APPENDIX

1

Transportation Modeling and Forecasting

September 2020

Pine Bluff - White Hall - Jefferson County
Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

Prepared by:

NEEL-SCHAFFER
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1 Introduction and Model Overview

1.1 Introduction

This report includes a description of the procedures used in developing the demographics and travel estimates used in the 2045 Metropolitan Transportation Plan (MTP) for the Southeast Arkansas Regional Planning Commission (SEARPC) Metropolitan Planning Organization (MPO). It also describes the relationship between planning data and trip making, and the calibration and testing of the model. This report does not include how to operate the model.

1.2 Model Overview

The SEARPC MPO Travel Demand Model (TDM) was created for use in the MPO's new 2045 MTP. The model was calibrated and validated to meet the requirements established by the Federal Highway Administration (FHWA) and uses the calibration and validation parameters described in the latest *Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee*[1].

The TDM uses a 2019 base year and contains:

- a master roadway network,
- socioeconomic data and corresponding trips rates,
- turn penalties and trip prohibitions,
- time penalties,
- capacity factors, and
- external trip data

[1] http://tnmug.utk.edu/wp-content/uploads/sites/47/2017/06/MinimumTravelDemandModel2016.pdf

The SEARPC MPO TDM is based upon the conventional trip-based four-step modeling approach.

Broadly, the main model components fall within the following four categories:

Trip Generation

- The process of estimating trip productions and attractions at each TAZ

Trip Distribution

- The process of linking trip productions to trip attractions for each TAZ pair.

Mode Choice

- The process of estimating the number of trips by mode for each TAZ pair.
- This process allows the model to calculate transit trips.

Trip Assignment

- The process of assigning auto and truck trips onto specific highway facilities in the region.

The TDM's focus is on the region's highway network due to a limited number of transit trips. As a result, a transit element has not been included, eliminating the Mode Choice step. The TDM was developed in TransCAD 8.0 travel demand forecasting software and the model interface was developed using GISDK macros.

2 Traffic Analysis Zones and Socioeconomic Data

2.1 Study Area and Traffic Analysis Zones

The accuracy necessary for generating trips from planning data requires it to be aggregated by small geographic areas. These areas are called Traffic Analysis Zones (TAZs).

TAZs are generally homogeneous areas and were delineated based on:

- population,
- land use,
- census geography,
- physical landmarks, and
- governmental jurisdictions.

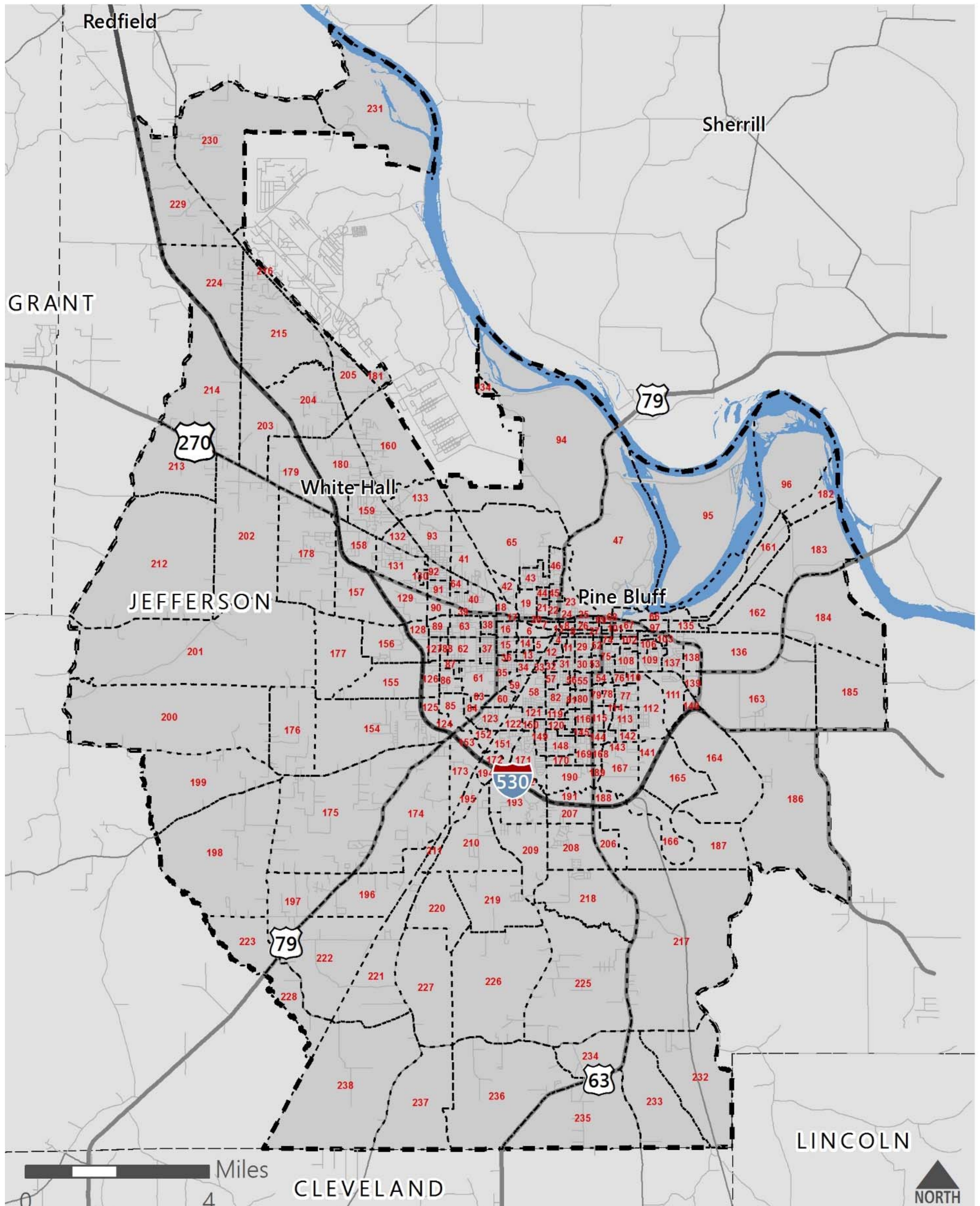
The MTP 2045 study area is the same as the previous MTP. However, the TAZ structure used in the TDM was developed as part of the MTP 2045. The MTP 2045 study area was divided into 238 TAZs. Additionally, there are 17 external stations. A map of the TAZs is shown in Figure 2.1.

All of the local governments in the MPA, including the county government, are members of the MPO. This includes:

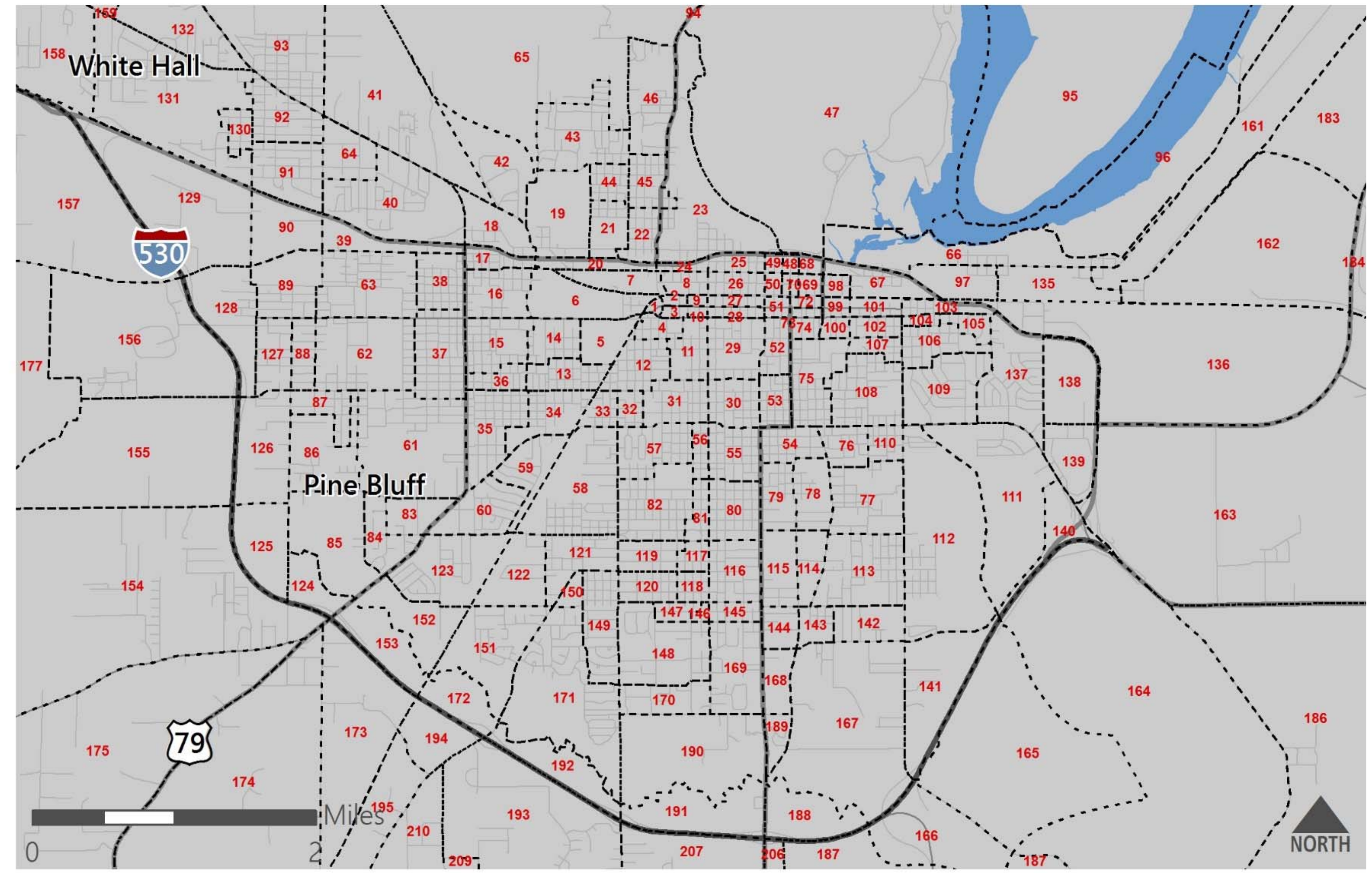
- The City of Pine Bluff,
- the City of White Hall, and
- the urbanized portion of Jefferson County

Figure 2.1: MPO Study Area

Metropolitan Planning Area



Urban Core



Legend

Model TAZ

- Model TAZ
- Planning Area

Data Sources: Census Bureau; Pine Bluff MPO

Disclaimer: This map is for planning purposes only.

2.2 Base Year (2019) Model Socioeconomic Data

This MTP effort uses a 2019 base year with housing, income, employment, and school attendance data as model inputs. This section describes the procedures used to create the model files and base year socioeconomic data.

2.2.1 Household Data Development

Household data for the MPO TAZs was derived from the 2010 Census and the 5-year American Community Survey (ACS) estimates. The steps to create the household data for the TDM included:

- Using block-level data from the 2010 Census was to determine the households and persons in each TAZ for year 2010, the average household occupancy, and assign a block group to the TAZ.
- Developing an annual growth rate for each block group in the MPA based on the 2010 Census population and 2019 ACS projected population.
- Applying the block group growth rate to each TAZ to determine the 2019 persons in each TAZ.
- Using the 2019 persons to derive the 2019 households using the 2010 average population per household in each TAZ obtained from the 2010 Census.

Table 2.1 displays the estimated 2019 household data within the study area.

Table 2.1: Study Area Households and Population, Base Year 2019

Variable	Total
Total Population	63,993
Household Population	59,891
Households	23,935

Source: Census 2010; NSI, 2020

2.2.2 Employment Data Development

The employment values used in the model came from the U.S. Census LEHD (Longitudinal-Employer Household Dynamics Program) 2017 data. This data is collected by states in the Quarterly Census for Employment and Wages under an agreement with the Bureau of Labor Statistics and includes information like number of employees, NAICS category, and establishment location. The federal Office of Personnel Management provides information on most Federal employees and jobs. The spatial point data from LEHD was overlaid on the TAZs in GIS. Then, the total number of jobs and jobs per category were aggregated per TAZ.

Two flaws in LEHD data are that government and military jobs are sometimes undercounted, and sometimes jobs are counted at the establishment's headquarters rather than the individual job sites. To correct for these flaws, the LEHD data was cross-referenced with data from the Jefferson County Chamber of Commerce regarding major employers and job sites. When discrepancies arose, information from the Chamber of Commerce and company or institutional websites was used over LEHD data. This occurred for only a few employers, such as schools and correctional facilities.

After updating employer data, these jobs were organized by NAICS category into five categories:

- Agriculture, Mining and Construction (NAICS 11, 21, 23)
- Manufacturing, Transportation/Communications/Utilities, and Wholesale Trade (NAICS 31-33, 48-49, 22, 42)
- Retail Trade (NAICS 44-45, NAICS 72)
- Government, Office, and Services (NAICS 51-56, 61, 62, 71, 81, 92)
- Other Employment (NAICS 99)

It should be noted that, due to the nature of the LEHD data, it could not be determined what values would fall under other employment category. Table 2.2 displays the study area employment by type.

Table 2.2: Study Area Households and Population, Base Year 2019

Variable	Description	Total
TOT_EMP	Total Employment	28,108
AMC_EMP	Agriculture, Mining and Construction Employment	631
MTCUW_EMP	Manufacturing, Transportation/Communications/Utilities and Wholesale Trade Employment	6,997
RET_EMP	Retail Employment	5,269
OS_EMP	Government, Office and Services Employment	15,211
OTH_EMP	Other Employment	0

Source: InfoUSA; NSI, 2020

2.2.3 School Enrollment Data Development

The MTP 2045 school enrollment uses data received from the National Center for Education Statistics. This data was used to geocode and assign schools to the TAZs in the TDM, along with each school's total enrollment. School attendance figures include public and private elementary, middle, and high schools; colleges; universities; vocational and business schools. Total school attendance in the study area in 2019 was 14,370 students. For modeling purposes, the school attendance is measured by the number of students attending a school in a traffic zone and *not* by the number of students residing in a traffic zone.

3 Roadway Network

3.1 Network Line Layer

The simulation of travel patterns in a computer model requires a representation of the street and highway system in digital format. The TransCAD model creates such a network from a geographic line layer in GIS. The line layer dataview records contain descriptive information for each link and it's properties. Restricted turning movements, called turn prohibitors in the model, are also coded into the network at locations where certain movements are not allowed or physically cannot be made.

For this TDM, a roadway network was created based on the Arkansas Department of Transportation (ArDOT) functionally classified roadways.

This network included:

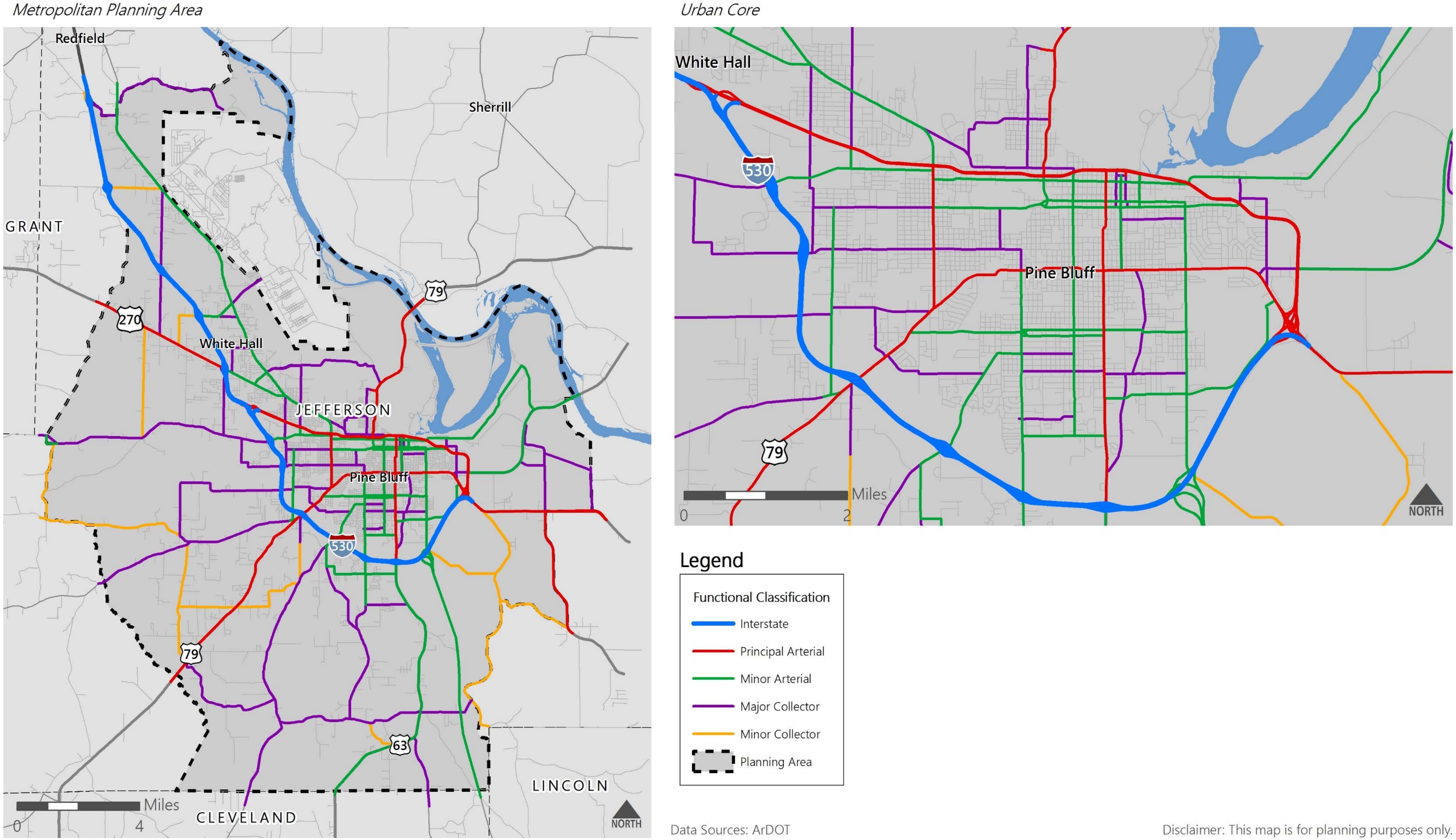
- number of lanes,
- speed limits and operating speeds,
- roadway capacities,
- ArDOT functional classification,
- volume-delay function parameters (alpha and beta values), and
- daily traffic counts and traffic stations (where necessary).

The TDM uses a master network in the model's setup folder. This line layer contains the records for all roadway links used in the TDM process. The master network contains the data for the base year, Existing Plus Committed network, and all roadway test projects. Figure 3.1 displays the base year roadway network and link functional classifications used in the TDM.

3.2 Functional Classification

Each link in the model's roadway network was assigned a functional classification based on the system maintained by ArDOT. The functional classifications used in the TDM are shown in Table 3.1.

Figure 3.1: Roadway Network and Functional Classification, Base Year



Data Sources: ArDOT

Disclaimer: This map is for planning purposes only.

Table 3.1: Functional Classification Used in MPO Model

Description	ArDOT Functional Classification Number
Interstate	1
Principal Arterial	3
Minor Arterial	4
Major Collector	5
Minor Collector	6
Ramp	**
System Ramp	**
Centroid Connector	0

**NOTE: Ramps follow the same functional classification as the primary roadway they connect to.

Source: FHWA, ArDOT

3.3 Model Link Speeds and Capacities

Roadway speeds and capacities are important TDM inputs that affect the traffic assignment model. The posted speed, which is assumed to be the free flow speed, for each roadway link is contained in the network database. The model uses capacity factors based on several inputs, which are shown in Figure 3.2. The capacity inputs consider factors such as:

- Roadway functional classification
- Location of roadway in an urban or rural area
- Number of lanes
- Presence of a median or dividing feature
- Presence and width of shoulder on roadway

Figure 3.2: Model Capacity Factors

Link Capacity (LOS D)

Vehicles per lane per hour - vphpl

Functional Class			vphpl Directional
All Interstate			
	2 Lanes		2,300
	>2 Lanes		2,400
Principal Arterial			
	Rural	Divided	1,700
	Rural	Undivided	1,500
	Urban	Divided	1,500
	Urban	Undivided	1,300
Minor Arterial			
	Rural	Divided	1,600
	Rural	Undivided	1,350
	Urban	Divided	1,400
	Urban	Undivided	1,150
Collector			
	Rural	Divided	1,350
	Rural	Undivided	1,150
	Urban	Divided	1,150
	Urban	Undivided	950
Local			
	Rural	2 Lane	900
	Rural	>2 Lane	1,000
	Urban	2 Lane	800
	Urban	>2 Lane	900
Ramps			1,000
Centroid Connectors			9,999

Adjustment Factors

Acronym	Name	Facility Type	Lane Width	LW Code	Shoulder	SW Code	Factor
Fw	Lane & Shoulder Width	All	Simplified in PB Model				1.00
Fhv	Heavy Vehicle	Interstate					0.88
		Principal Arterial					0.90
		Minor Arterial					0.90
		Collector					0.92
		Local					0.97
Fp	Driver Population	Rural Interstate					0.90
		Urban Interstate					0.92
		System Ramp					0.92
		Principal Arterial					0.95
		Minor Arterial					0.98
		Collector					NA
		Local					NA
Fe	Driving Environment	Interstate					NA
		Rural Prin Art	Divided				1.00
		Rural Prin Art	Undivided				0.90
		Urban Prin Art	Divided				0.90
		Urban Prin Art	Undivided				0.80
		Rural Minor Art	Divided				1.00
		Rural Minor Art	Undivided				0.90
		Urban Minor Art	Divided				0.90
		Urban Minor Art	Undivided				0.80
		Rural Collector	Divided				1.00
		Rural Collector	Undivided				0.90
		Urban Collector	Divided				0.90
		Urban Collector	Undivided				0.80
		Rural Local	2 Lane				0.90
		Rural Local	>2 Lane				0.90
		Urban Local	2 Lane				0.80
		Urban Local	>2 Lane				0.80
Fd	Directional Distribution (Local only)	2 Lane	Divided				0.94
		>2 Lane	Divided				1.16
		2 Lane	Undivided				0.94
		>2 Lane	Undivided				1.10
Fctl	Center Turn Lane	Interstate					NA
		All Other					1.08
Fpark	On Street Parking	Any					0.95

SF = c x Fw x Fhv x Fp x Fe x Fd x Fsd x Fctl x Fpark X (V/C)

SF = Model vphpl for desired level of service
c = Ideal vphpl
(V/C)I = Rate of service flow for level of service D

Source: Nashville Model

3.4 Centroid Connectors

Centroid connectors are imaginary roadway network links that connect a TAZ's centroid to the adjacent roadway network at nodes. These links represent the local streets on the street and highway system that are not in the model network. Centroid connectors provide the model the ability to move trips generated from individual TAZs to the roadway network. Where centroid connectors access the model network is based on features such as neighborhood roadway entrances, driveways, and parking lots.

During the TDM update, the centroid connectors were adjusted to match locations where traffic is most likely to access the model's roadways. This was accomplished by relocating the centroid for the TAZ to reflect the "center of mass" of developed land and/or moving the centroid connector roadway network access points to a location where trips generally enter or leave the TAZ. This changes the length of the centroid connectors and the travel times on the links to encourage modeled traffic to use certain access points to reflect the observed traffic.

