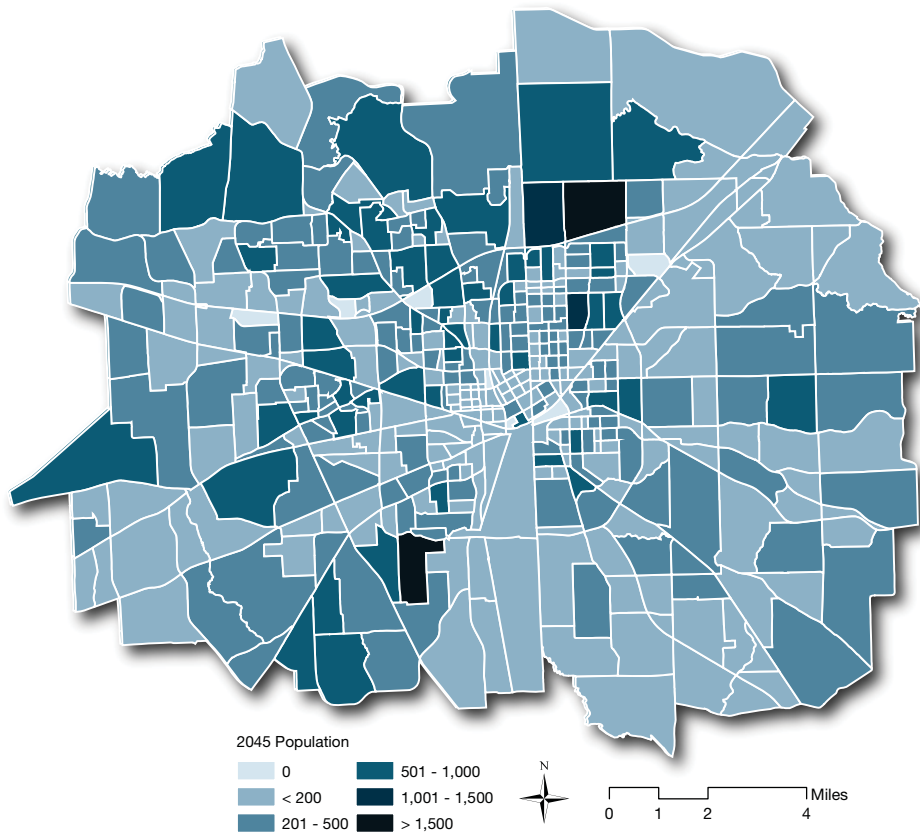


Figure 17: 2045 Population by TAZ

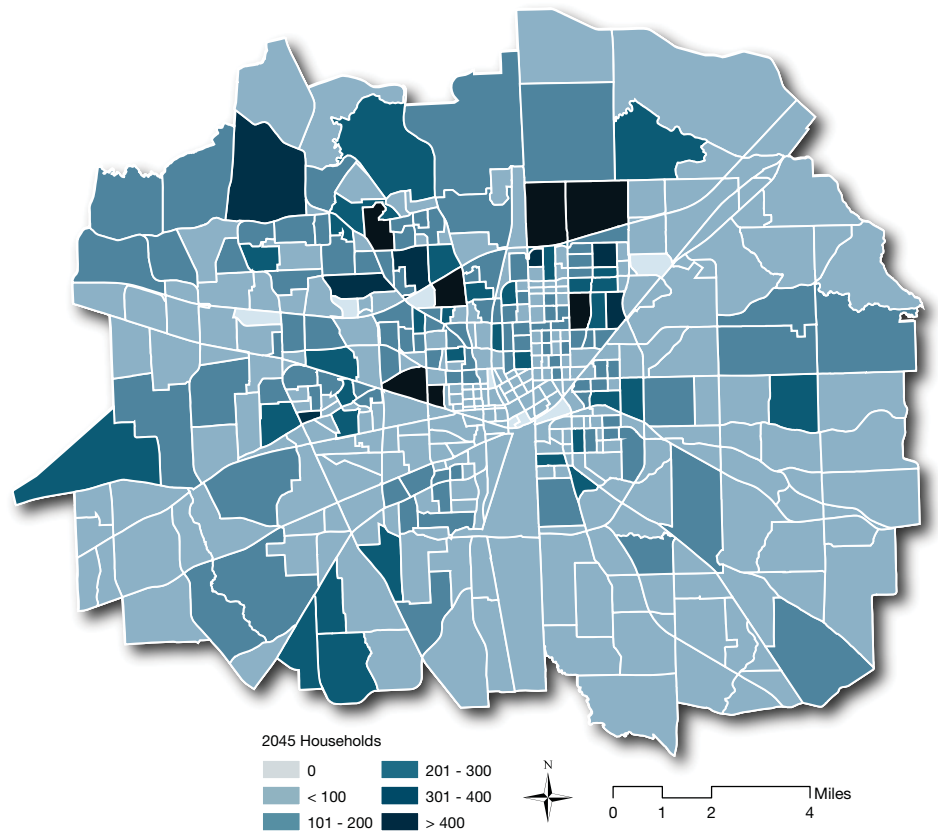


Figure 18: 2045 Total Households by TAZ

## Employment

Similar to the allocation of population to the forecast years, employment was also allocated based on the suitability results. However, a separate suitability analysis was completed for employment to differentiate the desirability from residential uses, understanding that employment attraction differs from residential desirability.

The employment allocation was divided into the three main employment types: basic, retail, and service. Based on the carrying capacity analysis, each TAZ had an available capacity based on the future land use for each employment type. Figures 19-22 shows the distribution of employment for 2045.

