JOPLIN AREA ORIGIN-DESTINATION STUDY

Prepared for:

Joplin Area Transportation Study Organization (JATSO)

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JOPLIN AREA Transportation Study Organization | olsson® | REPLICA

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FREQUENTLY USED TERMS



AADT (Average Annual Daily Traffic):
The average number of vehicles passing a specific point or link on a roadway on a typical day in a given year.

Capacity:
The maximum number of vehicles that can reasonably be expected to traverse a section of roadway during a given time period under prevailing conditions.

JATSO (Joplin Area Transportation Study Organization):
The metropolitan planning organization responsible for transportation planning in the Joplin, Missouri surrounding area.

Link:
A segment of a transportation network that connects two nodes, representing a section of roadway or pathway.

Location Based Services (LBS):
Geographic information collected through wireless communication networks using technology like GPS, Wi-Fi, or cellular networks

Metro Area Public Transit System (MAPS):
An on-demand transit system serving the greater Joplin Area

Mode Choice:
Describes the method by which travelers make their trip, i.e. walking, biking, private vehicle, transit, etc.

MoDOT (Missouri Department of Transportation):
The state agency responsible for the construction and maintenance of the state's transportation infrastructure, including highways, bridges, and public transit systems.

MPO (Metropolitan Planning Organization):
A regional organization responsible for transportation planning and project selection in metropolitan areas.

Node:
Point at which two or more links converge and may represent an intersection. Nodes serve as start and end points for a trip; trips are loaded onto and off the network at nodes. Each TAZ has a node at its centroid.

Point of Interest (POI) Data:
Data collected according to a specific geographical location, such as employment in a parcel.



FREQUENTLY USED TERMS

Replica:
A nationwide, calibrated travel demand model that provides detailed insights into human movement patterns, enabling the analysis of travel behaviors and traffic flows for informed transportation planning and infrastructure development.

Ridership:
The number of individuals riding a mass transit mode.

On-Demand Transit:
A public transportation service that allows riders to request a vehicle at a specific time and place.

Origin-Destination (O-D) Study:
A review of where vehicles/people are coming from, where they are going, why these trips occur, when these trips occur, and by what mode people are traveling.

TAZ (Traffic Analysis Zone):
A geographic unit used in transportation planning models to tabulate traffic-related data, typically consisting of one or more census blocks.

Travel Demand Model:
A model that predicts the flow of traffic or travel demand between zones in a metropolitan area given socioeconomics and demographics of the residents, the land use of the region and the transportation network available.

Trip:
A single journey made by an individual between two points by a specified mode of travel and for a defined purpose. Note: the end of a trip is defined as a detectible stop at a desired destination. See “dwell time” definition below.

Volume:
The number of vehicles that pass a specific point on a roadway during a given time period, usually expressed in vehicles per hour or vehicles per day.

Volume-To-Capacity Ratio:
A ratio of the volume of a roadway to the capacity of the roadway; the higher the ratio, the less available capacity on the roadway.

Vehicle Miles Traveled (VMT):
The sum of the length for all trips taken by all vehicles during a specific time period for a link or region.

Vulnerable Road Users (VRUs):
People using the roadway that are not in a vehicle.



REPLICA SPECIFIC TERMS

Dwell Time:
The time spent not moving by a traveler at a destination. Using the location-based data, Replica can identify stops as short as five minutes with 85% accuracy and 15-minute stops with 90% accuracy. Documentation

Replica Places:
Simulates the complete activities and movements of residents, visitors, and commercial vehicles in a region on a typical day of a given season. Replica Places are high-fidelity activity-based travel models, with data outputs down to the network-link level. “Modeled trips that could take place on a given day in a given region.”

Replica Trends:
Weekly and historical data for mobility, consumer spending, and land use. The output of Trends is a series of data points for each census tract in the country, delivered weekly. “Actual trips that did take place on a given week in a region.”

Season:
A Places Season is the base time period for Replica’s seasonal mobility model.

- Spring: A typical weekday (Thursday) or weekend day (Saturday) over a 13-week modeling season including March, April, May of the given year you’re viewing
- Fall: A typical weekday (Thursday) or weekend day (Saturday) over a 13-week modeling season including September, October, November of the given year you’re viewing.

Synthetic Population:
A statistically-equivalent population that represents the real population, used by Replica to predict travel behavior and demand while also protecting the privacy of the real population.

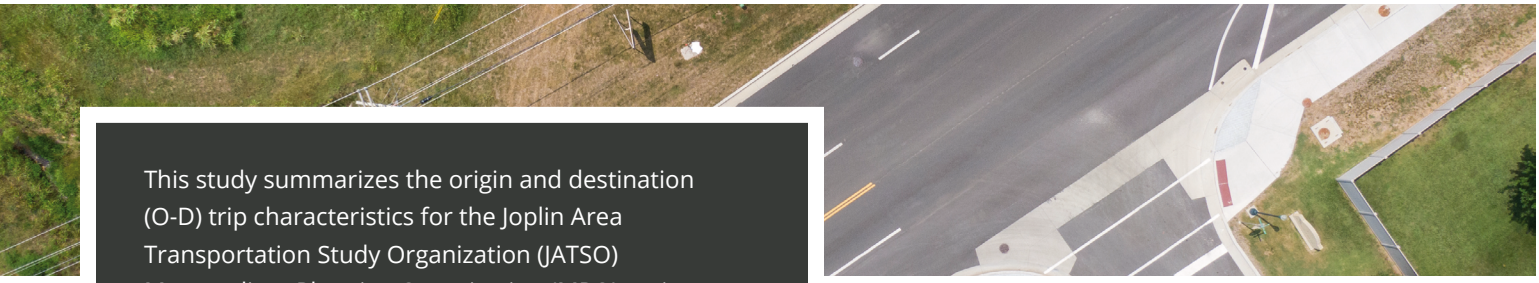
Mobility model:
Using location-based data, “travel personas” are developed to reflect travel behavior patterns for a given individual.

Network Link Volume:
The number of trips on a network link for a given time period. Differentiated from AADT and Volume in that all trips are included regardless of mode.

Travel Persona:
An extraction of behavioral patterns from individuals. Composed of activity planning/sequencing, destination location choice, and mode choice.

01
INTRODUCTION AND OBJECTIVE

01 INTRODUCTION AND OBJECTIVE



This study summarizes the origin and destination (O-D) trip characteristics for the Joplin Area Transportation Study Organization (JATSO) Metropolitan Planning Organization (MPO) region and makes recommendations for areas that are likely to need infrastructure improvements or further analysis. These findings will be based on information including, but not limited to:

- Trip Purpose
- Travel Pattern Observation
- Common Route Usage by Various Modes
- Mode Choice Patterns including Active Transportation and Transit
- Roadway Capacity
- Demographic, socioeconomic and economic indicators
- Daytime population estimates

This study makes use of the Replica platform as a primary data source for these findings. Replica is a data platform that provides detailed insights into human movement and land use to support transportation and urban planning. Built on a privacy-first approach, Replica combines aggregated and de-identified mobile location, connected vehicle, economic activity, and public datasets, and advanced modeling techniques to create representative travel demand models. These models help governments, agencies, and enterprises make data-driven decisions for infrastructure and mobility planning. The Replica data referenced in this report is generally between Fall of 2023 and Fall of 2024. and November 2024. Additional supplemental information from the 2020 U.S. Census, City of Joplin, JATSO, and the Joplin Metropolitan Transportation Plan (2020 and 2016); Ozark Transportation Organization (OTO) and MoDOT data were also referenced.

1.1. Purpose and Need

The purpose of this study is to investigate the existing characteristics of transportation users, both motorized and non-motorized, and identify travel trends within the region to assist JATSO leaders to make educated planning decisions across the region. Trips within, into, and out of the region were studied to establish a baseline for the existing and future transportation network. By establishing a baseline considering current and anticipated travel needs, potential infrastructure needs or areas of further investigation were identified. This study also presents demographic and socioeconomic data related to travelers in the region to help understand how the network serves its constituents.

The data presented in this study aims to go beyond summarizing the common origins and destinations (i.e. the “where”) of trips within the region. It is also seeking to provide insight into the “who”, “what”, “when”, “why”, and “how” of these trips, thereby empowering area leaders to make well-informed decisions.

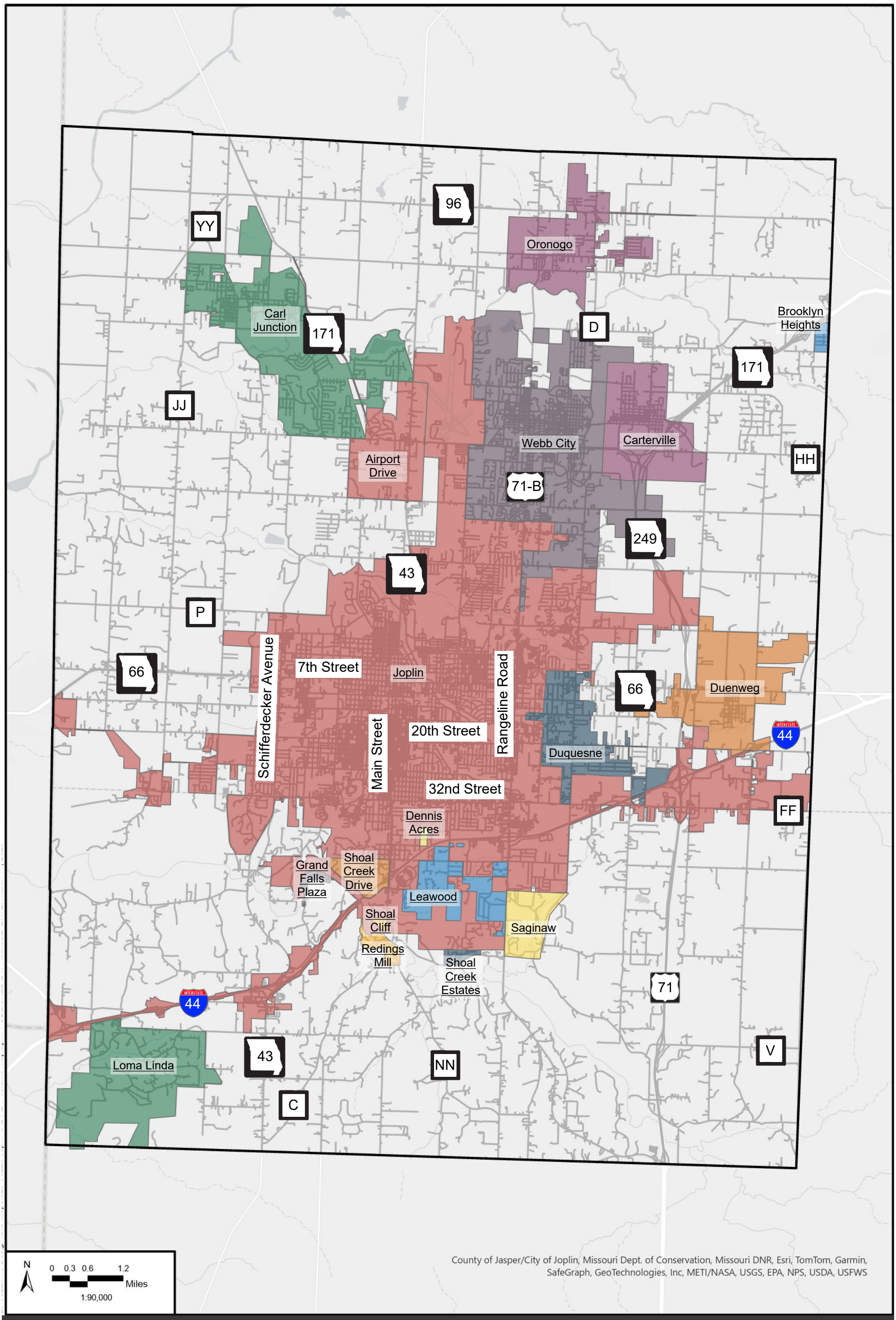
1.2. Study Area

The JATSO MPO boundaries include approximately 200 square miles in Jasper and Newton Counties including Joplin, Carl Junction, Webb City, and 15 other municipalities. The population of the two counties exceeds 180,000 people as of the 2020 census.

Located at the junction of I-44, I-49, and other important highway systems, the region also serves as an important interstate travel hub with related travel between Missouri, Oklahoma, Kansas, Arkansas, and beyond.

Figure 1 illustrates the MPO boundary and primary study area for this report.

Figure 1. Project Vicinity Map



VICINITY MAP

1.3. Data Sources

The Replica platform is composed of several tools that describe the people and trips for a given region and time. The Replica Places studies and Replica Trends dashboards are the two primary applications, but there are a variety of tools created for a specific purpose such as estimated AADT volumes and county-to-county spending flows.

Replica uses a diverse set of third-party data from public and private-sector sources. These sources include five categories of data that are outlined below. For Replica's extended data inputs, please see Replica's public methodology page.

- Mobile location data
  - Location-based services (LBS) data
  - Vehicle in-dash GPS data
  - Point-of-interest (POI) data
- Consumer/resident data
  - Demographic data from public and private sources
- Built environment data
  - Land use data
  - Building data
  - Transportation network data
- Economic Activity Data
  - Credit, debit, cash transactions
- Ground Truth Data
  - Auto/freight volumes
  - Transit ridership

The Replica Places model first creates a national synthetic population using demographic and consumer data that is statistically equivalent to the actual population. Next, a Mobility model is created using location-based data to capture travel patterns for certain "travel personas" in a region. Replica then applies the synthetic population to the patterns found in the mobility model to generate activity (network link volumes). These volumes are calibrated using a control group of "ground truth data" (i.e.: traffic counts). As with all models, uncertainty and variance are unavoidable in statistical analysis. For more information on the methodology for a specific application or the results of the validation process can befound on Replica's Help webpage.

To supplement the results retrieved from the Replica platform, this O-D study data was collected from the following sources:

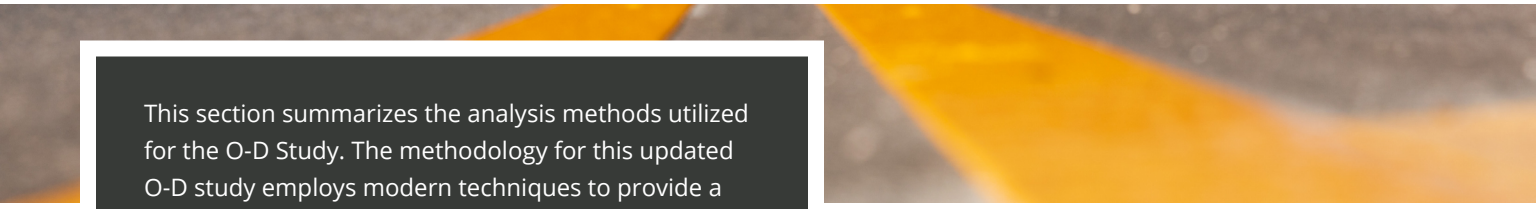
- U.S. Census Bureau
- Open Street Map
- Ozark Transportation Organization
- City of Joplin
- Missouri Department of Transportation
- Missouri Department of Social Services

Data retrieved from Replica was processed to provide results for the volume-to-capacity ratio and transit propensity. For more information on the refinement of these network characteristics, **see Section 2.2.**



02
METHODOLOGY

02 METHODOLOGY



This section summarizes the analysis methods utilized for the O-D Study. The methodology for this updated O-D study employs modern techniques to provide a more dynamic and comprehensive review of travel patterns and interrelated characteristics such as economic indicators across the region. Unlike the 2008 O-D study, which relied on traffic data from 26 perimeter locations and traveler surveys at various sites, this study utilizes more efficient and up-to-date methods to capture detailed travel information. In some cases, the data from Replica was synthesized with other data sources to help provide insights on the JATSO region.

2.1. Data Collection

Traffic and traveler data in this report was provided by Replica, a nationwide travel demand model. For more on how Replica generates and validates their data, see Section 1.3. **This report retrieved Replica data from several of their web-based applications:**

REPLICA PLACES:
Data from Places Studies was pulled for Thursday, Fall 2023. Data retrieved included network link volumes and demographic information for trips.

REPLICA TRENDS:
Data from Trends Dashboard was pulled from November 18, 2023 to November 23, 2024. Data retrieved included demographic information, mode choice and land use.

REPLICA AADT EXPLORER:
2023 Jasper and Newton County AADTs. This data provided the AADT for the Open Street Map Network Links.

REPLICA SPEND:
Provided the County-to-County Flows by resident location and was collected for Jasper and Newton County over various time periods.

REPLICA DAYTIME POPULATION:
Provided for a typical weekday in the Spring of 2024

Additional demographic and travel network data was sourced from:

- U.S. Census Bureau
  - 2020 Population, socioeconomic and demographic data
- Open Street Map
  - Network link information
- Ozark Transportation Organization
  - Theoretical capacity calculation methodology for various functional classifications was referenced from this peer-organization.
- City of Joplin
  - Metro Area Public Transit Systems (MAPS) transit ridership data
- JATSO
  - JATSO boundary
  - Network link information
- Missouri Department of Transportation
  - Historical AADT data
- Missouri Department of Social Services (DDS)
  - Benefit income limits

The following documents were also referenced when conducting this report:

- 2007 Regional Origin and Destination Survey (2008)
- Joplin Connected: Active Transportation Plan for the City of Joplin Missouri (2022)
- JATSO Bicycle and Pedestrian Transportation Plan (2018)
- JATSO 2036 Metropolitan Transportation Plan (2016)
- JATSO 2045 Metropolitan Transportation Plan Update (2020)

2.2. Data Analysis and Refinement

While much of the data referenced in this report was retrieved directly from Replica, two characteristics in particular required additional processing.

VOLUME-TO-CAPACITY RATIO:

Volume-to-Capacity (v/c) ratio is a measure of how much traffic is on a roadway versus the total capacity that roadway can convey. Though 2023 AADT was directly provided by Replica, the capacity for each roadway section had to be calculated. The roadway network included with the AADT data from Replica was provided by Open Street Map (OSM). Open Street Map is a free world map that Replica uses as the basemap for their model. This study focused on the v/c ratio of links classified as collector or higher.

The predominant factors that impact the theoretical capacity of each roadway include the number of through lanes and the functional classification of the roadway; these characteristics were sourced from the **2045 JATSO Metropolitan Transportation Plan** Update. The maps for the functional classification and the theoretical through lane capacity on each roadway are included in **Figure 14.** For each functional classification, the capacity per through lane depends on whether a roadway is rural or urban; rural capacity is greater than urban. For the purposes of this study, all roadways within the JATSO region were considered as urban. These should be considered high level v/c results. Factors such as turn lane presence, intersection type, and driveway presence, among others, can also affect roadway capacity but were not considered in this review.

Table 1: JATSO Theoretical Through Lane Capacity

JATSO FUNCTIONAL CLASSIFICATION	URBAN CAPACITY PER THROUGH LANE
Interstate/Freeway	16,500
Expressway	8,875
Major Arterial	7,900
Minor Arterial	7,100
Collector Street	6,500
Local Roadway	5,000



The theoretical urban through lane capacity values for each functional class were referenced using methods similar to the neighboring OTO MPO and are provided in **Table 1.**

After confirming the lane and functional classification data, the 2023 capacity and v/c ratio for each of the roadways was calculated. The results of this analysis are detailed in Section 3.4. Traffic volumes were then projected 20 years into the future to analyze corridor life expectancy.

The roadways that were selected for volume growth projection were identified in two ways. JATSO staff provided four areas with expected development in the near term. Secondly, historical AADT trends (either the last 5 or 20 years depending on the data available) were referenced and suggested that corridor volumes around the JATSO region experienced between -5.2% and 4.7%. Volumes in downtown Joplin experienced steady or negative growth, while roadways further out tended to have positive growth rates. **Figure 17** depicts the areas that have been identified as potential growth areas.

The population growth rate in the JATSO region over the previous 20 years was approximately 0.9%. Given these historical population and traffic volume trends, a growth rate of 0.25% was selected for the JATSO downtown core and 1% for areas outside of that. Traffic volumes were projected 20 years into the future. The results of this future v/c ratio evaluation are discussed further in Section 3.4.

TRANSIT PROPENSITY

Transit propensity was determined based on three criteria. Each criteria described a section of the population that was more likely to take public transit. Using available data on the Replica platform, the three criteria identified are individuals that live in a household with less than $50,000 annual income, individuals over 65 years of age, and individuals who live in a household with access to one or less vehicles. The income level was determined by the Missouri Department of Social Services benefit program income limits which is shown in **Table 2.**

Given this information, using individuals who live in a household with income under $50,000 would likely overestimate the number of people who live below the poverty line in the JATSO region. However, Replica's filters allow for household income at <$25,000 and $25,001-$50,000. A limit of $25,000 would underestimate those who live below the poverty level; thus, $50,000 was used for the purposes of this study.

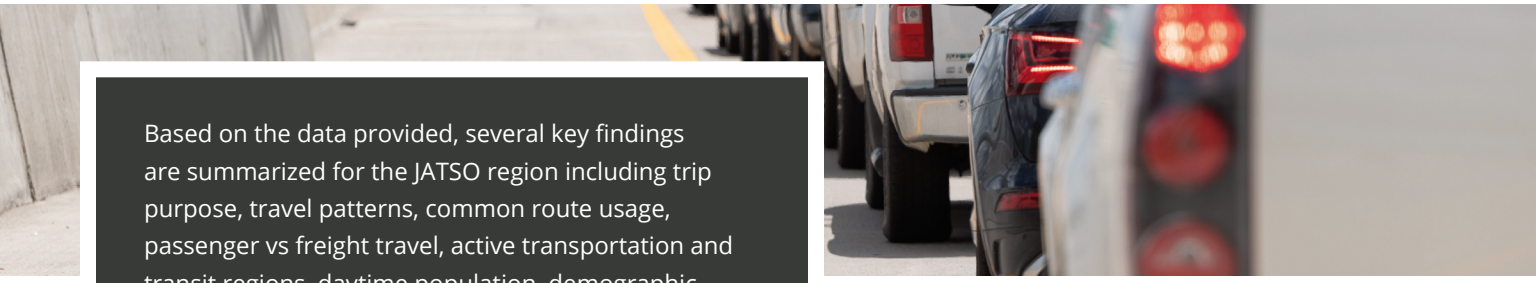
Table 2: Missouri DSS Federal Poverty Income Limits by Household Size

HOUSEHOLD SIZE	1	2	3	4	5	6	7	8
ANNUAL INCOME	$15,060	$20,440	$25,820	$31,200	$36,580	$41,950	$47,340	$52,720



03
ORIGIN-DESTINATION TRIP OBSERVATIONS

03 ORIGIN-DESTINATION TRIP OBSERVATIONS



Based on the data provided, several key findings are summarized for the JATSO region including trip purpose, travel patterns, common route usage, passenger vs freight travel, active transportation and transit regions, daytime population, demographic and economic indicators, and corridor capacity.

3.1. Trip Purpose

Details regarding trip purpose provide insight into why people are making trips to, from, and within the JATSO region. This was reviewed considering all trips starting and ending in the region, as well as trips made within the JATSO boundary. This can be further broken down by trips made by one's home location – specifically people living within or outside the JATSO region.

The following tables provide a breakdown of trip purpose for each of these categories. The trip purpose categories presented below refer to any trip ending in a specific location. Common trip categories related to the JATSO region are defined below:

- Home – trips ending at one's home
- Shop – includes trips that end at one of the following (think goods or retail):
  - Car dealership
  - Gas station
  - Grocery store
  - Pharmacy
  - Retail Business
- Work – includes all trips that end at work, including return from lunch trips for example
- Eat – a trip ending at a restaurant
- Social – a trip ending at someone else's home
- School – any trip that ends an individual's school or college
- Errands – similar to shop, includes trips that end at one of the following (think services or daily life errands):
  - Auto shops
  - Banks
  - Church/Religious organizations
  - Daycare services (childcare drop-off)
  - Dentist
  - Doctor's office
  - Dry cleaning and laundry services
  - Hairdressers
  - Hospitals
  - Nail salons
  - Nursing care facilities
  - Post Office
  - Storage facilities
- Recreation – a trip ending at a recreational destination, including:
  - Amusement parks and arcades
  - Gyms/Fitness centers
  - Casinos
  - Museums
  - Parks and swimming pools
  - Spectator sports
  - Golf courses and country clubs
  - Movies

- Commercial (freight) – specific to medium or large trucks, these are trips for deliveries or of business purpose. Note that a commercial trip purpose does not include a home location.
- Lodging – includes trips by visitors to overnight accommodation such as hotel or short term rental such as Airbnb or VRBO.
- Pass-through – trips made by non-residents that start and end outside the region.
- Regional departure – a trip ending by visitors to a "port-of-exit" such as an airport or train station.
- Other – any trip not classified in the above categories.

Replica does not include "looping" trips, such as walking a dog or jogging, that don't have a specific destination. As a reminder, a trip in the tables below indicate a "person-trip" as opposed to a "vehicle-trip".

Figure 2 summarizes the trip purposes for trips that start and end in the JATSO region. **Figure 3** shows the trip purpose for trips that end in the JATSO region but don't start there. **Figure 4** shows the trip purpose for the trips that start within the JATSO region but don't end there. Lastly, **Figure 5** shows the purpose of all trips (local or not) by people living in the JATSO region.