3.5 Traffic Counts

The TDM contains traffic volumes received from ArDOT and reflect the 2019 base year volumes. The model calibration and validation process included the verification of count stations upon the existing TDM links and ensuring that the ADTs are assigned to the correct link, with adjustments made as necessary.

3.6 Network Attributes

Table 3.2 displays the network attributes used on the links in the TDM.

Table 3.2: Model Link Attributes

Attribute Name	Description	Input Type
LENGTH	Real (4 bytes) Segment length in miles	Automatic
DIR	Integer (2 Bytes) 0 = Two way link 1 = one way link, AB fields will be used -1 = one way link, BA fields will be used.	Automatic but user can override.
NAME	Character Street Name	User

ADT_19	Integer (4 bytes) 2019 Daily Traffic Count	User
DIR_19	Integer (2 Bytes) 2019 Link Direction 0 = Two way link 1 = one way link, AB fields will be used -1 = one way link, BA fields will be used.	User
NETWORK_19	Integer (2 bytes) 1= Network Road link 2= Centroid connector 0 or null= Link will not be included in the model run	User*
AB_ArDOT_FC_19	Integer (4 bytes) Refer to Table 3.1	User
BA_ArDOT_FC_19	Integer (4 bytes) Refer to Table 3.1	User
ArDOT_FC_DESC_19	Character Refer to Table 3.1	User
MODEL_FC_19	Integer (4 bytes) Model functional classification code	User*
MODEL_FC_DESC_19	Character Model functional classification description	User
AB_CLASS_19	Integer (4 bytes) Field denoting number of lanes and configuration in AB direction	User
BA_CLASS_19	Integer (4 bytes) Field denoting number of lanes and configuration in BA direction	User
POSTED_SPEED_19	Integer (4 bytes) Posted Link Speed (mph)	User
AB_SPEED_19	Real (8 bytes) Link speed (mph) in AB direction	User*
BA_SPEED_19	Real (8 bytes) Link speed (mph) in BA direction	User*
LANES_19	Integer (4 bytes) Number of lanes for the roadway	User

AB_LANES_19	Integer (4 bytes) Number of lanes in AB direction	User*
BA_LANES_19	Integer (4 bytes) Number of lanes in BA direction	User*
ALPHA_19	Real (8 bytes) BPR Function Parameter	User*
BETA_19	Real (8 bytes) BPR Function Parameter	User*
AB_TT_19	Real (8 bytes) Link travel time in AB direction	Model
BA_TT_19	Real (8 bytes) Link travel time in BA direction	Model
AB_AM_TT_19	Real (4 bytes) Morning link travel time in AB direction	Model
BA_AM_TT_19	Real (4 bytes) Morning link travel time in BA direction	Model
AB_MD_TT_19	Real (4 bytes) Midday link travel time in AB direction	Model
BA_MD_TT_19	Real (4 bytes) Midday link travel time in BA direction	Model
AB_PM_TT_19	Real (4 bytes) Afternoon link travel time in AB direction	Model
BA_PM_TT_19	Real (4 bytes) Afternoon link travel time in BA direction	Model
AB_NT_TT_19	Real (4 bytes) Night-time link travel time in AB direction	Model
BA_NT_TT_19	Real (4 bytes) Night-time link travel time in BA direction	Model
OP_COST_19	Real (4 bytes) Operating cost	User
TOLL_COST_19	Real (4 bytes) Toll cost	User
Fw_19	Real (8 bytes) Capacity factor for lane and shoulder width	User
Fhv_19	Real (8 bytes) Capacity factor for heavy vehicles	User

Fp_19	Real (8 bytes) Capacity factor for driver population	User
Fe_19	Real (8 bytes) Capacity factor for driving environment	User
Fd_19	Real (8 bytes) Capacity factor for directional distribution	User
Fctl_19	Real (8 bytes) Capacity factor for center turn lanes	User
Fpark_19	Real (8 bytes) Capacity factor for on street parking	User
Fall_19	Real (8 bytes) Overall capacity factor	User
IDEAL_VPHPL_19	Real (8 bytes) Maximum capacity in vehicles/hour/lane	User
AB_VPHPL_19	Real (8 bytes) Capacity in AB direction in vehicles/hour/lane	User
BA_VPHPL_19	Real (8 bytes) Capacity in AB direction in vehicles/hour/lane	User
IS_MANUAL_CAP_19	Integer (2 bytes) 0 or null= Model calculates the link capacity Any other value= Link capacity value input by User will be retained	User*
AB_CAPACITY_19	Integer (4 bytes) Capacity in AB direction	Model
BA_CAPACITY_19	Integer (4 bytes) Capacity in BA direction	Model
AB_CAP_AM_19	Integer (4 bytes) Morning capacity in AB direction	Model
BA_CAP_AM_19	Integer (4 bytes) Morning capacity in BA direction	Model
AB_CAP_MD_19	Integer (4 bytes) Mid-day capacity in AB direction	Model
BA_CAP_MD_19	Integer (4 bytes) Mid-day capacity in BA direction	Model
AB_CAP_PM_19	Integer (4 bytes) Afternoon capacity in AB direction	Model

BA_CAP_PM_19	Integer (4 bytes) Afternoon capacity in BA direction	Model
AB_CAP_NT_19	Integer (4 bytes) Night time capacity in AB direction	Model
BA_CAP_NT_19	Integer (4 bytes) Night time capacity in BA direction	Model
DAILY_FLOW	Real (8 bytes) Total daily model volume	Model
AB_DAILY_FLOW	Real (8 bytes) AB directional daily model volume	Model
BA_DAILY_FLOW	Real (8 bytes) BA directional daily model volume	Model
DAILY_TOT_VMT	Real (8 bytes) Total daily vehicle miles travelled	Model
DAILY_AB_VMT	Real (8 bytes) AB directional daily vehicle miles travelled	Model
DAILY_BA_VMT	Real (8 bytes) BA directional daily vehicle miles travelled	Model
DAILY_TOT_VHT	Real (8 bytes) Total daily vehicle hours travelled	Model
DAILY_AB_VHT	Real (8 bytes) AB directional daily vehicle hours travelled	Model
DAILY_BA_VHT	Real (8 bytes) BA directional daily vehicle hours travelled	Model
DAILY_TOT_VHD	Real (8 bytes) Total daily vehicle hours delay	Model
DAILY_AB_VHD	Real (8 bytes) AB directional daily vehicle hours delay	Model
DAILY_BA_VHD	Real (8 bytes) BA directional daily vehicle hours delay	Model
DAILY_AB_VOC	Real (8 bytes) AB directional volume/capacity	Model
DAILY_BA_VOC	Real (8 bytes) BA directional volume/capacity	Model
DAILY_MAX_VOC	Real (8 bytes) Higher of AB and BA volume/capacity	Model
DAILY_TRK_FLOW	Real (8 bytes) Total daily model truck volume	Model

AB_DAILY_TRK_FLOW	Real (8 bytes) AB directional daily model truck volume	Model
BA_DAILY_TRK_FLOW	Real (8 bytes) AB directional daily model truck volume	Model

Note:

*: These fields must be filled in within the network for the model scenario to function.

1. Each of the suffix "19" fields should be repeated for EC, VIS, and SCE suffixes as well.
2. Volume-delay function parameter fields ALPHA_19 and BETA_19 are based on BPR function.
3. In addition to the base year fields, each planned year should have a field called "PROJECT_[suffix]" of type Integer. This field should have a unique project number for each committed or planned project.

Source: NSI, 2020

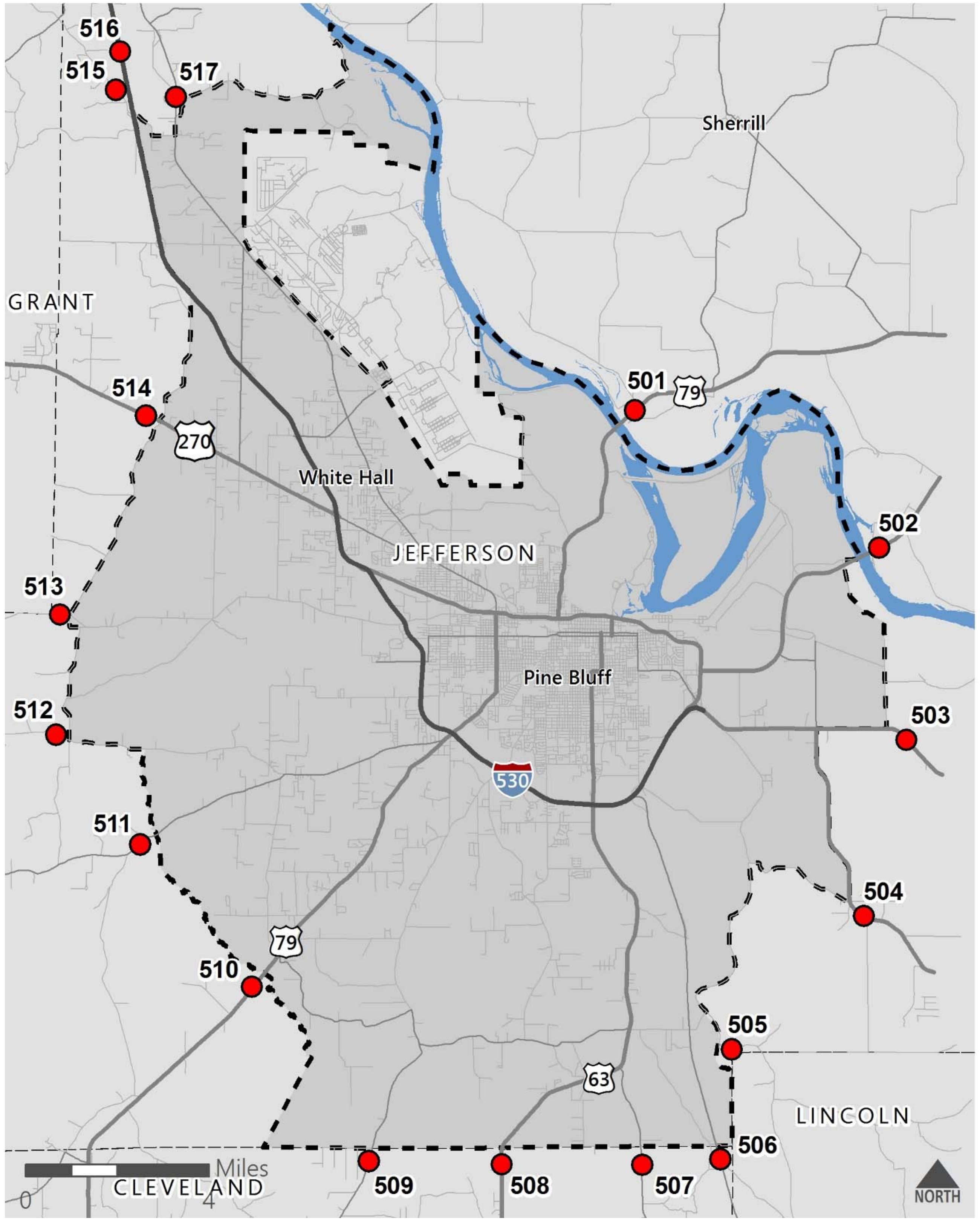
4 External Travel

There are two types of external travel trips: external-internal (EI) trips and external-external (EE) trips. EI trips have one end of the trip inside the study area, and the other outside. EE trips pass through the study area and have no origin or destination within the study area itself. Both trip types are assigned at external stations located on significant roadways that are at the study area's periphery. These stations represent most of the trips that are crossing the study area boundary. The locations of the TDM's external stations are shown in Figure 4.1.

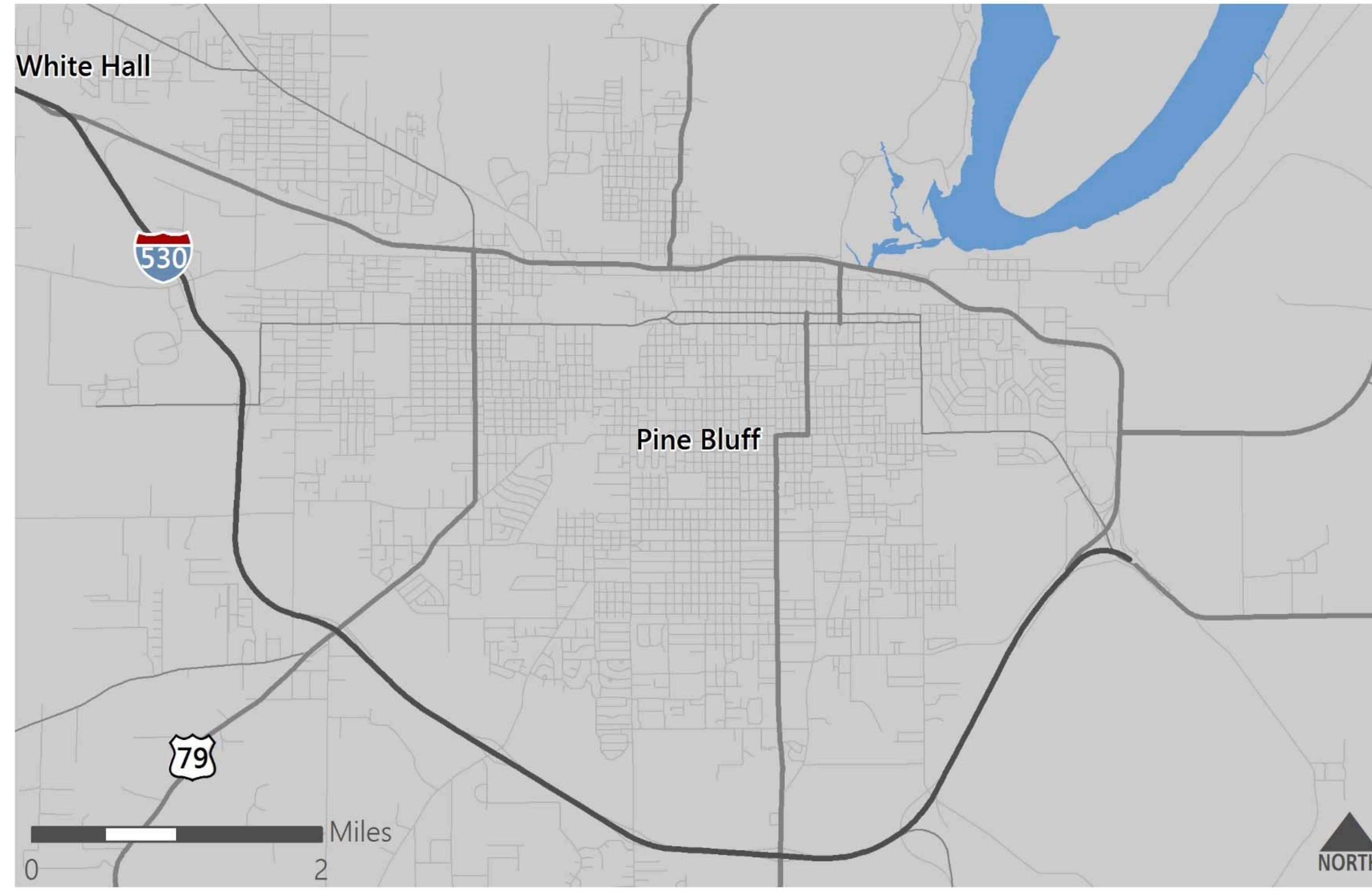
External trips in the model are divided into auto trips (AUTO) and truck (TRK) trips. Auto trips are those that are made in a personal vehicle. While not actually an auto trip, commercial vehicle (CMVEH) trips are included in AUTO trips for the purposes of external trips and represent four-tire commercial vehicles. Commercial vehicles include delivery and service vehicles. Truck trips represent single-unit with six or more tires and multi-unit with three-plus axle combination trucks.

Figure 4.1: Model External Stations

Metropolitan Planning Area



Urban Core



Legend

Model External Stations

- External Station
- Planning Area

Data Sources: Pine Bluff MPO

Disclaimer: This map is for planning purposes only.

4.1 External-External Trips

The MTP 2045 TDM uses external-external trip matrices that were derived from the methodology described in NCHRP 716 and local traffic counts at the external stations. The Fratar procedure was used to obtain balanced trips crossing the study area boundary. Table 4.1 displays the expanded 24 hour EE trip table for all vehicles.

4.2 External-Internal Trips

During model development, EI trips were separated into auto and truck trips based on the vehicle classification counts at external stations.

The following EI attraction equations were used in the travel demand model for EIAUTO and EITRK trips.

EIAUTO Attractions = 0.4380 * (OCCDU) + 1.0670 * (RET_EMP + RET_EMP2) +

0.5230 * (AMC_EMP + MTCUW_EMP + OS_EMP + OTH_EMP)

EITRK Attractions = 0.1160 * (RET_EMP + RET_EMP2) +

0.0930 * (AMC_EMP + MTCUW_EMP)

Note: RET_EMP2 is not used in the SEARPC TDM.

Descriptions of the variables used in the equations were included in Tables 2.1 and 2.2. Table 4.2 displays the EI trips at each external station.

Table 4.1: Expanded 24-Hour EE Trip Table for All Vehicles

TAZ	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	Total
501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.4	2.4	357.2	7.8	455.8
502	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.5	1.9	317.0	6.4	406.8
503	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	532.5	5.3	919.6	18.1	1,475.5
504	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.5	2.7	442.6	9.3	561.1
505	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	2.0	0.0	2.3
506	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.4	0.2	207.7	0.7	240.0
507	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0	45.1	0.2	52.1
508	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.2	0.5	285.4	1.6	328.7
509	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	34.1	0.1	39.4
510	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	672.2	17.9	695.4
511	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	54.8	0.8	55.8
512	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.1	5.9
513	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	30.5	0.5	31.1
514	88.4	81.5	532.5	106.5	0.3	31.4	6.8	41.2	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	893.8
515	2.4	1.9	5.3	2.7	0.0	0.2	0.0	0.5	0.0	5.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	18.6
516	357.2	317.0	919.6	442.6	2.0	207.7	45.1	285.4	34.1	672.2	54.8	5.8	30.5	0.0	0.0	0.0	0.0	3,374.0
517	7.8	6.4	18.1	9.3	0.0	0.7	0.2	1.6	0.1	17.9	0.8	0.1	0.5	0.0	0.0	0.0	0.0	63.5
Total	455.8	406.8	1,475.5	561.1	2.3	240.0	52.1	328.7	39.4	695.4	55.8	5.9	31.1	893.8	18.6	3,374.0	63.5	8,699.8

Source: NSI, 2020

Table 4.2: External Station EI Data

Station Number	Description	EI AUTO Trips	EI TRK Trips
501	US 79B	1,657	131
502	US 63	2,355	532
503	US 65	3,234	815
504	US 425	1,261	317
505	Gibb-Anderson Rd	45	0
506	AR 530	4,320	0
507	AR 54	996	0
508	AR 63	3,128	315
509	Magnolia St	694	7
510	US 79	1,753	356
511	Sulphur Springs Rd	832	26
512	Lee Springs Rd	63	6
513	Princeton Pike	598	0
514	US 270	3,600	612
515	Stagecoach Rd	503	0
516	I-530	13,484	1,768
517	AR 365	1,223	50

Source: NSI, 2020

5 Trip Generation

This section describes the procedures used to determine the number of trips that begin or end in a given traffic zone. Trip generation is the estimation of the amount of person trips that are produced and attracted to each TAZ. Trip rates for the various types of trips are based upon the land use properties and demographic characteristics of each TAZ.

The model considers the following internal trip purposes:

- Home-based Work (HBW)
- Home-based Other (HBO)
- Non-home-based (NHB)
- Commercial Vehicle (CMVEH)
- Truck (TRK)

Home-based trips are those that have one trip end located at the traveler's household. Examples of home-based trips include travel from home to work, shopping, or other personal business. Non-home-based trips include travel to and from any location that does not involve the traveler's household. Examples of these trips can include travel from work to shopping, from school to daycare, and from work to a lunch location.

5.1 Internal Travel Model

For home-based trips, the productions refer to the home end, and the attractions refer to the non-home end of the trip. For NHB, CMVEH, and TRK trips, productions and attractions refer to the origin and destination respectively.

The model uses cross-classification trip production models for the home-based and non-home-based trip purposes. This means that trip rates that vary by household type are applied at the zonal level. The trip attraction models are linear regression equations that relate zonal employment, school enrollment, and households to trip attractions. For the commercial vehicle and freight vehicle trip purposes, the model applies a linear regression equation that relates zonal employment and households to trip productions and attractions. These equations are based on the Quick Response Freight Manual II. Casino gaming trips also use linear regression equations based on zonal employment, households, occupied casino hotel rooms, and gaming square footage.

The trip production and attraction models used in the TDM were based on those from the Monroe, Louisiana area and adjusted as needed to reflect the Pine Bluff/White Hall region. The final trip generation production and attraction models for HBW, HBO, and NHB trips are shown in Tables 5.1 and 5.2 respectively. The final trip generation production and attraction models for CMVEH and TRK trips are shown in Tables 5.3 and 5.4 respectively.

Table 5.1: HBW, HBO, and NHB Trip Production Rates

Trip Purpose	Number of Vehicles	Household Size				
		HHS1	HHS2	HHS3	HHS4	HHS5P
HBW	VEH0	0.5421	1.1007	1.4656	1.8221	1.9846
	VEH1	0.8339	1.5364	1.8221	2.2776	2.4277
	VEH2	0.8339	1.8575	2.0993	2.6341	2.9593
	VEH3P	0.8339	1.9263	2.3568	2.9906	3.1896
HBO	VEH0	1.1021	2.0347	3.2530	4.1887	5.4509
	VEH1	1.6956	2.8401	4.0442	5.2358	6.6676
	VEH2	1.6956	3.4335	4.6596	6.0553	8.1277
	VEH3P	1.6956	3.5607	5.2311	6.8749	8.7604
NHB	VEH0	0.6414	1.0930	1.7552	2.0076	2.2315
	VEH1	0.9867	1.5256	2.1821	2.5094	2.7296
	VEH2	0.9867	1.8444	2.5142	2.9022	3.3273
	VEH3P	0.9867	1.9127	2.8225	3.2950	3.5863

Source: NSI, 2020

Table 5.2: HBW, HBO, and NHB Trip Attraction Rates

	OCCDU	RET_EMP	RET_EMP2	OS_EMP	OTH_EMP	AMC_EMP	MTCUW_EMP	SCHATT
HBW	0.0000	1.5569	1.5569	1.5569	1.5569	1.5569	1.5569	0.0000
HBO	1.1499	2.5553	11.4987	2.1720	0.6388	0.6388	0.6388	0.8522
NHB	0.5525	1.5470	4.5302	1.3259	0.5525	0.5525	0.5525	0.3050

Source: NSI, 2020

Table 5.3: CMVEH and TRK Trip Production Rates

	OCCDU	RET_EMP	RET_EMP2	OS_EMP	OTH_EMP	AMC_EMP	MTCUW_EMP
CMVEH	0.2510	0.8880	0.8880	0.4370	0.4370	1.1100	0.9380
TRK	0.0771	0.1789	0.1789	0.0433	0.0433	0.2604	0.1946

Source: NSI, 2020

Table 5.4: CMVEH and TRK Trip Attraction Rates

	OCCDU	RET_EMP	RET_EMP2	OS_EMP	OTH_EMP	AMC_EMP	MTCUW_EMP
CMVEH	0.2510	0.8880	0.8880	0.4370	0.4370	1.1100	0.9380
TRK	0.0771	0.1789	0.1789	0.0433	0.0433	0.2604	0.1946

Source: NSI, 2020

5.2 Special Generators

A special generator is a land use with unusually low or high trip generation characteristics when compared to the established trip generation rates. For the SEARPC TDM these special generators included:

- TAZ 58; Southeast Arkansas College (12,000 trips) - the local college produces more trips than the employment and school enrollment suggest it would receive, resulting in low volumes compared to traffic counts.
- TAZ 148; Jefferson Regional Medical Center (12,000 trips) – this regional medical center is the major hospital in the region and receives more trips than the attraction trip rates estimate.
- TAZ 168; J Robley High School (3,000) trips - the school produces and attracts more trips than the employment and school attendance trip rates would suggest.