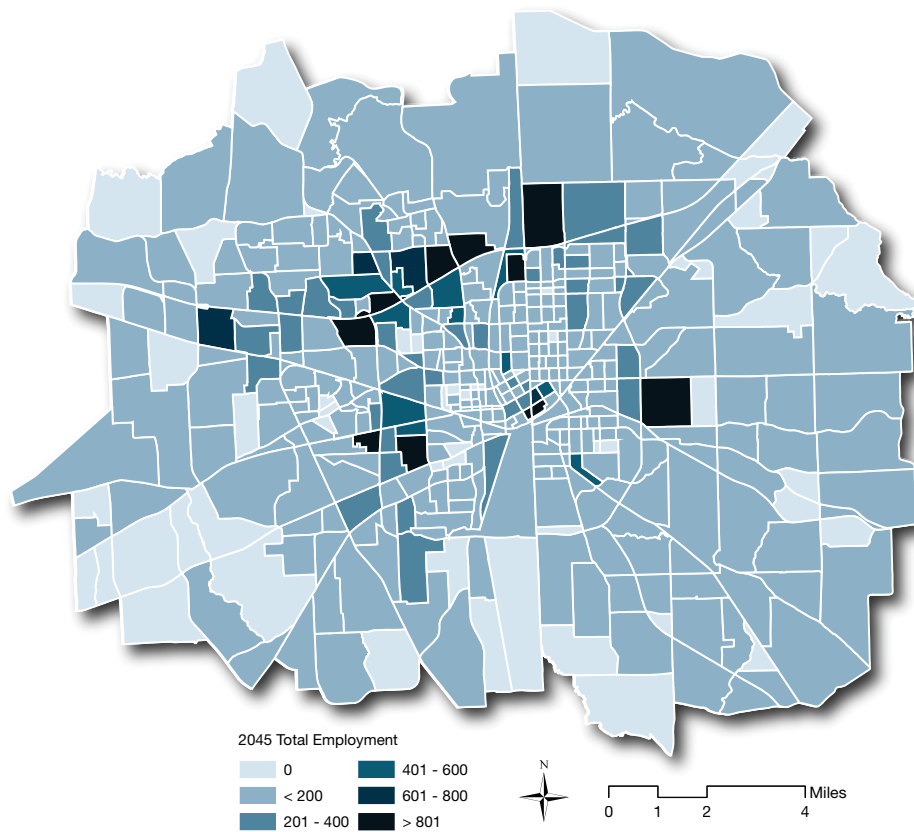


Figure 19: 2045 Total Employment by TAZ

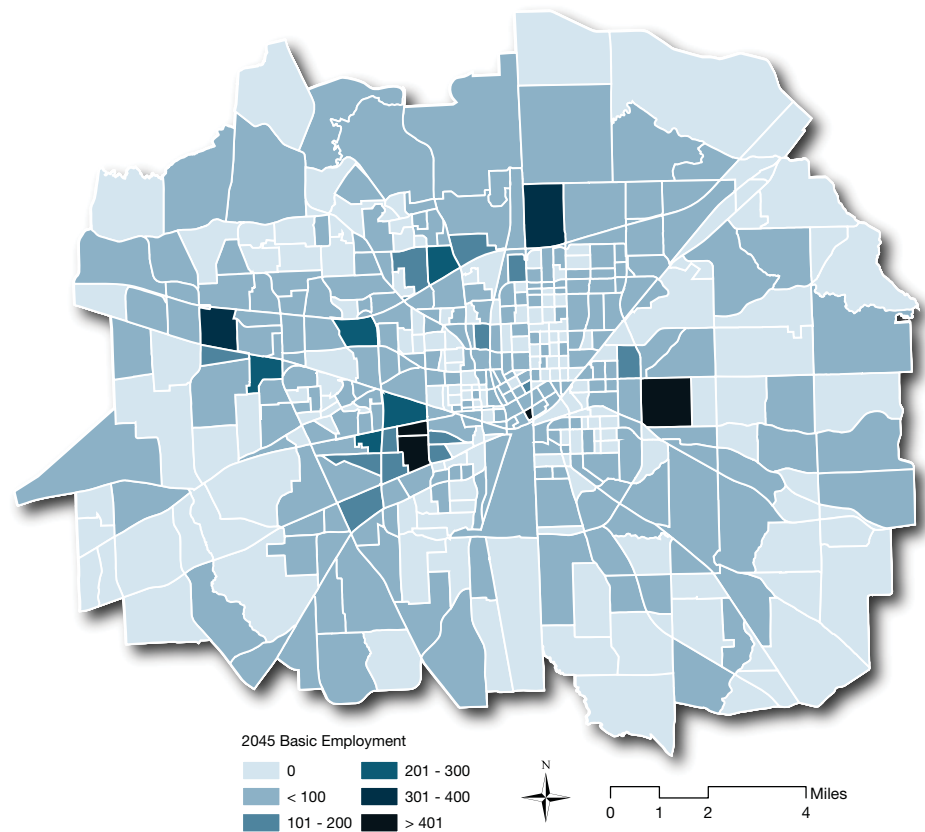


Figure 20: 2045 Basic Employment by TAZ

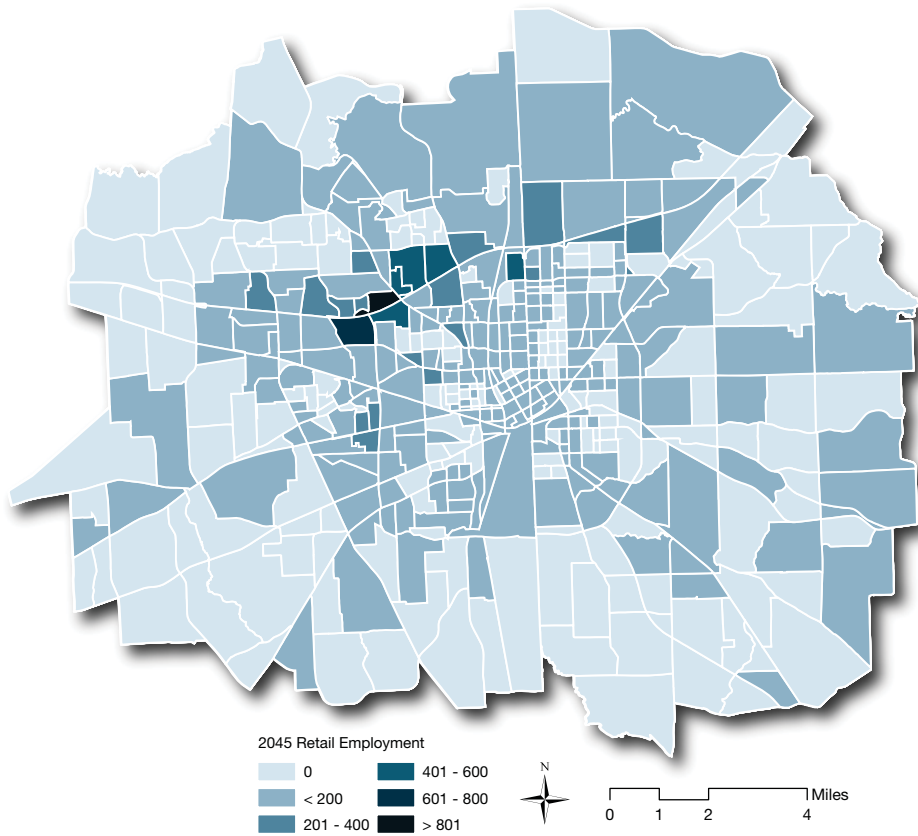


Figure 21: 2045 Retail Employment by TAZ

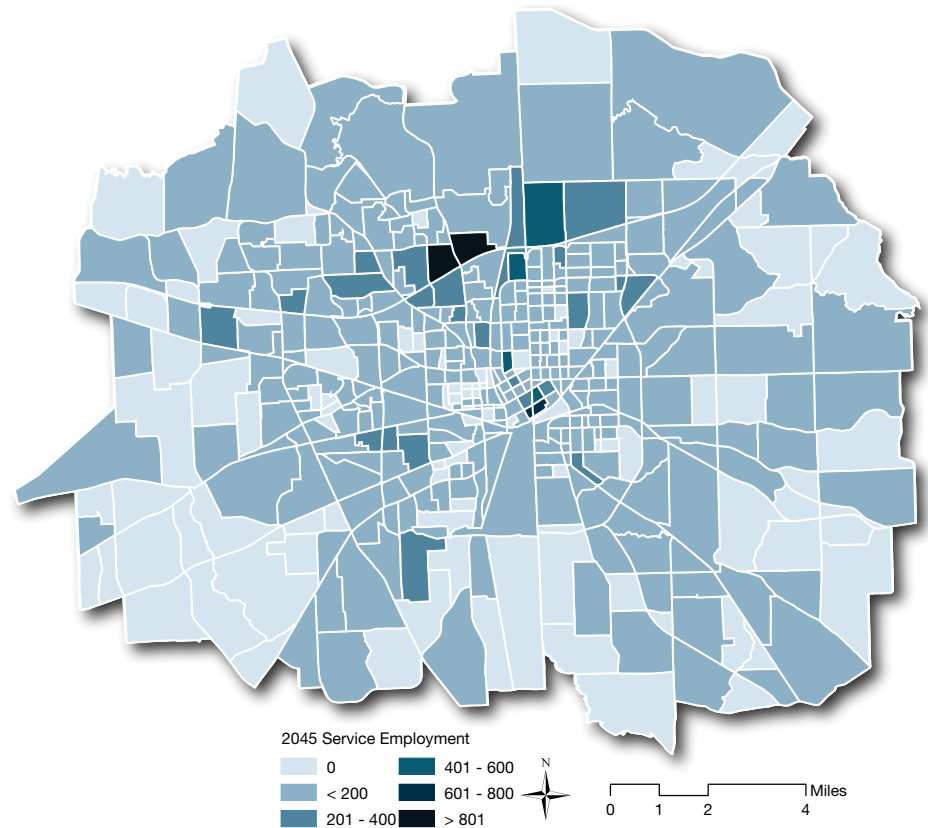


Figure 22: 2045 Service Employment by TAZ

## Special generators

Special generators are those population and employment demographics that are not considered typical population and households or typical forms of basic, retail, and service employment. They are characterized as having unique rates of trip generation.

The special generator population for the base year of 2013 was determined based on data gathered from the U.S. Census and the 2009 – 2013 ACS. Some of the group quarters population was included as special generators, however not all of the group quarters populations identified in the U.S. Census was considered special generators. Due to the complexity of predicting future special generator growth in each of the forecast years, an annual growth rate of 0.5% was used to allocate population. See Table 7 for the forecast special generator population by TAZ.

Table 7: Special Generator Population Forecast

TAZ	Special Generator	2013	2018	2023	2028	2045	2050
390	University of Arkansas Medical Sciences	618	634	650	666	725	743
125	Christus St Michael Hospital	112	115	118	121	131	135

Special generator employment for the base year of 2013 was determined based on the employment data provided by the InfoUSA. The employers identified as special generators demonstrated unique characteristics that are not typical of travel patterns such as hospitals, universities, prisons, and large employment centers. For the forecast year special generator allocation, an annual growth rate was applied to the existing special generators of 0.5% for basic employment, 0.5% for retail employment, and 0.5% for service employment. Table 8 provides the special generator employment summary.