Figure 2: Trip Purpose for Trips that Start and End in the JATSO Region (Spring 2024)

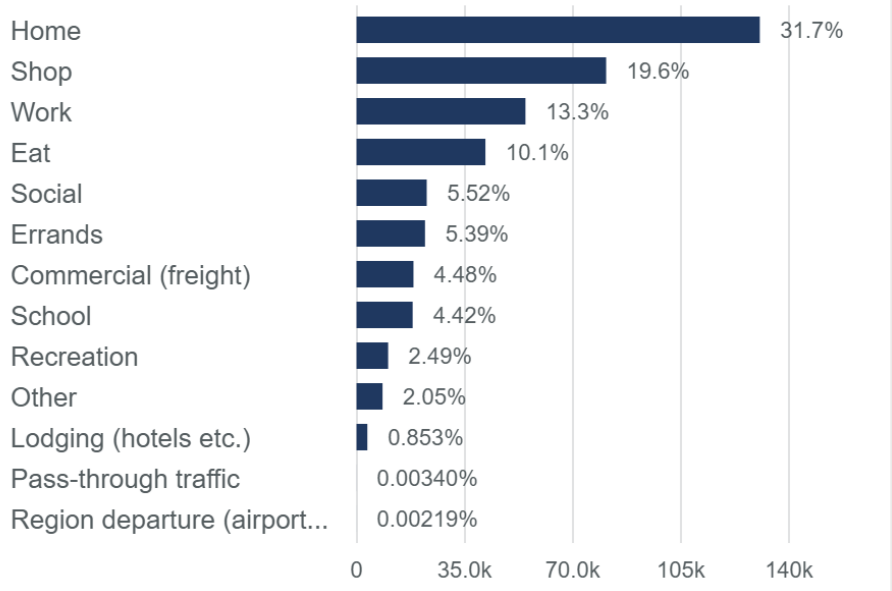


Figure 3: Trip Purpose for Trips that Start Outside but End in the JATSO Region (Spring 2024)

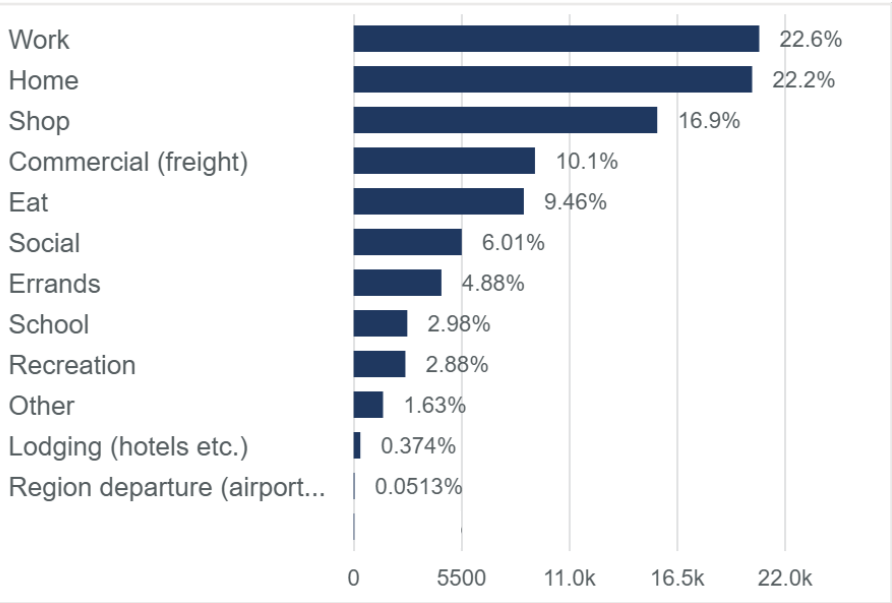


Figure 4: Trip Purpose for Trips that Start In but Leave the JATSO Region (Spring 2024)

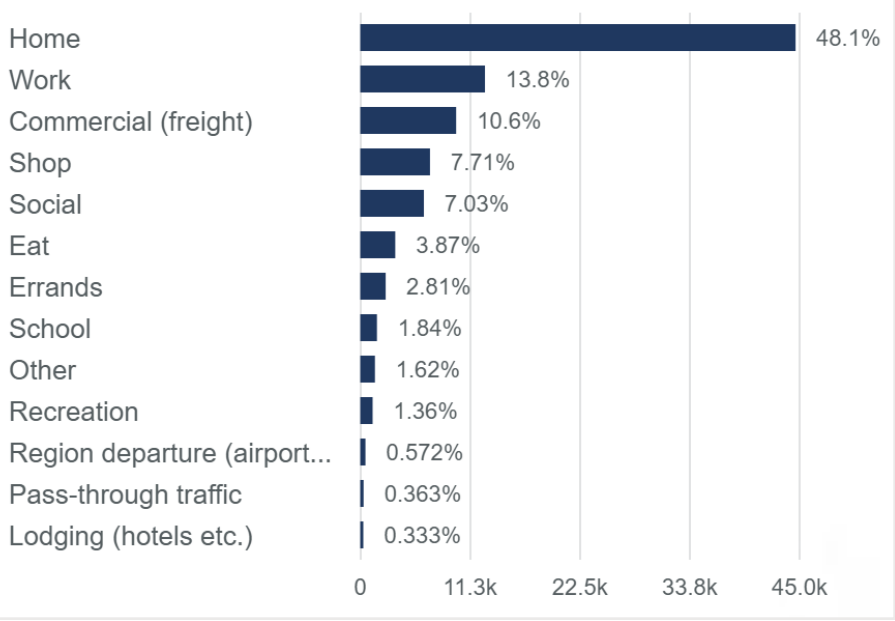
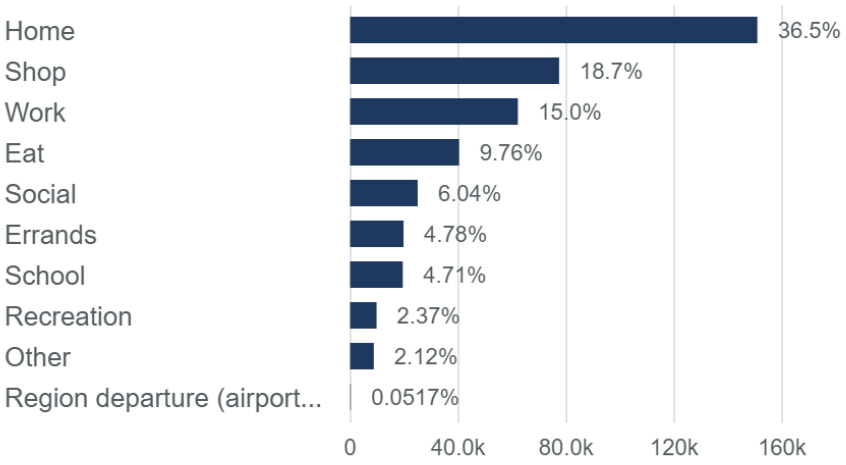


Figure 5: Trip Purpose for Residents of the JATSO Region (Spring 2024)



For trips that begin and end within the JATSO region, the most common trip purpose is heading home, followed by shopping and work. This is not surprising given that these trips are reflective of a person's standard day-to-day trip patterns. Note that Figure 2 and Figure 5 provide very similar results. The difference between these results is due to the fact that not all trips that start and end in the region are made by residents, and not all resident makes trips that only start or end in the region. For trips that begin outside the JATSO region but end up within JATSO, the most common trip purposes are work and home, followed again by shopping. These trips that come to the JATSO region from outside show what attracts people to the region, although notably it also shows that a fair number of people that live in the region are regularly leaving the region. Trips that begin in the JATSO region but end outside of the region are heavily heading to the triptaker's home. Note that these trip purposes reflect single trips, and that a person makes a series of these throughout a day. In other words, these trips cannot be used to directly estimate the number of daily visitors coming to the JATSO region. For example, a non-resident could enter the region for work, leave for lunch, and return to work. In this example, one visitor would account for two work trips and one eat/restaurant trip. For this reason, these trips should be referenced to provide insight into the type of trips made across the region. For more information on the number of regional visitors, see the Daily Population discussion in **Section 3.6.**

3.2. Trip Pattern Observations

GENERAL TRIP CHARACTERISTICS:

Approximately 410,000 trips start in the JATSO region on a daily basis according to the Replica Trends dashboard. The Replica Trends dashboard provides weekly updates on activity in a region, which can be used to investigate how those activities change over time. The total number of trips starting in the JATSO region fluctuates between the weeks of November 18, 2023 through November 23, 2024 based on season as seen in **Figure 6** below. The highest number of daily trips (approximately 440,000) occurred in early October 2024 while the lowest number of trips (380,000) occurred in early September 2024. The fluctuations over the year reflect the seasonal trip patterns and events that occur in the JATSO region. For example, based on information received from JATSO, the dip in trips during September of 2024 correlates with fewer tax revenues recorded.

Figure 6: Total Trips Originating in the JATSO Region from Nov. 18, 2023 to Nov 23, 2024 (Replica Trends)

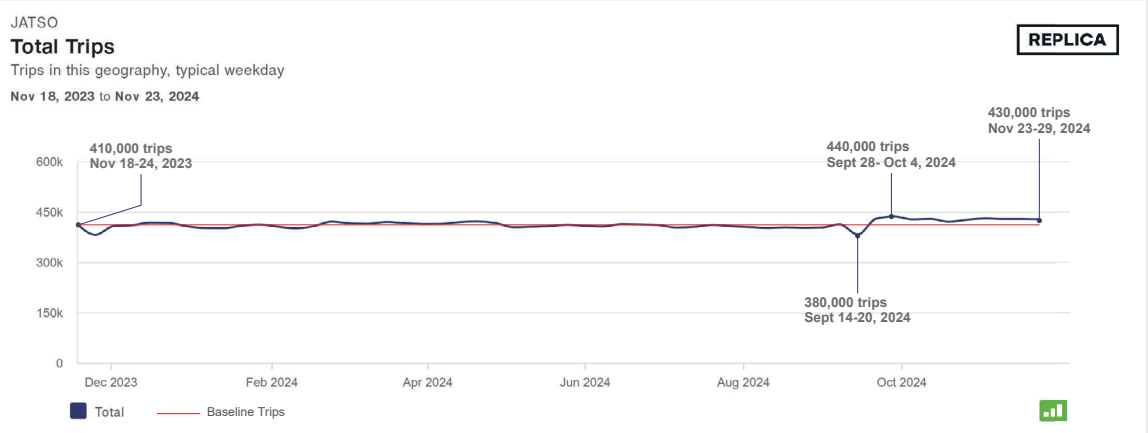
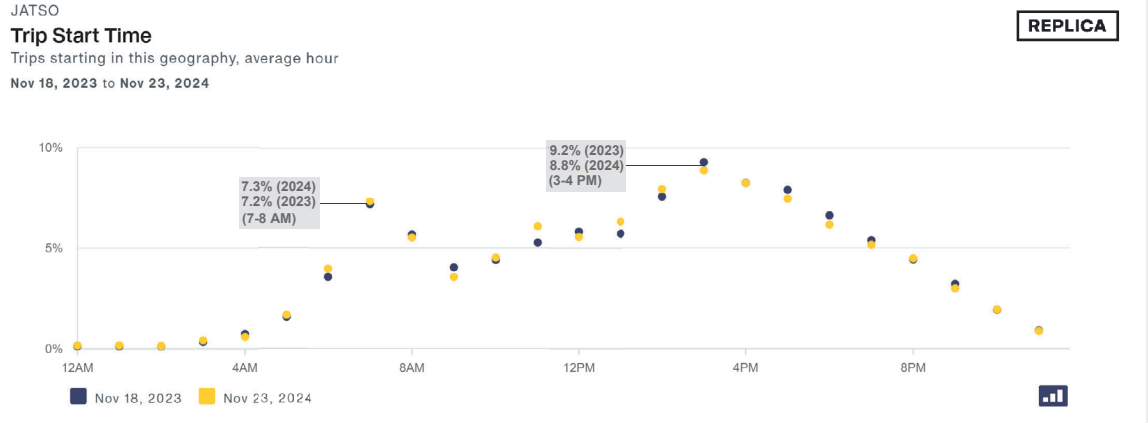


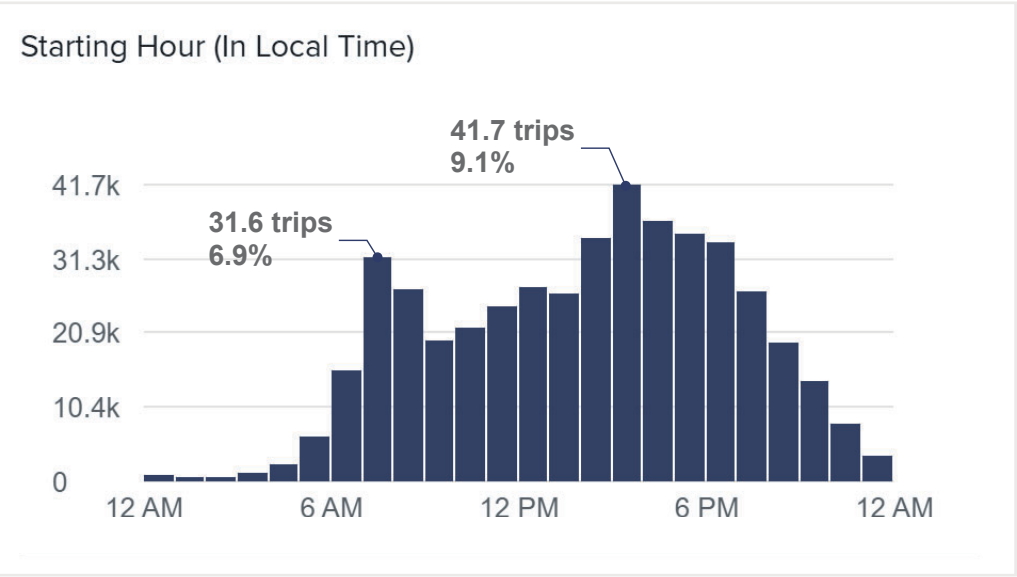
Figure 6 illustrates the year-over-year comparison of the time-of-day pattern. The two data sets included in **Figure 7** depict the proportion of trips starting in the JATSO region for each hour for a typical weekday during the weeks starting November 18, 2023 and November 23, 2024. The time-of-day patterns for the JATSO region exhibit a conventional AM and PM peak hour pattern without a clear mid-day peak. Approximately 7.2% of the daily trips start in the 7 AM hour and approximately 9.0% of trips start in the 3 PM hour. Note, since these totals are summed for each hour, the true AM and PM peak hour may occur during 60-minute interval, not starting at the top of the hour.

Figure 7: Starting Time for Trips Starting in the JATSO Region for an Average Weekday (Replica Trends)



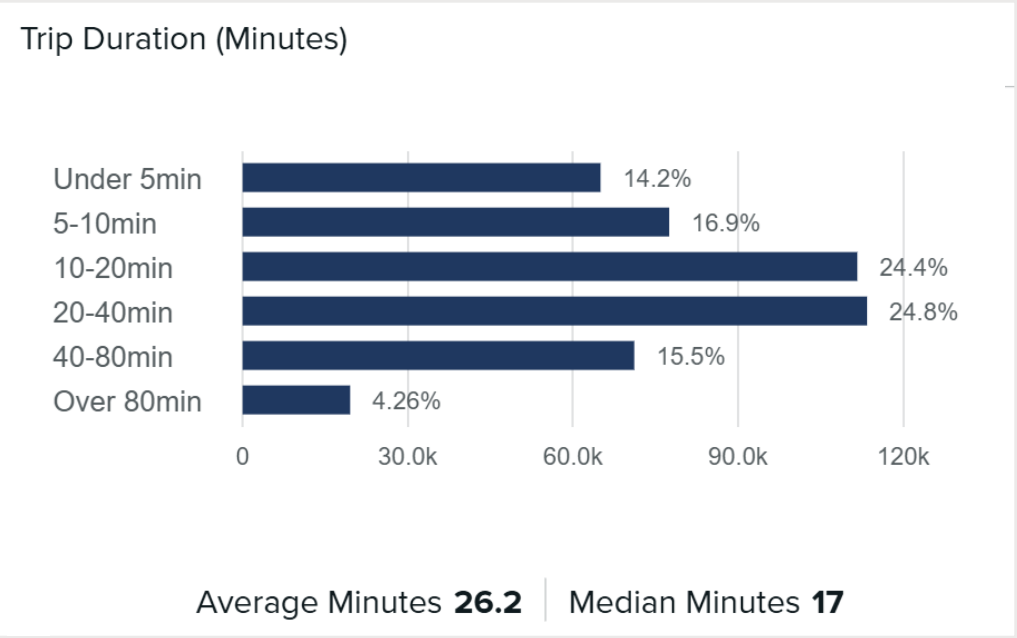
In addition to the time-of-day patterns found in the Replica Trends Dashboard, Replica Places studies can also provide a summary of starting hour. **Figure 8** charts the starting hour for trips originating in the JATSO region for a typical Thursday during the fall of 2023 and includes trip totals.

Figure 8: Trip Start Time for Trips Originating in the JATSO Region (Fall 2023)



Using the same Replica Places study, **Figures 9 and 10** summarize trip duration and trip distance characteristics for trips originating in the JATSO region.

Figure 9: Trip Duration for Trips Originating in the JATSO Region (Fall 2023)



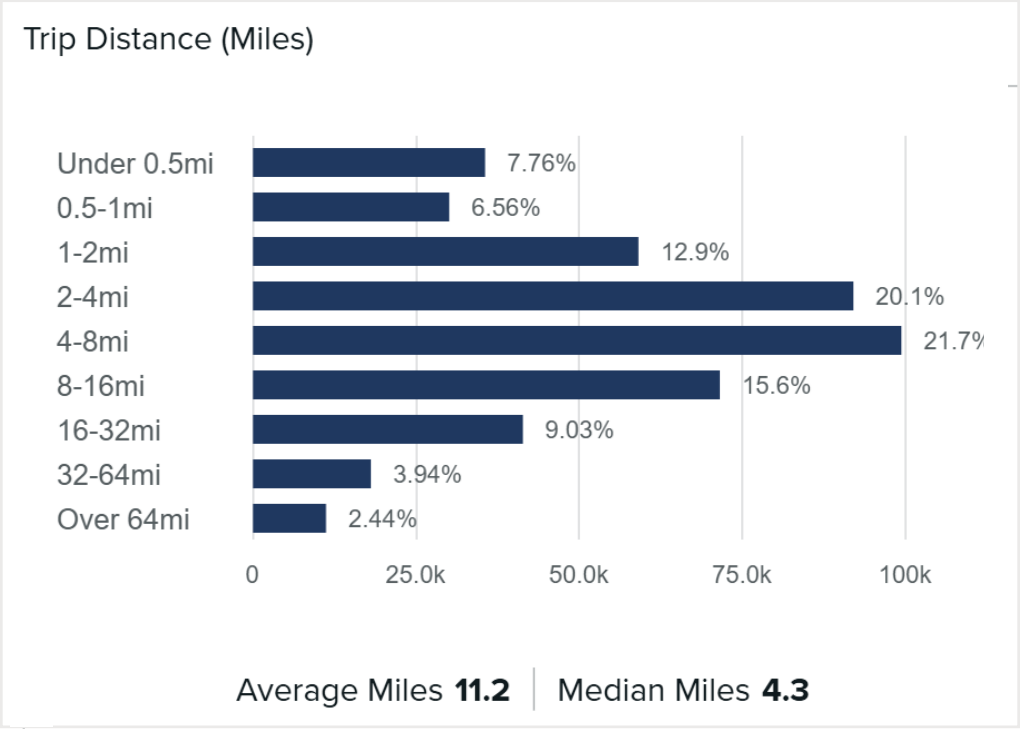


Figure 10: Trip Distance for Trips Starting in the JATSO Region (Fall 2023)

Figures 9 and 10 show that slighty less than half of the trips (49.2%) that begin the JATSO region last between 10 and 40 minutes. Similarly, 57.4% of trips that begin in the JATSO region travel a distance between 2-16 miles.

MODE CHOICE:

Replica Trends Dashboard data provides a snapshot of the current mode choice breakdown of the trips that are taken within the JATSO region, which is summarized in **Figure 11** on the right. Most trips (85% of the total) are made by private auto or private auto passengers. Of all the trips made by individuals using a private vehicle, a large majority are made by a single occupant. Walking (11%) is the next most common mode of transportation, while biking accounts for 1% of the trips. Other (3%) includes trips made by any and all other modes, including motorcycles or electric scooters.

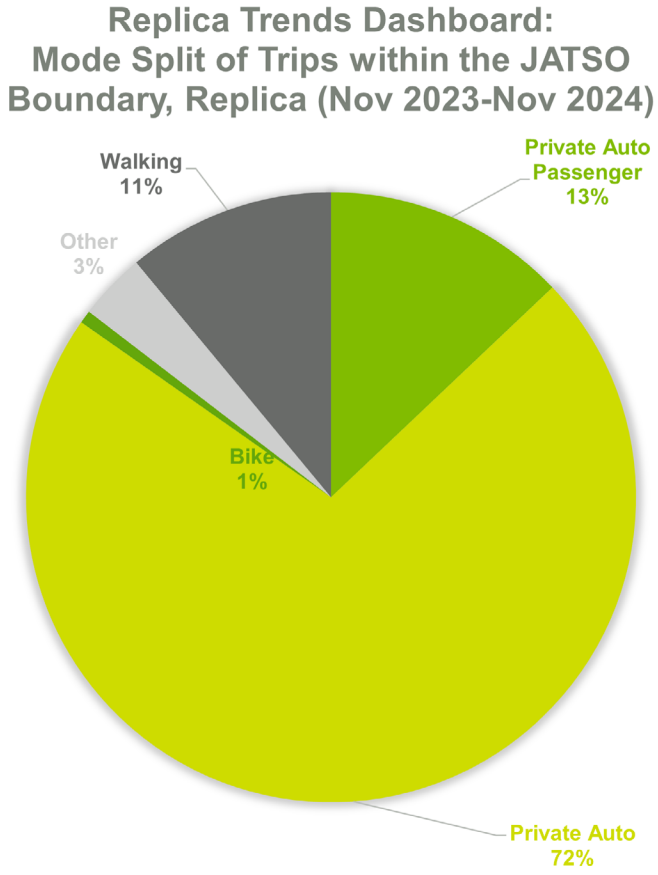


Figure 11: Replica Trends Dashboard: Mode Split of Trips within the JATSO Boundary, Replica (Nov 2023-Nov 2024)

Notably, the Replica provides specific language regarding rideshare trips: "While rideshare, delivery, and long-haul freight are included in total trip volumes, we do not track them individually and do not recommend using Trends data to analyze them at this time." Since transit trips in JATSO region during the analysis period were only through the on-demand service, MAPS, these specific trips are not differentiated from the private auto trips in the chart below. Transit ridership is discussed further in **Section 3.5.**

At the time of this study, the Sunshine Lamp Trolley is just resuming service as of February 2025. However, for the analysis period, that service was not running set transit routes and schedules; these routes were paused during Covid and are in the process of resuming. During this time, Metro Area Public Transit System (MAPS) has been providing demand-response only. These on-demand transit trips are included in the Replica model as either private auto, other or private auto passenger trips (exact classification unknown) rather than transit trips. Based on data provided by City of Joplin, the known JATSO on-demand transit ridership for the years 2023 and 2024 are shown in **Table 3** below.

When these trips are placed in context with the mode split chart in **Figure 11,** the annual ridership for transit in the region is roughly equal to the number of walkers. This would mean that approximately 11% of the trips in the region are transit. Note, these trips are currently included in Replica's model, but categorized as other, private vehicle or private vehicle passenger trips.

COMMON ORIGINS AND DESTINATIONS:

In order to create a travel demand model, a trip origin or destination location in the same vicinity are grouped into a Traffic Analysis Zone (TAZ). These TAZs are drawn based on a variety of inputs but are primarily based on the US Census blocks. Each TAZ is often characterized by a predominant feature or collection of features. For example, a TAZ could be characterized by a land use that is largely residential or industrial and therefore has trip patterns that reflect standard commutes or shifts. On the other hand, a TAZ may include a hospital or university that has its own distinct travel pattern. Overall, the TAZs highlighted in this section serve as the primary generators and attractors for the JATSO region.

Table 3: MAPS On-Demand Transit Ridership

	2022/2023	2023/2024
November	5,886	3,506
December	2,474	3,040
January	2,548	2,815
February	2,840	3,445
March	3,501	3,499
April	3,080	3,955
May	3,455	3,827
June	3,123	3,127
July	2,997	3,445
August	3,647	3,608
September	3,503	3,417
October	3,891	3,328
12 Month Total	40,945	41,012

Trip origins and destinations were determined using Replica Places. The top ten attractors are included below in **Figure 12**. The top ten origins are the same except for the inclusion of a TAZ along I-44 at the border of Missouri and Kansas and the exclusion of the TAZ that includes Missouri Southern State University. This TAZ includes the location of large truck and fueling centers and therefore is a common trip starting point. Overall, these locations have remained mostly unchanged since the 2008 O-D study. Since the 2008 study, the John Q Hammons Convention Center closed, and the St. John's Regional Medical Center was heavily damaged by the 2011 tornado and subsequently demolished. The TAZ that includes site of the convention center is still included in **Figure 12** under the Sam's Club. Two new hospitals have been built since the St. John's Regional Medical Center closed. The TAZ that includes Freeman Hospital is included in **Figure 12.** Notably, Mercy Hospital is just outside the top 10 list below but is included in the top 20 (6,970 trips). Outside of the hospital itself, it's TAZ mostly includes sparse residential lots.

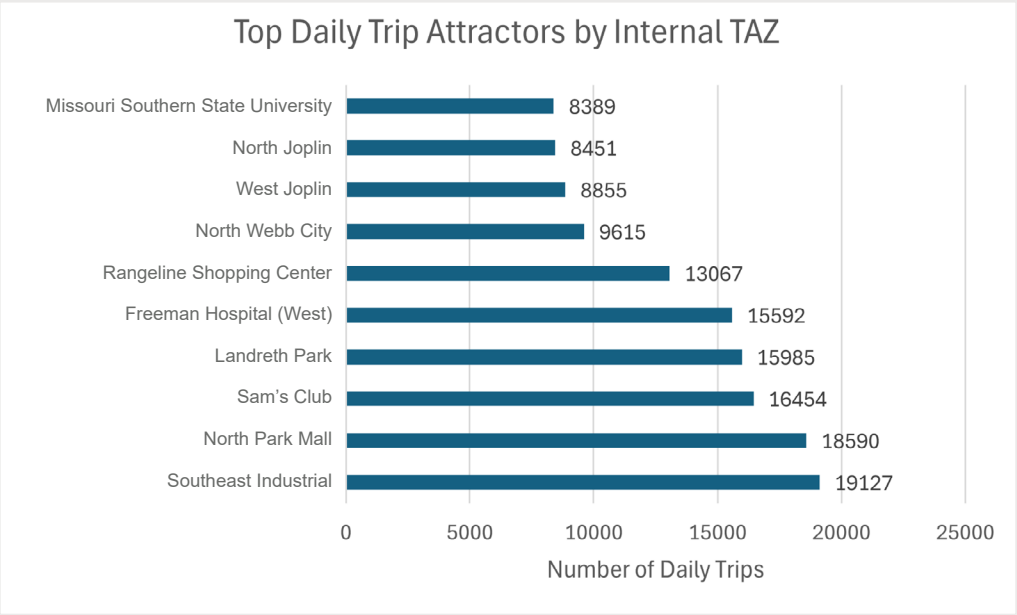


Figure 12: Top Daily Trip Destinations with the JATSO Region, (Fall 2023)

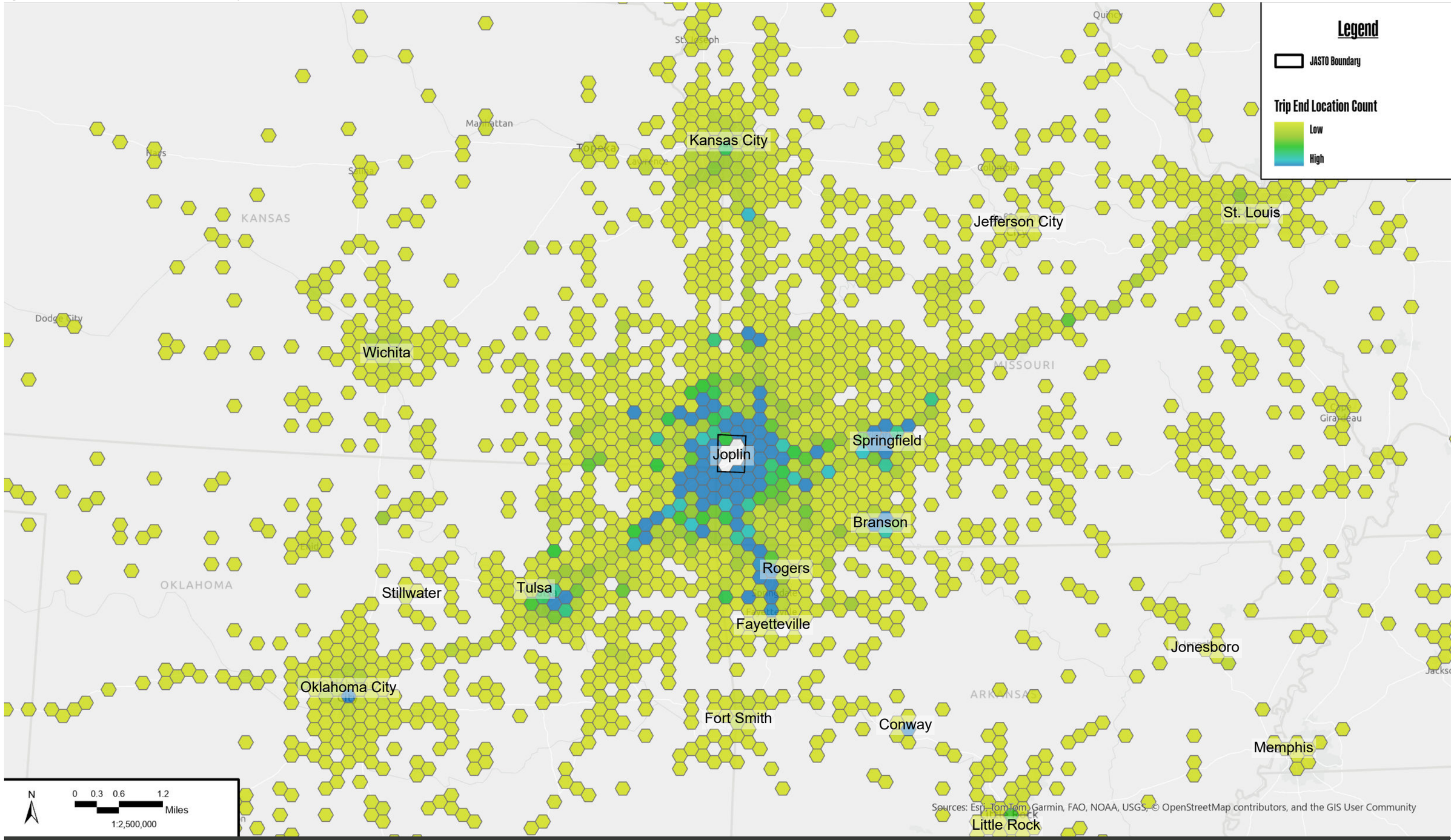
Additional details for these top destination TAZs can be found in **Appendix A.**

EXTERNAL TRIPS

Figure 13 illustrates the destinations for external trips leaving the JATSO region. The source of this data was specially derived by Replica staff due to the region's proximity to the borders of the Replica's mega-region. Replica provided the raw trip tables in order to identify where the external trips that are ending in the JATSO region are coming from.