5.3 Balancing Productions and Attractions

Productions and attractions are balanced at the study area level for all trip purposes. This means that the area-wide trip attractions match the amount of area-wide trip productions. HBW, HBO, and TRK trips are balanced by holding the productions as a constant. The NHB and CMVEH trips are balanced by holding the attractions as a constant. This reflects that the trips produced at the households or trip origins must be equal to the total number of trips attracted to the non-home ends or destinations. Table 5.5 shows the daily trips by trip purpose before and after balancing.

Table 5.5: Balanced Productions and Attractions

Trip Purpose	Before Balancing		After Balancing	
	Productions	Attractions	Productions	Attractions
HBW	41,364	43,761	41,364	41,364
HBO	96,922	98,144	96,922	96,922
NHB	51,989	56,641	56,641	56,641
CMVEH	24,597	24,597	24,597	24,597
TRK	4,973	4,973	4,973	4,973

Source: NSI, 2020

5.4 Summary

Two separate documents were used in the calibration and validation of the SEARPC MPO TDM. The first is the *Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee*, which was last updated in 2016. The second is the *Travel Model Validation and Reasonableness Checking Manual, 2nd Edition*.[2] Using these guidelines, several key statistics for trip generation were monitored, which are shown in Table 5.6.

[2] Travel Model Validation and Reasonableness Checking Manual, 2nd Edition. Travel Model Improvement Program.

Table 5.6: Modeled vs Benchmark Trip Rates

Trip Rate	Modeled	Low Benchmark	High Benchmark
Person Trips per Person	3.9	3.3	4.0
Person Trips per Household	9.9	8.0	10.0
HBW Trips	21.7%	12.0%	24.0%
HBO Trips	50.8%	45.0%	60.0%
NHB Trips	27.6%	20.0%	33.0%

Source: Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee; NSI, 2020

These statistics are within the reasonable limits established by the Tennessee Model User's Group (TNMUG) guidance. No further adjustments were made since the model was performing well within all other benchmark ranges.

5.5 Time of Day

The speed feedback loop implemented within the TDM requires that the production and attractions are split into four different time periods during Trip Generation. This time of day split is based on factors derived from the Houma, Louisiana TDM. The time of day factors are shown in Table 5.7. The four assignment time periods are:

- AM Peak Period: 6:00 AM to 9:00 AM
- Mid-Day: 9:00 AM to 3:00 PM
- PM Peak Period: 3:00 PM to 6:00 PM
- Night: 6:00 PM to 6:00 AM

Table 5.7: Trip Generation Time of Day Factors

	HBW	HBO	NHB	CMVEH	TRK	EIAUTO	EITRK
AM	0.2806	0.1386	0.1258	0.1258	0.1540	0.1609	0.1352
MD	0.2875	0.3130	0.5087	0.5087	0.3960	0.3249	0.3442
PM	0.2207	0.2620	0.2236	0.2236	0.1440	0.2884	0.1570
NIGHT	0.2112	0.2864	0.1419	0.1419	0.3060	0.2258	0.3636

Source: NSI, 2020

6 Trip Distribution

The next step in travel demand modeling is the trip distribution process. This function determines the destinations of trips produced in the trip generation model, and conversely, where the attracted trips originated.

6.1 Gravity Model

Many models are available for this process; however, the TDM effort used the traditional gravity model.

This model employs two relationships, the first of which is indirect:

> The shorter the travel time to the destination zone, the greater the number of trips will be distributed to it from the origin zone.

The second relationship is a direct one:

> The more attractions there are in a destination zone, the more trips will be distributed to it from the origin zone.

The generalized equation for this model is:

$$T_{ij} = \frac{(P_i)(A_j)(F_{ij})}{\sum_{j=1}^{n}(A_j)(F_{ij})(K_{ij})}$$

Where:

T_{ij} = Trips distributed between zones i and j

P_i = Trips produced at zone i

A_j = Trips attracted to zone j

F_{ij} = Relative distribution rate (friction factors or impedance function) reflecting impedance between zone i and zone j

K_{ij} = Calibration parameter

n = Total number of zones in study area

6.2 Shortest Path Matrix

The TDM uses a travel time impedance matrix for each zonal pairing within the study area. This matrix traced the shortest free-flow travel time path from zone i (the start of the trip) to zone j (the end of the trip). These values are used in the calculation of F_{ij} as described in Section 6.1.

6.3 Friction Factors

Friction factors are another input used to calculate F_{ij}. This is the first relationship that was mentioned for the gravity model. These factors measure the probability of trip making at one-minute increments of travel time. Friction factors in the gravity model are an inverse function of travel time and each unique trip purpose has its own friction factors. The TDM's friction factor values can be found in the model's FF.bin file.

6.4 Terminal Times

Terminal times reflect additional travel that is associated with a trip. These can be events such as parking or walking to vehicles and/or facilities. This factor was added to the beginning and end of each trip and is stored in a matrix used by the model. The TDM effort uses a one (1) minute terminal time at the beginning and end of each trip.

6.5 Trip Length Frequency Distribution

As mentioned previously, the gravity model develops friction factors in one minute increments and accommodates various trip lengths. The average trip lengths obtained from the model are displayed in Table 6.1. Figures 6.1 through 6.3 show the modeled trip length frequency distribution for HBW, HBO, and NHB trips.

Table 6.1: Average Trip Length by Trip Purpose

Trip Purpose	2018 Model Average Trip Length (min)
HBO	8.18
HBW	10.23
NHB	9.34

Source: NSI, 2020

Figure 6.1: Modeled HBW Trip Length Frequency Distribution

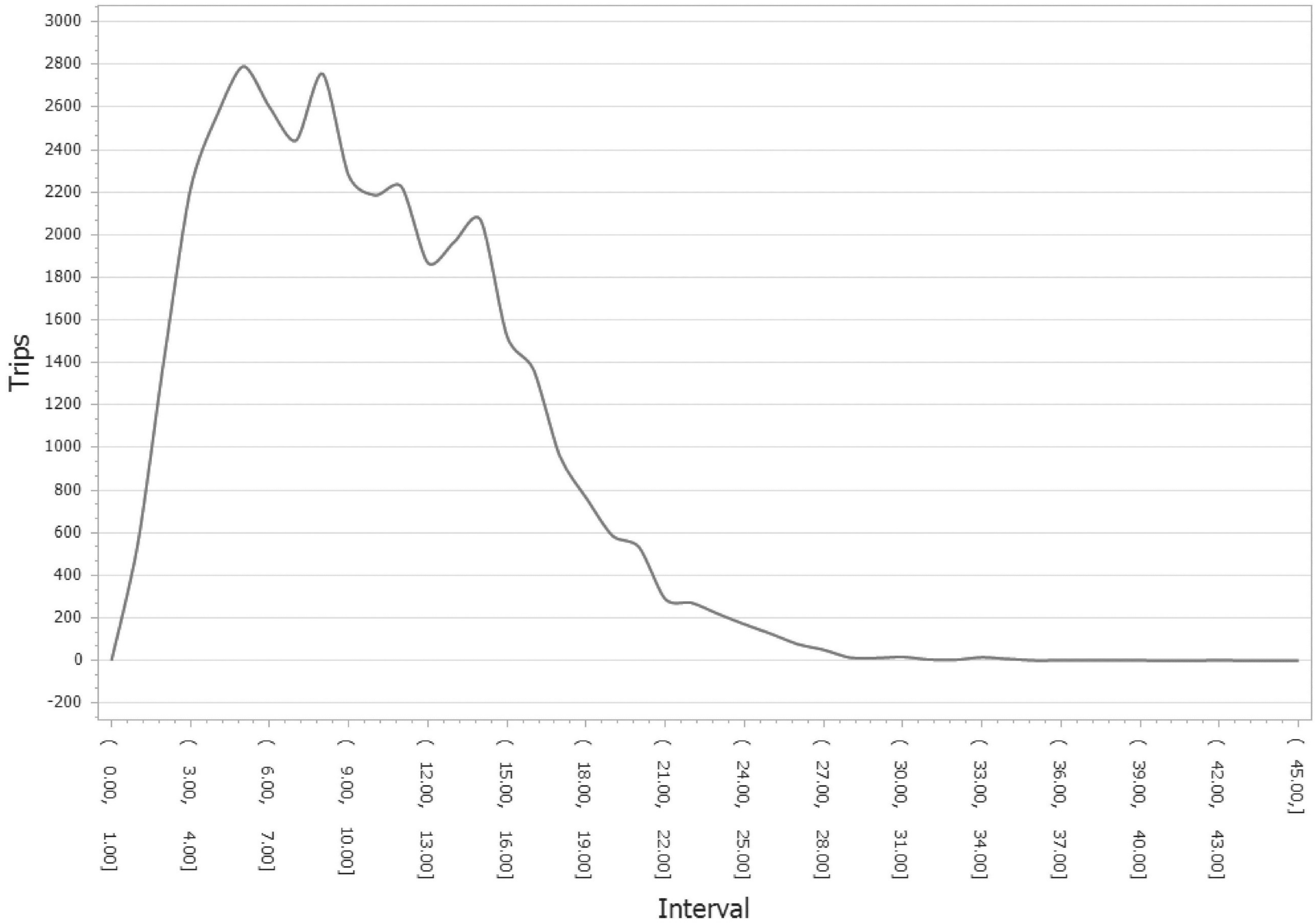


Figure 6.2: Modeled HBO Trip Length Frequency Distribution

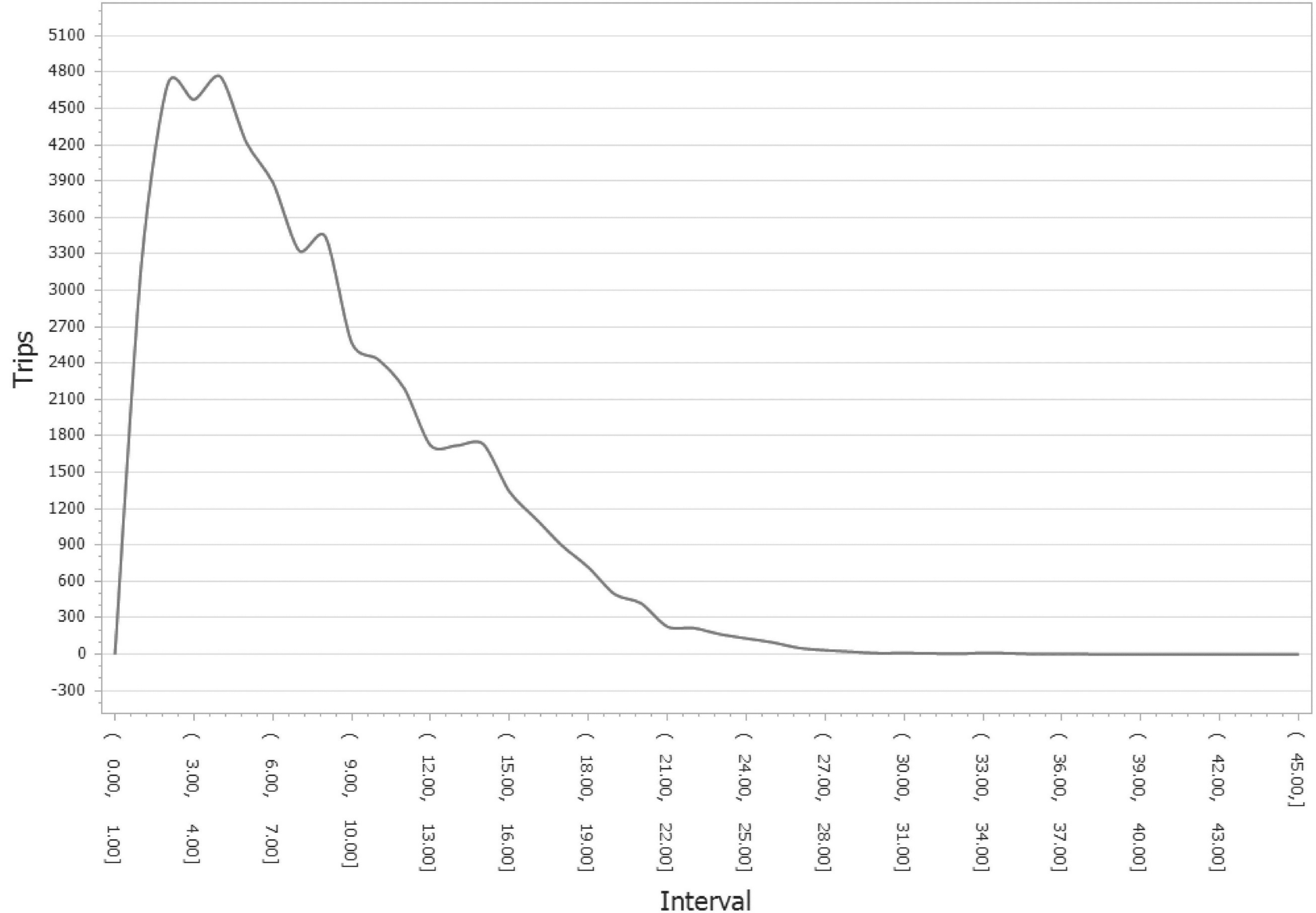
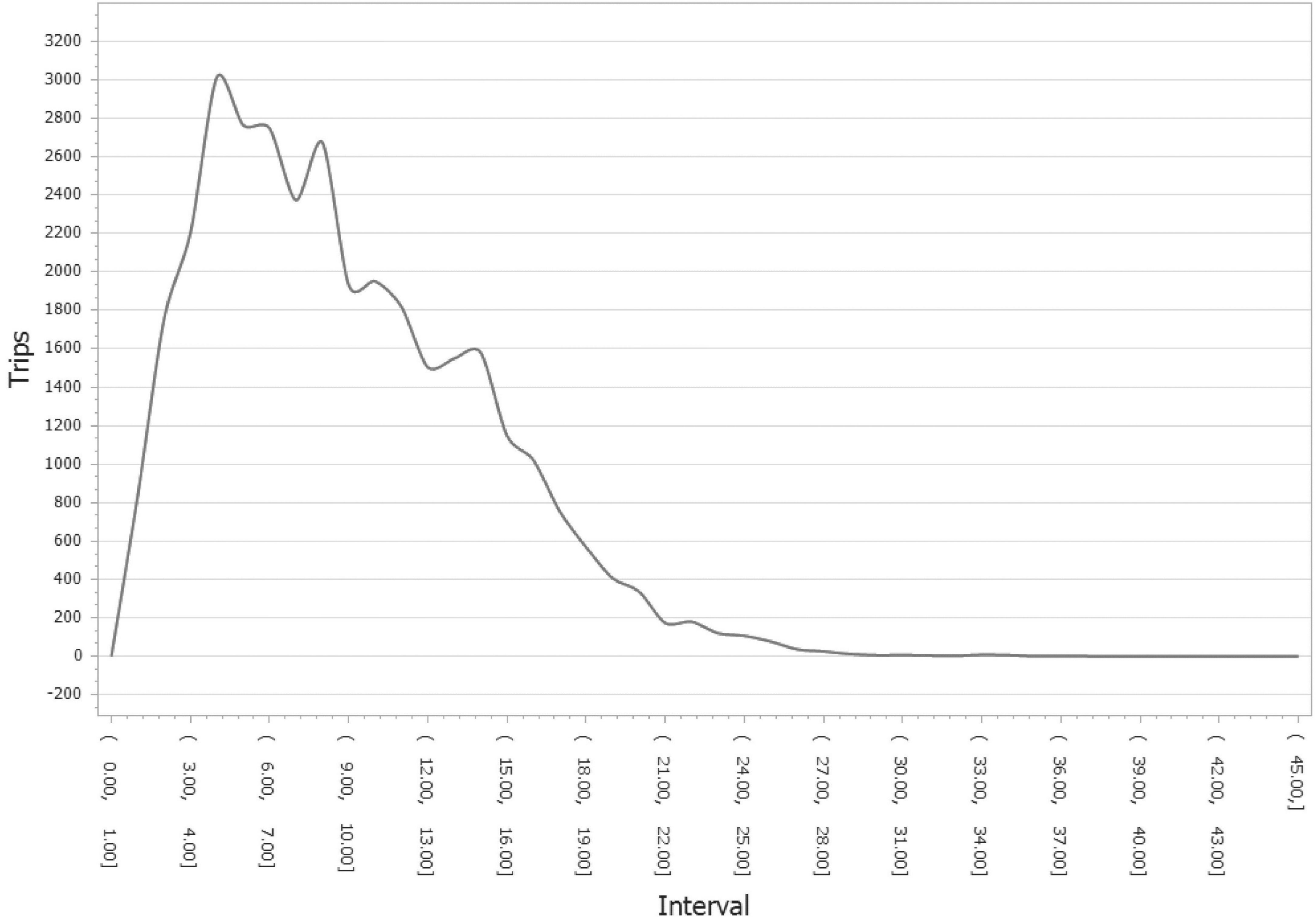


Figure 6.3: Modeled NHB Trip Length Frequency Distribution



6.6 Auto Occupancy Rates

The trip rates calculated in the Trip Generation step for HBW, HBO, and NHB trips are in person trips. In order for the TDM to assign vehicles to the roadway network, the amount of trips assigned must be in vehicle trips. This process is done using auto occupancy factors. It divides the amount of person trips by the corresponding occupancy factors shown in Table 6.2.

Table 6.2: Model Auto Occupancy Factors

Trip Purpose	Auto Occupancy Factor
HBW	1.12
HBO	1.92
NHB	1.68
CMVEH	1.00
TRK	1.00

Source: NSI, 2020

7 Trip Assignment

Trip assignment is the final step in the traditional four step planning model.

> Traffic assignment models are used to estimate the traffic flows on a network.

The main input to these models is a matrix of flows that indicate the volume of traffic between origin-destination (O-D) pairs. The other inputs to these models are network topology, link characteristics, and link performance functions.

The trips between each O-D pair are loaded onto the network based on the travel time or impedance of the alternative paths that could carry this traffic. The MTP 2045 model is a user equilibrium model with a generalized cost assignment that uses travel time as the cost.

7.1 BPR Volume-Delay Functions

The TDM link travel time was estimated by the Bureau of Public Roads (BPR) Volume-Delay function. The values that were used in the BPR formula are determined by facility type. The TDM uses alpha and beta values assigned by a roadway's functional classification. The assignment process used in the TDM analyzes link and intersection delay. As traffic volume increases on a roadway and approaches its maximum capacity, the average speed on the roadway declines. After a point, the roadway speed declines past that of the free flow speed and indicates congestion.

The generalized equation for the BPR formula is:

$$T = T_0 * (1 + \alpha * (\frac{v}{c})^{\beta})$$

Where: T = Congested travel time

T_0 = Free flow travel time

v = Assigned link volume

c = Capacity

α, β= BRP coefficients

This allows for the calculation of the roadway's peak hour travel:

$$\text{Peak Hour Travel Speed} = (\text{Free Flow Speed}) / (1 + \alpha * (\frac{v}{c})^{\beta}$$

The BPR coefficients used in the TDM are shown in Table 7.1.

Table 7.1: BPR Volume-Delay Function Parameters

Model Functional Classification	Alpha	Beta
Rural Interstate	0.71	2.10
Rural Principal Arterial	0.71	2.10
Rural Minor Arterial	0.71	2.10
Rural Major Collector	0.60	1.60
Rural Minor Collector	0.60	1.60
Rural On/Off Ramp	0.56	3.60
Urban Interstate	0.71	2.10
Urban Principal Arterial	0.71	2.10
Urban Minor Arterial	0.71	2.10
Urban Collector*	0.60	1.60
Urban On/Off Ramp	0.56	3.60
Centroid Connector	0.15	4.00

*Urban Collectors include Major and Minor Collectors

Source: NSI, 2020

8 Model Validation

The purpose of model validation is to make the adjustments necessary to replicate the base-year traffic conditions as closely as possible.

In practice, this means making the link assignment volumes approximate the traffic estimates, based on actual counts, within acceptable limits of deviation. Generally speaking, the lower the volume, the greater the relative deviation that is acceptable. Conversely, the greater the amount of traffic, the greater the degree of accuracy required. This is because the ultimate purpose of the model is to determine whether additional vehicular capacity will be needed on any given roadway at a designated future date.

Where existing volumes are low, the model assignment may deviate from actual conditions by 40 or 50 percent without affecting the projected need for additional capacity. On the other hand, in the case of a heavily traveled Interstate route, a deviation of 20 percent may be significant (i.e., alter the projection of required capacity). The validation process is intended to ensure that the model is performing within the limits that define acceptable ranges of deviation from observed "real-world" values.

As stated previously, this modeling effort uses the *Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee* and the *Travel Model Validation and Reasonableness Checking Manual, 2nd Edition*, as guidelines for the validation of TDMs.

The following criteria were used to validate the SEARPC TDM:

- Percent Root Mean Square Error (RMSE) by ADT Group
- Percent RMSE by Roadway Functional Classification
- Percent Error/Deviation by ADT Group
- Percent Error/Deviation by Functional Classification

8.1 Percent RMSE

The RMSE measure was chosen because when comparing model flows versus counts, sometimes a direct aggregate sum by link group can be misleading. The sum of all traffic counts for a particular link group may be close to the sum of the corresponding traffic flows, but individual link flows may still be very different than their corresponding link count. However, the RMSE statistic does not convey information about the magnitude of the error relative to that of the counts. Therefore, the Percent Root Mean Square Error (Percent RMSE or % RMSE) is often computed. This measure expresses the RMSE as a percentage of the average count value. The Percent RMSE is defined below:

$$\%RMSE = \frac{\sqrt{\sum_j (Model_j - Count_j)^2 / (Numberofcounts)}}{\left(\sum_j Count_j \Big/ Numberofcounts \right)} * 100$$

Validation results by ADT group and functional class are shown in Table 8.1 and Table 8.2 respectively.

Table 8.1: RMSE by ADT Group

ADT Range	Number of Observations	Total Count	Total Model Volume	% RMSE	% RMSE Limit[1]
ADT < 5,000	168	408,320	405,627	38.2	45.0 - 100.0
5,000 ≥ ADT < 10,000	37	243,000	233,682	19.4	35.0 - 45.0
10,000 ≥ ADT < 15,000	33	402,000	375,819	15.2	27.0 - 35.0
15,000 ≥ ADT < 20,000	10	159,000	141,164	14.7	25.0 - 30.0
20,000 ≥ ADT < 30,000	1	22,000	22,000	0.0	15.0 - 27.0
Areawide	249	1,236,060	1,178,297	24.8	35.0 - 45.0

Source: Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee; NSI, 2020

Table 8.2: RMSE by Functional Classification

Functional Classification	Number of Observations	Total Count	Total Model Volume	% RMSE	% RMSE Limit[1]
Interstate	13	170,000	169,723	10.2	20
Principal Arterial	67	501,750	491,534	17.8	30
Minor Arterial	80	387,390	359,711	29.2	40
Collector	87	169,430	149,653	45.7	70
Areawide	249	1,236,060	1,178,297	24.8	35.0 - 45.0

Source: Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee; NSI, 2020

(1) % RMSE Limit is the maximum acceptable magnitude of the error relative to that of the counts conducted by LADOTD

8.2 Percent Error

The next measure of model validation is the percent error, or percent deviation, of the model's assigned traffic volumes to the observed traffic counts. Tables 8.3 and 8.4 display the validation results by ADT group, ADT and lane group, and by facility category respectively.