Table 8: Special Generator Employers Forecast

TAZ	Special Generator	2013	2018	2023	2028	2045	2050
424	Texarkana Regional Airport	206	211	217	222	242	248
90	Texarkana College	290	297	305	313	340	349
139	Texas A&M University - Texarkana	169	173	178	182	198	203
390	University of Arkansas Medical Sciences	68	70	71	73	80	82
430	University of Arkansas Community College	17	17	18	18	20	20
93	Central Mall	995	1,020	1,046	1,072	1,167	1,197
8	Wadley Regional Medical Center	779	799	819	840	914	937
125	Christus St Michael Hospital	1,961	2,011	2,061	2,113	2,300	2,358

## Employment to Population Ratio

The employment population ratio for the Texarkana MPO planning area is approximately 40% for the region. The employment population ratio slightly increased through the forecast years to over 46%. Table 9 summarizes the population and employment totals for the MPO area.

Table 9: Texarkana MPO Modeling Area Statistics

	2018	2023	2028	2045	2050
<b>Population</b>	100,743	102,869	104,952	110,080	111,726
<b>Employment</b>	41,286	42,801	44,372	50,157	51,998
<b>Employment/Population Ratio</b>	40.98%	41.61%	42.28%	45.56%	46.54%

## ALTERNATIVE GROWTH SCENARIO

The results for the forecast year were presented to the Texarkana MPO Technical Committee on August 2, 2018. The Committee felt that the control totals for the region were lower than expected for the study area. As a result of that feedback, a second growth scenario was developed that more closely reflected more recent trends in growth for Miller County and the historical growth trends in Bowie County. This scenario was created to provide an alternative forecast that can be utilized in future studies of the area. Table 10 compares the result of scenario 1 and scenario 2. Figures 23 and 24 show the 2045 allocated population and employment for scenario 2.

Table 10: Scenario 1 & 2 Comparison

	Base Year 2013	Scenario 1 2050	Scenario 2 2050	Scenario Difference
<b>Population</b>	98,565	111,726	117,245	+5,519
<b>Employment</b>	39,824	51,998	54,569	+2,571
<b>Basic Employment</b>	7,386	9,821	10,335	+514
<b>Retail Employment</b>	8,568	12,220	12,992	+772
<b>Service Employment</b>	17,154	23,241	24,527	+1,286

