4. Existing and Future Conditions

4.1 Introduction

This chapter presents the existing and future conditions within Lubbock County with a more detailed analysis within the LMPO area, as described in **Chapter 1**. **Section 4.2** present the characteristics of the transportation system (miles of roadway and functional classification). **Section 4.3** provides land use and socioeconomic characteristics with a review of the existing and future population and employment projections. **Section 4.4** describes existing transportation conditions. **Section 4.5** discusses future transportation conditions. **Section 4.6** addresses the natural environment. **Section 4.7** describes the natural hazard risk and **Section 4.8** includes the hazard mitigation.

The material for this section is primarily based on data from the LMPO Travel Demand Model (LMPO TDM), LMPO Crash Dashboard, and TxDOT Pavement Management Information System (PMIS). Existing land use was obtained from the Lubbock County Appraisal District. Future land use was derived from the adopted comprehensive plans for the City of Lubbock and the City of Wolfforth.

4.2 Transportation System Characteristics

This section summarizes the characteristics of LMPO area's existing and future transportation systems, including the road network, public transit, active transportation, passenger air, and freight (trucks, rail, and airports).

4.2.1.Existing and Future Road Network

The descriptions of the existing and future road networks are based on the LMPO TDM, which projects a promising future for the area's transportation. The LMPO TDM was created in partnership with TxDOT to examine the urban core while taking into consideration travel forecasts into and out of Lubbock County. External trips originating outside of Lubbock County were incorporated into the 2050 LMPO TDM from the Statewide Analysis Model (SAM). The countywide data outputs from the model were used for this analysis. The network includes a combination of interstate, principal arterials, minor arterials, major collectors, minor collectors, and local roads, all of which are poised to support the area's growth and development.

Existing Freeway System

The LMPO region has one interstate freeway, I-27, running north-south through the center of Lubbock County. Other freeways or expressways in the area include US 62 and US 82 running from the southwest to the northeast, US 84 running from the northwest to the southeast, US 87 in the south, and Loop 289 in the heart of the urbanized area (**Figure 4.1**).

Existing Arterial Network

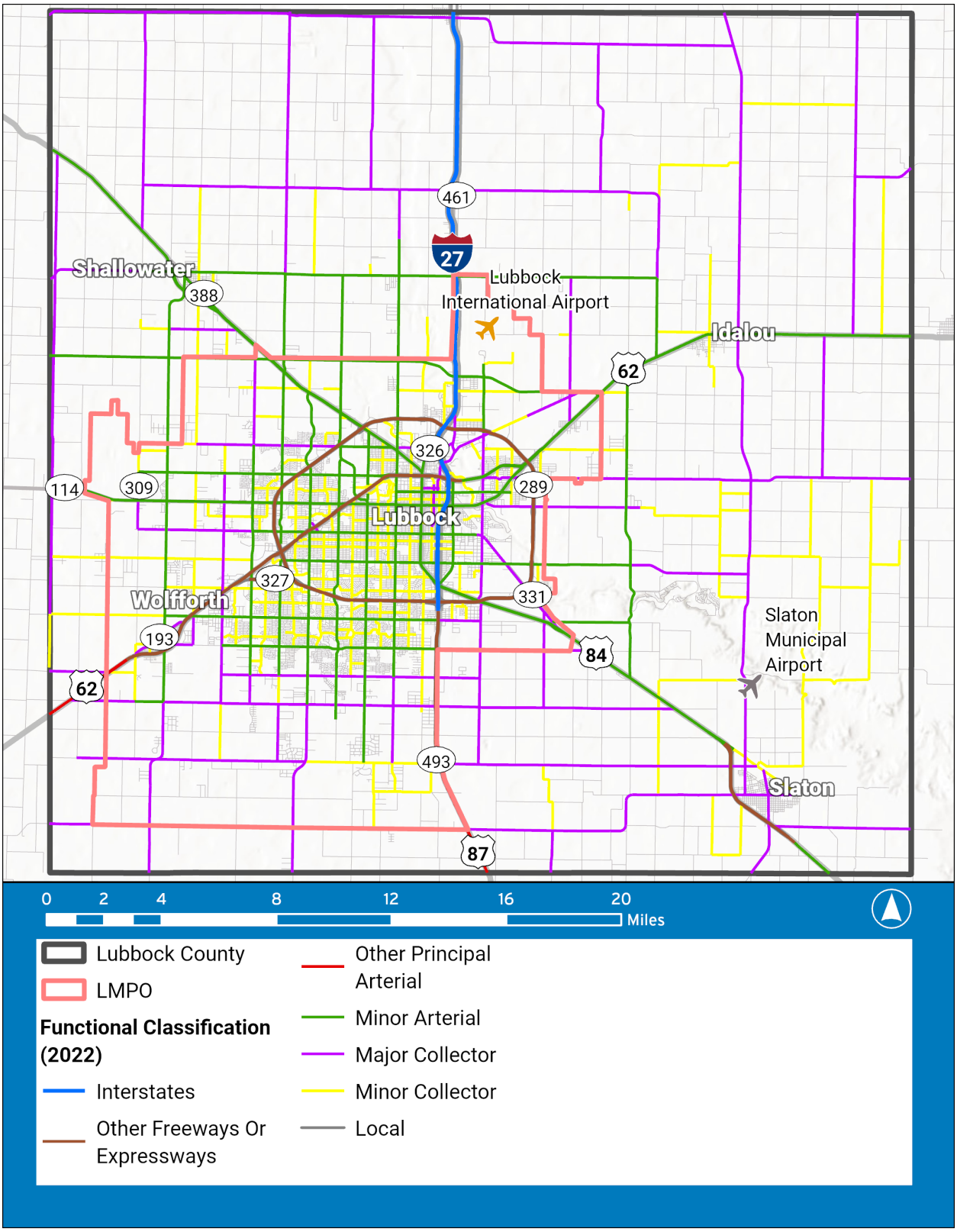
The arterial system within the LMPO area and Lubbock County consists of a grid system with major east-west and north-south arterials spaced at one-mile intervals. Collector streets are located along the half-mile interval. The 2022 TxDOT roadway inventory consists of 680 centerline miles of roadway (**Table 4.1**). Most roadways (301 miles) are classified as collectors. Roughly 240 miles of roadway are classified as arterials. Approximately 12 miles of roadway are classified as interstate.

Table 4.1 - TxDOT Centerline Miles by Functional Class Within LMPO, 2022

Functional Class	Miles
Interstate	12
Freeways, Expressways and Other Principal Arterials	50
Minor Arterial	190
Major Collector	117
Minor Collector	184
Local	127
Total	**680**

Source: LMPO 2022 Loaded Travel Demand Model , 2022

Figure 4.1 - Existing Roadway Network, 2022



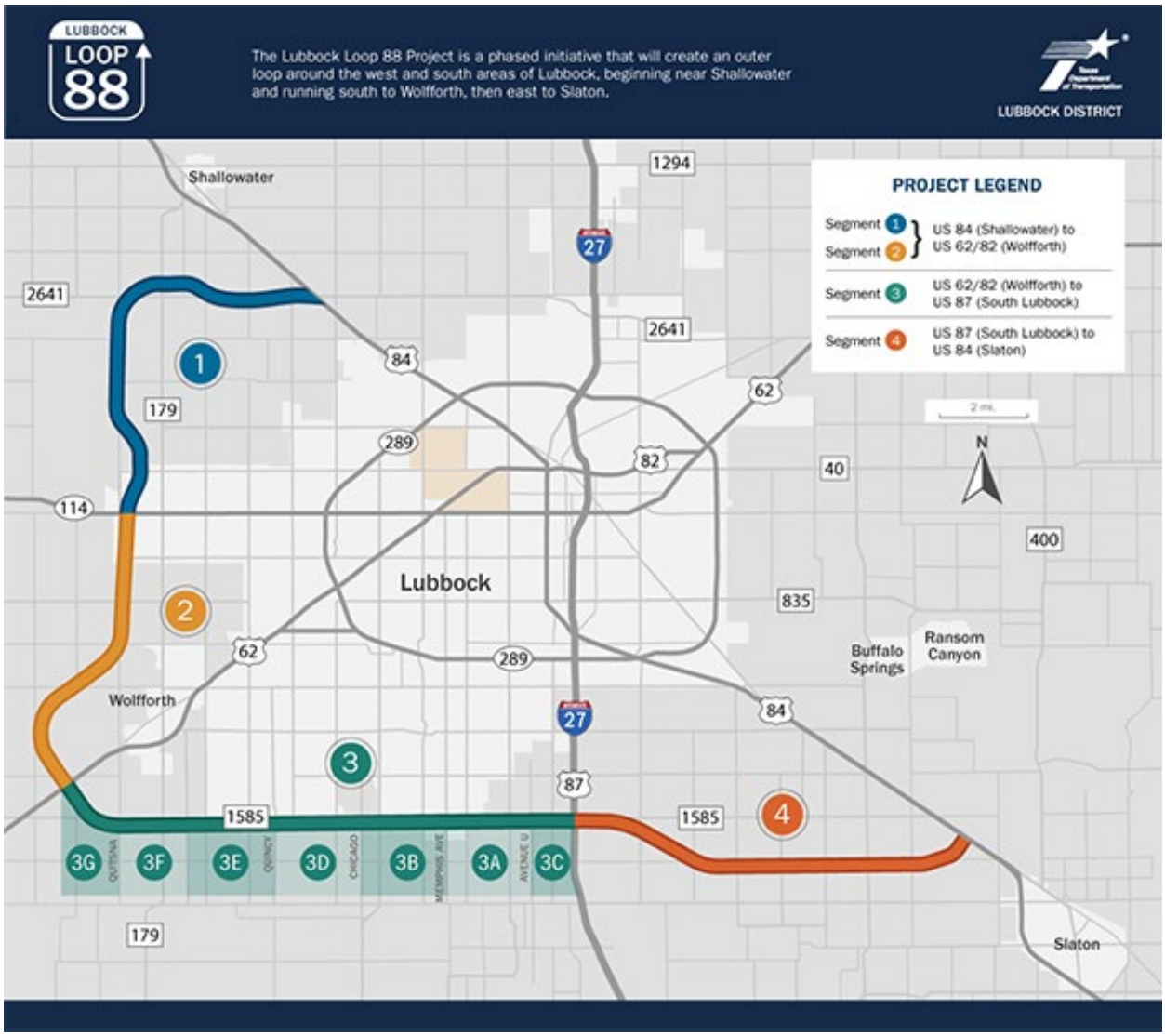
Source: LMPO 2022 Loaded Travel Demand Model, 2022

Freeway and Expressway Improvements

Freeway and expressway improvements are expected within or adjacent to the LMPO area boundary. These improvements, detailed in **Appendix A**, include:

- Loop 88 (130th, CR 1300, FM 1585, FM 2641, Outer Route, and Quitsna Avenue) is a conversion of a two-lane non-freeway to a six-lane freeway. A portion of this project is located outside of the LMPO area boundary; and
- US 84 interchange improvement to construct a new bridge/interchange in Shallowater.

Figure 4.2 - Future Lubbock Loop 88 Project



Source: TxDOT Lubbock Loop 88, *https://www.txdot.gov/projects/projects-studies/lubbock/lubbock-loop-88-overview.html*, accessed 23 May 2024.

Arterial and Collector Improvements

Major arterial and collector improvements expected in the LMPO area include:

- Widen 34th Street, 50th Street, 66th Street, 82nd Street, 98th Street (CR 7200), 114th Street, 146th Street, Alcove Avenue (CR 1500), Avenue P, Broadway Avenue, CR 2300, CR 2500, CR 7300, Erskine Street, FM 179 (Dowden Road, Inler Avenue), FM 1730, Frankford Avenue (FM 2528, CR 1800), Indiana Avenue (CR 2100), Martin L. King Boulevard, Milwaukee Avenue (CR 1700), Municipal Drive, Quaker Avenue, Southeast Drive, University Avenue, Upland Avenue (CR 1600), Ursuline Street, Woodrow Avenue (CR 7600)
- Signalized intersection improvements to include accessible pedestrian stations and Smart AI traffic platform.
- Construction of wide shoulders along various Lubbock County roads.
- Safety and pedestrian improvements along Woodrow Road in conjunction with road widening.

Detailed project descriptions are provided in Appendix A.

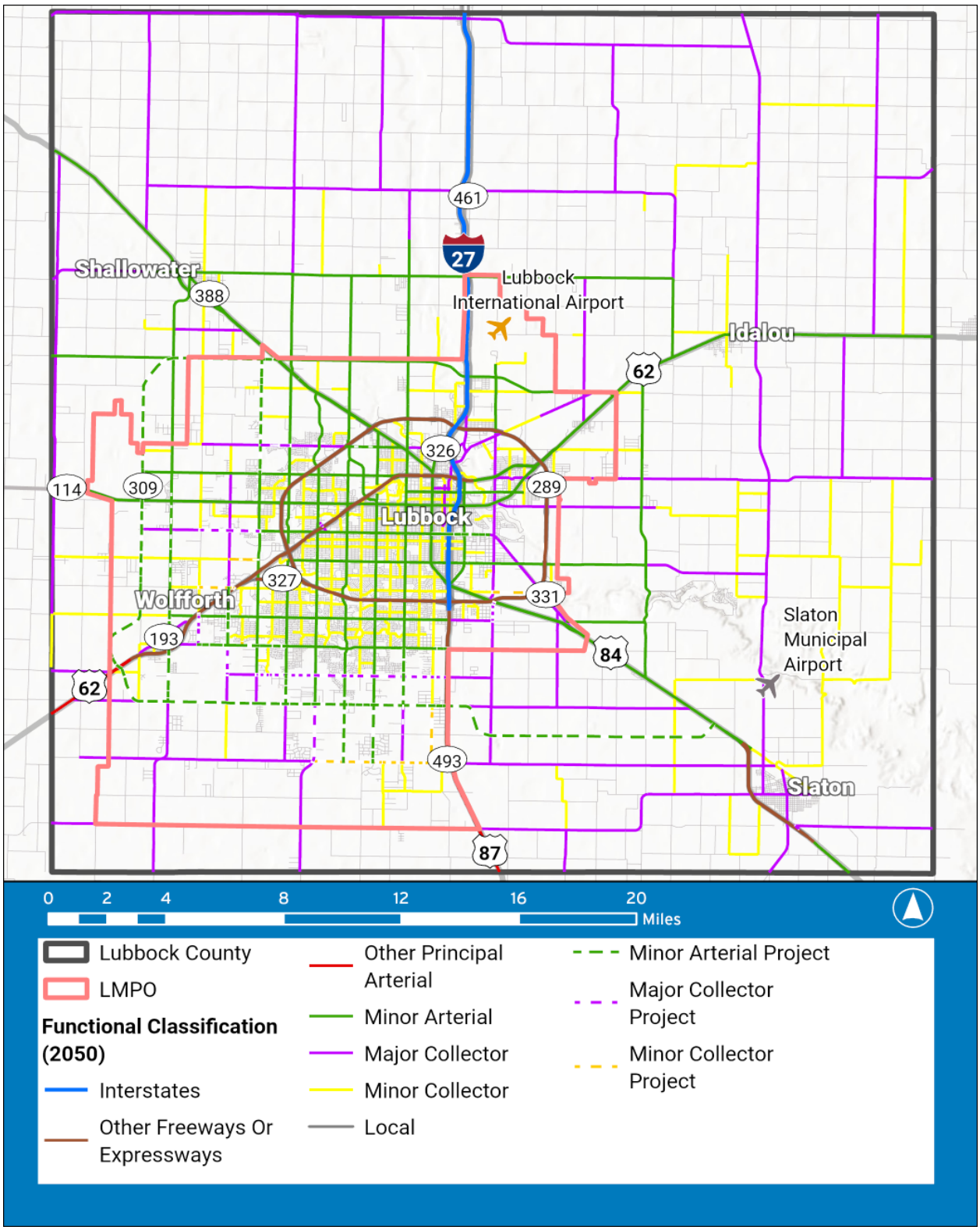
The 2050 LMPO TDM network within the LMPO area includes roadway widening projects and new miles of minor arterials, major collectors and minor collectors (**Figure 4.3** and **Table 4.2**). The projected number of centerline miles for minor arterials has grown from 190 to 218. Several major collectors in the current network are expected to be upgraded to minor arterials as result of improvements that allow for higher traffic volumes and speed. The overall roadway system is expected to grow by 13 centerline miles between 2022 and 2050.