Figure 13 shows a strong correlation between JATSO and adjacent communities such as Pittsburg, Neosho, Miami, and other nearby municipalities within approximately a 40-minute drive. In addition, common regional destinations from JATSO include Springfield, Northwest Arkansas, Little Rock, Branson, Kansas City, Tulsa, and Oklahoma City. The data also highlights Joplin's relationship with the interstate system, showing intermediate destinations along I-49, such as Nevada, and I-44, such as Big Cabin. This underscores how the Joplin metro serves as an important junction for interstate travelers and presents opportunities for the city to capitalize economically, attracting businesses and travelers who rely on these interstate corridors.

Figure 13: External Destination Points Heat Map



EXTERNAL DESTINATION POINTS HEAT MAP: COMMON EXTERNAL DESTINATIONS FOR TRIPS STARTING IN THE JATSO REGION

3.3. Common Route Usage

Using the 2023 AADT data retrieved from Replica, all roadways classified as collector and above were mapped to identify the highest volume roadways in the region. The following figures depict the functional classification and capacity **(Figure 14),** AADT **(Figure 15),** and Freight AADT **(Figure 16).** The capacity was estimated using the number of lanes available and the functional classification as explained in **section 2.2.**

Figure 14: Functional Classification and Capacity of Major Roadways

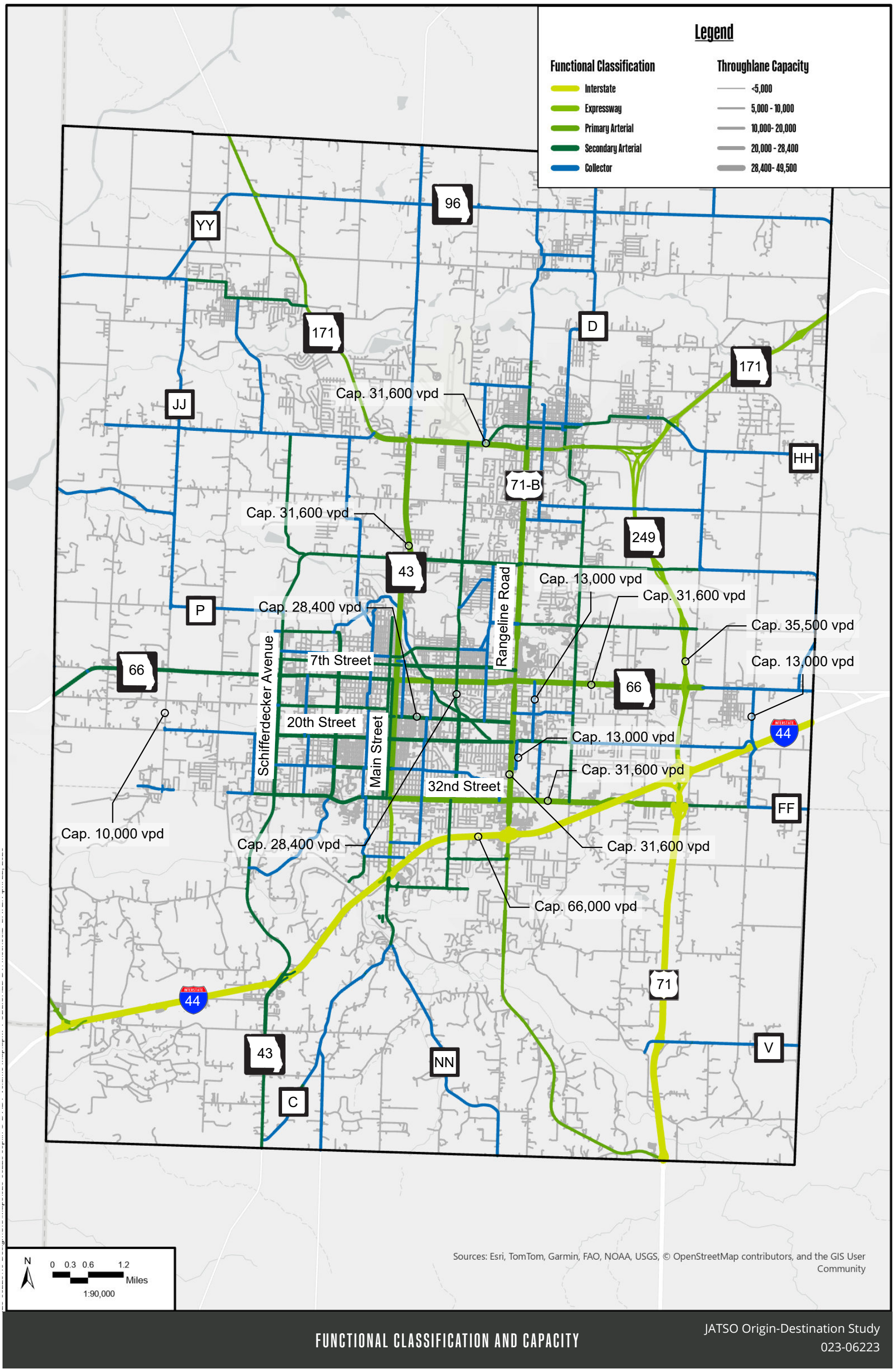
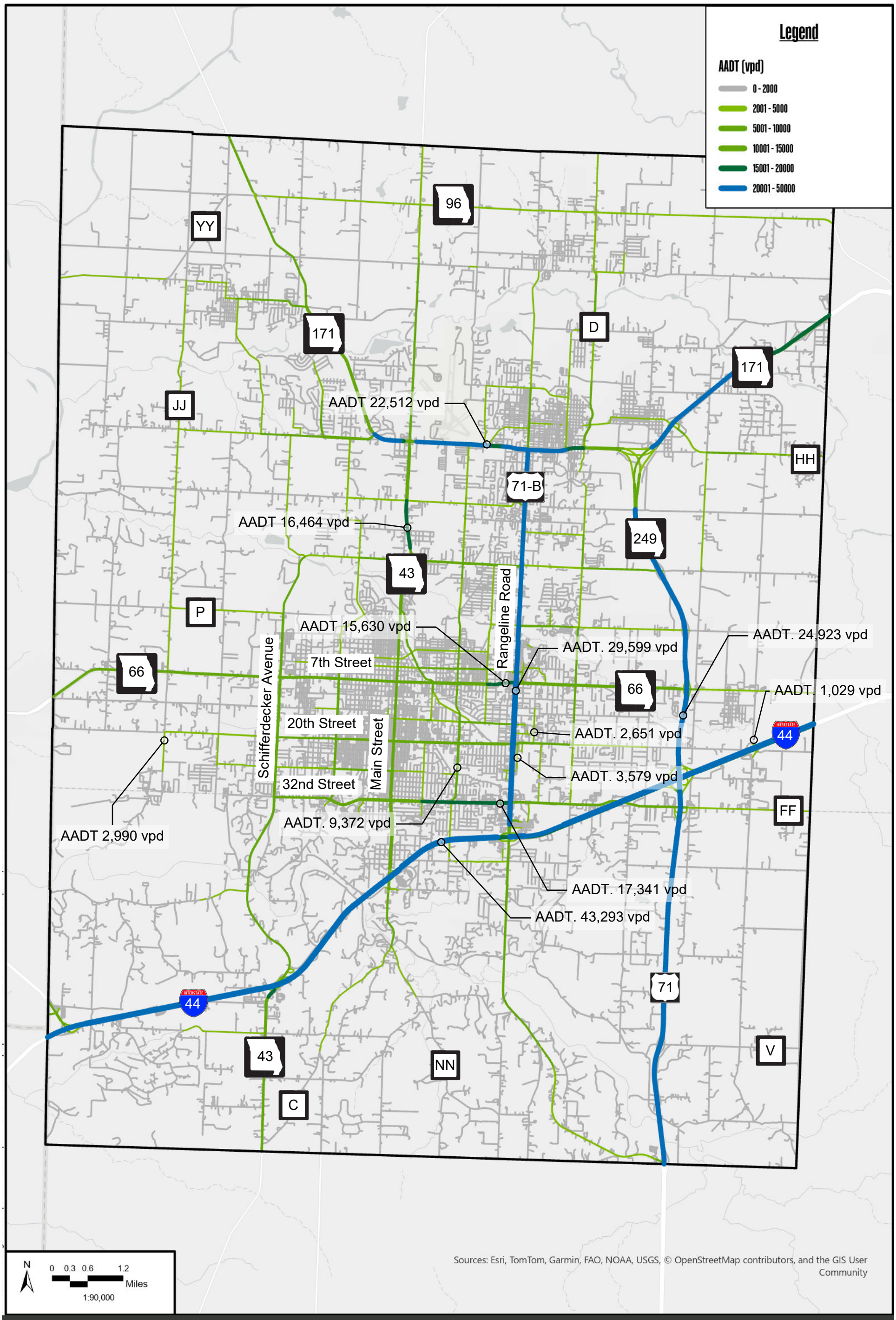


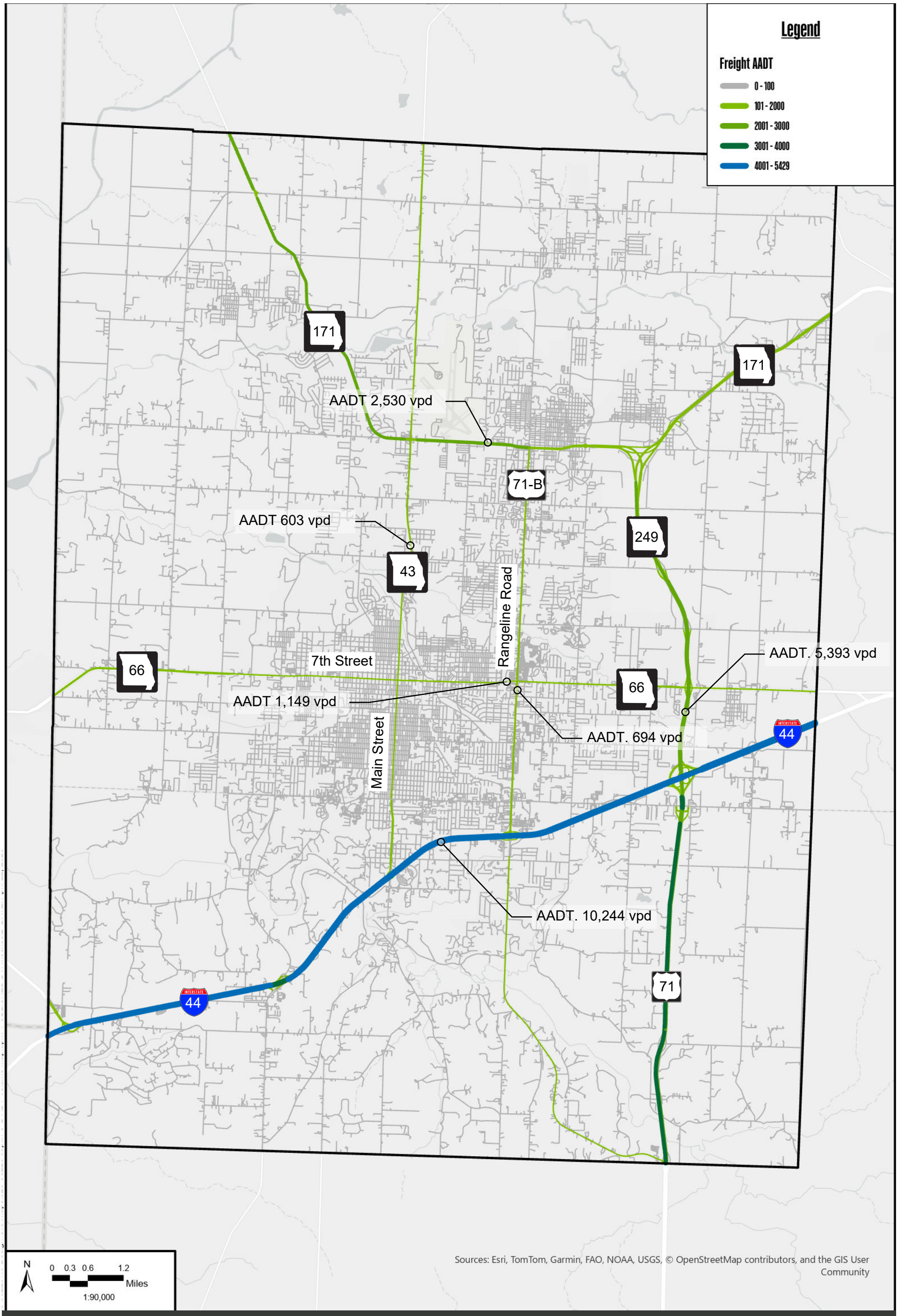
Figure 15: 2023 AADT of Major Roadways



AADT, VEHICLES PER DAY (VPD)

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Figure 16: 2023 Freight AADT on Interstate, Expressway and Primary Arterials



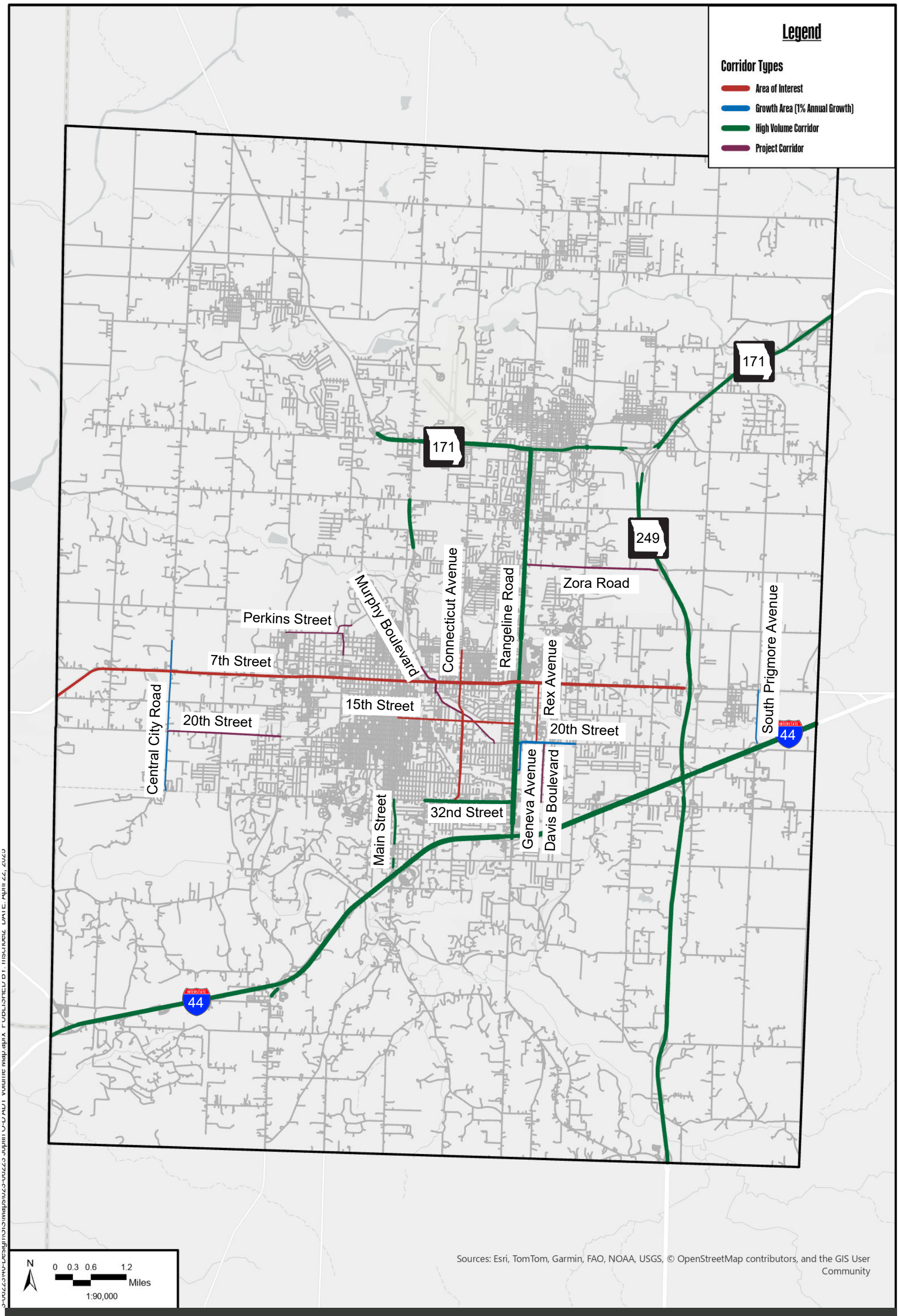
FREIGHT ONLY AADT, VEHICLES PER DAY (VPD)

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Note that Replica can only provide Freight AADT numbers for the functional classes Interstate, Expressway and Primary Arterial from their AADT tool.

Several segments were identified by JATSO staff as focus areas, as shown in **Figure 17** below. These include corridors with expected development activity, areas of interest, or a planned project. A Project Corridor includes corridors with planned or active infrastructure improvements. A Growth Area represents an area where known development projects are planned and a 1% annual growth rate was applied in the 2043 projection. Area of Interest are those roadways that either are critical to the network or provide context to some of the other focus areas. High Volume Corridors (greater than 15,000 vpd) are also included.

Figure 17: Expected Growth Corridors, Areas of Interest, and Planned Projects



CORRIDORS TO MONITOR

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As illustrated in **Figure 18,** nearly three-fourths of roadway segments with a functional classification of collector and higher have a bidirectional volume of less than 8,500 vpd.

Figure 18: 2023 AADT Distribution by Functional Classification

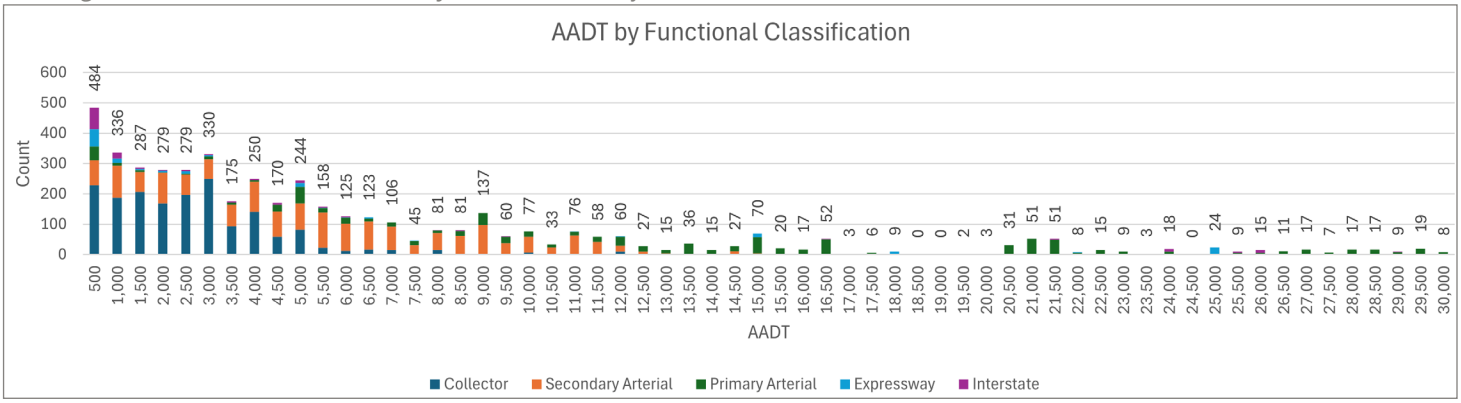


Table 4 provides 2023 baseline volume information for high volume roadways (greater than 15,000 AADT) as well as the areas focus areas noted in the previous figure.

Table 4: High Volume Corridors and Focus Areas.

SEGMENT	FUNCTIONAL CLASS	THEORETICAL CAPACITY (VPD)	2023 AADT (VPD)*	2023 FREIGHT AADT	CORRIDOR TYPE
I-44 (Hearnes Boulevard/Main street to Rangeline Road)	Interstate	66,000	43,293	10,244	High Volume Corridor
MO 171 (Prairie Flower Road to Colonial Drive)	Primary Arterial	31,600	22,512	2,530	High Volume Corridor
MO 249 (7th Street to Newman Road)	Expressway	35,500	24,923	5,393	High Volume Corridor
Rangeline (32nd Street to 20th Street)	Primary Arterial	31,600	29,599	694	High Volume Corridor
Main Street (North of Zora Interchange)	Primary Arterial	31,600	16,464	603	Area of Interest
32nd Street (I-49 and Arizona Avenue)	Primary Arterial**	31,600	17,341	N/A**	Area of Interest
7th Street (S Florida Avenue to Rangeline Road)	Primary Arterial	31,600	15,630	1,149	Area of Interest
15th Street (Connecticut Avenue to Murphy Boulevard)	Secondary Arterial	28,400	5,803	N/A	Area of Interest
20th Street (Rangeline and Duquesne)	Secondary Arterial	28,400	9,995	N/A	Growth Area
Connecticut/St. Louis (32nd street and Broadway Street)	Secondary Arterial	28,400	9,372	N/A	Area of Interest
Rex Avenue (7th Street to 20th Street)	Collector	13,000	2,651	N/A	Area of Interest
South Prigmore Ave (I-44 and 7th Street)	Collector	13,000	1,029	N/A	Growth Area
Geneva (20th Street to 24th Street)	Collector	13,000	3,579	N/A	Growth Area
Central City Road (7th Street/ Route 66 and 32nd Street)	Residential	10,000	2,990	N/A	Growth Area

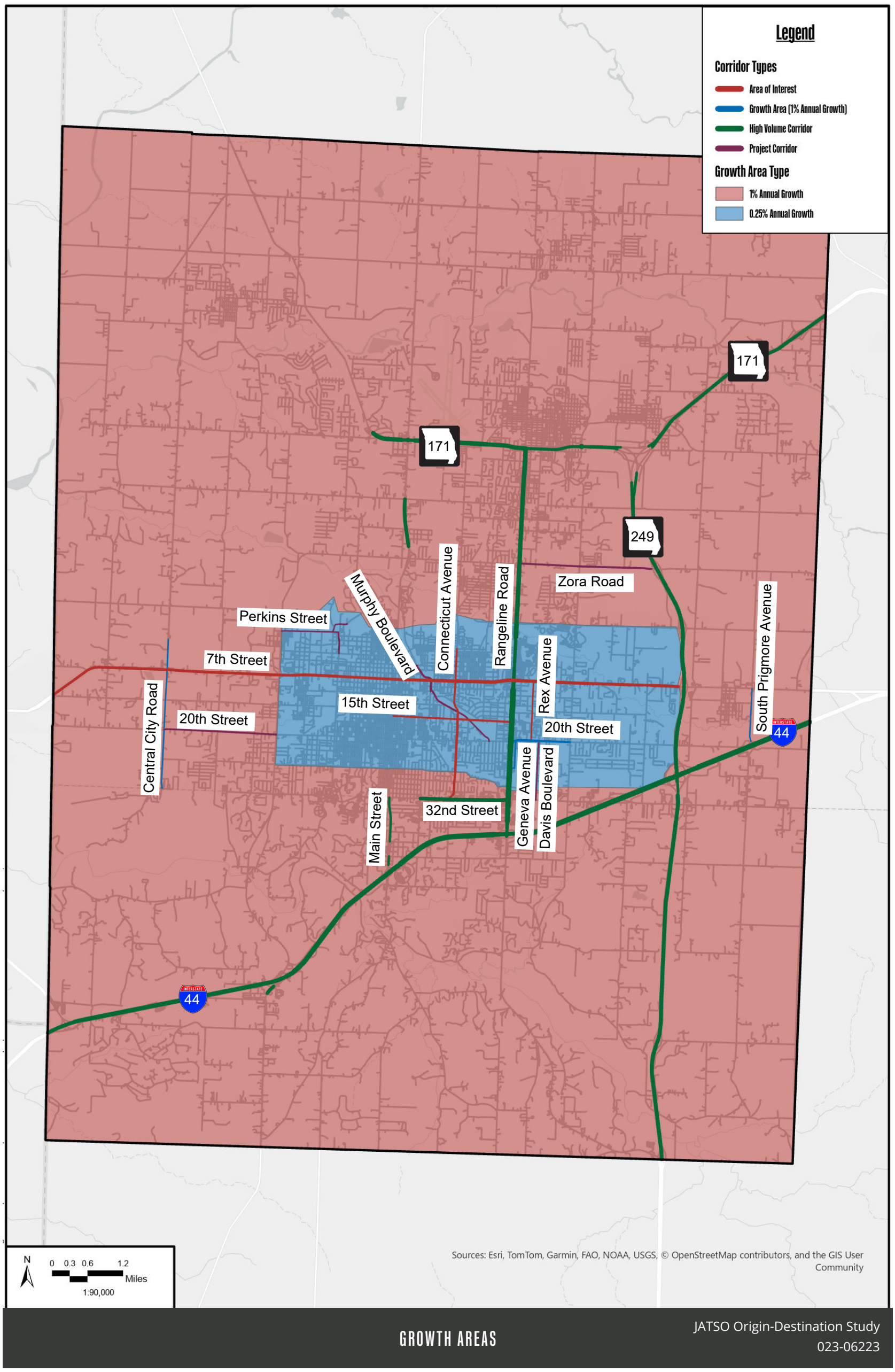
** AADT includes all vehicle types, including freight*
*** Primary Arterial per JATSO 2045 Metropolitan Transportation Plan Update (2020) Functional Classification Map (Figure 2.2); not classified as a primary arterial in Replica's Model.*

3.4. Evaluation of Capacity and Corridor Life Expectancy

In order to evaluate the capacity and life expectancy of roadways in the region, the 2023 AADTs were projected 20 years into the future. To create these projected AADTs, historical AADT data from MoDOT's Data Zone tool was collected at 22 various locations around the JATSO region. Considering the observed historical traffic volume trends, combined with the population growth described in Section 3.7 and development potential within the JATSO region, an area of higher (1%) annual growth rate and an area of more modest (0.25%) annual growth rate were noted. These two regions are depicted below along with the focus corridors in **Figure 19.**

Corridors in the outer, higher growth region were projected for future year 2043 using the 1% annual growth rate. All development corridors regardless of region also were projected to increase 1% annually. The lower, inner area roadways were grown by 0.5% annually.