Table 8.3: Percent Deviation by ADT Group

ADT Range	Number of Observations	Total Count	Total Model Volume	% Deviation	% Deviation Limit[1]
ADT < 1,000	39	21,720	29,008	33.6	200.0
1,000 ≥ ADT < 2,500	47	83,500	74,852	-10.4	100.0
2,500 ≥ ADT < 5,000	82	303,100	301,767	-0.4	50.0
5,000 ≥ ADT < 10,000	37	243,000	233,682	-3.8	25.0
10,000 ≥ ADT < 25,000	44	583,000	538,983	-7.6	20.0
Areawide	249	1,236,060	1,178,297	-4.7	5.0

Source: Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee; NSI, 2020

Table 8.4: Percent Deviation by Functional Classification

Functional Classification	Number of Observations	Total Count	Total Model Volume	% Deviation	% Deviation Limit[1]
Interstate	13	170,000	169,723	-0.2	+/- 7.0
Principal Arterial	67	501,750	491,534	-2.0	+/- 15.0
Minor Arterial	80	387,390	359,711	-7.1	+/- 15.0
Collector	87	169,430	149,653	-11.7	+/- 25.0
Areawide	249	1,236,060	1,178,297	-4.7	+/- 5.0

Source: Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee; NSI, 2020

(1) % Deviation Limit is the maximum acceptable magnitude of the error relative to that of the counts conducted by LADOTD

The validation effort concluded that the Pine Bluff-White Hall study area travel demand forecasting model performs within the established limits of acceptable deviation from base year estimated volumes.

9 Future Year Model Development

Future year models were developed to forecast traffic that the study area will experience based on its anticipated growth. This includes forecast socioeconomic data, external travel, and special generator data. Forecast models also require updates to the roadway network based on projects that are expected to occur or have allocated funding in the near future.

9.1 Future Year Socioeconomic Data Development

To adequately forecast future transportation system needs, future projections of demographic variables were developed for each Traffic Analysis Zone (TAZ).

9.1.1 Population and Employment Growth

The Pine Bluff-White Hall-Jefferson County area has steadily declined in population and employment over the last several decades. However, in 2018 and 2019 the MPA saw this decline stop and plateau. Whether this will be a new trend for the MPA or not is unknown, however, the MPO and its stakeholder partners believe that the region will begin to grow, albeit at a rate slower than the state average. This is further reinforced by known and confirmed upcoming developments in the region such as a new gas-to-liquid plant, the Saracen Casino, an expansion of Jefferson Regional Medical Center, and several housing developments.

The MPO, stakeholders, and mayors of the Cities of Pine Bluff and White Hall provided a list of upcoming developments and potential developments that could occur as a result of the known developments or roadway projects. These developments were used to estimate changes in population and employment within the MPA over the next 25 years and reviewed by the MPO and ArDOT. The MPA control totals are shown in Table 9.1 and Table 9.2.

9.1.2 School Enrollment Growth

School enrollment was forecasted to grow at the same annual growth rate (0.1 percent) that population is anticipated to experience.

Table 9.1: Population and Households by Year

Variable	2019	2025	2035	2045
Total Population	63,993	64,505	64,968	65,125
Household Population	59,891	60,403	60,866	61,023
Households	23,935	24,116	24,298	24,366

Source: NSI, 2020

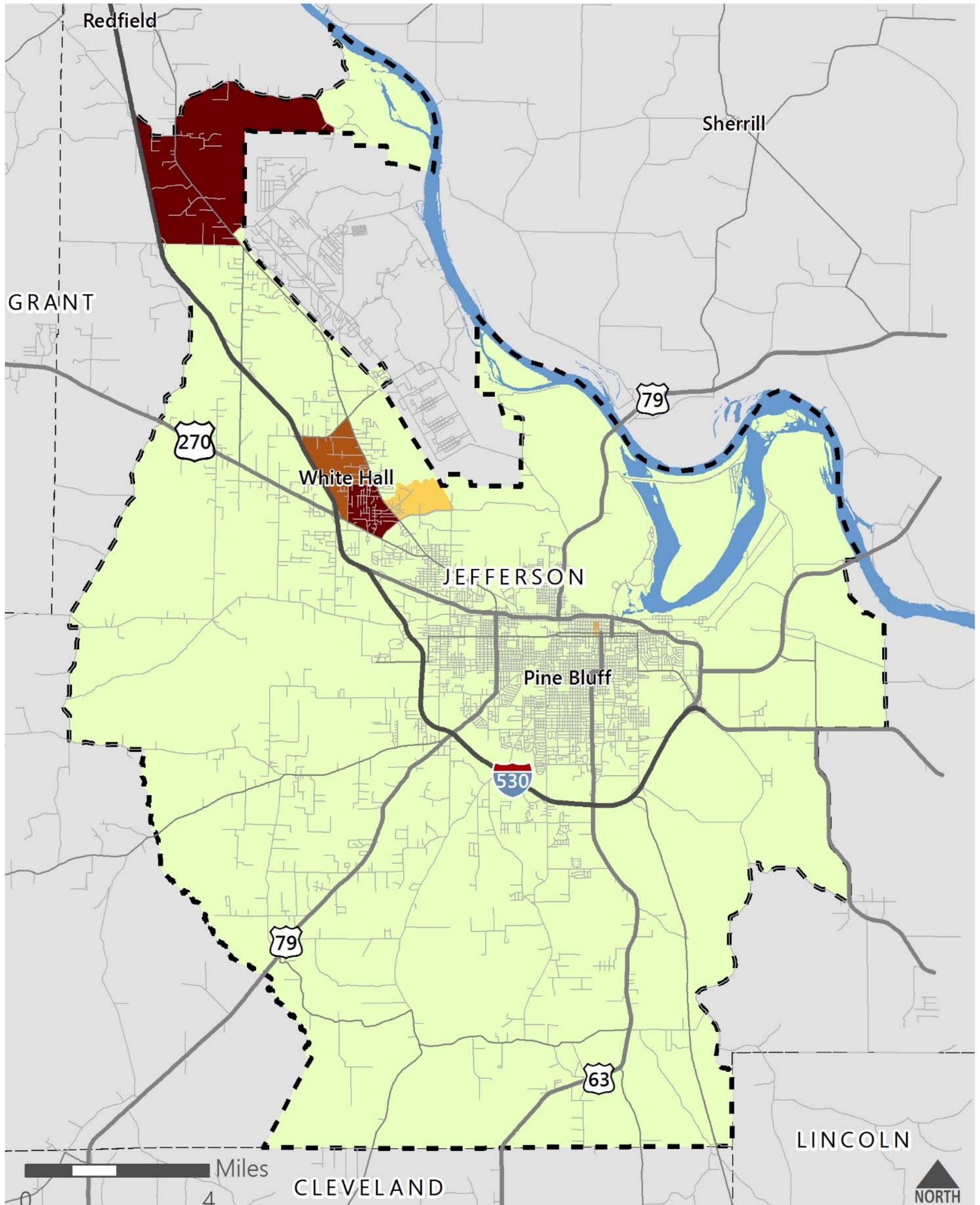
Table 9.2: Employment by Year

Variable	2019	2025	2035	2045
TOT_EMP	28,218	29,693	30,268	30,643
AMC_EMP	631	631	631	681
MTCUW_EMP	6,997	7,222	7,222	7,272
RET_EMP	5,269	5,269	5,469	5,494
OS_EMP	15,211	16,571	16,946	17,196
OTH_EMP	0	0	0	0

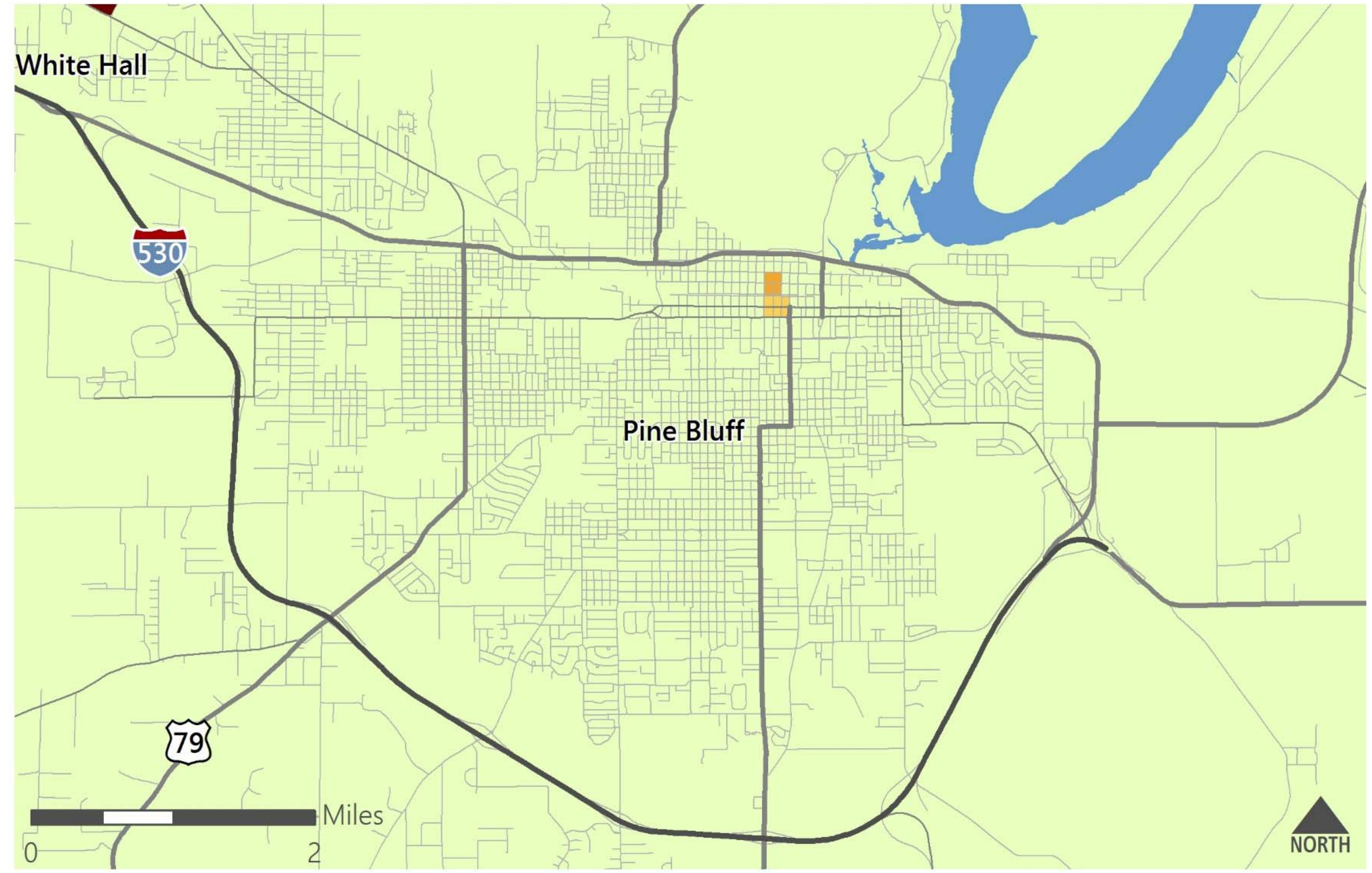
Source: NSI, 2020

Figure 9.1: Household Growth, 2019-2045

Metropolitan Planning Area



Urban Core



Legend

Change in Households by Traffic Analysis Zone (TAZ)

- 0 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 111
- Planning Area

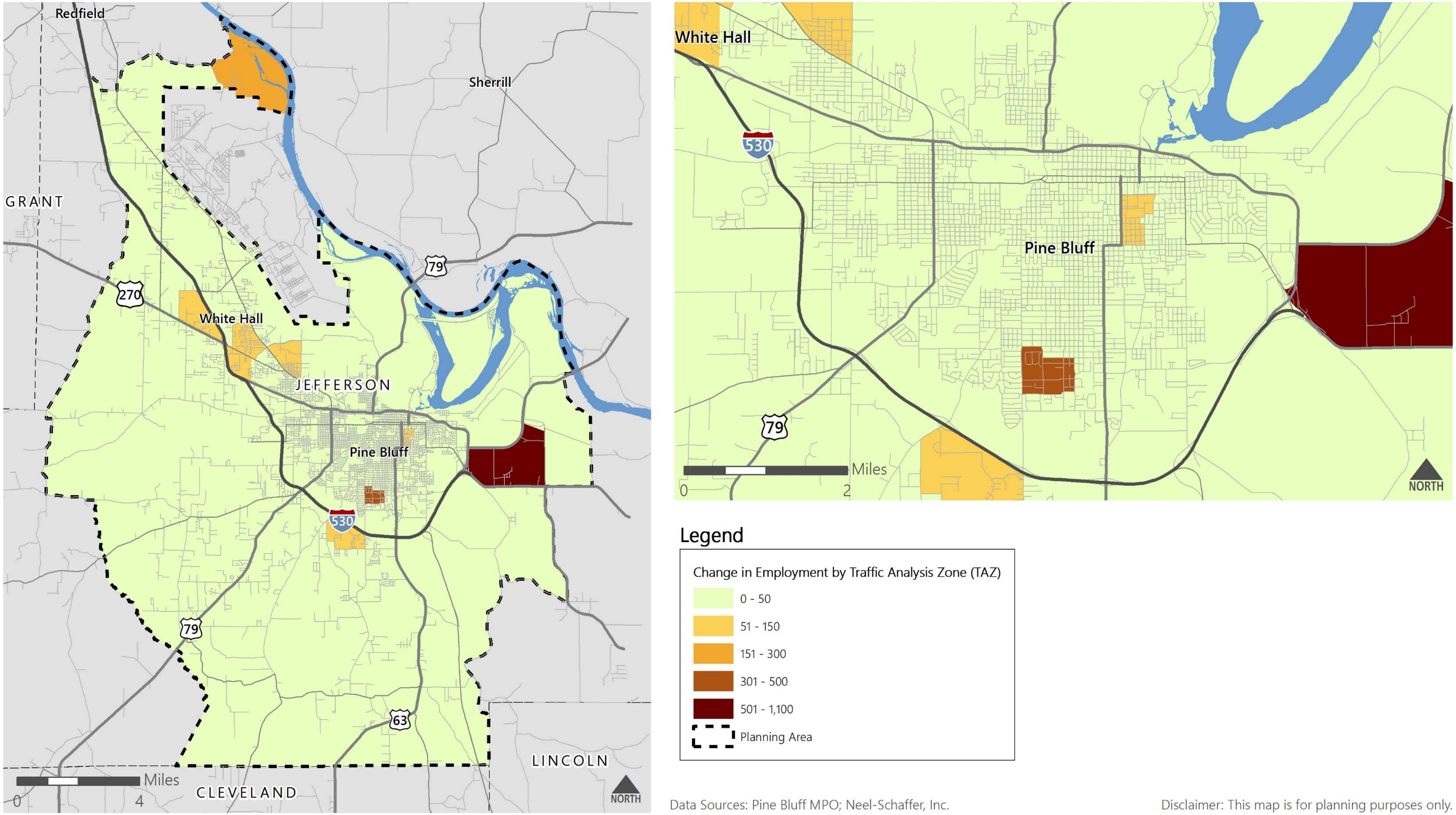
Data Sources: Pine Bluff MPO; Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

Figure 9.2: Employment Growth, 2019-2045

Metropolitan Planning Area

Urban Core



Data Sources: Pine Bluff MPO; Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

9.2 Existing Plus Committed (E+C) Network

The base year network was defined as the street and highway system that existed in year 2019. Once the base year network was calibrated, the E+C network was developed which included committed projects.

Committed projects are those improvements for which:

- construction was either completed or had begun since 2019,
- a contract for construction has been awarded,
- have completed the National Environmental Policy Act (NEPA) phase, or
- have funding for right-of-way and/or construction programmed in the MPO's Transportation Improvement

Committed projects were added to the base network using the following procedure:

- New routes were coded with the proposed number of lanes, and with the posted speed and volume-delay function attributes that reflect the project's functional classification.
- Widened roadways change the number of lanes to the appropriate amount in each direction as well as the lane configuration field required by the network.
- All E+C projects were flagged in the 'PROJECT_EC' field using a unique project ID.

The committed projects are listed in Table 9.3 and shown in Figure 9.3.

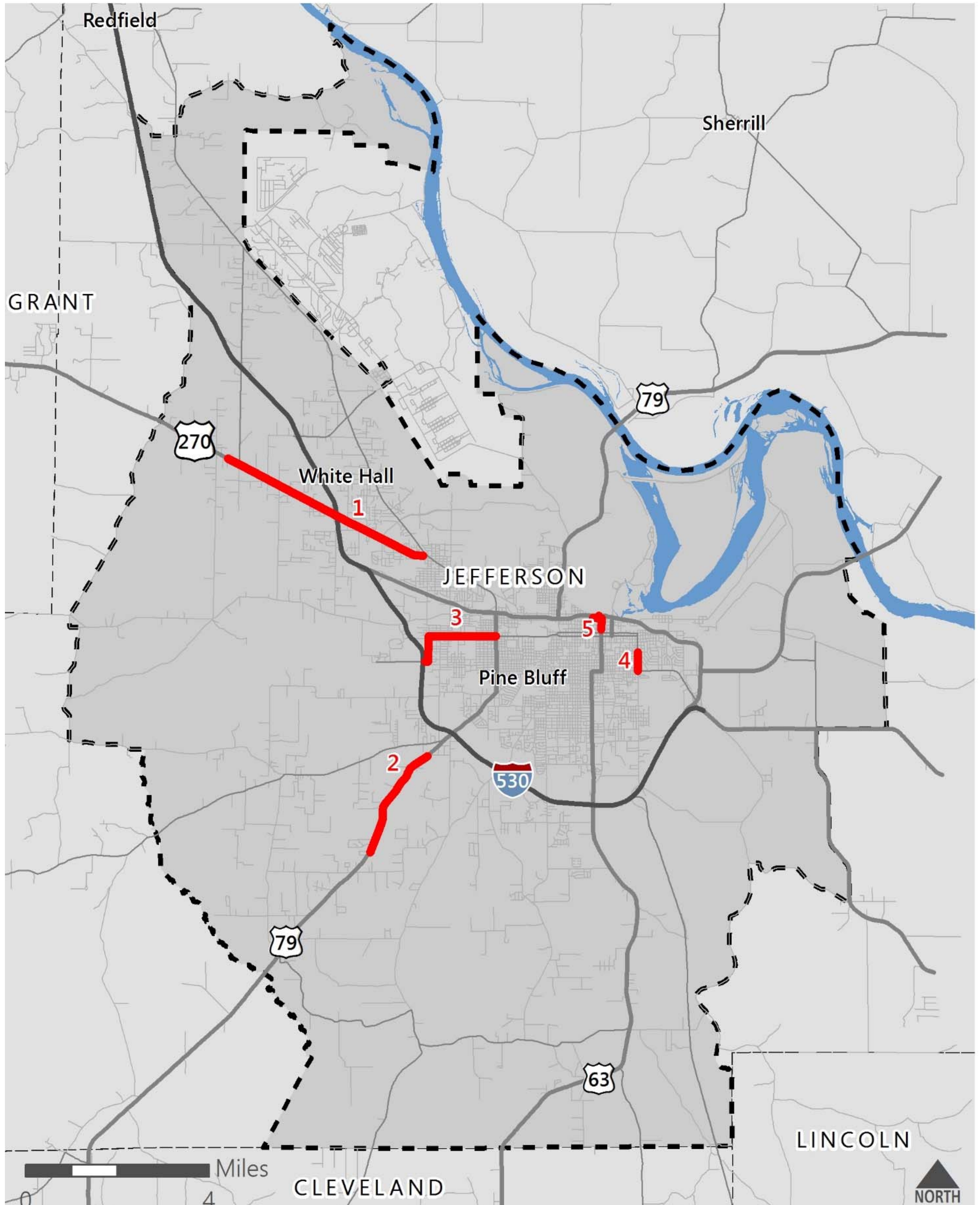
Table 9.3: Existing + Committed Projects

Project ID	Roadway	Location	Improvement
1	US 270 & Hwy 365S (Sheridan Rd)	Hwy 104 to Hwy 365	Widen to 5 Lanes
2	US 79 (S Camden Rd)	Couch Ln to Suburbia Dr	Widen to 4 Lanes
3	Hwy 190 (S Franklin St/W 6th Ave)	I-530 to Hwy 79B (S Blake St)	Center Turn Lane
4	Hwy 190 (Ohio St)	11th Ave to Harding Ave	Center Turn Lane
5	Pine St; Barraque Ave; Main St	Martha Mitchell to Barraque Ave; Walnut St to Main St; Barraque Ave to 4th Ave	Road Diet

Source: SEARPC, ArDOT

Figure 9.3: Existing + Committed Projects

Metropolitan Planning Area



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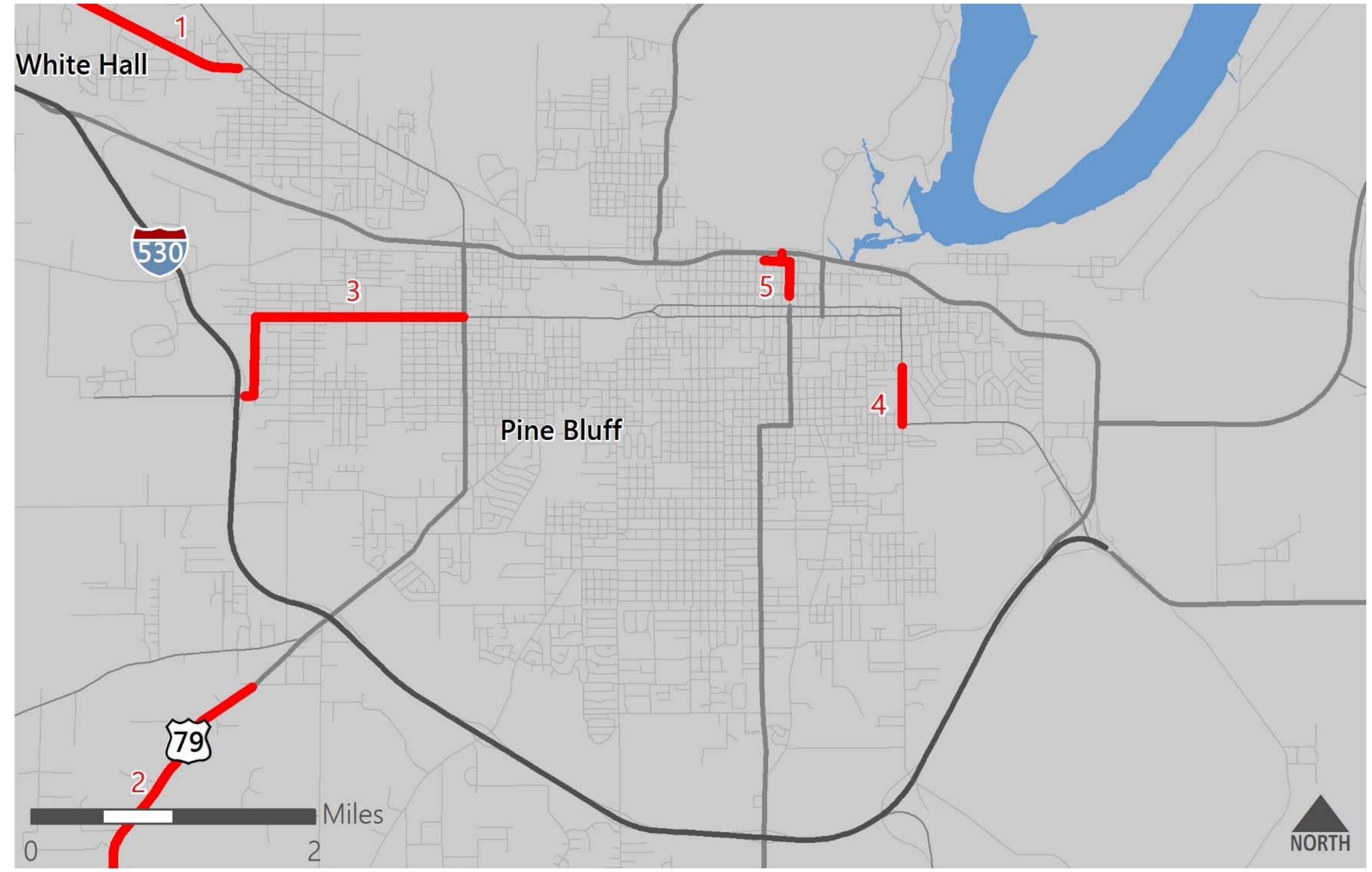

Legend

Existing + Committed Projects

Project Limits

Planning Area

Data Sources: Pine Bluff MPO; ArDOT

Disclaimer: This map is for planning purposes only.