Table 4.2 - LMPO TDM Centerline Miles by Functional Class, 2050

Functional Class	Miles
Interstate	12
Freeways, Expressways and Other Principal Arterials	50
Minor Arterial	218
Major Collector	100
Minor Collector	186
Local	127
Total	693

Source: LMPO 2050 Loaded Travel Demand Model, *2024*

Figure 4.3 - LMPO TDM Planned Future Road Network, 2050



Source: LMPO 2050 Loaded Travel Demand Model, 2024

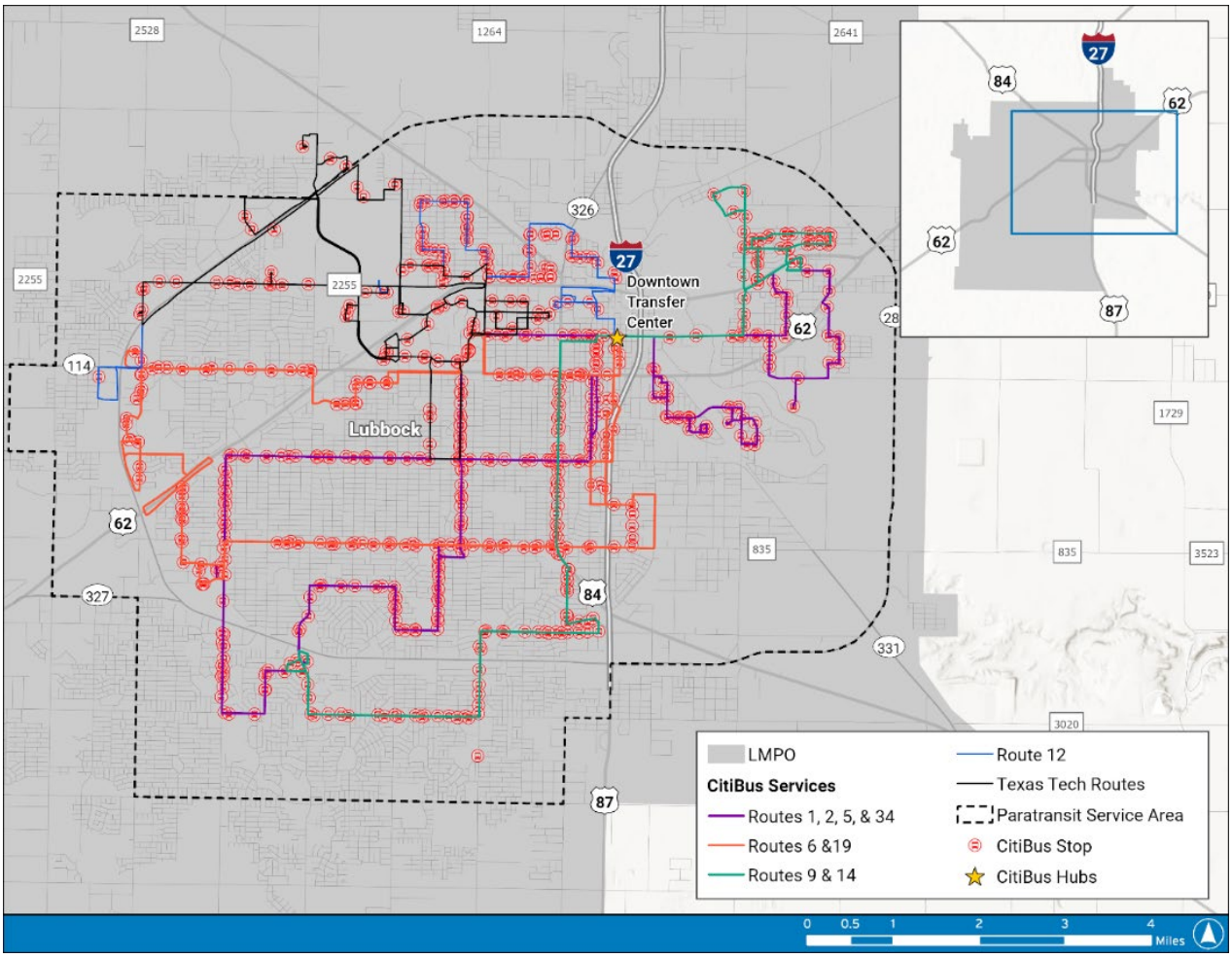
4.2.2. Public Transit

Citibus provides public transportation services within the City of Lubbock and has limited fixed transit service outside the city. Citibus provides multi-passenger transit services that connect people to employment, educational institutions, and medical facilities. Citibus expands transportation options to more individuals by operating a fully accessible fleet and providing bicycle racks on buses for individuals that cycle to/from bus stop locations.

Citibus operates a fleet of 72 buses (including two trolleys) and 32 paratransit vans. All revenue vehicles are wheelchair accessible, and the paratransit service functions as CitiAccess, covering approximately 64 square miles of the City of Lubbock (marked in **Figure 4.3**). The agency also operates hybrid public transit vehicles, and in 2019 received delivery of two all-electric buses and installed two charging stations. Citibus also serves as a subcontractor for the Medicaid non-emergency medical transportation program, operating Monday through Saturday. Texas Tech services are available Monday through Friday during school sessions. The Downtown Transfer Plaza (DTP) facilitates most route transfers, with space for twelve buses and indoor amenities for passengers.

All the Citibus routes and stops within the LMPO area are illustrated in **Figure 4.4**. The 2024 Citibus routes cover a total of 150 miles. Fifty-one (51) miles of these routes are designated as the Texas Tech route. The remaining mileage is distributed among the fixed routes, CitiAccess routes, and other special routes.

Figure 4.4 - Citibus Routes and Stops in the LMPO Area



Source: Citibus, 2024

Table 4.3 – Citibus Ridership provides detailed ridership characteristics of Citibus from 2020 to 2022, segmented by the various types of routes mentioned above. Citibus has regained a good share of its ridership in 2022. The Texas Tech route has the highest share of users among the four categories of routes.

Table 4.3 - Citibus Ridership, 2020-2022

Route	FY 2020	FY 2021	FY 2022	% Change 20-21	% Change 21-22
Fixed Route	474,705	333,413	397,957	-30%	19%
CitiAccess	82,686	92,154	119,583	11%	30%
Texas Tech	1,693,946	626,127	1,336,656	-63%	113%
Special	76,016	22,709	79,137	-70%	248%
Total	2,327,353	1,074,403	1,933,333	-54%	80%

Source: Citibus, 2023

Citibus also offers a citywide on-demand service to address transit gaps during times and in areas not covered by the regular fixed-route bus service. However, many on-demand trips overlap with the fixed route network due to the longer vehicle headways. Among all users, Texas Tech students make up the largest group utilizing the on-demand service, surpassing ridership in downtown or other activity centers.

Some proposed services planned by Citibus for the future include:

2

Proposed at least **two** express routes

3

Three core routes and three local routes

6

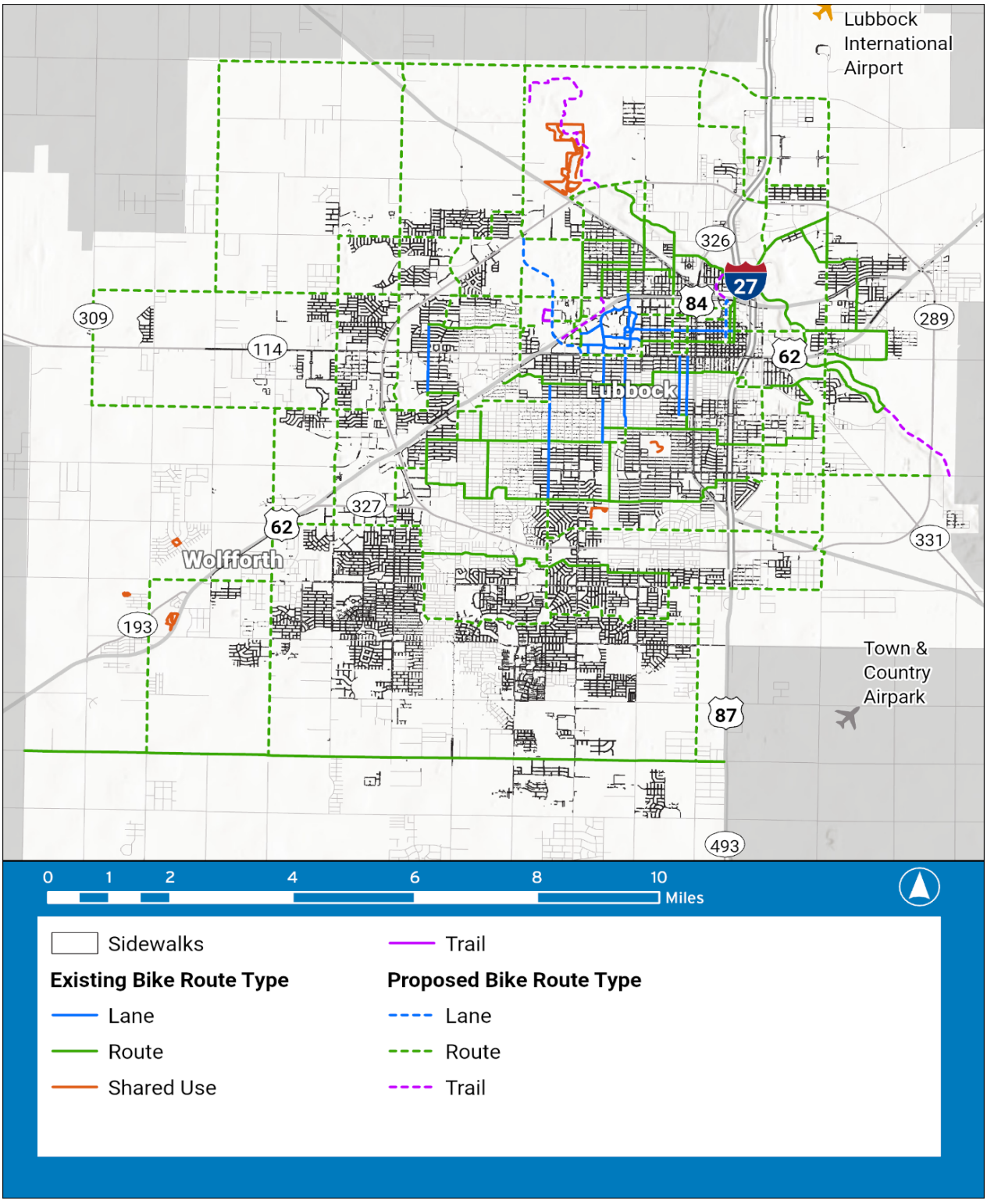
Six on demand zones

For intercity travel, Greyhound and FlixBus provide travel to 26 destinations from Lubbock, including Dallas, Houston, and San Antonio, TX. The intercity bus stop is located at the Citibus Downtown Transfer Plaza.

4.2.3.Active Transportation

The LMPO area is expanding its network of sidewalks, bike lanes, and shared-use paths. In 2018, the City of Lubbock, LMPO, and other stakeholders developed the Walk and Bike Lubbock Pedestrian and Bicycle Master Plan. This plan outlines proposed bike paths and routes for city planners. The bicycle rideability map was updated in 2023 to reflect recent changes and adjustments made to the 2018 plan. The new map, designed as a public brochure, highlights all bicycling trails, lanes, and routes in Lubbock, along with shared-use paths. The map also lists amenities and resources for bicycling, including safety tips and general information about Lubbock.

Figure 4.5 - Active Transportation Network in the LMPO Area



Source: City of Lubbock, 2024

Table 4.4 - Mileage of Bike Facilities in the LMPO Area

Status	Lane	Route	Shared use	Trail	Total
Existing	14.7	74.5	10.2	1.1	100.6
Proposed	3.3	119.7	0	7.3	130.3

Source: City of Lubbock, 2024

Figure 4.5 depicts Lubbock's active transportation network, which includes bike facilities, trails, and sidewalks. Sidewalks span most of the City of Lubbock, with gaps in the southern portion of the LMPO area. The map showcases existing and future bike routes, and **Table 4.4** breaks down the mileage for 100 miles of existing and 130 miles of planned bike facilities of various categories and surface types. The four types of facilities are described below:

- **Bike lanes** are one-way sections of road designated for cyclists, marked by signs and pavement markings, generally located on the right, to improve safety and visibility next to vehicle traffic. Most of the existing bike lanes are concentrated around the Texas Tech campus, with additional lanes in downtown and nearby residential neighborhoods. Future plans include extending bike lanes beyond Texas Tech to the further northwest region of the campus.
- **Bike routes** are roadways intended for bicycle usage, where bicycles share lanes with motor vehicles. They typically have low traffic volumes and speeds and serve as important links in the city's cycling network. **Figure 4.5** shows that the majority of the current bike routes are on major and minor collectors. A large number of bike routes are proposed in the LMPO area, primarily along minor arterials.
- **Shared-use paths** are paved paths separated from vehicular traffic. They are designed to follow roadway corridors and accommodate two-way travel for bicyclists, pedestrians, and other non-motorized users. Most current shared-use paths are located in and around the region’s various lakes, with the remainder dispersed among various recreational and open-space areas.
- **Trails**, which are often used interchangeably as shared-use paths, are designated paved or unpaved travel ways intended for nonmotorized use such as walking, running, biking, skating, or horseback riding. Existing trails, like shared-use paths, are scattered across the LMPO area.

In addition to infrastructure developments, recent years have seen further improvements, including the LMPO's biking survey, distributed online in 2024, to gauge public interest, opinions, and biking experiences. The establishment of the LMPO Active Transportation Ad-Hoc Committee, comprised of pertinent transportation and public health stakeholders, aims to enhance the regional active transportation network through viable funding and efficient implementation. The creation and launch of an Active Transportation Dashboard, provides real-time information on the location and amenities of alternative modes of transportation in the region.

4.2.4. Passenger Air

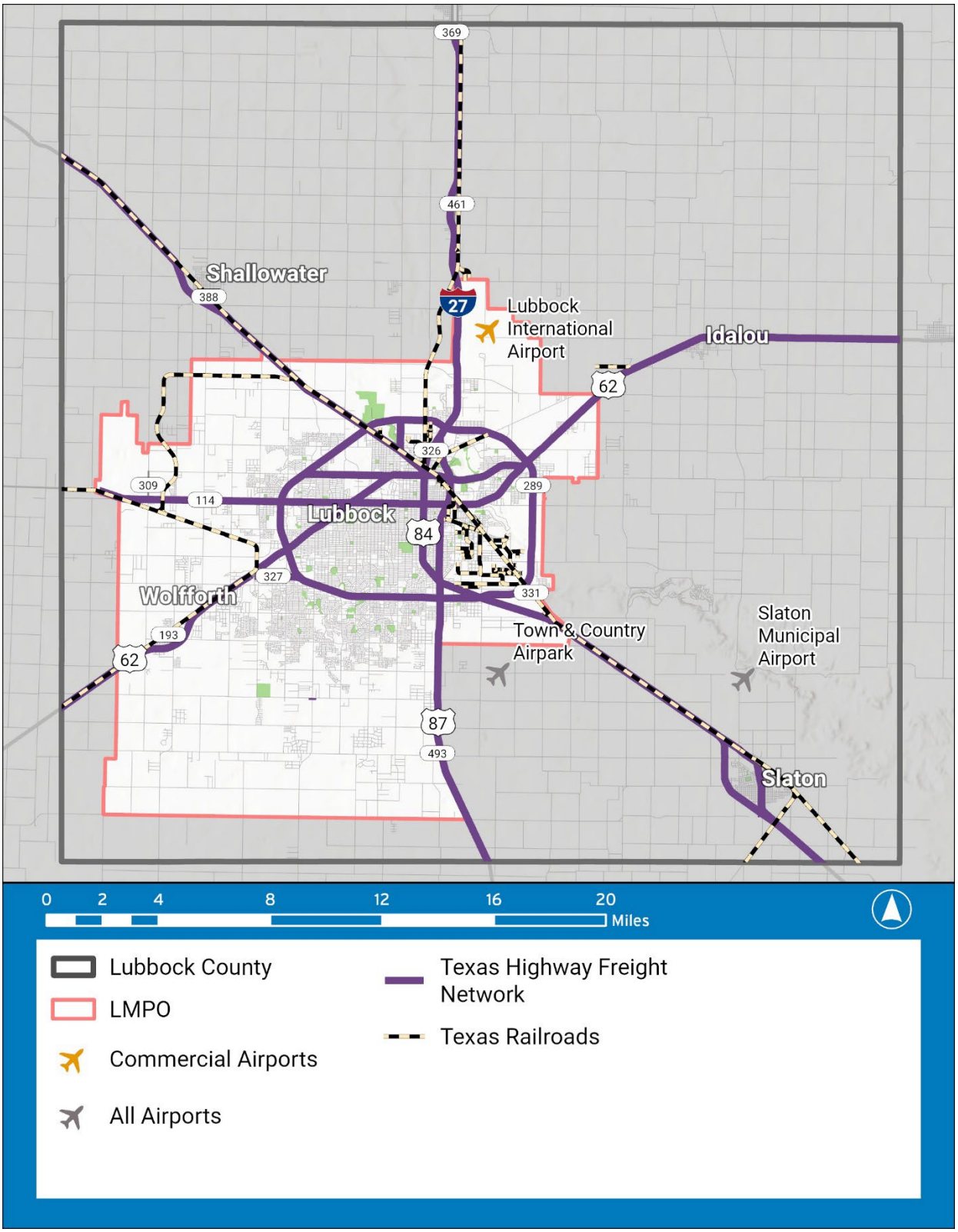
The Lubbock Preston Smith International Airport (LBB) is located in the northeastern part of the LMPO area (**Figure 4.6**). In 2022, LBB served 489,710 passengers, a twenty-one percent (21%) increase from the previous year[1].