Figure 19. Projected Growth Rate by Area



GROWTH AREAS

JATSO Origin-Destination Study
023-06223

Several current and future projects were noted by JATSO staff as summarized in **Table 5.** These roadways correspond with the Project Corridors highlighted in **Figure 17.**

Table 5. Near-term Planned Projects

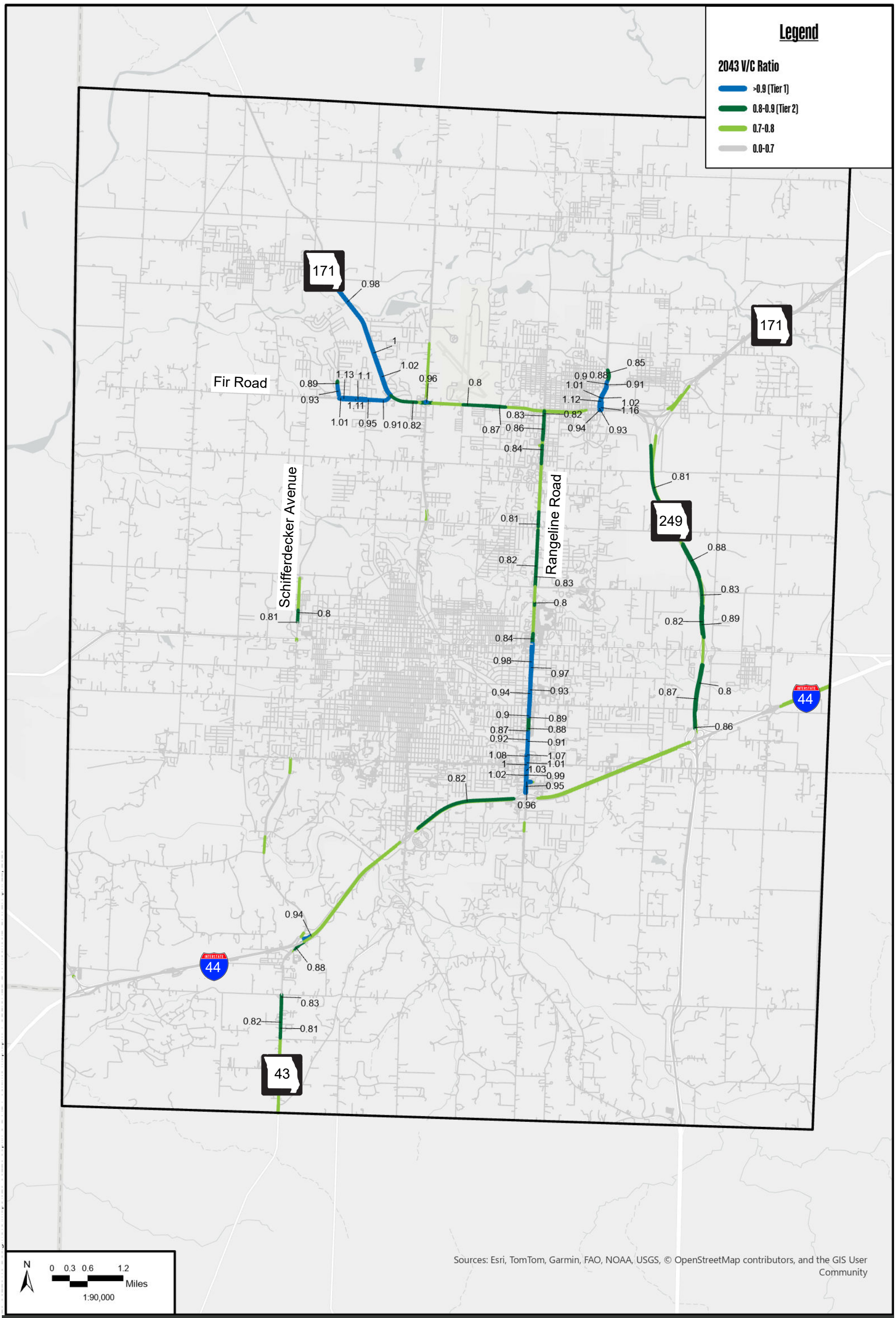
ROAD SEGMENT	DESCRIPTION	ADDITIONAL NOTES/CAPACITY CHANGES
20th Street (Schifferdecker Avenue to Central City Road)	• Provide additional capacity for vehicular traffic • Improve pavement deficiencies • Add bicycle and pedestrian shared path	• For this study, the future capacity of this roadway was increased to reflect the additional lane
Zora Street (Rangeline to MO 249)	• 2-lane with curb and gutter typical section. • Left turn lanes at key intersections. • From Hall Street to MO 249, widening to a 2- lane with 10' paved shoulders.	• No through lane capacity change was considered
St. Louis Ave (Campbell Pkwy to Broadway St)	• Add pedestrian and bicycle accommodations • Increase safety for all transportation modes	• The three-lane section is being reduced to two lanes and therefore, the future capacity reflects this change
Davis Blvd	• Improve Davis Blvd. from 20th to 32nd Street with wider roadways • Increase safety and efficient traffic flow • Accommodate for heavy truck traffic • Review to potentially add pedestrian and bicycle shared path	• Though wider lanes may slightly increase capacity, no through lane capacity adjustment was made for the purposes of this study.
15th & Murphy Intersection (Roundabout)	• Design intersection for existing 5 roads included • Improve intersection to include vehicular, pedestrian and bicycle traffic • Increase safety for all modes of transportation • Reduce accidents and create more efficient traffic flow	• Multi-lane, 5-leg peanut roundabout
Maiden Ln/Perkins/ Murphy Blvd	• Improve connection of Maiden Lane at Perkins Avenue to Murphy Blvd. • Add pedestrian and bicycle accommodations • Increase traffic efficiencies to alleviate congestion	• The planned improvements are likely to increase capacity, but the scale of this project is more localized than what is considered in this O-D study. Therefore, no changes to capacity were made in the future scenario.

With the planned projects noted above in place, the expected 2043 V/C ratios were calculated to estimate potential capacity constraints. Several roadways were identified as nearing or exceeding their capacity. These roadways were divided into two groups:

- Tier 1 includes roadways with a V/C greater than 0.9.
- Tier 2 includes roadways with a V/C ratio between 0.8 and 0.9. These roadways are between 80-90% of their theoretical capacity limit.

The expected Tier 1 and Tier 2 roadways with elevated volume-to-capacity ratios are shown on **Figure 20.** It should be noted that these capacities are theoretical and primarily consider functional classification and through lane volume. Presence of turn lanes, intersection types, driveway density, and other factors will also affect capacity.

Figure 20: Tier 1 and Tier 2 2043 V/C Ratios



2043 VOLUME TO CAPCITY (V/C) RATIO

Based on the expected volume-to-capacity, **Tables 6 and 7** note the following segments classified as Tier 1 and Tier 2 roadways for the future year 2043.

Table 6. Tier 1 Volume-to-Capacity Roadway Segments in 2043

SEGMENT	FUNCTIONAL CLASSIFICATION	2043 SEGMENT V/C (MAX.)	NOTES
Fir Road (West Leg of Intersection of Briarbrook Road and Fir Road)	Collector	1.13	Study previously done in 2021.
Rangeline (North of 32nd Street)	Primary Arterial	1.08	Not realistically able to recommend additional lanes.
Dermot Drive, MO-171 (North of Fir Road)	Primary Arterial	1.02	Lanes reduce from 5 to 2 around the curve. Several intersections along this section do have left turning lanes with ample stopping distance.
32nd/36th Street/Hammons Blvd near Rangeline (East leg of intersection of Rangeline and 36th Street)	Residential	0.97	These cross streets are gonna get a little busier due to CC development 600 feet from the interchange There is considerable development occurring in the vicinity at the site of the convention center. Currently experiencing a high v/c at the intersection of 32nd Street and Rangeline Road as well as at the Sam's Club entrance. As development continues, additional nearby intersections may experience capacity restrictions.
Briarbrook Drive (North leg of intersection of Briarbrook Drive and Fir Road)	Residential	0.93	Study previously done in 2021.
North East Street (North leg of Intersection with E Daugherty Street and East Street)	Residential	0.91	North of the roundabout at MacArthur and East Road, this section of roadway serves as an outlet for Webb City.

Based on the expected volume-to-capacity, **Tables 6 and 7** note the following segments classified as Tier 1 and Tier 2 roadways for the future year 2043.

Table 7. Tier 2 Volume-to-Capacity Roadway Segments in 2043

SEGMENT	FUNCTIONAL CLASS	2043 SEGMENT V/C (MAX.)	NOTES
MO-249 (Southbound Between Newman Road and 7th Street)	Expressway	0.88	Though the area between Newmann Road and 7th Street observed the highest v/c ratio, both northbound and southbound MO-249 is above 0.8 V/C from MacArthur to I-44
South Madison Street (South Leg of intersection with MO-171 to Fountain Road)	Primary Arterial	0.87	Though the Same Road as Rangeline Separated here to highlight a different section in Webb City
MO-43 (Between Douglas Fir Road and Dutch Elm Drive)	Secondary Arterial	0.83	North of this area, the road has been widened.
Westbound I-44 (Between Rangeline Road and S Main Street)	Interstate	0.82	I-44 improvements are under consideration.
Schifferdecker (Between 1st street and 4th street)	Secondary Arterial	0.80	This is a residential area

For the recommendations for these two groups, see **Section 4.2.** Note, the roundabout at Macarthur Drive and East Street was one of the intersections that was noted of have a higher capacity. However, since this is a roundabout intersection of relatively recent construction, it is likely that the v/c ratio based simply on number of lanes does not adequately capture the capacity of a roundabout. That said, East Street does appear to have some capacity concerns.

3.5. Active Transportation and Transit Regions

TRANSIT RIDERSHIP:

The Replica platform provides demographic and socioeconomic information that can be helpful in assessing transit needs of the JATSO region. Several of these components, income, vehicle ownership, and age, and how they correlate to transit ridership are discussed below. See **Section 3.7** for additional demographic and socioeconomic information reviewed as part of this study.

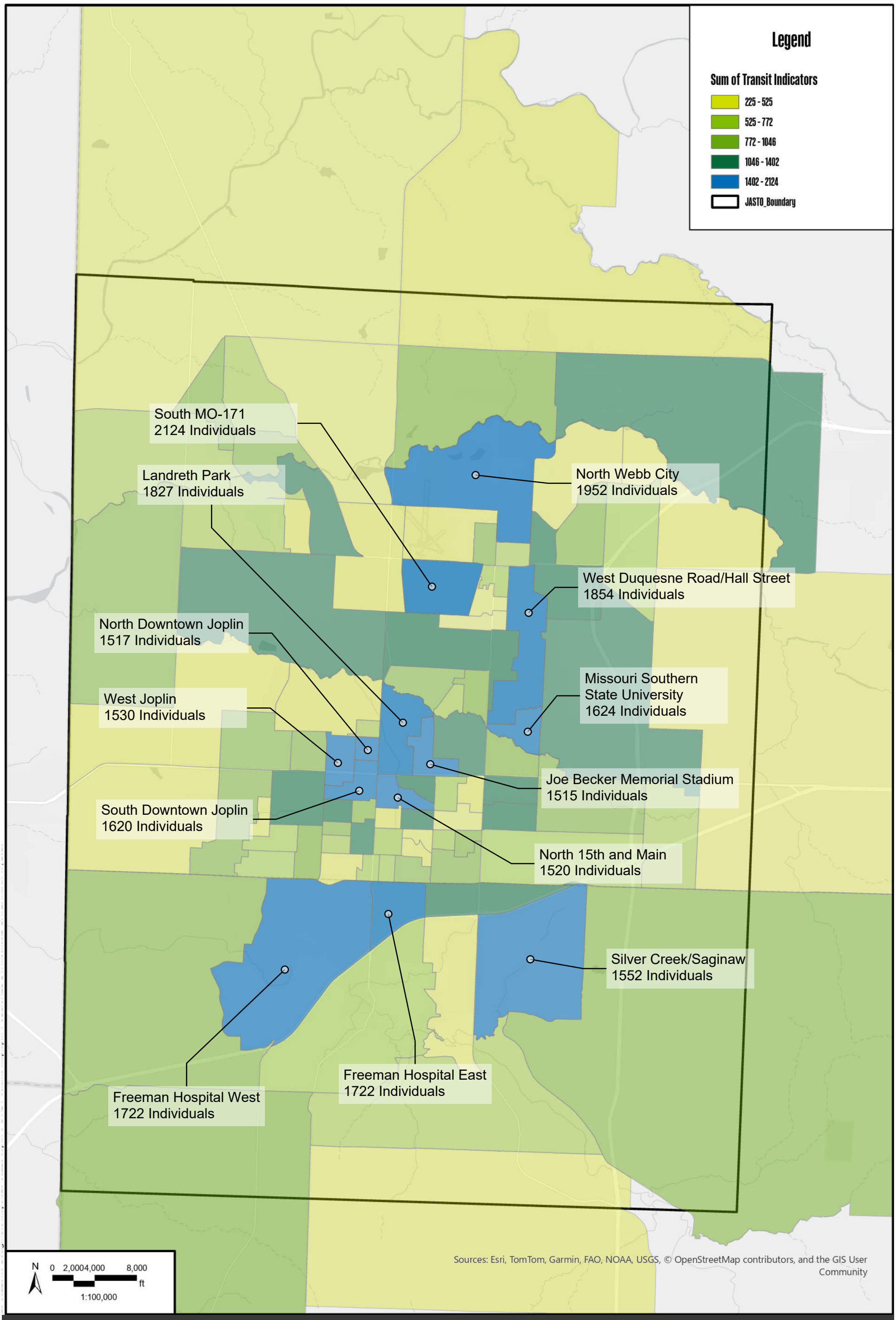
Individuals within the JATSO region were reviewed based on the criteria below to evaluate the transit propensity across the area. In general, transit reliance tends to increase for people/households that are lower income, have access to one or less private vehicles, and/or are elderly. The number of individuals living in the JATSO region that meet the following criteria was filtered in the Replica Places application:

- Income – household income below $50,000 per year
- Vehicle Ownership – access to one or less vehicle per household
- Age – individuals older than 65.

It should be noted that the income threshold was set to $50,000 to capture all individuals that live in households with income under the Federal Poverty Level as explained in **Section 2.2.** For every individual that met one of the above criteria, their home location was mapped in **Figures 21 and 22** according to either TAZ or municipality. Individuals that met two or more of these criteria (e.g. lower income with no vehicles) was counted each time. Therefore, individuals who satisfy several transit propensity factors are more heavily weighted than those who only meet one or two of the criteria.



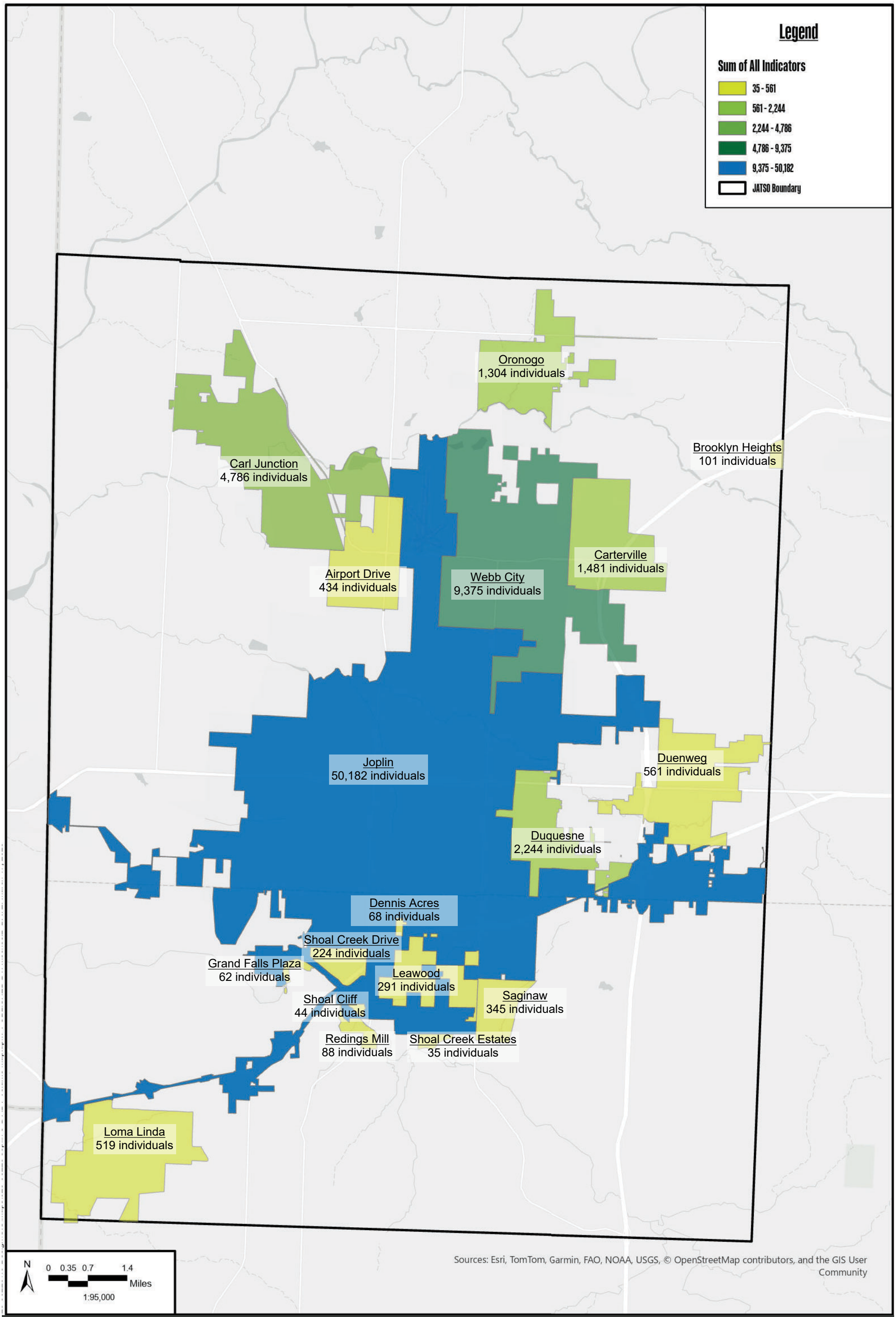
Figure 21: Number of Individuals with Transit Indicators by TAZ (Fall 2023)



TRANSIT PROPENSITY BY TAZ

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Figure 22: Number of Individuals with Transit Propensity by City (Fall 2023)



TRANSIT PROPENSITY BY MUNICIPALITY

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The TAZs and municipalities shown in blue in **Figures 21 and 22** indicate the areas with the highest number of individuals meeting a transit propensity criterion. In **Figure 22**, the city of Joplin has the highest number of residents that meet one of the criteria. For each of the TAZs, **Table 8** below includes the number of individuals included for each criteria as well as some geographical notes to help characterize each TAZ.

Table 8: Transit Propesnity by TAZ (Fall 2023)

GEOGRAPHICAL LOCATION	TAZ	VEHICLE OWNERSHIP ONE OR LESS	OVER 65 YEARS OLD	INCOME >$50,000	TOTAL INDIVIDUALS
Zone is predominantly residential south of Joplin Regional Airport and MO-171	2909700000240	838	407	879	2124
North of Webb City, relatively rural residential area	2909700000246	602	400	950	1952
Includes Freeman East Hospital	2914500000153	592	589	711	1892
North of Missouri Southern State University, Industrial Area	2909700000245	410	722	722	1854
Downtown Joplin	2909700000215	532	261	1034	1827
Includes Freeman West	2914500000151	400	652	670	1722
Includes Missouri Southern State University	2909700000244	519	162	943	1624
Downtown Joplin	2909700000211	597	266	757	1620
Rural Area south of I-44 and East of Rangeline Road	2914500000156	453	458	641	1552
Downtown Joplin	2909700000212	550	138	842	1530
Downtown Joplin	2909700000202	530	244	746	1520
Downtown Joplin	2909700000213	607	122	788	1517
Downtown Joplin	2909700000216	559	187	769	1515

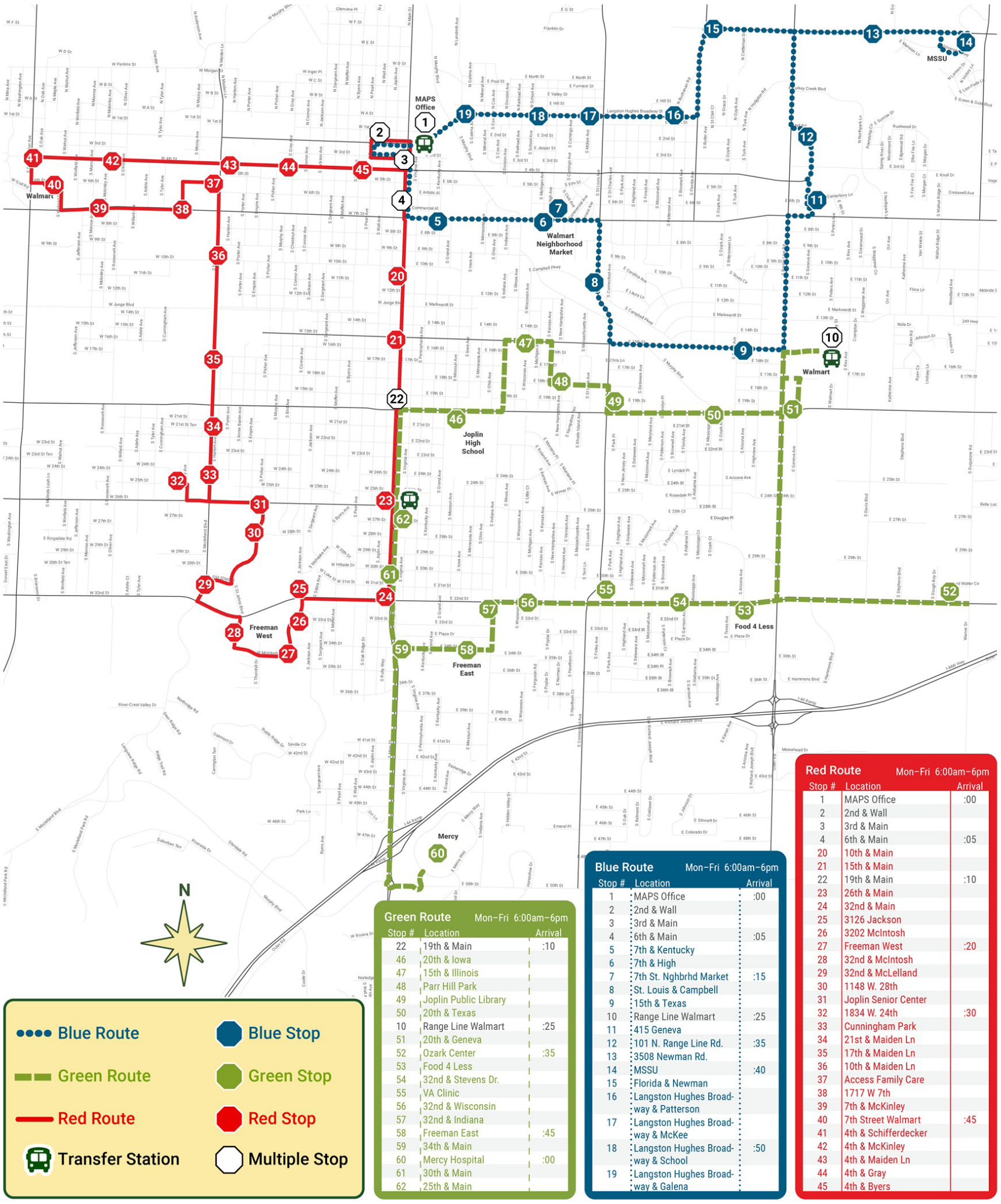
From this table, in Downtown Joplin there is a higher number of individuals meeting the income and vehicle access criteria. These two criteria are linked in that lower income would likely reduce access to multiple private vehicles. Another observation is that the area around Missouri Southern State University and the Hospitals also have a higher number of older residents.

Figure 23 below shows the planned routes for the resumption of service for the Sunshine Lamp Trolley service. When compared to the maps in **Figures 21 and 22,** both the Red and Blue routes of the Sunshine Lamp Trolley service are expected to service the downtown Joplin areas that were identified as high transit propensity. Joplin has the greatest transit need**,** but there are some areas that do appear to have high transit propensity that would not be served by the planned service routes.

Figure 23: Sunshine Lamp Trolley Route Map

JOPLIN MISSOURI

Sunshine Lamp Trolley Route



Green Route Mon–Fri 6:00am–6pm

Stop #	Location	Arrival
22	19th & Main	:10
46	20th & Iowa	
47	15th & Illinois	
48	Parr Hill Park	
49	Joplin Public Library	
50	20th & Texas	
10	Range Line Walmart	:25
51	20th & Geneva	
52	Ozark Center	:35
53	Food 4 Less	
54	32nd & Stevens Dr.	
55	VA Clinic	
56	32nd & Wisconsin	
57	32nd & Indiana	
58	Freeman East	:45
59	34th & Main	
60	Mercy Hospital	:00
61	30th & Main	
62	25th & Main	

Blue Route Mon–Fri 6:00am–6pm

Stop #	Location	Arrival
1	MAPS Office	:00
2	2nd & Wall	
3	3rd & Main	
4	6th & Main	:05
5	7th & Kentucky	
6	7th & High	
7	7th St. Nghbrhd Market	:15
8	St. Louis & Campbell	
9	15th & Texas	
10	Range Line Walmart	:25
11	415 Geneva	
12	101 N. Range Line Rd.	:35
13	3508 Newman Rd.	
14	MSSU	:40
15	Florida & Newman	
16	Langston Hughes Broadway & Patterson	
17	Langston Hughes Broadway & McKee	
18	Langston Hughes Broadway & School	:50
19	Langston Hughes Broadway & Galena	

Red Route Mon–Fri 6:00am–6pm

Stop #	Location	Arrival
1	MAPS Office	:00
2	2nd & Wall	
3	3rd & Main	
4	6th & Main	:05
20	10th & Main	
21	15th & Main	
22	19th & Main	:10
23	26th & Main	
24	32nd & Main	
25	3126 Jackson	
26	3202 McIntosh	
27	Freeman West	:20
28	32nd & McIntosh	
29	32nd & McLelland	
30	1148 W. 28th	
31	Joplin Senior Center	
32	1834 W. 24th	:30
33	Cunningham Park	
34	21st & Maiden Ln	
35	17th & Maiden Ln	
36	10th & Maiden Ln	
37	Access Family Care	
38	1717 W 7th	
39	7th & McKinley	
40	7th Street Walmart	:45
41	4th & Schifferdecker	
42	4th & McKinley	
43	4th & Maiden Ln	
44	4th & Gray	
45	4th & Byers	

Source: City of Joplin, 2025

ACTIVE TRANSPORTATION:

As previously mentioned, approximately 12% of the trips made in the region can be categorized as active transportation modes, either walking or biking. The following images depict several areas of note with relatively high volumes pedestrian and cyclists.

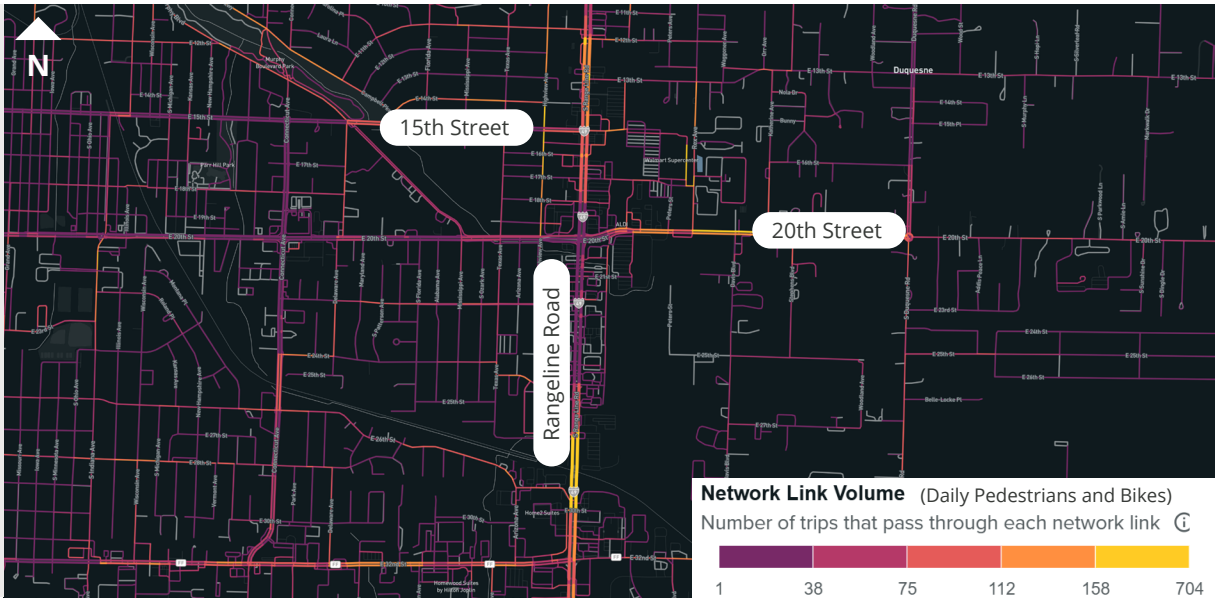


Figure 24: Active Transportation Rangeline Between 32nd Street and 20th Street.