9.3 External Station Growth

The base year traffic counts at each external station were projected to 2025, 2035, and 2045 using growth rates developed based on the 2040 Arkansas statewide TDM (ARTDM), the most recent statewide TDM available. This was done by:

- Obtaining 2010 and 2040 traffic volumes at the Pine Bluff TDM's external stations.
- Calculating the compound annual growth rate for each station using the ARTDM volumes.
- Reviewing the growth rates for reasonableness and adjusting them as necessary.
- Applying the final annual growth rates to the Pine Bluff TDM 2019 external station volumes to obtain TDM external volumes for each milestone year.

The final forecast growth rates for each external station and comparison of external travel forecast for the base year and target years is shown in Table 9.4. The total traffic at each station was then divided into EI and EE trips with the assumption that there would not be a significant change in the distribution from the base year. In addition, both EI and EE forecast trips were also separated into auto and truck trips.

It should be noted that the growth rates obtained from the 2040 ARTDM are based upon a decline in population in Jefferson County due to the region's historical population and employment trends mentioned in Section 9.1.1. However, upon review, the growth rates are reasonable and result in an overall external station growth rate that is similar to that of the forecasted population and employment growth. In particular, decline in external volumes is largely along the MPA's eastern side, while growth in volumes comes from the west and north, reflecting increased traffic coming from Little Rock which would be attracted by the gas-to-liquid plant, Saracen Casino, and Jefferson Regional Medical Center.

Table 9.4: External Station Forecast Growth

External Station	Forecast Annual Growth Rate	2019 Volume	2025 Volume	2035 Volume	2045 Volume
501	0.09%	2,700	2,714	2,738	2,761
502	0.15%	3,700	3,733	3,789	3,845
503	0.50%	7,000	7,214	7,584	7,974
504	-2.28%	2,700	2,350	1,866	1,481
505	-0.72%	50	48	45	41
506	0.00%	4,800	4,800	4,800	4,800
507	-4.77%	1,100	820	503	309
508	-1.23%	4,100	3,807	3,364	2,973
509	-0.89%	780	739	676	618
510	-0.10%	3,500	3,479	3,444	3,409
511	0.86%	970	1,021	1,113	1,213
512	1.14%	80	86	96	108
513	1.31%	660	714	813	926
514	1.84%	6,000	6,692	8,026	9,627
515	1.88%	540	604	727	875
516	0.37%	22,000	22,487	23,323	24,190
517	-0.04%	1,400	1,396	1,390	1,384

Source: SEARPC; NSI, 2020

9.4 Future Year Model Runs

The TDM was used to forecast traffic for the future years using the E+C network and forecast socioeconomic, external station, and special generator data. Interpolation was used where necessary to obtain a future year scenario that occurred between the base year (2019), interim years (2025 and 2035), or the horizon year (2045).

APPENDIX

Existing Conditions Analysis

2

Draft September 2020

Pine Bluff - White Hall - Jefferson County
Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

Prepared by:

NEEL-SCHAFFER
Solutions you can build upon

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1 Introduction

This report identifies the conditions and characteristics of the existing transportation system in the Pine Bluff Metropolitan Planning Area (MPA) for 2019 where possible. Where required by the Fixing America's Surface Transportation (FAST) Act, it provides the data for the most recent year available.

For each mode of transportation, the report focuses on the following information:

- Network facilities and assets
- Maintenance
- Safety and security
- Traffic and demand

Detailed information for federally required performance measures and targets are discussed in a separate document, the Transportation Performance Management Report.

> Planning for the future transportation system and its improvements begins with evaluating the existing transportation system.

2 Roadways and Bridges

2.1 Introduction

The region's roadways and bridges are used by personal motor vehicles, public and private transportation providers, bicyclists, and freight trucks. These roadways can also be used to provide access to other transportation modes. This section discusses the general use of the MPA's roadways and bridges. The existing conditions for biking, walking, public transit, and freight will be discussed in greater detail in later sections.

87.3%

Households commute by motor vehicle and drive alone

For households in urbanized areas, like Pine Bluff, traveling by motor vehicle is the primary means of transportation. The most recent American Community Survey (ACS) 5-year estimates show that commuting by motor vehicle without carpooling is the most common method of commuting within Jefferson County, where the MPA is located. This means the overwhelming majority of household travel is affected by the condition of the MPA's roadways and bridges.

2.2 The Roadway Network

Several federal and state highways serve the study area and comprise its main roadway network. The most significant of these facilities are shown in Table 2.1.

Table 2.1: Significant Roadway Facilities in the Pine Bluff MPA

Road	Description
INTERSTATE ARKANSAS 530	I-530 begins at the I-30/I-440 interchange in Little Rock, AR and travels south to its southern terminus at the US 63/US 65/US 79/US 425 interchange in Pine Bluff. The interstate travels along the western and southern sides of the study area.
63	US 63 begins at I-20 in Ruston, LA and travels north to US 2 in Moquah, WI. US 63 proceeds through the study area from south to northeast. US 63 is concurrent with I-530 along the southeastern side of the study area and with US 79 from Pine Bluff east to Stuttgart, AR.
65	US 65 begins at US 425 in Clayton, LA and travels north to I-35 in Albert Lea, MN. US 65 proceeds through the study area from east to northwest. US 65 is concurrent with I-530 along I-530's entire length from Pine Bluff to Little Rock, AR.
79	US 79 begins at I-35 in Round Rock, TX and travels northeast to US 68 in Russellville, KY. US 79 proceeds through the study area from southwest to northeast. US 79 is concurrent with I-530 along the southern side of the study area and with US 63 from Pine Bluff east to Stuttgart, AR.
270	US 270 begins at US 54/US 83 in Liberal, KS and travels southeast to its eastern terminus at I-530 in Pine Bluff. US 270 enters the study area from the northwest.
425	US 425 begins at US 61/US 84 in Natchez, MS and travels north to its northern terminus at the I-530/US 63/US 65/US 79 interchange in Pine Bluff. US 425 enters the study area from the southeast.
190	AR 190 travels east-west through Pine Bluff, following Franklin St, 5th Ave, 6th Ave, 13th Ave, Ohio St, and Harding Ave. AR 190 begins just west of I-530 west of Pine Bluff and ends at the I-530/US 63/US 65/US 79/US 425 interchange southeast of Pine Bluff.
365	AR 365 begins at US 65B/US 79B in Pine Bluff and travels northwest to US 65B/AR 60 in Conway. AR 365 enters the study area from the northwest and was the original alignment of US 65 between Pine Bluff and Little Rock, AR.
530	AR 530 is the planned north-south extension of I-530 from Pine Bluff to US 278 (and Future I-69) in Wilmar, AR. The state highway currently exists as a two-lane highway between I-530 in Pine Bluff and AR 11 near Star City, AR and between AR 35 and US 278 near Monticello, AR.

2.2.1 Roadways by Functional Classification

Each type of roadway serves a function in the overall roadway network. Roadways are divided into functional classes based on their intended balance of mobility (speed) and access to adjacent land. Their designs vary in accordance with this functional classification, shown in Figure 2.1.

Figure 2.1: Roadway Functional Classification Hierarchy

Interstates

- Divided highways with full control of access and grade separations at all intersections.
- The controlled access character results in high lane capacities, three times greater than the individual lane capacities of urban arterials.

Expressways

- Provides for movement of large volumes of traffic at relatively high speed, and are primarily intended to serve long trips.
- Have some grade separated intersections, while the majority of the intersections are widely spaced and signalized.

Arterials

- Serve both as feeders to Interstates and expressways, and as principal travel ways between major land use concentrations within the study area.
- Typically divided facilities (undivided where right-of-way limitations exist) with relatively high traffic volumes and traffic signals at major intersections.
- The primary function of arterials is to move traffic; they are the main means of local travel, with a secondary function of land access.

Collectors

- Provide both land service and traffic movement functions.
- Serve as intermediate feeders between arterials and local streets and primarily accommodate short distance trips.
- Generally not continuous for any great length since they serve few through trips.

Local Streets

- Provide access to immediately adjacent land.
- Within the local street classification, three subclasses are established to indicate the type of area served: residential, industrial, and commercial.

Within the arterial classification are principal and minor subclassifications. Principal arterials serve as high volume traffic corridors. They provide access to the major centers of activity of a metropolitan area from its furthest points. Minor arterials connect the principal arterials and provide a lower level of travel mobility for shorter travel lengths.

Within the collector classification are major and minor subclassifications. Major collectors are those collectors in that carry low-medium traffic volumes and connect arterials and local streets, while minor collectors perform the same function but carry less volume.

Table 2.2 summarizes the centerline miles and lane miles, by functional classification, within the MPA. Figure 2.2 illustrates the functional classification of the Pine Bluff MPA's roadways.

Table 2.2: Roadway Model Network Lane Mileage by Functional Class, 2019

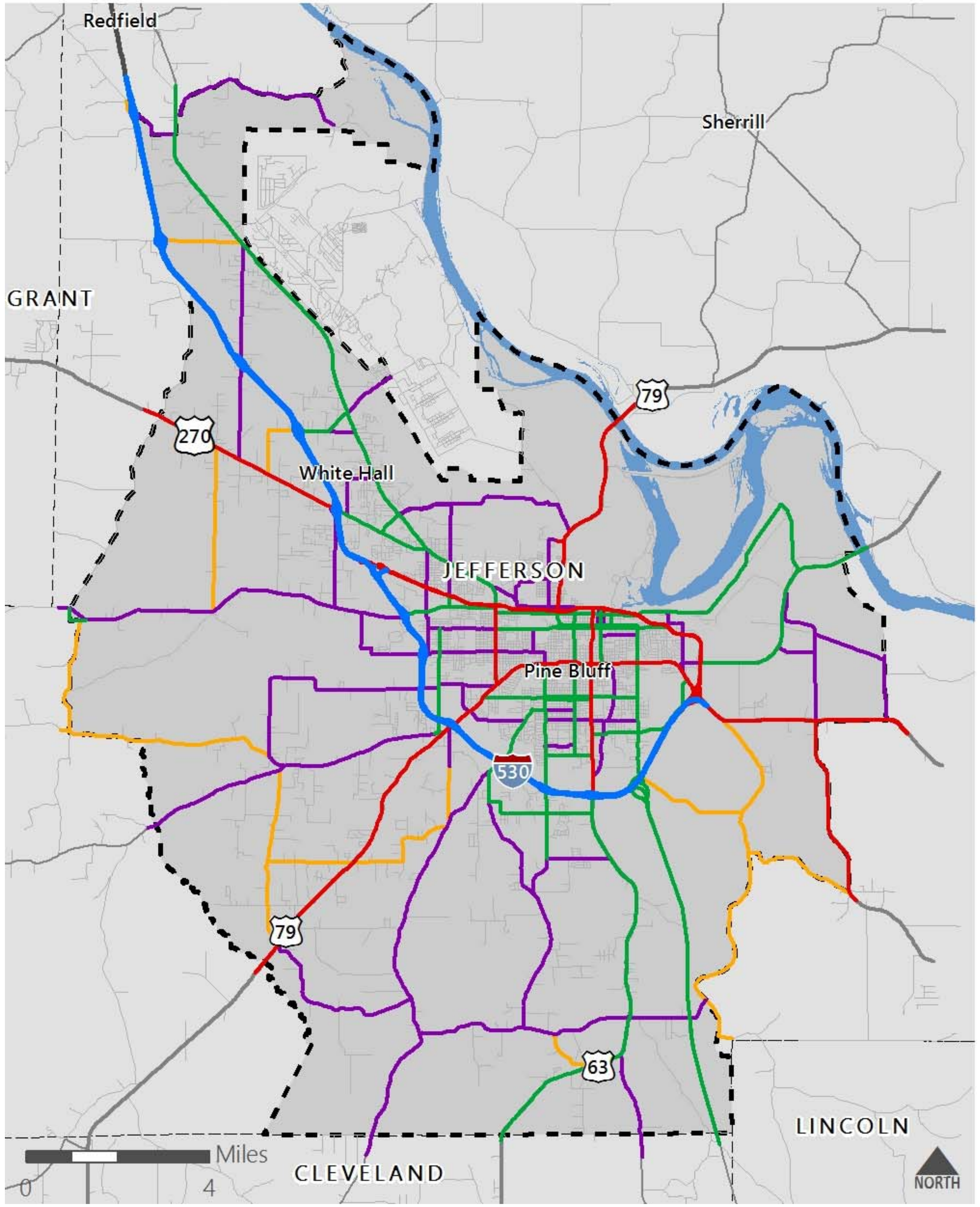
Functional Class	Centerline Miles		Lane Miles	
	Miles	Percent	Miles	Percent
Interstate	23.3	7.7%	105.7	13.2%
Principal Arterial	46.1	15.2%	166.5	20.8%
Minor Arterial	85.4	28.2%	223.7	28.0%
Major Collector	108.8	36.0%	225.8	28.2%
Minor Collector	39.1	12.9%	78.2	9.8%
Total	302.7	100.0%	799.8	100.0%

Note: Centerline miles does not include ramps.

Source: SEARPC Travel Demand Model

Figure 2.2: Functional Classification of Roadways, 2019

Metropolitan Planning Area



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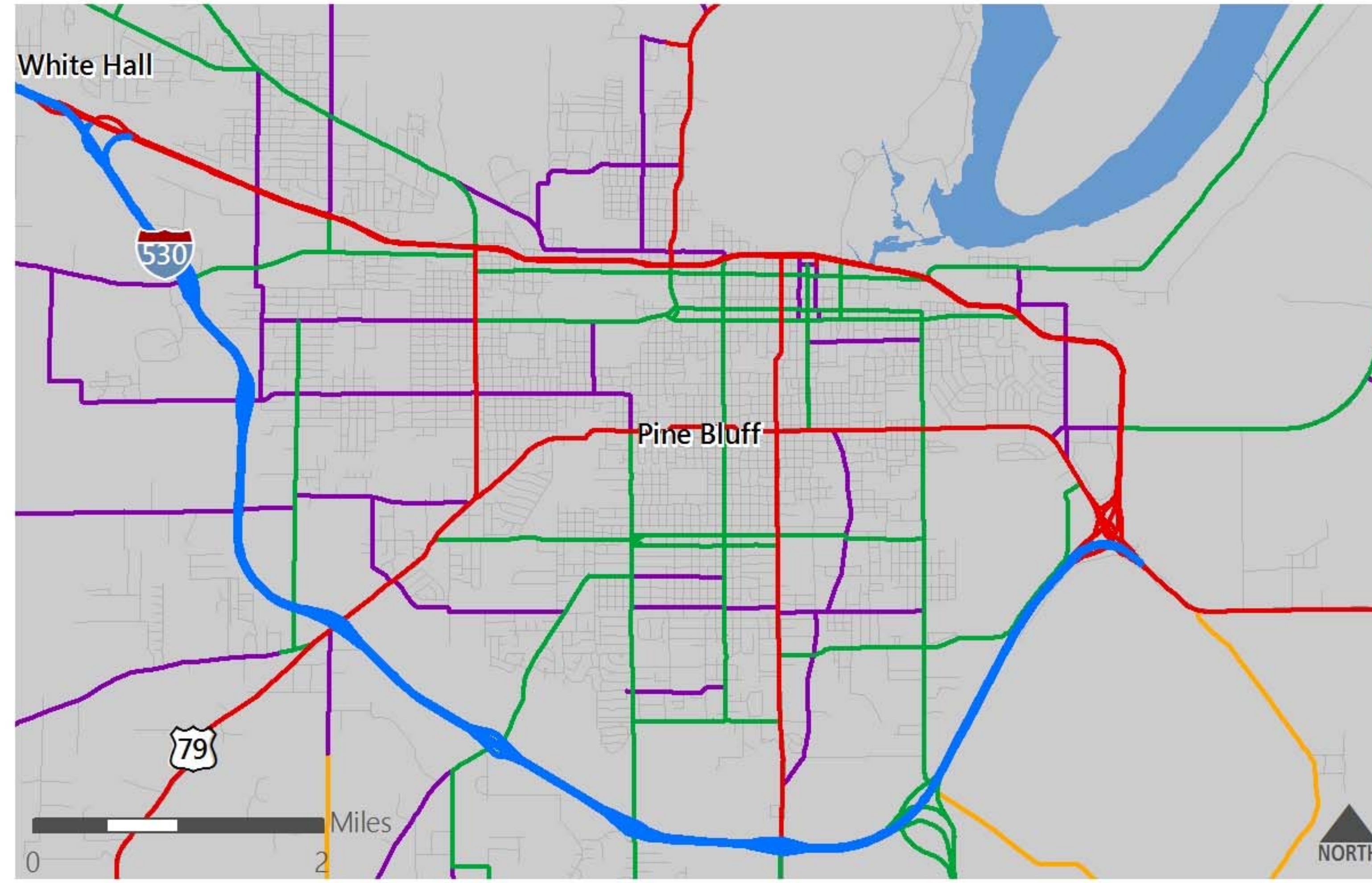


Legend

Functional Classification

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Planning Area

Data Sources: ArDOT

Disclaimer: This map is for planning purposes only.

2.3 Traffic and Congestion

The number of daily trips estimated by the Travel Demand Model, by trip purpose, in 2019 is summarized in the graph below. Approximately three (3) percent of vehicle trips pass through the MPA. Internal commercial and freight vehicle trips (e.g., truck, taxi, etc.) account for about 11 percent of vehicle trips. The majority of vehicle trips in the MPA (51 percent) begin or end at home.

273,226

Daily trips within the MPA

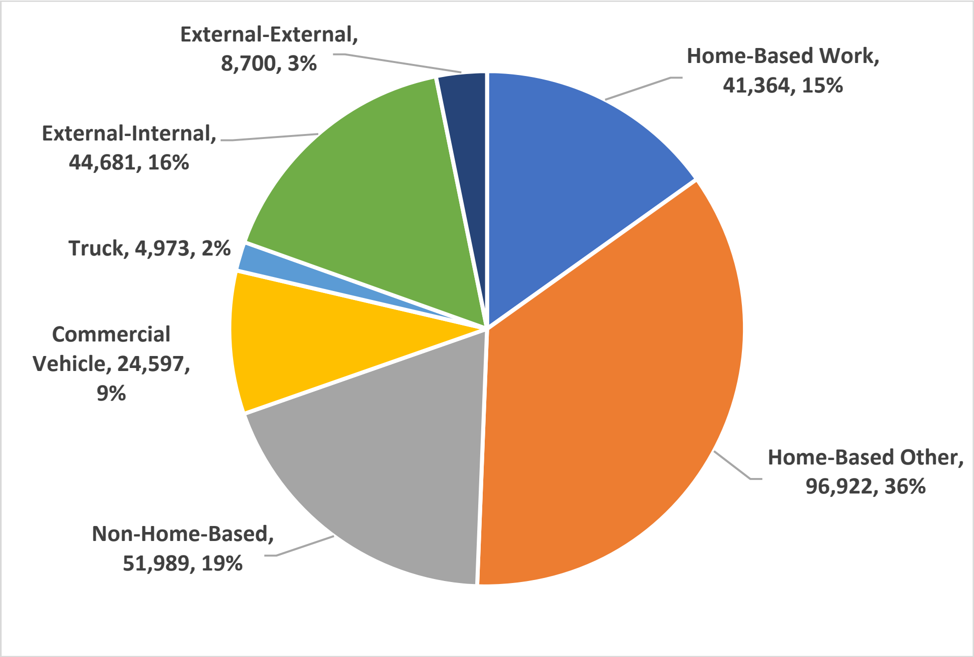


Table 2.3 displays how these trips are distributed onto the modeled transportation network. Over 57 percent of the delay is estimated to occur on the principal and minor arterials. This coincides with where the most vehicle miles travelled and vehicle hours travelled occur. There is comparatively little delay estimated to occur on collectors.

