JOPLIN CITY COUNCIL
SPECIAL MEETING NOTICE
6:00 P.M.
MONDAY AUGUST 24, 2020
5TH FLOOR COUNCIL CHAMBERS
602 S. MAIN ST.

This meeting can be viewed live on KGCS-TV channel 21 and regional cable television systems including Sparklight in Joplin; or livestream at http://www.joplinmo.org/182/Video-Multimedia
In compliance with the social distancing requirement of six feet, the number of guests in the Council Chambers is limited to 45.

Notice is hereby given that the City Council of the City of Joplin, Missouri, will conduct a Special Meeting at 6:00 p.m. on Monday, August 24, 2020, at Joplin City Hall, 5th Floor Council Chambers, 602 S. Main Street for the purposes stated below.

AGENDA

1. Call to Order
2. Invocation
3. Pledge of Allegiance to the United States of America
4. Reading of the Special Call
5. Roll Call
6. Public Hearing on the 2020-2021 Property Tax Rate.
7. Ordinances - Emergency

   Council Bill No. 2020-520 - an ordinance levying taxes in the City of Joplin, Missouri for the year 2020 in the amount of Eighteen and Six Hundredths Cents ($0.1806) on One Hundred Dollars of valuation of all real property in said City, and levying taxes in the Joplin Public Library District for the year 2020 in the amount of Twenty-Five and Forty-Five Hundredths Cents ($0.2545) on One Hundred Dollars of valuation of all real property in said District, and containing an emergency clause.
8. Transit Master Plan Analysis
9. Adjourn

Barbara Gollhofer

Barbara Gollhofer City Clerk, for Mayor Ryan D. Stanley

Notice posted at 9:30 a.m. this 20th day of August 2020 (RSMo 610.020)

CITY OF JOPLIN
COUNCIL AGENDA ITEM

ITEM
Council Bill 2020-520 – Approving the real property tax levy in the City of Joplin

MEETING DATE
August 24, 2020

ORIGINATING DEPT
Finance

ATTACHMENTS
CB 2020-520 Ordinance; Public Hearing Notice; and Average Property Tax Calculation

REVIEWED BY
Department Head: Leslie Haase; City Attorney: Peter Edwards; City Manager: Nick Edwards

SUMMARY
This Council Bill approves the real property tax levy in the City of Joplin, including the Library property tax levy.

BACKGROUND
This is a public hearing to discuss the proposed fiscal year 2020-2021 property tax levy for the City of Joplin and for the affirmation of the tax levy of the Joplin Public Library District. The maximum authorized property tax levy is 54.0 cents and the CPI is 2.3% based on calculations by the State Auditor's office. The property tax of the City of Joplin represents a very small portion of the overall property tax liability for the citizens of Joplin. Property tax provides approximately 1.5% of the general government revenue and is used to fund a portion of Health, Parks and Solid Waste activities.

Staff is recommending the acceptance of the amount calculated utilizing the State Auditor's worksheet at $.1806, which represents a small increase in the City property tax rate from $.1797. The library rate will also remain the same at $.2545 as set forth by Missouri Statute. The total rate will increase to $.4351 from $.4342 per $100 of assessed valuation. Property tax is expected to generate $1,176,669.00 for the City and $1,473,205 for the library. The property tax for a home with an assessed valuation of $100,000 will increase to $82.67 from $82.50 for both the city and the library portion of the property tax.

According to preliminary assessment valuations for 2020 released by the County Clerk's Offices of Jasper and Newton Counties, the assessed valuations for each county for the city are:

	2019	2020
Jasper County	$460,341,621	$520,635,871
Newton County	157,961,104	158,044,568
Total – Both Counties	$618,302,725	$678,680,439

FUNDING SOURCE
This item is not applicable for this agenda item.

RECOMMENDATION

Staff recommends approval of this council bill on an emergency basis. Property tax rates must be set by the end of August by state statute.

CITY OF JOPLIN
PUBLIC HEARING

The City of Joplin, Missouri will hold a public hearing during a special council meeting of the City Council on Monday, August 24, 2020 at 6:00 p.m. in the Council Chambers of the Joplin City Hall located at 602 South Main Street, Joplin, Missouri.

The purpose of the hearing will be to obtain public input concerning the proposed real estate tax levy for the 2020-2021 fiscal year. The tables below provide the preliminary assessed valuations for 2019 and 2020 of taxable real property located within the City of Joplin and the Joplin Library District for comparative purposes. Also presented are the estimated net tax collections for each of the funds for which a tax is levied. Final rates adopted by Council may change slightly due to final assessed values sent to the State by the County.

Entity	2019 Locally Assessed Valuation	2020 Locally Assessed Valuation	2020-2021 Estimated Tax Revenue	Estimated Delinquent Taxes (4%)	2020-2021 Estimated Net Tax Receipts
City of Joplin	$618,302,725	$678,680,439	$1,225,697	$49,028	$1,176,669
Joplin Public Library	$542,946,223	$602,981,714	$1,534,588	$61,384	$1,473,205
			$2,760,285	$110,411	$2,649,874

TAX REVENUE ESTIMATES FOR 2019-2020

Fund	2020 Tax Rate	Proposed 2021 Tax Rate	Estimated 2020 Net Tax Revenues	Projected 2021 Net Tax Revenues
Health & Welfare Fund	$0.0599	$0.0602	$355,549	$392,223
Parks & Recreation Fund	$0.0599	$0.0602	$355,549	$392,223
Solid Waste Mgmt Fund	$0.0599	$0.0602	$355,549	$392,223
Joplin Public Library	$0.2545	$0.2545	$1,326,526	$1,473,205
TOTALS	$0.4342	$0.4351	$2,393,173	$2,649,874

Leslie Haase, C.P.A., C.M.A.
Director of Finance
City of Joplin, Missouri

CITY OF JOPLIN, MISSOURI
PROPERTY TAX LEVY CALCULATION
FOR FISCAL YEAR 2020-2021

NEW TAX RATE

APPRAISED VALUE OF RESIDENCE	MULTIPLIED BY	ASSESSMENT RATIO FOR RESIDENTIAL	DIVIDED BY	PER $100 OF ASSESSED VALUATION	MULTIPLIED **CITY & LIBRARY** RATE	EQUALS	TAX LIABILITY PER YEAR
$ 100,000.00	X	19%	/	100	0.4351	=	$ 82.67

PRIOR YEAR TAX RATE

APPRAISED VALUE OF RESIDENCE	MULTIPLIED BY	ASSESSMENT RATIO FOR RESIDENTIAL	DIVIDED BY	PER $100 OF ASSESSED VALUATION	MULTIPLIED **CITY & LIBRARY** RATE	EQUALS	TAX LIABILITY PER YEAR
$ 100,000.00	X	19%	/	100	0.4342	=	$ 82.50

Total Increase in Tax Liability **$ 0.17**

COUNCIL BILL NO. 2020-520 ORDINANCE NO.

AN ORDINANCE levying taxes in the City of Joplin, Missouri for the year 2020 in the amount of Eighteen and Six Hundredths Cents ($0.1806) on One Hundred Dollars of valuation of all real property in said City, and levying taxes in the Joplin Public Library District for the year 2020 in the amount of Twenty-Five and Forty-Five Hundredths Cents ($0.2545) on One Hundred Dollars of valuation of all real property in said District, and containing an emergency clause.

BE IT ORDAINED by the Council of the City of Joplin, Missouri, as follows:

Section 1. There be and is hereby levied Six and Two Hundredths Cents ($0.0602) on One Hundred Dollars valuation of all such property as is assessed by the City and County Assessors jointly, except household property, as passed upon and equalized by the Board of Equalization for the purposes of creating a fund for Health and Welfare of the City of Joplin.

Section 2. There be and is hereby levied Six and Two Hundredths Cents ($0.0602) on One Hundred Dollars valuation of all such property as is assessed by the City and County Assessors jointly, except household property, as passed upon and equalized by the Board of Equalization for the purposes of creating a fund for Solid Waste Management of the City of Joplin.

Section 3. There be and is hereby levied Six and Two Hundredths Cents ($0.0602) on One Hundred Dollars valuation of all such property as is assessed by City and County Assessors jointly, except household property, as passed upon and equalized by the Board of Equalization for the purposes of creating a fund for Parks and Recreation of the City of Joplin.

Section 4. There be and is hereby levied Twenty-Five and Forty-Five Hundredths Cents ($0.2545) on One Hundred Dollars valuation of all such property as is assessed by the City and County Assessors jointly, except household property, as passed upon and equalized by the Board of Equalization for the purpose of creating a fund for the Public Library District of the City of Joplin.

Section 5. That this Ordinance, fixing a tax rate or assessment of the City, is an emergency within the meaning of Section 2.12(5) of THE HOME RULE CHARTER OF THE CITY OF JOPLIN, MISSOURI, as an ordinance setting a tax rate and shall be in full force and effect immediately from and after its passage and approval.

COUNCIL BILL NO. 2020-520

PASSED BY THE COUNCIL OF THE CITY OF JOPLIN, MISSOURI, this _____

day of _____, 2020, by a _____vote.

_____
Ryan D. Stanley, Mayor

ATTEST:

_____
Barbara J. Gollhofer, City Clerk

APPROVED AS TO FORM:

_____
Peter C. Edwards, City Attorney



Joplin Transit System Analysis

City of Joplin | February 2020



TranSystems

EXPERIENCE | Transportation

Vireo

Joplin Transit System Analysis

City of Joplin, Missouri

February 2020

Acknowledgements

The City of Joplin and a study team consisting of TranSystems and Vireo held stakeholder meetings for the Joplin Transit System Analysis. Special thanks to the following groups: City of Joplin staff, City of Joplin City Council, elected officials and staff from surrounding communities in the Joplin Area, employers, transit riders and drivers, paratransit providers, and stakeholders representing education, housing, neighborhoods, community groups, medical, social service, faith-based institutions, advocacy groups, youth, and older adults.

Delivered By: TranSystems with Vireo





TABLE OF CONTENTS

CHAPTER 1 | INTRODUCTION 1

1.1 Study Area 1

1.2 Document Review 1

CHAPTER 2 | MARKET ANALYSIS 5

2.1 Demographic Analysis 5

2.2 Employment Analysis 13

2.3 Land Use Analysis 16

2.4 Transportation Choice Analysis 19

2.5 Transit Demand Index 23

CHAPTER 3 | EXISTING TRANSIT SERVICES 31

3.1 Metro Area Public Transit System (MAPS) 31

3.2 OATS, Inc. 36

3.3 Other Transit Services 38

3.4 Peer City Analysis 38

3.5 Key Takeaways 39

CHAPTER 4 | COMPREHENSIVE SERVICE ANALYSIS 40

4.1 Fixed Route Performance Measures 40

4.2 Demand Response Performance Measures 44

4.3 Route Profile Sheets 45

4.4 Summary 54

CHAPTER 5 | PUBLIC INVOLVEMENT AND VISIONING 55

5.1 Market Analysis 55

5.2 Visioning 55

5.3 Alternatives 56

CHAPTER 6 | PLAN DEVELOPMENT 58

6.1 Short-Term Plan 58

6.2 Medium-Term Plan 60

6.3 Long-Term Plan 79

LIST OF EXHIBITS

Exhibit 1.1: Study Area

Exhibit 2.1: Population Density
Exhibit 2.2: Older Adults
Exhibit 2.3: Minority Population
Exhibit 2.4: Persons with a Disability
Exhibit 2.5: Low Income Population
Exhibit 2.6: Zero Vehicle Households
Exhibit 2.7: Employment Density
Exhibit 2.8: Largest Private Employers
Exhibit 2.9: Existing Land Use
Exhibit 2.10: Future Land Use
Exhibit 2.11: Land Use Change
Exhibit 2.12: Commute by Carpool
Exhibit 2.13: Commute by Public Transit
Exhibit 2.14: Mean Travel Time to Work
Exhibit 2.15: Transit Demand Index

Exhibit 3.1: Daily Transit Riders by Service
Exhibit 3.2: MAPS Service Area
Exhibit 3.3: Flex Route Characteristics
Exhibit 3.4: Average Daily Flex Route Ridership
Exhibit 3.5: Flex Route Transit Map
Exhibit 3.6: Average Daily MAPS Demand Response Ridership
Exhibit 3.7: OATS Route Characteristics
Exhibit 3.8: Average Daily OATS Ridership
Exhibit 3.9: OATS Routes Transit Map
Exhibit 3.10: Specialized Transportation Service
Exhibit 3.11: Peer City Daily Transit Commuters

Exhibit 4.1: Trips per Revenue Mile
Exhibit 4.2: Trips per Revenue Hour
Exhibit 4.3: On-Time Performance
Exhibit 4.4: Meeting Timepoints
Exhibit 4.5: Subsidy per Revenue
Exhibit 4.6: Farebox Recovery Ratio
Exhibit 4.7: Potential Demand Response Data Zones
Exhibit 4.8: Blue Route Performance Measures
Exhibit 4.9: Blue Route Map
Exhibit 4.10: Blue Route Transit Demand Index
Exhibit 4.11: Green Route Performance Measures
Exhibit 4.12: Green Route Map
Exhibit 4.13: Green Route Transit Demand Index
Exhibit 4.14: Red Route Performance Measures
Exhibit 4.15: Red Route Map
Exhibit 4.16: Red Route Transit Demand Index

Exhibit 6.1: Proposed Short-Term System Map
Exhibit 6.2: Proposed Short-Term Stop Changes
Exhibit 6.3: Estimated Short-Term Capital Costs
Exhibit 6.4: Proposed Medium-Term System Map
Exhibit 6.5: Proposed Blue Route
Exhibit 6.6: Proposed Blue Route Stops
Exhibit 6.7: Proposed Light Blue Route
Exhibit 6.8: Proposed Light Blue Route Stops
Exhibit 6.9: Proposed Yellow Route
Exhibit 6.10: Proposed Yellow Route Stops
Exhibit 6.11: Proposed Orange Route
Exhibit 6.12: Proposed Orange Route Stops
Exhibit 6.13: Proposed Brown Route
Exhibit 6.14: Proposed Brown Route Stops
Exhibit 6.15: Proposed Purple Route
Exhibit 6.16: Proposed Purple Route Stops
Exhibit 6.17: Proposed Green Route
Exhibit 6.18: Proposed Green Route Stops
Exhibit 6.19: Proposed Red Route
Exhibit 6.20: Proposed Red Route Stops
Exhibit 6.21: Estimated Medium-Term Capital and Operating Costs
Exhibit 6.22: Proposed Dark Green Route
Exhibit 6.23: Proposed Dark Green Route Stops
Exhibit 6.24: Proposed Teal Route
Exhibit 6.25: Proposed Teal Route Stops
Exhibit 6.26: Proposed Red Route
Exhibit 6.27: Proposed Red Route Stops
Exhibit 6.28: Proposed Yellow Route (Long Term)
Exhibit 6.29: Proposed Yellow Route Stops
Exhibit 6.30: Proposed Long-Term System Map
Exhibit 6.31: Estimated Long-Term Capital and Operating Costs

CHAPTER 1 | INTRODUCTION

In January 2019, the City of Joplin initiated the Joplin Transit Comprehensive Operational Analysis (COA). The objective of the Comprehensive Operational Analysis is to analyze existing transit service; engage the community and local stakeholders about the role of public transit; develop transit service design guidelines; conduct an alternatives analysis; and identify short-term, medium-term, and long-term service plans.

There are three primary transit modes operating in the Joplin area:

- *Flex Route Bus Service:* The Metro Area Public Transit System (MAPS) operates three flex routes known as the Sunshine Lamp Trolley.
- *Demand Response (MAPS):* MAPS operates demand response and paratransit service within the Joplin city limits and adjacent communities within the Joplin Metropolitan Area.
- *Demand Response (OATS):* OATS, Inc. is the rural and small urban demand response provider for Missouri. OATS operates intercity trips to and from Joplin on specific days, as well service outside the city limits for residents not served by the flex route bus service.

1.1 Study Area

The study area encompasses the urbanized 2018 MAPS service area including Joplin and surrounding communities of Carl Junction, Carterville, Webb City, Duquesne, Duenweg, Silver Creek, Saginaw, Leawood, Redings Mill, Airport Drive, several other smaller jurisdictions. The study area is identified in Exhibit 1.1.

1.2 Document Review

The following relevant documents were reviewed to provide a foundation for the study process:

- Joplin Area Long-Range Transportation Plan Update (2016)
- Joplin Area 2018-2022 Transportation Improvement Program (2017)
- Public Transit-Human Services Transportation Coordination Plan (2017)
- Joplin Area Bicycle and Pedestrian Transportation Plan (2018)
- Joplin Comprehensive Plan (2012)

Joplin Area Long-Range Transportation Plan (2016)

As a metropolitan area, Joplin is required to submit a long-range transportation plan in order to receive federal transportation funding. The Joplin Area Transportation Study Organization (JATSO), the metropolitan planning organization, developed the Long-Range Transportation Plan to provide a 20-year vision for the Joplin Area through 2036. One of the major plan goals outlined in the plan seeks to provide a balanced transportation system that provides a choice of travel modes for different individuals and activities. Recommendations include:

- Continue to obtain local and state funding for improved transit services
- Utilize the knowledge, expertise, and equipment of current service providers
- Identify transit needs and provide a plan for areas to be served by improved public transportation

Transit-related recommendations were divided into short-term and long-term recommendations:

- *Capital Improvements:* Add turnouts to trolley stops (short-term).
- *Service Hours Expansion:* Explore offering transit service outside of the traditional daytime work shift hours (short-term).
- *Service Area Expansion:* Expand the transit service areas in southwest Joplin, western Joplin, Webb City, and Carl Junction. Areas along Rangeline Road and near industrial employers southeast of the city were specific locations identified as desired transit destinations (long-term).

Joplin Area 2018-2022 Transportation Improvement Program (2017)

The Transportation Improvement Program outlines funding for a five-year period. The majority of funding allocated to transit provides the local match for vehicle purchases. Other specific transit projects include installing shelters at 26th Street and Main Street and at 20th Street and Iowa Avenue.

Public Transit-Human Services Transportation Coordination Plan (2017)

The Public Transit-Human Services Transportation Coordination Plan outlines transit gaps and a needs assessment for the four-county area of Barton, Jasper, Newton, and McDonald Counties. Within the four-county area, there is interest in new transit connections to nearby Galena, Kansas and improved transit connections from Joplin to Webb City, Carthage, Neosho, and Oronogo. Other recommendations include:

- Replace aging vehicles when necessary
- Use smaller, more efficient vehicles when appropriate
- Establish methods to record data about ridership and usage of services
- Explore coordination of training and maintenance between transit providers
- Improve cross jurisdictional communications between service providers
- Reduce duplications in services (routes, schedules, etc.)
- Promote available services

Joplin Area Bicycle and Pedestrian Transportation Plan (2018)

The Joplin Area Bicycle and Pedestrian Plan primarily focuses on non-motorized forms of transportation, but also places an emphasis on providing access to transit stops. Recommendations related to transit accessibility include:

- Prioritize sidewalks on both sides of the street on principal arterials and minor arterials. Coordinate sidewalk improvements with roadway improvements to ensure the most efficient use of available resources. The Sunshine Lamp Trolley system primarily services arterials.
- Evaluate accessibility and sidewalk continuity to transit stops in order to improve first-mile and last-mile connections to transit. Support funding for a sidewalk program to fill gaps along these major corridors. Corridor scoping studies may be appropriate to identify potential projects.
- Explore opportunities to connect to transit stops when planning off-road bicycle paths.
- Encourage changes to the development code to require new developments and redevelopments to construct sidewalks and provide connections between public sidewalks and private paths and building entrances. Support the inclusion of these connections through the development review process.

Joplin Comprehensive Plan (2012)

The Joplin Comprehensive Plan recommends several corridor improvements that could support transit. For example, grandfathered curb cuts and associated conflict points on Main Street should be considered for amortization in favor of access from the grid-pattern side streets. Other key corridors are not walkable and specific sidewalk and crosswalk improvements are recommended at Connectivity Avenue and 20th Street and at Murphy Boulevard and 20th Street, both of which are served by the Green Trolley route. A Complete Streets policy becomes a new guiding transportation philosophy with the adoption with this plan. Complete Streets are designed and operated to work for all users – motorists, transit users, bicyclists, and pedestrians – and for all ages and abilities. The policy benefits transit users who need well-designed pedestrian infrastructure to access bus stops.

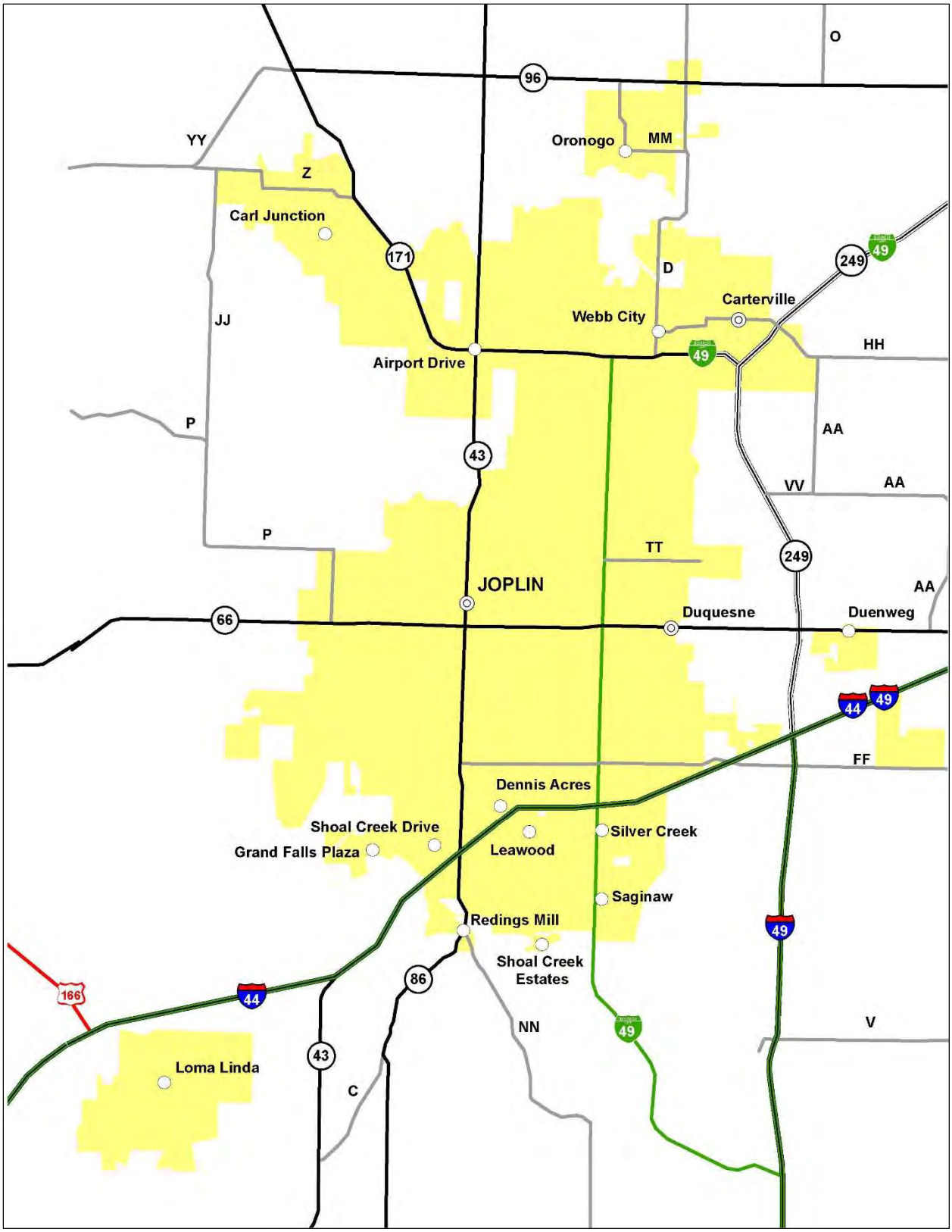
The related Joplin Comprehensive Housing Market Analysis (2011) recommends increasing housing supply targeted towards seniors, including homes that require less maintenance in locations that are readily access via public transportation.

Other Local Comprehensive Plans

The comprehensive plans available from other communities in the study area do not directly recommend transit changes or improvements. However, there are some indirect relevant recommendations contained in these plans.

- The *Carl Junction Comprehensive Plan Update (2011)* recommends the inclusion of one or more transit stops in the community if the system expands. Pennell Street and Main Street is identified as an appropriate location for a transit stop that would be within walking distance of the community center, city government, schools, post office, downtown businesses, and key residential neighborhoods. Additional stops may be feasible on Pennell Street (Summer Fresh Market), Wise Street (Carl Junction High School), and Fir Road.
- The *Loma Linda Comprehensive Development Plan (1997)* does not anticipate the need for public transportation in the community.

Exhibit 1.1: Study Area



CHAPTER 2 | MARKET ANALYSIS

The market analysis provides current and projected demographic, employment, land use, and transportation choice information that will be used to plan future transit changes in the study area.

2.1 Demographic Analysis

The demographic analysis consisted of identifying existing and future population characteristics, including a density analysis. Specific demographic groups were selected for analysis as these populations are more likely to rely on transit compared to the general population: older adults, persons with a disability, minorities, low-income households, and zero vehicle households. The maps in this section do not show the Joplin Industrial Park as it does not have any residents.

Population Density

There are approximately 79,000 people currently residing in the study area[1] with approximately 65 percent of those residents living in Joplin. The study area primarily consists of single-family housing with a few large apartment complexes located in areas with a high concentration of commercial properties or on the periphery of Joplin.

The study area has an overall population density of 373 people per square mile with the highest population density generally located between Main Street and Maiden Lane. The highest population density is located northeast of Main Street and 32nd Street. Although the area is characterized by single-family homes, they are generally located on small lots with no nearby commercial uses. This development pattern is also the result of a tornado that devastated the area. Despite the many vacant lots in the neighborhood, the density remains high of Main Street between 15th Street and 26th Street. When all of the vacant lots are developed, the neighborhoods should be one of the higher-density neighborhoods in the study area. Population density is displayed in Exhibit 2.1.

Most of the additional population growth will be located in Newton County. It is anticipated that the population in the study area will grow approximately 3.8 percent per year.[2]

Older Adults

The percentage of older adults, or residents over 65 years, within the study area is approximately 14 percent of the population.[3] The majority of older adults reside within the southern portion of the study area in Newton County with the highest percentage residing in Dennis Acres. Few block groups have less than five percent of this demographic group. Only two senior independent living facilities are near the neighborhoods with the highest concentration of older adults. The percentage of older adults is displayed in Exhibit 2.2.

Minority Population

The percentage of minorities within the study area is approximately 14 percent of the population.[4] The predomination minor group is Hispanic or Latino (3.7%), followed by African American (2.8%) and

1. 2017 American Community Survey 5-year estimates
2. Joplin, Missouri Situation and Outlook Report prepared by Proximity One (CBSA 27900)
3. 2017 American Community Survey 5-year estimates
4. 2017 American Community Survey 5-year estimates

Native American (1.5%). While the minority population is not concentrated in any particular portion of the study area, the neighborhood at the south end of Parr Hill Park has the highest concentration of minority population in the area. The percentage of minority population is displayed in Exhibit 2.3.

Persons with a Disability

The percentage of persons with a disability, which includes individuals between 18 years and 64 years, within the study area is approximately 12 percent of population,[5] which is higher than the state and national average. The highest percentage (30%) of persons with a disability reside west of downtown Joplin. The highest concentration of persons with a disability (approximately 2.5 per acre) reside in the neighborhood northwest of downtown Joplin. The percentage of persons with a disability is displayed in Exhibit 2.4.

Low Income Population

The Joplin Metropolitan Area demonstrates a slightly lower level of income disparity compared to nearby urban areas of Pittsburg, Kansas; Springfield, Missouri; Fayetteville, Arkansas; Tulsa, Oklahoma; and Kansas City, Missouri. Within a Gini coefficient[6] of 0.4470 (a coefficient value of one is the maximum level of inequality),[7] the level of income disparity is also slightly lower, but similar, to Gini coefficients for the United States (0.4815), Midwest region (0.4632), and Missouri (0.4630).

The poverty rate in the study area is approximately 10 percent. The highest concentration of low income population generally aligns with areas that demonstrate the highest concentration of persons with a disability, suggesting that these two characteristics may be correlated in the study area. A high concentration of subsidized housing complexes are located near Maiden Land and 26th Street, but the highest concentration of low income population are located northwest of downtown Joplin. The percentage of low income population is displayed in Exhibit 2.5.

Zero Vehicle Households

The percentage of residents without access to a vehicle in the study area is approximately three percent of the population.[8] The highest percentage of residents in the study area without access to a vehicle reside in area direct west of downtown Joplin. Lacking access to a vehicle, or possessing an unreliable vehicle, is a key indicator for a transit-dependent person. The percentage of zero vehicle households is displayed in Exhibit 2.6.