4.2.5. Freight

Lubbock County serves as a transportation hub as it is strategically located at the center of both regional and national freight networks. Its extensive infrastructure, which includes busy highways, well-established railways, and the LBB Airport, provides a diverse foundation for the smooth transportation of commodities both domestically and internationally. **Figure 4.6** shows the railroad, airport, and portion of the Texas Highway Freight Network within the Lubbock region.

[1] Federal Aviation Administration, 2023, *Final CY22 Enplanements at Commercial Service Airports, by Rank Order*, accessed 3 June 2024. https://www.faa.gov/sites/faa.gov/files/2023-09/cy22-commercial-service-enplanements.pdf

Figure 4.6 - Freight Transportation Network (Rail, Trucking, Airports)



Source: Texas Department of Transportation , 2023

Highway Freight

Key corridors that run through Lubbock are US 84, US 87, and US 62, which are critical routes for truck traffic in the Texas Panhandle and neighboring states. I-27 also serves a key role as part of the Ports-to-Plains Corridor, connecting Mexico and southern Texas to the Great Plains and other significant interstates like I-40 and I-20, via Lubbock. It should be noted that other highways that are not part of the Texas Highway Freight Network also receive a significant amount of freight traffic through the LMPO area.

Railways

Currently, Lubbock is served by two railroads. The Burlington Northern Santa Fe Railway (BNSF) and the WATCO Lubbock and Western Railway (LBWR) both have lines that travel through or terminate in Lubbock.

As a Class I railroad, BNSF oversees four lines that travel along US 84 in both the northwest and southeast, along I-27 in the north, and along US 62/82 in the northeast. Currently, the BNSF runs 14 trains through the LMPO area daily. Hazardous material makes up roughly 30% of the freight transported by BNSF rail. The 195.98 miles of track that LBWR operates, with interchange points in Plainview and Lubbock, were put into service in 2015. The main commodities transported by LBWR are frac sand, chemicals, fertilizer, grain, animal feed, and oil.

Airport

The LBB serves as an important center for regional aviation freight. Easy access to major highways and interstates is a key factor in enabling the smooth integration of airfreight with ground-based transportation networks. LBB is one of the state's top ten cargo airports, and it has been recognized for its cargo volume in the Texas Delivers 2050 initiative. In 2022, the airport handled approximately 380 million pounds of goods. This was a 4.6% decrease from the previous year.[2] Federal Express and United Parcel Service also strengthen LBB's position as an important airfreight gateway.

While rural west Texas face challenges with highway connectivity, necessitating longer detours to access major routes, ongoing infrastructure improvements are steadily enhancing accessibility. Moreover, advances in data collection and distribution hold immense potential to revolutionize freight movement in the region, promising more efficient and streamlined operations in the future.

[2] Federal Aviation Administration, 2023, *Calendar Year 2022 All-Cargo Landed Weight*, accessed 3 June 2024. https://www.faa.gov/sites/faa.gov/files/2023-08/CY2022-All-Cargo-airports.pdf.

4.3 Land Use and Socioeconomic Characteristics

This section summarizes existing and future land use and socioeconomic characteristics in the LMPO area. The socioeconomic characteristics include the existing and future population, the number of households, and employment.

4.3.1. Existing and Future Land Use

Today, the land use in the LMPO area is primarily residential (single-family and multi-family) or agricultural, with several pockets of commercial activity (**Figure 4.7**).

The percent composition of land uses in the LMPO area (**Table 4.5**):

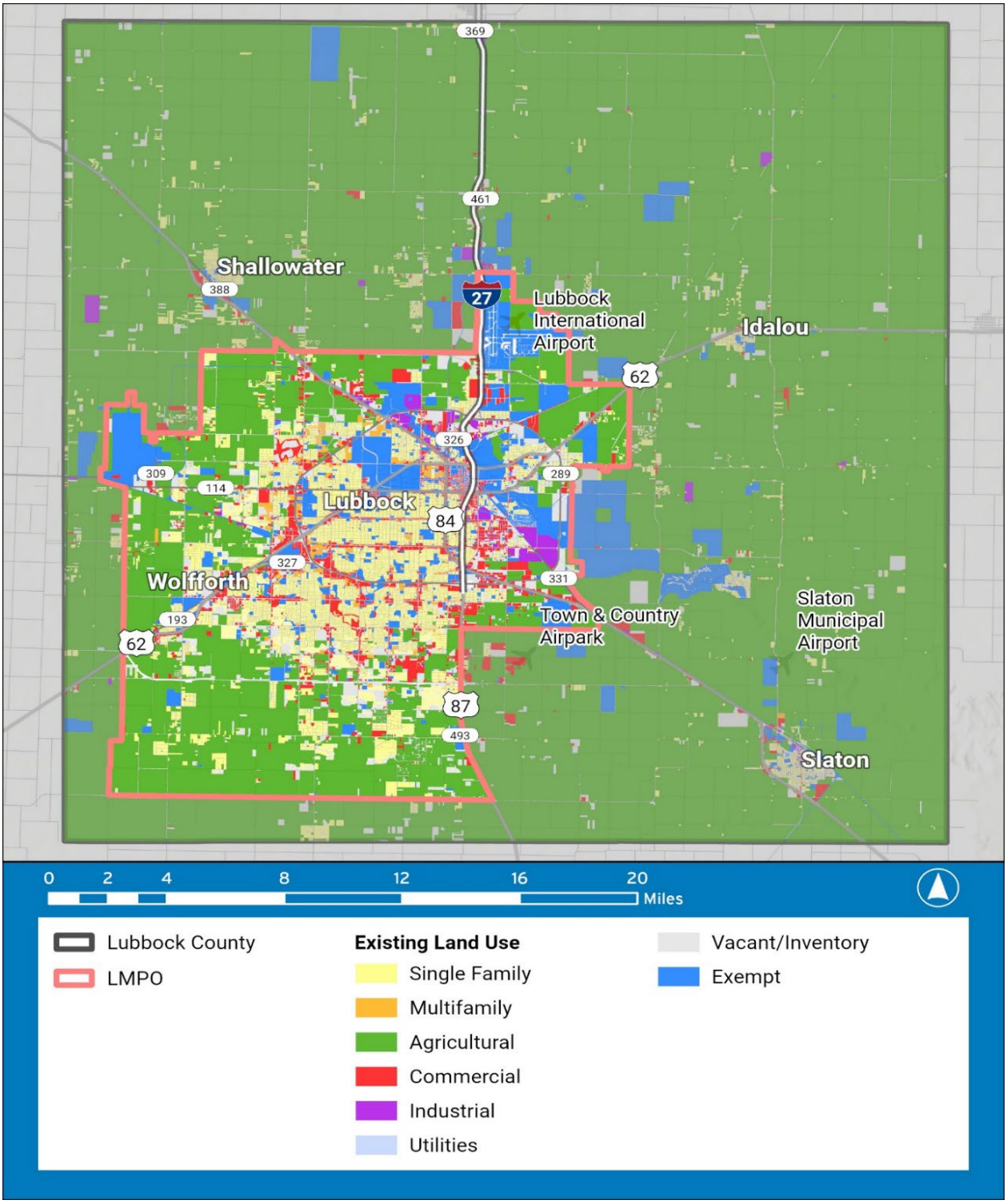
- Residential land use accounts for 28% of the LMPO area, encompassing various housing options such as single-family homes, apartments, and manufactured homes.
- Commercial land use makes up approximately 6% of the total land area in the LMPO area. This includes retail stores, restaurants, offices, and other commercial businesses.
- Industrial land use, dedicated to manufacturing facilities, warehouses, and distribution centers, comprises 1%.
- Agricultural land, vital to the region's economy, comprises 44% of the LMPO area. This includes farms and ranches.

Table 4.5 - LMPO Area Existing Land Use Composition, 2024

Land Use	Acres	Percentage
Agricultural	75,625	44%
Single Family	46,741	27%
Multifamily	2,265	1%
Commercial	11,187	6%
Industrial	1,708	1%
Utilities	77	0%
Vacant/Inventory	18,778	11%
Exempt	16,367	9%

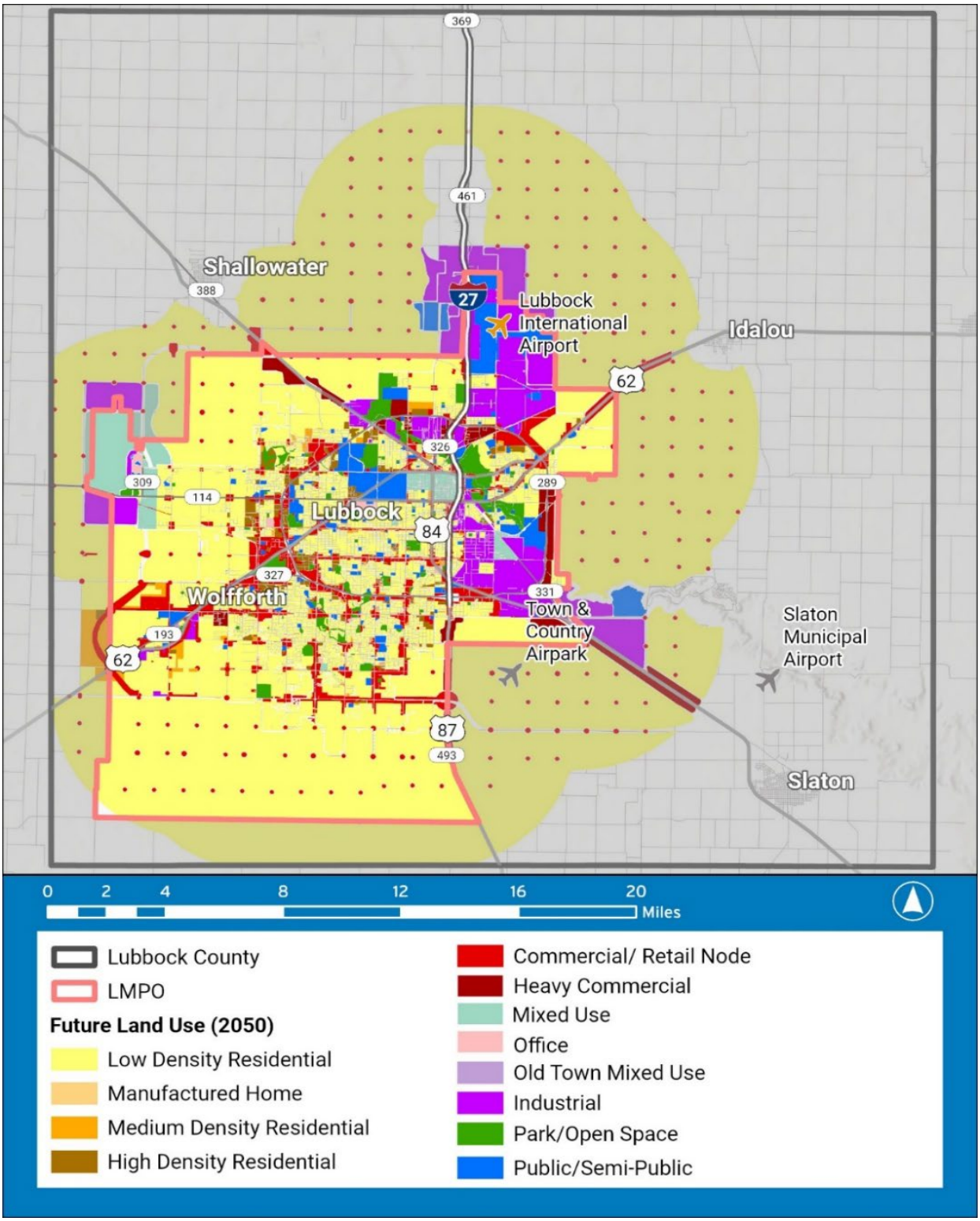
Source: Lubbock County Appraisal District, 2024

Figure 4.7 - Existing Land Use



Source: Lubbock County Appraisal District, 2024

Figure 4.8 - Future Land Use



Source: City of Lubbock Plan Lubbock 2040, 2024. City of Wolfforth Future Land Use Plan, 2024.

The Lubbock 2040 Comprehensive Plan identifies suburban low-density residential housing as the primary driver of future growth in the LMPO area, with commercial and retail nodes at one-mile intervals, as shown in **Figure 4.8**. Significant industrial growth is projected in the eastern part of the LMPO area east of I-27, while significant mixed-use development is projected for the northwestern part of the study area. **Figure 4.8** includes the future land use maps from the City of Lubbock and the City of Wolfforth's comprehensive plans for their respective geographic jurisdictions.

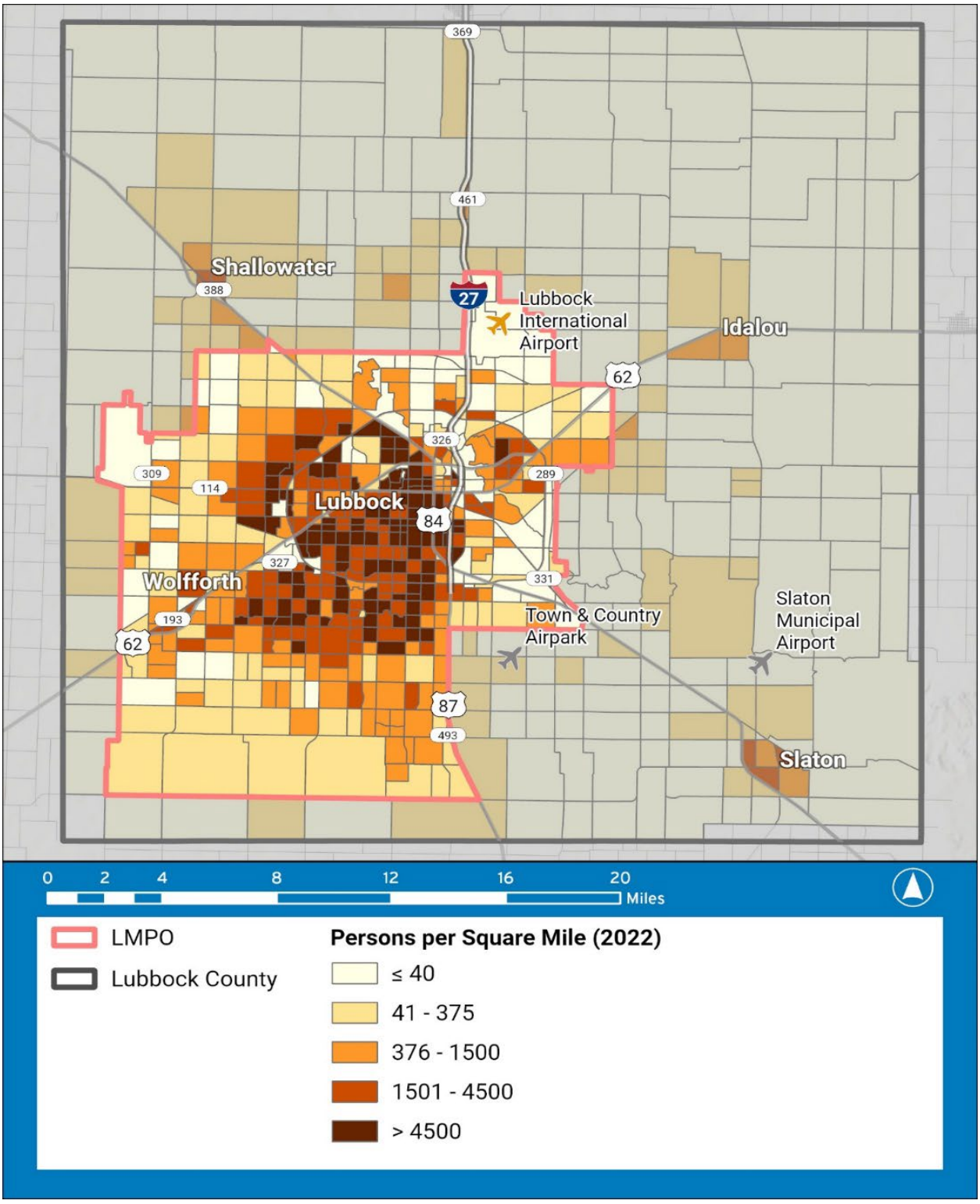
4.3.2. Existing and Future Population

The LMPO TDM was used to establish the existing and projected population numbers within the LMPO boundary.