Figure 25: Active Transportation Downtown Joplin Near Landreth Park

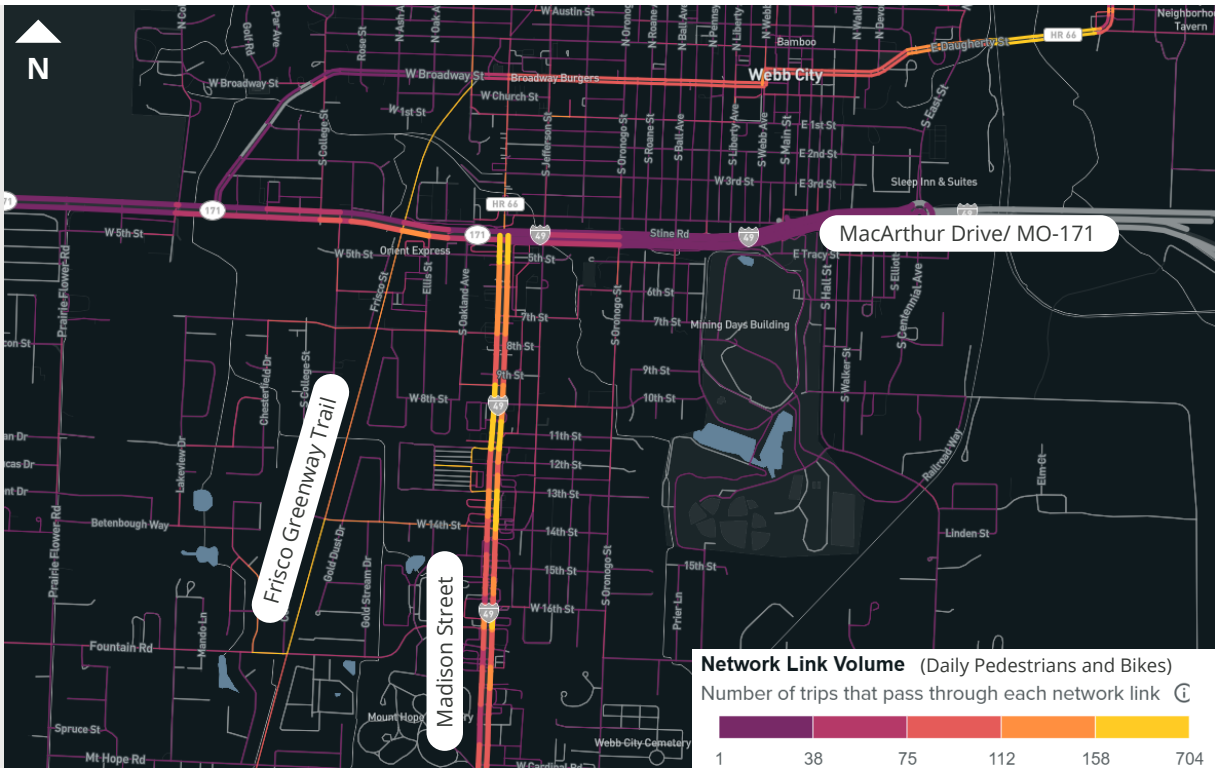


Figure 26: Webb City and the Frisco Greenway Trail

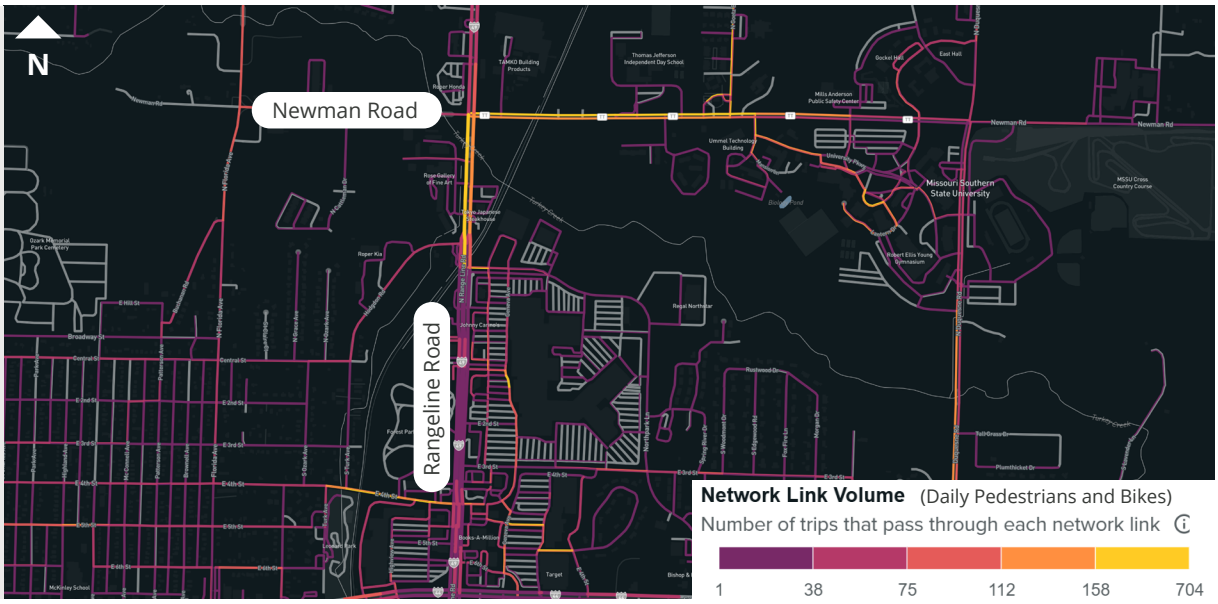


Figure 27: Missouri Southern State University

It should be noted that the Replica platform uses a synthetic population and a mobility model to generate biking and walking trips on a roadway link network. It is possible that the exact pedestrian route is not on the roadway link network (perhaps instead using a shortest path through a park, parking lot, unmapped pathway, etc.). In that instance, that trip would be attributed to the closest possible network link. **Figure 27** may provide an example of this phenomenon. In this case, it is likely that Missouri Southern State University pedestrian traffic is using the provided trail between campus and the commercial area southwest of Turkey Creek rather than Newman Road and Rangeline Road, neither of which have sidewalks. Still, this data provides an indication of active transportation user "hot spots", which could be useful when evaluating multimodal needs along a given corridor.

3.6. Daytime Population

Replica provided a daytime population estimate for Jasper and Newton counties. The data is aggregated at a county level and was unavailable for the JATSO boundary specifically. **FIgures 28-30** depict the estimated daytime population in Jasper and Newton counties throughout the day for a typical Thursday in the Spring of 2024.

Figure 28: Daytime Population Trends for the JATSO Region, Typical Thursday, in Spring 2024

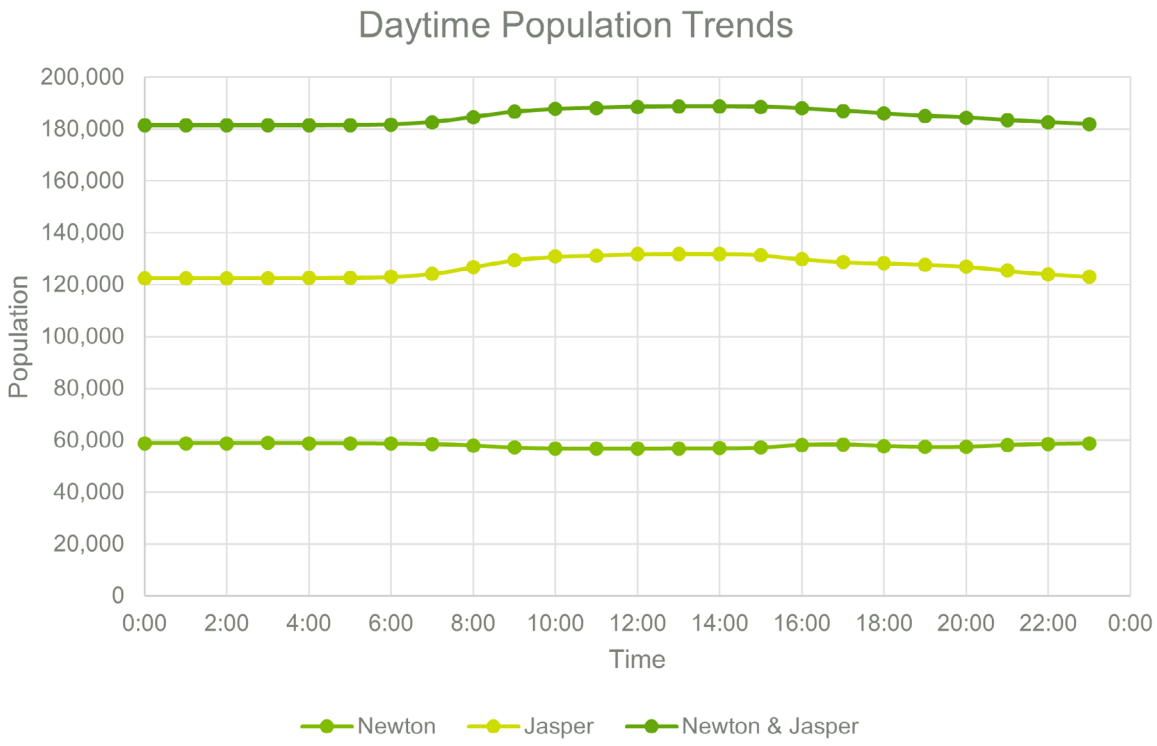


Figure 29: Daytime Population Trends for Jasper County, Typical Thursday in Spring 2024

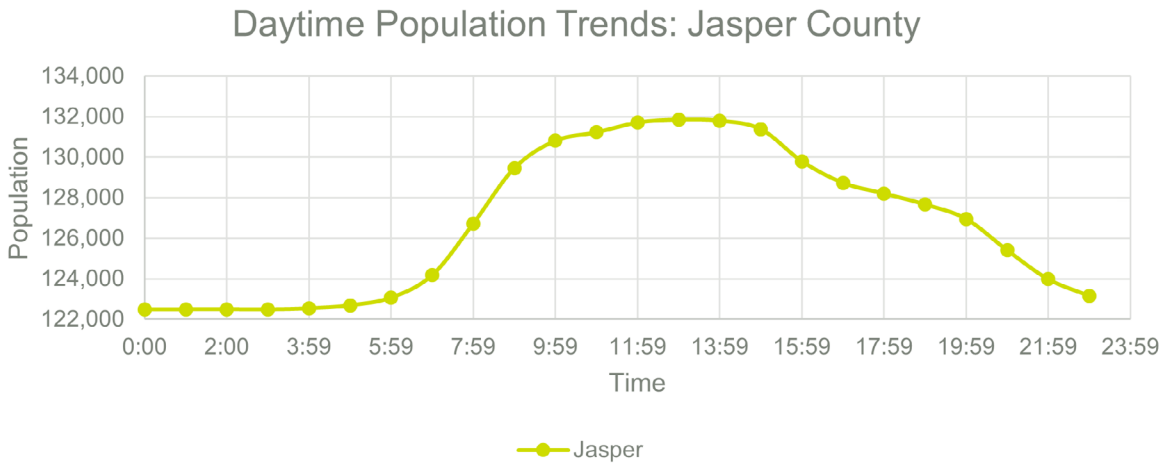
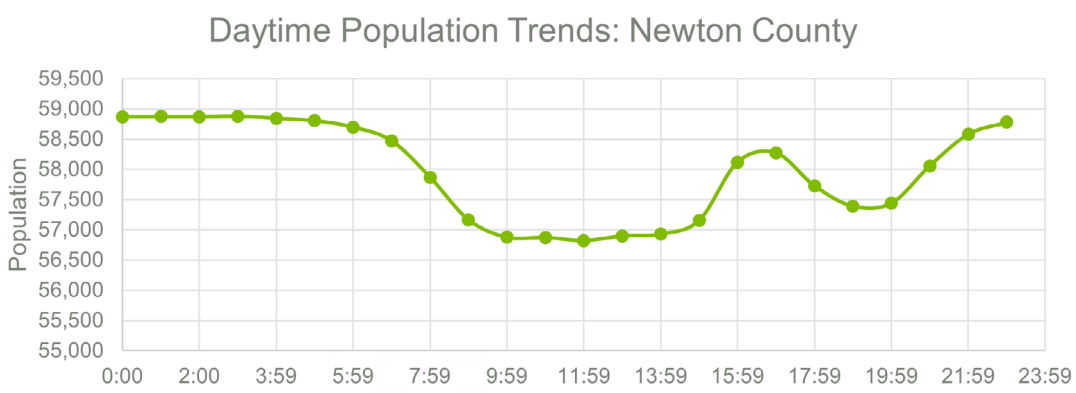


Figure 30: Daytime Population Trends for Newton County, Typical Thursday in Spring 2024



This data indicates two observations specific to each county. Jasper County increases by approximately 9,000 people over the course of the day. The daytime population of Newton County subsequently reduces by approximately 2,000, potentially leaving to work in Jasper or other neighboring regions. When considered together, the two counties peak at approximately 189,000 at approximately 1:00 pm, which represents a net increase of approximately 7,400 people (4%) from external regions. Replica computes daytime population as a function of stops within the region. In other words, as people arrive at different destinations within the region, the daytime population will vary throughout the day. This computation does not include pass-through trips which were previously included in the 2008 O-D Study. The overall daytime population statistics are summarized in **Table 9.**

Table 9: Replica 24-Hour Population Estimates for Jasper and Newtown Counties for a Typical Thursday in the Spring of 2024

	24 HOUR MAXIMUM (TIME)	24 HOUR MINIMUM (TIME)	DIFFERENCE (% OF MINIMUM)	24 HOUR AVERAGE POPULATION
Jasper County	131,860 (1:00 pm)	122,487 (3:00 am)	9,373 (7.7%)	126,723
Newton County	58,881 (3:00 am)	56,823 (12:00 pm)	2,058 (3.6%)	57,970
Total	188,758 (1:00 pm)	181,364 (12:00 am)	7,394 (4.1%)	184,693

In section 3.1, people living outside the JATSO boundary making a work trip that ended within the JATSO Boundary on a typical day was approximately 26,000. A similar amount of shopping trips was also observed. The daytime population indicates approximately 7,400 people from outside the two counties; this generally tracks with the trip purpose observations, especially when considering the JATSO boundary does not exactly match with the county boundaries.

The changes occurring throughout the daytime population can be useful for regional planning purposes. For reference, **Tables 10 and 11** include the population projections from the **2036 Metropolitan Transportation Plan (2016)** and how the 24-hour average daytime population estimate coincides with those population estimates.

Table 10: JATSO 2036 Master Transportation Plan Population Projections

2036 MTP POPULATION PROJECTIONS

AREA	2010 CENSUS	NET CHANGE IN POP.	% CHANGE IN POP.	2035 PROJ.	ANNUAL GROWTH RATE
Jasper County	117k	+35.1k	29.9%	**153k**	**1.08%**
Newton County	58k	+8.0k	13.8%	**66k**	**0.52%**
Joplin MSA	176k	+43.1k	24.6%	**219k**	**0.88%**

Source: JATSO 2036 Master Transportation Plan, Table 1.2

Table 11: Projecting Population for the JATSO Region Using Census and Replica Estimates

PROJECTING POPULATION FOR THE JATSO REGION							
AREA	2010 CENS.	2020 CENS.	REPLICA 24-HOUR AVERAGE (2024)	NET CHANGE IN POP.	% CHANGE IN POP. 2010-2024	2035 LINEAR PROJECTION	OBSERVED ANNUAL GROWTH RATE
Jasper County	117k	123k	127k	+9.3k	7.9%	134.0k	0.59%
Newton County	58k	59k	58k	-0.1k	0.0%	57.8k	0.0%
Joplin MSA	176k	181k	185k	+13.2k	7.5%	199.1k	0.36%

Source: U.S. Census Bureau (2010, 2020), Replica (2024)

Given the updated census data as well as the Replica population estimates, growth has been slower than originally anticipated in the 2036 MTP. The 24- hour average for both counties is 185,000. This is more than the the 2020 census result but results in a 2035 projection that is less than in the 2036 MTP. The 2036 MTP used a compound annual growth rate of approximately 1% for Jasper county while the actual annual growth was closer to 0.5%. As discussed in section 3.3 and 3.4, this would mean that a 1% annual growth is an overly conservative projection.



3.7. Demographic, Socioeconomic, and Economic Indicators

REPLICA DEMOGRAPHICS

Replica provides information on area demographics, socioeconomics and county-to-county spending data. **Figures 31-34** illustrate baseline demographic data for the people who live in the JATSO region for a typical Thursday in the Fall 2023. As noted in **Section 2**, the data contained in these tables is the result of Replica's methodology for creating a synthetic population, i.e. using publicly available or vendor-procured data to create a statistically equivalent population. For example **Figures 33 and 34** were used in the investigation described in **Section 3.5** on Transit Propensity. When reviewed in combination with other trip pattern data, this information helps tell the story of why and how people are moving throughout the region.



Figure 31: Educational Attainment by Individuals Living in the JATSO Region (Fall 2023).

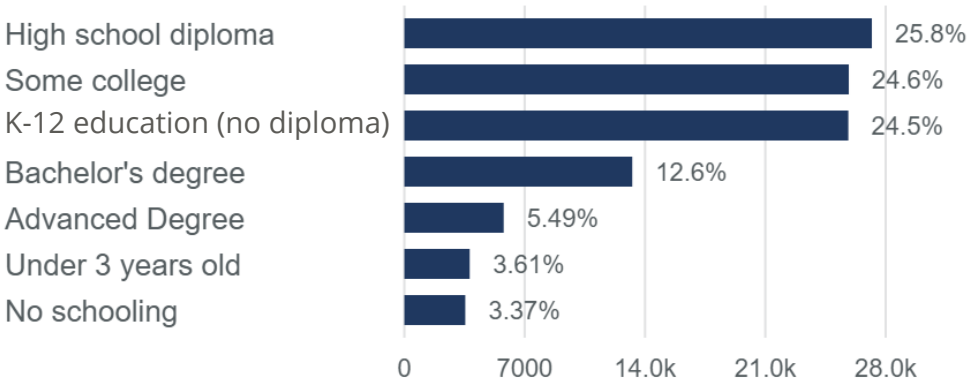


Figure 32: Employment Status Individuals Living in the JATSO Region (Fall 2023)

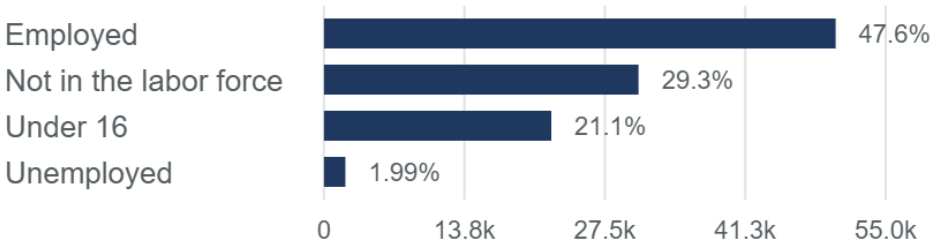


Figure 33: Private Vehicle Access by Individuals who Live in Households in the JATSO Region (Fall 2023)

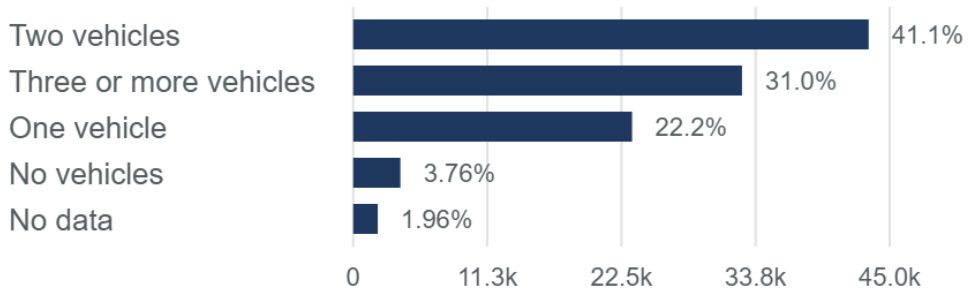
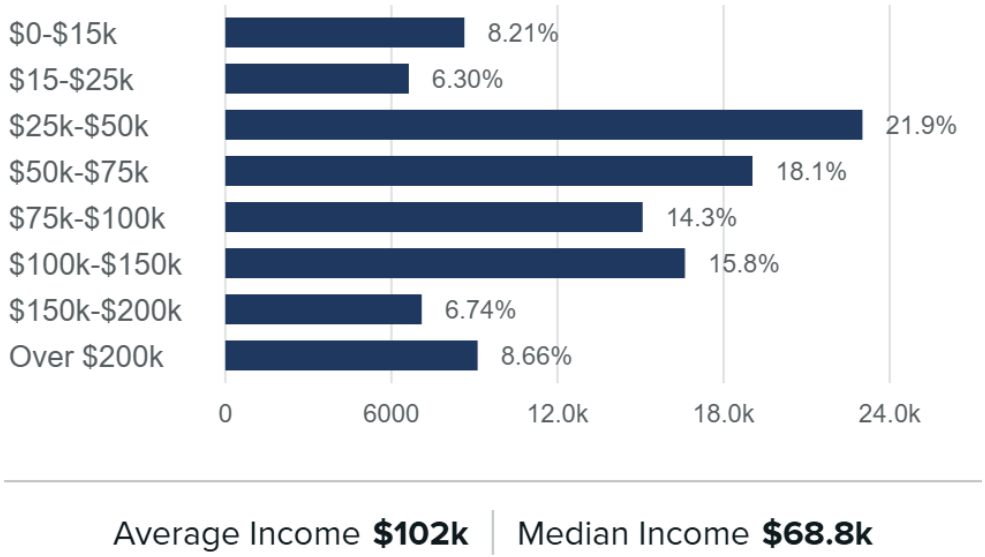


Figure 34: Household Income for Individuals Living in the JATSO Region (Fall 2023)





COUNTY-TO-COUNTY SPEND FLOWS:

Additionally, the Replica platform can be leveraged to evaluate spending trends across county lines. This tool combines publicly available sources with vendor-procured data to model spending patterns between counties. The "Spend by home location" tool provided the total spending for six market areas where residents are spending their money within the JATSO region. **Figures 35 and 36** depict the percentage spend for each of these market areas including online and offline shopping for those that applies. The main difference during the holiday season is a slight increase in retail shopping online and restaurant takeout.

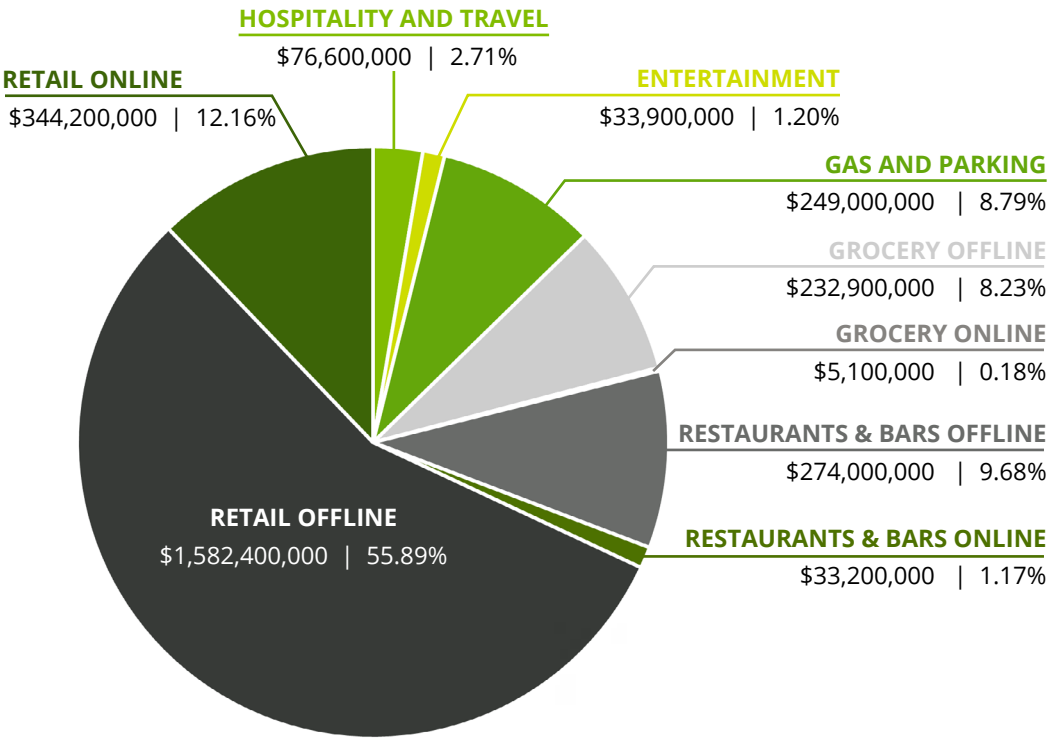


Figure 35: Annual Spending for JATSO Residents (Jan 2024-Dec 2024)

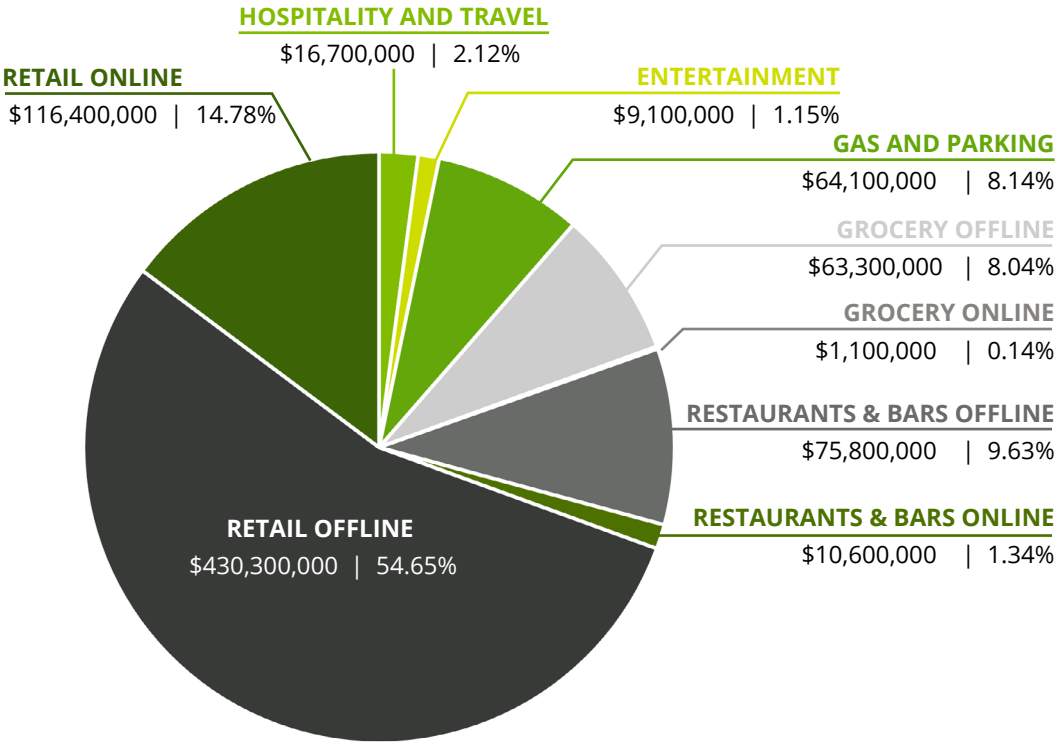


Figure 36: Holiday Spending for JATSO Residents (Oct 2024-Dec 2024)

A similar tool, "Spend County-to-County Flows by Resident location," provides spending by resident living within Jasper and Newton counties that was aggregated to provide a high-level understanding of spending habits outside the MPO boundary. This tool is county-to-county based and therefore could not be restricted to just the JATSO boundary. The data presented below shows where Jasper and Newton county residents are spending their money outside of the region and what they are spending that money on. Replica also provides similar data organized by merchant location which would show what people who live outside of Jasper and Newton county are spending their money on within the region but this is not included in this report. **Table 12** includes the total spend for Jasper and Newton counties and the total spend flowing out of these counties for the 3-month holiday season (October-December 2024) and for the whole year (January 2024-December 2024).

Table 12: Overall Spend by Jasper and Newton County Residents that is Leaving the Two Counties

TIME PERIOD	TOTAL SPEND FLOWING OUT OF JASPER AND NEWTON COUNTIES	TOTAL SPEND	PERCENT LEAVING
Last Full Year (Jan-Dec 2024)	$1,332.7M	$6,216.5M	21%
3-month Holiday Season (Oct-Dec 2024)	$224.3M	$1,244.8M	18%

Overall, around 20% of the total spend is leaving the Jasper and Newton counties during the two time periods. Furthermore, the proportion of each market that is flowing out of the region appears to be stable over the two time periods as well, though during the holiday season more money stayed local. **Table 13** summarizes each the proportion of dollar outflow for each of the six market regions for Jasper and Newton counties over the two time periods.