5. 2017 American Community Survey 5-year estimates

6. The Gini coefficient is a measure of statistical dispersion and is the most commonly used measurement of inequality.

7. 2017 American Community Survey 5-year estimates

8. 2017 American Community Survey 5-year estimates

Exhibit 2.1: Population Density

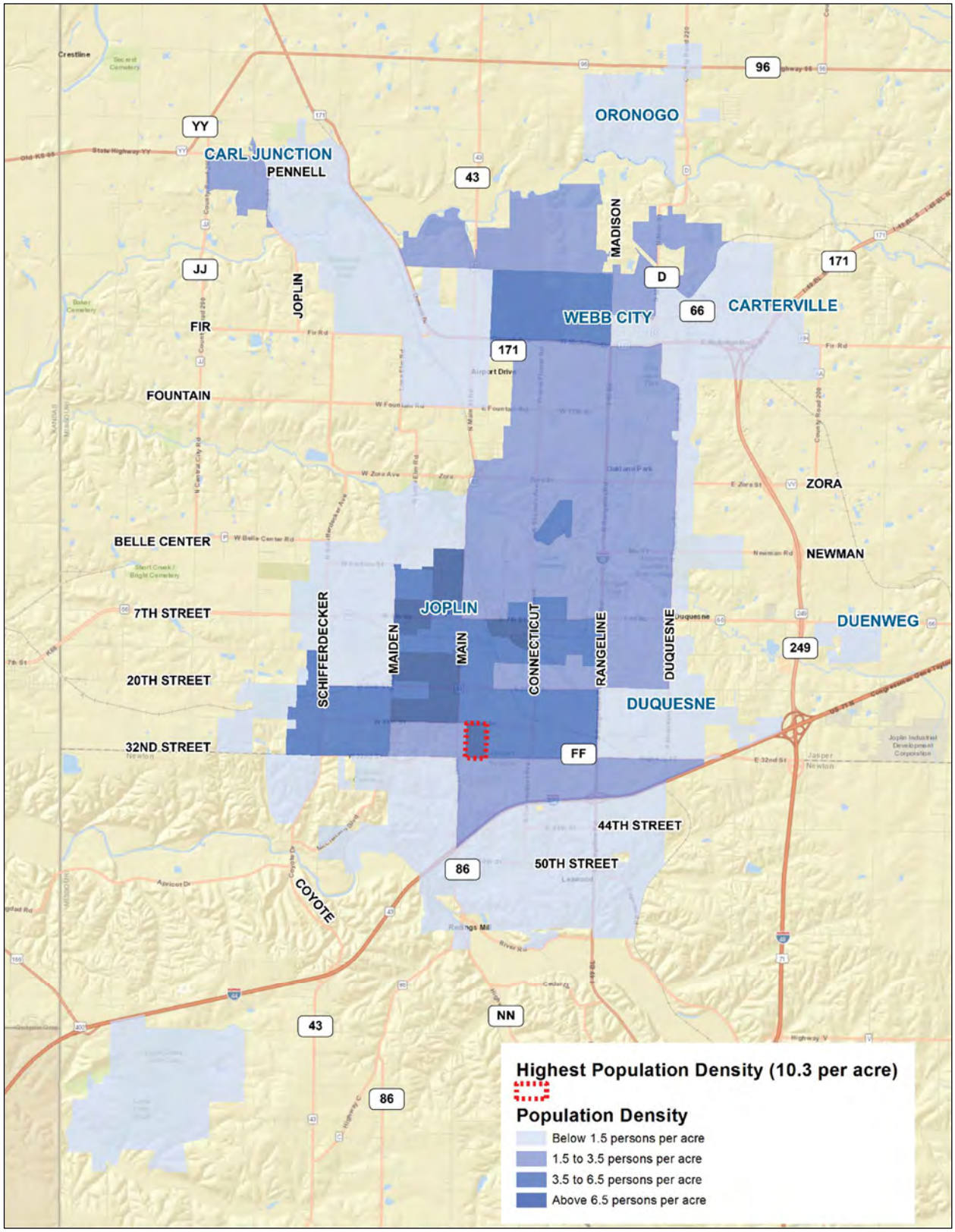


Exhibit 2.2: Older Adults

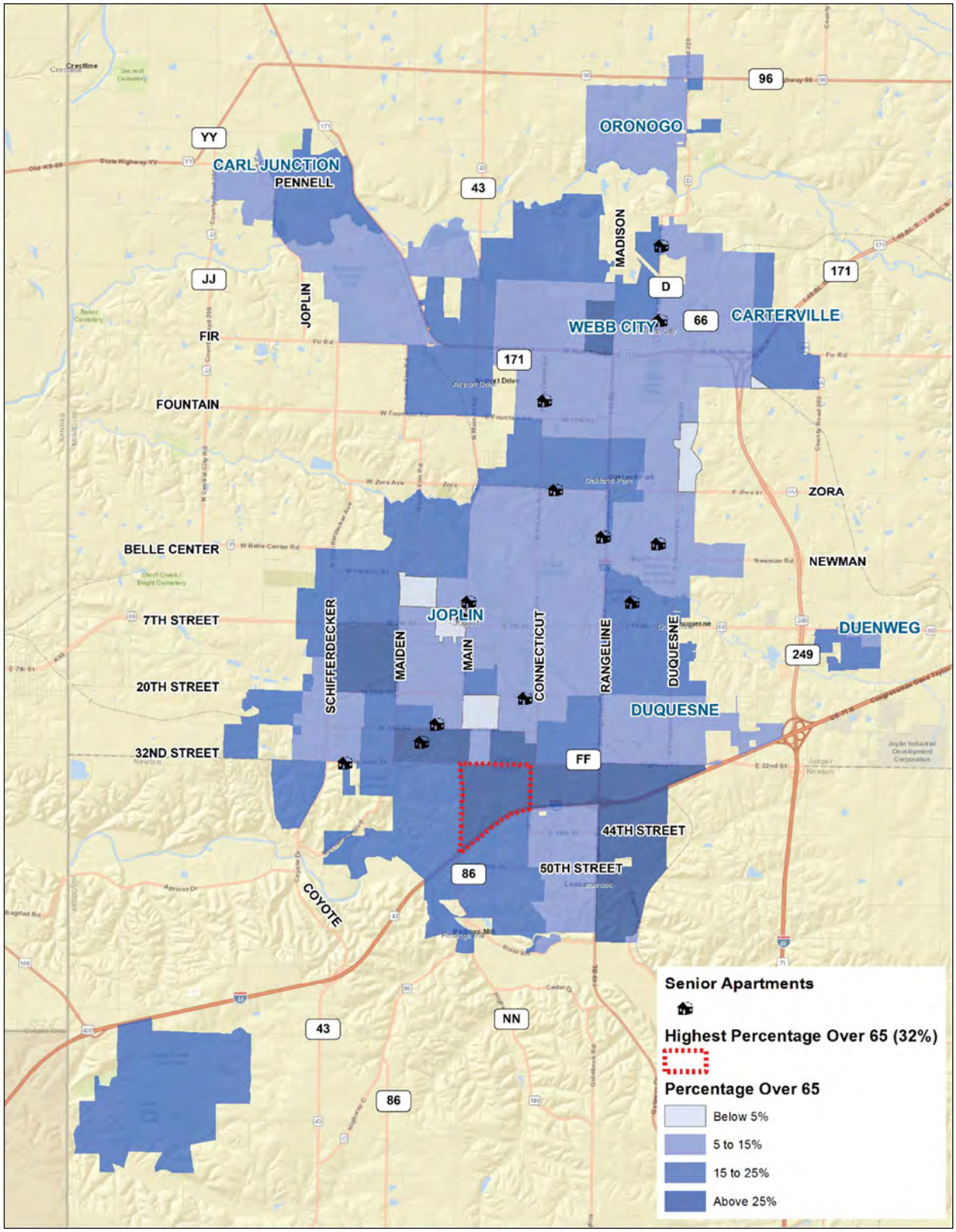


Exhibit 2.3: Minority Population

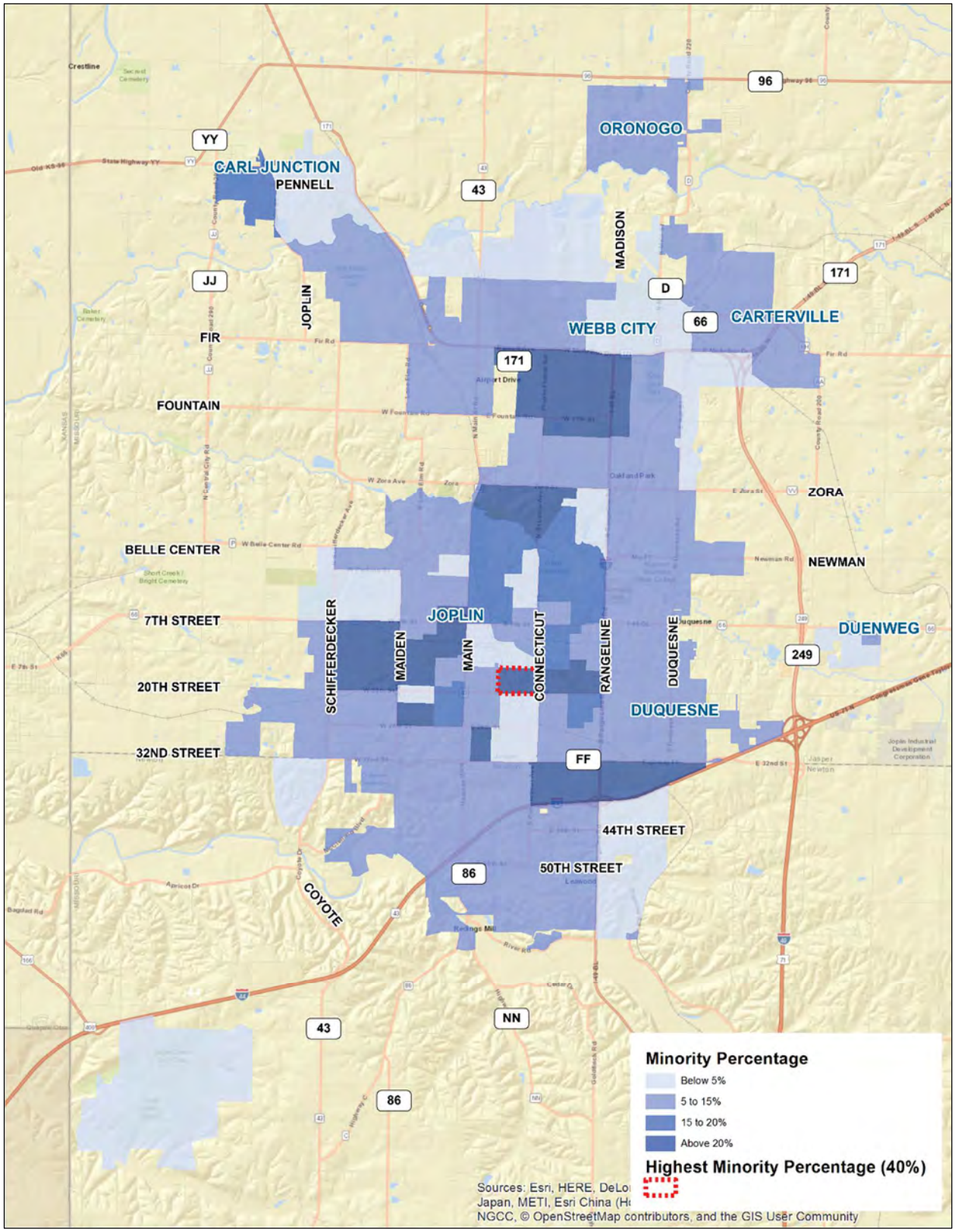


Exhibit 2.4: Persons with a Disability

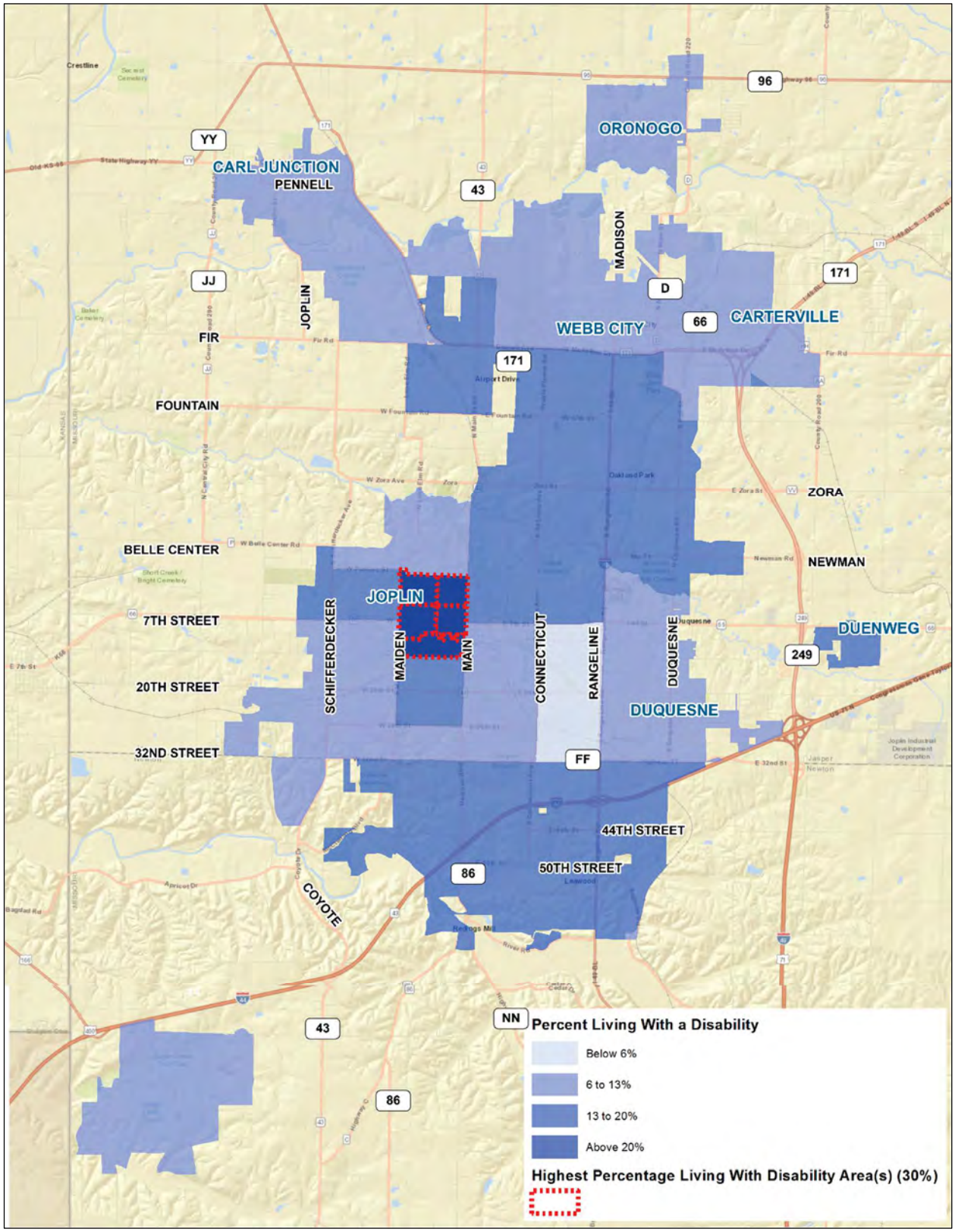


Exhibit 2.5: Low Income Population

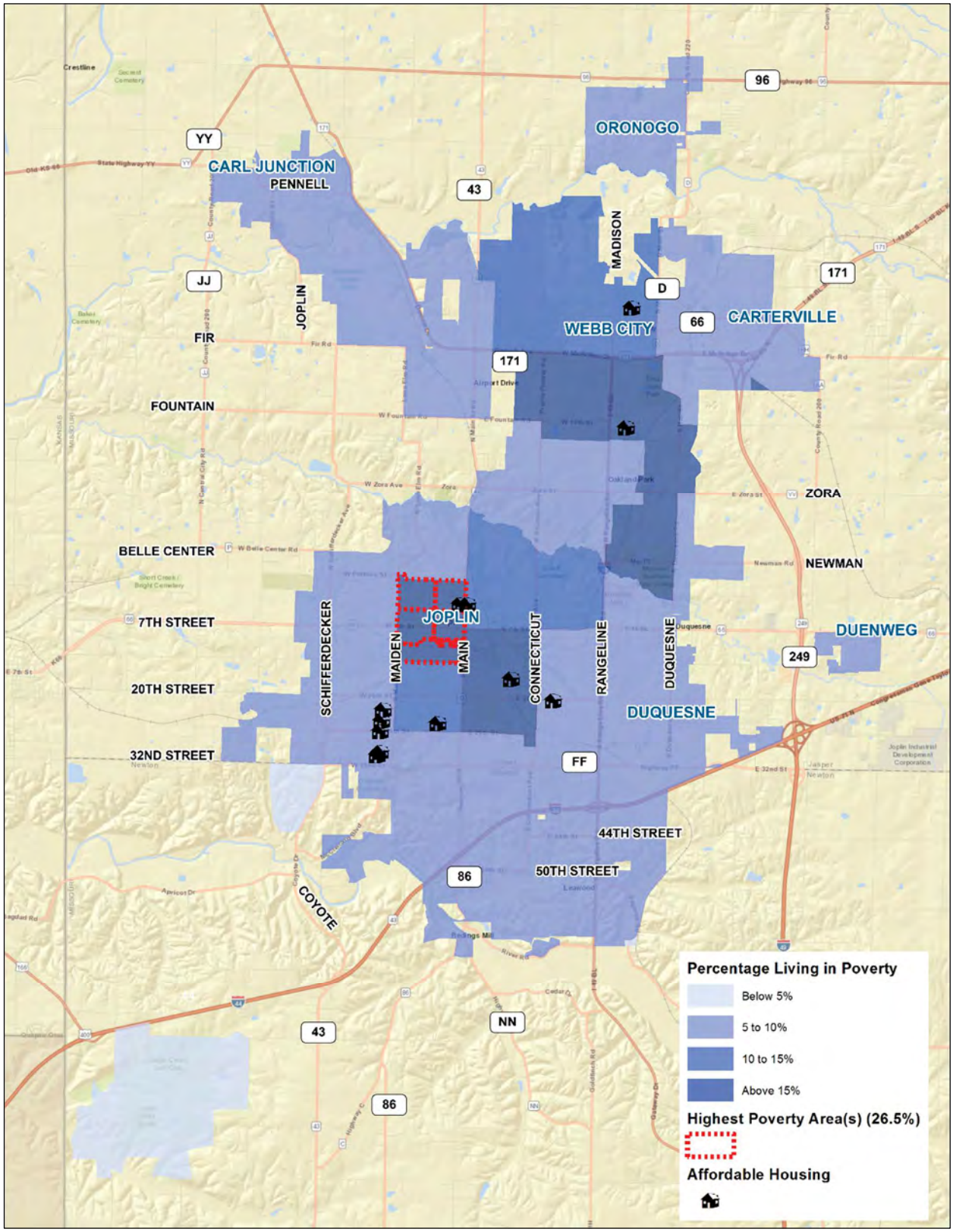
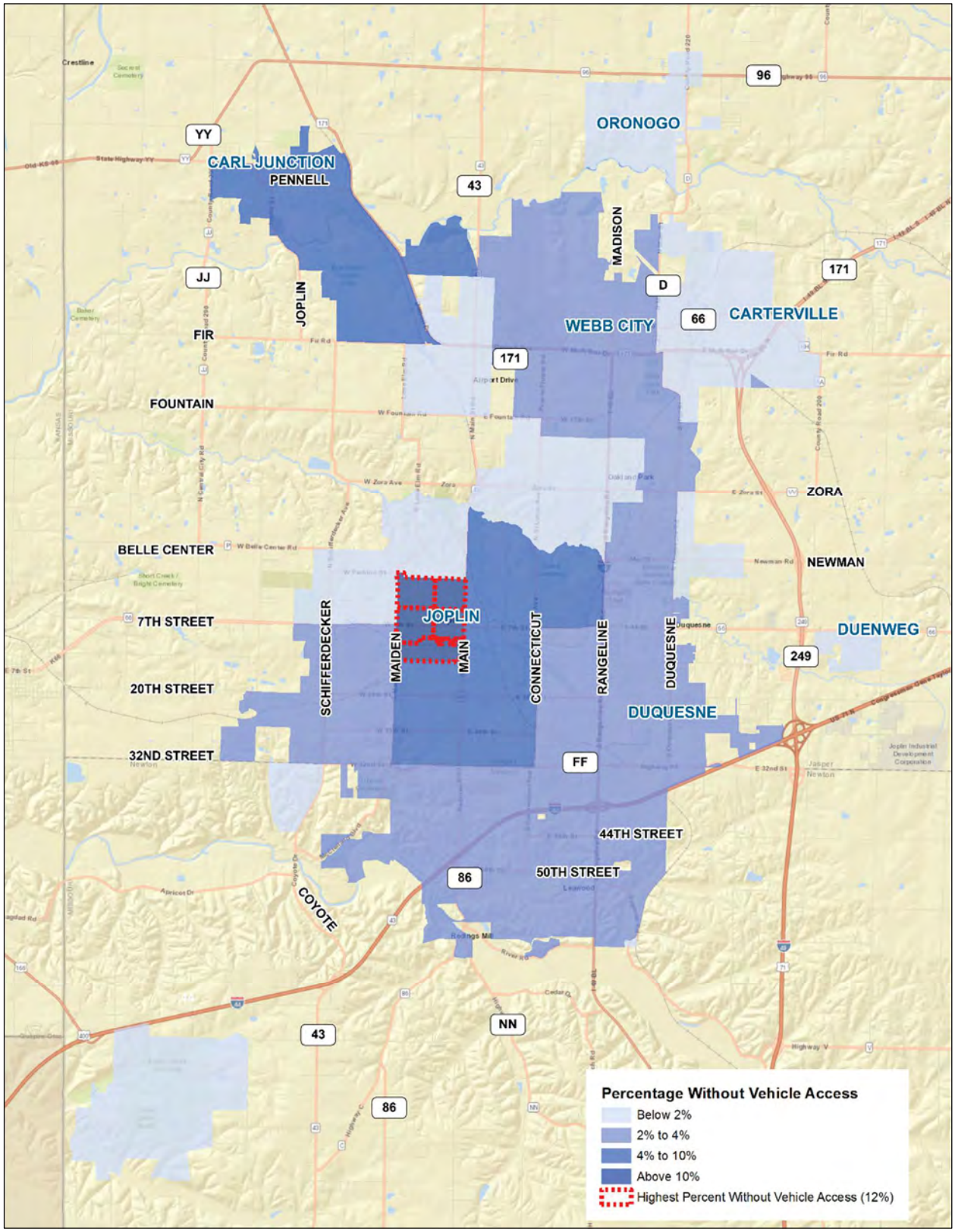


Exhibit 2.6: Zero Vehicle Households



2.2 Employment Analysis

There are approximately 52,000 jobs in the study area. With about 38,000 employees residing within the Joplin area, there are more jobs in the study area than workers.[9] Therefore, the study area is generally a net attractor of jobs, and the predominant commuting travel flows are into the Joplin area in the morning and out of the area in the evening.

Employment Density

Since the study area is relatively compact, most employment centers are within a 15-minute drive of each other. The densest employment areas are located in downtown Joplin and on the east side of Joplin. The highest number of jobs (approximately 5,900 jobs) is located between Rangeline Road and Duquesne Road near 32nd Street, but the highest number of service jobs is located to the north along 7th Street. Employment density is displayed in Exhibit 2.7.

The largest employment sectors in are healthcare (21%), manufacturing (14%), and retail (13%). The largest private employers by number of jobs are outlined in Exhibit 2.8.[10] The list excludes public employers such as school districts and government offices. Although these entities have large numbers of employees, their facilities and employees are dispersed through the area rather than concentration in one area.[11] In addition to private employers, the City of Joplin employs approximately 580 people[12], and the Joplin School District employs nearly 1,300 people[13]. While, overall these entities are large employers, the employees are dispersed throughout various locations throughout the region rather than in one specific area.

Joplin has a higher number of manufacturing jobs compared to the national average. Manufacturing employers are concentrated in southeast Joplin and are anticipated to grow in the future. Many manufacturing jobs are tied to the nearby energy production sector in Oklahoma and Texas. For example, welding-related jobs are anticipated to grow 10 percent in the next five years.[14] Other job categories projected for large-scale growth in the area over the next five years are industrial machinery mechanics and registered nurses. Therefore, job growth is anticipated to be focused in the southeast area of Joplin near the industrial park and in areas near the hospitals on the south side of Joplin.

Travel Patterns

Work Location of Residents: Since the job-housing balance is greater than one in the study area, most workers stay within the Joplin area to work. If they do work outside the study area, the locations they are most likely to work include Carthage (3.1%), Neosho (2.2%), Springfield (1.4%), Galena (0.9%), and Baxter Springs (0.8%). [15] *Residence Location of Workers:* Approximately 62 percent of those who work in study area also live in the Joplin Area. If workers reside outside the study area, the locations they are most likely to reside include Carthage (4.5%), Springfield (4.5%), Neosho (2.3%), Kansas City (1.1%), Galena (1.0%), and Pittsburg (0.8%).[16]

9. 2015 Longitudinal Employer-Household Dynamics Origin-Destination Statistics (LODES)
10. 2017 Joplin's Comprehensive Annual Financial Report
11. The importance of identifying large number of employees at one location is to determine the need for transit to that location.
12. 2017 Joplin's Comprehensive Annual Financial Report
13 Joplin School District Website
14. "Job growth committee sizing up workforce, projections" by Jordan Larimore. *Joplin Globe* January 27, 2017
15. 2015 Longitudinal Employer-Household Dynamics Origin-Destination Statistics (LODES)
16. 2015 Longitudinal Employer-Household Dynamics Origin-Destination Statistics (LODES)

Exhibit 2.7: Employment Density

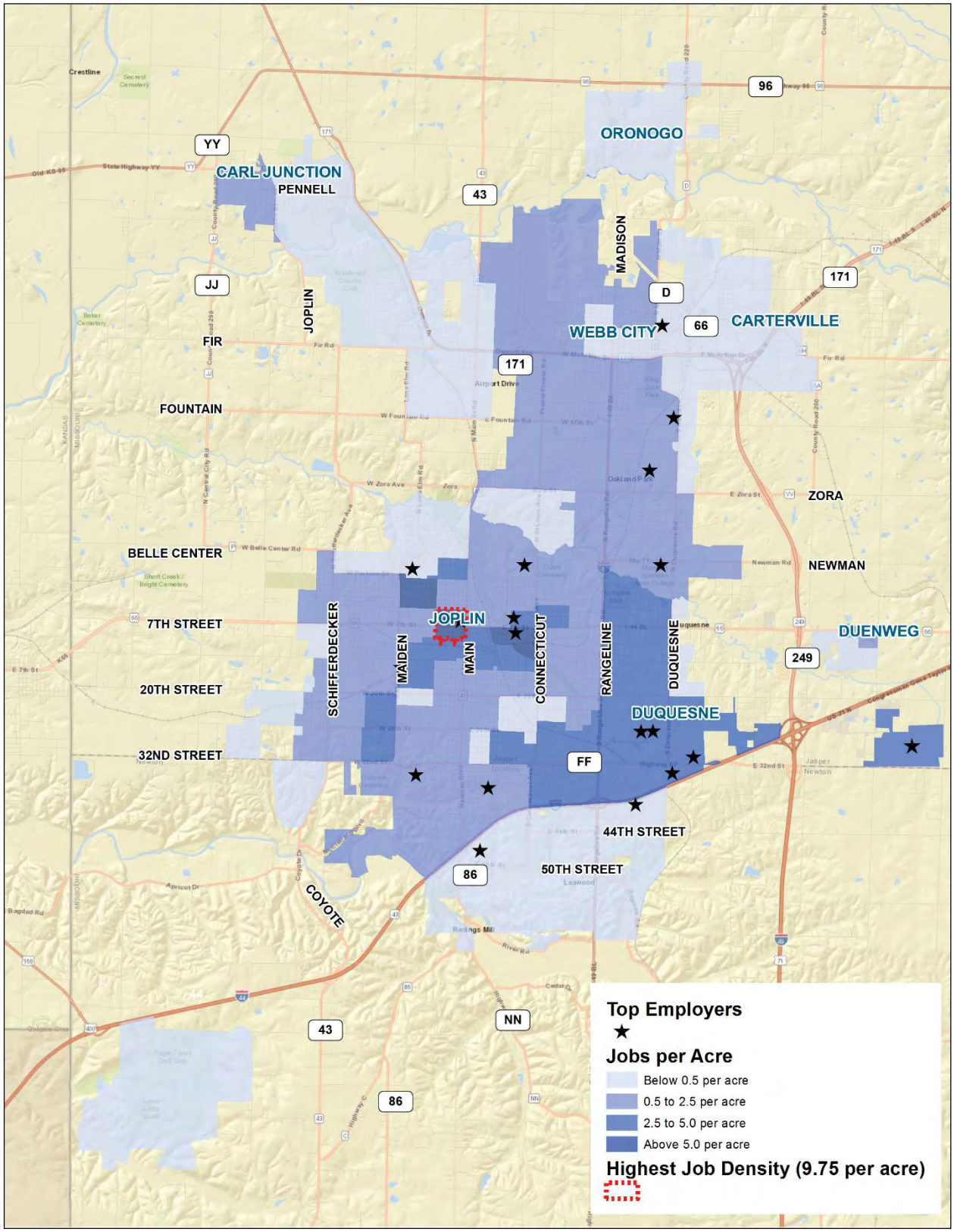


Exhibit 2.8: Largest Private Employers[17]

Employer	Sector	Location	Employment
Freeman Hospital	Healthcare	Joplin - Southwest	2,866
Mercy Hospital	Healthcare	Joplin - South	1,310
Tri-State Motor Transport	Transportation	Joplin - East	1,135
Eagle Picher	Manufacturing	Joplin	1,015
Tamko Building Products	Manufacturing	Joplin - North	1,000
Downstream Casino	Entertainment	Joplin - South	923
Walmart	Retail	Joplin	900
Empire District Electric	Public Service	Joplin - Central	784
Missouri Southern State University	Education	Joplin - Northeast	620
Teleperformance	Call Center	Joplin - East	567
Gilster Mary Lee	Manufacturing	Joplin - Southeast	450
Jasper Products	Manufacturing	Joplin - Southwest	399
Ducommun La Barge	Manufacturing	Joplin - West	258
Bemis Packaging	Manufacturing	Joplin - Northeast	250
West Rock Company	Manufacturing	Joplin - Southeast	250
Cardinal Scale	Manufacturing	Webb City	250
Joplin Workshops	Social Services	Joplin - Central	220
ProSys	Manufacturing	Webb City	200

[17] From the Joplin 2017 CAFR

2.3 Land Use Analysis

Land use analysis focuses on the core of the study area as the City of Joplin has the most available data of all of the MAPS contributing communities.

Existing Land Use

Most of the core study area is zoned as low density residential uses (single-family housing and duplex housing). Commercial uses are concentrated along Rangeline Road and 32nd Street with another large commercial cluster near 20th Street and St. Louis Avenue. A significant amount of this commercial development was destroyed during the tornado, but new construction is also anticipated to be commercial uses. Manufacturing is located generally on small lots bordering downtown Joplin to the south and east with large lot manufacturing to the north near Webb City and along 32nd Street east of Rangeline Road. The only area planned for large office development is near Freeman West Hospital on the southwest side of Joplin. Zoned manufacturing land uses comprise of about one and a half times commercial and office zoned land uses in the core study area. Existing land use is displayed in Exhibit 2.9.

Future Land Use

While low density residential is assumed to remain the predominant land use in the core study area, the biggest land use changes are envisioned to occur in downtown Joplin where existing industrial uses will be replaced by retail uses and medium density residential development. Contrary to the current trajectory of retail development, a new commercial opportunity is envisioned west of the city on Route 66 as well as an industrial opportunity away from the high concentrations of industries on the southeast side of Joplin. There will be a continuing emphasis on Joplin as a regional shopping destination but low density housing will be less prevalent than existing land use patterns. Future land use is displayed in Exhibit 2.10 with a summary of anticipated land use changes outlined in Exhibit 2.11.