Existing Population

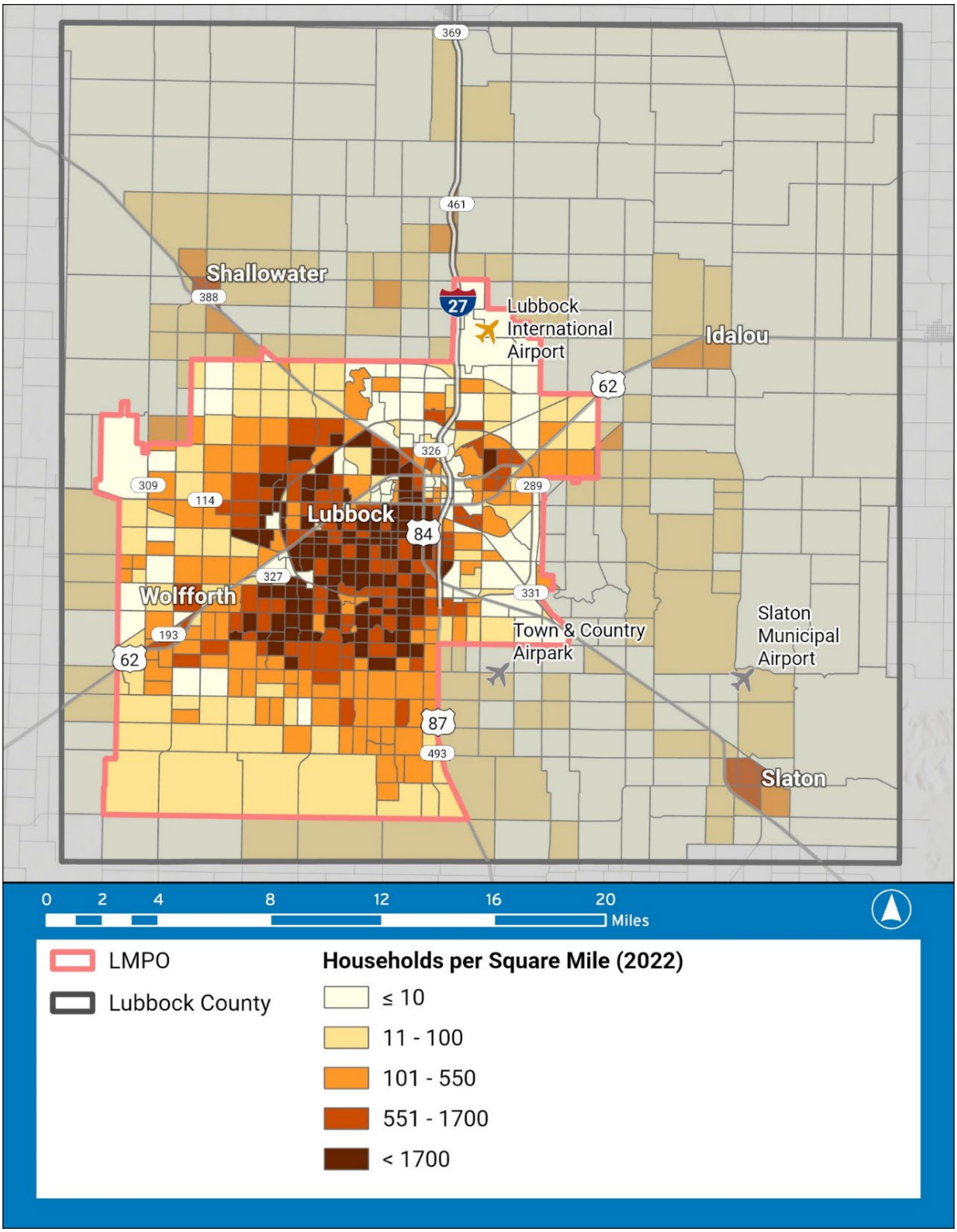
In 2022, just over 300,000 people lived within 113,000 households within the LMPO area, with the majority concentrated within the cities of Lubbock and Wolfforth west of I-27 in the central and western parts of the LMPO area. **Figures 4.9** and **4.10** present the 2022 population density and household density in the LMPO area.

Figure 4.9 - Population Density, 2022



Source: LMPO 2022 Loaded Travel Demand Model, 2024

Figure 4.10 - Household Density, 2022

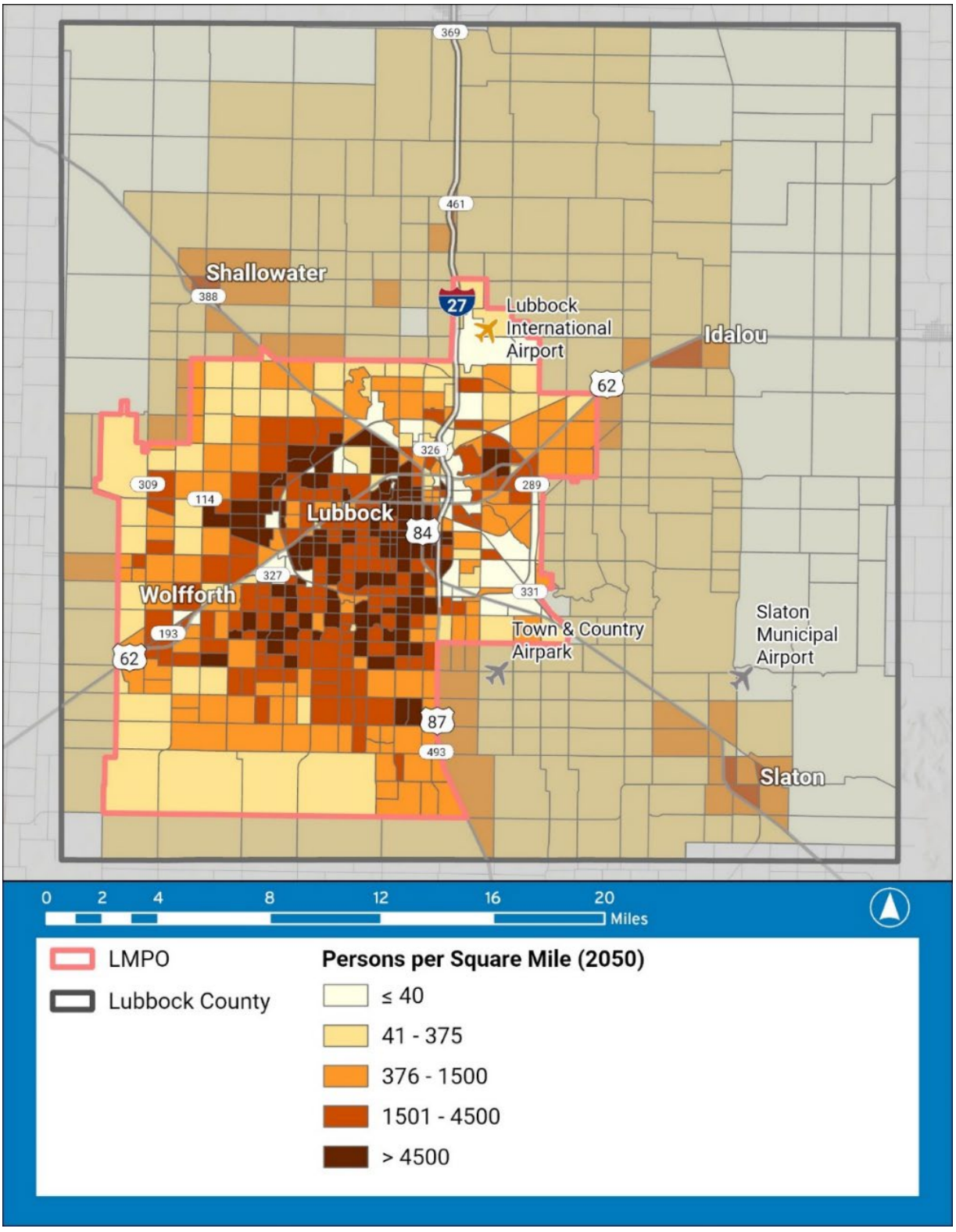


Source: LMPO 2022 Loaded Travel Demand Model, 2024

Future Population

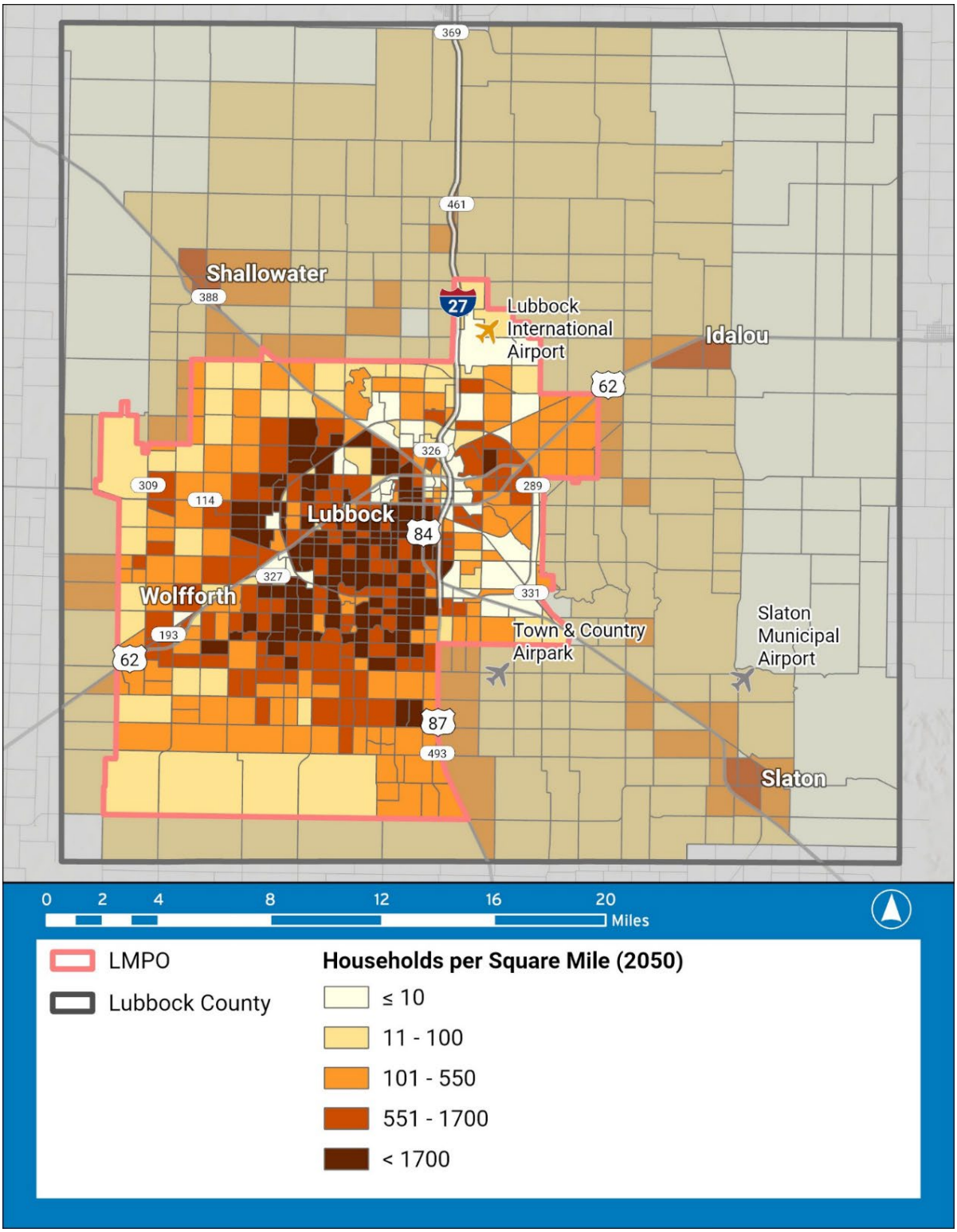
The population in the LMPO area is expected to grow significantly over the next 25 years. Using data generated from the LMPO TDM, the LMPO's population is expected to grow by about 37% by 2050, to about 410,000 people within 156,000 households. The growth reflects the continued development of the existing cities of Lubbock and Wolfforth, as well as significant new developments that are expected to occur within the unincorporated parts of Lubbock County. In 2050, the LMPO's central and western regions are projected to continue to have the highest population densities, while the northern, eastern and southern regions are expected to grow significantly.

Figure 4.11 - Population Density, 2050



Source: LMPO 2050 Loaded Travel Demand Model, 2024

Figure 4.12 - Household Density, 2050



Source: LMPO 2050 Loaded Travel Demand Model, 2024

4.3.3. Existing and Future Employment

The employment estimates in the LMPO area are based on the LMPO TDM.

Existing Employment

In 2022, employment within the LMPO area is estimated to be slightly more than 150,000 jobs. **Figure 4.13** presents the existing employment density for the LMPO area. Most of these jobs are located within the City of Lubbock, with some growth areas in the City of Wolfforth. The estimated 2022 number of employees by sector in the LMPO area is shown in **Table 4.6**. The service sector provides the largest number of the jobs in the LMPO area, followed by jobs in the retail and basic service sectors. The top employers in Lubbock include Covenant Health System, Texas Tech University, Lubbock Independent School District, University Medical Center, TTU Health Sciences Center, and United Supermarkets.[3] There are three universities and one community college in Lubbock, which are Texas Tech University, Lubbock Christian University, Wayland Baptist University–Lubbock Center, and South Plains College.