Table 13: Percentage of Spend by Jasper and Newton County Residents that is Leaving the Two Counties

TIME PERIOD	HOSPITALITY AND TRAVEL	ENTERTAINMENT	GAS AND PARKING	GROCERY	RESTAURANTS	RETAIL
Last Full Year (Jan-Dec 2024)	50% $50.5M	38% $18.2M	37% $178.9M	21% $100.1M	20% $96.7M	19% $888.3M
3-month Holiday Season (Oct-Dec 2024)	47% $11.2M	34% $4.5M	35% $43.9M	20% $26M	18% $23.8M	14% $114.9M



The County-to-County spend flows also provide information on where money is being spent by residents. **Tables 14 and 15** summarize the most common counties where JATSO residents are spending non-local dollars. **Newton and Jasper were the number one recipient of dollars from each other and were therefore not included in these lists.** Note, online purchases are categorized according to where they are received and taxed, which is often the purchaser's home address.

One suprising observation from these tables is the amount of spend flowing from Newtown County to Clark County, Nevada. Large outflows to destinations like Las Vegas can sometimes be driven by a small number of high-spending individuals, particularly in industries with concentrated wealth.

The remaining counties are approximately within one hour drive from the JATSO region. They include nearby major metro areas such as Springfield, MO and Northwest Arkansas as well as neighboring cities and towns.

Table 14: Dollar Outflow From Newton and Jasper Counties, Jan - Dec 2024

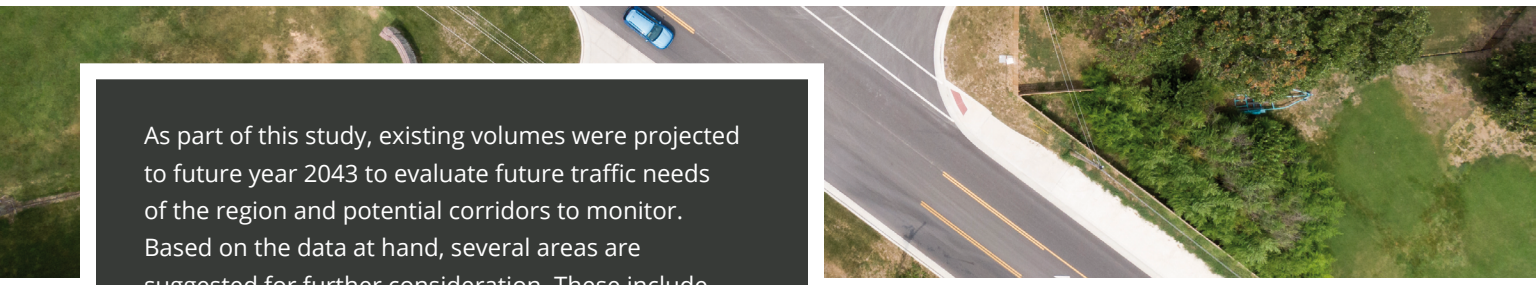
TO (MERCHANT LOCATION)	FROM NEWTON COUNTY	FROM JASPER COUNTY	TOTAL
1. Clark County, NV	$65.5M	$1.3M	$66.8M
2. Greene County, MO	$21.1M	$42.4M	$63.4M
3. Barry County, MO	$28.2M	$10.5M	$38.7M
4. Benton County, AR	$21.3M	$17.2M	$38.5M
5. Crawford County, KS	$4.4M	$27.9M	$32.3M
6. McDonald County, MO	$22.2M	$9.5M	$31.8M
7. Ottawa County, OK	$11.8M	$17.2M	$29.1M
8. Lawrence County, MO	$10.6M	$17M	$27.7M
9. Cherokee County, KS	$7.1M	$17.9M	$25M
10. Barton County, MO	$4.9M	$17M	$22M

Table 15: Dollar Outflow From Newton and Jasper Counties, Oct - Dec 2024

TO MERCHANT LOCATION	FROM NEWTON COUNTY	FROM JASPER COUNTY	TOTAL
1. Greene County, MO	$5.4M	$10.8M	$16.2M
2. Clark County, NV	$15.7M	$0.3M	$16M
3. Benton County, AR	$5.6M	$4.5M	$10.1M
4. Barry County, MO	$7.3M	$2.7M	$10M
5. Crawford County, KS	$1.1M	$7.2M	$8.4M
6. McDonald County, MO	$5.6M	$2.4M	$8M
7. Ottawa County, OK	$3M	$4.4M	$7.4M
8. Lawrence County, MO	$2.7M	$4.4M	$7.2M
9. Cherokee County, KS	$1.8M	$4.6M	$6.5M
10. Barton County, MO	$1.3M	$4.4M	$5.6M

04
RECOMMENDATIONS FOR FURTHER STUDY

04 RECOMMENDATIONS FOR FURTHER STUDY



As part of this study, existing volumes were projected to future year 2043 to evaluate future traffic needs of the region and potential corridors to monitor. Based on the data at hand, several areas are suggested for further consideration. These include corridors that are expected to be at or nearing capacity based on future projections, in need of more detailed study due to development activity, or where policy considerations could be evaluated for other users such as freight and multimobility.

4.1. Corridor& Intersection Studies

As identified in **Figure 20,** the following roadways are expected to reach or be nearing roadway capacity and are recommended for further investigation. Tier 1 includes roadways that have a future volume-to-capacity (v/c) ratio that exceeds 0.9 (i.e. 90 percent of the theoretical daily capacity). Tier 2 includes roadways with a future v/c ratio between 0.8 and 0.9.

TIER 1

- **Fir Road (between MO-171 and Joplin Street):** A corridor study was previously completed in 2021 and recommended a 3-lane section along Fir Road between MO-171 and Joplin Street including several other intersection improvements. One option to address this is enact a plan to move forward with the improvements recommended within the study. It should be noted that it has been over three years since the study was conducted, so traffic conditions may have changed.
- **Rangeline Road (between I-44 and 7th Street):** Between I-44 and 7th Street, the entire Rangeline Road corridor is shown to be at capacity. Additional through lanes are likely impractical. If maximizing available capacity is a priority, other options could include access management (e.g. lower driveway density or raised median) and continual refinement of signal timings.
- **Dermot Drive/MO-171 (North of Fir Road):** Dermott Drive/MO-171 transitions from a four-lane divided roadway (east of Madison Street), to an undivided five-lane roadway (between Madison Street and Fir Road), to a two-lane road north of Fir Road. Extending the four or five-lane section to the north and west could be considered to increase capacity. Note, the 2021 Fir Road corridor study previously recommended additional through lane capacity at the MO-171 intersection. A corridor study could be conducted to confirm the appropriate cross-section for the entire segment west of Madison Street.
- **East Road in Webb City:** High V/C ratios are expected along East Road between Galena St, through Broadway Street, and MO-171. For reference, the reported V/C ratio is partially driven by its functional classification, residential, which typically has a low capacity. This corridor should be monitored to determine if additional lane capacity and/or intersection improvements are warranted.

TIER 2

- **I-44 (between Hearnes Boulevard and Rangeline Road):** This interstate may see improvements as part of the Forward 44 project. JATSO constituents should remain vigilant and active to ensure that project meets local and regional needs.
- **MO-249 (between 7th Street and Newman Road):** Increased density was noted along the highway between these two interchanges. A third 'weaving' lane in each direction or collector-distributor road system could be an option but should be further evaluated. This study could be expanded to the whole section of MO-249 between MacArthur Drive and I-44, as these highway segments are of similar configuration.

- **Cherokee Ave/MO-43:** South of the truck stops located near Cedar Drive, Cherokee Avenue transitions to a 2 lanes section. There is a fair number of industry located along this rural section of highway. A corridor study could be considered in the near future or as additional development occurs to investigate the potential benefits of a center turn lane or other appropriate modifications.
- **Schifferdecker Ave:** Like Cherokee Avenue, the V/C ratio increases as the cross-section transitions to a two-lane road near 4th Street. Unlike Cherokee Ave/MO-43, this road is entering a residential area with school zone and adjacent land uses that could potentially serve vulnerable road users. For roadways such as this, widening and capacity increases could have drawbacks like increased speeding and longer pedestrian crossing distances.

The following intersections are recommended for further investigation based on their adjacent roadway capacities and/or potential development activity nearby.

- **Fir Road and Briarbrook Drive:** Included as a part of the 2021 Fir Road Study, those associated recommendations could be considered.
- **Rangeline Road and 32nd Street/36th Street/ Hammons Boulevard:** As this area continues to develop, congestion and volumes may increase. The intersection of Hammons Boulevard and 32nd Street was recently upgraded with dual left-turns and right-turn lanes as appropriate. This section of Rangeline Road is nearing capacity, which may indicate a lack of sufficient gaps at times for stop controlled full access streets like Hammons Boulevard. It's close proximity to the I-44 interchange, 36th Street signal, could present concerns during peak times. If not previously considered, an evaluation of Hammons Boulevard at Rangeline Road, and how any modifications might affect the area between Rangeline/32nd/Hammons, could be conducted.
- **Rangeline Road and 20th Street/20th Street and Geneva Street:** The intersections of 20th Street with Rangeline Road and 20th Street with Geneva Street are in close proximity and in an area of potential development activity. An evaluation of the desired configuration of 20th Street and Geneva, and the potential effects any modifications could have to the adjacent roadway network, could be conducted.

Note: Partnering agencies such as MoDOT are continuously updating their transportation system, which will directly impact travel patterns within the JATSO region. Three impending studies that are likely to significantly affect existing travel patterns across the metro area include:

- I-44 Expansion
- Route 171 / Route 249 Corridor (East of Joplin proper)
- Joplin West Corridor (West of Joplin proper).

Planning for the results of these studies is crucial for the region's long-range planning.

For example, capacity improvments to I-44 or Route 249 could lead to cascading impacts as people adjust to find optimal routes to their destinations, potentially diverting commuter traffic from local streets to these newly improved highways. Additionally, constructing a new north/south expressway on the west side of Joplin may spur development in the area or create an alternative route choice into downtown Joplin from the west.

An updated travel demand model would be a valuable tool to evaluate these impacts, predicting changing route choices with these planned alternatives in place and considering future land use and growth patterns anticipated by JATSO staff. JATSO last updated their model in 2020.

It is recommended to monitor these corridor studies, their potential improvements, and consider the effects of their planned roadway modifications when determining future local project prioritization.

- **Rangeline Road and 7th Street:** With elevated V/C ratios expected, the intersection should be monitored. As mentioned above, traditional lane additions are likely not practical here.

4.2. Incident Management & Freight Considerations

While reviewing the traffic patterns, one observation is that several roadways carrying a significant amount of traffic are adjacent to parallel routes with considerably less capacity. This isn't necessarily a bad thing, as it can help divert traffic from local streets to larger roads.

However, it can cause problems if the main road becomes too crowded or if crash blocks lanes for an extended period. This is especially true for highways. Potential roadways where incident management considerations could be helpful include I-44, MO-249, and MO-171 Street. Common strategies include:

- **Detection and Verification:** Using CCTV, sensors, and other incident detection algorithms to quickly identify and confirm incidents.
- **Traveler Information:** Providing real-time updates to motorists through variable message signs, mobile apps, radio broadcasts GPS, and in-vehicle navigation systems.
- **Response:** Coordinating with emergency services, including police, fire, and medical responders, to ensure a swift and effective response.
- **Traffic Incident Management:** Implementing traffic control measures to secure the incident scene and manage traffic flow around it.
- **Quick Clearance and Recovery:** Removing vehicles and debris from the roadway as quickly as possible to restore normal traffic conditions.

A map of the common freight routes within the JATSO area is summarized in **Figure 16.** As would be expected, the Interstates and Freeways carry the majority of the freight traffic in the region.

4.3. Multimodal Considerations

Our transportation system serves a variety of needs. Some are intended to move large trucks or ensure daily commuters arrive safely and efficiently. It is also important to note that transit, cyclists, pedestrians, and other vulnerable road users also have a right to use the roadway system. Transportation systems at their core are designed to move people safely and efficiently.

The context of the roadway should be considered whenever modifications are being considered. This not only includes the current context but perhaps more importantly, it should include the desired context of the roadway. In other words, for some corridors the goal might not be to simply move cars. This section provides information on several corridors with potential multimodal considerations. The framework used to identify these corridors could be applied to other areas of the JATSO region as well.



In section 3.5, areas with high bike and pedestrian trips were highlighted. In the 2022 Active Transportation Master Plan (ATMP) and 2018 Bicycle and Pedestrian Transportation Plan, several recommendations have already been made. Using the policy guidelines and best practices laid out in these documents, tools like Replica can be leveraged to further evaluate pedestrian and multimodal needs.

For example, areas with known pedestrian activity can be observed to prioritize corridors where pedestrian level of traffic stress (PLTS) can be evaluated, and multimodal improvements can have a greater impact. For example, the Walmart Supercenter along Rangeline Road has a several residential TAZs in the immediate vicinity. When filtered to mode and origin and destination, 15th street and Rangeline Road both carry pedestrian from the residential TAZs to the Walmart Supercenter TAZ. However, these routes are designated as PLTS 4 – "A roadway/corridor/route with high stress and few pedestrians are willing to walk here. Pedestrians walking along a PLTS 4 road have no other choice in their route selection to get to their desired destination." In other words, despite the area having a higher PLTS, pedestrians are still using the route. Mitigation or creating an alternative access that lowers the PLTS might make the area more amenable to the pedestrians.

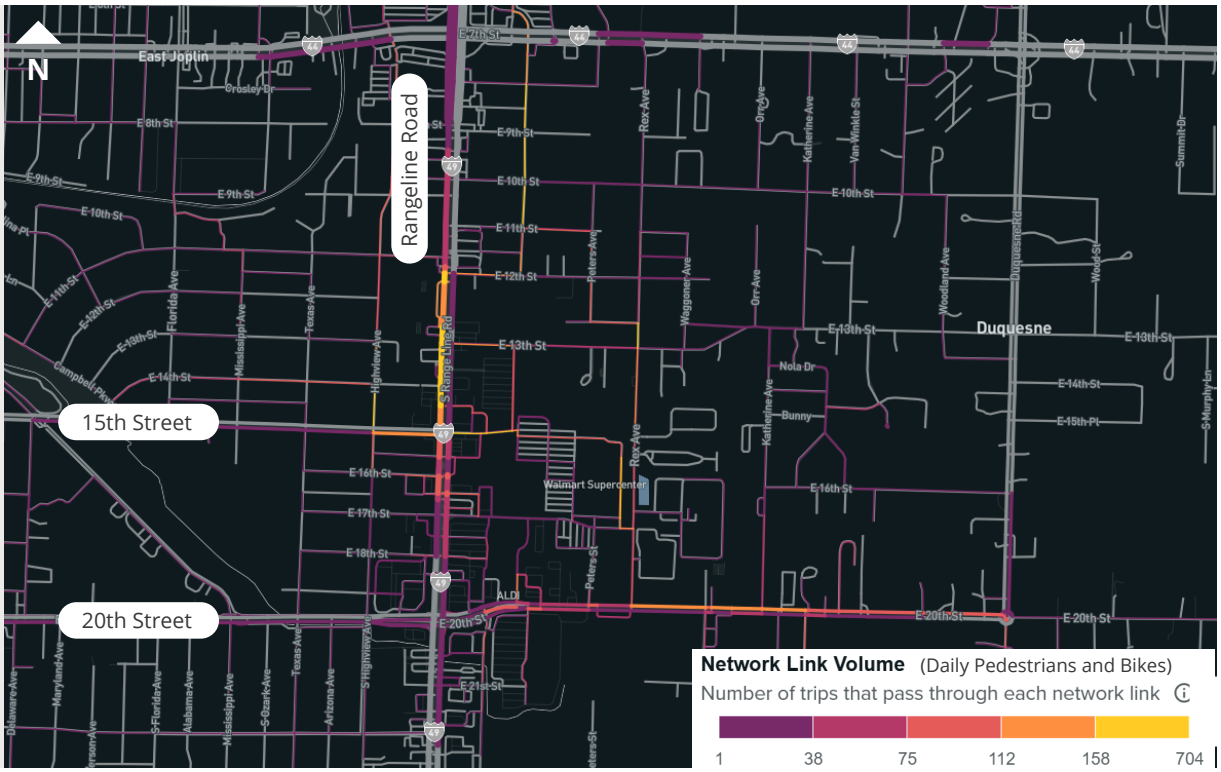


Figure 37: Filtered Pedestrian Trips along Rangeline Road

Filters:
Primary Mode: Bike, Walking
Trip Origin (TAZ): 2909700000200, 2909700000181, 2909700000180, 2909700000183, 2909700000201, 2909700000217, 2909700000184, 2909700000182, 2909700000202, 2909700000203, 2909700000199, 2909700000198, 2909700000177, 2909700000216
Trip Destination (TAZ): 2909700000179

Similarly, the transit network is also currently being evaluated under a separate study. Additionally, the transit propensity index that was described in **section 3.5** and other factors included in macrolevel tools such as Replica can be leveraged to identify areas where transit needs are high. The resumption of the Trolley service is expected to serve several of the areas identified as high propensity. However, there are areas in and outside of Joplin that have a high transit propensity that would only be served by the on-demand transit system, MAPS.

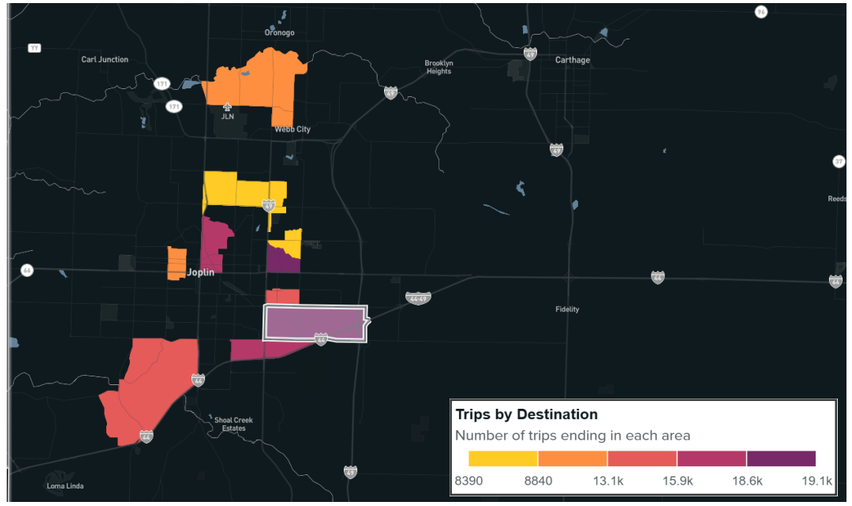
APPENDIX A

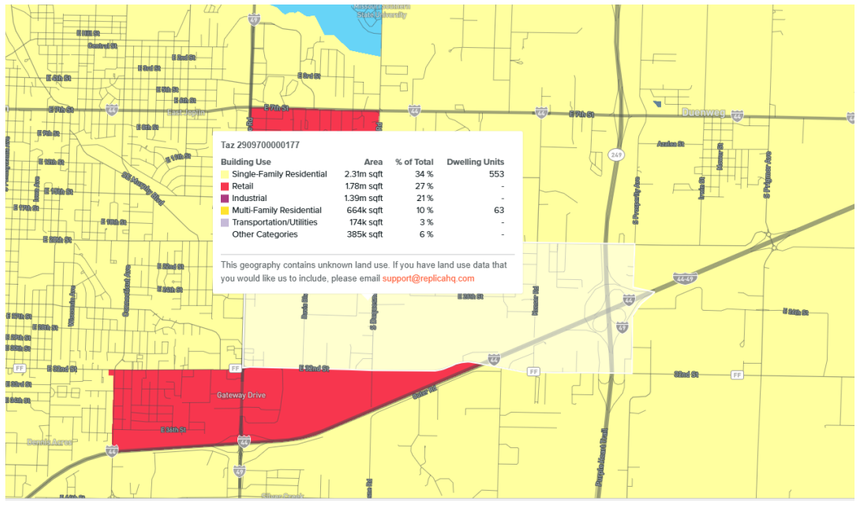
Top 10 Destinations within JATSO Region

SOUTHEAST INDUSTRIAL

Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: This TAZ encompasses several industrial workplaces as well as retail and restaurants.



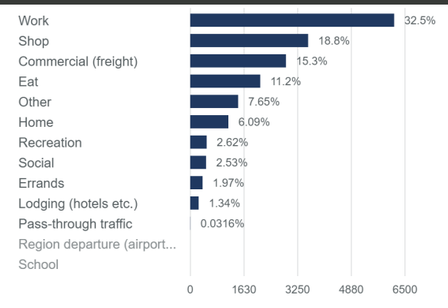






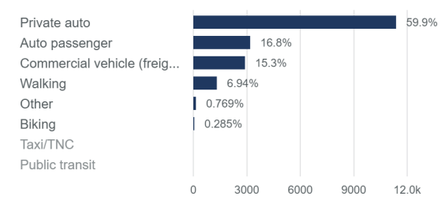


TRIP PURPOSE



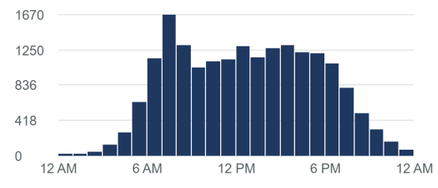
TRAVEL PATTERN OBSERVATIONS: Work, shopping and commercial freight make up ~50% ending in this TAZ.

PRIMARY MODE



TAZ DEMOGRAPHIC OBSERVATION: Commercial vehicles make up 15% of the trips to this TAZ.

STARTING HOUR (IN LOCAL TIME)

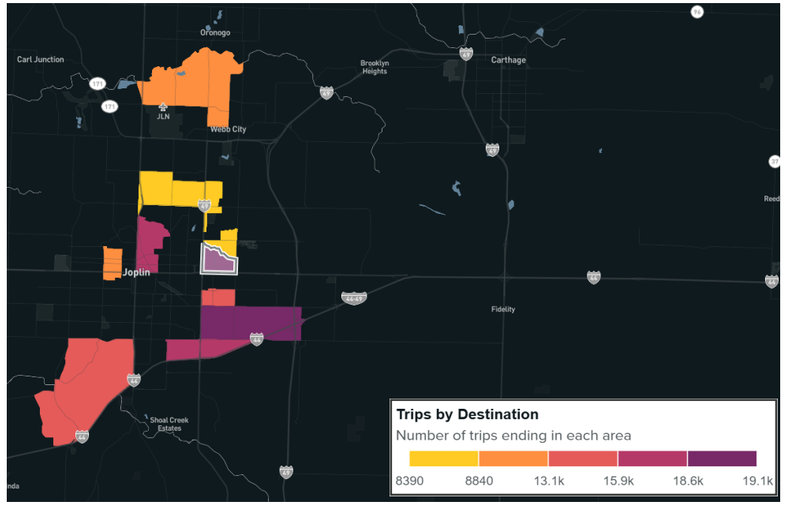


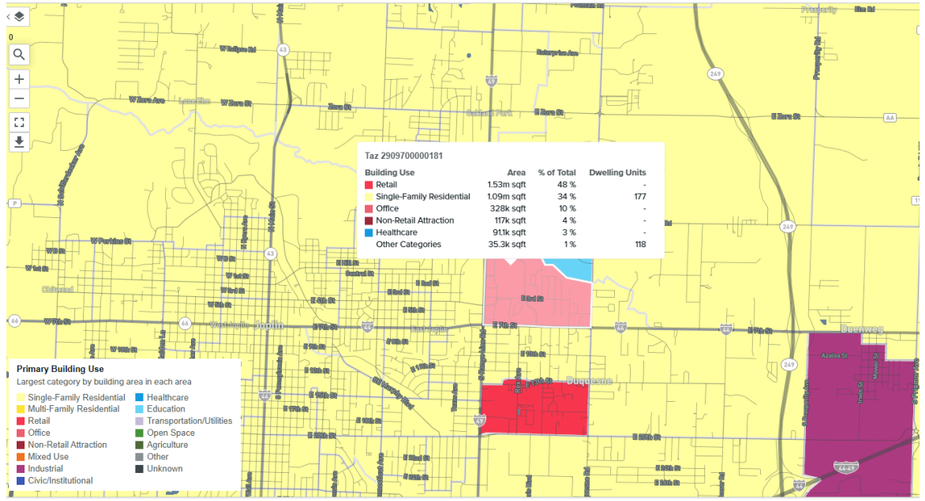
TRIP PATTERN OBSERVATION: The TOD patterns are consistent with an active retail and industrial area.

NORTH PARK MALL

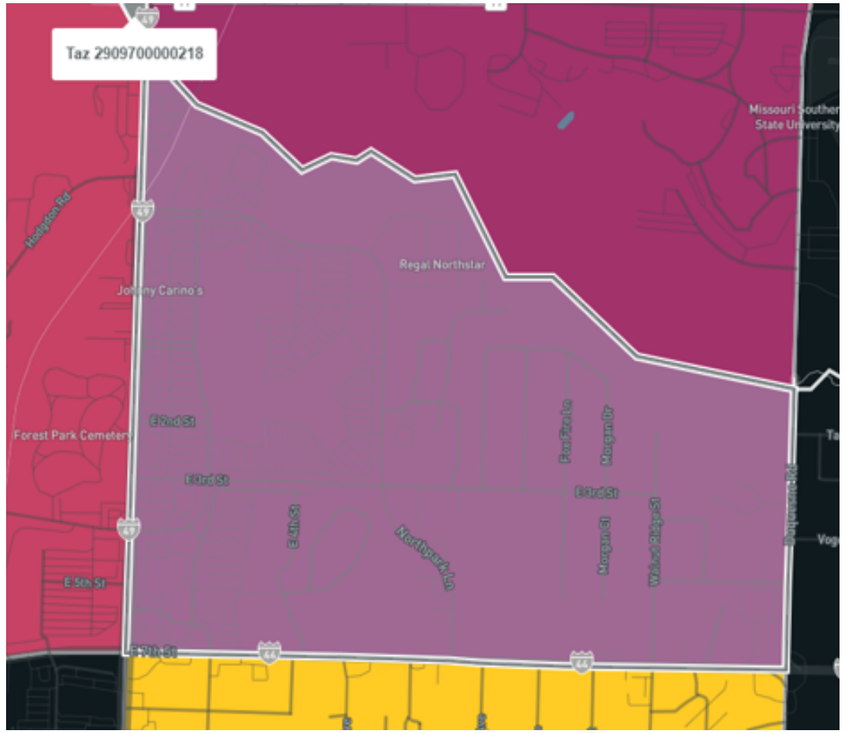
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: North Park Mall and other retail makes up much of the land area in the TAZ. The rest is residential.

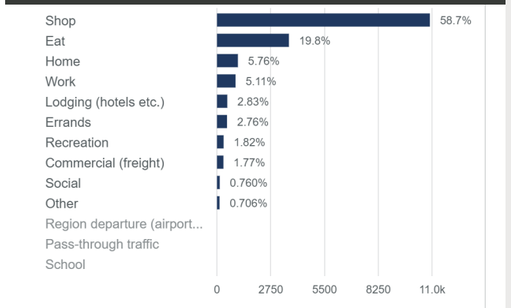






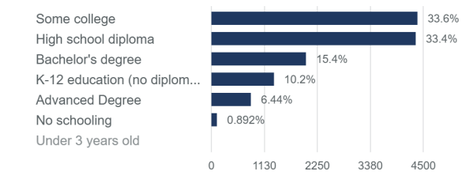


TRIP PURPOSE



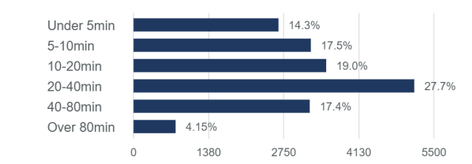
TRAVEL PATTERN OBSERVATIONS: Shopping is the primary purpose for trips ending in this TAZ. Although no hotels are present, the data indicates short-term rentals may be present.

EDUCATION



TAZ DEMOGRAPHIC OBSERVATION: 67% of people taking trips to this location have some college/ high school diploma.