Exhibit 2.9: Land Use Change

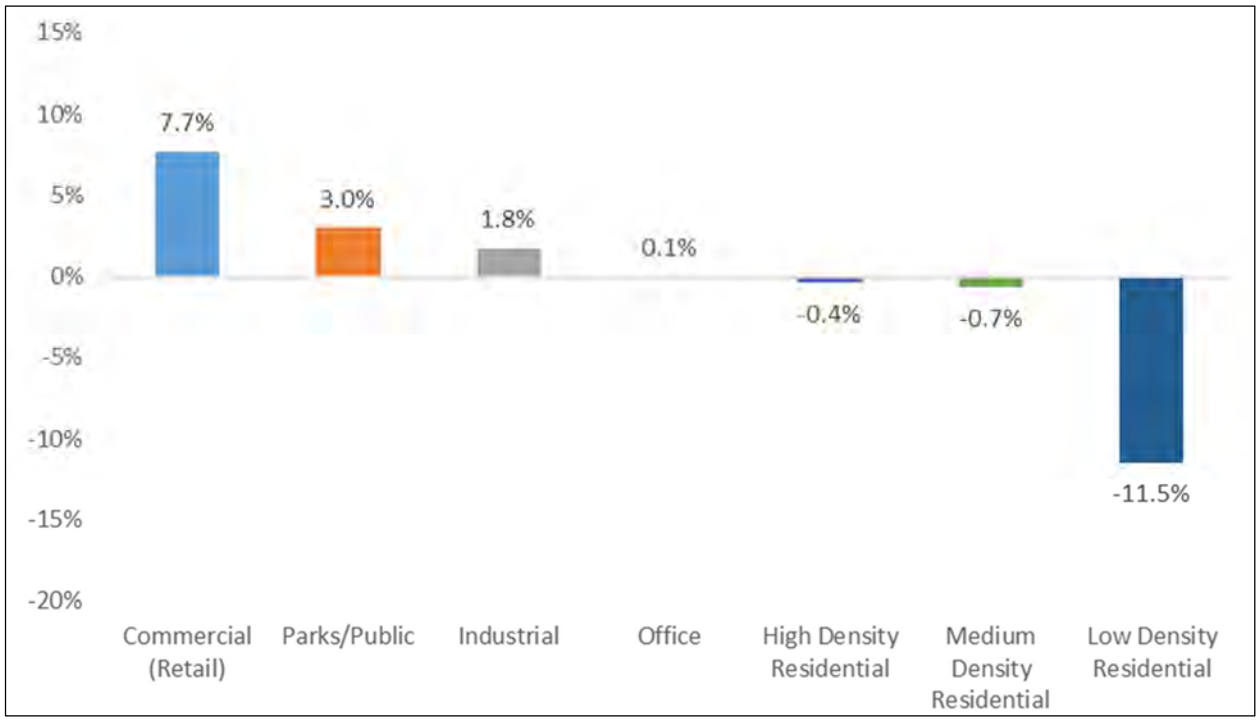


Exhibit 2.10: Existing Land Use

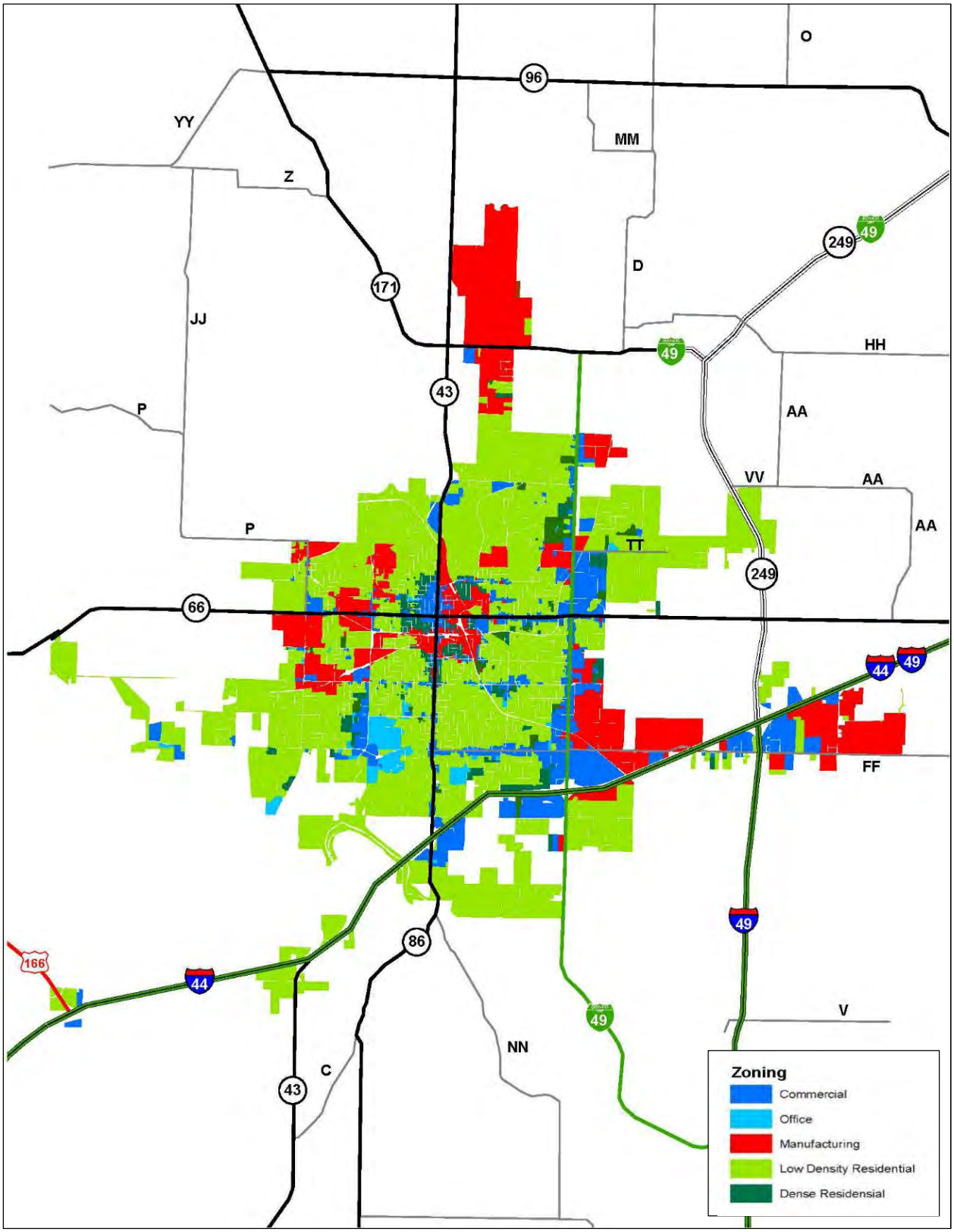
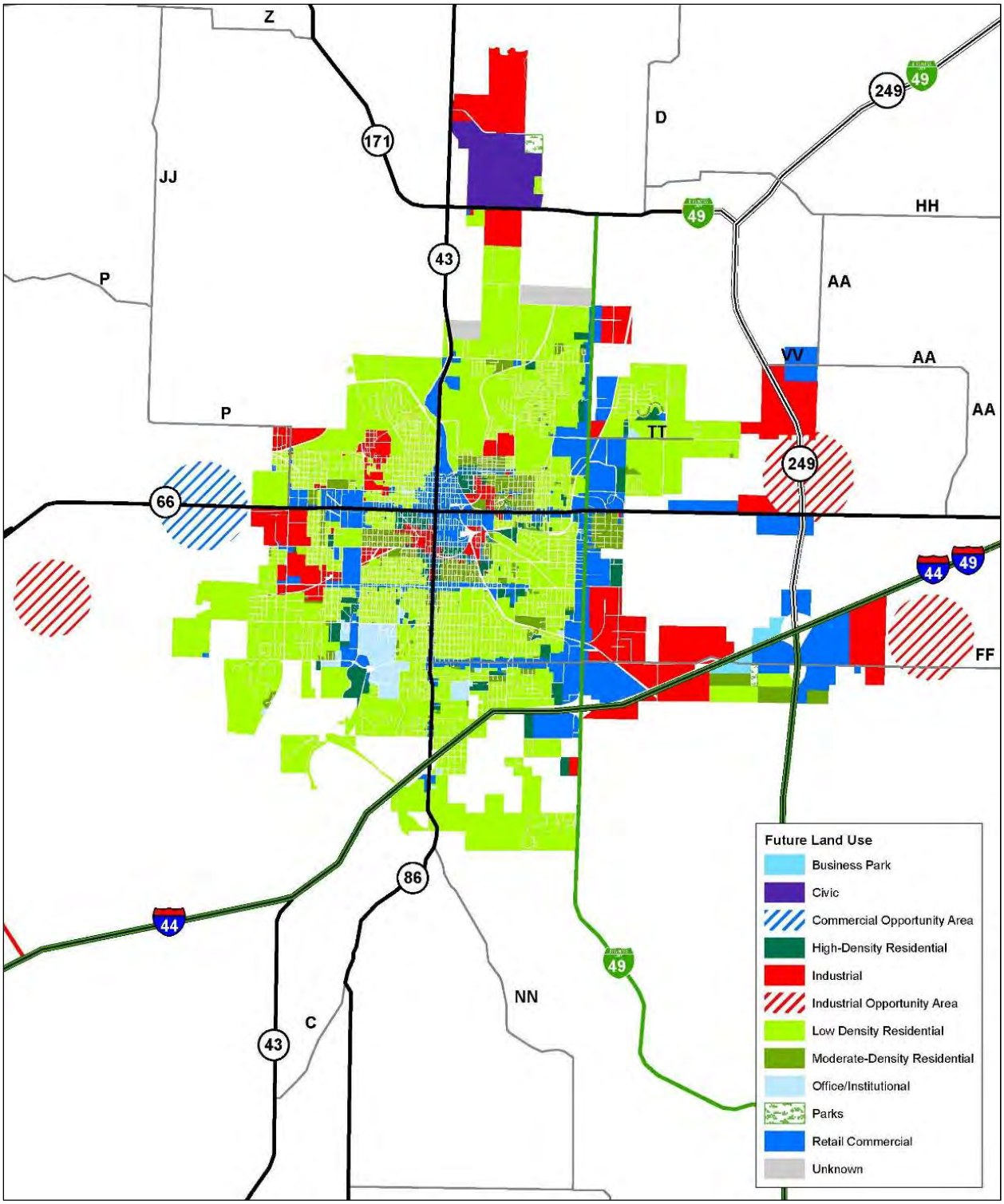


Exhibit 2.11: Future Land Use



2.4 Transportation Choice Analysis

Transportation choices such as commute characteristics and travel time to work can also demonstrate a potential transit market to explore or expand.

Commute by Carpool

Approximately four percent of residents in the study area carpool to work,[18] the lowest percentage among surrounding urban areas and about half of the next highest carpool percentage (7% carpool use in Pittsburg, Kansas). The highest concentration of employees who carpool to work live in the tornado recovery zoning surrounding the southern portion of Murphy Boulevard Park. Residents who carpool represent a potential transit market. The percentage of residents who carpool to work is displayed in Exhibit 2.12.

Commute by Public Transit

Only one-third of block groups in the study area reported greater than one percent of employees who used public transportation for commuting purposes. Overall, less than one percent of the study area's residents use public transportation for this purpose. The highest percentage of transit commuters are located near Maiden Lane and Perkins Street (Red Trolley route). In contrast, walking or biking to work as a commuting choice is six times as common as those who use transit to commute to work. The percentage of residents who utilized public transit to commute to work is displayed in Exhibit 2.13.

Mean Travel Time to Work

Residents with the longest mean travel time to work live in far north Oronogo, although the commute is still approximately 20 minutes. With the study area anchored by a mid-size city, most residents work within close proximity to their place of employment.[19] Mean travel time to work for residents within the study area is displayed in Exhibit 2.14.

18. 2016 American Community Survey 5-year estimates
19. 2017 American Community Survey 5-year estimates

Exhibit 2.12: Commute by Carpool

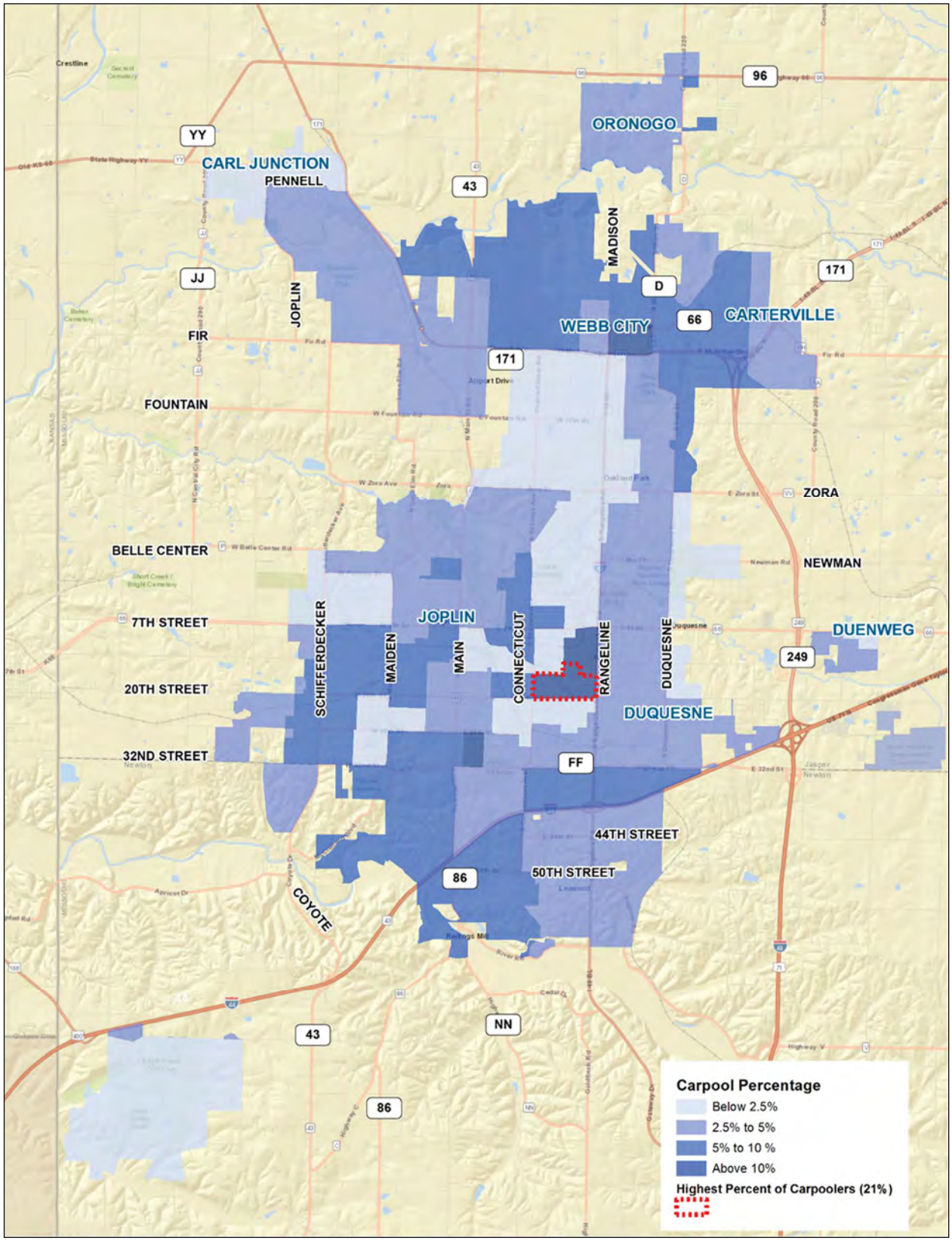


Exhibit 2.13: Commute by Public Transit

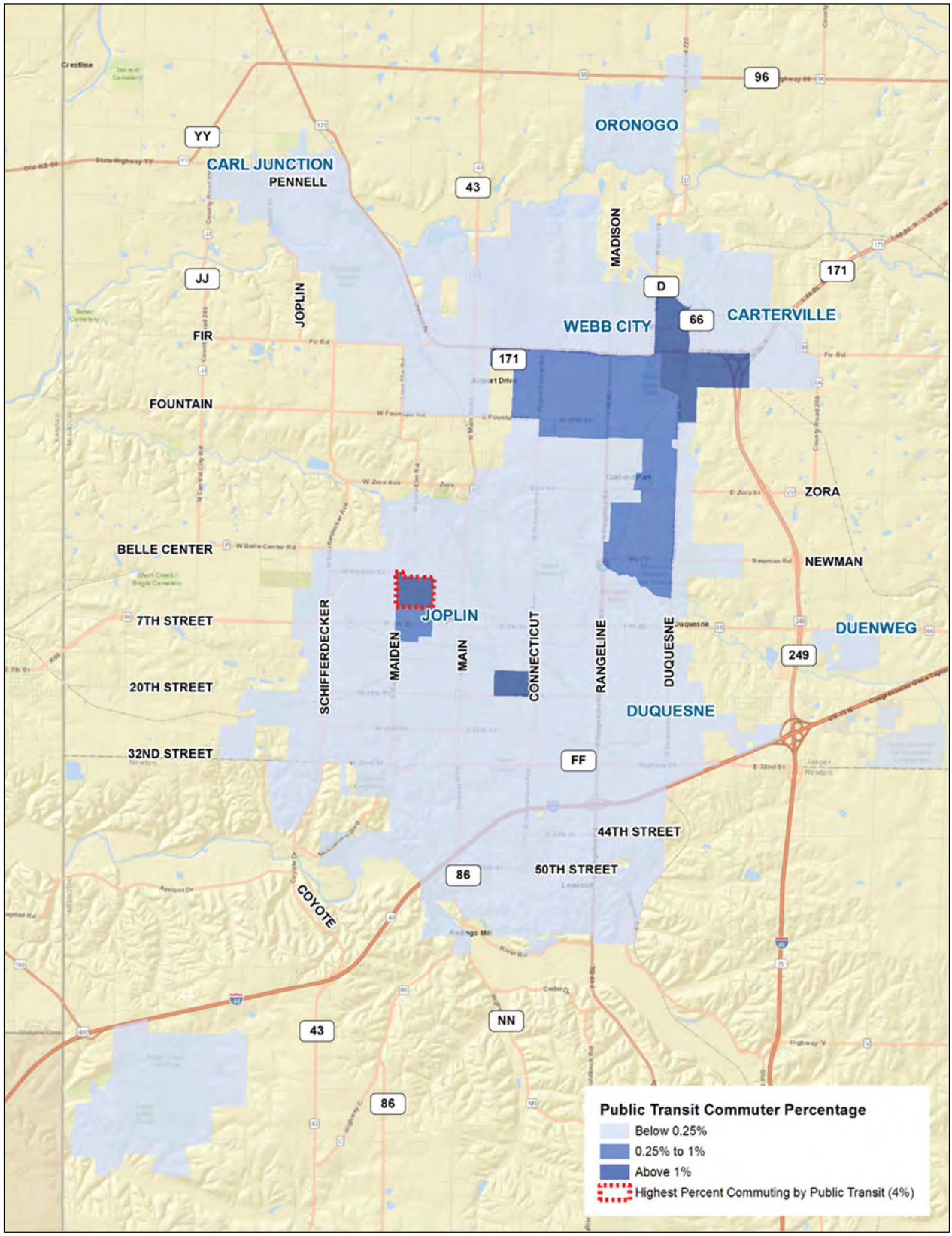
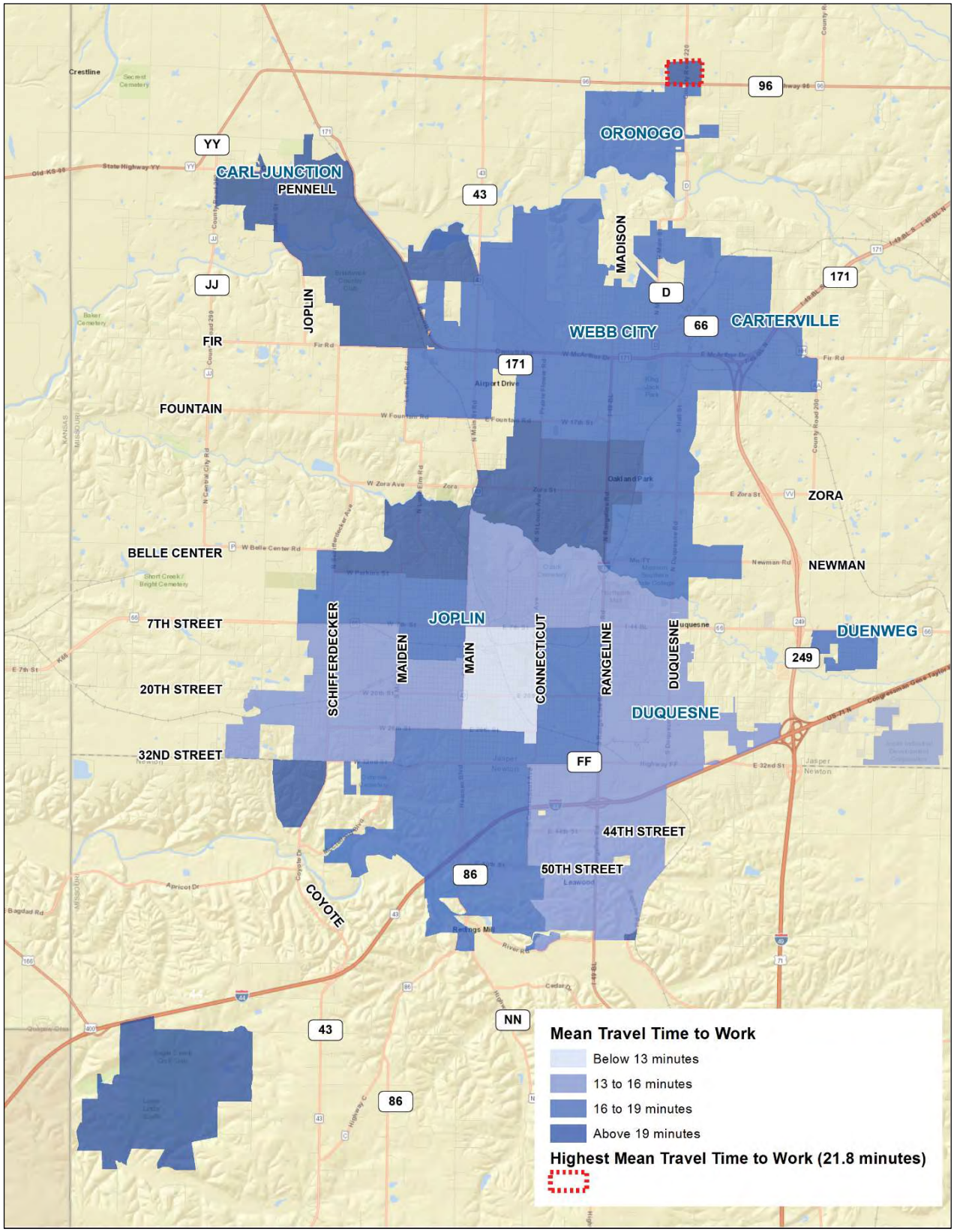


Exhibit 2.14: Mean Travel Time to Work



2.5 Transit Demand Index

The previous demographic, employment, land use, and transportation choice information was combined into a Transit Demand Index to numerically capture and identify the greatest demand for transit service in the study area. The index uses the work of Dr. Steve Polzin of the Center for Urban Transportation Research (CUTR) at the University of South Florida as the basis for the formula, and has been enhanced utilizing best practices developed by the study team. Polzin uses the following equation in his research to determine transit demand:

$$Population + (Jobs \times 0.50) + (Service\ Jobs \times 0.75) + (Zero\ Vehicle\ Households \times 1.75)$$

For the study area, the baseline equation was expanded by separating the population into the following transit-dependent demographic groups:

- Older Adults (65+ Years)
- Minority Population
- Persons with a Disability
- Low Income Population
- Zero Vehicle Households

Previous research also supports the following guidelines in metropolitan areas:[20]

- Individuals over 65 years are over 1.5 times more likely to use transit.
- Minority populations are a more than 2.0 times as likely to use transit.
- Persons with a disability are 5.5 times more likely to use transit.
- Low income residents are about 1.5 times more likely to use transit.
- Individuals without access to a vehicle are nearly 8.0 times more likely to use transit.

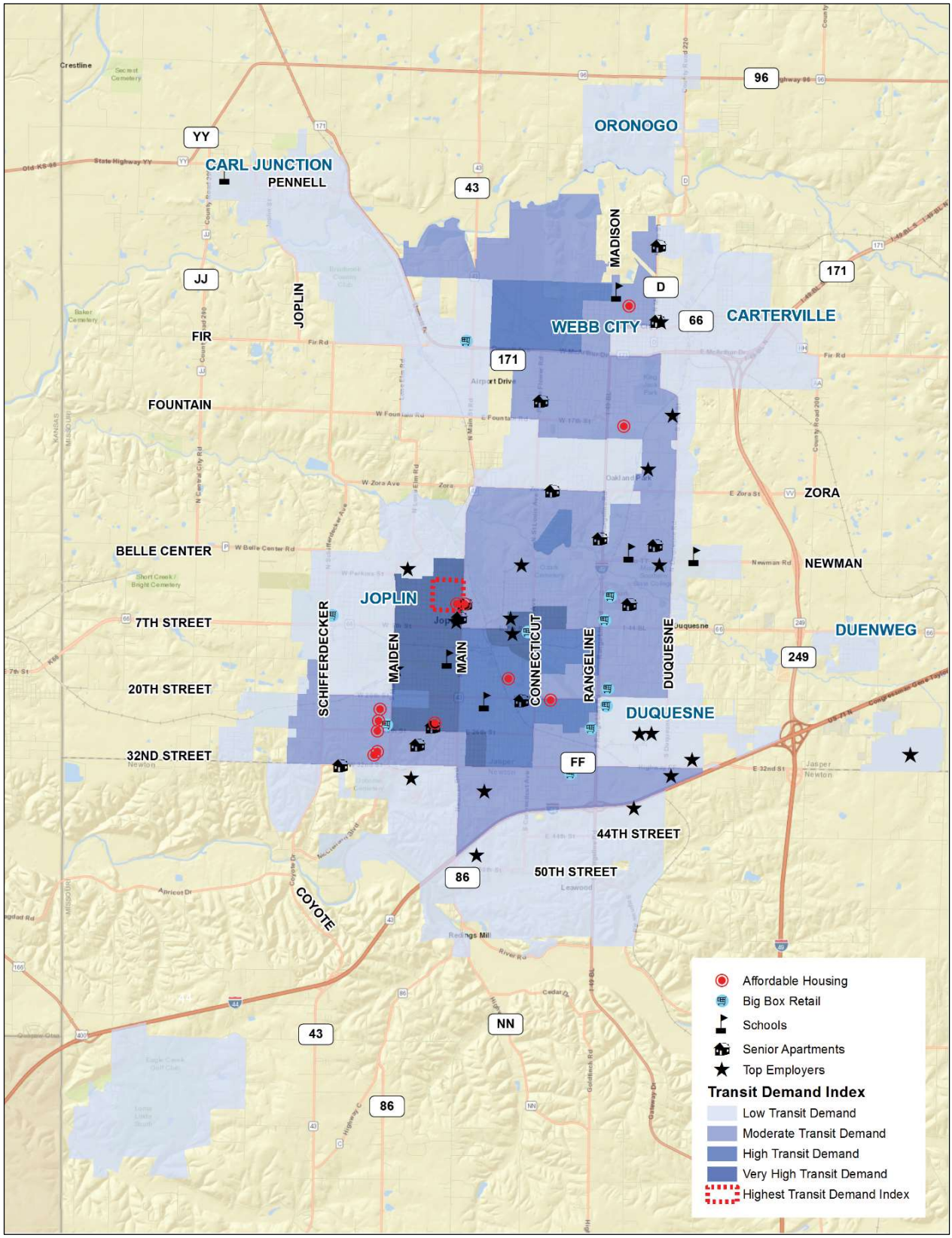
Since these demographic groups have different propensities to use transit, multiplying the population of the groups by these factors will provide a more accurate snapshot of transit demand rather than just using total population. The tailored equation also takes into account the density of the block groups surveyed. Where information was only available at the tract level, percentage of individuals with a disability within a tract was assumed to remain constant across all block groups within that census tract. Note that the Transit Demand Index will tend to favor denser areas and areas that have a good mix of jobs and housing.

$$\frac{Population + (Older\ Adult \times 1.6) + (Minority \times 2.3) + (Disability \times 5.5) + (Low\ Income \times 1.4) + (Zero\ Vehicle \times 8.0) + (Jobs \times 0.5) + (Service\ Jobs \times 0.75)}{Acres\ in\ Block\ Group}$$

The transit demand index can be applied to any community, as the resulting numbers should be viewed as relative to the overall average index of a community, rather than to an ideal baseline. Overall, the area of Joplin with the highest transit demand is the downtown area north of 7th Street and adjacent to Main Street. The Transit Demand Index is displayed in Exhibit 2.15.

20. "TCRP Report 28: Transit Markets of the Future: The Challenge of Change" Table 4

Exhibit 2.15: Transit Demand Index



CHAPTER 3 | EXISTING TRANSIT SERVICES

There are three types of public transportation services operating in the study area:

- *Sunshine Lamp Trolley:* The Metro Area Public Transit System (MAPS) operates three flex routes known as the Sunshine Lamp Trolley.
- *MAPS:* MAPS operates demand response and paratransit service within the Joplin city limits and adjacent communities within the Joplin Metropolitan Area.
- *OATS:* OATS, Inc. is the rural and small urban demand response provider for Missouri. OATS operates intercity trips to and from Joplin on specific days, as well service outside the city limits for residents not served by the flex route bus service.

As displayed in Exhibit 3.1, the majority of transit riders in the study area use the Sunshine Lamp Trolley.

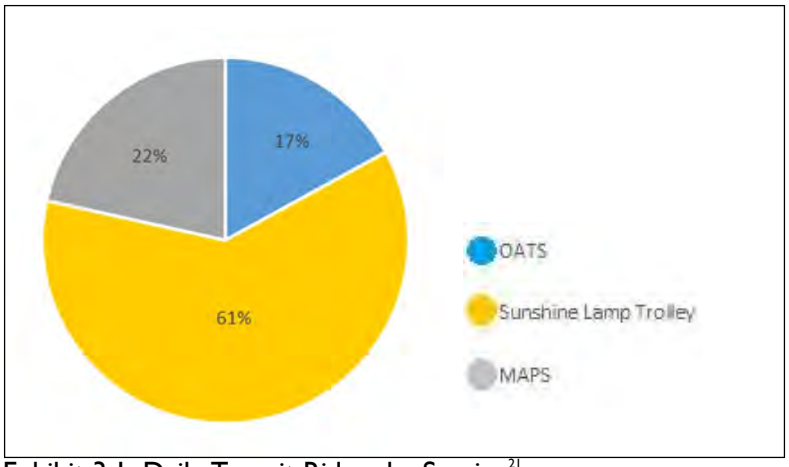


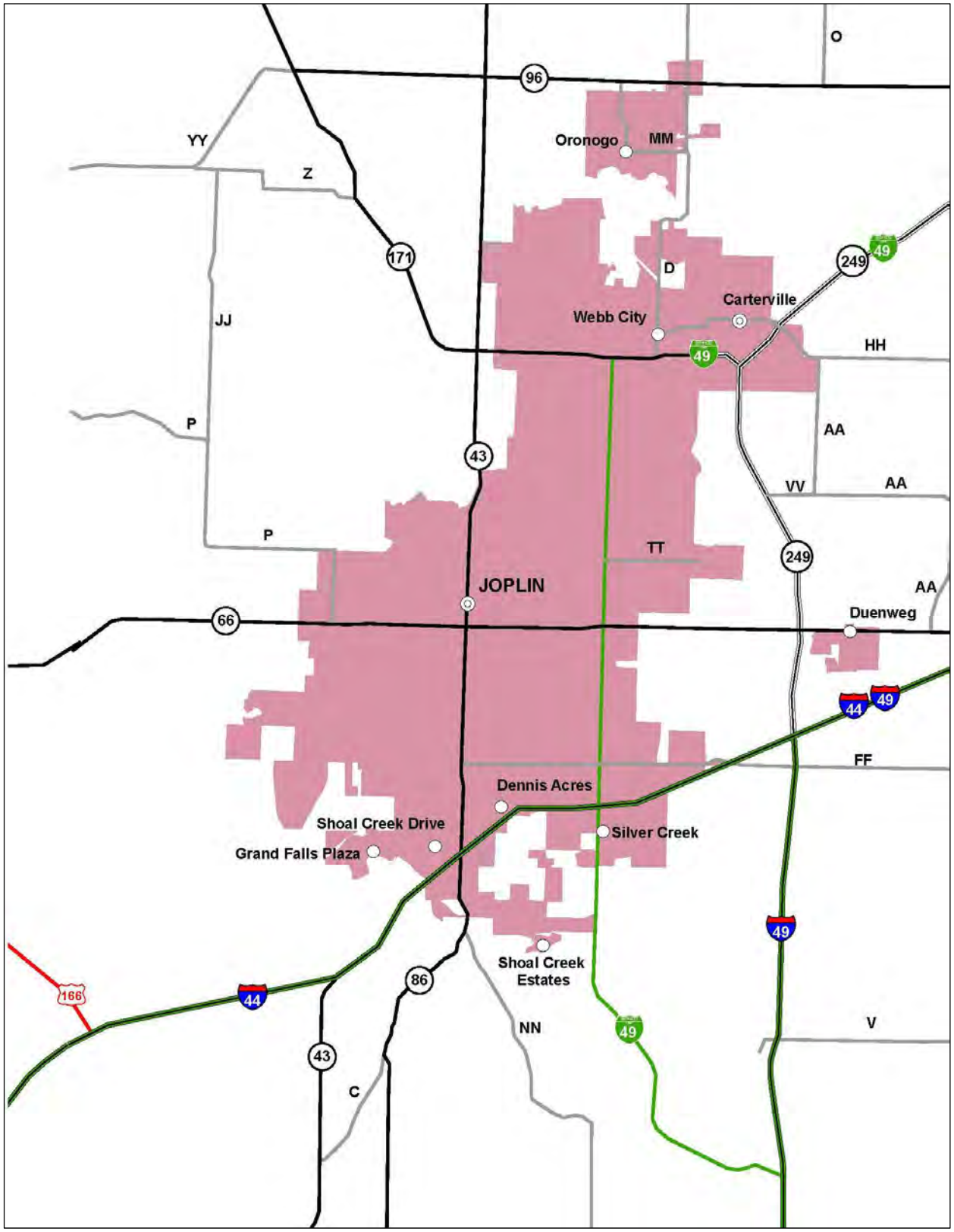
Exhibit 3.1: Daily Transit Riders by Service[21]

3.1 Metro Area Public Transit System (MAPS)

MAPS is the primary public transit service provider in the study area. It is also the name used to differentiate the flex route service (Sunshine Lamp Trolley) from the demand response service (MAPS). The MAPS service area included the following communities as of 2018: Airport Drive, Carterville, Dennis Acres, Duenweg, Grand Falls Plaza, Joplin, Leawood, Oronogo, Redings Mill, Saginaw, Shoal Creek Drive, Shoal Creek Estates, Silver Creek, and Webb City. Although Duquesne and Carl Junction were contributing jurisdictions in 2018, they elected to cease being funding communities in 2019. The MAPS service area is displayed in Exhibit 3.2.