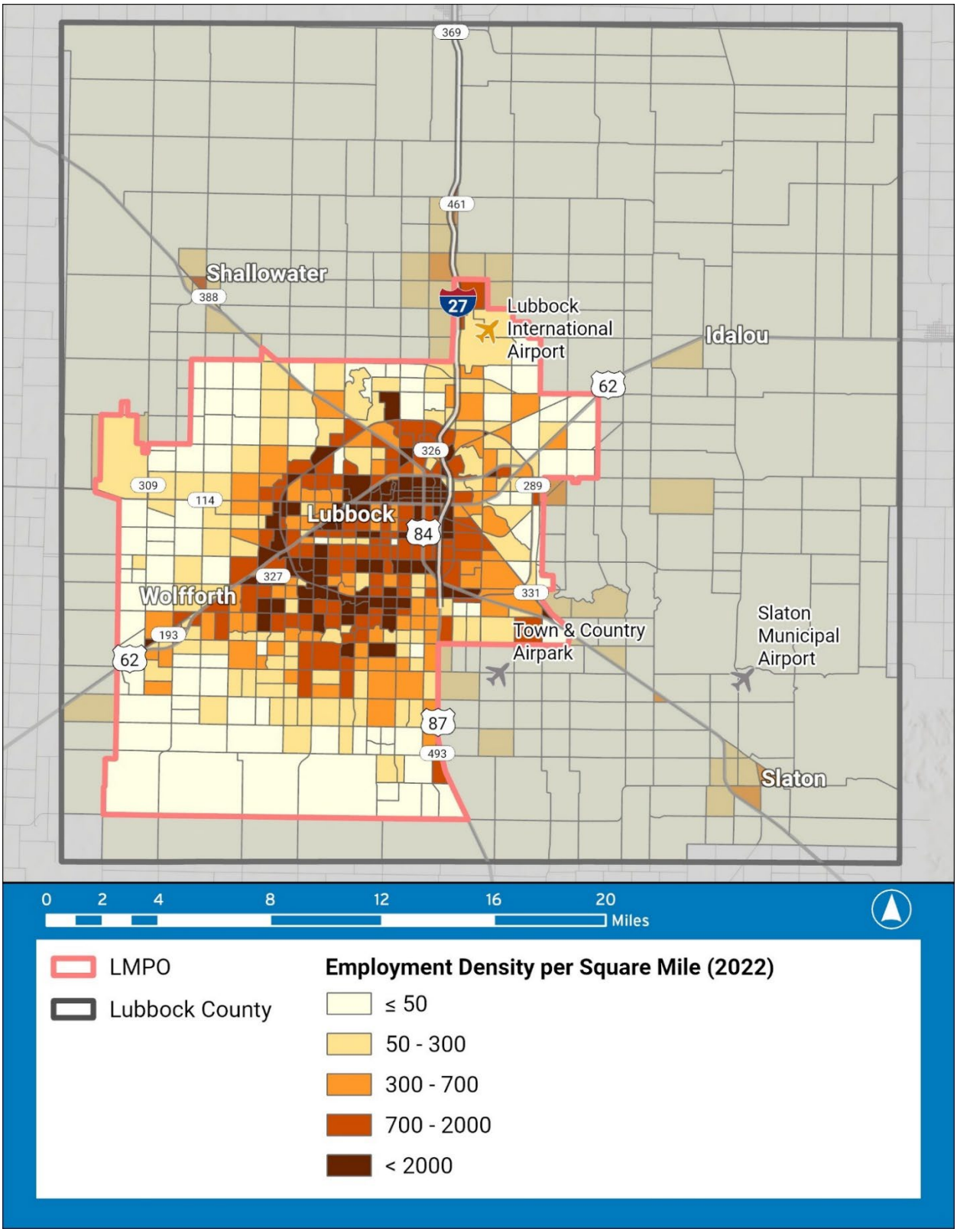
Table 4.6 - Number of Employees by Sector, 2022

Employment Sector	Employees
Basic	29,615
Retail	41,264
Service	59,476
Education	6,770
Other	14,210
Total	**151,335**

Source: LMPO 2022 Loaded Travel Demand Model

[3] City of Lubbock, *Popular Annual Financial Report for the Fiscal Year Ended September 30, 2023*, https://ci.lubbock.tx.us/storage/images/1XH7AchSlOTiHNcm9GL490a5mfo4nRZgGF9cQT1x.pdf accessed 3 June 2024.

Figure 4.13 - Employment Density, 2022



Source: LMPO 2022 Loaded Travel Demand Model, 2024

Future Employment

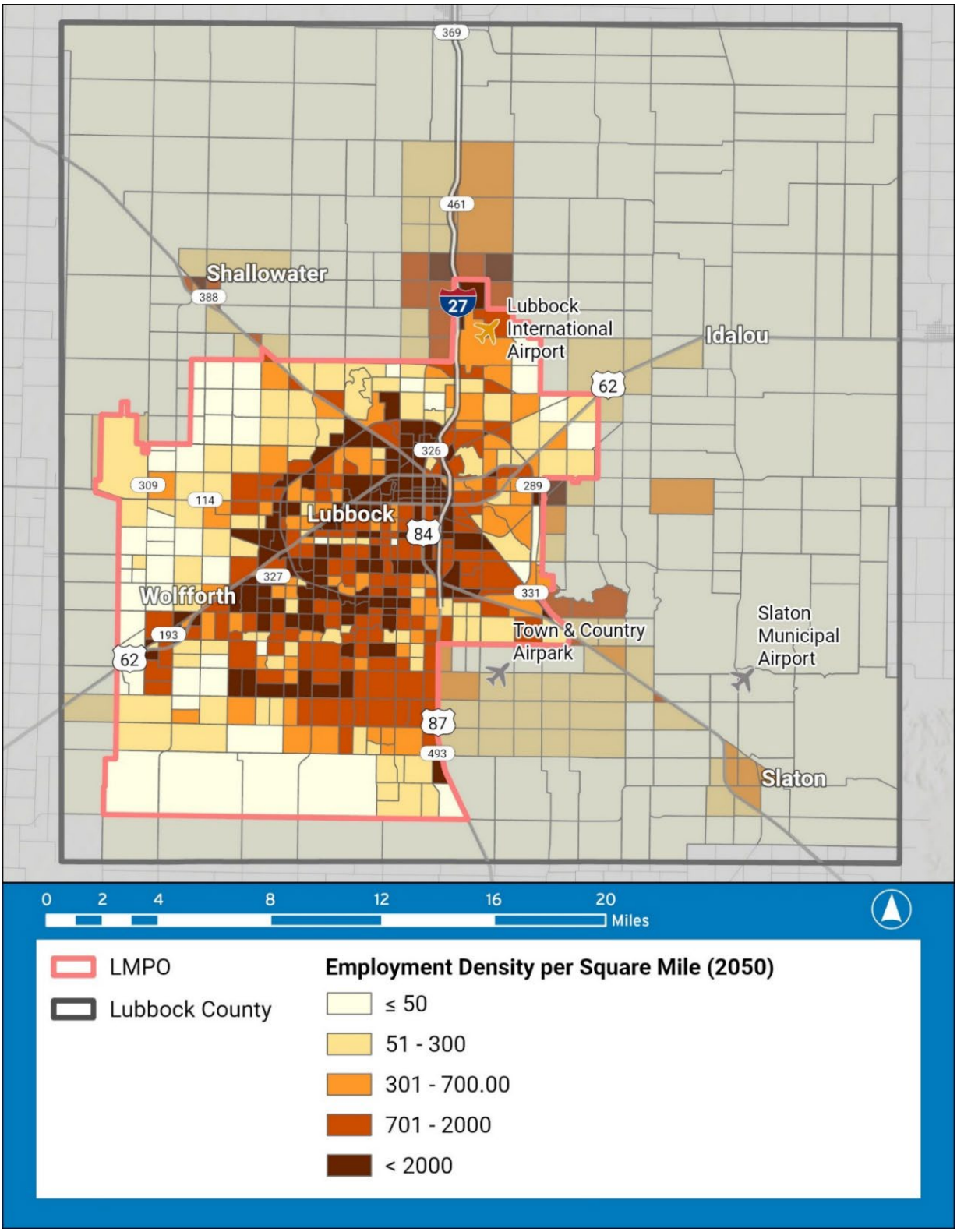
Employment in the LMPO area is growing at a faster pace than population growth. Employment in the LMPO area is expected to grow by over 70% by 2050. This high growth in employment will significantly impact the existing transportation network. Commuter traffic will increase specifically with the population living beyond the MPO boundary making connections in the region for employment. Total employment within the LMPO area for 2050 is estimated at over 257,000, representing an increase of more than 106,000 jobs. Most of these jobs are in the cities of Lubbock and Wolfforth and the unincorporated parts of Lubbock County in the southern region (**Figure 4.14**). The service sector is estimated to continue to provide the greatest number of jobs in the LMPO area, followed by jobs in the retail and basic service sectors, as shown in **Table 4.7**.

Table 4.7 -Number of Employees by Sector, 2050

Employment Sector	Employees
Basic	48,068
Retail	80,396
Service	98,449
Education	13,275
Other	17,377
Total	**257,565**

Source: LMPO 2050 Loaded Travel Demand Model, 2024

Figure 4.14 - Employment Density, 2050

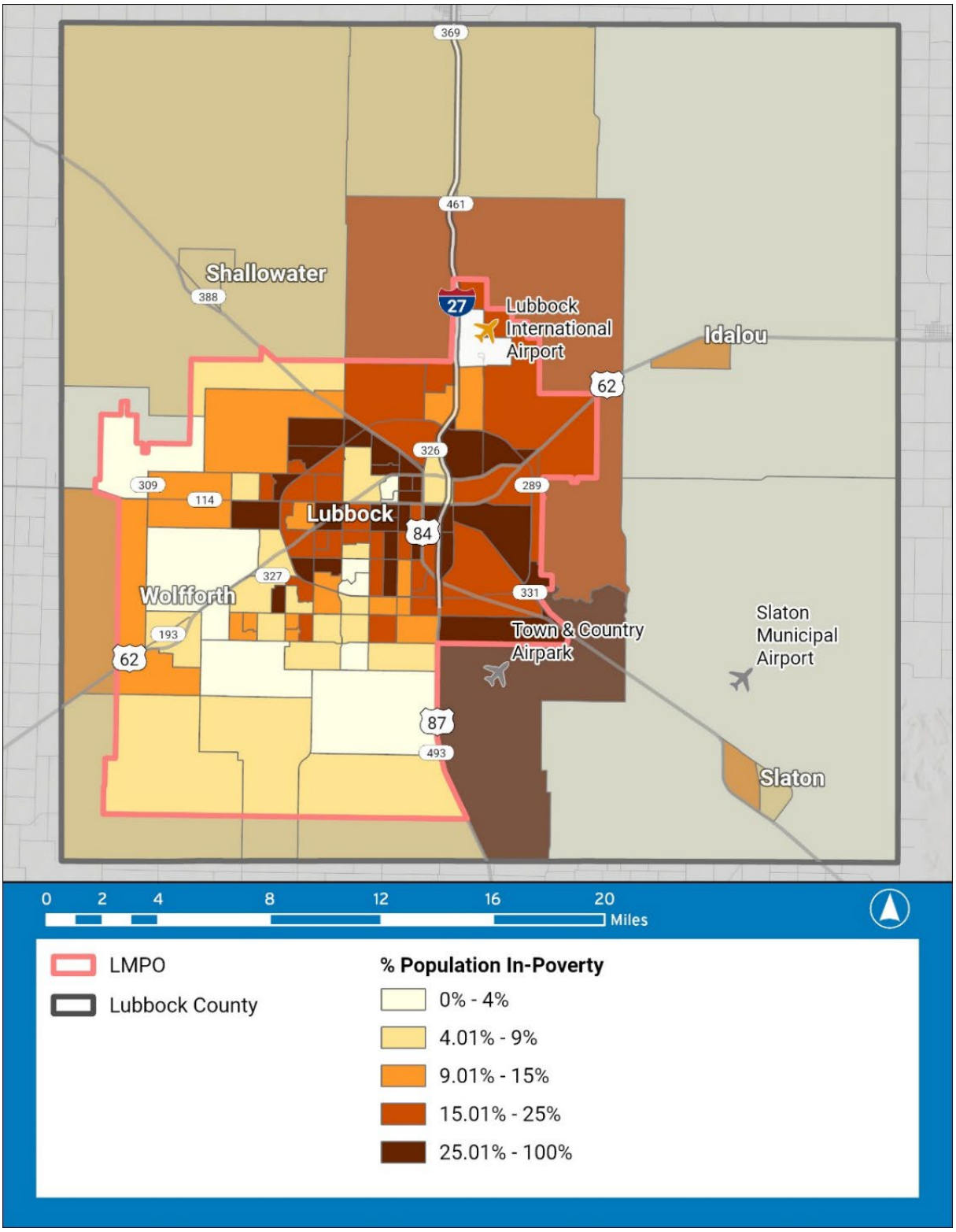


Source: LMPO 2050 Loaded Travel Demand Model, 2024

4.3.4. Existing Income and Demographics

The existing income and demographic statistics in the LMPO area are based on Block Group data from the 2022 U.S Census Bureau, American Community Survey (ACS). In 2022, approximately 17% of people in the LMPO area lived in poverty, with the largest percentage of persons in poverty located in the northern half of the LMPO area. **Figure 4.15** presents the 2022 persons in poverty locations in the LMPO area.

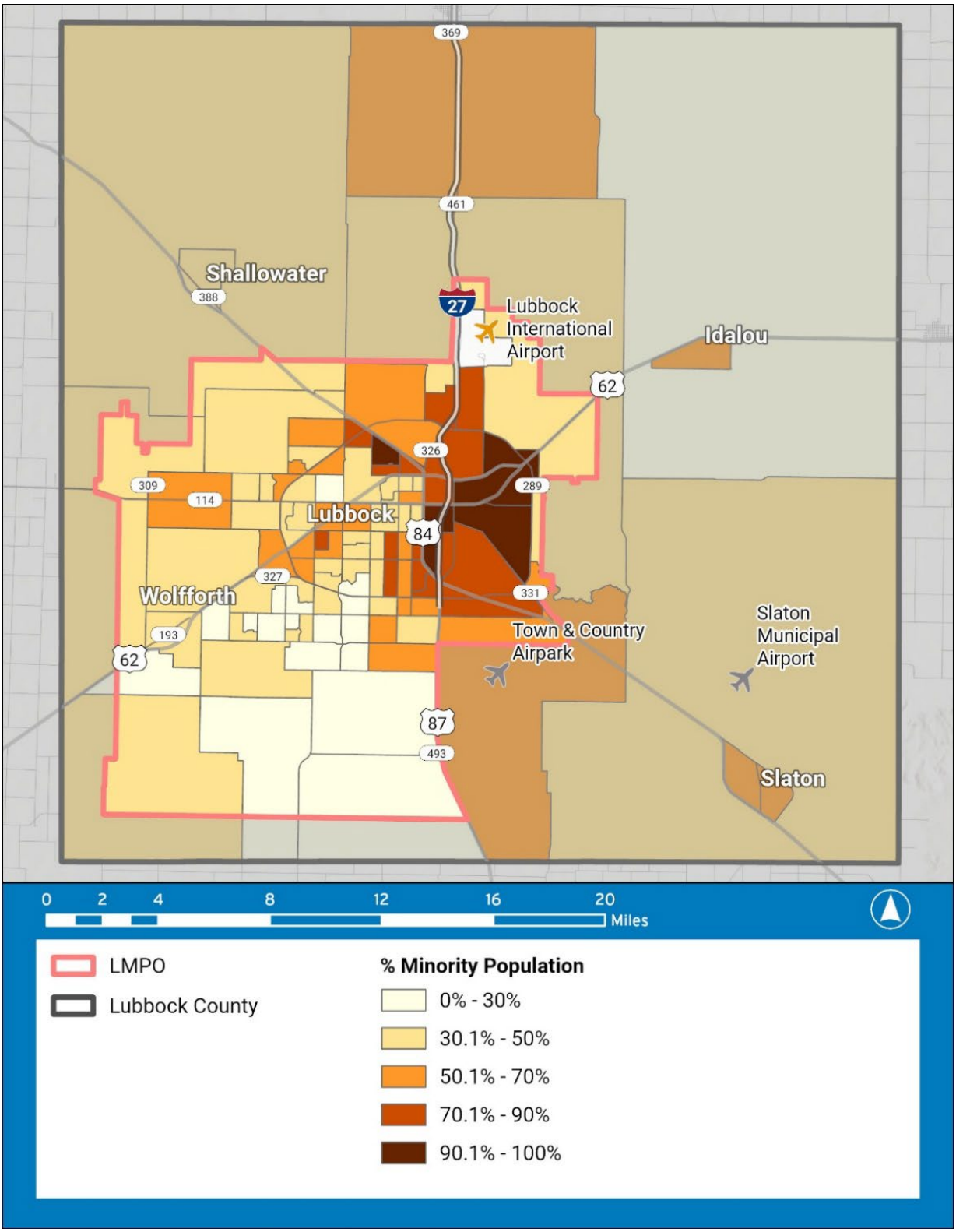
Figure 4.15 - Poverty Levels, 2022



Source: U.S Census Bureau, American Community Survey, 2022

In 2022, the percentage of minority population within the LMPO area was approximately 49%, with the largest percentage of minority populations located in the eastern part of the LMPO area. **Figure 4.16** present the 2022 minority population locations in the LMPO area. Minority population generally include Hispanic/Latinos, African Americans, Asians, Native Americans, Hawaiian/Pacific Islanders, and those of two or more races.