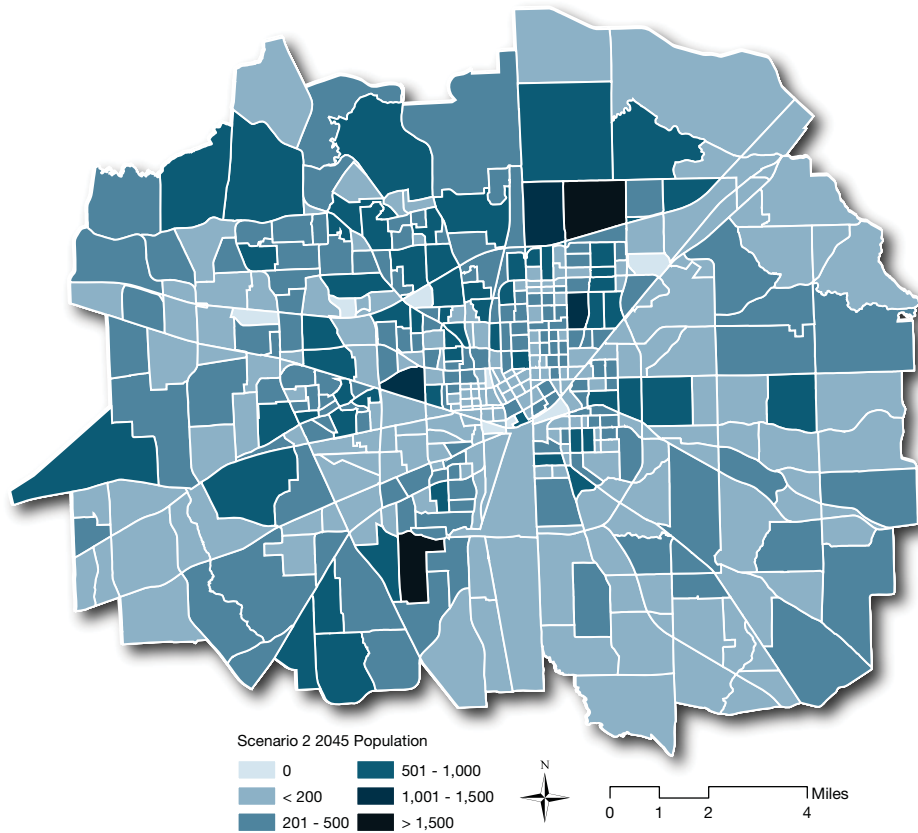


Figure 23: Scenario 2 2045 Population by TAZ

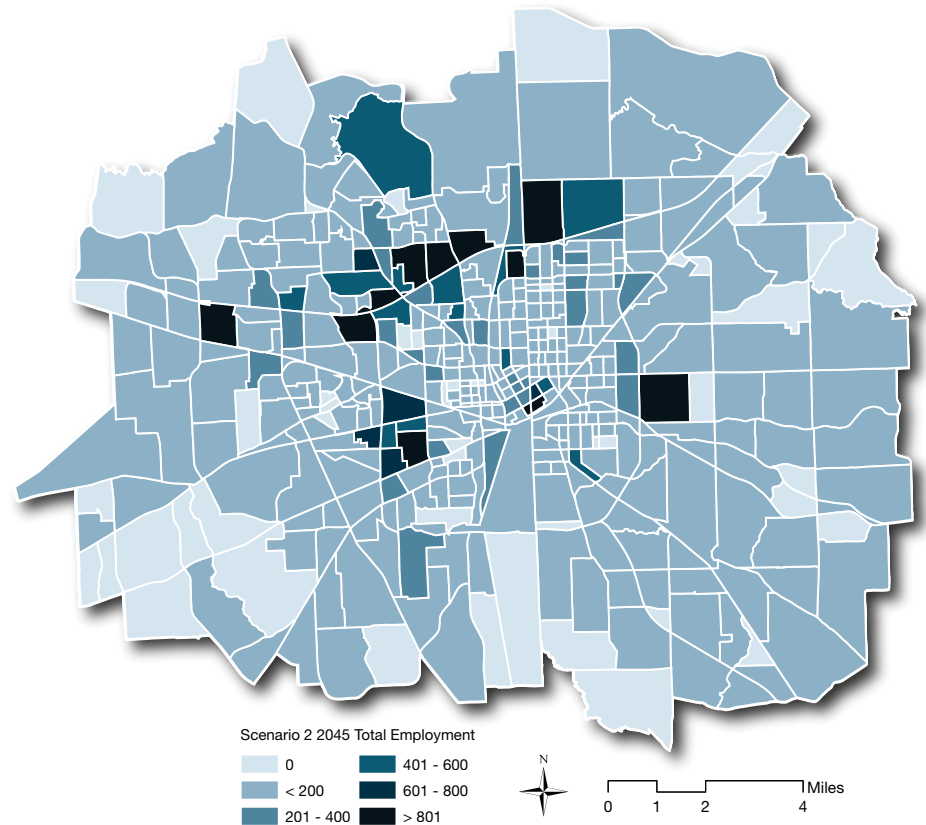


Figure 24: Scenario 2 2045 Total Employment by TAZ

## SUMMARY

The forecast year demographic section of this report described the process involved in developing the data for the forecast years of 2018, 2023, 2028, 2045, and 2050 for the Texarkana MPO modeling area. Additional figures for the forecast years for both scenarios are found in the Appendix.

The forecast year data provides the information needed to understand the traffic implications as growth occurs in the future. This data is used as input into the Texarkana MPO travel demand model. The following section describes the process used in updating the travel demand model network for the base year and each forecast years.

## 4. MODEL NETWORK UPDATE



For the base year of 2013, the model network was updated to reflect the changes that have occurred since the last model update was completed. The model network determines the supply or capacity of the transportation system in the region. This capacity is determined through the number of lanes on each roadway, the area type that the roadway traverses, and the functional classification of the roadway. The factor in the model network that affects travel time is the length of the roadway and the speed. Figure 25 identifies all of the roadways considered part of the model network for 2013. Each has been coded and updated with the appropriate functional class, area type, number of lanes, and speed.

In addition to the update of the 2013 base year model network, the forecast years of 2018, 2023, 2028, 2045, and 2050 were updated to include all of the capacity projects that have been included in the previous MPO planning studies such as the Transportation Improvement Program (TIP) and the Metropolitan Transportation Plan (MTP). For each of the forecast years, the model network is displayed with the recommended network changes highlighted red to indicate the projects that have been included in that forecast year network. The project descriptions for each year are included below each map consisting of Tables 11 through 14.