21. OATS ridership estimated by multiplying the statewide per capita ridership by the population study area.

Exhibit 3.2: 2019 MAPS Service Area



Sunshine Lamp Trolley (Flex Routes)

Three flex routes operate in the study area as the Sunshine Lamp Trolley. Flex routes are a hybrid between fixed routes and demand response service. A bus will operate along a designated route but will deviate up to 3/4-mile off the route to pick-up or drop-off riders upon request. Deviations must be scheduled with at least one hour advanced notice.

The three flex routes are identified by color as the Blue route, Red route, and Green route. Characteristics of each route are outlined in Exhibit 3.3. All service runs within the Joplin city limits from 7:00 AM and 6:00 PM on weekdays and 9:00 AM to 4:00 PM on Saturdays. The full fare is $1.00 with a $0.50 reduction if a rider is over 60 years, has a disability, or is a Medicare recipient. Route deviations cost $2.00 and routes run every 60 minutes. The Red route and Blue route each carry approximately 37 percent of all daily riders while the Green route carries 26 percent of daily riders. Daily system ridership is summarized in Exhibit 3.4 with the three flex routes displayed in Exhibit 3.5.

Exhibit 3.3: Flex Route Characteristics

Route	Destinations	Transfer Location	To Route
Red	Downtown Joplin, Freeman West Hospital, Mercy Village, Price Cutter	MAPS Office	Blue
		20th Street & Main Street	Green
Blue	Walmart, Northpark Mall, Northpark Crossing, Missouri Southern State University	MAPS Office	Blue
		Walmart (Rangeline Road)	Green
Green	Walmart, Sam's Club, Food 4 Less, Freeman East Hospital, Mercy Village	20th Street & Main Street	Red
		Walmart (Rangeline Road)	Blue

Exhibit 3.4: Average Daily Flex Route Ridership

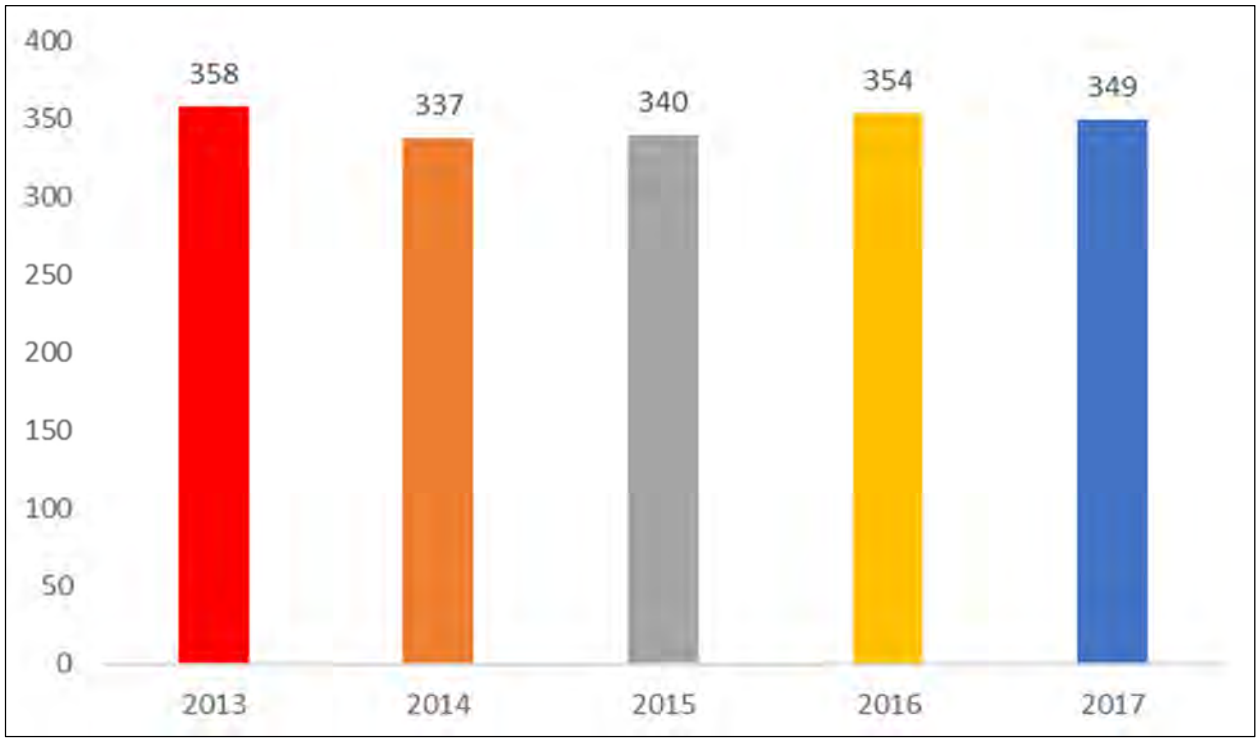
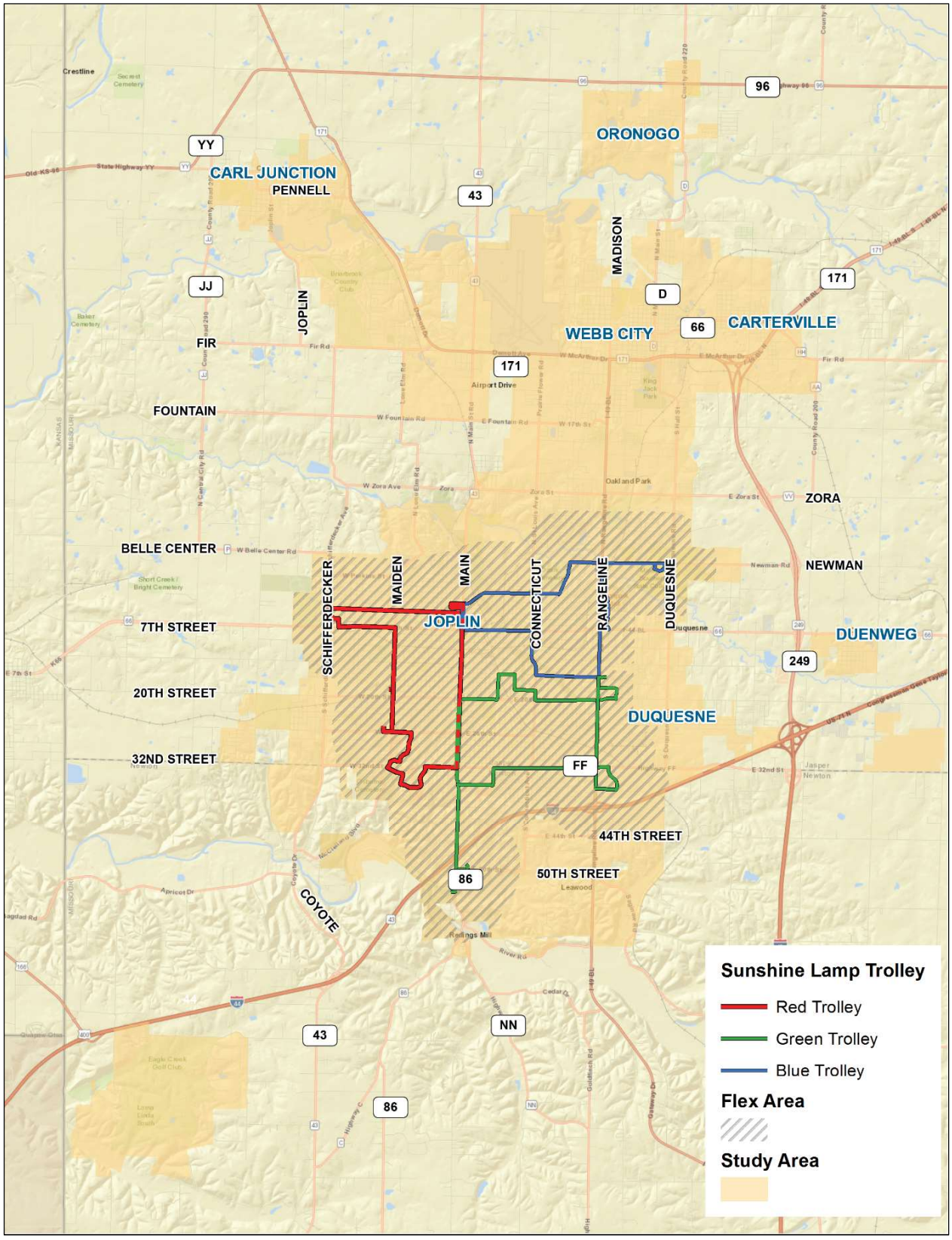


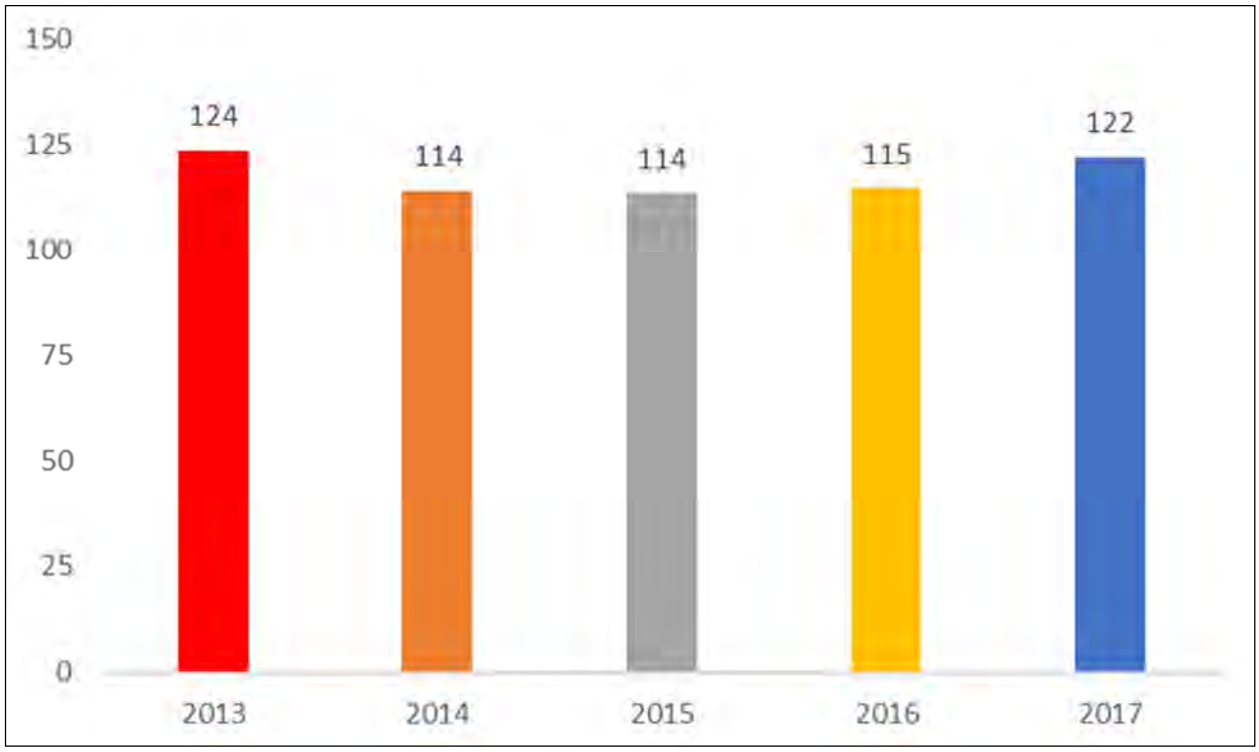
Exhibit 3.5: Flex Route Transit Map



MAPS (Demand Response)

MAPS operates demand response service Monday through Friday from 6:00 AM to 5:00 PM and Saturdays from 8:30 AM to 3:30 PM. All riders are advised to reserve a trip seven days in advance. Although rides can be scheduled a day in advance, same day requests cannot always be accommodated. MAPS charges a flat fare of $4.00 for general public riders, with a $2.00 fare if a rider is over 60 years, has a disability, or is a Medicare recipient. As displayed in Exhibit 3.6, ridership has remained fairly steady over the past five years.

Exhibit 3.6: Average Daily MAPS Demand Response Ridership



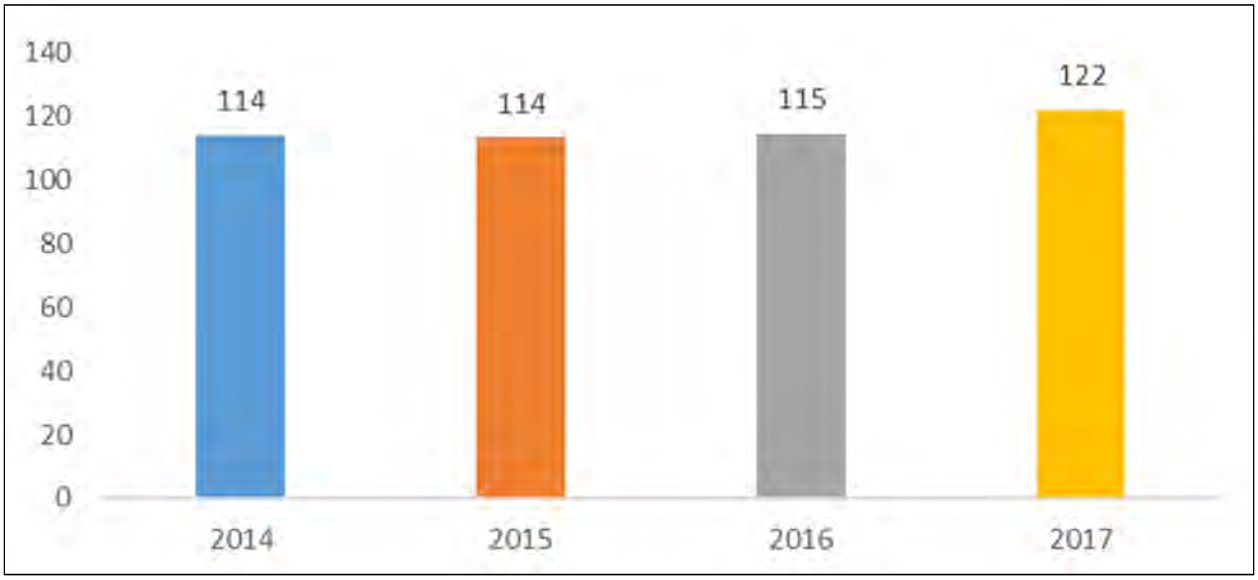
3.2 OATS, Inc.

OATS, Inc. operates rural demand response service (curb to curb) in 87 counties in Missouri. Both Jasper County and Newton County are within their service area. While OATS, Inc. does not serve the study area directly, the provider offers several trips into Joplin from surrounding counties. Characteristics of each route are outlined in Exhibit 3.7. These trips range from a flex route that runs from near the Arkansas-Missouri state line to scheduled demand response "routes" that run occasionally to Joplin. All routes require advance reservations. Fares vary by distance depending on whether the trips is entirely within a community, within a county, or crosses county lines. There are no transfer media available if a rider wants to transfer from an OATS, Inc. bus to a service run by MAPS. As displayed in Exhibit 3.8, OATS ridership is estimated to be only a third the Sunshine Lamp Trolley ridership. OATS routes are displayed in Exhibit 3.9.

Exhibit 3.7: OATS Route Characteristics

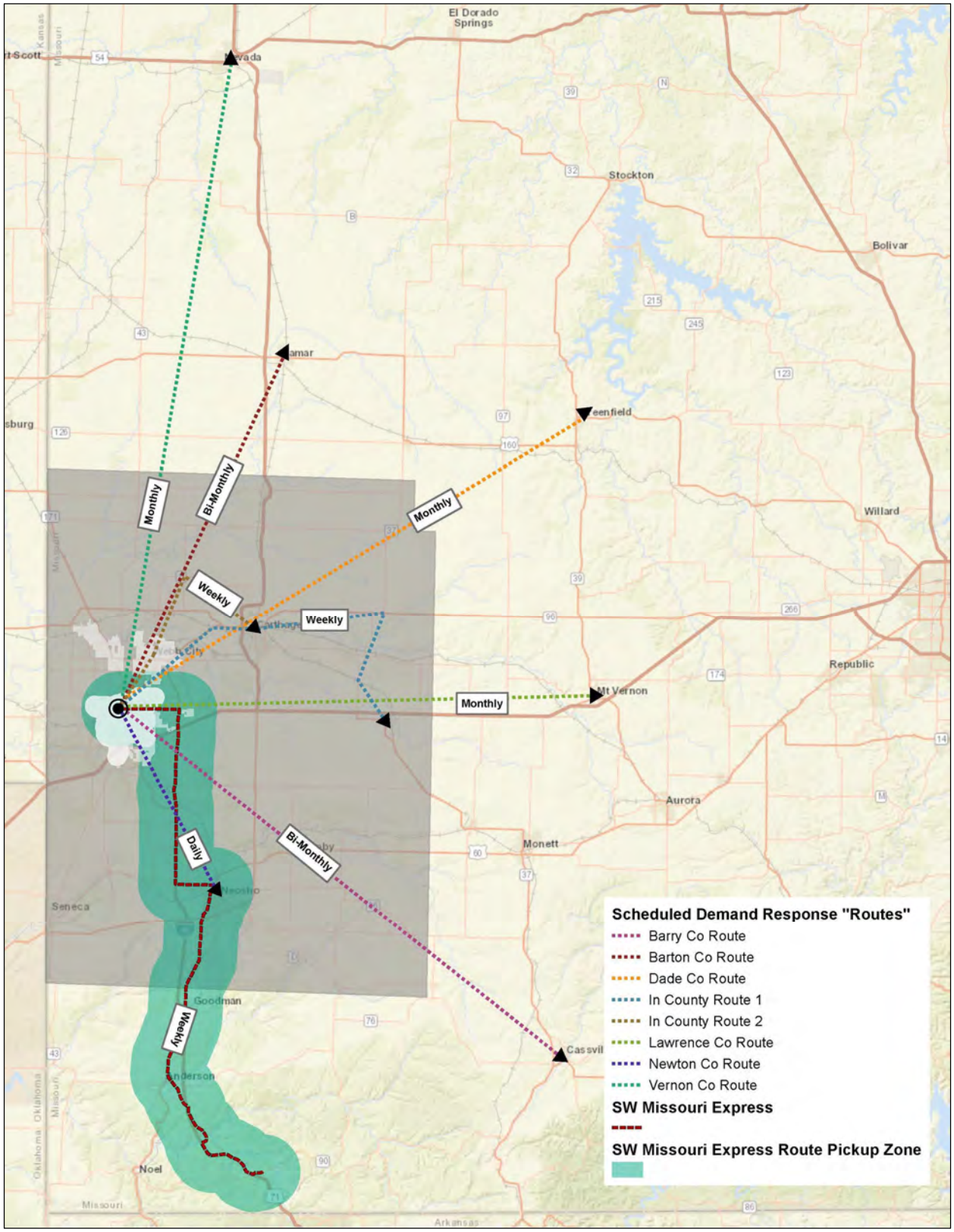
Route	Origin	Frequency
Barton County	Barton County	1st Monday, 3rd Thursday
Carthage-Joplin	Carthage, Webb City, Alba	Every Monday
Dade County	Dade County	3rd Monday
Lawrence County	Lawrence County	4th Monday
Newton In-County	Rural Newton County	Every Thursday
Sarcoxie-Joplin	Carthage, Reed, Avilla, Sarcoxie	Every Tuesday
SW Missouri Intercity Express	Pineville, Anderson, Goodman, Neosho	Every Wednesday
Vernon County	Vernon County	1st Wednesday

Exhibit 3.8: Average Daily OATS Ridership[22]



22. Estimates, based on statewide per capita OATS ridership, applied to the study area population

Exhibit 3.9: OATS Routes Transit Map



3.3 Other Transit Services

ADA Paratransit

ADA paratransit service is required by the federal Americans with Disabilities Act. Only persons who are certified as a person with a disability are eligible to ride this service. Trips are only provided at the same times and within the same geographic areas as fixed route bus service. All fixed routes in the study area are flex routes that will deviate up to 3/4-mile off route for pickups and drop offs (the required ADA service area) so the Sunshine Lamp Trolley provides the ADA service as well.

Specialized Transportation Services

In addition to MAPS service, there are a few non-profit or social service agencies that also provide paratransit services for their clients. These specialized services, which operate during various hours and from different locations, are outlined in Exhibit 3.10.

Exhibit 3.10: Specialized Transportation Service

Service	Days	Hours
Cerebral Palsy of Tri-County	Monday to Friday	7:30 AM to 5:00 PM
Checker Mobility Transport	Monday to Sunday	24 Hours
Joplin Workshops	Monday to Friday Saturday	6:00 AM to 11:30 PM 6:00 AM to 4:30 PM
Newton county Developmental Disabilities Board	Monday to Friday	8:00 AM to 5:00 PM
Ozark Center	Monday to Friday	6:00 AM to 6:00 PM

Nearby Demand Response Transportation Services

Two nearby demand response service system operate in Oklahoma and Kansas, both of which serve the general public:

- *SEK-CAP:* This provider operates demand response service northwest of the study area in Crawford County, Kansas. Service operates from 8:30 AM to 3:00 PM weekdays only and is free (although donations of $1.00 are accepted).
- *Pelivan:* This provider operates demand response service southwest of the study area in Ottawa County, Oklahoma. Service operates from 8:00 AM to 4:00 PM weekdays. The current cash fare is $3.00 with an additional $200 per mile fee beyond Miami city limits.

The systems are briefly included in the analysis as they could serve as potential connections to MAPS service at Loma Linda or the Downstream Casino.

3.4 Peer City Analysis

Peer cities of Joplin that have fixed or flex route transit systems include Fort Smith, Arkansas (Fort Smith Transit); Jackson, Tennessee (JTA); Waterloo, Iowa (MET); Jackson, Michigan (JATA); and Kingsport, Tennessee (KATS). For comparison, the percentage of residents in those service areas that use public transit to commute to work is outlined in Table 5. All but Kingsport, Tennessee have higher numbers of transit commuters compared to the study area. The national average using public transit to commute to work is approximately 5.1 percent.

Exhibit 3.11 outlines the percentage of residents in those service areas that use public transit to commute to work. All but Kingsport have higher numbers of transit commuters. Note that the national average is 5.1 percent.

Exhibit 3.11: Peer City Daily Transit Commuters[23]

Area	Daily Commuters	Daily Transit Commuters	Percent
Study Area	40,873	118	0.29%
Jackson, Michigan	12,647	183	1.45%
Jackson, Tennessee	28,318	341	1.20%
Waterloo, Iowa	58,525	355	0.61%
Fort Smith, Arkansas	31,121	171	0.46%
Kingsport, Tennessee	20,913	32	0.15%

3.5 Key Takeaways

The information in the *Market Analysis* chapter *and the Existing Transit Services* chapter will be used to formulate service recommendations. The following are key takeaways from the analysis:

- *Ridership:* Sunshine Lamp Trolley (flex route) transit ridership has remained consistently strong over the past five years. Additional coordination between OATS and MAPS services in Joplin could lead to efficiencies in service.
- *Trip Purpose:* Most riders are using transit to shop, visit friends, or for medical trips. Few people are currently using transit to commute to work. The strongest commuting flows are into the study area in the morning and out of the study area in the evening. The opportunity moving forward is to sustain the popularity of the Sunshine Lamp Trolley and find a way to attract more work trips.
- *Land Use:* There is good mix of retail and housing in most block groups in the study area, leading to low residential densities, but a better than average amount of mixed-use districts. The tornado recovery zone along 20th Street has the greatest potential to increase in population in the short-term as housing continues to be rebuilt in this area. Large employers are scattered but are largely grouped on the east and west edges of the study area. The Sunshine Lamp Trolley generally serves affordable (non-senior) housing, retail, and medical services in the study area. Relatively few of the largest employers or senior housing is currently served.
- *Unmet Transit Demand:* The Rangeline Road corridor north of Newman Road to Webb City demonstrates the most unmet transit demand. There are many block groups with a high Transit Demand Index and these block groups tend to be concentrated between an area roughly bounded by 26th Street, Main Street, Maiden Lane, and F Street.

23. Table S0802: Means of Transportation to Work by Selected Characteristics 2013-2017 American Community Survey 5-Year Estimates

CHAPTER 4 | COMPREHENSIVE SERVICE ANALYSIS

Establishing performance measures to evaluate current and future fixed routes, as well as demand response service, is essential in identifying potential areas of improvement.

4.1 Fixed Route Performance Measures

Proposed performance measures of productivity, reliability, and subsidy are relevant to performance and vary enough by route to be useful for comparison. Each measure should be calculated quarterly and for each type of trip (weekday or weekend). Routes that fall below the standard for four consecutive quarters, or that demonstrate a consistent downward trajectory, should be modified, restructured, or eliminated.

Productivity

This category measures how useful the route is in serving passenger demand. A route with low productivity would be a candidate for elimination or route adjustment in order for resources expended on this route to be better utilized elsewhere. The productivity measures are trips per revenue mile and trips per revenue hour. A revenue hour or trip is the time or distance the bus travels when paying passengers can board (excludes deadhead time back to the garage or other routes).

Most demand response exclusive transit systems have better productivity on weekdays than weekends. However, in Joplin, most cases demonstrate better performance on Saturdays. The Blue route and Red route perform much better than the Green route in all measures. The current fixed route system productivity is illustrated by route in Exhibits 4.1 and 4.2 The peer transit systems to Joplin (Jackson, TN; Jackson, MI; Waterloo, IA; Fort Smith, AR; and Kingsport, TN) have an average of 0.88 trips per revenue mile and 12.06 trips per revenue hour as illustrated in Exhibits 4.1 and 4.2. Currently, the Blue route and the Red route meet these standards in three out of four instances, where the Green route meets it just once.

Exhibit 4.1: Trips per Revenue Mile

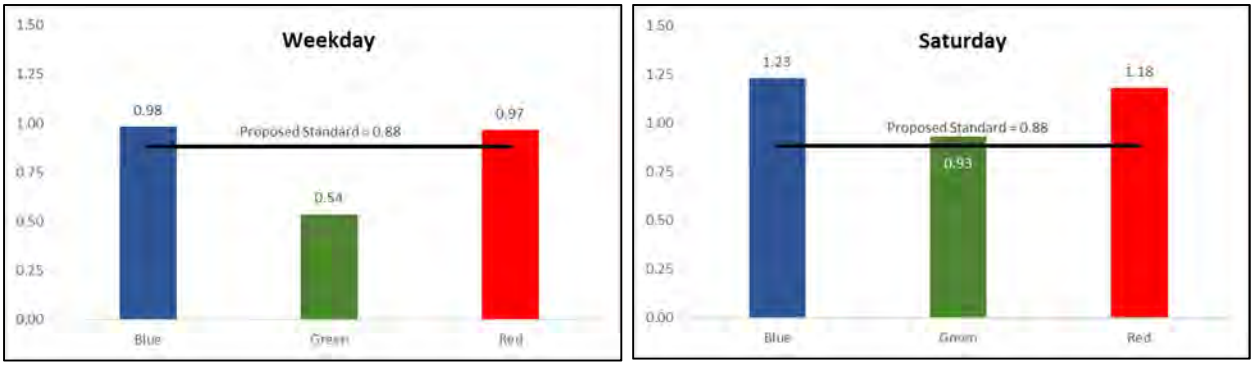
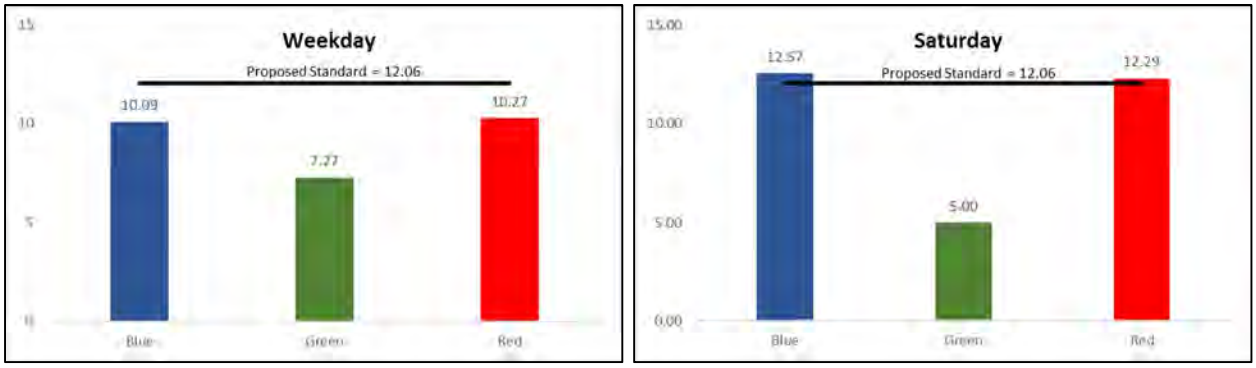


Exhibit 4.2: Trips per Revenue Hour



Reliability

Reliability is directly tied to the customer experience. An unreliable route system could discourage all but the most dedicated riders and hinder growth of a system. There is anecdotal evidence that the Joplin fixed route system sometimes has difficulty running on time, causing trips late in the day to be missed, once the cumulative minutes the route is late is beyond 30 minutes. The reliability measures are on-time performance in Exhibit 4.3 and meeting timepoints in Exhibit 4.4. On-time performance measures the percentage of trips ending with enough time to start the next trip on time. Meeting timepoints is the percentage of times the route is less than six minutes late to a key timepoint. The following timepoints were used in the analysis: 20th Street and Main Street, Walmart (Rangeline Road), Freeman East Hospital, MAPS Office, Joplin Housing Authority, and Missouri State Southern University.

There is little difference in on-time performance or ability to meet timepoints by day type. The Green route demonstrates the most difficulty in both of these measures. The industry target goal for on-time performance is 90 percent. The industry goal for meeting timepoints is 75 percent of trips. With a flex route system, the latter goal may be a difficult measure to achieve. None of the routes meet the on-time performance goal and only the Blue route achieves the meeting timepoint goal as illustrated in Exhibits 4.3 and 4.4.