Figure 4.16 – Minority Population, 2022



Source: U.S Census Bureau, American Community Survey, 2022

4.4 Existing Transportation Conditions

This section presents the current transportation conditions for the LMPO region, including traffic volumes, roadway level of service, crashes, pavement conditions, and other relevant data. The material for this section is based on data from the LMPO TDM, the LMPO Crash Dashboard, and the TxDOT PMIS.

4.4.1. Existing Traffic Volumes

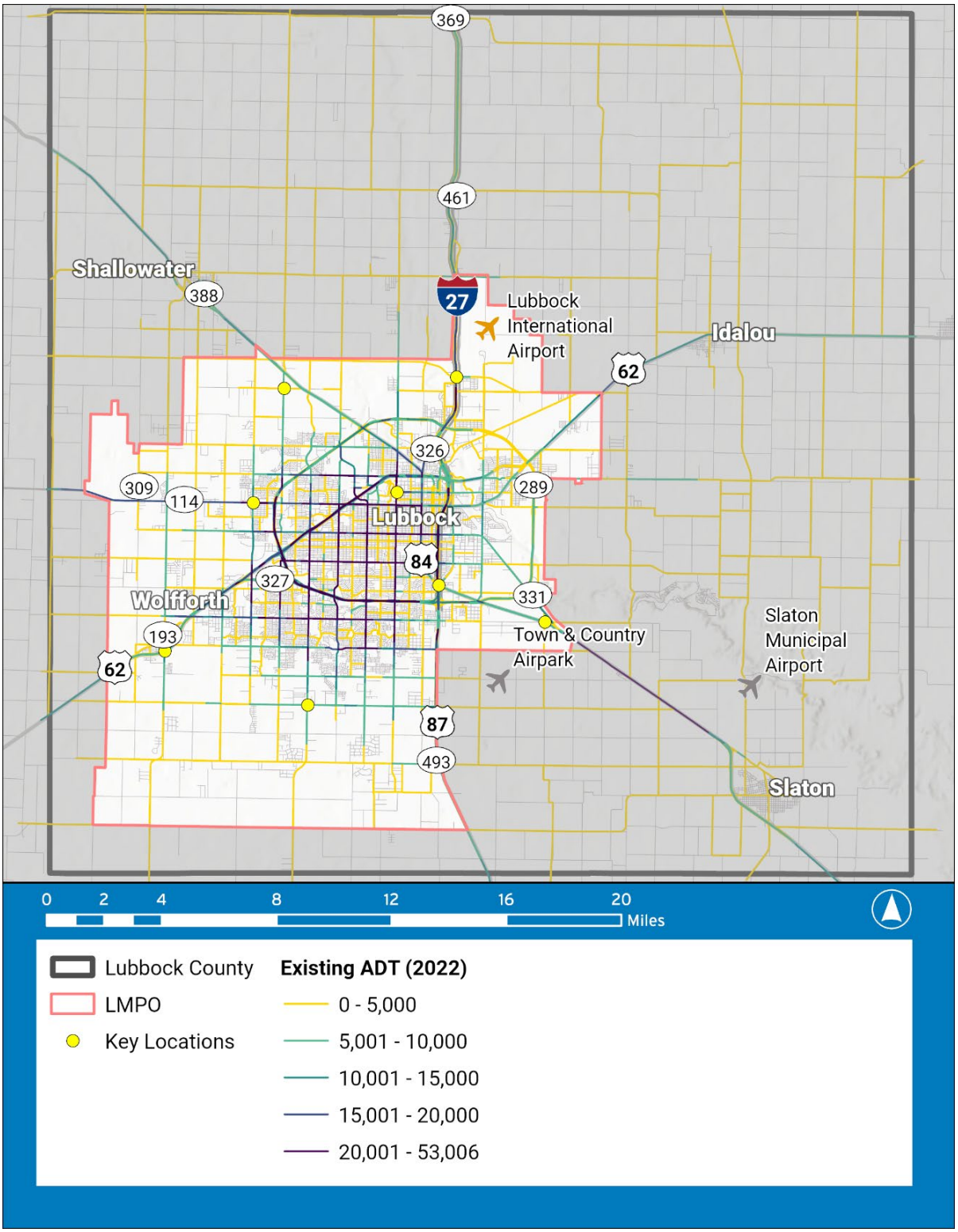
The highest traffic volumes are along segments of freeways and arterial segments in the LMPO's central region. Existing traffic volumes at key locations within the LMPO area are listed in **Table 4.8**. These key locations are representative of interstates, other freeways, arterials and collectors for the purposes of presenting the level of projected growth in traffic volumes in the LMPO area. The future (2050) average daily traffic (ADT) volumes at these key locations are shown in **Table 4.13**. The estimated 2022 ADT volumes for the LMPO area are presented in **Figure 4.16**. The highest traffic volumes in the LMPO area are on I-27.

Table 4.8 -Average Daily Traffic Volumes at Key Locations in the LMPO Area, 2022

Road	Cross Street	Estimated Volume
I-27 Mainline	US 84	55,000
I-27 Mainline	Regis Street (FM 2641)	35,000
University Avenue	Broadway Street	28,000
US 84 (E Slaton Road)	Olive Avenue (FM 3431)	13,000
Milwaukee Avenue	19th Street	11,000
Dowden Avenue (FM 179)	US 62	8,000
130th Street (FM 1585)	Slide Road (FM 1730)	8,000
N Frankford Ave (FM 2528)	County Road 6300	8,000

Source: LMPO 2022 Loaded Travel Demand Model, 2024

Figure 4.16 - Average Daily Traffic Volumes, 2022



Source: LMPO 2022 Loaded Travel Demand Model, 2024

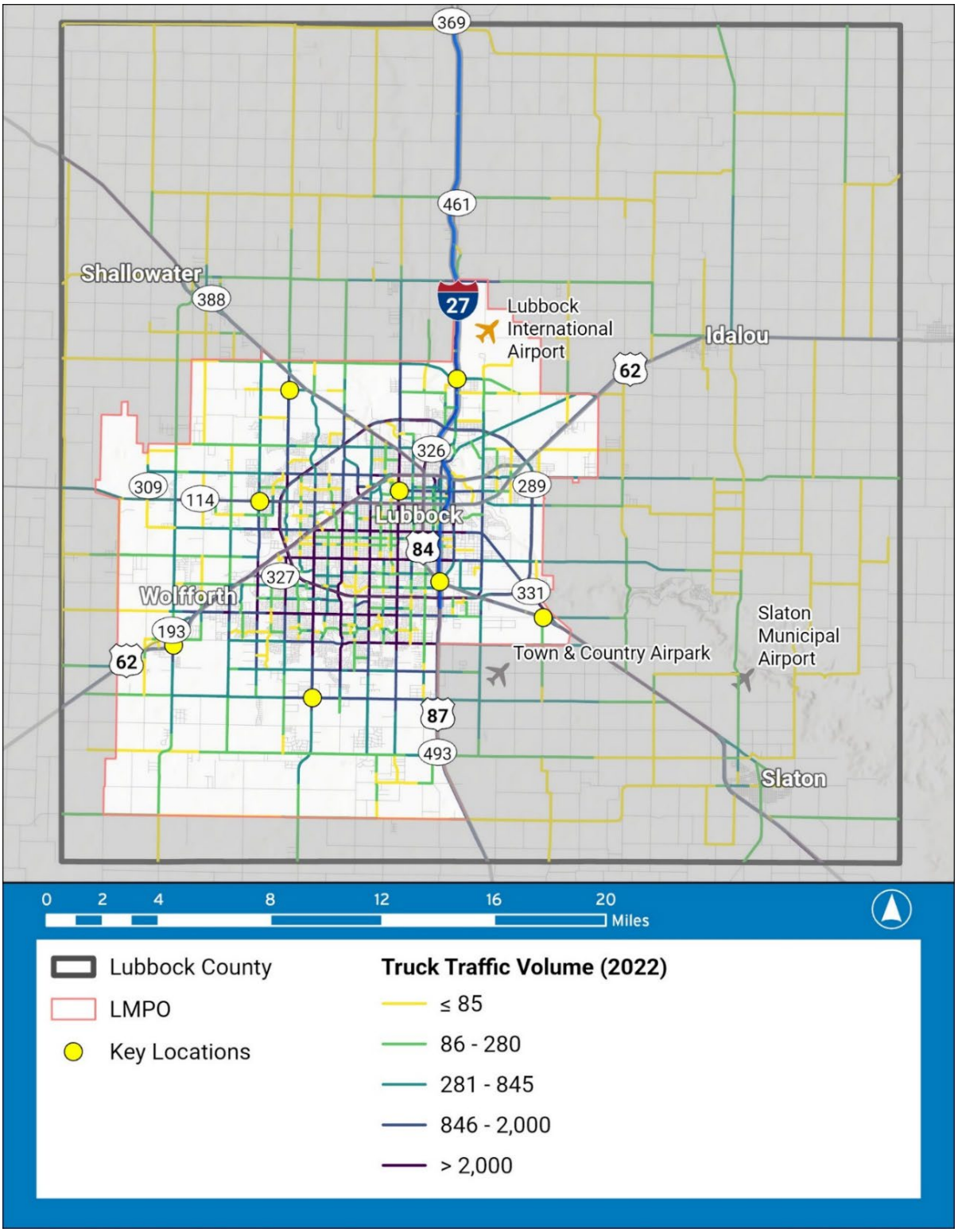
The highest truck volumes occur on freeways and the arterial segments in the northern part of the LMPO area. **Table 4.9** lists existing truck volumes at key locations in the LMPO region, while **Figure 4.16** depicts the LMPO region's estimated truck ADT volumes in 2022. The highest truck volumes in the LMPO area are concentrated along I-27.

Table 4.9 -Truck Volumes at Key Locations in the LMPO Area, 2022

Road	Cross Street	Estimated Volume
I-27 Mainline	US 84	10,000
I-27 Mainline	Regis Street (FM 2641)	7,000
University Avenue	Broadway Street	3,000
US 84 (E Slaton Road)	Olive Avenue (FM 3431)	2,000
Milwaukee Avenue	19th Street	1,000
Dowden Avenue (FM 179)	US 62	1,000
130th Street (FM 1585)	Slide Road (FM 1730)	1,000
N Frankford Ave (FM 2528)	County Road 6300	1,000

Source: LMPO 2022 Loaded Travel Demand Model, 2024

Figure 4.17 - Average Daily Truck Volumes, 2022



Source: LMPO 2022 Loaded Travel Demand Model, 2024

4.4.2. Existing Level of Service

Level of service (LOS) describes the degree of congestion on a roadway and is a key indicator of its performance. Roadways receive a LOS grade from A to F, with A representing free-flow conditions and F representing complete gridlock. The letter grades are based on a ratio of the number of vehicles using the road to the capacity of the roadway (the volume-to-capacity (V/C) ratio). Numeric and descriptive definitions of the LOS grades are provided in **Table 4.10**. These grades are consistent with the LOS criteria used by TxDOT.

Table 4.10 - Roadway Segment LOS

LOS	V/C Ratio	Detailed Description
A	0.00 – 0.35	Represents the best operating conditions and is considered free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
B	0.35 – 0.58	Represents reasonable free-flowing conditions but with some influence by others.
C	0.58 – 0.75	Represents a constrained constant flow below speed limits, with additional attention required by the drivers to maintain safe operations. Comfort and convenience levels of the driver decline noticeably.
D	0.75 – 0.90	Represents traffic operations approaching unstable flow with high passing demand and passing capacity near zero, characterized by drivers being severely restricted in maneuverability.
E	0.90 – 1.00	Represents unstable flow near capacity. LOS E often changes to LOS F very quickly because of disturbances (road conditions, accidents, etc.) in traffic flow.
F	>1.00	Represents the worst conditions with heavily congested flow and traffic demand exceeding capacity, characterized by stop-and-go waves, poor travel time, low comfort and convenience, and increased accident exposure.

Source: Highway Capacity Manual, 6th Edition, 2016

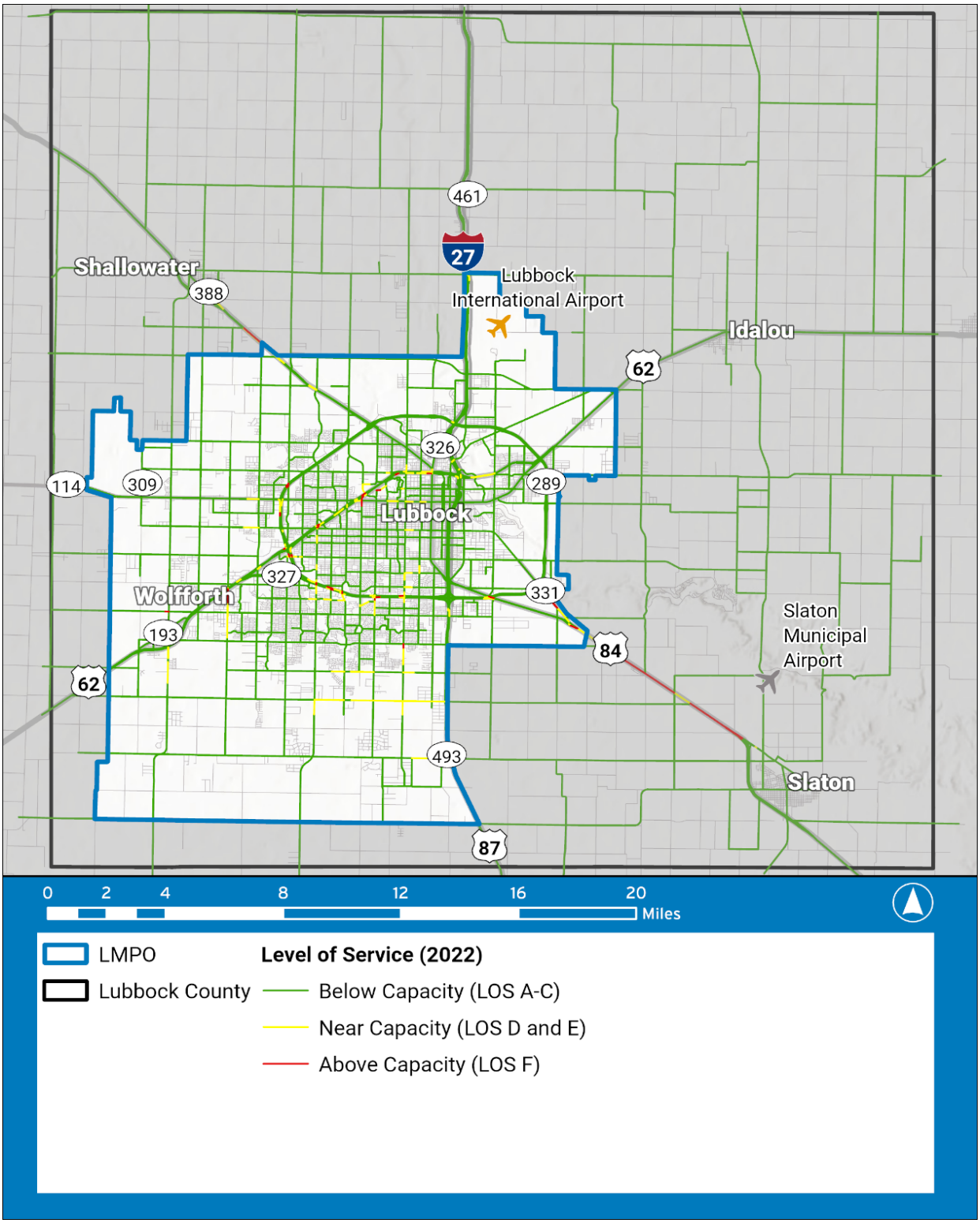
Figure 4.17 presents the resulting LOS grades for the roadway segments within the study area for 2022. These LOS ratings are grouped into three categories: 1) below capacity (LOS A to C), 2) nearing capacity (LOS D and E), and 3) above capacity (LOS F). Generally, there was enough capacity in the LMPO area under current operations conditions. Only a few roadway segments operate LOS D or below within the study area. Current traffic exceeds capacity (LOS F) at a few locations, including the following:

- Nine intersections in the western and southern portions of Loop 289;
- Six intersections in the central portion of US 62/US82;
- Segment of Memphis Avenue, directly south of US 62;
- A half-mile segment of Southeast Drive at the southeast end of the LMPO area;
- A quarter-mile segment of US 84 at the southeast end of the LMPO area; and
- A minor collector and minor arterial intersection in the western and southern portions of the LMPO area. Specifically, 9700 block of University Avenue and County Road 1600 (Upland Avenue) south of US Route 62.