TRIP DURATION



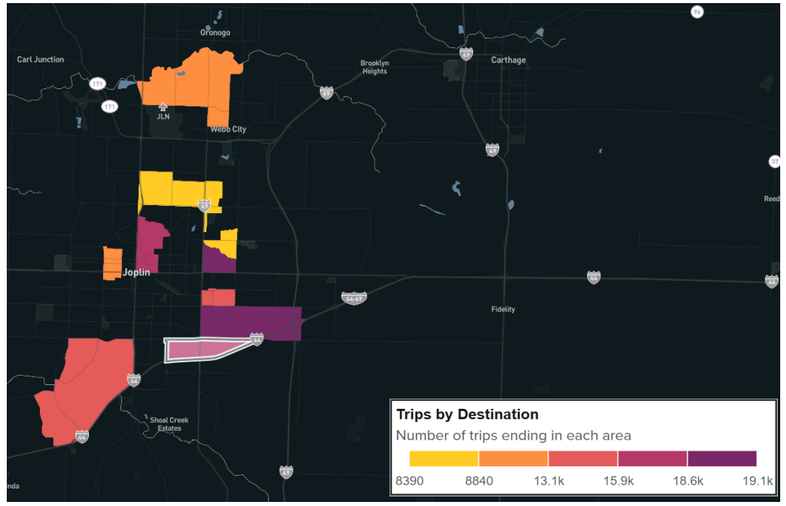
Average Minutes **26.2** | Median Minutes **19**

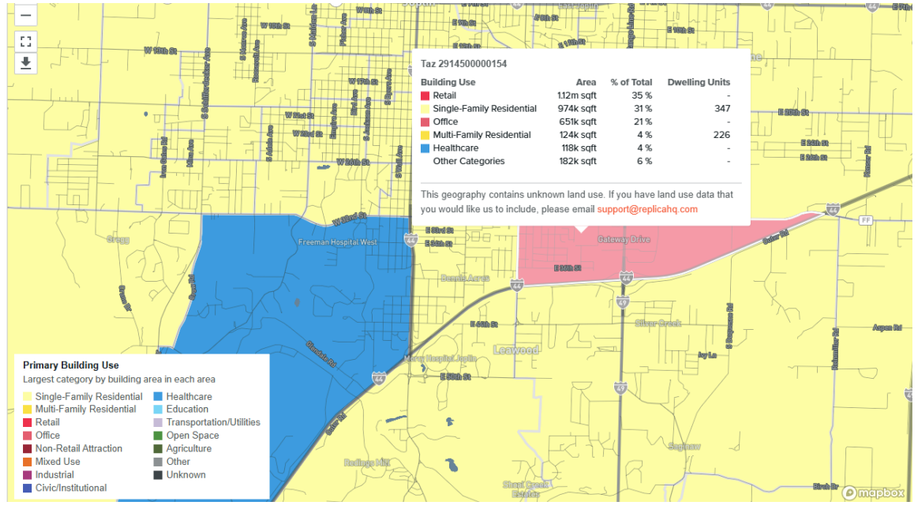
TRIP PATTERN OBSERVATION: Approximately half of trips to this TAZ are local (<20 min), half regional (>20 min).

SAM'S CLUB

Trip Characteristics for Trip Ending in This TAZ, Fall 2023

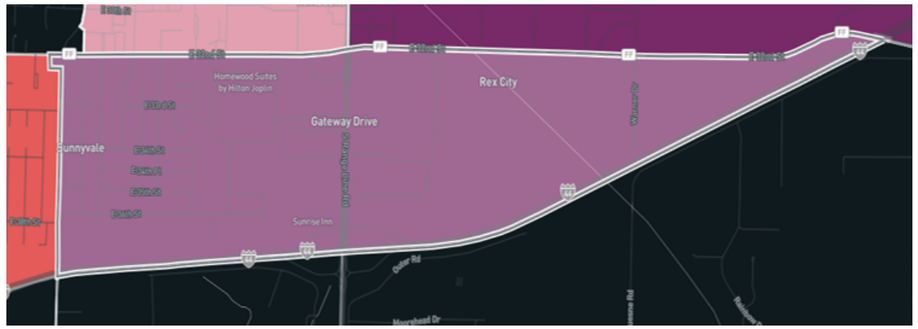
DESCRIPTION: Sandwiched between I-44 and 32nd Street corridor, this TAZ includes a wide variety of land uses. Development is currently underway in this area that previously served as the site of the John Hammons Convention Center, which has since closed.



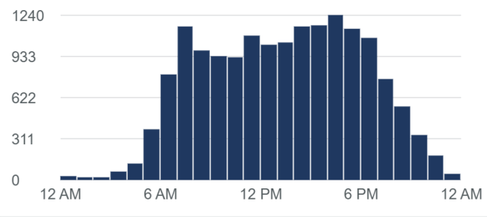






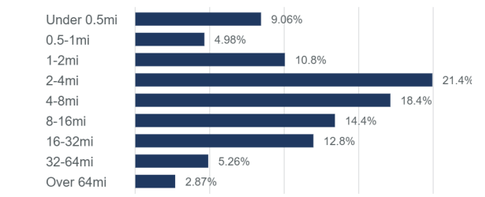


STARTING HOUR (IN LOCAL TIME)



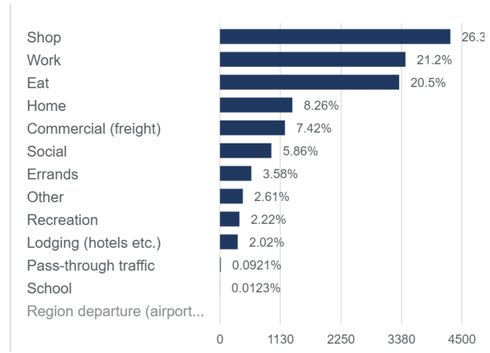
TRAVEL PATTERN OBSERVATION: The TOD patterns are consistent with an active retail and industrial area.

TRIP DISTANCE (MILES)



TRIP PATTERN OBSERVATION: Approximately 46% of the trips made to this TAZ are less than 4 miles.

TRIP PURPOSE

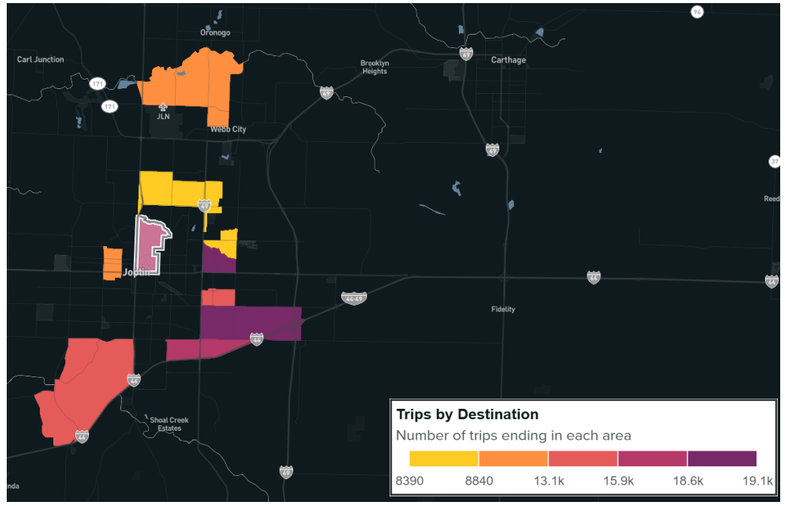


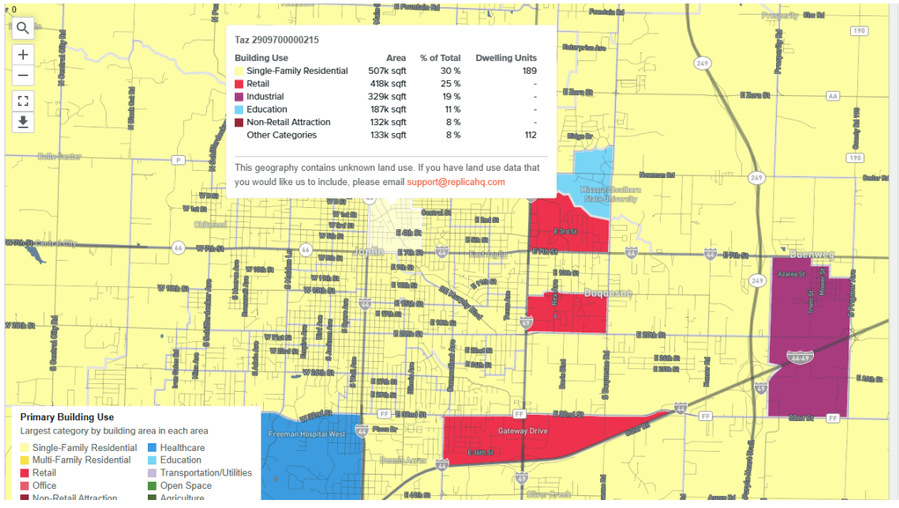
TRAVEL PATTERN OBSERVATIONS: Shopping, work and eating make up 60% of the trips ending in this TAZ.

LANDRETH PARK

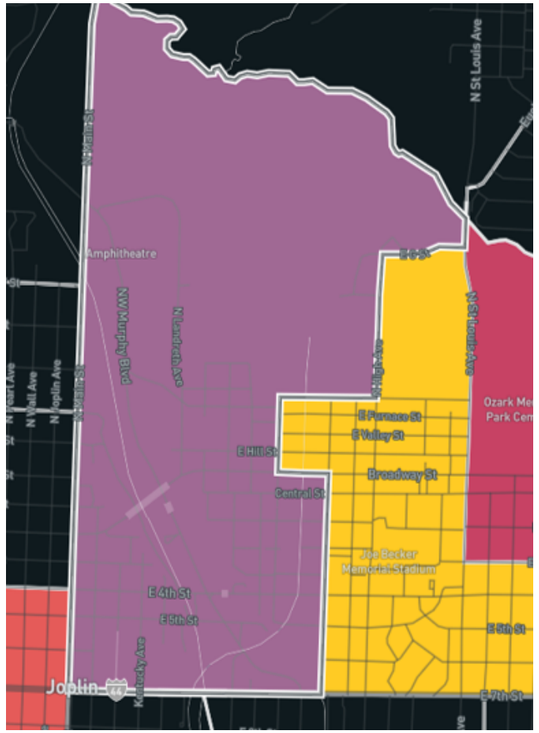
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: Right in the heart of downtown Joplin, this TAZ encompasses Landreth Park, Ozark Christian College, as well as the Joplin Municipal Court and several businesses. Note: The mailing address for Joplin High School and several other schools had a mailing address located within this TAZ in the National Center of Education Statistics database. As a result, the proportion of school-related trips to this TAZ is overrepresented. This issue will be rectified in subsequent Replica Models.

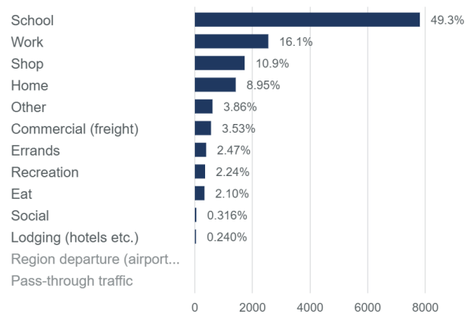






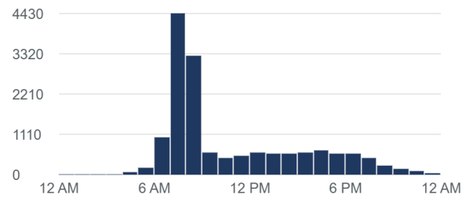


TRIP PURPOSE



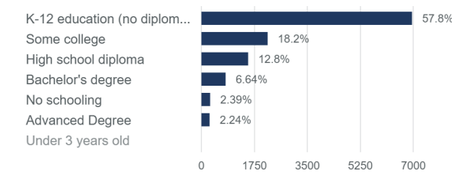
TRIP PATTERN OBSERVATION:
School makes up 49.3% of trips to this location. Note: Although Ozark Christian College operates in this TAZ, several Joplin area schools are misallocated to this TAZ. These issues will be resolved in upcoming Replica Models.

STARTING HOUR (IN LOCAL TIME)

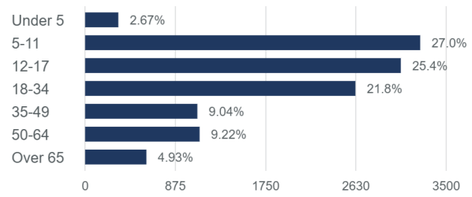


TRIP PATTERN OBSERVATION:
The TOD pattern is reflective the morning arrivals to school and work. Note: due to the misallocation of school trips, the AM peak is exaggerated.

EDUCATION



AGE

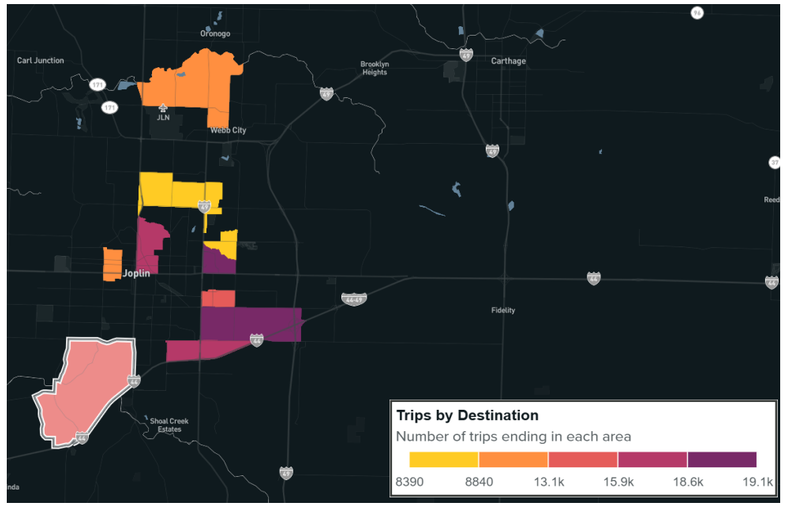


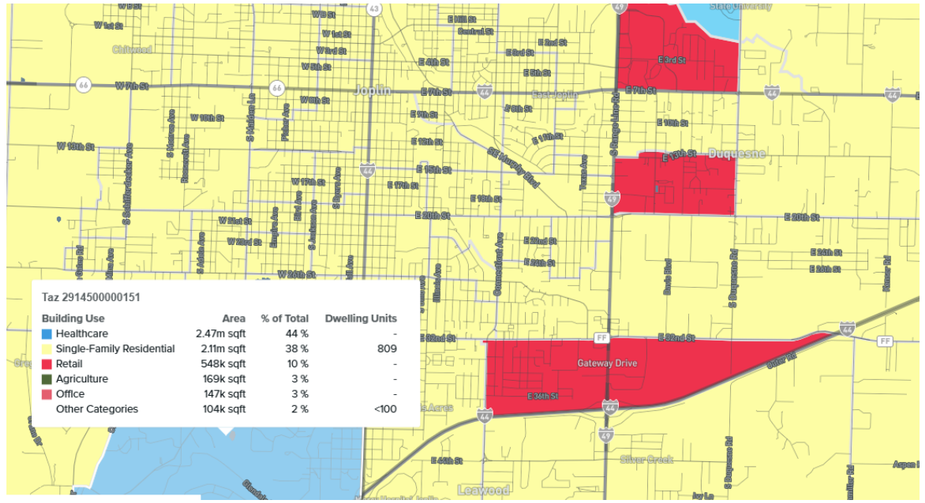
TAZ DEMOGRAPHIC OBSERVATION:
Most of the people making these trips are students without a diploma. Note: due to the misallocation of students, the age distribution for this TAZ skews older than this graph would indicate.

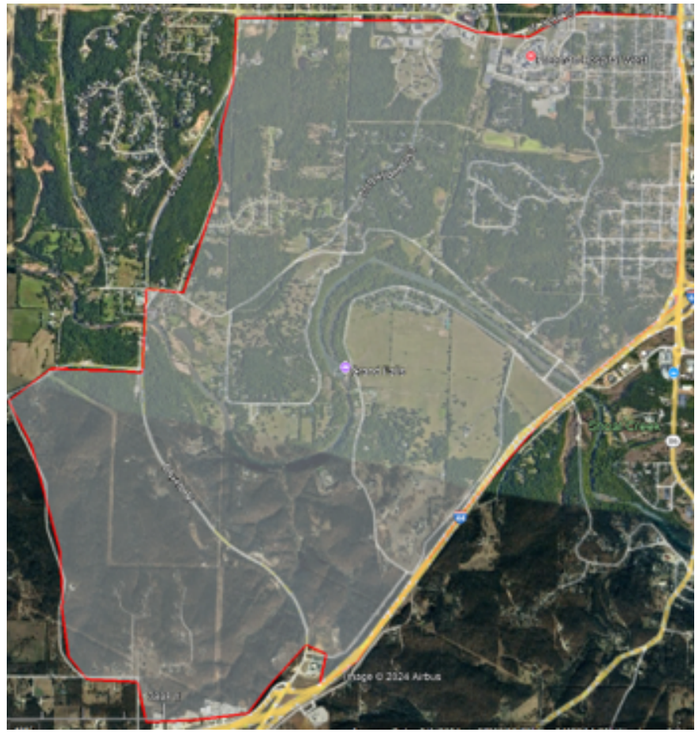
FREEMAN HOSPITAL (WEST)

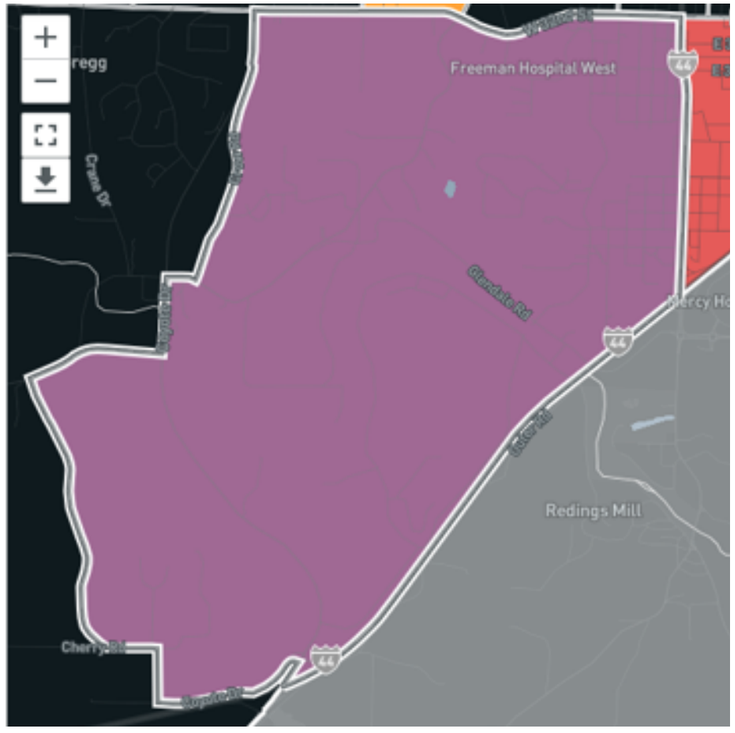
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: This large TAZ contains Freeman West Hospital and several surrounding offices, despite being otherwise less dense than other TAZs.



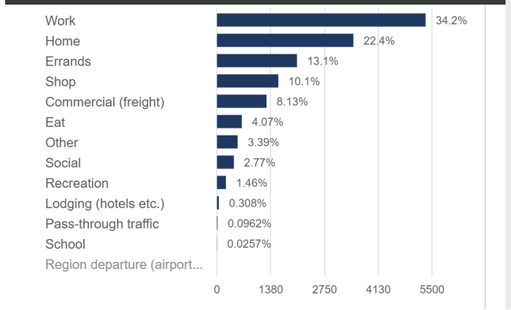






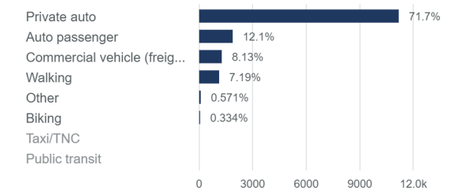


TRIP PURPOSE



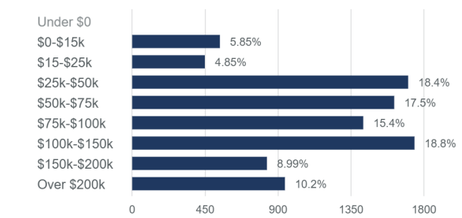
TRAVEL PATTERN OBSERVATIONS:
Work and Home trips make up 56.6% of the trips to this location

PRIMARY MODE



TRIP PATTERN OBSERVATION:
84% of trips ending here were made by private auto or passenger. 7% walking+biking trips may be correlated to the parks, camping, and recreation activities within the TAZ.

HOUSEHOLD INCOME

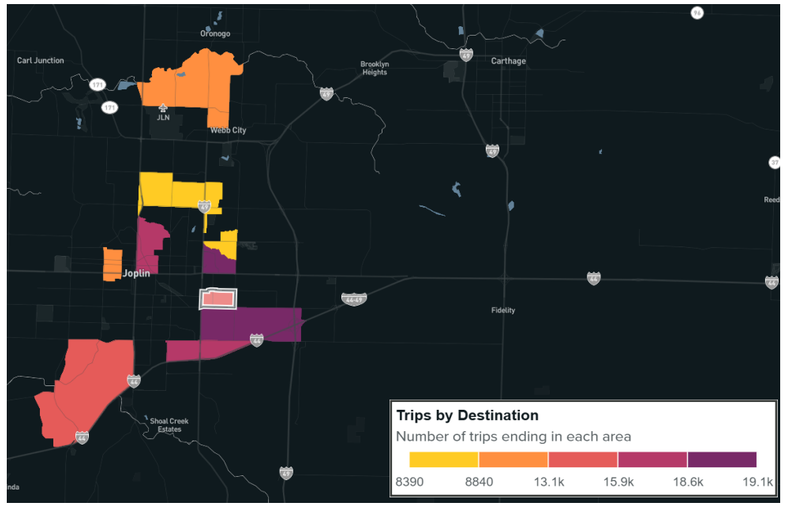


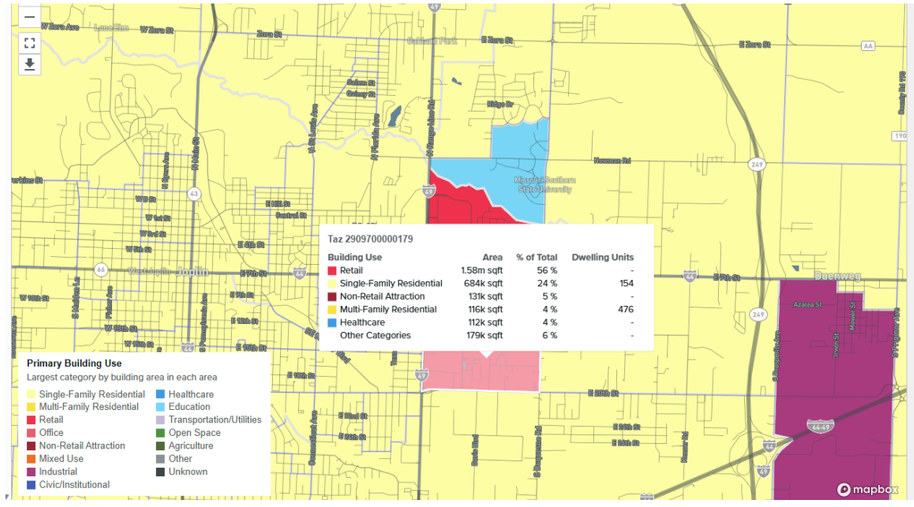
TAZ DEMOGRAPHIC OBSERVATION:
Houshold income for people making trips to this region skews higher than other TAZs.

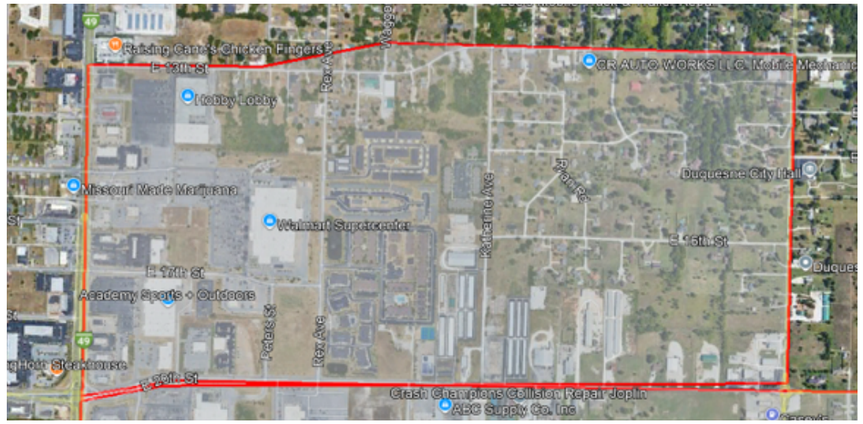
RANGELINE SHOPPING CENTER

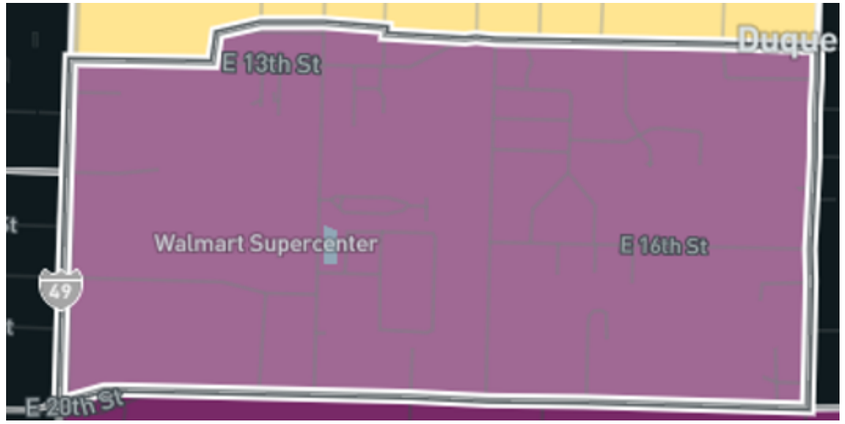
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: Despite the relatively smaller area, this TAZ encompasses the Walmart Supercenter as well as adjacent restaurants and other retail stores.



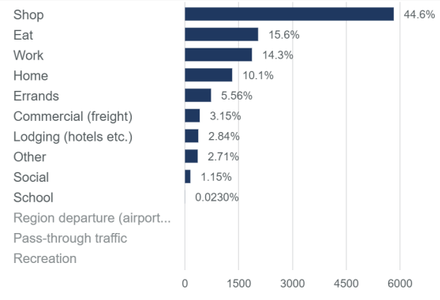






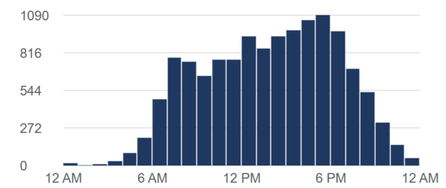


TRIP PURPOSE



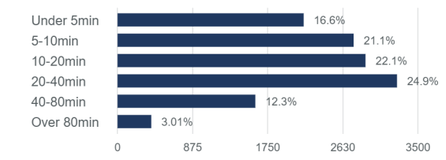
TRAVEL PATTERN OBSERVATIONS:
Shopping and eating compose 60.2% of trips to this location.

STARTING HOUR (IN LOCAL TIME)



TRIP PATTERN OBSERVATION:
The TOD patterns are consistent with an active retail shopping district in the TAZ.