Table 2.3: Roadway System Travel Characteristics, 2019

Functional Class	Daily Vehicle Miles Travelled (VMT)		Daily Vehicle Hours Travelled (VHT)		Daily Vehicle Hours of Delay (VHD)	
	Number	Percent	Number	Percent	Number	Percent
Interstate	506,417	35.4%	8,530	27.1%	469	26.2%
Principal Arterial	366,658	25.6%	8,801	28.0%	547	30.5%
Minor Arterial	376,404	26.3%	9,205	29.3%	485	27.1%
Major Collector	172,912	12.1%	4,657	14.8%	288	16.1%
Minor Collector	9,937	0.7%	258	0.8%	3	0.2%
Total	1,432,327	100.0%	31,452	100.0%	1,792	100.0%

Source: SEARPC Travel Demand Model

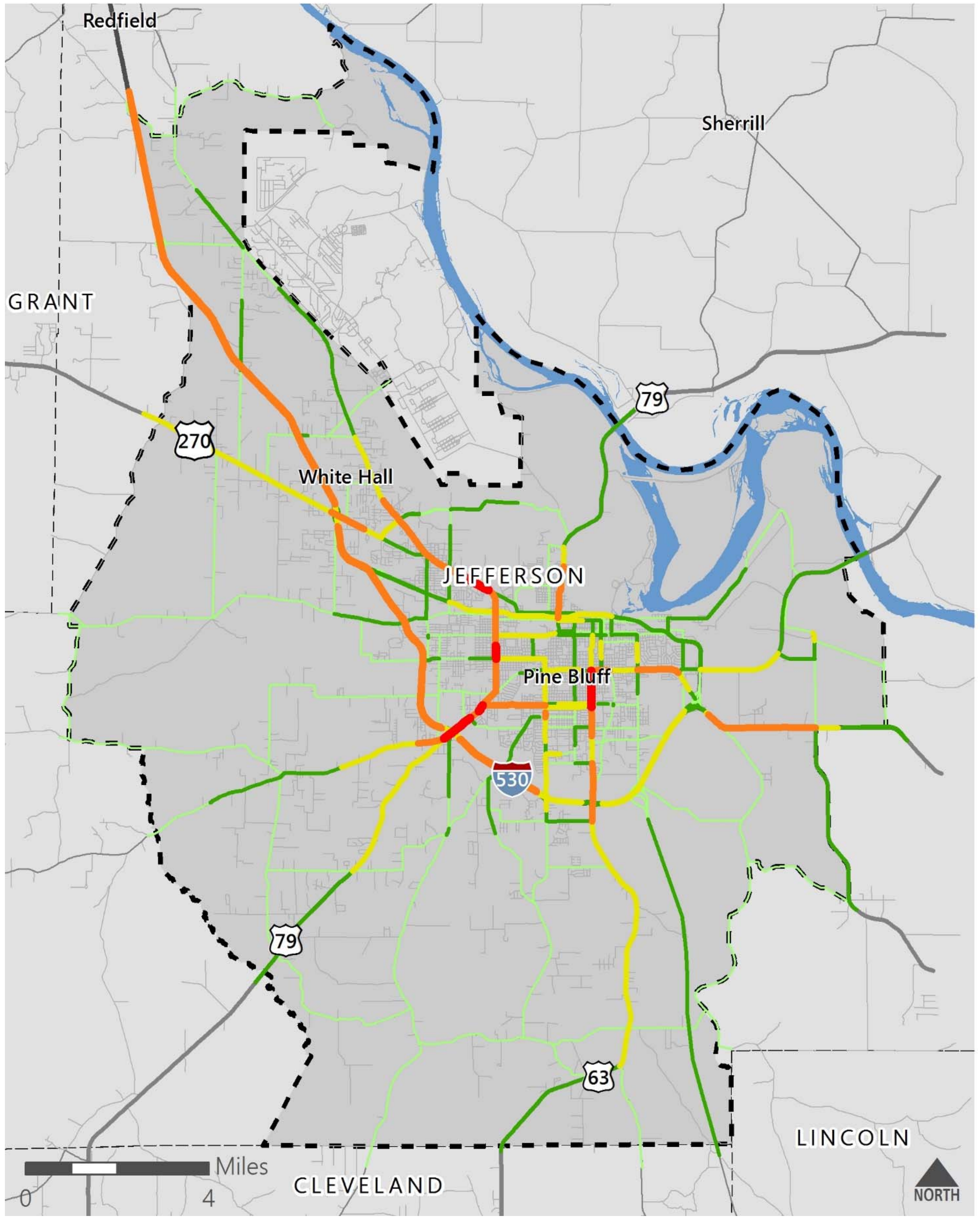
Figure 2.3 displays the vehicular traffic in the MPA, which is greatest on I-530 from the northern study area boundary to S Hazel Street. This area experiences over 20,000 vehicles. Roadways that experience greater than 15,000 vehicles per day include:

- S Camden Road, 15,000 to 19,000 vehicles.
- Dollarway Road, 15,000 to 17,000 vehicles.
- S Olive Street, 16,000 vehicles.
- S Blake Street, 15,000 vehicles.

Figure 2.4 displays the volume to capacity (V/C) ratios for the major roadways in the MPA. Currently, there are no roadway segments in the MPA that experience a V/C ratio of 1.0 or greater, representing congested segments. However, two (2) locations (summarized in Table 2.4) experience V/C ratios that suggest they could experience congestion in the future.

Figure 2.3: Average Daily Traffic on Roadways, 2019

Metropolitan Planning Area



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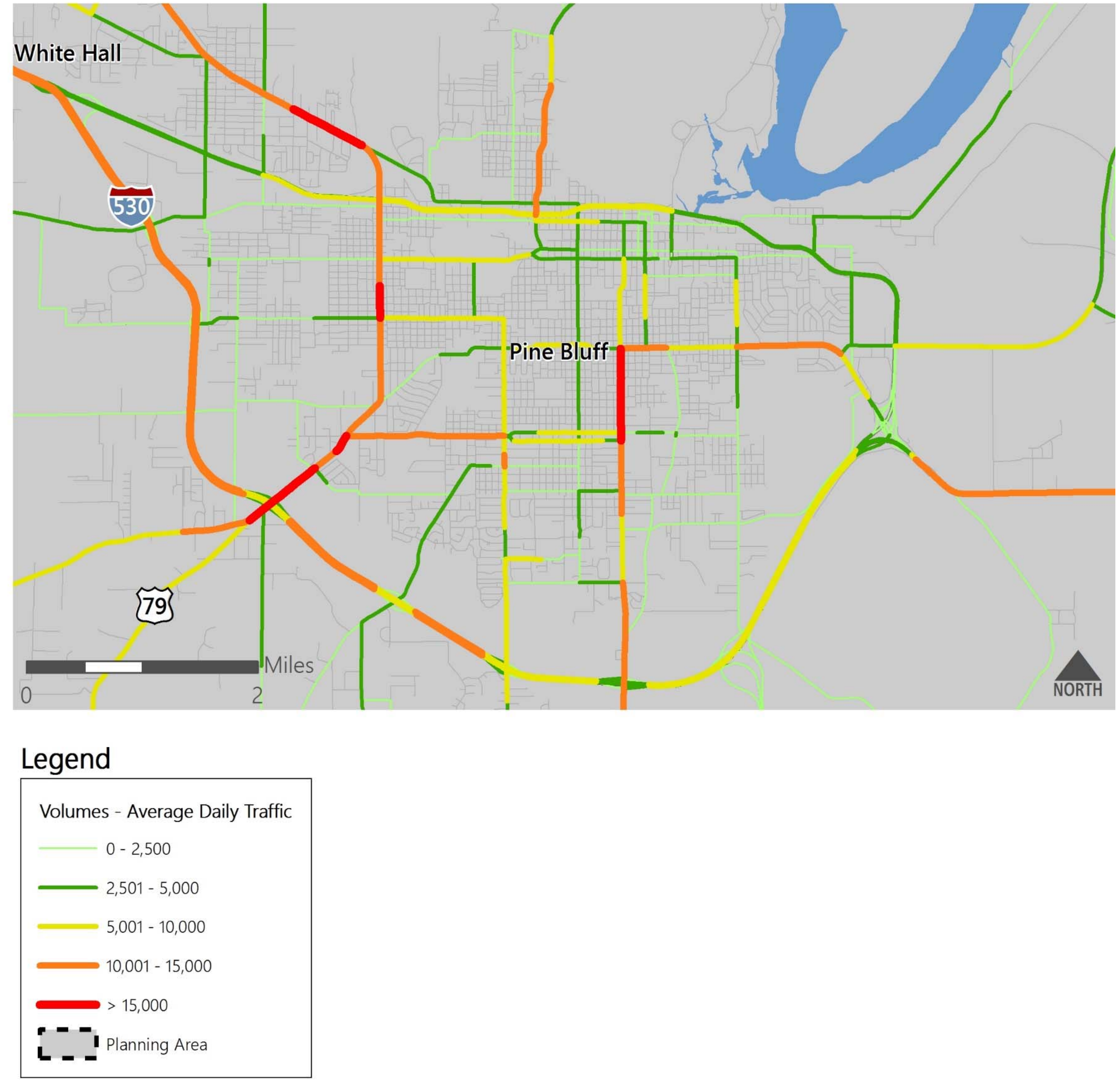
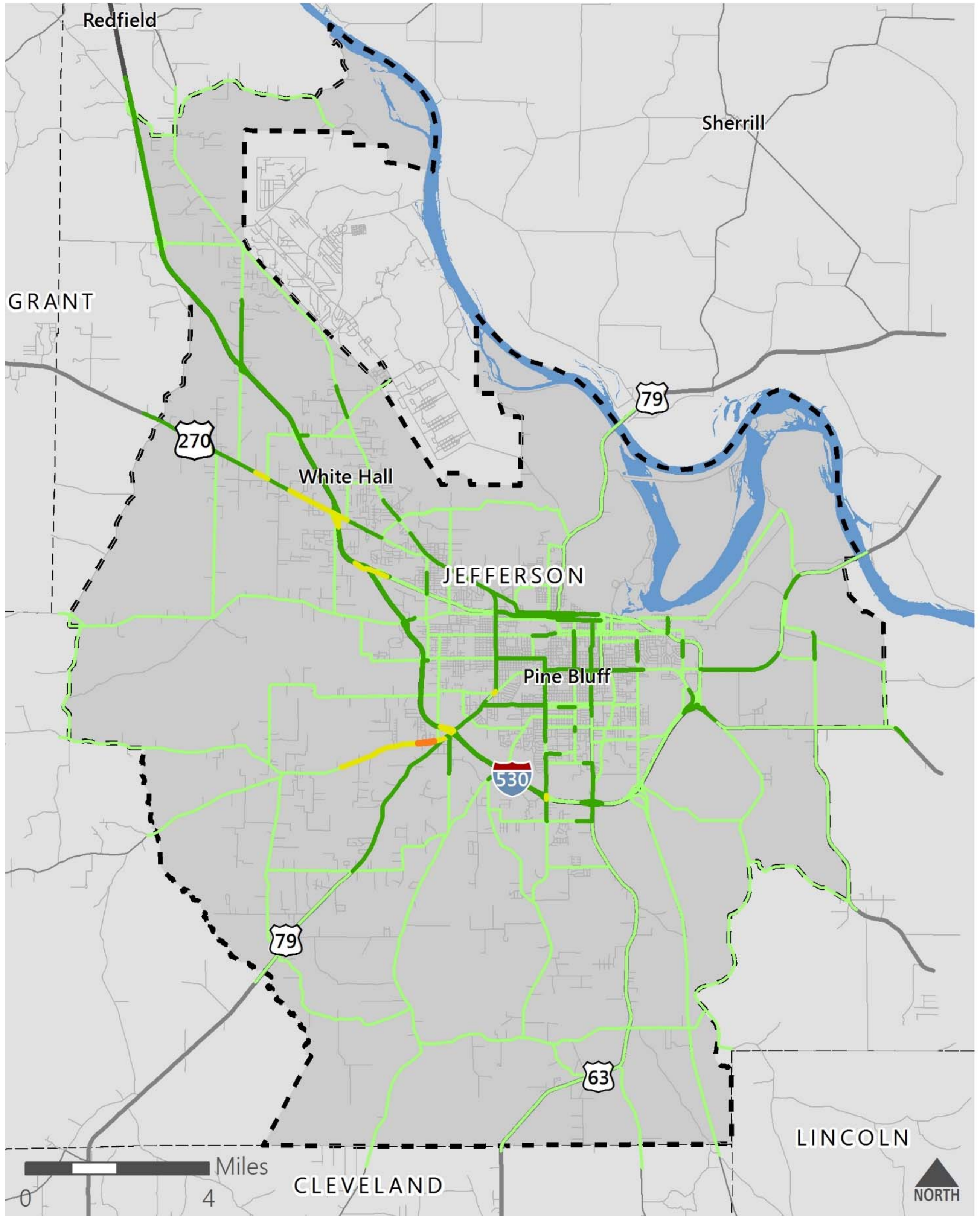


Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Figure 2.4: Existing Roadway Congestion, 2019

Metropolitan Planning Area



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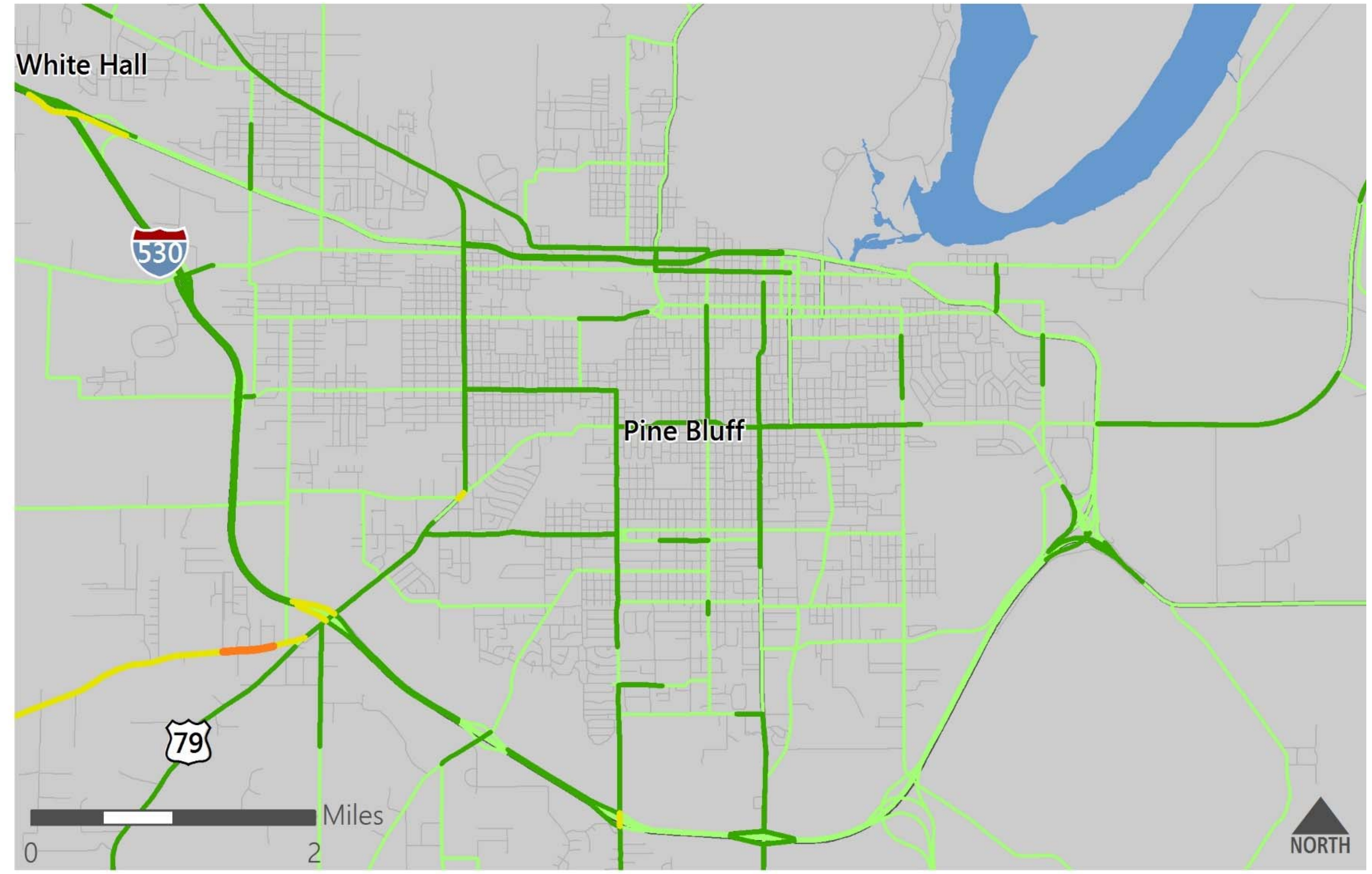


Legend

Volume / Capacity

- 0.00 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 1.00
- Planning Area

Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Table 2.4: Roadway Corridors with V/C over 0.70, 2019

Roadway	Location	Length (miles)
Sulphur Springs Rd	Chapel Heights Dr to E Greenway Dr	0.36
S Blake St	Faucett Rd to Miramar Dr	0.06

Source: SEARPC Travel Demand Model

2.4 Roadway Reliability

Most of the region's roadways do not have daily volumes that approach their daily capacities. However, there may still be congestion issues at specific times, notably peak periods. Travel time reliability is a measure of how congested travel times compare to free-flow conditions. The Level of Travel Time Reliability (LOTTR) is defined as:

$$\text{Segment LOTTR} = \frac{\text{"Longer" 80th Percentile Travel Time}}{\text{"Normal" 50th Percentile Travel Time}}$$

The LOTTR of each roadway segment is calculated for four time periods (including AM and PM peaks), with the worst LOTTR being used to determine segment reliability. The most recent LOTTR data available, year 2019, was obtained from the FHWA's National Performance Management Research Data Set (NPMRDS). Roadway segments with a LOTTR less than 1.5 are defined by the FHWA as reliable. Figure 2.5 displays the LOTTR of the monitored segments within the MPA.

It should be noted that the current NPMRDS for the Pine Bluff MPA meets the full Enhanced NHS and is reflected in this report. In the event that future MTPs experience a difference between NPMRDS data and the Enhanced NHS, it is due to the reporting cycle of the NPMRDS data and recent updates to the Enhanced NHS by the FHWA. The Federal Register states that the MPO is only responsible for reporting what the NPMRDS displays.

The NPMRDS data shows that both the Interstate and non-Interstate NHS systems within the MPA are very reliable.

100%

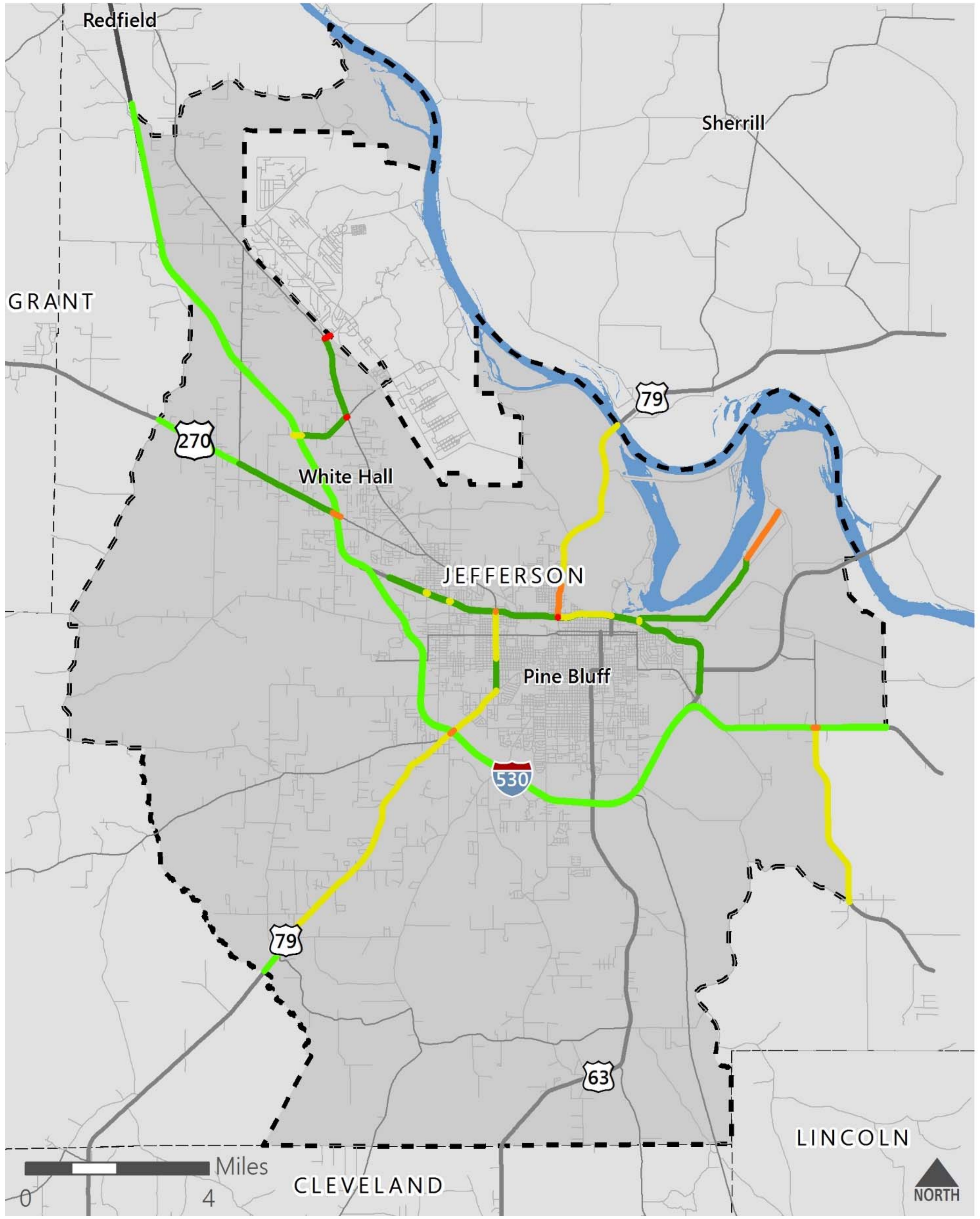
Interstate NPMRDS reported NHS person-miles travelled are reliable

98.2%

Non-Interstate NPMRDS reported NHS person-miles travelled are reliable

Figure 2.5: Level of Travel Time Reliability (LOTTR) on National Highway System (NHS) Routes, 2019

Metropolitan Planning Area



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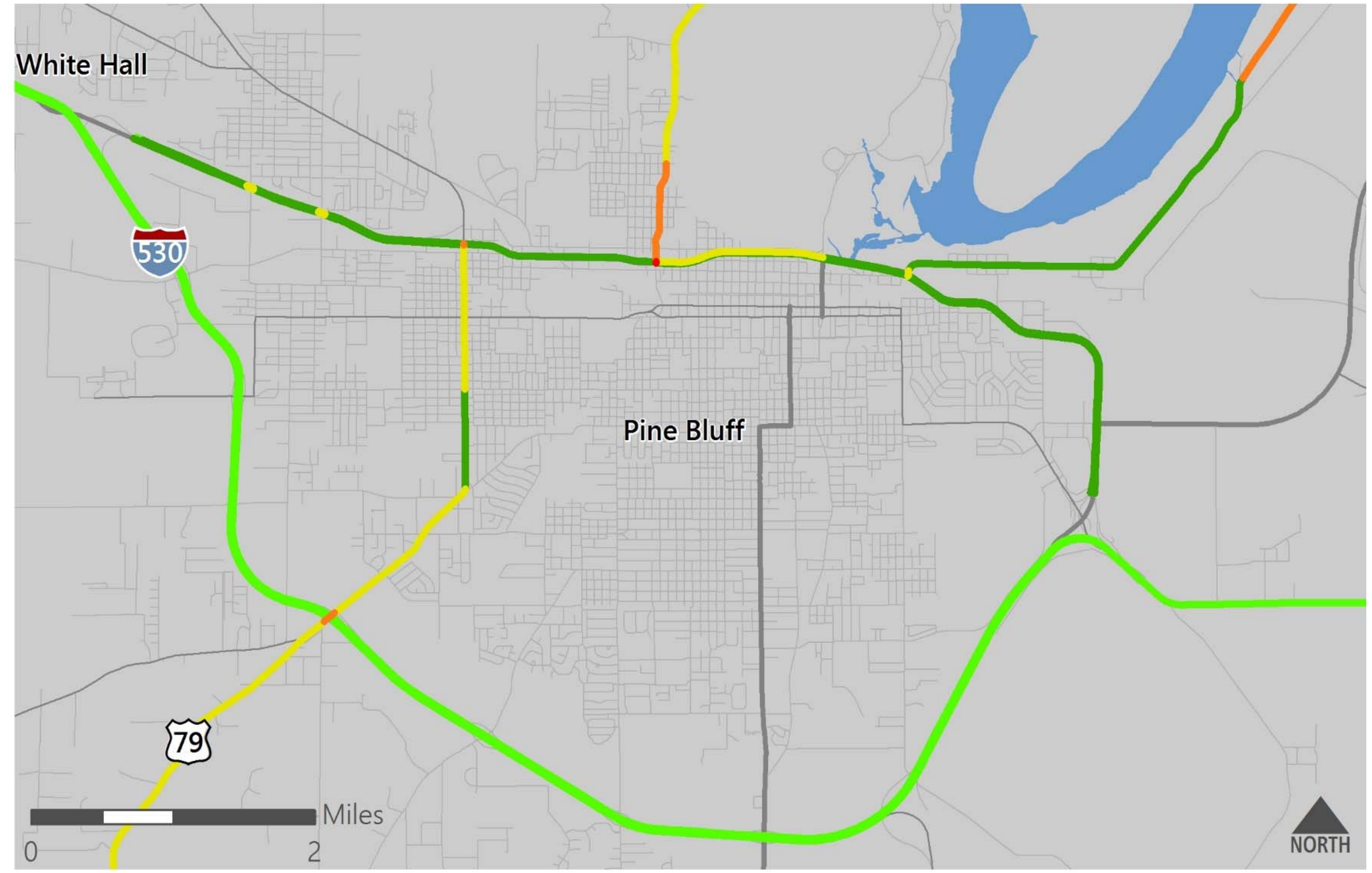


Legend

Level of Travel Time Reliability

- 1.00 - 1.15
- 1.16 - 1.30
- 1.31 - 1.50
- 1.51 - 2.00
- 2.01 - 2.83
- Planning Area

Data Sources: NPMRDS

Disclaimer: This map is for planning purposes only.