Current traffic is nearing capacity (LOS D and E) at a few locations, including the following:

- Along State Loop 289 in the south and west; and
- Portions of both east and west directions of US Route 62 within the City of Lubbock.
- Minor arterials include the following:
    - Farm-to-Market 179 (Dowden Road), south of Wolfforth;
    - Segments of the southern portions of University Avenue, Indiana Avenue, Quaker Avenue, and Slide Road;
    - East and west segments of Parkway Drive near Avenue A; and
    - Segments 19th Street between Interstate 27 and US 62.
- Collector roadways include the following:
    - Southern portion of Southeast Drive, near State Loop 289;
    - Upland Avenue, south of US 62;
    - Segments along 114th Street and 130th Street (FM 1585), between State Highway 87 and Slide Road;
    - Segment of 34th Street, west of Milwaukee Avenue;
    - Segments of 73rd and 74th Street;
    - Intersection of Memphis Drive and Memphis Avenue;
    - Intersection of 58th Street and Avenue U;
    - Main Street, at the intersection with Flint Avenue; and
    - 10th Street, at the intersection with Texas Tech Parkway.

Figure 4.18 - Existing Level of Service, 2022



Source: LMPO 2022 Loaded Travel Demand Model, 2024

4.4.3. Existing Crashes

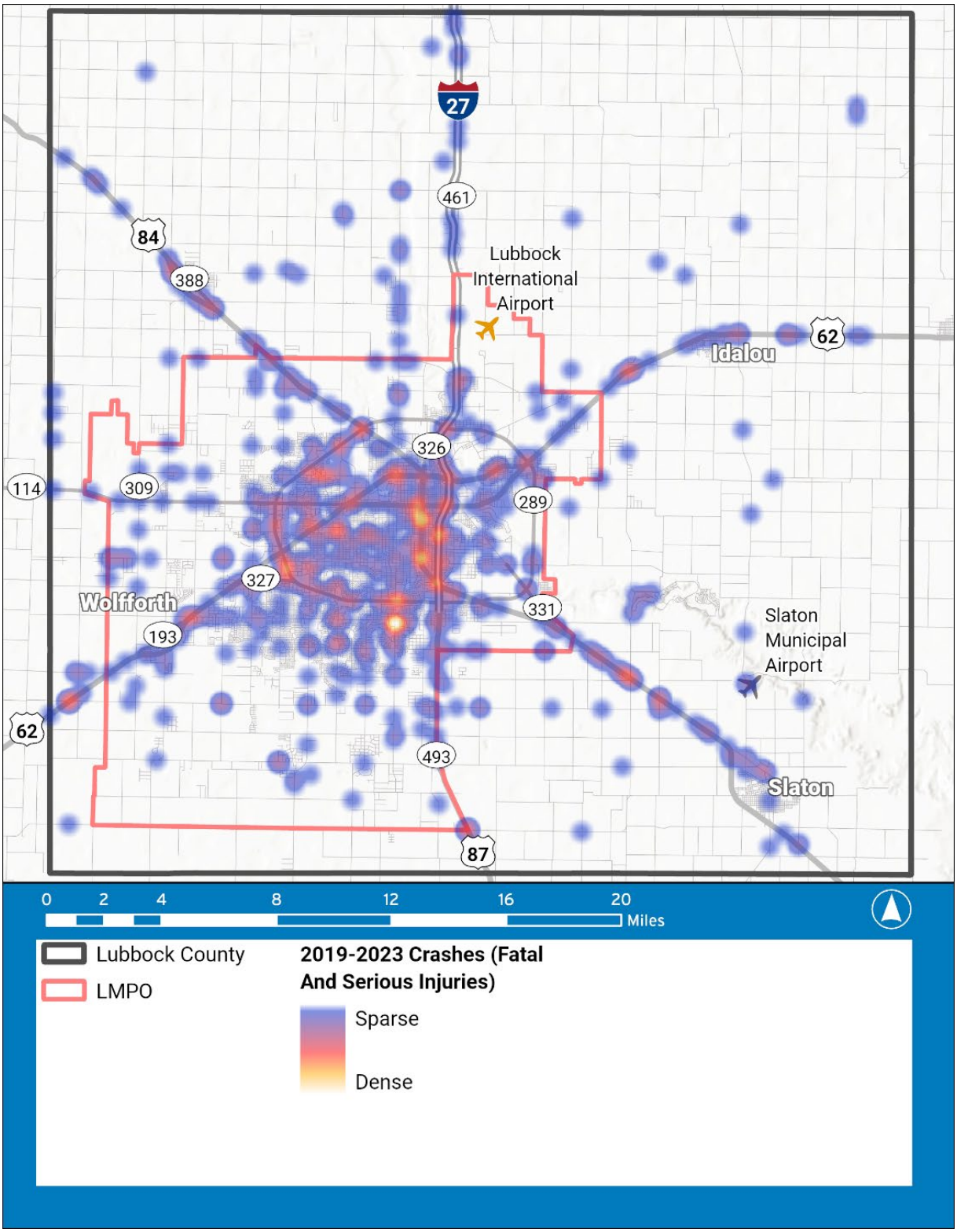
Traffic safety is a significant concern when examining the conditions within the LMPO area. This issue was addressed using motor vehicle crash statistics from the LMPO Crash Dashboard for the years 2019 to 2023. **Table 4.11** presents the crash record for all roadways in the LMPO area for these five years. Over 3,500 crashes were recorded from 2019 to 2023. These resulted in 198 fatalities and 382 suspected serious injuries. **Figure 4.18** depicts the locations of crashes that resulted in fatalities and serious injuries from 2019-2023. The three locations with the highest number of fatalities and suspected serious injuries are in proximity of the intersections of University Avenue/E 82nd Street, 19th Street/Loop 298, and 50th Street/US 84.

Table 4.11 - Number of Crashes by Injury Severity, 2019 - 2023

Injury Severity	Number of Crashes
Fatal	198
Suspected Serious Injury	382
Suspected Minor Injury	3,063
Total	**3,643**

Source: LMPO Crash Dashboard (2019-2023), 2024

Figure 4.19 - Fatal and Serious Injury Crash Locations, 2019 - 2023



Source: LMPO Crash Dashboard (2019-2023), 2024

Table 4.12 presents the non-motorized crash record for all roadways in the LMPO area from 2019 to 2023. Over this time period, there were 316 non-motorized crashes. These crashes included 227 pedestrian crashes and 89 bicycle crashes.

Table 4.12 - Non-Motorized Crashes, 2019 - 2023

Injury Severity	Pedestrian Crashes	Bicyclist Crashes
Fatal	48	3
Suspected Serious Injury	46	9
Suspected Minor Injury	133	77
Total	**227**	**89**

Source: LMPO Crash Dashboard (2019-2023), 2024

4.4.4. Existing Pavement Conditions

Table 4.13 - Pavement Condition, 2022

Pavement Condition	Percent of Roadways
A-Very Good	67.5%
B-Good	22.1%
C-Fair	6.1%
D-Poor	2.2%
F-Very Poor	2.1%

Source: TxDOT PMIS Lubbock County (2022), 2024

The TxDOT PMIS provided data for 388 miles of the 680 miles of principal, arterial, and collector roadways in the LMPO area. In 2022, approximately 90% of these 388 miles are considered to be in “good” or better condition, while 4% are classified as poor or very poor (see **Table 4.13**). The 90% percent of roadways that are considered to be in “good” or better condition is the same as the 2022 TxDOT's statewide percentage.

4.5 Future Transportation Conditions

This section presents the future transportation conditions for the LMPO area, including traffic volumes and roadway LOS for all vehicles and trucks. The material for this section is based on data from the LMPO TDM and the predicted traffic volumes and LOS calculations generated from the model. The future transportation conditions analysis is based on the future roadway network presented in **Section 4.2.1**

4.5.1. Future Traffic Volumes

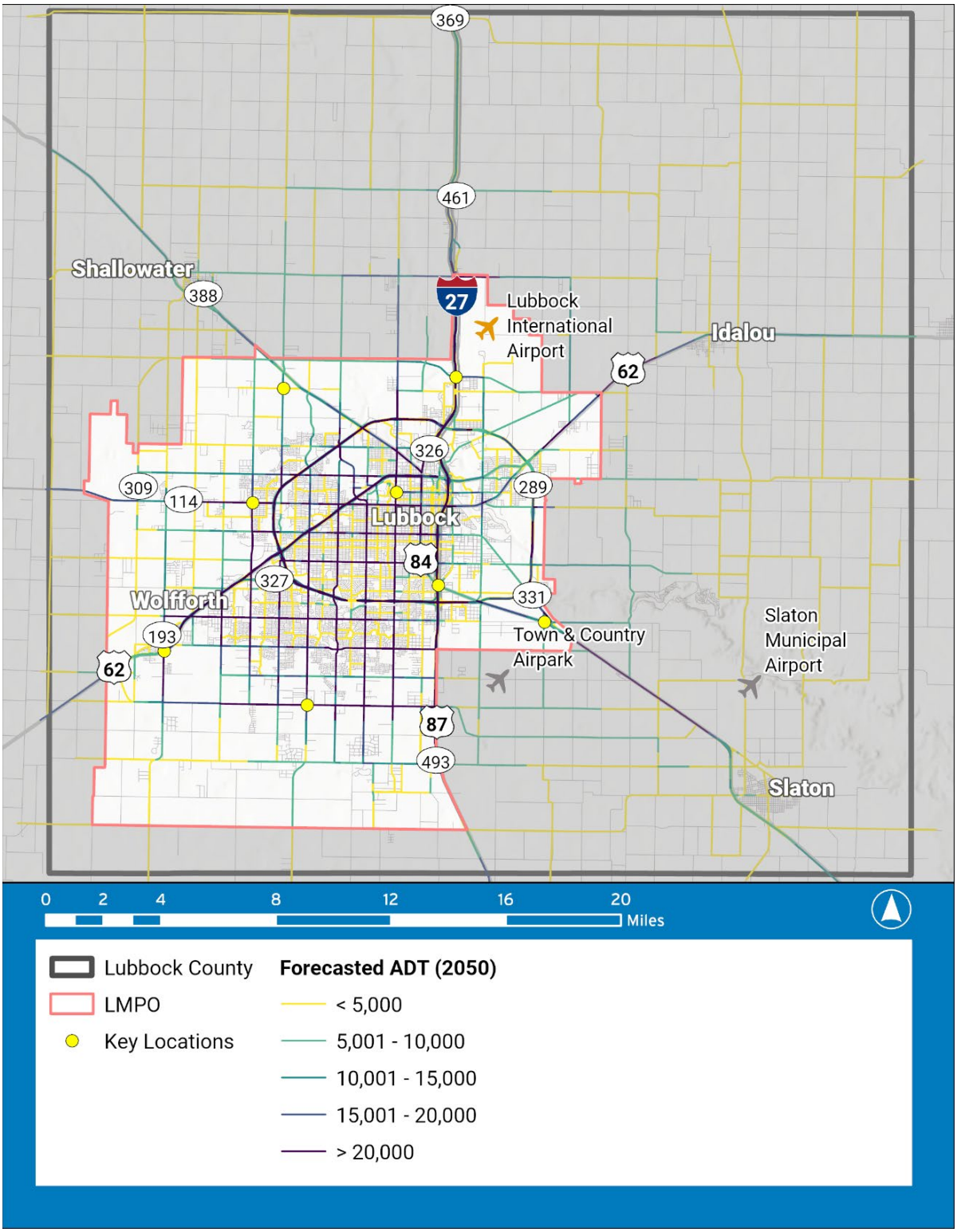
Table 4.14 lists the estimated future traffic volumes at key locations within the LMPO area, while **Figure 4.20** depicts the estimated 2050 ADT volumes for the LMPO roadway network. Traffic volumes at key locations on the roadway network are expected to double between 2022 and 2050. The heaviest volumes can be found along I-27. Several roadways are also expected to experience high traffic volumes, including over 30,000 vehicles per day at University Avenue and Broadway Street and at 130th Street and Slide Road.

Table 4.14 - Average Daily Traffic Volumes at Key Locations in the LMPO Area, 2050

Road	Cross Street	Estimated Volume
I-27 Mainline	Regis Street (FM 2641)	100,000
I-27 Mainline	US 84	90,000
130th Street (FM 1585)	Slide Road (FM 1730)	35,000
University Avenue	Broadway Street	33,000
US 84 (E Slaton Road)	Olive Avenue (FM 3431)	26,000
Dowden Avenue (FM 179)	US 62	23,000
Milwaukee Avenue	19th Street	19,000
N Frankford Ave (FM 2528)	County Road 6300	12,000

Source: LMPO 2050 Loaded Travel Demand

Figure 4.20 - Average Daily Traffic Volumes, 2050



Source: LMPO 2050 Loaded Travel Demand Model, 2024

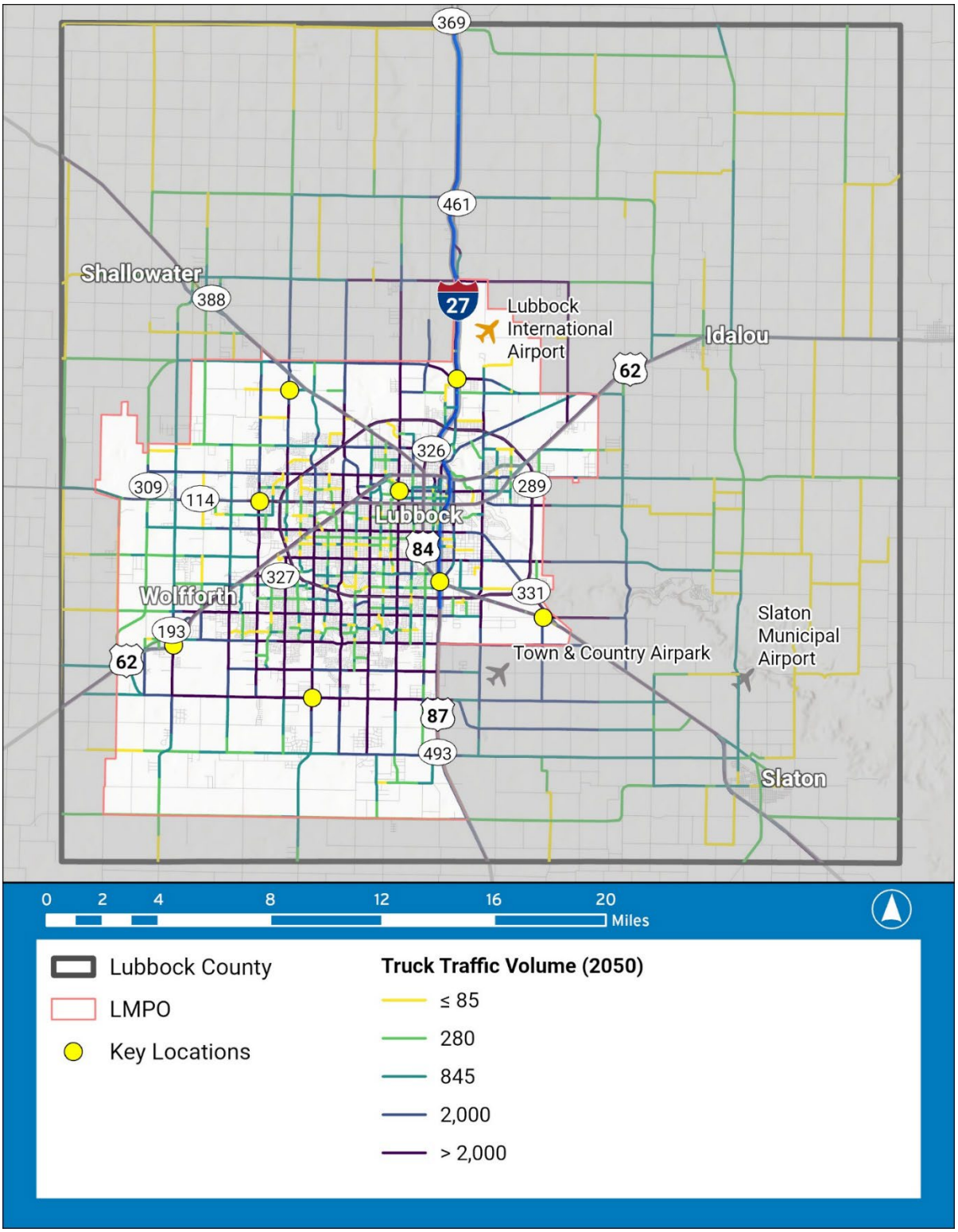
The estimated future truck volumes at key locations within the LMPO area are listed in **Table 4.15,** and the estimated 2050 truck ADT volumes for the roadway network in the LMPO area are shown in **Figure 4.21**. Truck volumes at key locations on the roadway network are expected to grow by 2.5 times between 2022 and 2050. The heaviest truck volumes can be found on I-27.