TRIP DURATION



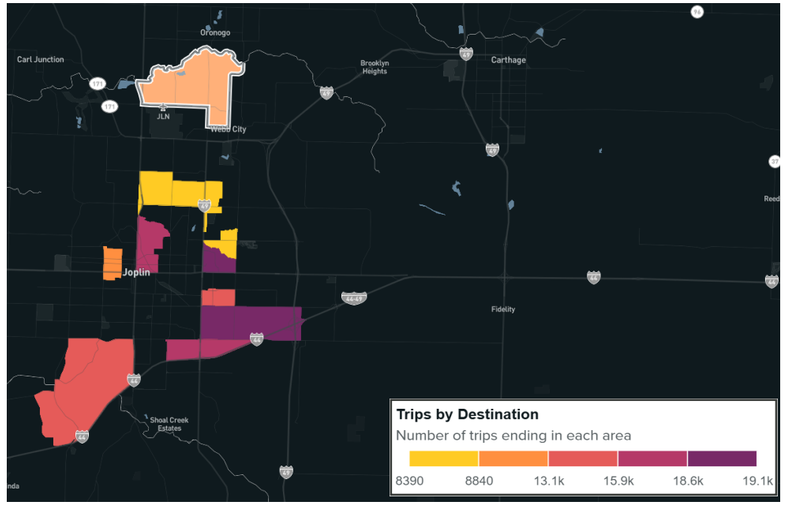
Average Minutes **22.4** | Median Minutes **14**

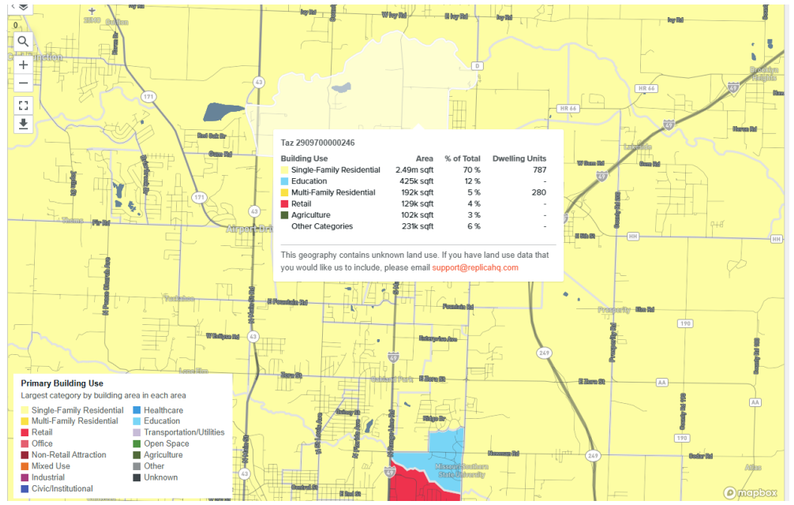
TRIP PATTERN OBSERVATION:
A trip to this TAZ takes on average 22.4 minutes, with a median trip duration of 14 minutes. While most trips are local, there is some regional attraction.

NORTH WEBB CITY

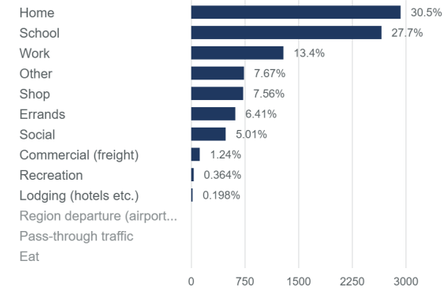
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: Trips ending at the Joplin Regional Airport are included (though notably the flight trips are not included) in this TAZ which is otherwise a mix of rural residential area and the higher density residential area of Webb City. The TAZ also includes Webb City High School and public works buildings. Note that in the Replica model, a trip always ends at a non-travel activity and at the centroid of the TAZ where that activity is. An airport traveler's trip "ends" in either a flight (which is captured as a regional departure trip in the TAZ immediately south) or perhaps shopping/food purchase in the airport terminal. The vast majority of airport trips will be apportioned to the airport to the south, regardless of terminal entry point or parking location.



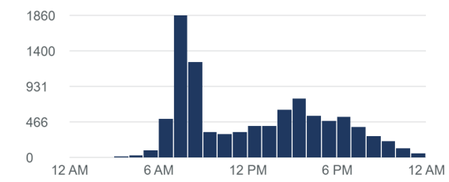


TRIP PURPOSE

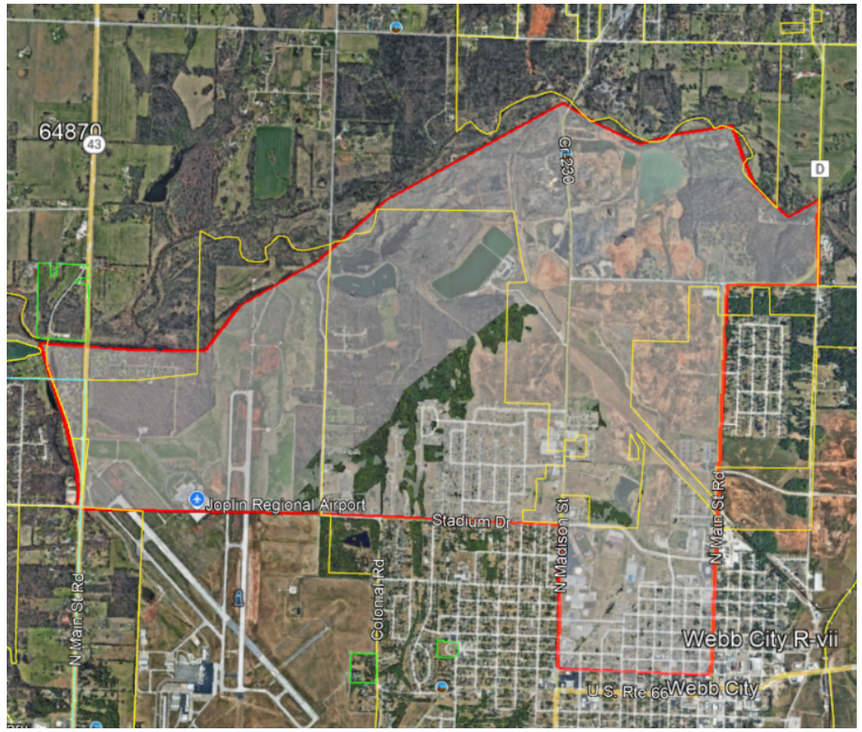


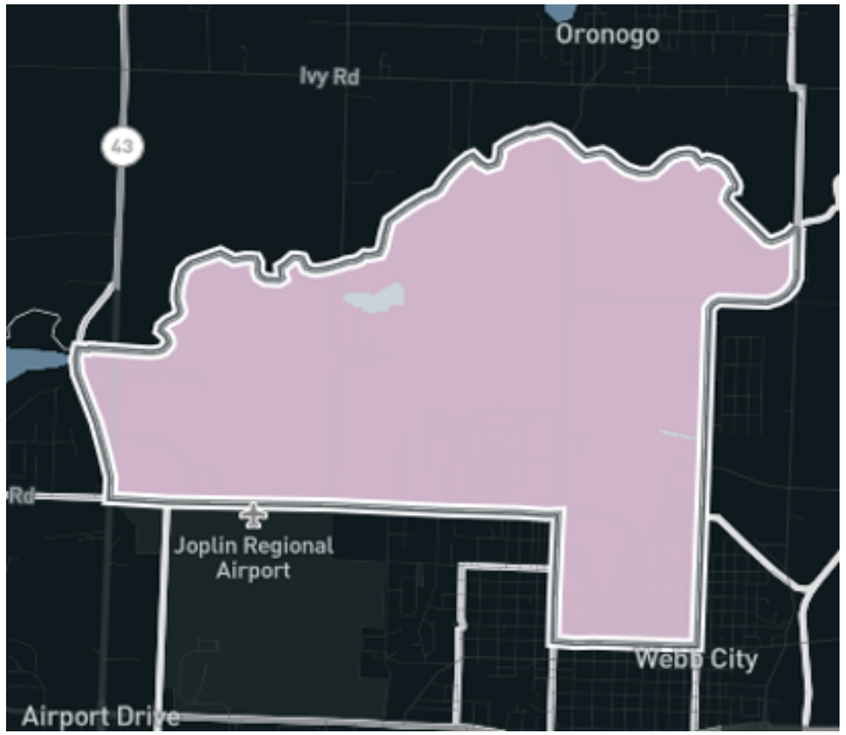
TRAVEL PATTERN OBSERVATIONS: Home, work, and school are most common. Regional departures at the airport are not included in this TAZ because the "departure point" for the airport is in the TAZ immediately south.

STARTING HOUR (IN LOCAL TIME)

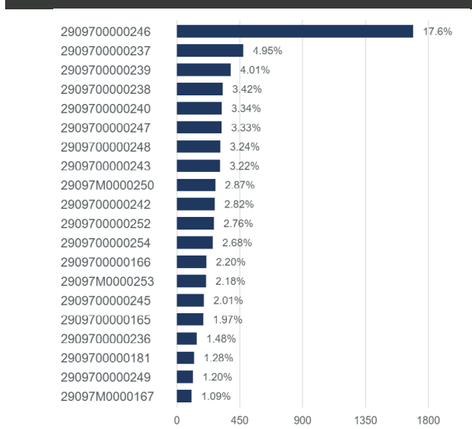


TRIP PATTERN OBSERVATION: The TOD pattern is reflective of the morning drop off to schools within the TAZ.





TRIP ORIGIN BY TAZ

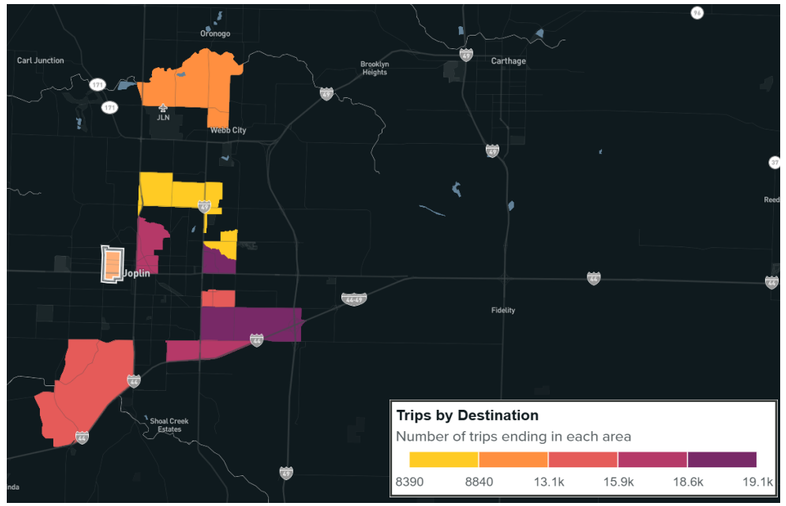


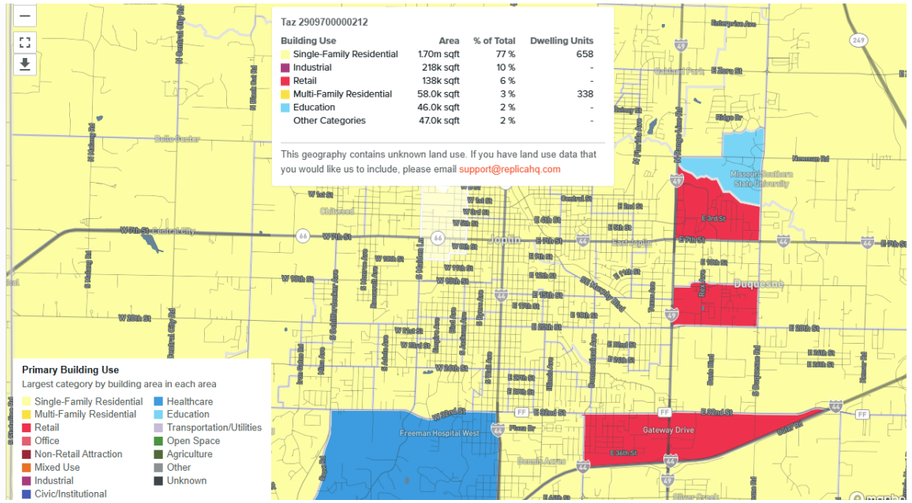
TRIP PATTERN OBSERVATION: Approximately 17.6% of trips to this TAZ originated in the TAZ (i.e. internal trip)

WEST JOPLIN

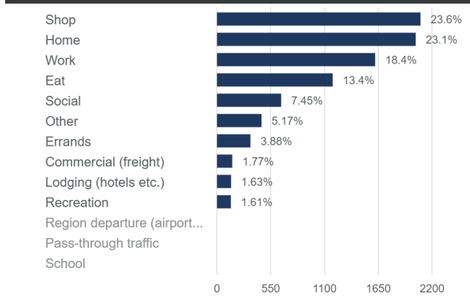
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: Several public works buildings and schools are interspersed throughout a relatively densely populated residential neighborhood.



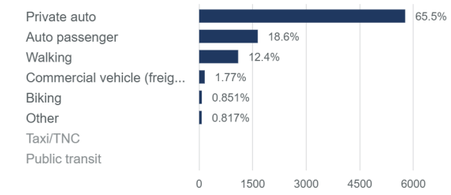


TRIP PURPOSE

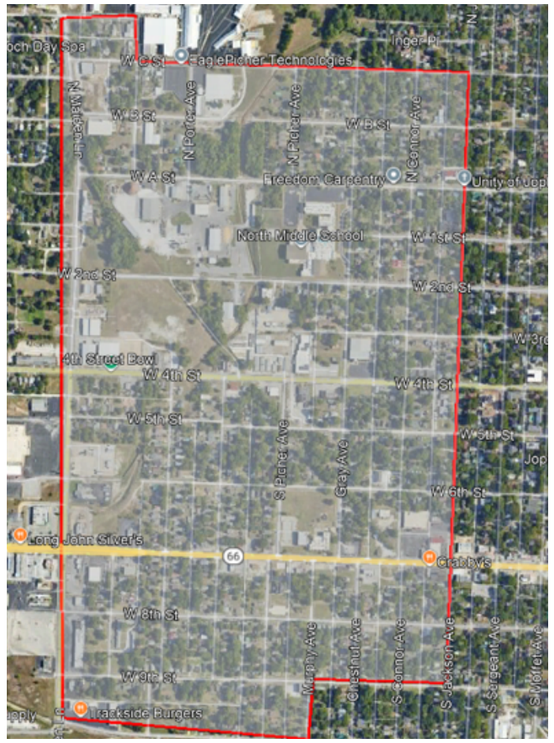


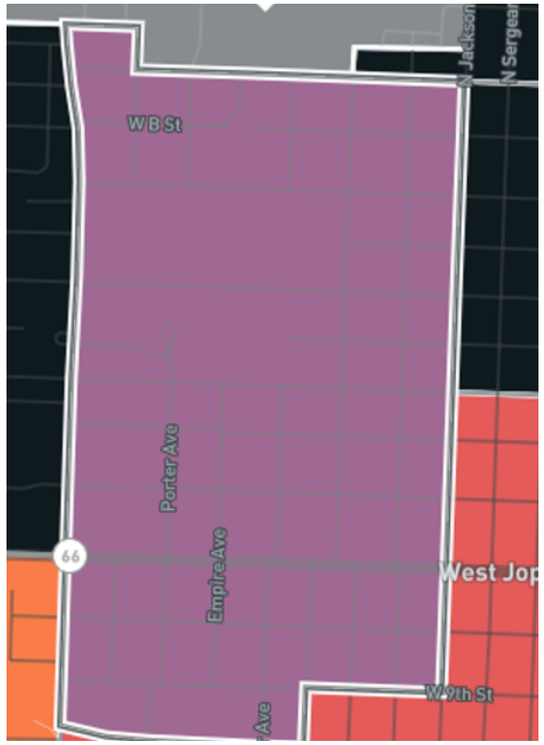
TRAVEL PATTERN OBSERVATIONS: While Shopping and Home trips make up most of the trips to the region, there is a wider variety of trip purposes compared to other TAZs.

PRIMARY MODE



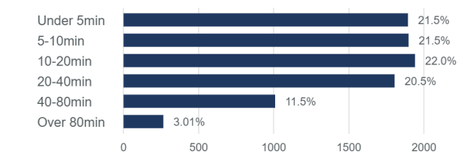
TRIP PATTERN OBSERVATION: 84% of trips ending here were made by private auto or passenger. 13% walking+biking trips may be correlated to the middle school, restaurants and convenience stores within the TAZ.







TRIP DURATION



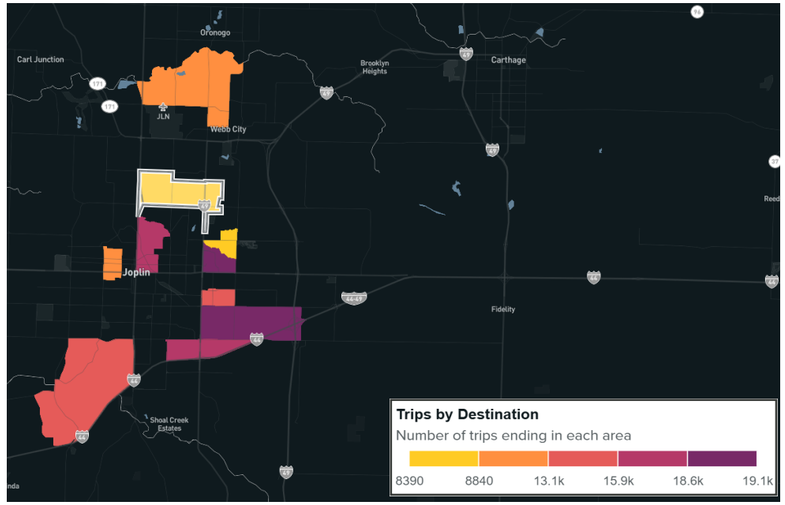
Average Minutes **20.5** | Median Minutes **12**

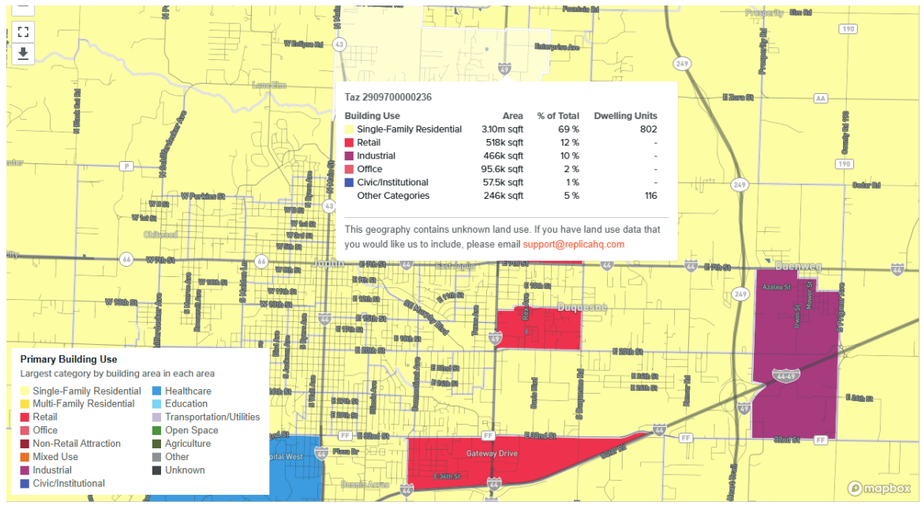
TRIP PATTERN OBSERVATION: 43% of trips ending in this region take less than 10 min.

NORTH JOPLIN

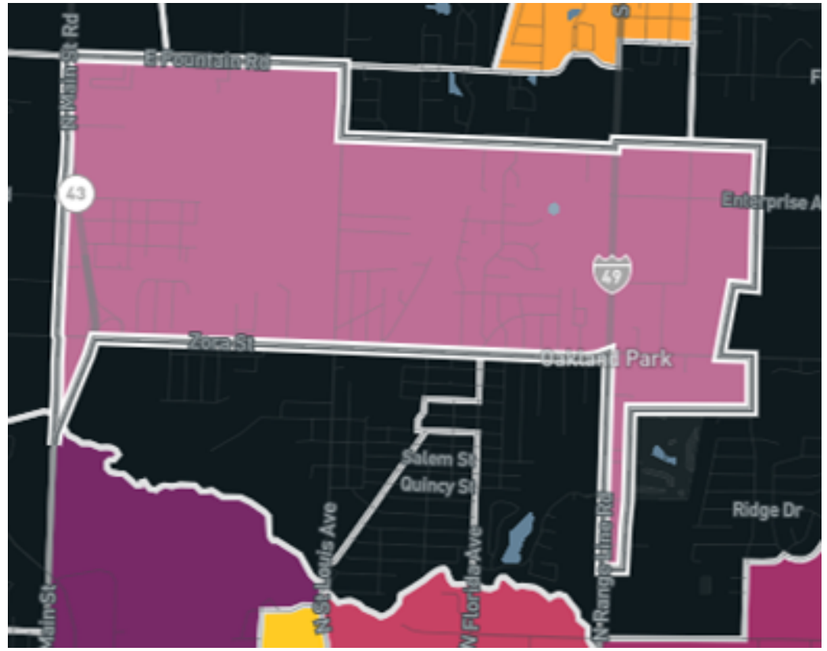
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: Residential developments, smaller businesses, and industrial are the most common land uses in this area.

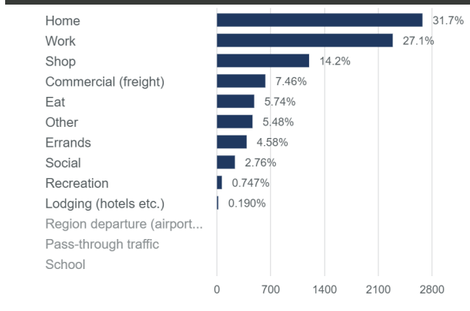






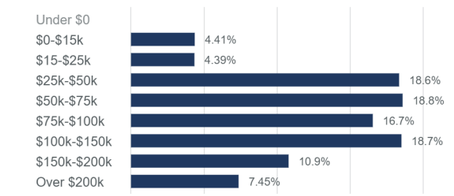


TRIP PURPOSE



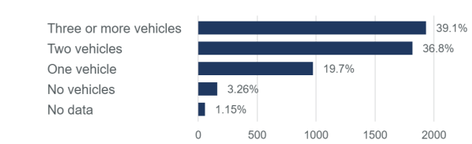
TRAVEL PATTERN OBSERVATIONS: Home and Work make up approximately 59% of trips to this region

HOUSEHOLD INCOME



TAZ DEMOGRAPHIC OBSERVATION: The household income for people making trips to this location skews higher compared to other TAZs

PRIVATE AUTO AVAILABILITY

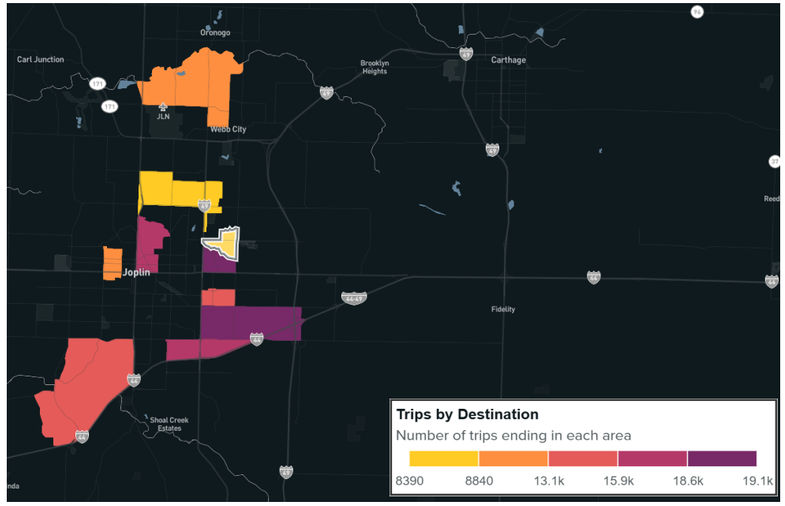


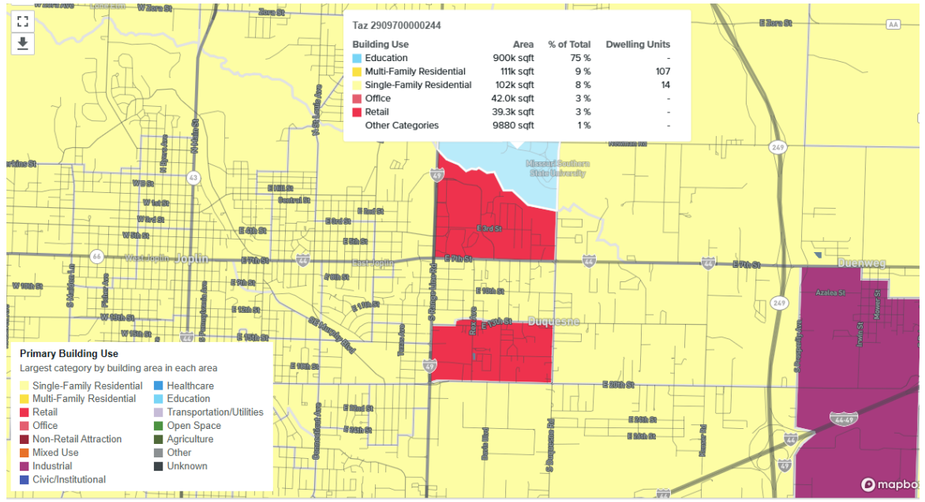
TAZ DEMOGRAPHIC OBSERVATION: 75.9% of people making trips to this location come from households with at least two vehicles

MISSOURI SOUTHERN STATE UNIVERSITY

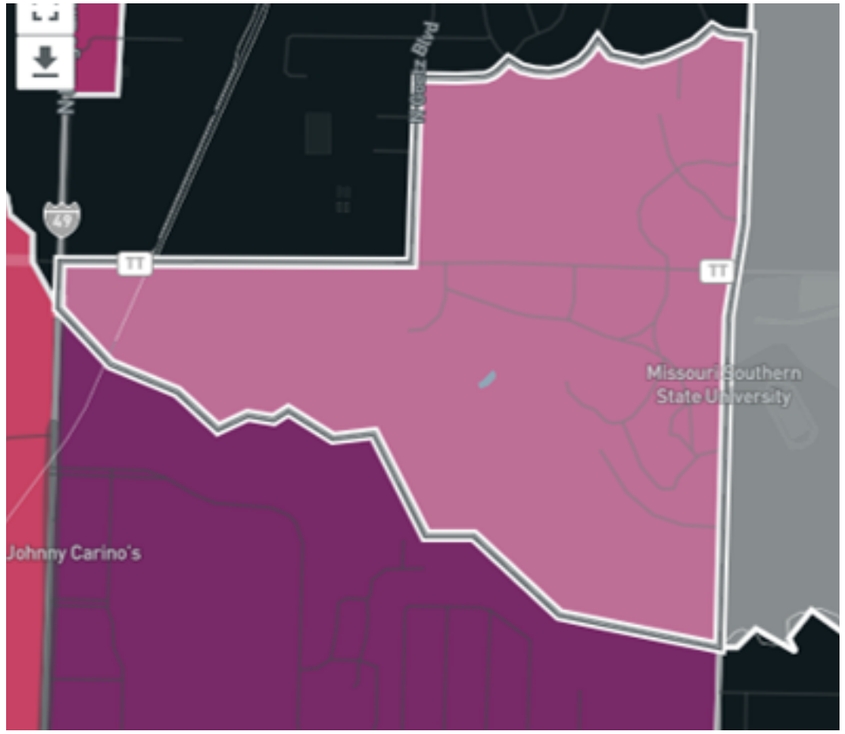
Trip Characteristics for Trip Ending in This TAZ, Fall 2023

DESCRIPTION: This TAZ contains Missouri Southern State University.

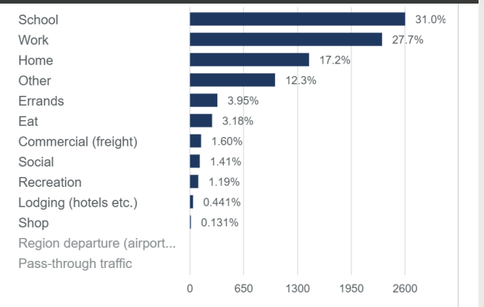






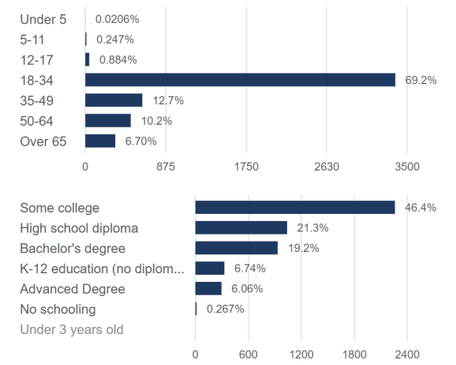


TRIP PURPOSE



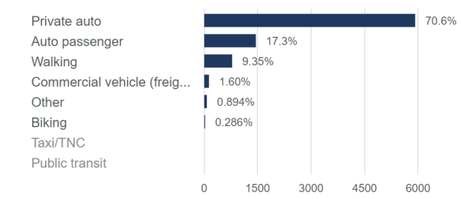
TRIP PATTERN OBSERVATION:
School and work are the two most common trips purposes to this location.

AGE & EDUCATION



TAZ DEMOGRAPHIC OBSERVATION:
Age and Education both reflect the fact that most trips to this region are made by college students.

PRIMARY MODE



TRAVEL PATTERN OBSERVATIONS:
88% of trips ending here were made by private auto or passenger. 10% walking+biking trips are likely student activity. It is estimated that approximately 15% of students live on campus.