2.5 Pavement Conditions

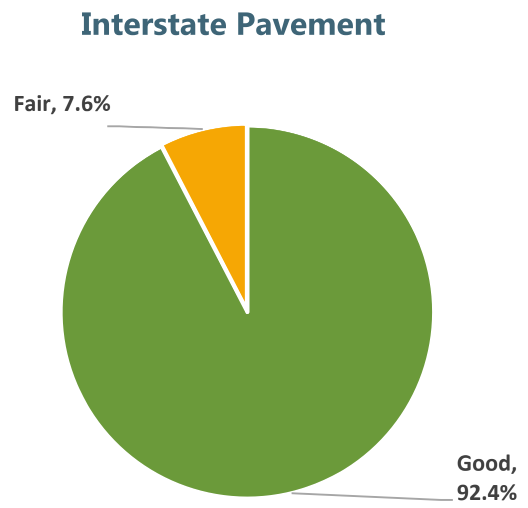
Maintaining sufficient pavement conditions ensures that roadways operate at their full capacity. Good pavement conditions provide roadway users with safe, comfortable travel experiences, while minimizing vehicle wear and tear.

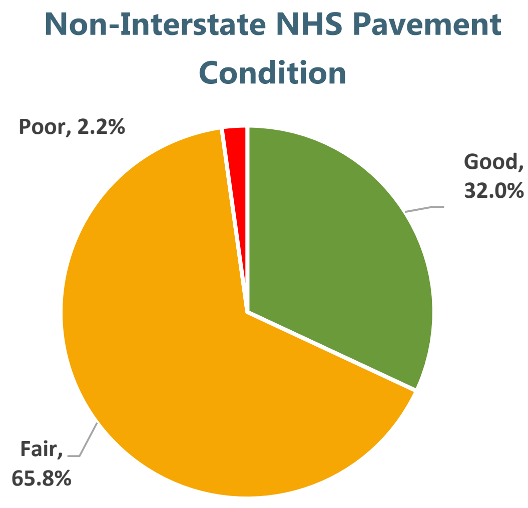
Results from the public participation survey showed that road and bridge conditions were one of the public's top priorities. Pavement condition ratings for the MPA's roadways were obtained from data submitted by ArDOT and found in the Highway Performance Monitoring System (HPMS). The HPMS is a national level highway information system that includes data on the:

- extent,
- condition,
- performance, and
- use and operating characteristics of the nation's highways.

The HPMS data is a sample dataset collected across the entire federal-aid eligible system for Interstate, arterial, and collector networks.

> The HPMS pavement condition is based on the International Roughness Index (IRI), cracking, rutting, and faulting.





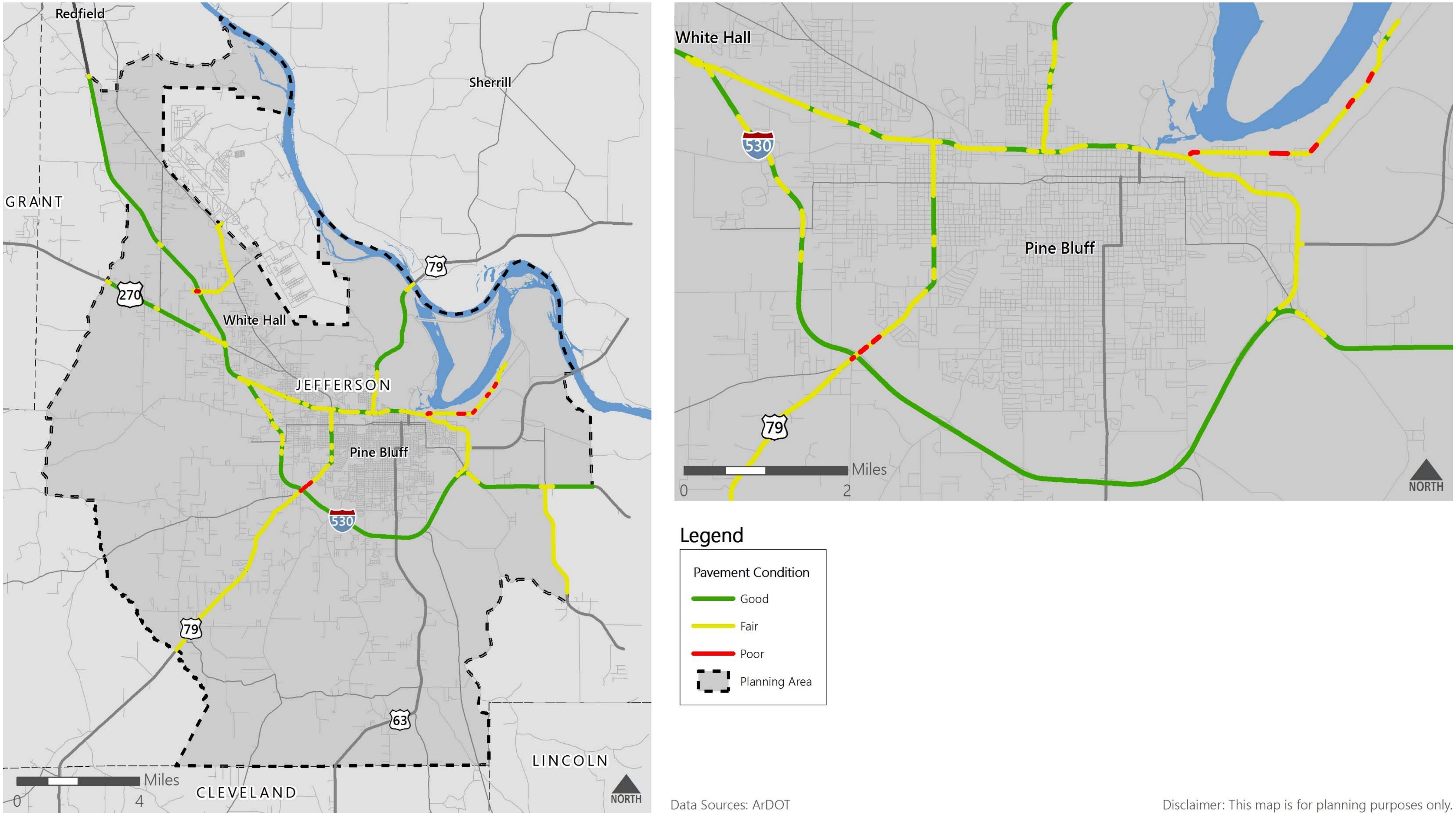
The data displayed in the above charts shows that there are currently no Interstate lane-miles within the MPA ranked as Poor. Currently, two (2) percent of Non-Interstate NHS pavements in the MPA rank as poor.

Figure 2.6 illustrates the most recent pavement condition data for the NPMRDS monitored roadways within the MPA. Poor pavement conditions within the MPA occur at various points along:

- US 79/S Camden Rd from Rayburn Rd to S Taft St.
- Port Rd from US 65 to Gravity Rd.
- W Holland Ave from the I-530 SB Ramps to the I-530 Overpass.

Figure 2.6: Roadway Pavement Conditions, 2019

Metropolitan Planning Area *Urban Core*



2.6 Bridge Conditions

Bridges are a critical part of the overall transportation network. They must be maintained and upgraded as needed to ensure that they are not safety or environmental hazards, bottlenecks, or limitations to freight movement.

> Bridges serve as important connections over waterways, provide grade separation between roadways and other transportation facilities, and connect transportation facilities to each other.

As previously mentioned, results from the public outreach survey showed that the public places a high priority on maintaining the current transportation system, which includes bridges, and increasing its safety. There are nearly 200 bridges within, or in close proximity to, the Pine Bluff MPA. Most of these cross waterways. However, bridges can also be structures that cross over other roadways and railroads.

2.6.1 Bridge Conditions and Scoring

The National Bridge Inventory (NBI) provides bridge conditions for all bridges in the United States with public roads passing above or below them. The NBI also defines bridges to include bridge-length culverts. The condition of the bridge is determined by the lowest rating of deck, superstructure, substructure, or culvert. If the lowest rating of these categories is greater than or equal to seven (7), the bridge is classified as good. If the score of the bridge is less than or equal to four (4), the classification is poor.

62.2%

NPMRDS defined NHS Bridges in Good Condition

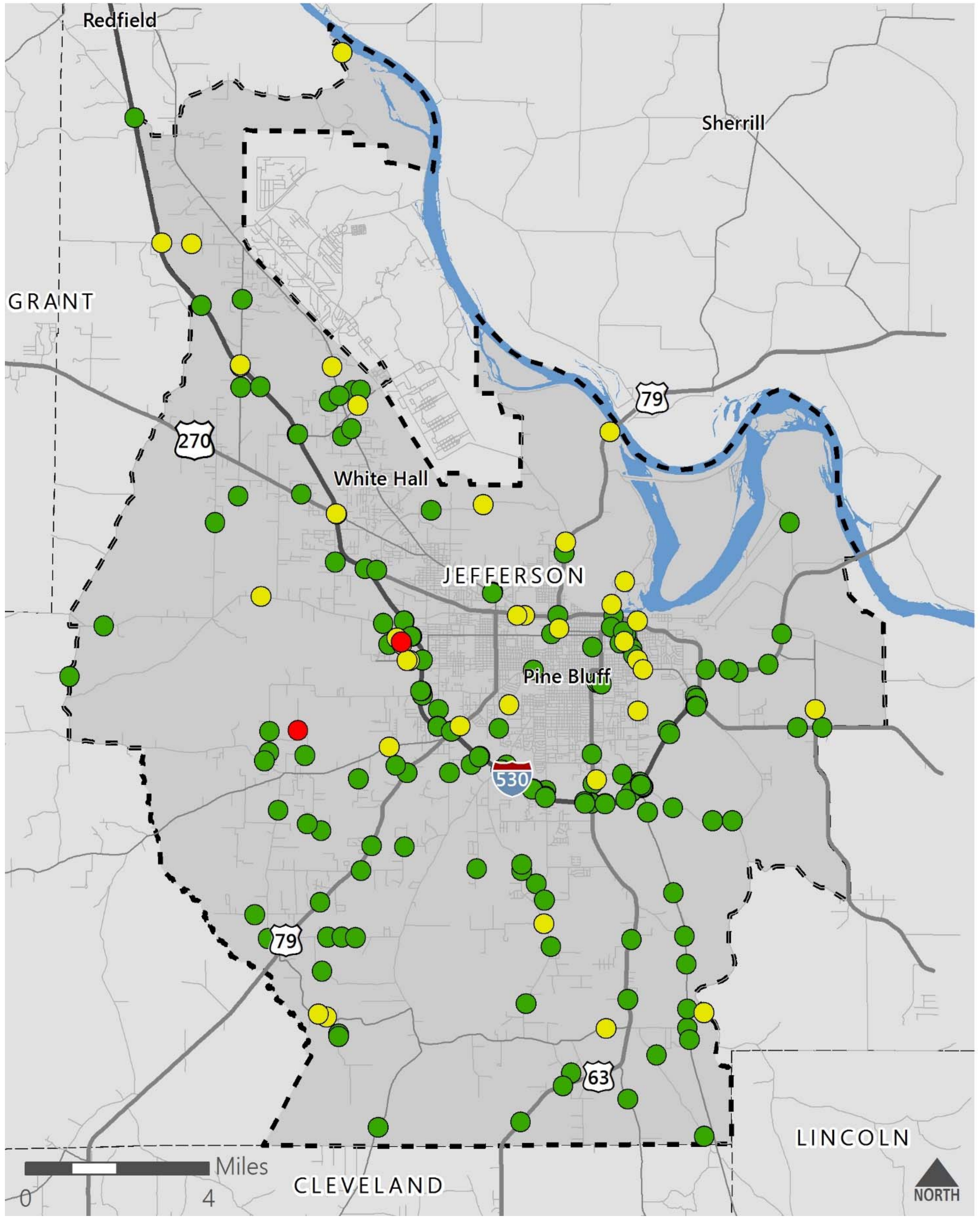
0.0%

NPMRDS defined NHS Bridges in Poor Condition

Figure 2.7 displays the condition of each bridge within the MPA. It should be noted that these include bridges that are a part of the National Highway System (NHS) and bridges that are not.

Figure 2.7: Bridge Conditions in the MPA, 2019

Metropolitan Planning Area



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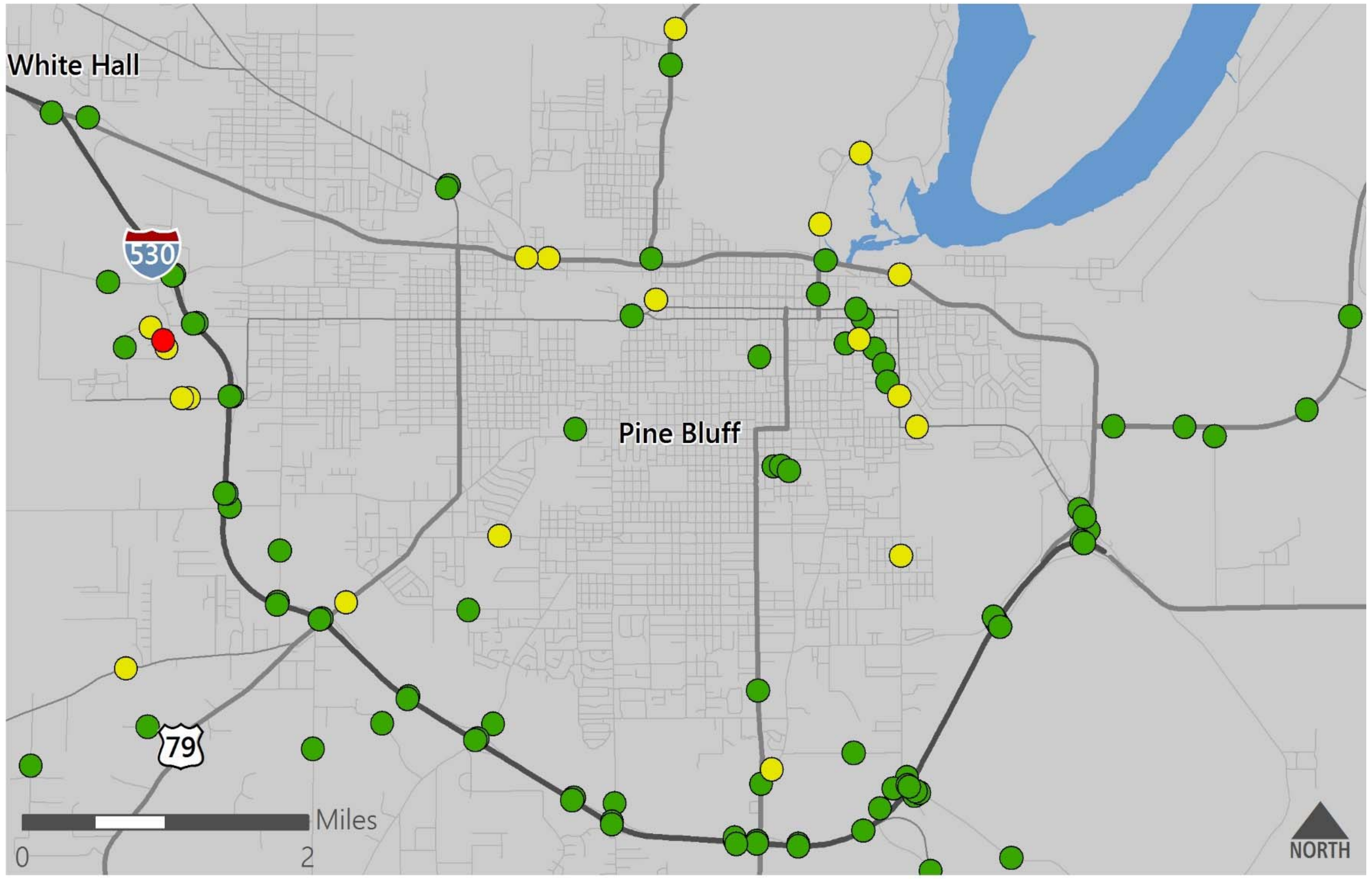
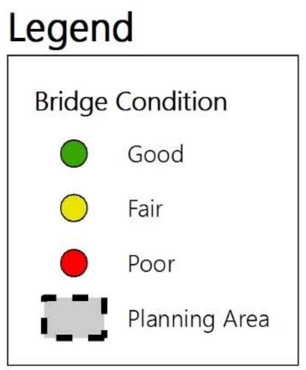




Data Sources: National Bridge Inventory

Disclaimer: This map is for planning purposes only.

2.6.2 Structurally Deficient and Functionally Obsolete Bridges

Nationally, all bridges are evaluated to determine if they are "structurally deficient". Structural deficiency is characterized by deteriorated conditions of significant bridge elements and potentially reduced load-carrying capacity. A structurally deficient bridge typically requires significant maintenance and repair to remain in service. These bridges would eventually require major rehabilitation or replacement to address the underlying deficiency. These bridges are those that are defined as having a score of four (4) or less on any of the scoring components described above. There are two (2) structurally deficient bridges in the MPA, none of which are on the reported sections of the NHS.

2.7 Roadway Safety

The Metropolitan Transportation Plan (MTP) safety analysis focused on gathering and analyzing available safety data and identifying hazardous locations. Due to the limited scope of this study, location-specific recommendations for the identified hazardous locations have not been developed.

"Disclaimer: This document and the information contained herein is prepared solely for the purpose of identifying, evaluating and planning safety improvements on public roads which may be implemented utilizing federal aid highway funds; and is therefore exempt from discovery or admission into evidence pursuant to 23 U.S.C. 409."

2.7.1 Supporting Documents

Highway Safety Improvement Program (HSIP)

The FAST Act requires each state to maintain an annually updated Highway Safety Improvement Program (HSIP). The HSIP must include the FHWA performance measures for roadway safety and the development of a Strategic Highway Safety Plan (SHSP). The required safety performance measures, state targets, and the Metropolitan Planning Organization's (MPO) existing performance are discussed in the MPO's Performance Report.

Strategic Highway Safety Plan (SHSP)

2017

Most Recent SHSP

A SHSP is a statewide coordinated safety plan developed and maintained by each state to reduce fatalities along all state highways and public roads. The SHSP[1], developed by the Arkansas Department of Transportation (ArDOT), uses the 4Es of traffic safety: Engineering, Enforcement, Emergency Response, and Education. The SHSP also identifies strategies and emphasis areas for analysis and investment. The ArDOT SHSP emphasis areas are shown in Table 2.5.

Table 2.5: 2017 SHSP Critical and Primary Emphasis Areas

Critical Emphasis Area	Primary Emphasis Area
Driver Behavior	• Impaired/drowsy driving • Occupant protection • Aggressive driving • Distracted driving
Infrastructure Improvement	• Roadway departure • Intersections • Work zones • Railroad crossings
Special Road Users	• Large commercial vehicles • Motorcyclists
Vulnerable Road Users	• Younger drivers • Older drivers • Drivers with disabilities • Bicyclists/pedestrians
Operational Improvements	• Emergency services capabilities • Incident management • Data collections and analysis

Source: 2017 Arkansas SHSP

[1] https://www.arkansashighways.com/Trans_Plan_Policy/traffic_safety/2017_SHSP_Final.pdf

2.7.2 Crash Impacts

According to the most recent Fatal Accident Crash Reporting System (FARS) data, an average of 36,019 people were killed annually from 2014 through 2018. Every crash, regardless of the severity, costs money and time in damages, emergency services, and delays. These costs affect both governments and taxpayers. One of the goals of the MTP process is to improve travel safety by reducing the risk of crashes on the roadways. This was accomplished by analyzing the data and determining the most hazardous locations in the MPA.

The crash records used in the analysis were obtained from ArDOT and cover all reported crashes from 2014 through 2018. The 2019 crash data from ArDOT is not currently available; however, 2014 through 2018 is used to provide a five-year rolling average.

The crash records include the:

- severity
- location
- DUI involvement
- vehicle type
- time of day
- number of fatalities or severe injuries
- roadway surface condition
- collision type

Latitude and longitude data was not reported for all crashes in 2014. Therefore, the number of crashes in 2014 will be underreported.

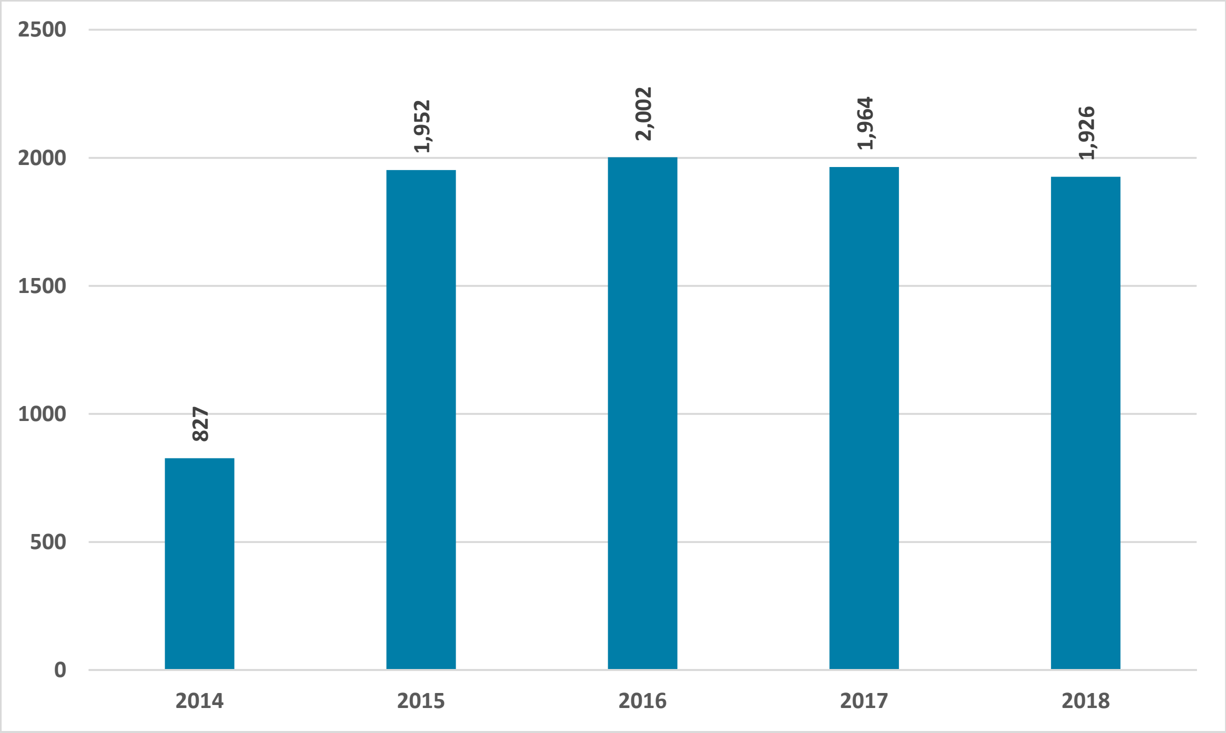
2.7.3 MPA Crash Trends

This section discusses the observed trends regarding all crashes that occurred within the MPA during the analysis period.