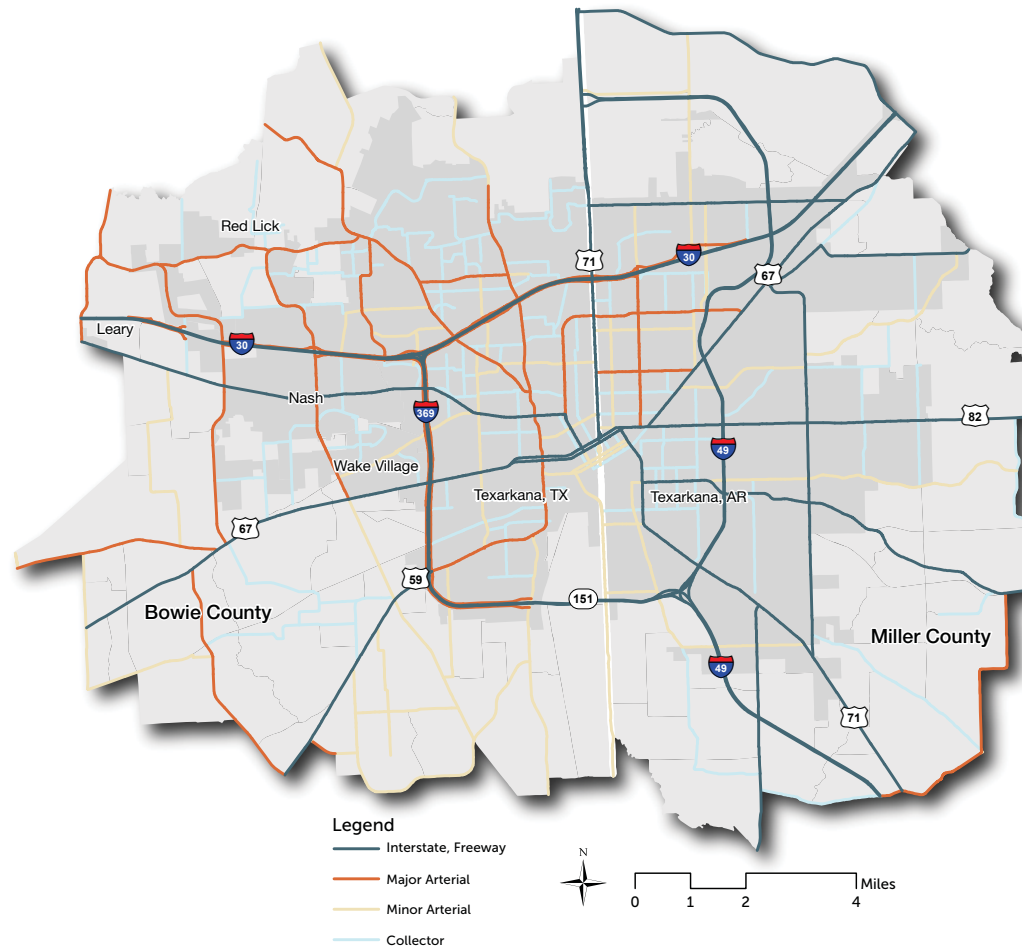


Figure 25: 2013 Base Year Network Functional Classification Map



Figure 26: 2018 Model Network Changes

Table 11: 2018 Model Network Changes

Travel Demand Model Year	Project	Location	Description
2018	IH 30	.6 mile west of FM 989 to Arkansas State Line	Widen existing Interstate from 4 lanes to 6 lanes