Exhibit 4.3: On-Time Performance

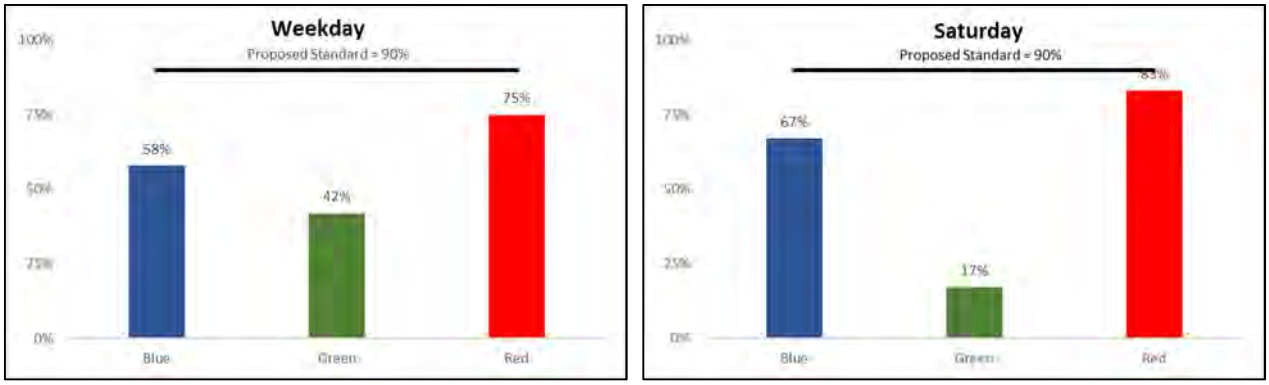
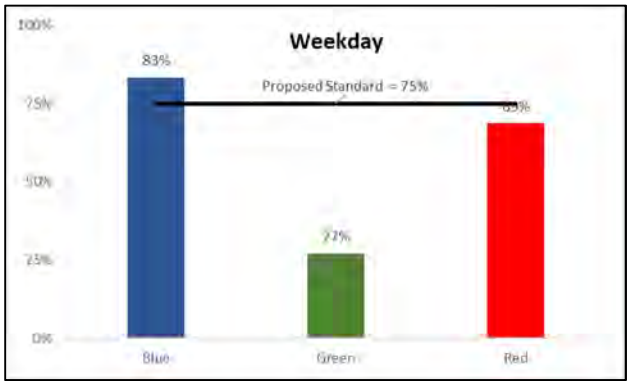
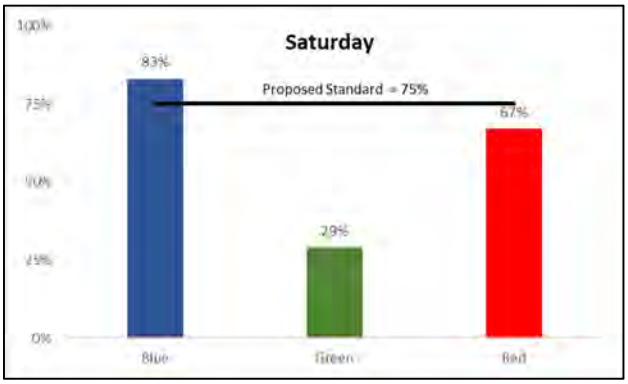


Exhibit 4.4: Meeting Timepoints



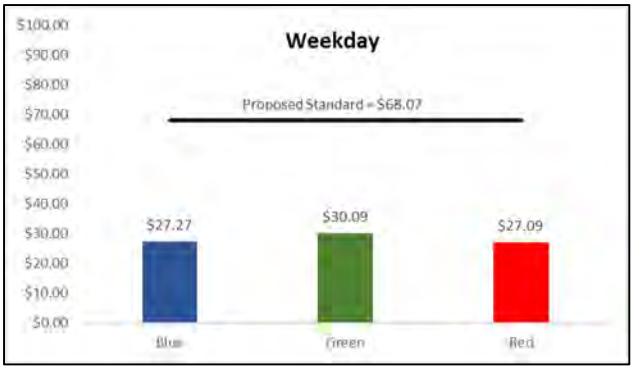


Subsidy

Subsidy measures the cost-effectiveness of a transit system. If running a flex route becomes less fiscally prudent than running demand response service in the same area, it may be necessary to reevaluate the type of service provided in a particular area. The two subsidy measures are subsidy per revenue hour in Exhibit 4.5 and farebox recovery ratio in Exhibit 4.6. Subsidy per operating hour is the cost to the MAPS funding partners of running an hour of service when passengers can be picked up (once fares are subtracted). Farebox recovery ratio is the percentage of fares paid by riders.

The amount of subsidy a local funding agency is willing to make is a policy issue, rather than necessarily a guide to route performance. For instance, a system with very little coverage may have a high farebox recovery ratio (as it is only serving a core area) without succeeding in its mission of serving the whole community. However, the peer transit systems to Joplin can serve as a guide. They average a subsidy of $68.07 per operating hour, which is a maximum measure in this instance. As illustrated on Exhibit 4.5, Joplin's current routes fall well below this measure. Based on the peer transit systems, a 10 percent farebox recovery ratio on weekdays and 27 percent recovery ratio on weekends is desirable. If this recovery ratio were used as the performance measure target, in only one instance would a route not meet it (the Green route) as illustrated in Figure 4.6.

Exhibit 4.5: Subsidy per Operating Hour



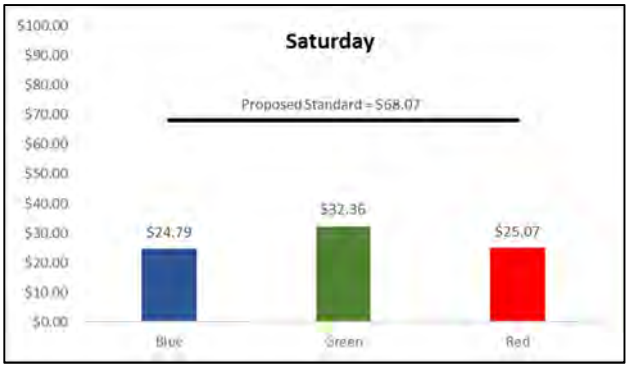
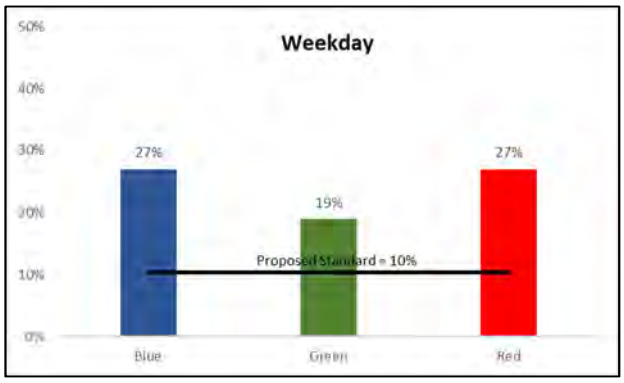
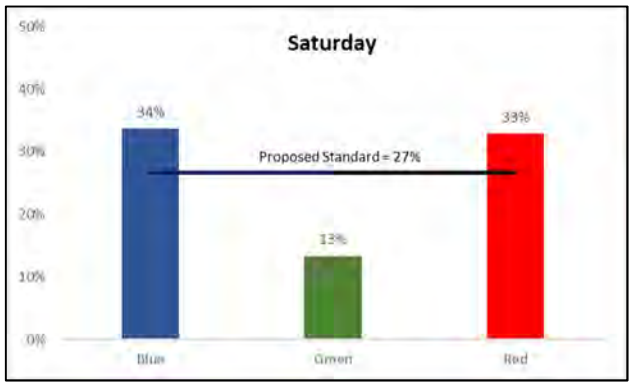


Exhibit 4.6: Farebox Recovery Ratio

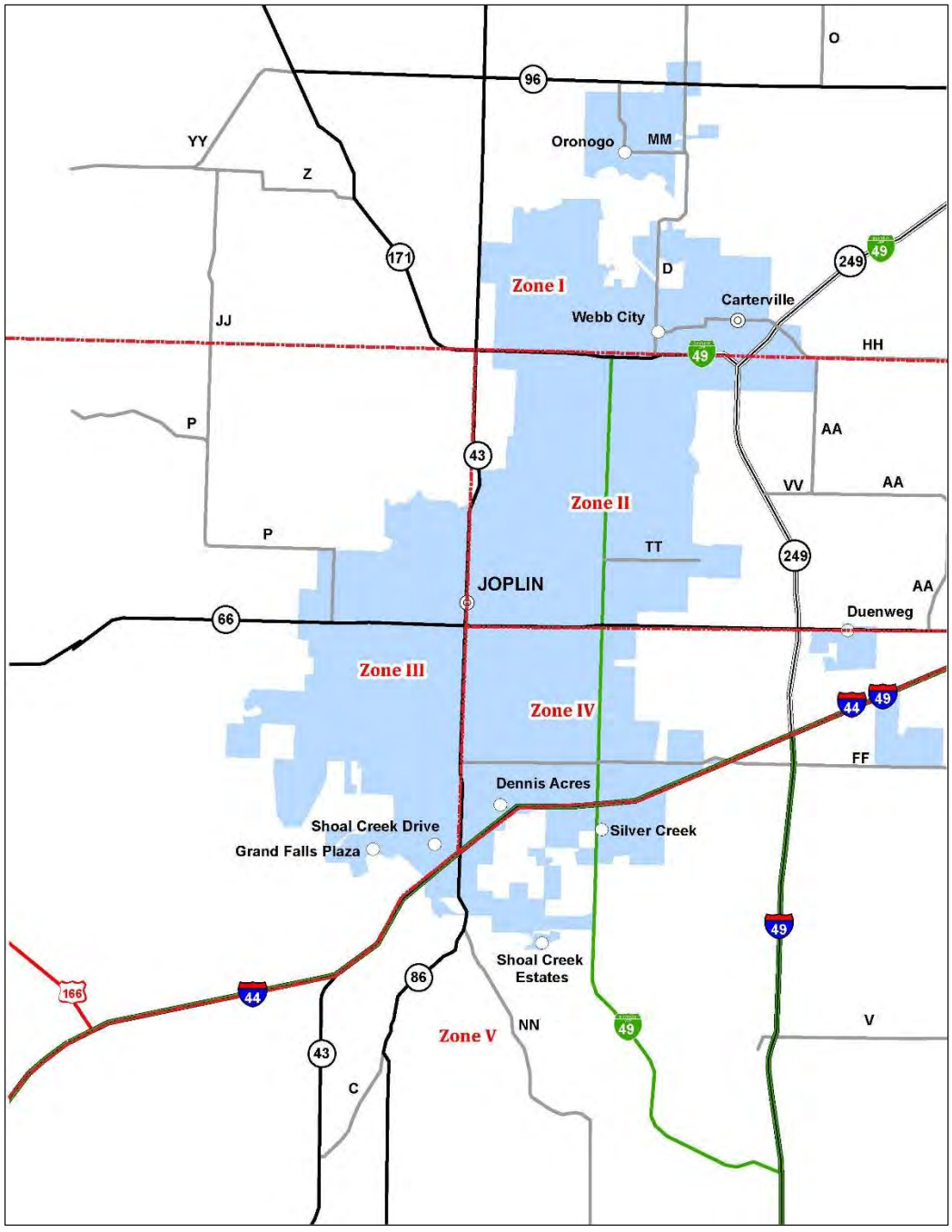




4.2 Demand Response Performance Measures

Common demand response performance measures include trips per revenue mile and ride turndown rates. When collected, these measures are evaluated on a monthly basis and apply to the entire system. As such, it may be difficult to identify where particular problems are occurring and whether the issue is a systemic rather than a localized issue. In order to better evaluate the demand response system, the service area should be segmented into data zones. Exhibit 4.7 outlines a potential method to identify data zones in the service area.

Exhibit 4.7: Potential Demand Response Data Zones



4.3 Route Profile Sheets

Route profiles indicate the performance of each route. An additional demographic measure (coverage) has also been added to evaluate these routes in the context of the *Market Analysis* chapter

Blue Route

The Blue route serves the northeast side of Joplin. The area served by the Blue route generally has between 1.5 and 3.5 persons per acre (below average in the service area), but does serve one high-density area.[24] This area is north of Murphy Boulevard Park near Park Apartments. The minority percentage in the Blue route service area is generally higher than average (above 15%), but is not the highest in Joplin. The route also mostly travels through higher than average low-income areas (above 10%). There is one large employer along the route (Tele performance) as well as many retail jobs along Rangeline Road. The route's service area has a diverse mix of uses, with manufacturing, commercial, and residential uses of various densities along the route.

Some notable destinations along the route include Messenger Towers, Park Apartments, Northpark Mall, Target, Walmart, and Missouri Southern State University. Transfers can be made to the Green route at Walmart and to the Red route at the MAPS office. Tuesday is the highest ridership day with the highest ridership trips occurring between 11:00 AM and 4:00 PM.

Performance measures for the Blue route are summarized in Exhibit 4.8. Route maps are displayed in Exhibit 4.9 and Exhibit 4.10.

Exhibit 4.8: Blue Route Performance Measures

Category	Performance Measure	Blue Route		System Average	
		Weekday	Saturday	Weekday	Saturday
Productivity	Trips per Mile	0.98	1.23	0.83	1.11
	Trips per Hour	10.09	12.57	9.21	9.95
Reliability	On-Time Performance	58%	67%	58%	56%
	Meeting Timepoints	83%	83%	60%	60%
Subsidy	Subsidy per Trip	$2.70	$1.97	$3,16	$3.49
	Subsidy per Hour	$27.27	$24.79	$28.15	$27.41
	Farebox Recovery Ratio	27%	34%	25%	27%
Coverage	High Transit Demand Areas Served	31%	31%	N/A	N/A
	Generators Served	22%	22%	N/A	N/A

[24] In these profile sheets, a high density area refers to an area with over 6.5 persons per acre.

Exhibit 4.9: Blue Route Map

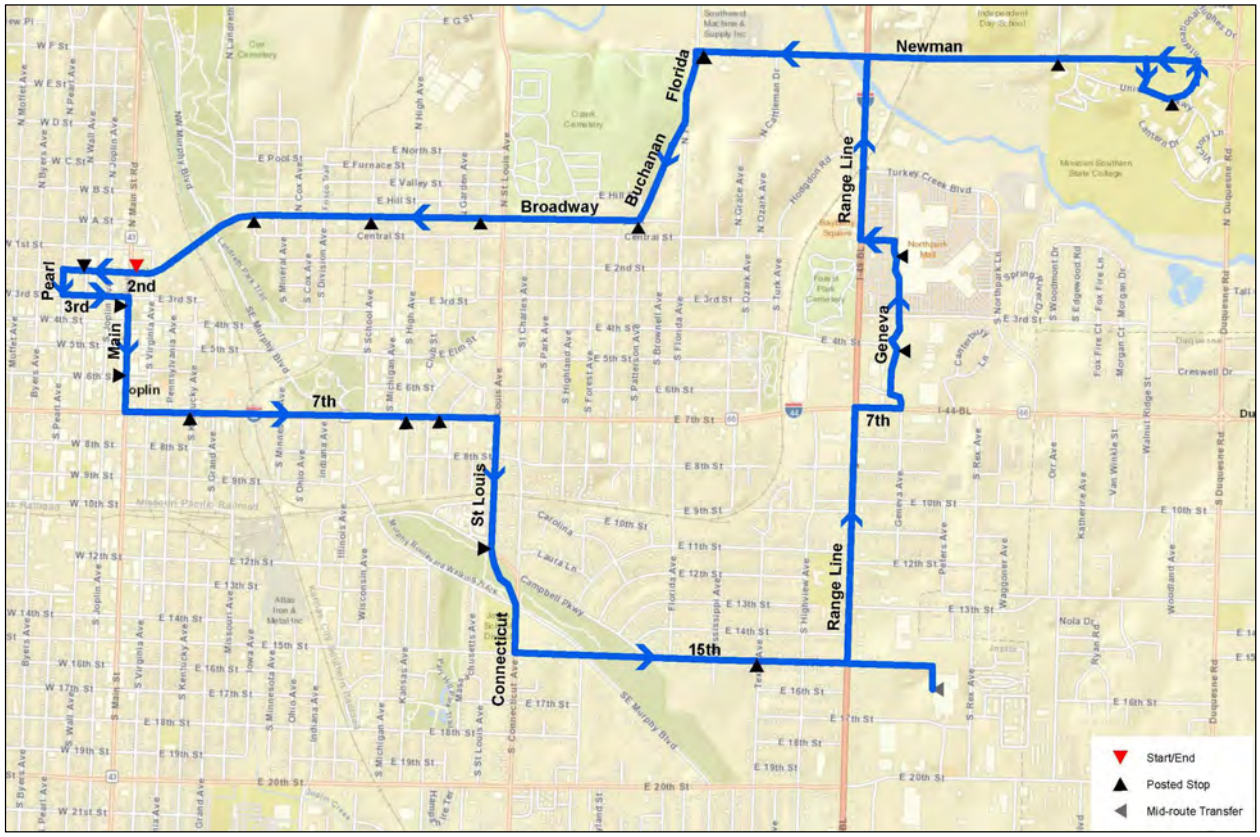
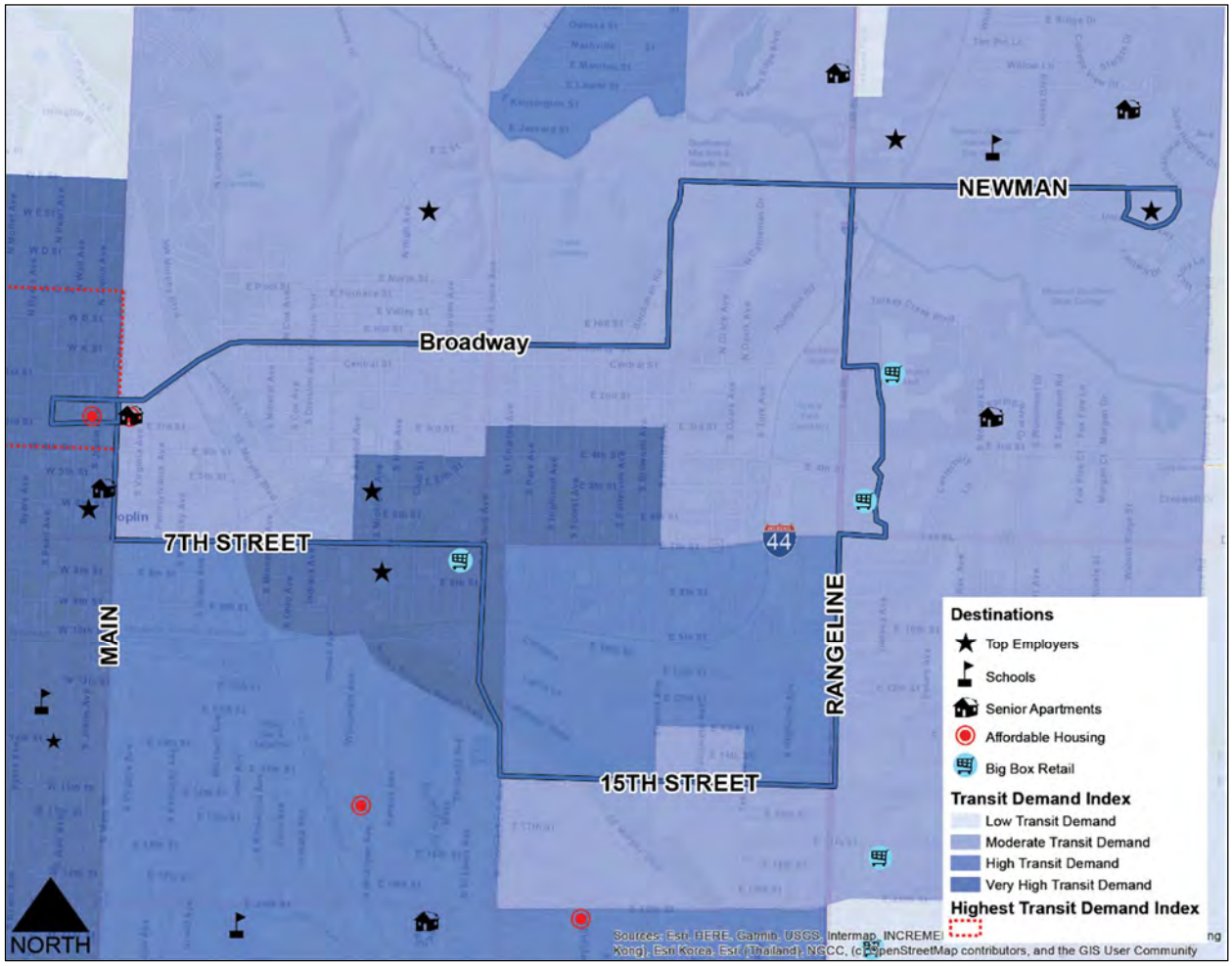


Exhibit 4.10: Blue Route Transit Demand Index



Green Route

The Green route, serves the south side of Joplin. It is the newest flex route of the Sunshine Lamp Trolley system. The Green route operates within the most population dense area of the service area (10.5 persons per acre) near the northwest corner of 32nd Street and Main Street. The Green route serves large minority populations in the Parr Hill Park neighborhood near 18th Street and Michigan Avenue (the highest percentage of minorities in the service area, 40%) and the Campbell Park South and Sunnyvale neighborhoods. Most of the route travels through relatively low-income areas. The only two large employers along the route are two hospitals (Mercy Hospital and Freeman East Hospital). Adjacent land uses are most commonly commercial, especially in the 32nd Street corridor and along Rangeline Road.

Some notable destinations along the route include hospitals, Food 4 Less, Walmart, and Sam's Club. Transfers can be made to the Blue route at Walmart and to the Red route at 20th Street and Main Street. Thursday is the highest ridership day with the highest ridership trips occurring near 1:00 PM (on weekdays) and 11:00 PM (on Saturdays).

Performance measures for the Green route are summarized in Exhibit 4.11. Route maps are displayed in Exhibit 4.12 and Exhibit 4.13.

Exhibit 4.11: Green Route Performance Measures

Category	Performance Measure	Green Route		System Average	
		Weekday	Saturday	Weekday	Saturday
Productivity	Trips per Mile	0.54	0.93	0.83	1.11
	Trips per Hour	7.27	5.00	9.21	9.95
Reliability	On-Time Performance	42%	17%	58%	56%
	Meeting Timepoints	27%	29%	60%	60%
Subsidy	Subsidy per Trip	$4.14	$6.47	$3,16	$3.49
	Subsidy per Hour	$30.09	$32.36	$28.15	$27.41
	Farebox Recovery Ratio	19%	13%	25%	27%
Coverage	High Transit Demand Areas Served	42%	42%	N/A	N/A
	Generators Served	15%	15%	N/A	N/A

Exhibit 4.12: Green Route Map

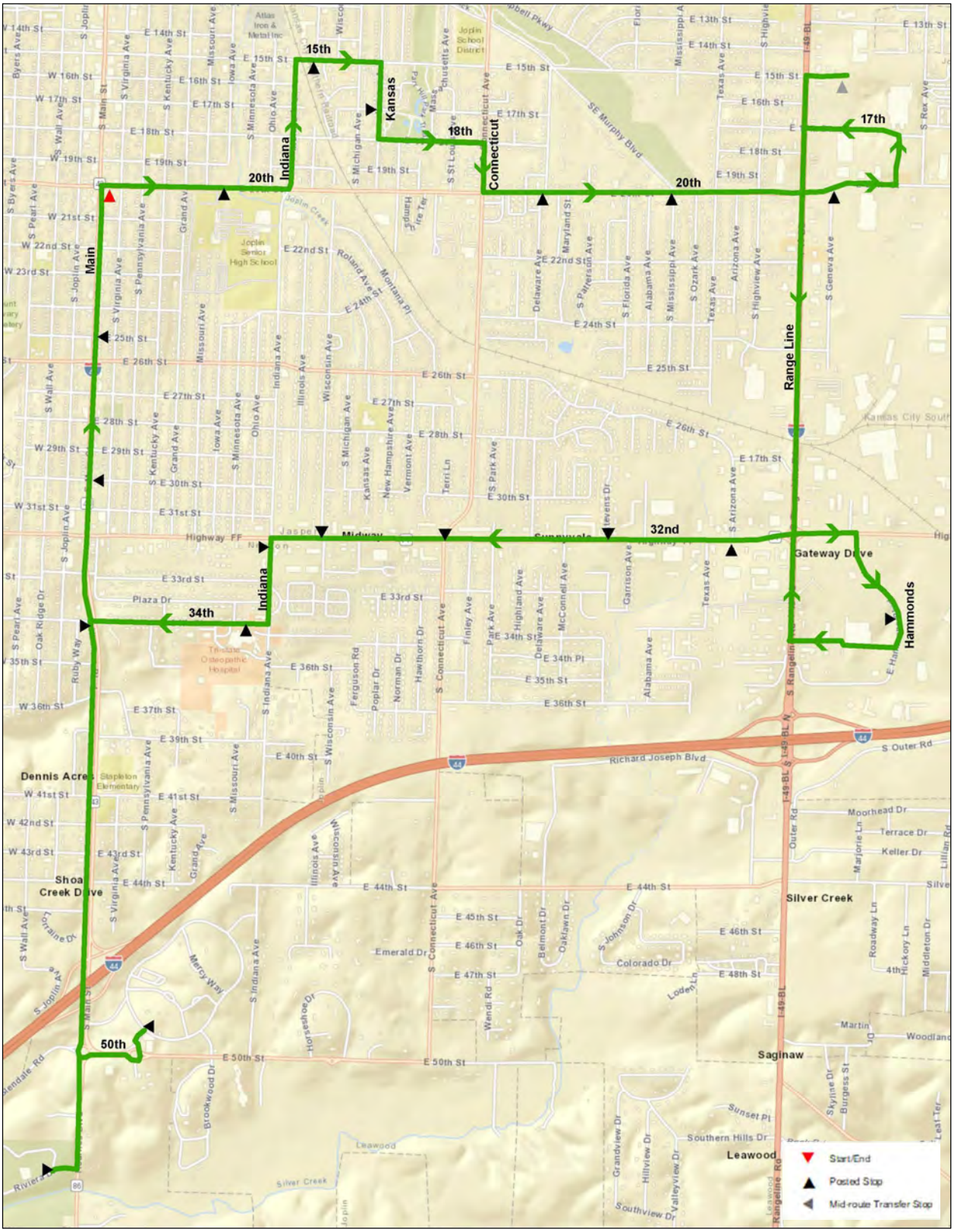
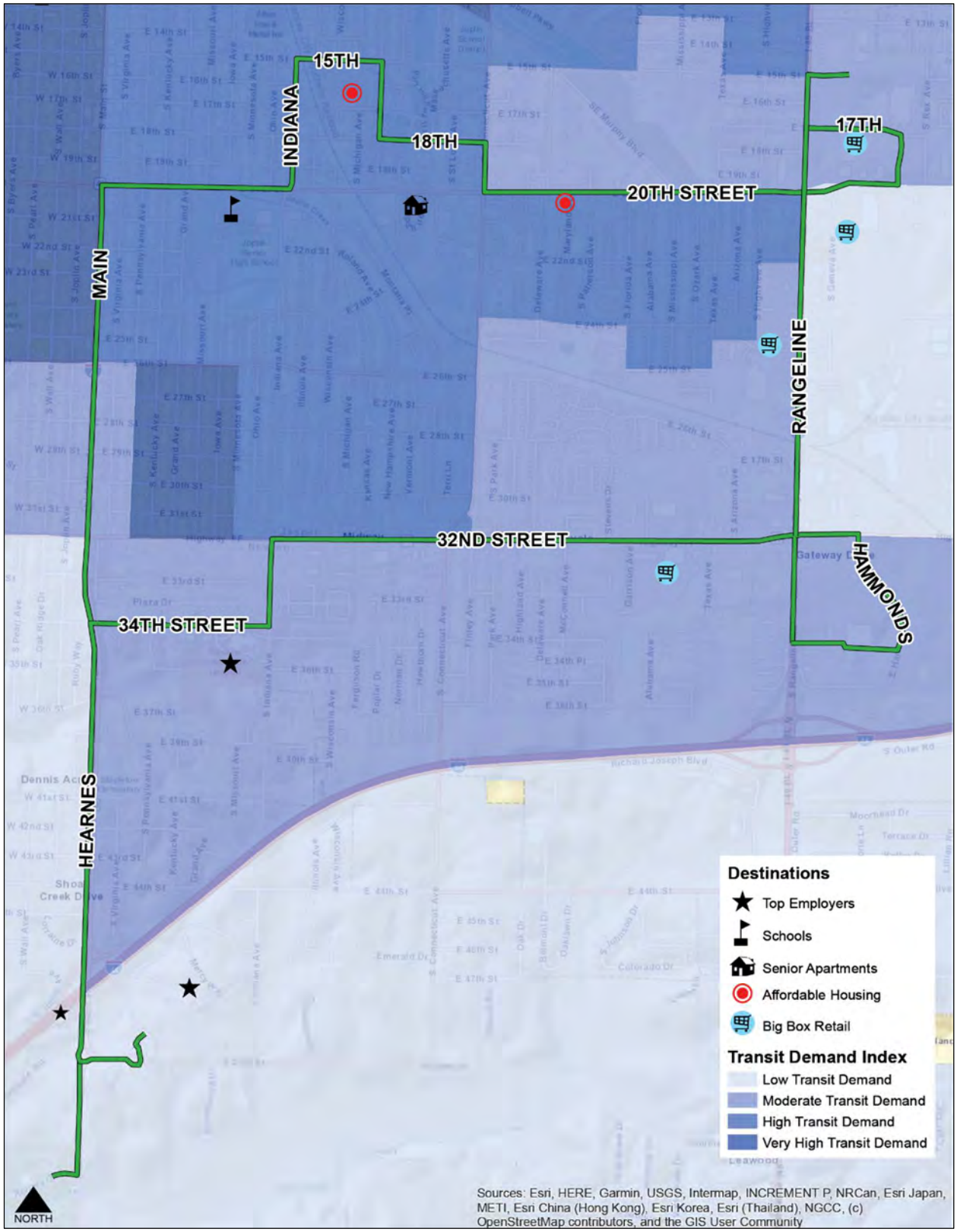


Exhibit 4.13: Green Route Transit Demand Index



Red Route

The Red route serves the west side of Joplin. Out of the nine highest density block groups in the study area, eight block groups are served by this route. Most of the block groups served by the Red route have minority populations above 20 percent. Murphysburg (northwest of downtown Joplin), which is the highest low-income neighborhood in the study area, is served by this route. Ducommun La Barge and Freeman West Hospital are the largest employers along the route and the route also serves a large concentration of manufacturing firms near Junge Boulevard and Maiden Lane.

Some notable destinations along the route include the hospital and the high concentration of medical offices nearby, Mercy Village, Murphy Manor Apartments, and Walmart on 7th Street. Transfers can be made at the Blue route at the MAPS office and to the Green route at 20th Street and Main Street. Tuesday is the highest ridership day with the highest ridership trips occurring between near 12:00 PM and 2:00 PM (on weekdays) and 1:00 PM (on Saturdays).

Performance measures for the Red route are summarized in Exhibit 4.14. Route maps are displayed in Exhibit 4.15 and Exhibit 4.16.