Table 4.15 - Truck Volumes at Key Locations in the LMPO Area, 2050

Road	Cross Street	Estimated Volume
I-27 Mainline	Regis Street (FM 2641)	24,000
I-27 Mainline	US 84	20,000
University Avenue	Broadway Street	4,000
Milwaukee Avenue	19th Street	2,000
130th Street (FM 1585)	Slide Road (FM 1730)	5,000
US 84 (E Slaton Road)	Olive Avenue (FM 3431)	5,000
Dowden Avenue (FM 179)	US 62	3,000
N Frankford Ave (FM 2528)	County Road 6300	2,000

Source: LMPO 2050 Loaded Travel Demand Model, 2024

Figure 4.21 - Average Daily Truck Volumes, 2050



Source: LMPO 2050 Loaded Travel Demand Model, 2024

4.5.2. Future Level of Service

Figure 4.22 presents the LOS on the roadway segments within the LMPO area for 2050. Significant population and employment growth in the LMPO area will produce congestion on both freeways and arterials by 2050. Large segments of the northern portion of I-27 within the LMPO area are expected to exceed its capacity in 2050. Large segments of the arterials and collectors in the northeastern and southeastern part of the LMPO area will exceed their capacity by 2050. Most collectors and arterials in the LMPO area will continue to operate below capacity by 2050.

Projected traffic exceeds capacity (LOS F) at a several locations, including the following:

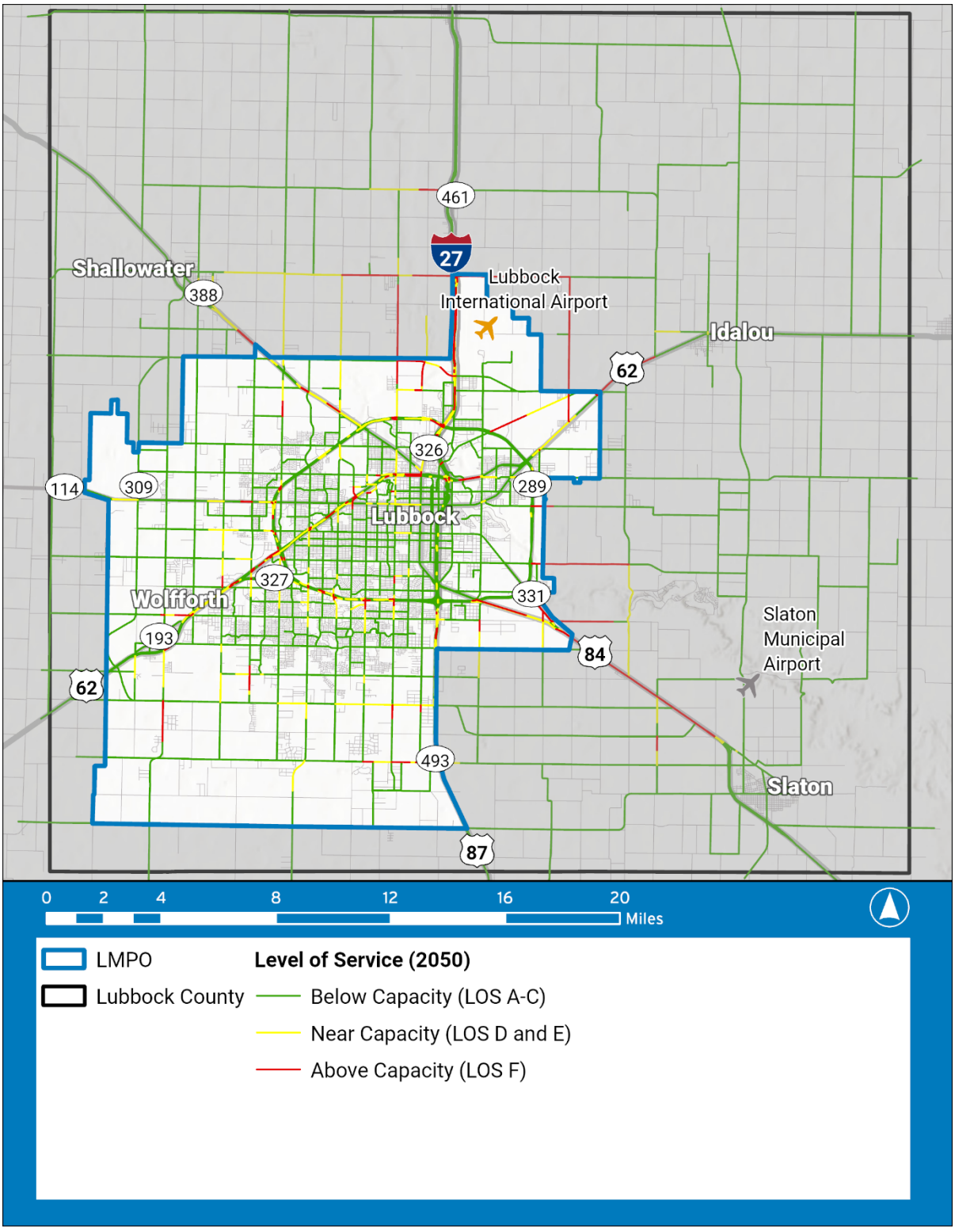
- Several segments of US 62, beginning at 19th Street to CR 1500;
- Portions of SL 289, mainly in the west and south;
- Minor arterials include the following:
    - 19th Street intersection with Milwaukee Avenue;
    - Donald Preston Drive, between US 62 and FM 179;
    - Western direction of US 84 access roads south of SL 289;
    - Franklin Avenue, at the intersections with Ursuline Avenue (CR 6400) and Spur 327;
    - Segments of Regis Street (FM 2641), between IH 27 and University Avenue;
    - 50th Street, east of SL 289; and
    - Several segments of US 84, north of SL 289;
- Collector roadways, major and minor, include the following:
    - Intersection of Kent Street and Avenue Q;
    - SL 289 intersections with 4th Street, 19th Street, Southeast Drive, and Municipal Drive;
    - FM 179, from FM 1585 to 151st Street, south of US 162;
    - Milwaukee Avenue, at the intersection 114th Street; and
    - Woodrow Road, from CR 2100 to US 87.

Projected traffic from the 2050 LMPO TDM expects more roadways nearing capacity (LOS D and E) at several locations. They include:

- Segment of US 87, from SL 289 to FM 1585 in the south;
- IH-27, from the north at the Lubbock International Airport to SL 289;
- SL 289, from N Avenue Q to US 84 towards the west;
- Minor arterials include the following:
    - FM 1585 from US 87 to Slide Road (FM 1730);

- Several intersections with southern portion of SL 289, including Frankford Avenue, Slide Road, Quaker Ave, Indiana Avenue, and University Avenue;
- Portion of US 84 from interchange with Southeast Drive to SL 289;
- Several segments of 19th Street, between US 84 to the roadway's conversion to SH 114;
- 34th street, from University Avenue and Avenue U intersections;
- Several intersections with US 62, including Slide Road, Quaker Ave, University Avenue, and Milwaukee Avenue;
- Intersection of Frankford Avenue and 50th Street;
- N Frankford Avenue intersection with CR 6300; and
- Segments of N CR 2000, from FM 2641 to US 84.

Figure 4.22 - Future Level of Service, 2050



Source: LMPO 2050 Loaded Travel Demand Model, 2024

4.6 Natural Environment

The LMPO area is in the High Plains ecoregion of Texas, which stretches through southeastern Wyoming, western Nebraska, eastern Colorado, western Kansas, the Oklahoma and Texas panhandles, and into eastern New Mexico. The High Plains is categorized by its hot summers, cold winters, and very little rainfall.

Historically, the High Plains region was covered in short and mid-grass prairies. Agriculture and urban sprawl have fragmented and replaced much of our prairie grasslands. Short-grass and mid-grass prairies are critical for black-tailed prairie dogs, pronghorns, swift foxes, burrowing owls, mountain plovers, lesser prairie-chicken, and migrating and resident grassland birds. Grassland birds are in a steeper decline than other groups of birds.

Playa lakes are a common feature of the High Plains ecoregion. Playas are extremely important to wildlife and the continuation of historical habitat in the High Plains and also serve as recharge sites for the Ogallala Aquifer but do not receive the protection that wetlands do.

Some common species of concern for the High Plains ecoregion of Texas include:

- The Western Burrowing Owl (Athene cunicularia hypugaea) is a federal species of concern. This species can be found within the Lubbock city limits, commonly utilizing prairie dog burrows for nesting.
- Lesser Prairie-Chicken (Tympanuchus pallidicinctus) is listed as vulnerable with decreasing populations.
- The Whooping Crane (Grus Americana) is listed as endangered yet increasing. This species is a migrant across the High Plains, using our wetlands and playas as a stopover during migration.
- Snowy Plover (Charadrius nivosus) is listed as Near Threatened with populations decreasing.

Some success stories of species in the High Plains ecoregion that recovered and are increasing due to cooperation and effort between Federal, State, and Local government include:

- Texas Horned Lizard (Phrynosoma cornatum) listed as least concern with stable populations.
- Swift Fox (Vulpes velox) listed as least concern with stable populations.

4.7 Natural Hazard Risk

The Federal Emergency Management Agency's (FEMA) National Risk Index leverages available source data for natural hazards and communities to develop a baseline relative risk measurement for each county and census tract within the United States. Risk Indexes are based on percentiles and are given both qualitative ratings and quantitative (out of 100) scores. The Risk Index is based on three components: Estimated Annual Losses, Social Vulnerability, and Community Resilience.

Lubbock County has a "Relatively High" risk index (95.74) when compared to the rest of the counties in the U.S.; 96% of U.S. counties have a lower risk index. **Table 4.16** summarizes the natural hazard types and corresponding risk index rating and scores, estimated annual frequency, and estimated annual losses for Lubbock County.

Table 4.16 - Natural Hazard Risk Index Summary for Lubbock County

Natural Hazard Event	Risk Index Rating (Score)	Estimated Frequency of Events per Year	Estimated Annual Loss from Hazard
Tornado	Relatively High (98.8)	0 – 1	$27,935,187.91
Hail	Very High (99.6)	5 - 6	$21,846,676.00
Strong Wind	Very High (99.9)	2 - 3	$14,419,374.31
Riverine Flooding	Relatively High (97.9)	2 - 3	$14,296,261.84
Drought*	Relatively High (99.4)	70 +	$12,552,182.00
Winter Weather	Very High (99.7)	1 - 2	$2,785,182.17
Cold Wave	Relatively High (96.1)	0 - 1	$1,436,217.00
Wildfire	Relatively Moderate (88.6)	<0.01	$1,292,844.06
Lightning	Relatively High (93)	50 +	$718,132.50
Ice Storm	Relatively High (84.9)	0 – 1	$354,755.43
Heat Wave	Relatively Moderate (74.2)	0 – 1	$320,217.40
Earthquake	Very Low (56.3)	<0.01	$173,054.20
Hurricane	Very Low (45.6)	0.01	$119,358.80
Landslide	Relatively Low (43.2)	0.01	$ 21,900.00
Total Estimated Annual Loss due to Natural Hazards			**$98,271,343.62**

* Drought Risk Index is based on Agricultural (crop only) impacts.

Source: FEMA National Risk Index, Data Version v.1.19.0, March 2023

4.8 Hazard Mitigation

The Lubbock County Local Emergency Planning Committee (LEPC) has developed plans for addressing multiple types of emergencies and security risks in Lubbock County. These plans include disasters caused by weather or other means. Lubbock County and the City of Lubbock have departments dedicated to emergency management efforts and coordinate with other local entities as well as with state and federal agencies.

In 2023, the County of Lubbock updated the Hazard Mitigation Action Plan (HMAP) to identify activities to mitigate hazards based on which hazards present the greatest risk to lives and property. **Table 4.17** summarizes the impact of natural hazards on transportation systems identified in the 2023 HMAP.

Table 4.17 - Hazard Risk & Vulnerability to Transportation Goals

Natural Hazard	Description of Impact to Transportation Goals
Tornado	• Create hazardous travel conditions (mobilized debris, strong gusts, need for shelter) • Restrict mobility & accessibility (fallen tree limbs, poles, mobilized debris make roadway impassible) • Damage to infrastructure (mobilized ancillary structures, damaged businesses/homes)
Hail	• Create hazardous travel conditions (damage to vehicles, pedestrians, bicyclists) • Damage to infrastructure
Strong Wind	• Create hazardous travel conditions (mobilized debris, strong gusts) • Restrict mobility & accessibility (fallen tree limbs, poles, mobilized debris make roadway impassible) • Power outages (downed trees/power lines)
Riverine Flooding	• Restrict mobility & accessibility (flooded roadways) • Create hazardous travel conditions (vehicles stranded in flood waters, reduced visibility from extreme rainfall intensity) • Damage infrastructure (roadway washout, pavement damage)
Winter Weather / Cold Wave / Ice Storm	• Create hazardous travel conditions (visibility dangerously restricted, increase in accidents) • Restrict mobility & accessibility (impassible due to snow drifts) • Power outages (increased energy demands for heating, downed trees/power lines)
Heat Wave	• Reduced mobility & accessibility (too hot for pedestrian/bicycle/transit)

	• Power outages (increased energy demands for cooling) • Damage infrastructure (buckle tracks & concrete, pavement damage) • Create hazardous travel conditions (damage to vehicles by overheating, smog reducing visibility, heat stroke)
Wildfire	• Create hazardous travel conditions (visibility dangerously restricted due to smoke, poor air quality, increase in vehicle accidents) • Restrict mobility & accessibility (impassible due to smoke/limited mobility) • Damage infrastructure (excessive heat)

Source: County of Lubbock, Lubbock County Hazard Mitigation Action Plan, 2023

The HMAP identified several proposed actions to mitigate natural hazard risk for Lubbock County, including the following related to transportation:

- Roadway and drainage improvements to reduce damage caused by flooding for 109th St from University to 0.4mi E of University; CR 1700 at CR 6300; CR 1700 at CR 6400; Woodrow Rd from FM 1730 to CR 1000; University Ave from 115th St to FM 1585; CR 7300 from CR 1300 to US 62/82; CR 7100 from CR 1100 to CR 1200; CR 1900 from CR 5300 to CR 5400; CR 5500 from IH27 to CR 2600; CR 3860 from FM 40 to CR 7300; CR 3650 from FM 40 to CR 6840.
- Develop alternative evacuation routes/plans and designate emergency thoroughfares.
- Purchase three sets of vehicle barricade systems for use in street closures and evacuations to reduce loss of life due to a vehicle entering a hazard area.
- Assess areas to widen and improve carrying capacity of floodwaters.
- Increase drainage capacity by upgrading undersized storm drains and culverts; add stormwater detention and retention ponds as necessary.
- Evaluate emergency road access conditions. Develop and implement option to improve access and/or add redundant access routes in high-risk areas.
- Install cover walkways or canopies throughout district during extreme heat events.
- Mitigate pavement throughout district to prevent cracking and potholes due to thawing and re-freezing.

Designated hazardous material routes in Lubbock County were developed and approved by the Texas Department of Public Safety in 1995. The Hazardous Materials Commodity Flows for roadways, pipelines, and railways was updated in 2011.