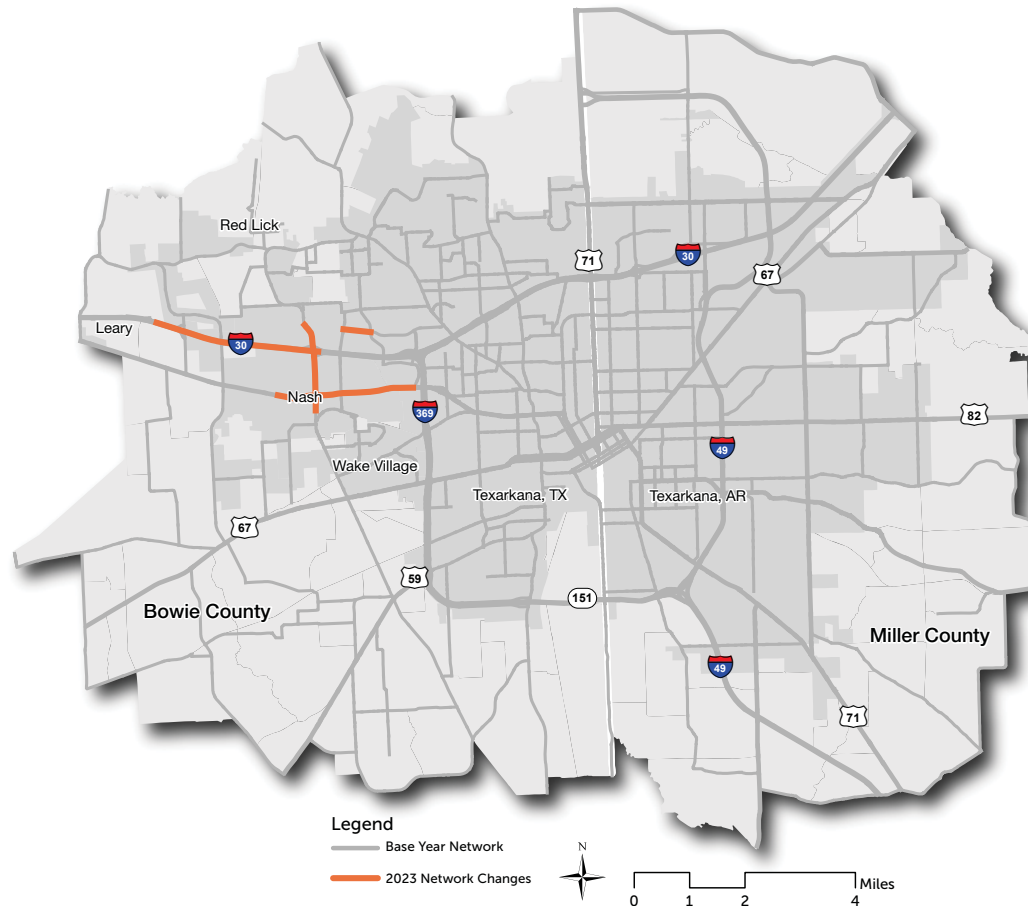


Figure 27: 2023 Model Network Changes

Table 12: 2023 Model Network Changes

Travel Demand Model Year	Project	Location	Description
2023	IH 30	FM 3419 to FM 989	Construct one-way frontage roads, entrance & exit ramps, & turnarounds
2023	FM 989	IH 30 South Frontage Road to .5 mile south of US 82	Widen existing 4-lane undivided highway to 4-lane divided
2023	US 82	.2 mile west of IH369 to .7 mile west of FM 989	Widen existing 2-lane highway to 4-lane divided
2023	FM 989	IH 30 North Frontage Road to .3 mile north of Gibson Lane	Widen existing 2-lane highway to 4-lane divided
2023	Gibson Lane	Univeristy Avenue to Pleasant Grove	Construct new roadway



Figure 28: 2028 Model Network Changes

Table 13: 2028 Model Network Changes

Travel Demand Model Year	Project	Location	Description
2028	FM 1397	University Avenue to .1 mile north of North Park Road	Widen existing 2-lane highway to 4-lane divided
2028	US 67	.2 mile west of FM 989 to FM 2148	Widen existing 2-lane divided highway to 4-lane divided
2028	North Kenwood Road	North Kenwood Road to Sowell Road	Extend existing roadway to Sowell Road



Figure 29: 2018-2050 Model Network Changes

Table 14: 2018-2050 Model Network Changes

Travel Demand Model Year	Project	Location	Description
2018	IH 30	.6 mile west of FM 989 to Arkansas State Line	Widen existing Interstate from 4 lanes to 6 lanes
2023	IH 30	FM 3419 to FM 989	Construct one-way frontage roads, entrance & exit ramps, & turnarounds
2023	FM 989	IH 30 South Frontage Road to .5 mile south of US 82	Widen existing 4-lane undivided highway to 4-lane divided
2023	US 82	.2 mile west of IH369 to .7 mile west of FM 989	Widen existing 2-lane highway to 4-lane divided
2023	FM 989	IH 30 North Frontage Road to .3 mile north of Gibson Lane	Widen existing 2-lane highway to 4-lane divided
2023	Gibson Lane	Univeristy Avenue to Pleasant Grove	Construct new roadway
2028	FM 1397	University Avenue to .1 mile north of North Park Road	Widen existing 2-lane highway to 4-lane divided
2028	US 67	.2 mile west of FM 989 to FM 2148	Widen existing 2-lane divided highway to 4-lane divided
2028	North Kenwood Road	North Kenwood Road to Sowell Road	Extend existing roadway to Sowell Road