Exhibit 4.14: Red Route Performance Measures

Category	Performance Measure	Red Route		System Average	
		Weekday	Saturday	Weekday	Saturday
Productivity	Trips per Mile	0.97	1.18	0.83	1.11
	Trips per Hour	10.27	12.29	9.21	9.95
Reliability	On-Time Performance	75%	83%	58%	56%
	Meeting Timepoints	69%	67%	60%	60%
Subsidy	Subsidy per Trip	$2.64	$2.04	$3,16	$3.49
	Subsidy per Hour	$27.09	$25.07	$28.15	$27.41
	Farebox Recovery Ratio	27%	33%	25%	27%
Coverage	High Transit Demand Areas Served	42%	42%	N/A	N/A
	Generators Served	25%	25%	N/A	N/A

Exhibit 4.15: Red Route Map

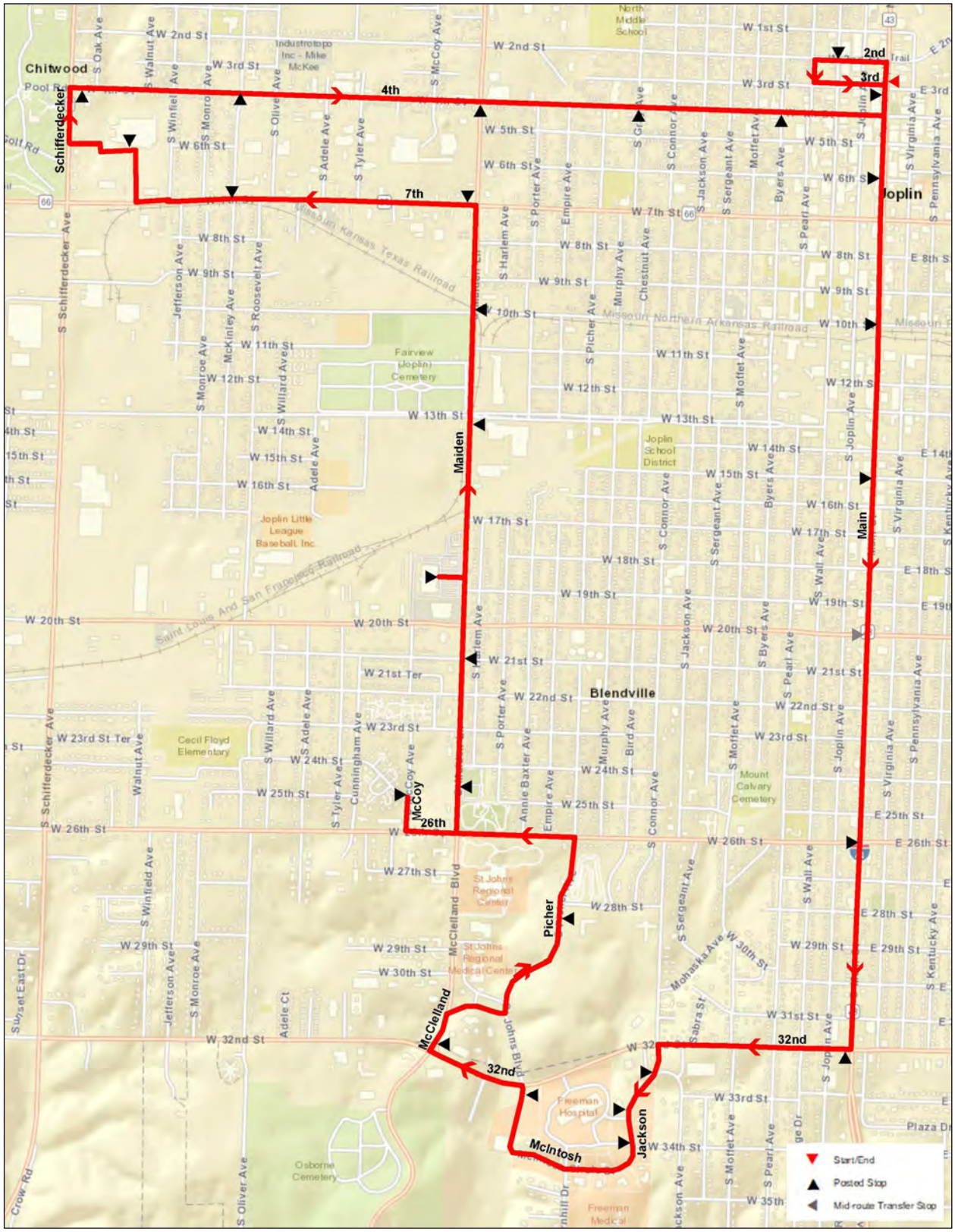
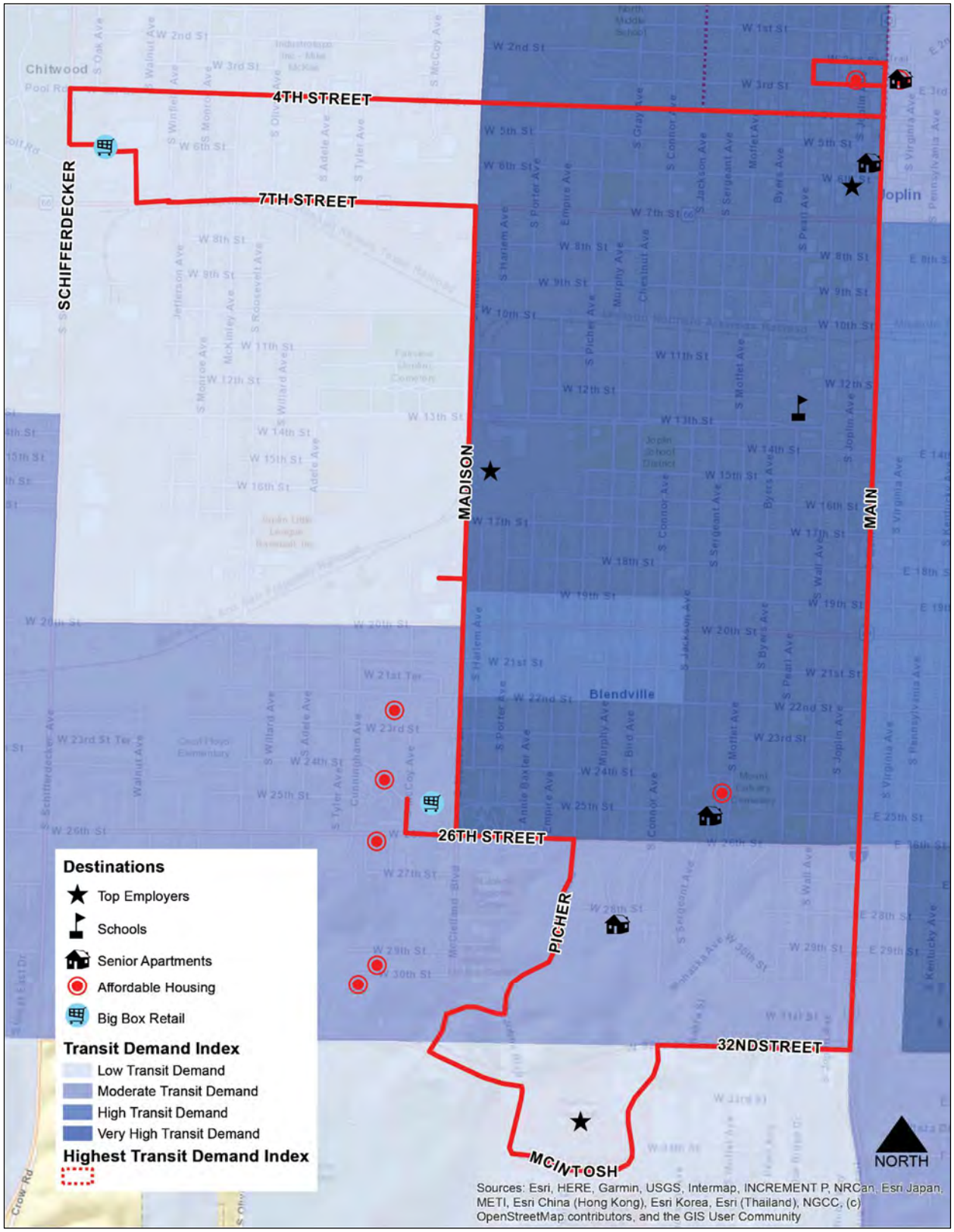


Exhibit 4.16: Red Route Transit Demand Index



4.4 Summary

The Green route consistently lags behind other routes in all performance measures. From this perspective, in the short-term, this route needs to be closely examined in order to enable it to perform better. All of the routes need to be shortened in order for all trips to be made. This can be accomplished by cutting unproductive parts or the route, eliminating unnecessary deviations of the fixed route (since it will already flex off route to pick up the mobility impaired), or changing the system to a fixed route system with accompanying paratransit (which could reduce load times).

For the demand response component of the transit system, zones that show too much demand to be fulfilled by demand response service or an extremely high number of trips per revenue mile should be evaluated as future markets for fixed or flex route service.

CHAPTER 5 | PUBLIC INVOLVEMENT AND VISIONING

The community engagement process began in March 2019 and concluded September 2019. Throughout the process, the study team engaged transit riders and drivers, education representatives, healthcare providers, employers, advocates, municipal officials, and others. Engagement activities were coordinated to coincide with the project's three phases: Market Analysis, Visioning, and Alternatives. The results of each phase of engagement are described below. Full details of the public involvement and visioning process are included in the Appendix.

5.1 Market Analysis

The City of Joplin and study team kicked off the project with a series of targeted, one-on-one and/or small group stakeholder meetings that took place mid-March 2019 at City Hall. Invitees included Joplin staff and elected officials, employers and economic development representatives, transit riders and drivers, paratransit providers, education representatives, apartment complexes, neighborhoods, community groups and clubs, medical and social service providers, faith-based institutions, advocacy groups, older adults, and others. A combination of press releases, phone calls, emails, and letters were used as meeting invitations. Ultimately, 17 meetings were scheduled and the team had participants for 13 meetings. Approximately 50 people signed-in to the meetings, not including several bus drivers.

Key discussion questions related to participants' familiarity with the existing trolley system and their vision for an improved version. Comments related to:

- Focusing transit service on the areas and populations most likely to need it
- Potential improvements, such as providing longer service hours and shorter transit trips between destinations
- Top challenges and opportunities, such as the need for easier ticket purchasing and trip planning
- Approaches to generating funding for public transit services

5.2 Visioning

Building on the results of the Stakeholder Meetings, the City of Joplin and study team conducted two Transit Visioning Sessions. Both were held on May 9, 2019 at the Joplin Public Library. The team used press releases, emails, bus fliers, and social media to provide meeting notice. Seventeen people, representing senior living, health and advocacy groups, news media, the general public, and others, attended and provided comments. Others commented via the study's online opinion survey at trolley.digicate.com.

At each visioning session, the team presented an outline of the project, stakeholder meeting results, market findings, and elements of a potential transit vision. Then, they organized participants into small groups around a large comment form that included potential goals and strategies for the Joplin transit vision. Goals involved the following six topics: 1) Coverage, 2) Performance, 3) Convenience, 4) Marketing and Education, 5) Funding, and 6) Technology and Amenities. Each goal was defined and included approaches for achieving it. The approaches ranged from darker green (easier, lower cost) to red (more difficult, higher cost). Over the course of the afternoon, participants used markers, pens, and the big comment forms to indicate that it was important to provide coverage to the areas with the highest potential demand for transit service.

They commented that 20- to 30-minute service was preferred and one-way loops could be replaced with 6-8 deviated fixed routes. They also said it was important to adjust the Sunshine Lamp Trolley's service hours to accommodate employer/employee needs for second shift start/end times and provide weekend service. Participants were in support of making digital services, such as the Sunshine Lamp Trolley website, more user friendly; keeping posted materials up to date; and making it easier to read the trolley map by providing smartphone apps and options, including integrating the trolley routes with Google Maps.

Attendees also expressed interest in a variety of funding strategies, including advertising on trolley vehicles, allowing entities to sponsor trolley stops, developing a coalition of transit partners, and coordinating with employers to provide incentives to increase transit use. Additionally, they expressed interest in mechanisms that would allow drivers to take a larger variety of payment options. Tools that permit electronic payment, such as reloadable plastic key cards with barcodes, for transit passes were also discussed.

Those who attended the visioning sessions in person provided their comments via discussions with the study team and comment forms. Over 80 comments were collected via the online survey from April 25 to May 31, 2019. Ninety percent (90%) of survey respondents were from Joplin and utilized the following zip codes: 64801, 64802, 64803, and 64804. The balance was from Carl Junction, Carterville, Carthage, Diamond, and Duenweg. The goals and strategies most important to survey respondents involved:

- Targeting transit service to areas with the highest potential demand for it
- Providing 30-minute transit stops to destinations
- Extending the Sunshine Lamp Trolley's service hours
- Adjusting weekday service hours to accommodate second and third shift workers
- Coordinating with a wide variety of partners to promote available transit services
- Increasing the amount of funding public transit receives
- Making it easy and comfortable to use public transit
- Developing a smartphone app that includes route information, payment options, and more

5.3 Alternatives

With the results of the Stakeholder Meetings, Transit Visioning Sessions, and online opinion survey in mind, the City of Joplin and study team developed transit recommendations and presented them to the public on August 28, 2019. They used a series of mobile meetings at busy bus stops/aboard the Sunshine Lamp Trolleys, a public open house at the Joplin Public Library, and another opinion survey to do so. The team advertised the events via social media, emails, bus fliers, and press releases. Then, they utilized a combination of posters and handouts to describe the proposed near-, medium-, and long-term recommendations. They gathered public feedback related to:

- Opinions of adding, removing, and modifying stops in the short-term
- Which medium- and long-term recommendations were a good fit for the Joplin area
- Other comments, such as bus stop positioning and walking distances between stops

The City and study team were able to talk with approximately 100 people during the meetings; most conversations occurred on the trolleys and feedback was collected via the opinion survey. A total of 306 people responded to the survey between August 28 and September 15.

Generally, respondents agreed with adding and/or removing trolley stops in the short-term. In addition, respondents:

- Believed the medium-term recommendations were a good fit for the Joplin area
- Felt transportation rides from a transit center directly to targeted destinations were a good fit for the Joplin in the long-term
- Liked partnering with employers and providing transit services to other cities over the long-term
- Were willing to walk an average of 7 minutes to reach a transit stop
- Were split on whether future bus stops should be directly across the street from each other

CHAPTER 6 | PLAN DEVELOPMENT

The plan includes short-term, medium-term, and long-term recommendations to the transit system.

6.1 Short-Term Plan

The only change to the short-term plan is to modify the Green route to serve the Ozark Center. Exhibit 6.1 displays the route change and indicates the reasons for the segments of the route that would need to be eliminated. The stop changes are outlined in Exhibit 6.2. There would be no service span or frequency changes for any of the routes.

Exhibit 6.1: Proposed Short-term System Map

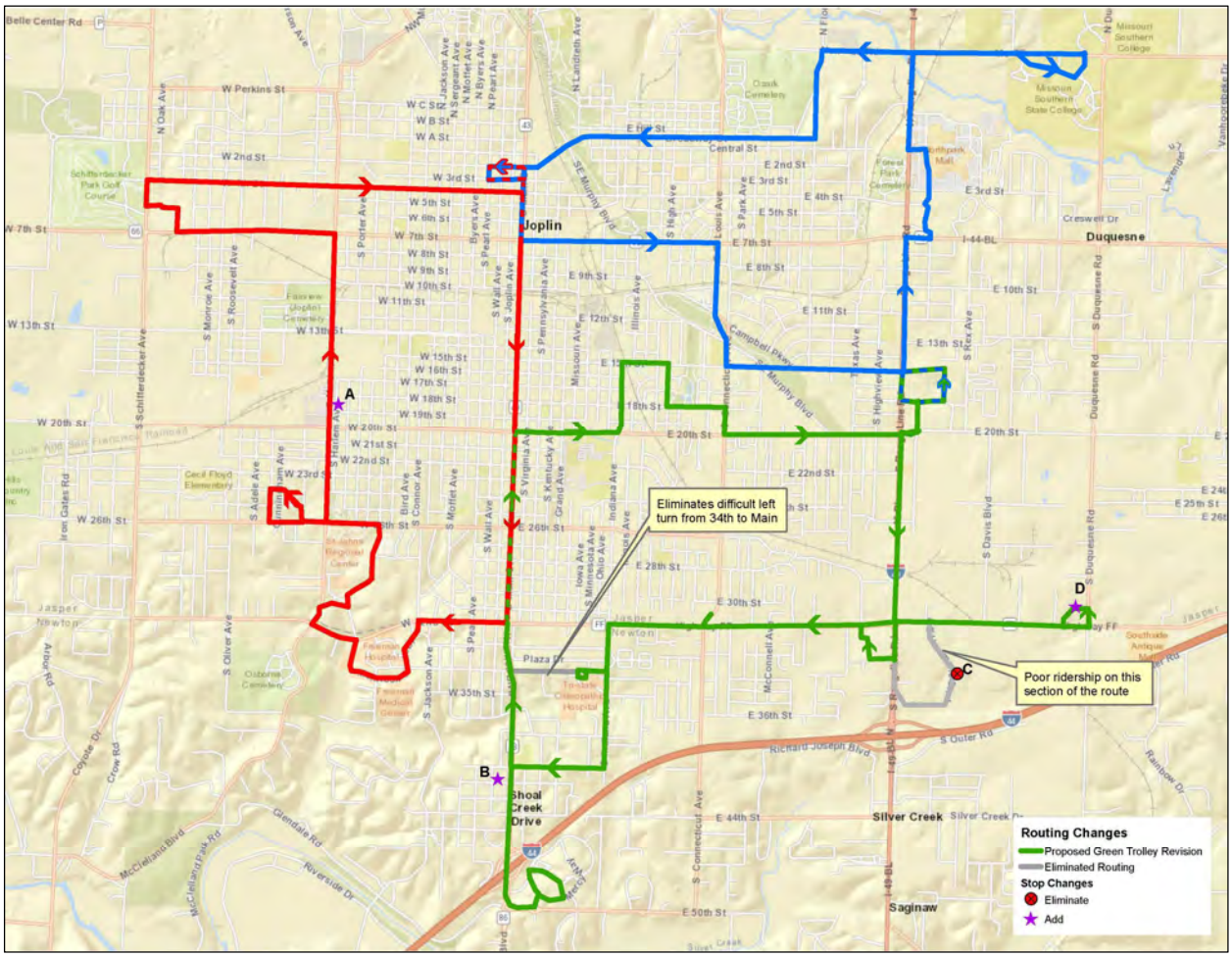


Exhibit 6.2: Proposed Short-Term Stop Changes

Map	Location	Route	Action	Note
A	Maiden Lane and 19th Street	Red	Add	Replaces Price Cutter stop
B	41st Street and Hearnes Boulevard (SW)	Green	Add	Stop on Frontage Road
C	Sam's Club	Green	Eliminate	Green Route in this area has been rerouted to the Ozark Center.
D	Ozark Center	Green	Add	Per community and riders' requests

Short-Term Funding Needs

As summarized in Exhibit 6.3, only nominal additional funding would be needed in the short-term plan. The funds would be used to add bus stop signs at three stops. The operating cost would remain the same. If new shelters are warranted at the Ozark Center or the VA Clinic (the best locations for new shelters), it would cost approximately $10,500 per shelter.

Exhibit 6.3: Estimated Short-Term Capital Costs

Capital Cost	Item Cost	Number	Total	Source
New Stops	$180	3	$540	Cost of installing a basic bus route sign and pole in Joplin.
Total Cost			**$540**	

6.2 Medium-Term Plan

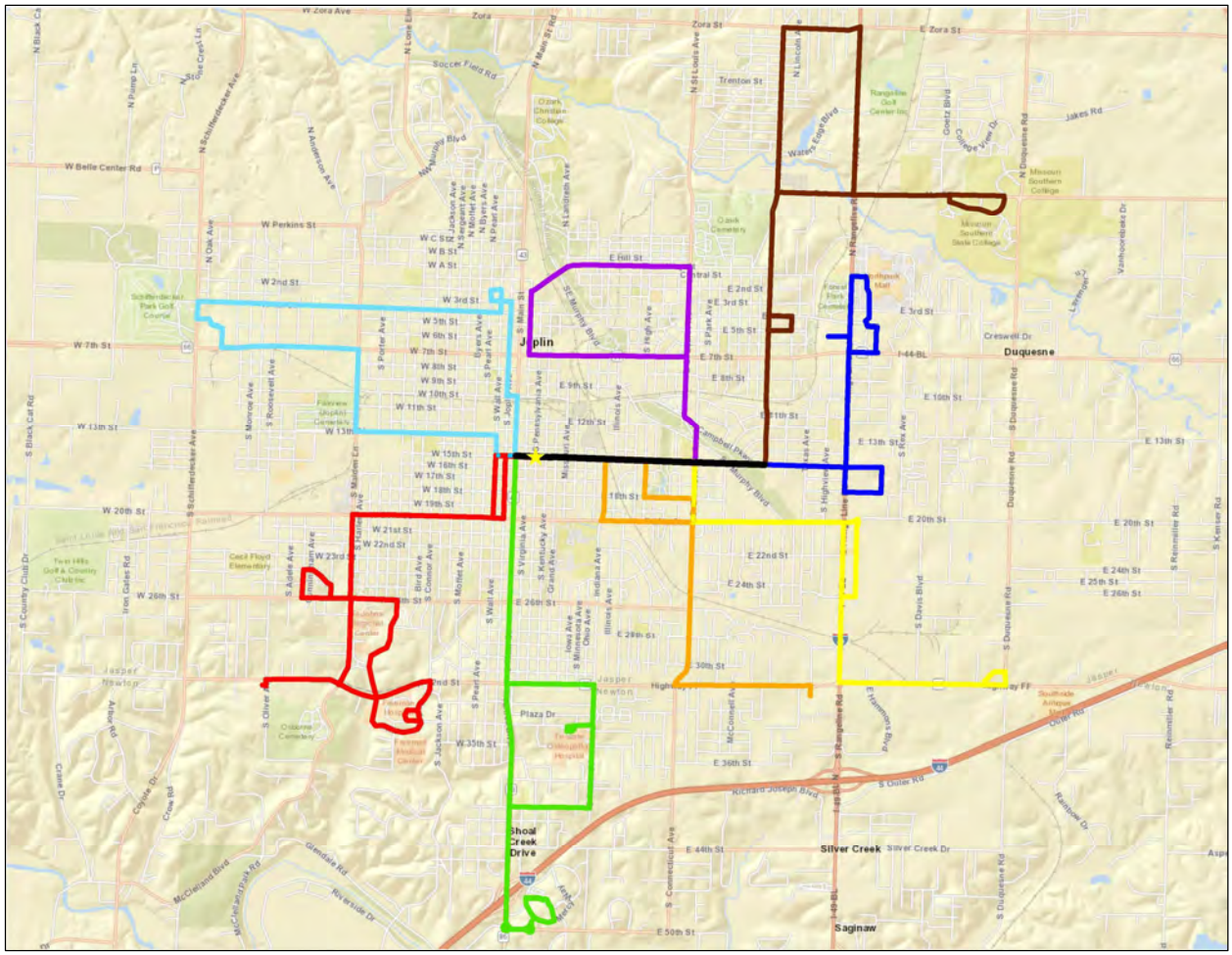
To build on changes in the short-term plan, the medium-term plan proposes several recommendations over the next two to three years. It is recommended that a new transfer facility be built in close proximity to the geographic center of the proposed service area. Based on the market analysis, the area is centrally located in the area with a high propensity for transit ridership. Additionally, this location would allow riders to transfer between routes with greater efficiency. The transfer facility would be located farther away from the existing transfer location near the MAPS office; therefore, new routes are recommended for this phase of the plan that will all connect to the new transfer location. The new routes are designed to run in 30-minute loops from the transfer facility to their terminus and back to the transfer facility.

Eight routes are proposed in the medium-term plan. As stated, these routes will run on 30-minute intervals from 6:00 AM to 8:00 PM on weekdays and 9:00 AM to 6:00 PM on Saturdays. New destinations that would be served include the Home Depot and Rangeline Road, Ozark Center's Hope Springs Facility, the Royal Heights neighborhood, and medical facilities west of McClelland Boulevard along Newton Road. Eight buses would be needed to run the routes, which would require the purchase of two additional buses. In each proposed route map the star indicates the recommended transfer facility.

Medium-Term Plan Summary

The proposed medium-term system map is displayed in Exhibit 6.4.

Exhibit 6.4: Proposed Medium-Term System Map



Proposed Blue Route

The Blue route covers much of the southern part of the current Blue route. Major destinations include Northpark Mall, Rangeline Road WalMart, Northpark Crossing (Target), and the Elms Shopping Center. Multiple transfer opportunities are available along 15th Street. The proposed Blue route is displayed in Exhibit 6.5 with stops summarized in Exhibit 6.6.

Exhibit 6.5: Proposed Blue Route

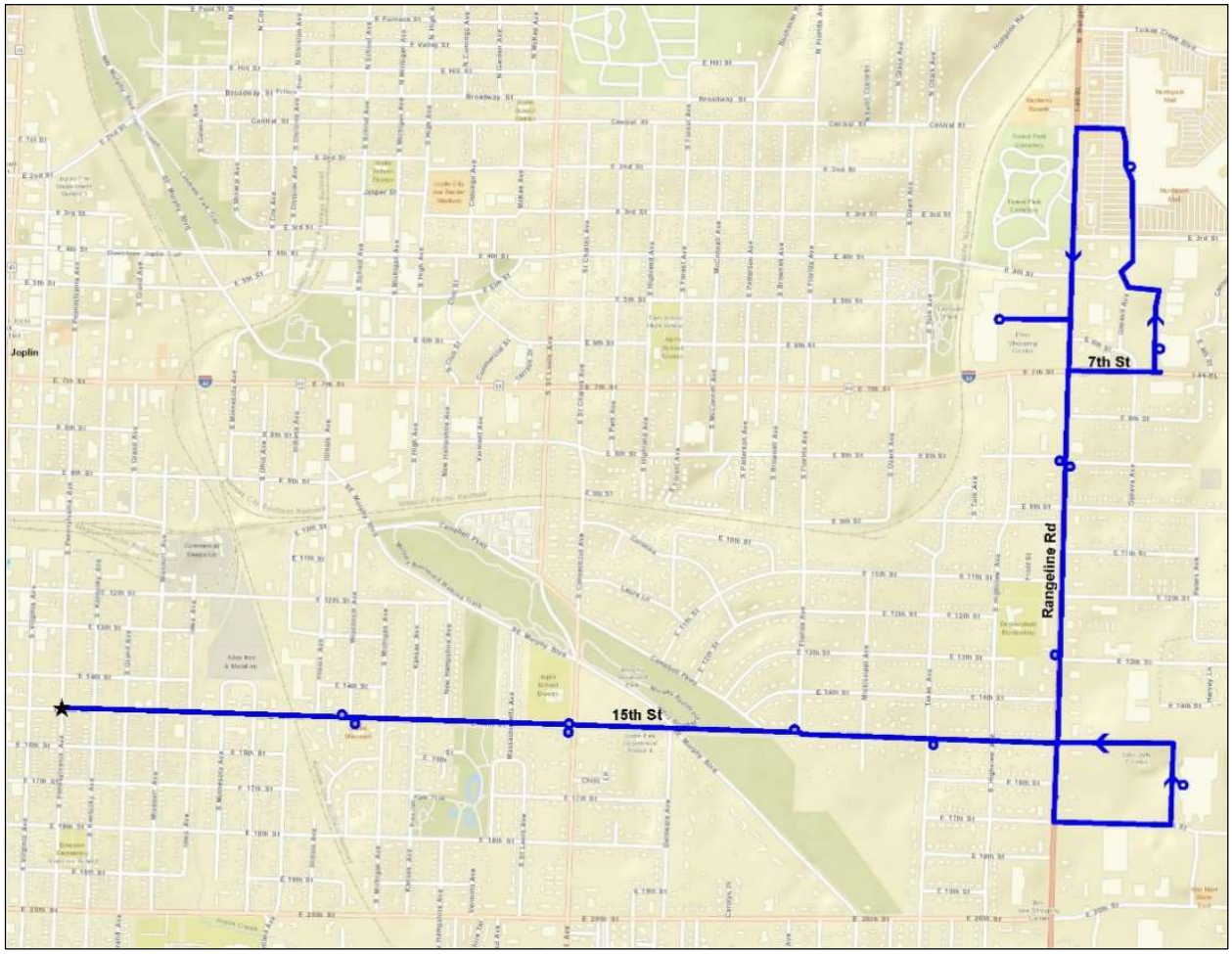


Exhibit 6.6: Proposed Blue Route Stops

Status	Routes Served	Location	Direction
New	Blue, Brown, Yellow	15th/Connecticut	Outbound
New	Blue, Brown, Yellow, Purple	15th/Connecticut	Inbound
New	Blue	15th/Florida	Inbound
Existing	Blue	15th/Texas	Outbound
Existing	Blue, Brown, Orange, Yellow, Purple	15th/Wisconsin	Inbound
Existing	Blue, Brown, Yellow, Purple	15th/Wisconsin	Outbound
New	Blue	Elms Shopping Center	Inbound
New	All	Main Transfer Center	Endpoint
Existing	Blue	Northpark Crossing	Outbound
Existing	Blue	Northpark Mall	Endpoint
New	Blue	Rangeline/13th	Inbound
New	Blue	Rangeline/8th	Inbound
New	Blue	Rangeline/8th	Outbound
Existing	Blue	WalMart (Rangeline)	Both

Proposed Light Blue Route

The Light Blue route would cover the current north part of the Red route. Major destinations include the Murphy Towers, Downtown Joplin, 7th Street Walmart, and Ducommun. The proposed Light Blue route is displayed in Exhibit 6.7 with stops summarized in Exhibit 6.8.

Exhibit 6.7: Proposed Light Blue Route

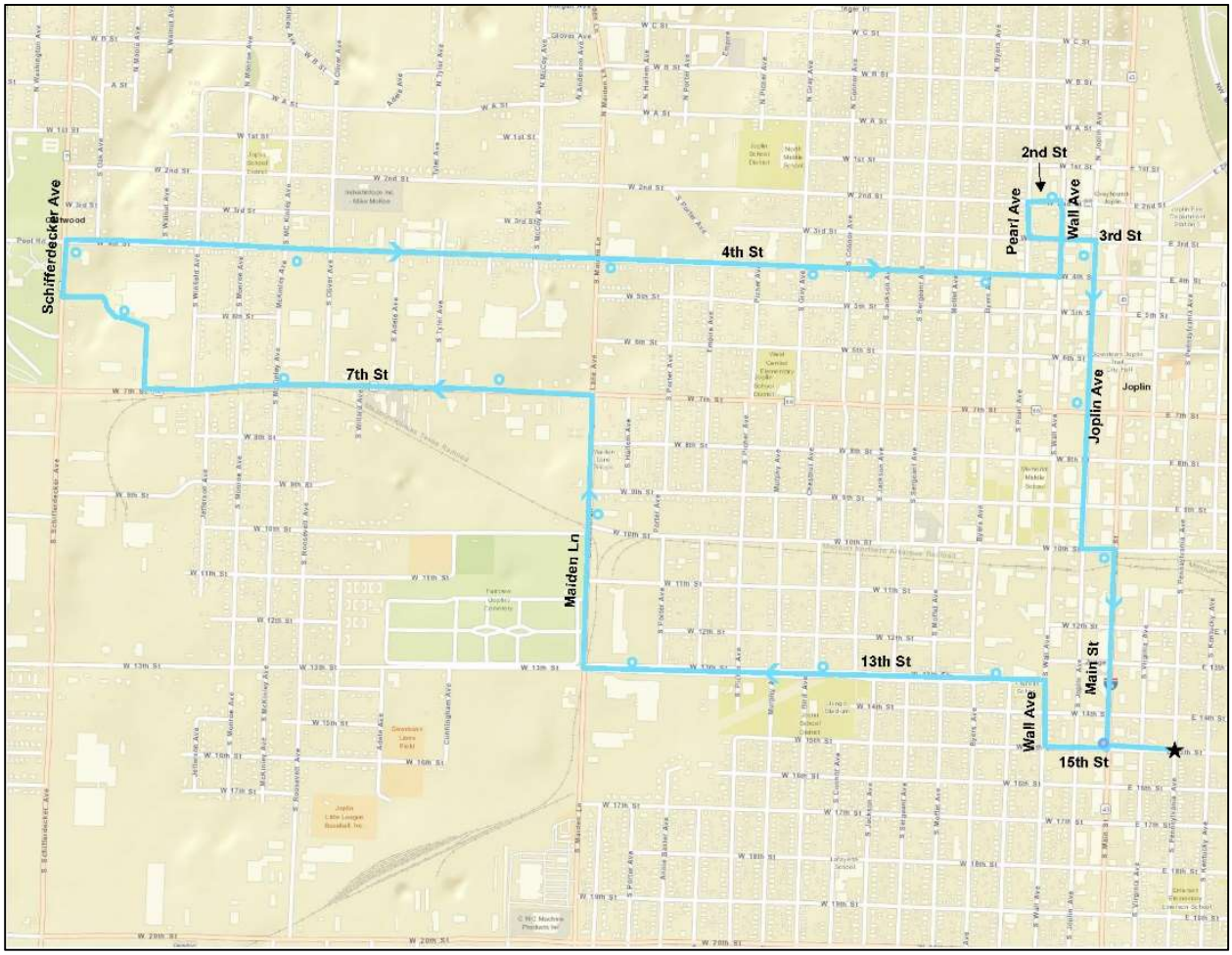


Exhibit 6.8: Proposed Light Blue Route Stops

Status	Routes Served	Location	Direction
Existing	Light Blue	2nd/Wall	Inbound
Existing	Light Blue	4th/Byers	Inbound
Existing	Light Blue	4th/Gray	Inbound
Existing	Light Blue	4th/Maiden	Inbound
Existing	Light Blue	4th/McKinley	Inbound
Existing	Light Blue	4th/Schifferdecker	Inbound
Existing	Light Blue	Walmart 7th Street	Endpoint
Existing	Light Blue	7th/McKinley	Outbound
Existing	Light Blue	1717 W 7th	Outbound
Existing	Light Blue	LaBarge	Outbound
New	Light Blue	Junge/Pearl	Outbound
New	Light Blue	Junge/Chestnut	Outbound
New	All	Main Transfer Center	Endpoint
Existing	Light Blue	Main/10th	Inbound
Existing	Light Blue	Main/7th	Inbound
Existing	Light Blue	Main/3rd	Inbound
New	Light Blue	Junge/Maiden	Outbound
Existing	Light Blue, Red	15th/Main (NW)	Outbound

Proposed Yellow Route

The Yellow route would mostly serve new transit markets. Major destinations include the Ozark Center, Home Depot, and Library. The proposed Yellow route is displayed in Exhibit 6.9 with stops summarized in Exhibit 6.10.

Exhibit 6.9: Proposed Yellow Route

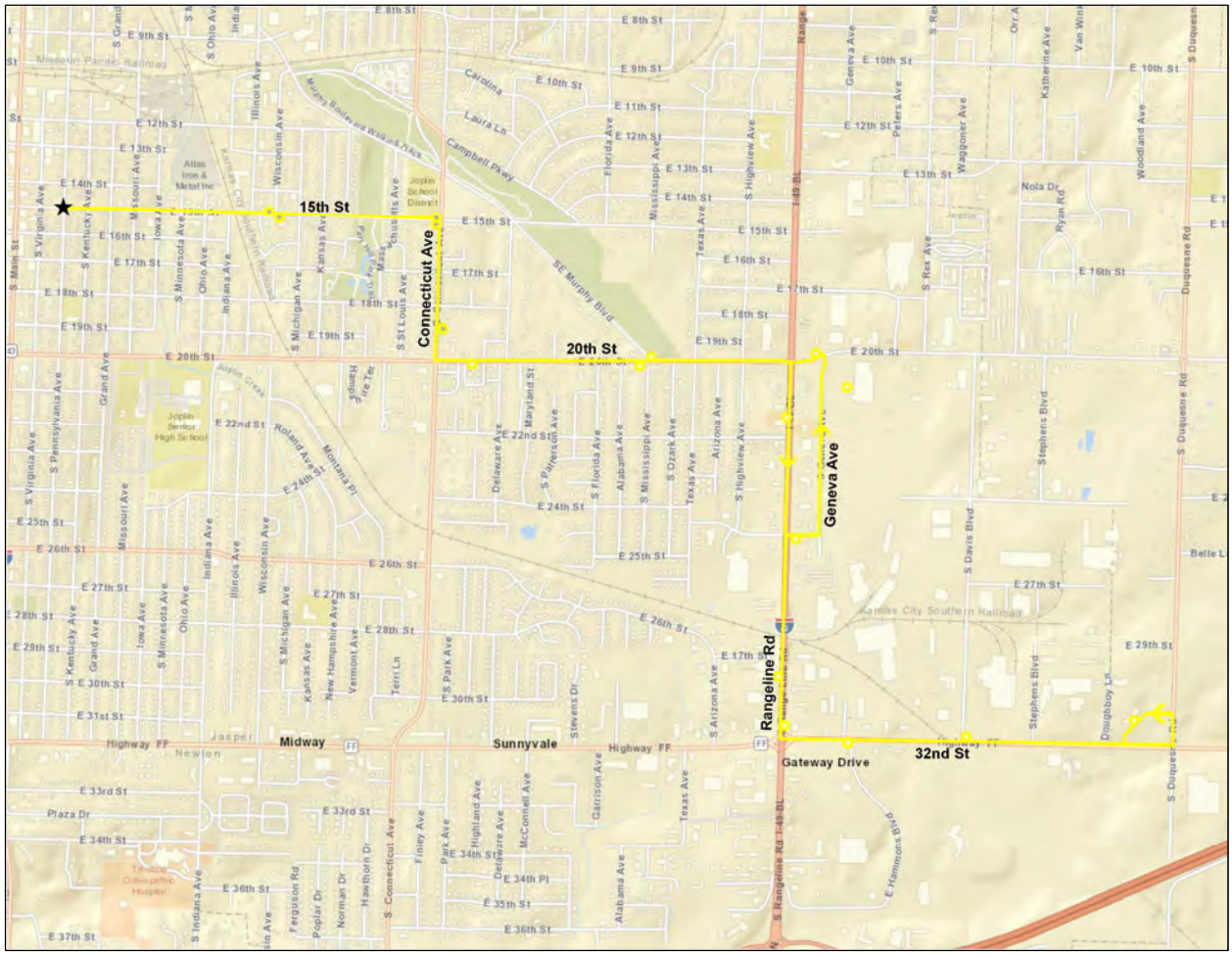


Exhibit 6.10: Proposed Yellow Route Stops

Status	Routes Served	Location	Direction
New	All	Main Transfer Center	Endpoint
New	Blue, Brown, Yellow	15th/Connecticut	Outbound
New	Blue, Brown, Yellow, Purple	15th/Connecticut	Inbound
Existing	Blue, Brown, Orange, Yellow, Purple	15th/Wisconsin	Inbound
Existing	Blue, Brown, Yellow, Purple	15th/Wisconsin	Outbound
Existing	Yellow	20th/Delaware	Outbound
Existing	Yellow	20th/Geneva	Inbound
Existing	Yellow	20th/Mississippi	Outbound
New	Yellow	20th/Murphy	Inbound
New	Yellow	24th/Rangeline	Inbound
New	Yellow	32nd/Davis	Inbound
New	Yellow	32nd/Hammons	Outbound
New	Yellow	Home Depot	Inbound
Existing	Orange, Yellow	Library	Both
New	Yellow	Ozark Center	Endpoint
New	Yellow	Rangeline/17th	Outbound
New	Yellow	Rangeline/32nd	Inbound
New	Yellow	Rangeline/Goodwill	Outbound

Proposed Orange Route

The Orange route would mostly serve new transit markets along 15th Street, Kansas Avenue, 18th Street, 20th Street, Connecticut Avenue, and Indiana Avenue. Major destinations include the Food 4 Less and VA Hospital. The proposed Orange route is displayed in Exhibit 6.11 with stops summarized in Exhibit 6.12.

Exhibit 6.11: Proposed Orange Route

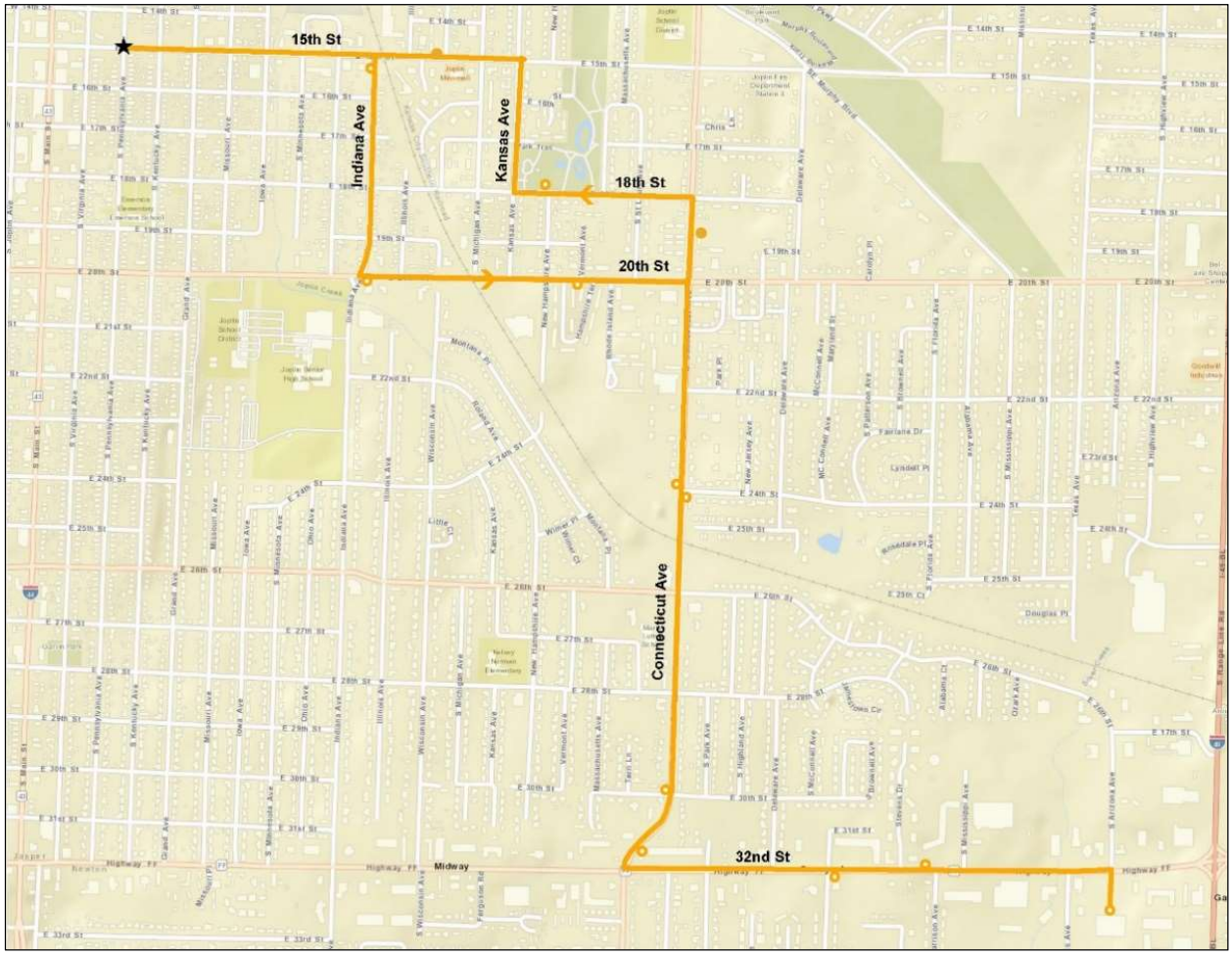


Exhibit 6.12: Proposed Orange Route Stops

Status	Routes Served	Location	Direction
Existing	Blue, Brown, Orange, Yellow, Purple	15th/Wisconsin	Inbound
New	Orange	20th/Hampshire Crossing	Outbound
New	Orange	20th/Indiana	Outbound
New	Orange	32nd/McConnell	Outbound
Existing	Orange	32nd/Stevens	Inbound
New	Orange	Connecticut/24th (NW)	Inbound
New	Orange	Connecticut/24th (SE)	Outbound
New	Orange	Connecticut/30th	Outbound
Existing	Orange	Food 4 Less	Endpoint
New	Orange	Indiana/15th	Outbound
Existing	Yellow, Orange	Library	Both
New	All	Main Transfer Center	Endpoint
Existing	Orange	Parr Hill Park	Inbound
New	Orange	VA Hospital	Inbound

Proposed Brown Route

The Brown route would serve new transit markets with the exception of covering some of the current Blue Route along Newman Road. Major destinations include Royal Heights, the Probation Office, and Missouri Southern State University. The proposed Brown route is displayed in Exhibit 6.13 with stops summarized in Exhibit 6.14.

Exhibit 6.13: Proposed Brown Route

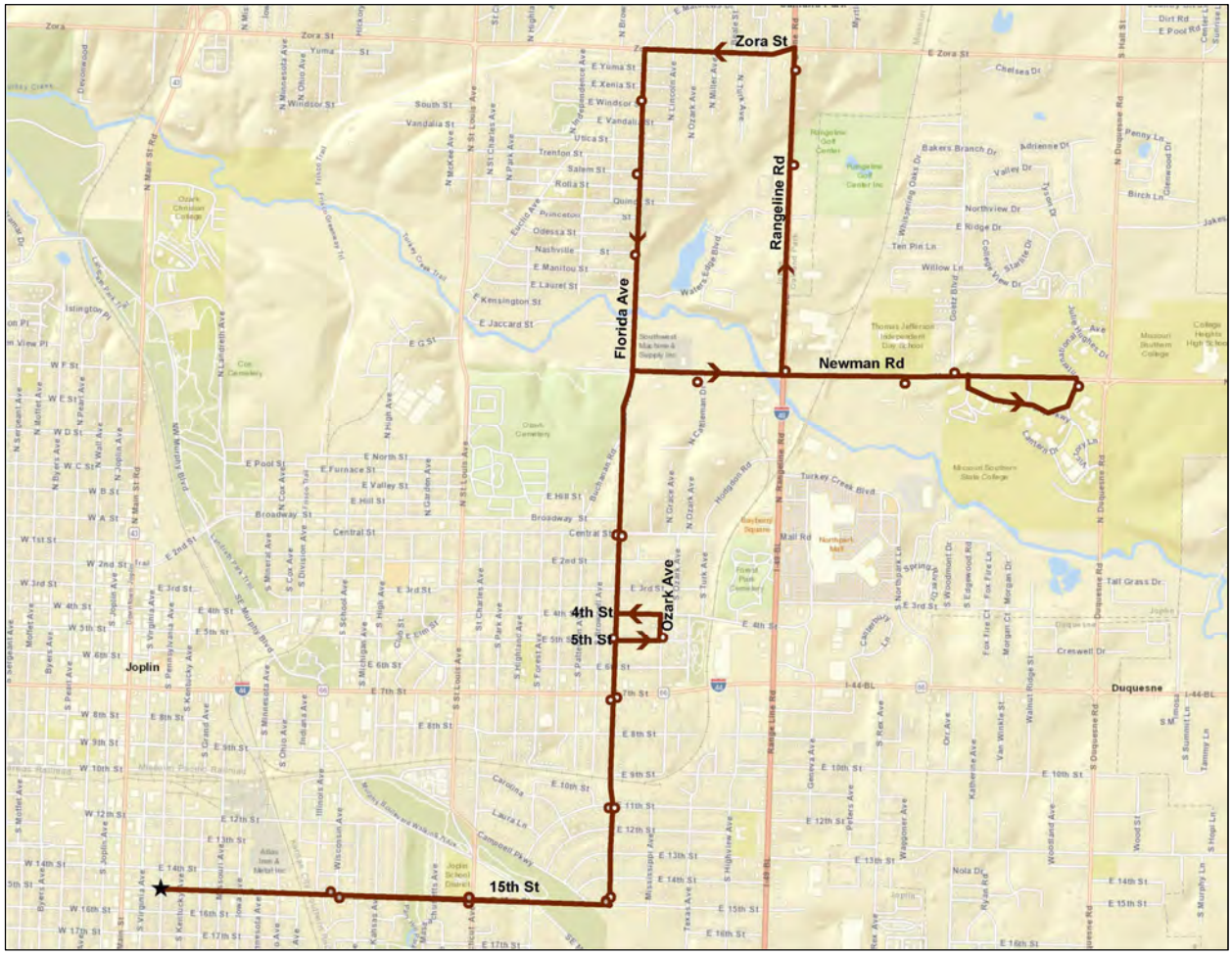


Exhibit 6.14: Proposed Brown Route Stops

Status	Routes Served	Location	Direction
New	Blue, Gold, Brown, Yellow	15th/Connecticut	Outbound
New	Blue, Gold, Brown, Yellow, Purple	15th/Connecticut	Inbound
New	Blue, Gold, Brown	15th/Florida	Inbound
Existing	Blue, Gold, Brown, Orange, Yellow, Purple	15th/Wisconsin	Inbound
Existing	Blue, Gold, Brown, Yellow, Purple	15th/Wisconsin	Outbound
New	Brown	Florida/11th (SE)	Outbound
New	Brown	Florida/11th (SW)	Inbound
New	Brown	Florida/15th	Inbound
New	Brown	Florida/5th	Inbound
New	Brown	Florida/7th (SE)	Outbound
New	Brown	Florida/7th (SW)	Inbound
New	Brown	Florida/Central (SE)	Outbound
New	Brown	Florida/Central (SW)	Inbound
New	Brown	Florida/Nashville	Inbound
New	Brown	Florida/Salem	Inbound
New	Brown	Florida/Windsor	Inbound
New	All	Main Transfer Center	Endpoint
Existing	Brown	MSSU	Endpoint
New	Brown	Newman/Catteman	Outbound
New	Brown	Newman/Goetz	Outbound
Existing	Brown	Newman/Northpark Apartments	Outbound
New	Brown	Newman/Rangeline	Outbound
New	Brown	Ozark/5th	Outbound
New	Brown	Rangeline/Probate Office	Inbound
New	Brown	Rangeline/Zora (SE)	Inbound
New	Brown	Zora/Lincoln	Inbound

Proposed Purple Route

The Purple route would mostly serve the part of the Blue route closest to Downtown Joplin. Major destinations include Downtown Joplin, MAPS, Messenger Towers, Health Department, Joplin Workshops, and Walmart on 7th Street. The proposed Purple route is displayed in Exhibit 6.15 with stops summarized in Exhibit 6.16.

Exhibit 6.15: Proposed Purple Route

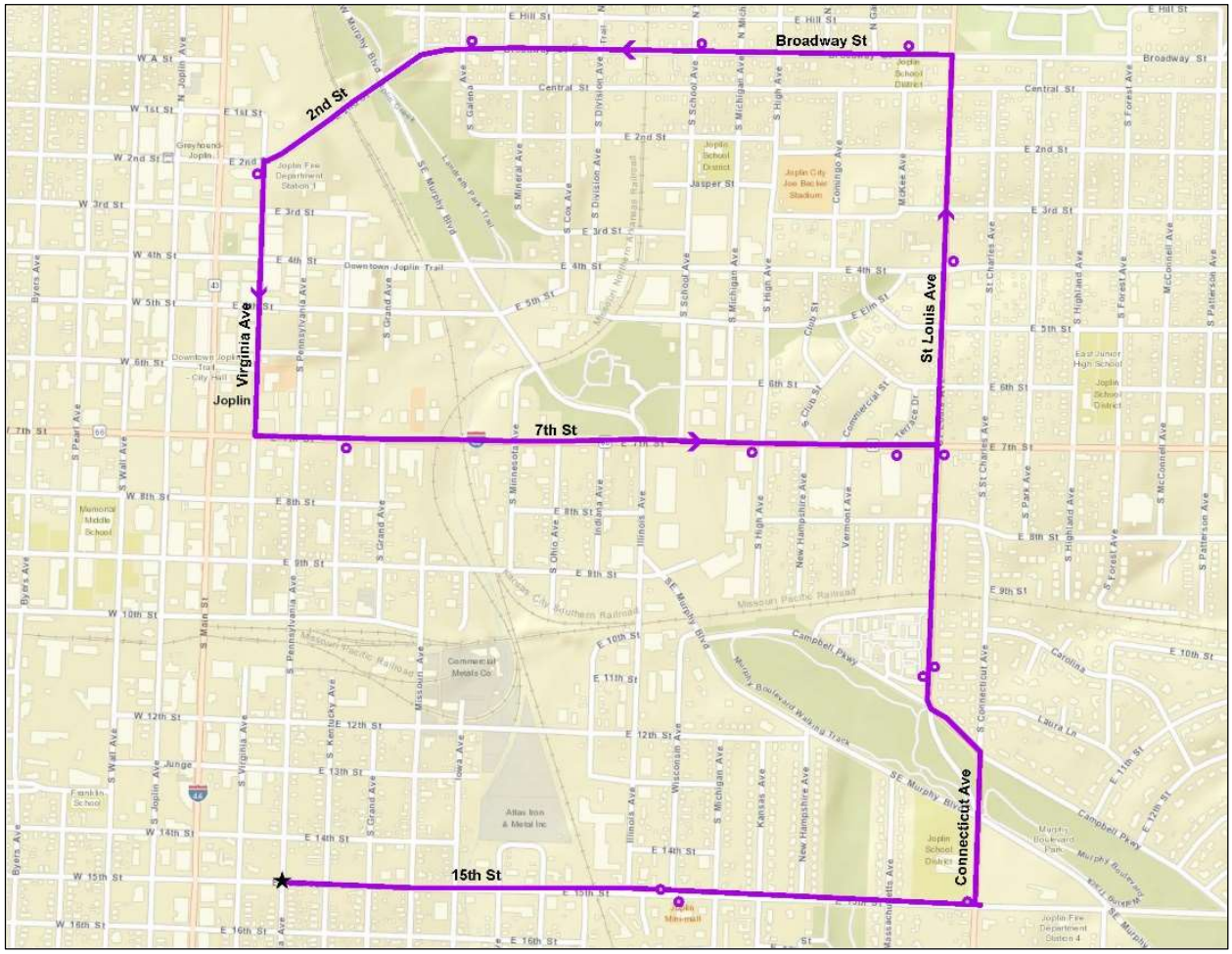


Exhibit 6.16: Proposed Purple Route Stops

Status	Routes Served	Location	Direction
New	Blue, Brown, Yellow, Purple	15th/Connecticut	Inbound
Existing	Blue, Brown, Orange, Yellow, Purple	15th/Wisconsin	Inbound
Existing	Blue, Brown, Yellow, Purple	15th/Wisconsin	Outbound
Existing	Purple	7th/High	Inbound
Existing	Purple	7th/Kentucky	Inbound
Existing	Purple	Broadway/Galena	Outbound
Existing	Purple	Broadway/McKee	Outbound
Existing	Purple	Broadway/School	Outbound
New	All	Main Transfer Center	Endpoint
New	Purple	St Louis/4th	Outbound
New	Purple	St Louis/7th	Outbound
New	Purple	St Louis/Park Apartments (E)	Outbound
Existing	Purple	St Louis/Park Apartments (W)	Inbound
New	Purple	Virginia/Messenger Towers	Endpoint
New	Purple	Walmart	Inbound

Proposed Green Route

The Green route would serve the western part of the current Green route with stops along Main Street. Major destinations include Freeman East Hospital and Mercy Hospital. The proposed Green route is displayed in Exhibit 6.17 with stops summarized in Exhibit 6.18.

Exhibit 6.17: Proposed Green Route

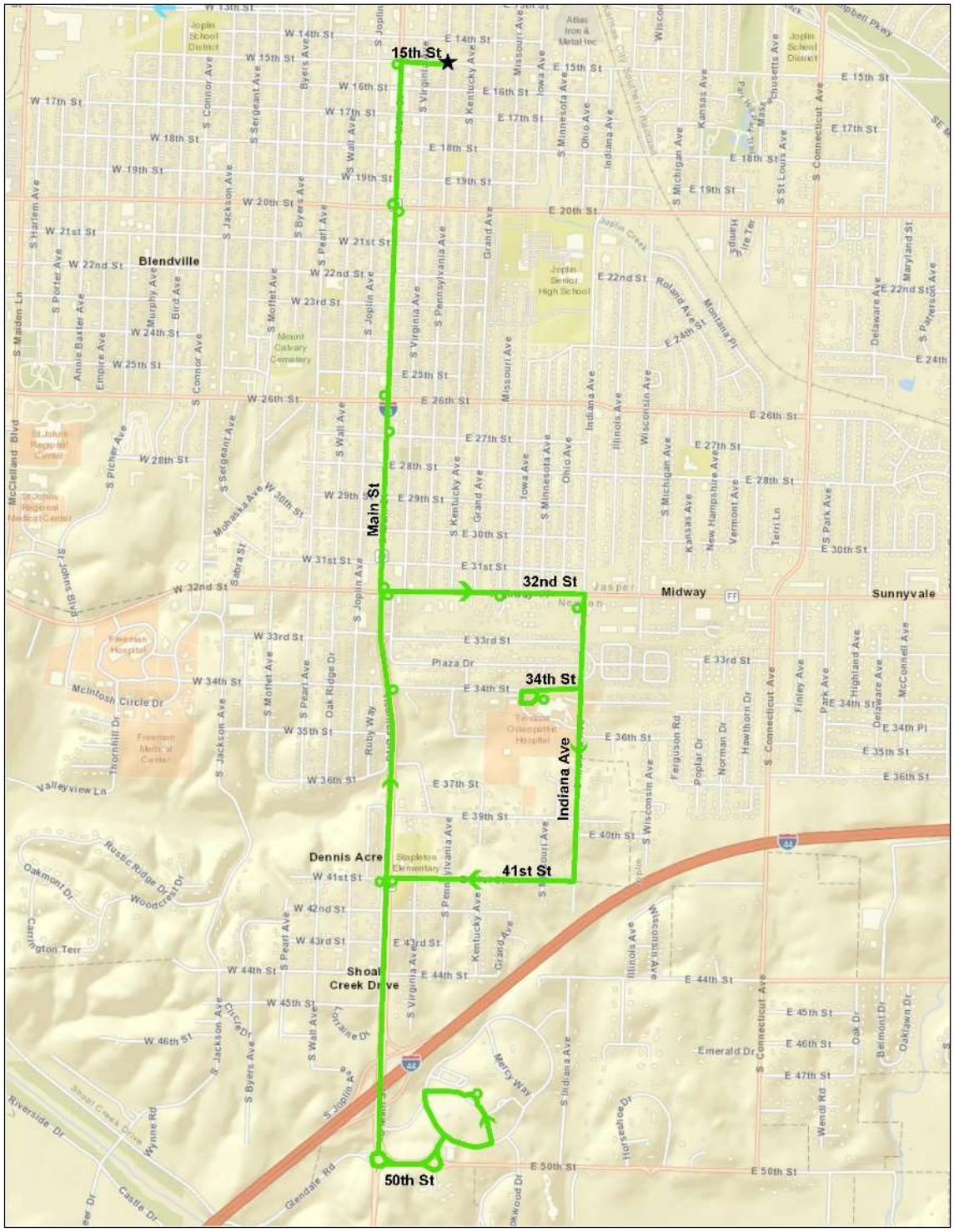


Exhibit 6.18: Proposed Green Route Stops

Status	Routes Served	Location	Direction
New	Green	32nd/Main	Outbound
New	Green	32nd/Missouri	Inbound
Existing	Green	Freeman East	Outbound
Existing	Green	Indiana/32nd	Outbound
New	All	Main Transfer Center	Endpoint
Existing	Green	Main/15th (SW)	Outbound
Existing	Green	Main/20th (NW)	Outbound
Existing	Green	Main/20th (SE)	Inbound
Existing	Green	Main/26th	Outbound
Existing	Green	Main/27th	Inbound
Existing	Green	Main/30th	Inbound
Existing	Green	Main/34th	Inbound
New	Green	Main/41st (SE)	Inbound
New	Green	Main/41st (SW)	Outbound
Existing	Green	Mercy Hospital	Endpoint

Proposed Red Route

The proposed Red route would cover the southern part of the current Red route. Major destinations include Freeman West Hospital, Joplin Housing Authority, and Cunningham Park. The proposed Red route is displayed in Exhibit 6.19 with stops summarized in Exhibit 6.20.

Exhibit 6.19: Proposed Red Route

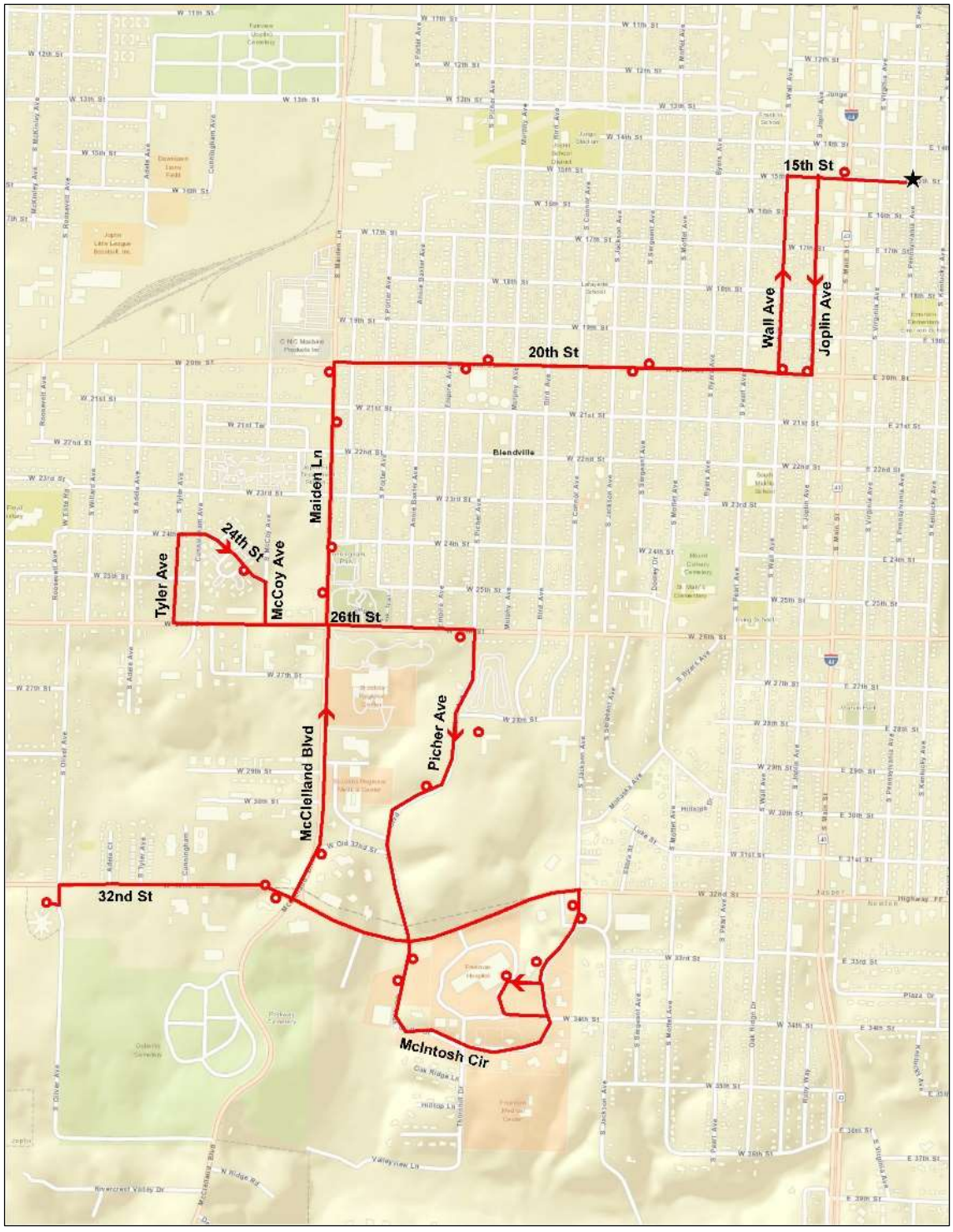


Exhibit 6.20: Proposed Red Route Stops

Status	Routes Served	Location	Direction
Existing	Light Blue, Red	15th/Main (NW)	Outbound
New	Red	20th/Picher (NE)	Outbound
New	Red	20th/Picher (SW)	Inbound
New	Red	20th/Sargent	Inbound
New	Red	20th/Sargent (NE)	Outbound
Existing	Red	3126 Jackson	Outbound
New	Red	32nd/McClelland (SW)	Inbound
Existing	Red	Bentledge Building	Both
Existing	Red	Freeman Hospital	Both
New	Red	Joplin Health and Rehabilitation Center	Endpoint
Existing	Red	Joplin Housing Authority (S)	Both
New	Red	Joplin Senior Center	Outbound
New	Red	Joplin/20th	Inbound
New	Red	KC University of Medicine	Outbound
New	Red	Maiden/20th	Outbound
New	Red	Maiden/21st	Inbound
New	Red	Maiden/24th	Inbound
New	Red	Maiden/25th	Outbound
New	All	Main Transfer Center	Endpoint
Existing	Red	McClelland/Old 32nd	Inbound
New	Red	McIntosh/Jackson	Inbound
Existing	Red	Mercy Village	Outbound
Existing	Red	Wall/20th	Inbound
New	Red	YMCA (E)	Inbound
Existing	Red	YMCA (W)	Outbound

Medium-Term Funding Needs

As summarized in Exhibit 6.21, additional funding would be needed in order to implement the medium-term plan, most of which will be capital funding. Two additional vehicles will be required, 62 stops will need to be established, and a transfer center will need to be constructed. If shelters are warranted at specific stops in the future, the total would increase to approximately $10,500 per shelter. Operating funding includes a raise in driver salaries to be competitive and to help fill the new driver positions created, as well as the restoring of Saturday service and extension of the service span two hours later on weekdays and Saturdays (8:00 PM and 6:00 PM, respectively). It is also anticipated with the increase in flex route service, only three vehicles (instead of the six currently assigned) will be operating demand response service. Thus, those costs will be reduced.[25]

Exhibit 6.21: Estimated Medium-Term Capital and Operating Costs

Capital Cost	Item Cost	Number	Grant Funding (80%)	Local Match (20%)	Total	Source
Transfer Center	$2,000,000-$3,000,000	1	$1,600,000 - $2,400,000	$400,000-$600,000	$2,000,000 - $3,000,000[26]	Independent Cost Estimates for Design and Construction of Transit Facilities in Rural and Small Urban Areas (2015)
New Stops	$180	62	$8,800	$2,200	$11,000	Cost of installing a basic bus route sign and pole
New Vehicles	$65,000	2	$104,000	$26,000	$130,000	2019 Ford Starcraft Allstar 12 passenger, 2 wheelchair shuttle bus
Additional Capital Cost Total			**$1,712,800 - $2,512,800**	**$428,200 - $628,200**	**$2,141,000 - $3,141,000**	

Operating Cost	Grant Funding (50%)	Local Match (50%)	Total
Expanding Trolley Service to 8 Routes	$115,000	$115,000	$230,000[27]
Extending Service by 2 hours per day	$192,500	$192,500	$385,000
Additional Operating Cost Total	**$307,500**	**$307,500**	**$615,000**

Total Medium-Term Cost	**$2,020,300 - $2,820,300**	**$735,700 - $935,700**	**$2,756,000 - $3,756,000**

[25] The expenses would be cut in half if the current driver salaries are maintained, but since it is anticipated they will increase, not all expenses will be able to be cut.

[26] National Academies of Sciences, Engineering, and Medicine 2015. Independent Cost Estimates for Design and Construction of Transit Facilities in Rural and Small Urban Areas. Washington, DC: The National Academies Press. ttps://doi.org/10.17226/22086. p. 14

[27] This includes an increase after reduction in Demand Response service.

6.3 Long-Term Plan

The long-term plan will build on the medium-term plan and expand fixed route service into new markets requested by the public. These route extensions would create a regional fixed route network, rather than just a city service only in Joplin. The new destinations that would be served include Wildwood Senior Apartments far west of Joplin, Joplin Industrial Park, Duenweg, and Webb City. The latter two communities, although a contributing member of MAPS, only have demand response service in their communities. The local governments have requested parity with Joplin, with fixed route service available as well. The Joplin Industrial Park has a large employment base that is growing; the employers there have requested service in the past.

Four additional routes or route extensions are proposed in the long-term. The route extension to the Joplin Industrial Park would run intermittently and be coordinated with the most common shift time changes during the weekday and Saturday service spans. The route extension to Wildwood Senior Apartments and the new Duenweg and Webb City routes would run on 60-minute intervals from 6:00 AM to 8:00 PM on weekdays and 9:00 AM to 6:00 PM on Saturdays. Twelve buses would be needed to run the routes, which would mean an additional four buses (over the amount needed to run the medium-term routes) would need to be purchased. In each proposed route map, the star indicates the recommended transfer location near the geographic center of the service area.

Proposed Dark Green Route

The Dark Green route would extend service to Webb City. Destinations served would include the Walmart in Webb City, Cardinal Scale, Ozark Christian College, Autumn Place Independent Living facility, downtown Joplin, and industrial jobs along Enterprise Avenue. The proposed Dark Green route is displayed in Exhibit 6.22 with stops summarized in Exhibit 6.23.

Exhibit 6.22: Proposed Dark Green Route

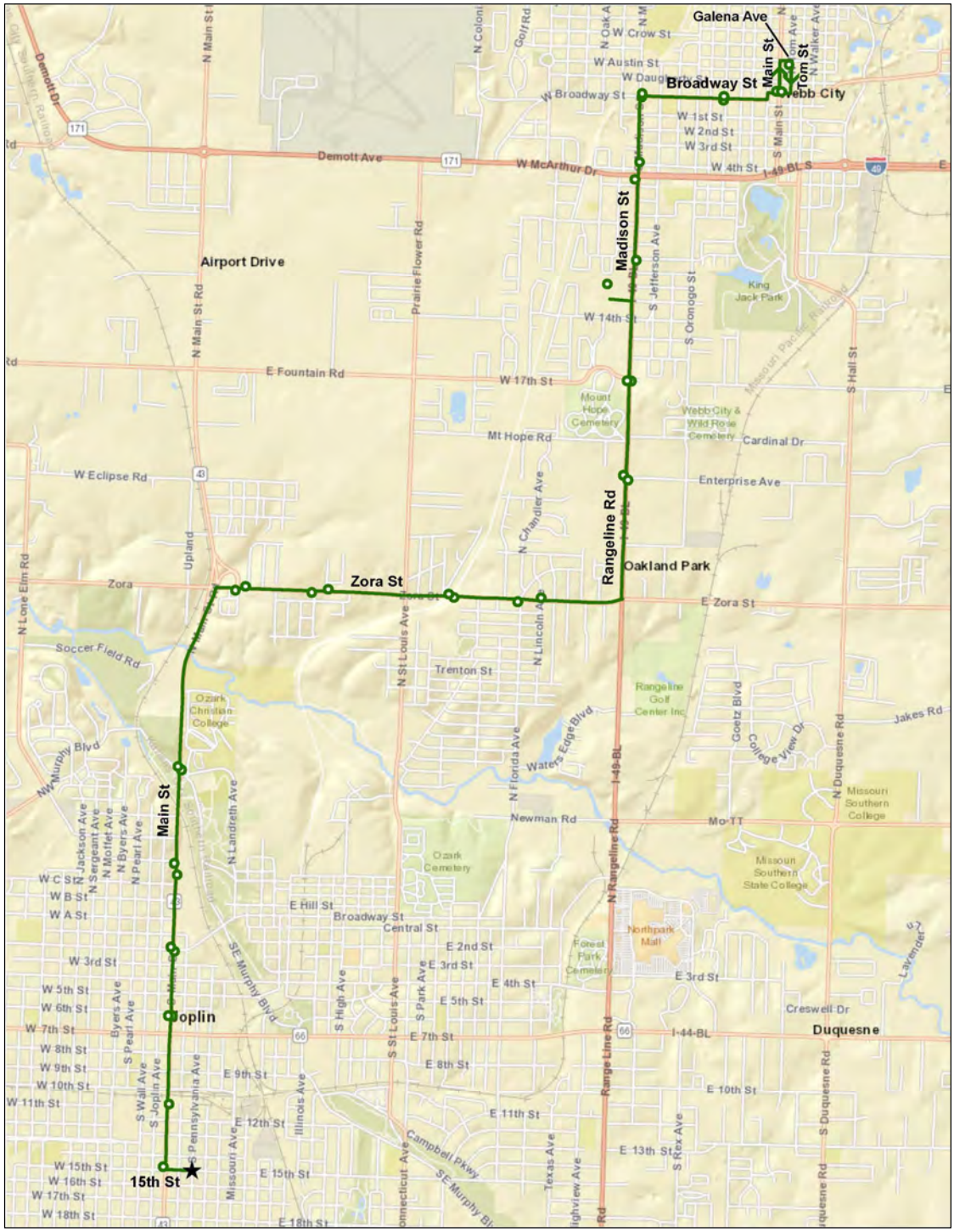


Exhibit 6.23: Proposed Dark Green Route Stops

Status	Routes Served	Location	Direction
New	Dark Green	1027 Main Street	Outbound
Existing	Light Blue, Red, Dark Green	15th/Main (NW)	Outbound
New	Dark Green	403 Main Street	Outbound
New	Dark Green	Autumn Ridge	Outbound
New	Dark Green	Broadway/Ball (NW)	Inbound
New	Dark Green	Broadway/Ball (SW)	Outbound
New	Dark Green	Broadway/Madison (NE)	Inbound
New	Dark Green	Broadway/Main	Outbound
New	Dark Green	Cardinal Towers	Outbound
New	Dark Green	Madison/10th	Outbound
New	Dark Green	Madison/4th	Outbound
New	Dark Green	Madison/Broadway (SE)	Outbound
New	Dark Green	Madison/McArthur	Inbound
New	All	Main Transfer Center	Outbound
Existing	Light Blue, Dark Green	Main/10th (SW)	Inbound
New	Dark Green	Main/2nd (NW)	Inbound
New	Dark Green	Main/2nd (SE)	Outbound
New	Dark Green	Main/6th (SE)	Outbound
New	Dark Green	Main/6th (SW)	Inbound
New	Dark Green	Main/Broadway	Outbound
New	Dark Green	Main/D	Inbound
New	Dark Green	Main/Murphy (NE)	Outbound
New	Dark Green	Main/Murphy (NW)	Outbound
New	Dark Green	Rangeline/Enterprise (NW)	Inbound
New	Dark Green	Rangeline/Enterprise (SE)	Outbound
New	Dark Green	Rangeline/Fountain (SE)	Outbound
New	Dark Green	Rangeline/Fountain (SW)	Inbound
New	Dark Green	Webb City Walmart	Both
New	Dark Green	Zora Mobile Home Park	Outbound
New	Dark Green	Zora/Florida	Outbound
New	Dark Green	Zora/Frisco Trail	Inbound
New	Dark Green	Zora/Hickory	Inbound
New	Dark Green	Zora/Illinois	Outbound
New	Brown, Dark Green	Zora/Lincoln	Outbound
New	Dark Green	Zora/Missouri	Inbound

Proposed Teal Route

The Teal route would extend service to Duenweg. The Greyhound station, Target and Walmart on Rangeline Road, and the Dollar General in Duenweg would be the destinations served. The proposed Teal route is displayed in Exhibit 6.24 with stops summarized in Exhibit 6.25.

Exhibit 6.24: Proposed Teal Route

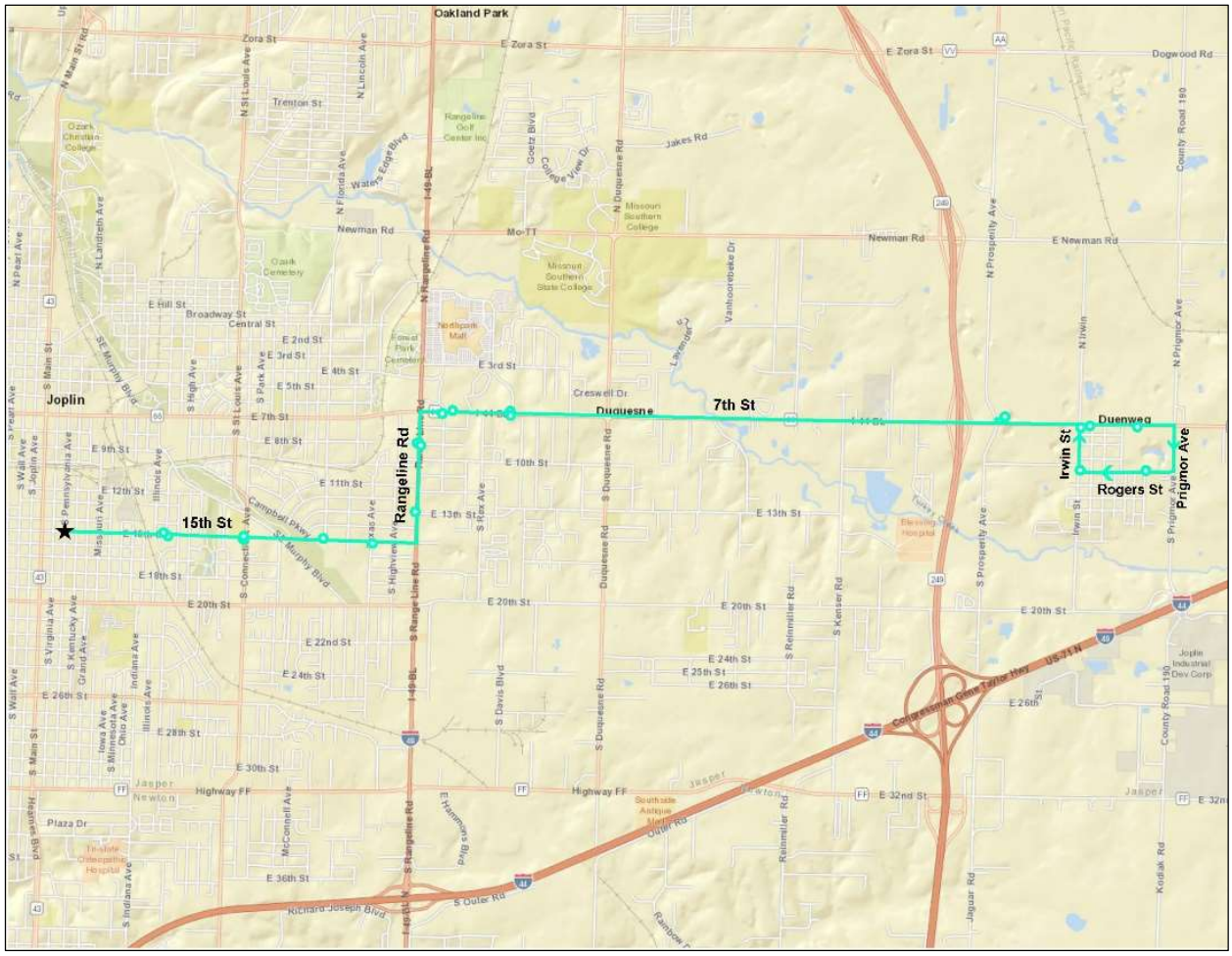


Exhibit 6.25: Proposed Teal Route Stops

Status	Routes Served	Location	Direction
New	Blue, Yellow, Teal, Brown	15th/Connecticut	Outbound
New	Blue, Yellow, Teal, Brown, Purple	15th/Connecticut	Inbound
New	Blue, Teal, Brown	15th/Florida	Inbound
Existing	Blue, Teal	15th/Texas	Outbound
Existing	Blue, Yellow, Teal, Brown, Orange, Purple	15th/Wisconsin	Inbound
Existing	Blue, Yellow, Teal, Brown, Purple	15th/Wisconsin	Outbound
New	Teal	7th/Geneva	Outbound
New	Teal	7th/Northpark (NW)	Inbound
New	Teal	7th/Northpark (SW)	Outbound
New	Teal	7th/Webb	Outbound
New	Teal	Duenweg Dollar General	Endpoint
New	Teal	Greyhound Station	Both
New	Teal	Irwin/7th	Inbound
New	Teal	Irwin/Rogers	Inbound
New	All	Main Transfer Center	Endpoint
New	Blue, Teal	Rangeline/13th	Inbound
New	Blue, Teal	Rangeline/8th	Inbound
New	Blue, Teal	Rangeline/8th	Outbound
New	Teal	Rogers/Robin	Inbound
New	Teal	Target	Inbound

Proposed Red Route

The Red route would extend farther west to serve the new destination of Wildwood. The ten stops on the table following highlighted in gray were added to the medium-term stops. The proposed Red route is displayed in Exhibit 6.26 with stops summarized in Exhibit 6.27.

Exhibit 6.26: Proposed Red Route

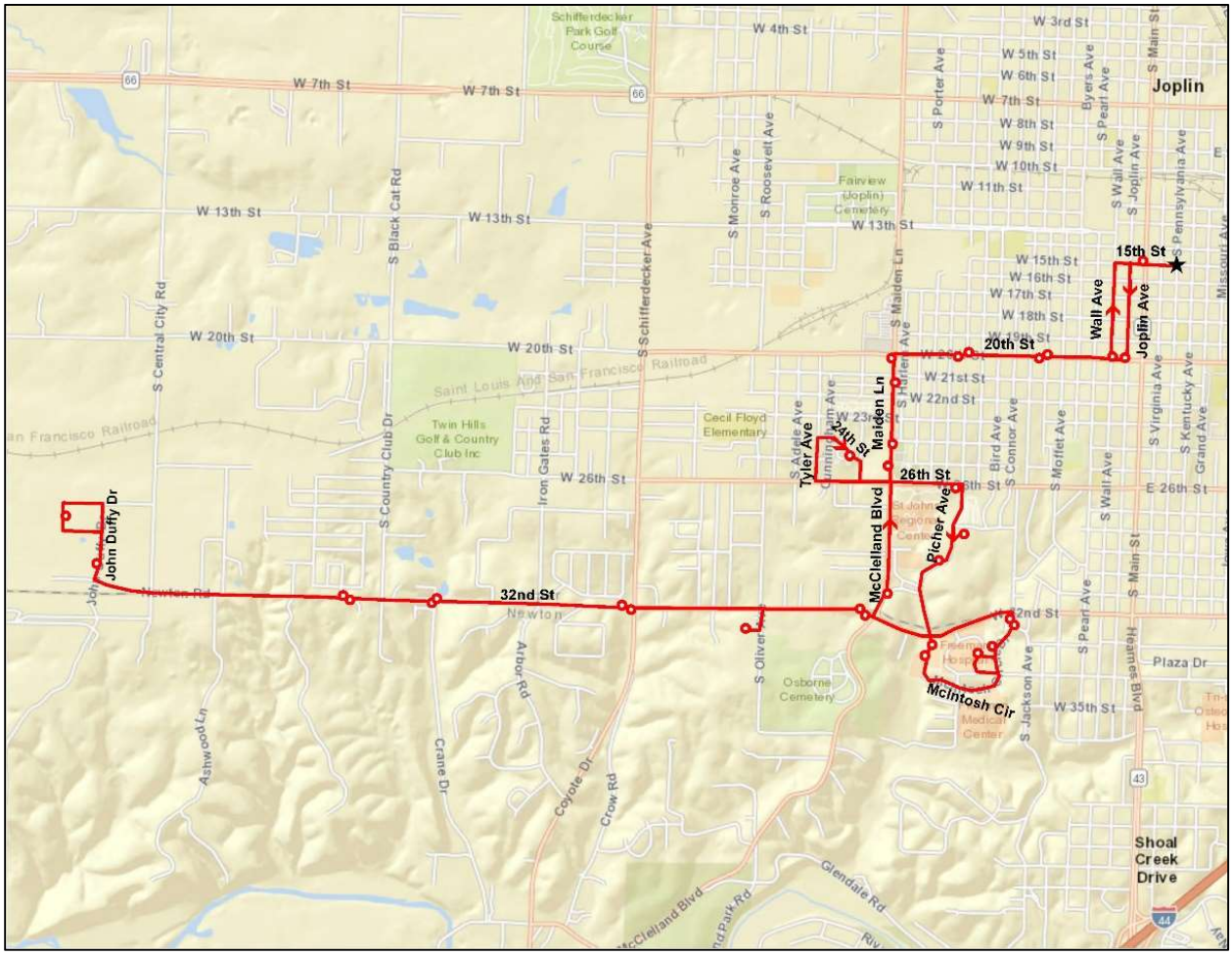


Exhibit 6.27: Proposed Red Route Stops

Status	Routes Served	Location	Direction
Existing	Light Blue, Red, Dark Green	15th/Main (NW)	Outbound
New	Red	20th/Picher (NE)	Outbound
New	Red	20th/Picher (SW)	Inbound
New	Red	20th/Sargent (SW)	Inbound
New	Red	20th/Sargent (NE)	Outbound
Existing	Red	3126 Jackson	Outbound
New	Red	32nd/Crane (NE)	Inbound
New	Red	32nd/Crane (SW)	Inbound
New	Red	32nd/Jennifer (NE)	Outbound
New	Red	32nd/Jennifer (S)	Inbound
New	Red	32nd/McClelland (SW)	Inbound
New	Red	32nd/McClelland (NW)	Outbound
New	Red	32nd/Schifferdecker	Inbound
New	Red	32nd/Sunset East	Outbound
Existing	Red	Bentledge Building	Both
Existing	Red	Freeman Hospital	Both
New	Red	Joplin Health and Rehabilitation Center	Endpoint; Both
Existing	Red	Joplin Housing Authority (S)	Both
New	Red	Joplin Senior Center	Outbound
New	Red	Joplin/20th	Inbound
New	Red	KC University of Medicine	Outbound
New	Red	Maiden/20th	Outbound
New	Red	Maiden/21st	Inbound
New	Red	Maiden/24th	Inbound
New	Red	Maiden/25th	Outbound
New	All	Main Transfer Center	Endpoint
Existing	Red	McClelland/Old 32nd	Inbound
New	Red	McIntosh/Jackson	Inbound
Existing	Red	Mercy Village	Outbound
Existing	Red	Wall/20th	Inbound
New	Red	Westgate at Wildwood	Inbound
New	Red	Wildwood Apartments	Endpoint
New	Red	YMCA (E)	Inbound
Existing	Red	YMCA (W)	Outbound

Proposed Yellow Route

The Yellow route would be extended from its medium-term endpoint (Ozark Center) to the Joplin Industrial Park on select trips (the gray highlighted stops would be added to the medium-term stops). The times of these trips would be determined after discussions with the larger employers in the Joplin Industrial Park. The additional destinations served would be large industrial employers such as CFI, Blue Buffalo, and Eagle Picher. The proposed Yellow route is displayed in Exhibit 6.28 with stops summarized in Exhibit 6.29.

Exhibit 6.28: Proposed Yellow Route (Long Term)

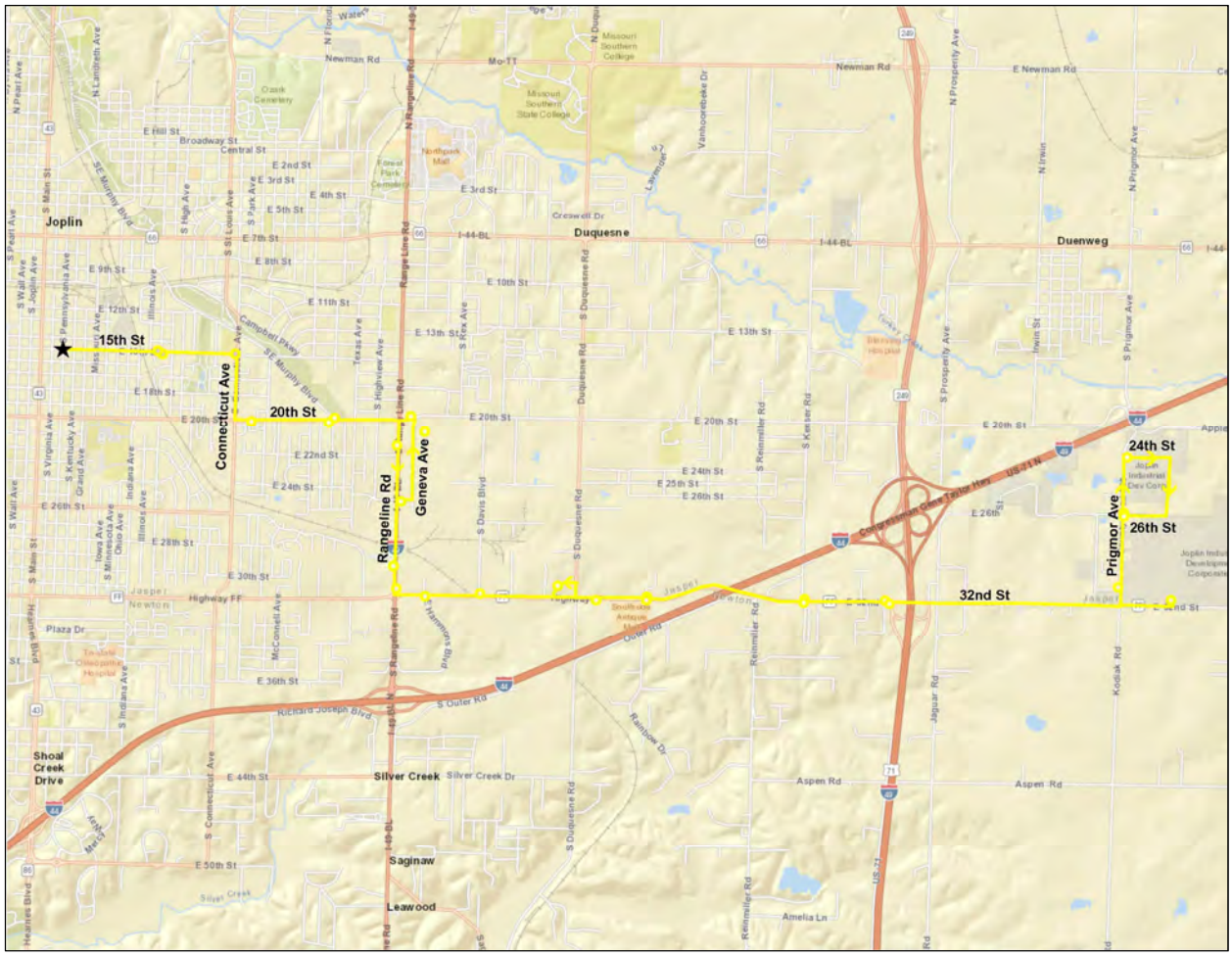


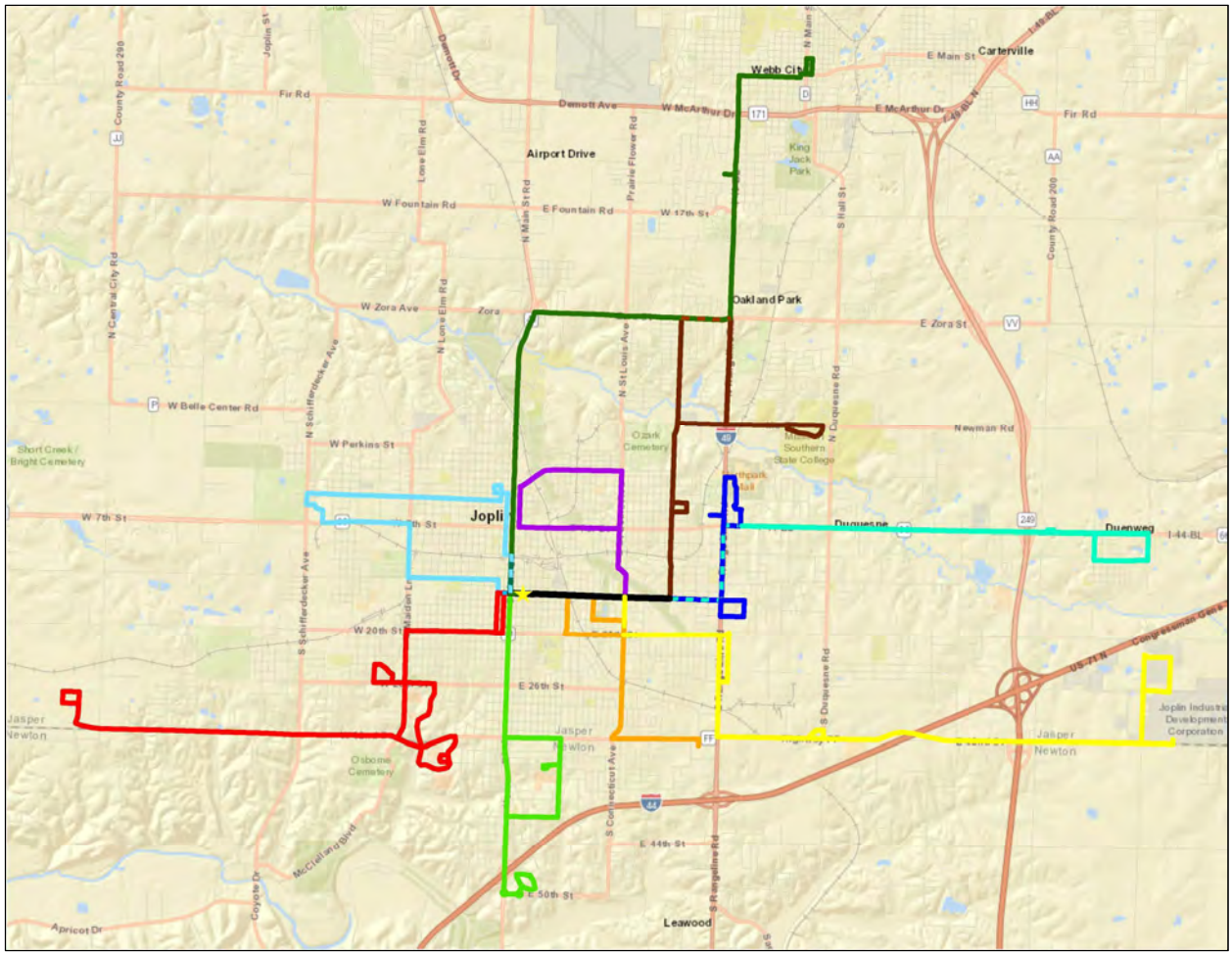
Exhibit 6.29: Proposed Yellow Route Stops

Status	Routes Served	Location	Direction
New	Blue, Yellow, Teal, Brown	15th/Connecticut	Outbound
New	Blue, Yellow, Teal, Brown, Purple	15th/Connecticut	Inbound
Existing	Blue, Yellow, Teal, Brown, Orange, Purple	15th/Wisconsin	Inbound
Existing	Blue, Yellow, Teal, Brown, Purple	15th/Wisconsin	Outbound
Existing	Yellow	20th/Delaware	Outbound
Existing	Yellow	20th/Geneva	Inbound
Existing	Yellow	20th/Mississippi	Outbound
New	Yellow	20th/Murphy	Inbound
New	Yellow	24th/Prigmore	Outbound
New	Yellow	24th/Rangeline	Inbound
New	Yellow	26th/Prigmore	Endpoint
New	Yellow	32nd/CFI	Inbound
New	Yellow	32nd/Davis	Inbound
New	Yellow	32nd/Flying J	Inbound
New	Yellow	32nd/Hammons	Outbound
New	Yellow	32nd/Hillside Estates	Outbound
New	Yellow	32nd/Lewellen	Outbound
New	Yellow	32nd/Oak Park	Outbound
New	Yellow	32nd/Serene	Inbound
New	Yellow	32nd/WestRock	Outbound
New	Yellow	Blue Buffalo	Both
New	Yellow	Home Depot	Inbound
Existing	Yellow, Orange	Library	Both
New	All	Main Transfer Center	Endpoint
New	Yellow	Ozark Center	Endpoint; Both
New	Yellow	Prigmore/26th	Outbound
New	Yellow	Prigmore/31st	Inbound
New	Yellow	Rangeline/17th	Outbound
New	Yellow	Rangeline/32nd	Inbound
New	Yellow	Rangeline/Goodwill	Outbound

Long-Term Plan Summary

The proposed long-term system map is displayed in Exhibit 6.30.

Exhibit 6.30: Proposed Long-Term System Map



Long-Term Funding Needs

As summarized in Exhibit 6.31, additional funding over what was provided in the medium-term will be needed in order to implement the long-term plan. Four additional vehicles will be needed for fixed route service, and an additional 63 stops will need to be established beyond those added in the medium-term. The span of service will be anticipated to remain the same as the medium-term. It is estimated that four additional trips will be needed to serve Joplin Industrial Park on the Yellow route. If shelters are warranted at specific stops in the future, the total would increase to approximately $10,500 per shelter.

Exhibit 6.31: Estimated Long-Term Capital and Operating Costs

Capital Cost	Item Cost	Number	Grant Funding (80%)	Local Match (20%)	Total	Source
New Stops	$180	63	$9,200	$2,300	$11,500	Cost of installing a basic bus route sign and pole
New Vehicles	$65,000	4	$208,000	$52,000	$260,000	2019 Ford Starcraft Allstar 12 passenger, 2 wheelchair shuttle bus
Additional Capital Cost Total			**$217,200**	**$54,300**	**$271,500**	

Operating Cost	Grant Funding (50%)	Local Match (50%)	Total
New Long-Term Routes and Extensions	$325,000	$325,000	$650,000

Total Long-Term Cost	**$542,200**	**$379,300**	**$921,500**

Appendix

Stakeholder Workshops

Visioning Sessions

Onboard Surveys and Public Meeting