Crashes by Year

From 2014 through 2018, there were a total of 7,844 crashes within the MPA. Figure 2.8 displays the total number of crashes within the MPA by year and county.

Figure 2.8: MPA Crashes by Year, 2014-2018



Crash Severity

Crash severity reveals the extent to which crashes in the MPA pose a safety risk to roadway users. Within the MPA there were 40 fatal crashes and 145 incapacitating (severe injury) crashes during the analysis period. Less than two (2) percent of the total crashes resulted in a fatality or severe injury. Figure 2.9 displays the severity of the fatal/injury crashes within the MPA by county.

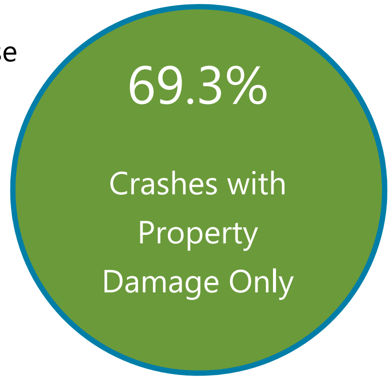
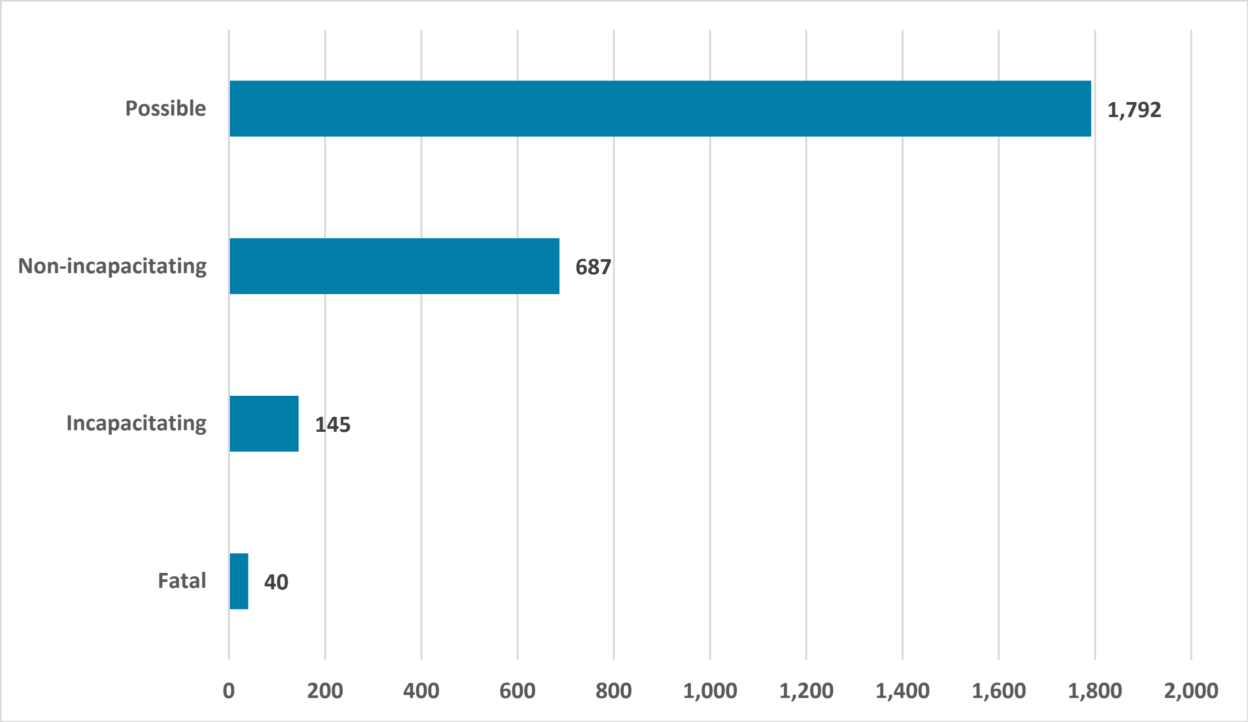
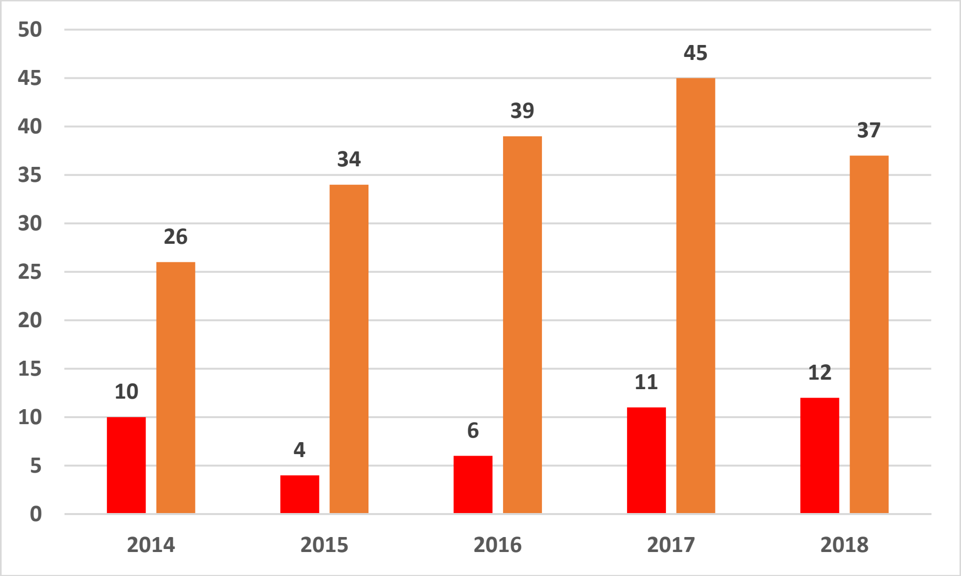


Figure 2.9: Severity of Fatal/Injury Crashes, 2014-2018



From 2014 through 2018, the fatal and incapacitating crashes resulted in 43 deaths and 181 severe injuries. The fatalities and severe injuries, by year, during this time period are shown in Figure 2.10.

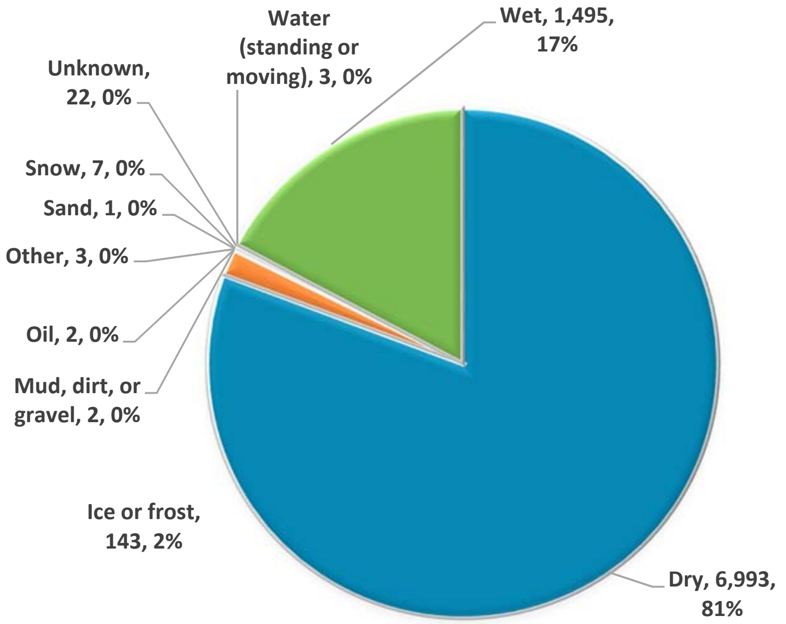
Figure 2.10: Fatalities and Severe Injuries; 2014-2018



Crash Times

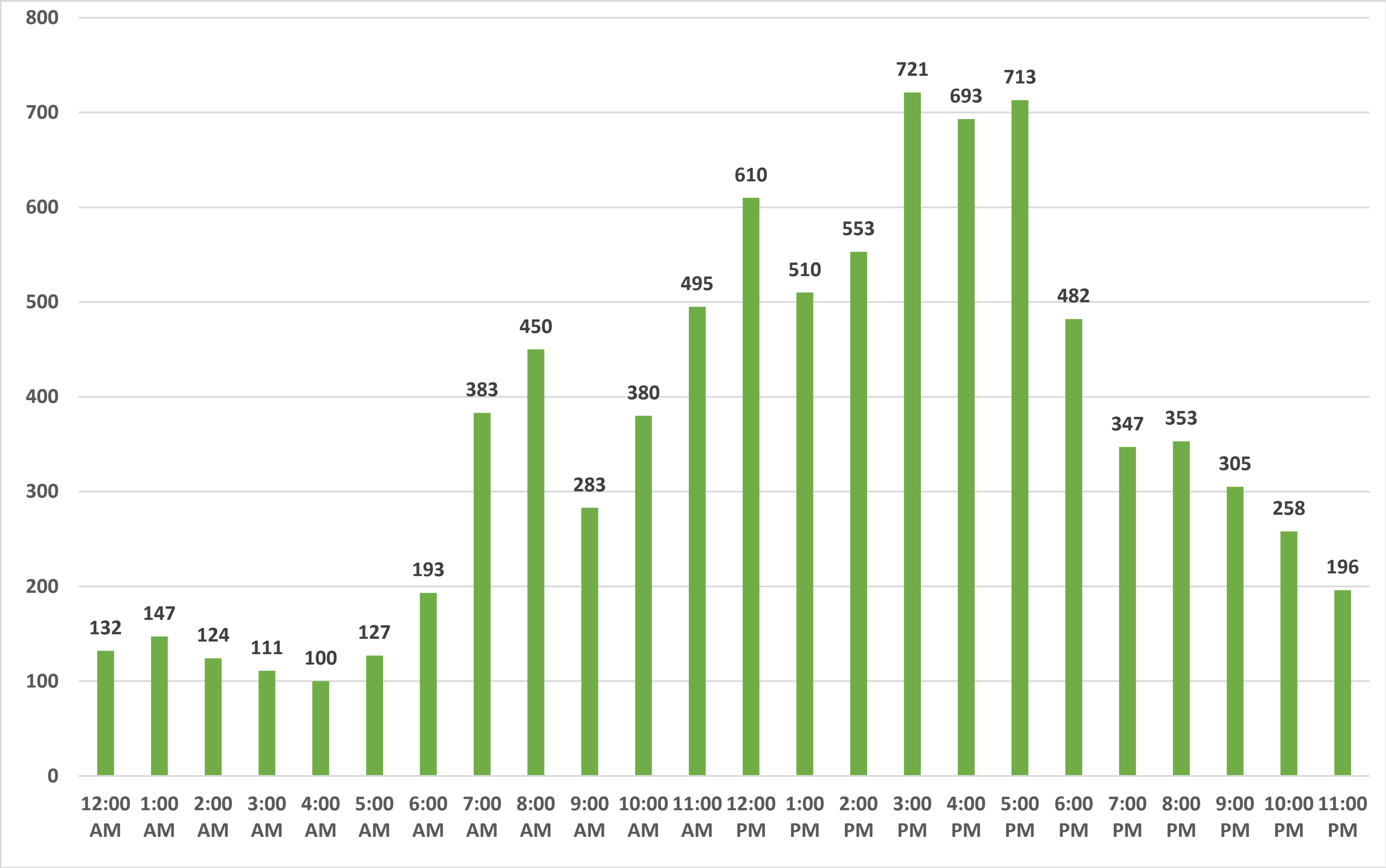
Identifying when crashes occur can assist with developing countermeasures for crashes affected by lighting, congestion, or other factors. Within the MPA, less than 30 percent of the crashes occur during hours where there is little to zero daylight (7:00 PM to 7:00 AM). However, nearly 25 percent of the MPA's crashes occur from 3 PM to 6 PM. This is likely the result of high traffic volumes when children are released from school or people return home from work. The hour in which the crashes occurred is displayed in Figure 2.11.

Roadway Surface Condition



The roadway surface can also contribute to a crash through adverse conditions such as rain, oil, debris, or other sources. These conditions temporarily reduce the safety of the roadway and can lead to a crash. However, more than 80 percent of the crashes occurred during dry conditions. This means the roadway surface condition is not a contributing factor in the vast majority of crashes.

Figure 2.11: Crashes by Hour, 2014-2018



Collision Type

This study also considers collision types that occurred. Table 2.6 displays the crashes by collision type and county.

Table 2.6: Crashes by Collision Type, 2014-2018

Collision Type	Number of Crashes
Angle	3,042
Front to front	136
Front to rear	2,104
Other	127
Rear to rear	22
Rear to side	101
Sideswipe, opposite direction	258
Sideswipe, same direction	761
Single vehicle crash	2,120

Source: ArDOT, 2020; NSI, 2020

Angle

Most common collision type

71.1%

Crashes that are Angle, Sideswipe, or Rear End

2.7.4 Crash Locations

The nature of this study is only to identify trends; thus, it did not attempt to analyze each hazardous location and corresponding crash records for specific solutions. However, it identifies locations that experience the highest crash frequencies or rates.   Crash frequencies reflect how often crashes occur at a given location and are expressed in crashes per year. Crash rates reflect the amount of crashes compared to the traffic volumes a roadway experiences and are expressed as crashes per million vehicle miles traveled for roadway segments. Intersection crash rates are expressed as crashes per million vehicles entering the intersection.

The hazardous locations shown in this report are not a ranking of these locations, but merely a list developed for informational purposes.

2.7.5 Segment Crashes

For this study, roadway segments are defined in two ways:

- A roadway link between two significant roadways.
- A roadway link between a significant roadway and a specific distance from that point.

Crashes on segments can occur due to roadway design, pavement condition, lighting, or other factors. A segment identified in this analysis should be further analyzed in additional studies to determine what contributes to the high crash frequency and/or crash rate it experiences. These studies should also be used to develop site-specific countermeasures.

Crash Frequencies

Table 2.7 displays the roadway segments in the MPA that have the highest crash frequencies and a breakdown of the severity of the crashes. These locations are shown in Figure 2.12.

20.5% of MPA crashes occur on the top 20 crash frequency segments.

Crash Rates

Crash rates for the study area were based on the model network layer and existing year (2019) volumes obtained from the Pine Bluff MPO (PBMPO) travel demand model. The length of each segment and the corresponding daily traffic volumes from the model are used in the crash rate equation.

The segment crash rate equation is:

$$Segment\ Crash\ Rate = \frac{N * 10^6}{365 * ADT * L}$$

Where: Segment Crash Rate = crashes per million vehicle miles traveled

N = average annual crash frequency of the segment

ADT = average daily traffic of the segment based on the 2019 Travel Demand Model

L = length of the model segment in miles

Table 2.8 displays the roadway segments in the MPA that have the highest crash rates. These locations are shown in Figure 2.13.

Table 2.7: Top 20 Crash Frequency Segments and Severity, 2014-2018

Route	Location	Total Crashes	Crash Frequency	Fatal Injury	Incapacitating Injury	Non-incapacitating Injury	Possible Injury	No Apparent Injury
I-530	Gravel Pit Rd to AR 104	98	19.6	1	5	10	14	68
W 28th Ave	S Fir St to S Hazel St	71	14.2	0	2	2	16	51
US 63B (S Olive St)	W 25th Ave to W 21st Ave	59	11.8	1	0	3	16	39
US 63B (S Olive St)	Hudson Ave to W 28th Ave	57	11.4	0	0	3	12	42
I-530	Gravel Pit Rd to Stagecoach Rd	56	11.2	0	3	6	8	39
W 28th Ave	S Catalpa St to S Fir St	53	10.6	0	0	7	13	33
I-530	US 79/US 79B (S Camden Rd) to AR 190 (W 13th St)	50	10.0	0	3	7	6	34
I-530	Between US 65B (Martha Mitchell Expwy) Ramps	49	9.8	2	1	1	9	36
I-530	US 65B (Martha Mitchell Expwy) to US 270 (Sheridan Rd)	47	9.4	0	2	1	10	34
I-530	AR 190 (W 13th St) to Princeton Pike	45	9.0	0	2	4	3	36
I-530	Old Warren Rd to US 79/US 79B (S Camden Rd)	45	9.0	0	3	5	8	29
I-530	W Holland Ave to AR 104	40	8.0	1	3	8	5	23
W 28th Ave	0.05 miles west of S Myrtle St to S Catalpa St	40	8.0	0	1	2	9	28
I-530	US 270 (Sheridan Rd) to W Holland Ave	39	7.8	0	5	2	8	24
US 63B	Mallard Loop to S Main St	39	7.8	0	1	2	5	31
AR 54 (Sulphur Springs Rd)	Temple Rd to Chapel Heights Rd	39	7.8	0	5	6	7	21
US 79B (S Blake St)	W 17th Ave to W 13th Ave	37	7.4	0	0	4	9	24
I-530	S Hazel St to Old Warren Rd	36	7.2	0	2	4	6	24
I-530	AR 530 to US 63/US 65/US 79/US 425/AR 190	36	7.2	3	2	4	7	20
AR 365	N Haley St to Cottonwood St	35	7.0	0	0	6	6	23
Total		971	194.2	8	40	87	177	659

Source: ArDOT, 2020; NSI, 2020

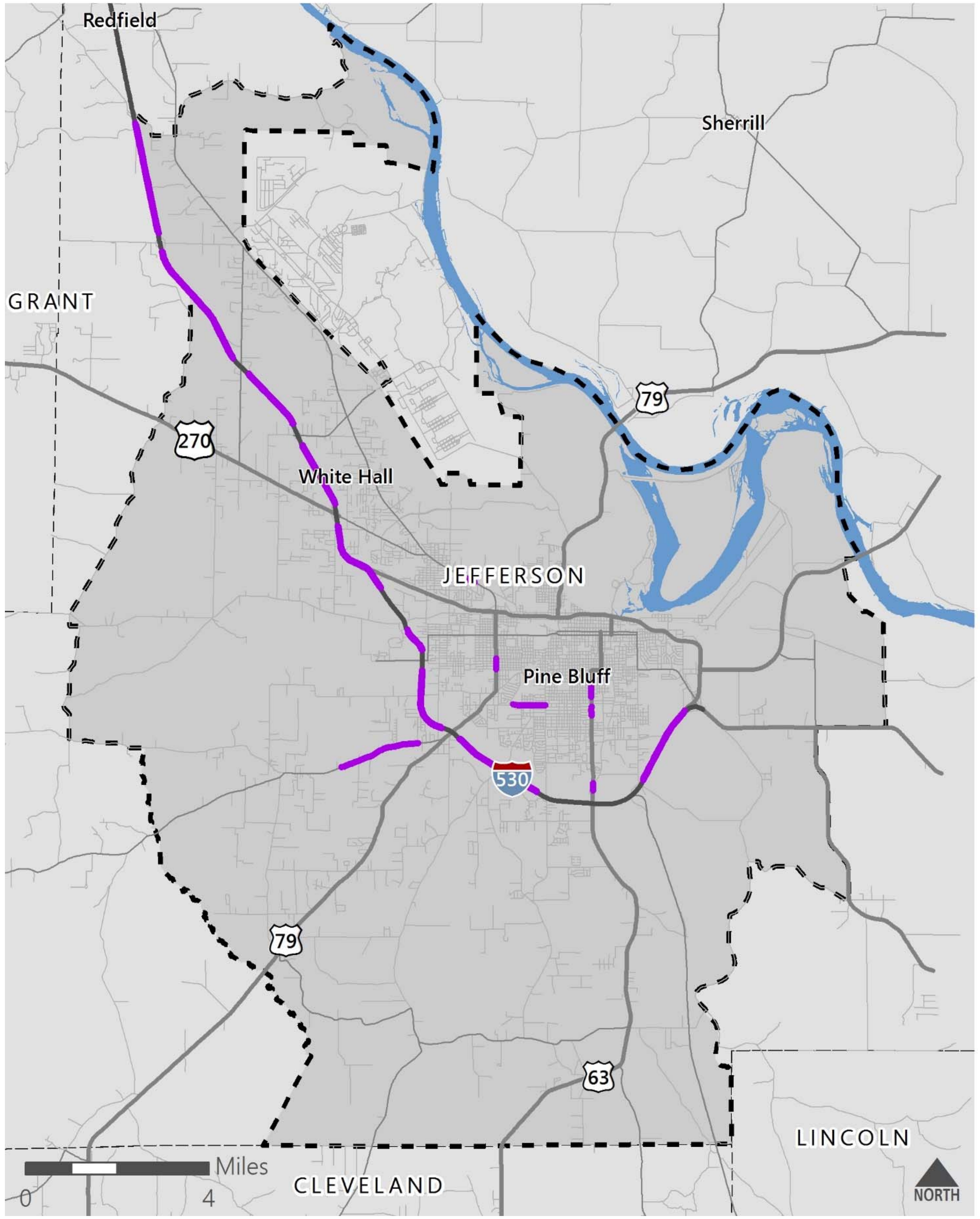
Table 2.8: Top 20 Crash Rate Segments, 2014-2018

Route	Location	Total Crashes	Crash Freq	ADT	Length (mi)	Crash Rate
W 34th Ave	0.11 miles east of S Juniper St to Old Warren Rd	25	5	1,093	0.24	52.42
E 8th Ave	US 63B (S Texas St) to S Morris St	11	2.2	1,437	0.13	32.19
L A Prexy Davis Dr	Fluker St to 0.09 miles north of W Reeker Ave	4	0.8	522	0.16	26.51
Miramar Dr	S Bay St to Jonquil St	12	2.4	1,782	0.15	24.38
Rhinehart Rd	AR 365 (N Blake St) to 0.11 miles south of AR 365 (N Blake St)	21	4.2	4,480	0.11	23.85
S Main St	Country Club Ln to 0.16 miles north of E 45th Ave	7	1.4	709	0.23	23.54
E 38th Ave	S Louisiana St to S Indiana St	6	1.2	818	0.19	21.70
AR 190 (W 6th Ave)	S Locust St to 0.02 miles west of S Linden St	24	4.8	3,527	0.18	20.96
Faucett Rd	Crestwood Dr to US 79B	11	2.2	1,094	0.26	20.84
S Ohio St	E 34th Ave to E 31st Ave	5	1	563	0.25	19.58
AR 190 (W 6th Ave)	S Cherry St to S Beech St	25	5	3,189	0.23	18.47
US 63B (E 8th Ave)	S Main St to 0.03 miles east of S State St	5	1	1,462	0.11	16.98
S Main St	Friendswood to Dr Country Club Ln	3	0.6	819	0.12	16.65
W 34th Ave	S Cedar St to S Locust St	2	0.4	593	0.11	16.32
W 28th Ave	S Cherry St to 0.73 miles east of S Elm St	31	6.2	5,109	0.21	15.90
N Hutchinson St	Joneswood Dr to W Malcomb St	10	2	2,768	0.13	15.25
E 34th Ave	S Louisiana St to S Virginia St	4	0.8	1,199	0.13	14.59
E 38th Ave	Georgia St to S Louisiana St	4	0.8	818	0.19	14.48
S Ohio St	T.L. Kimbrel Dr to E 34th Ave	2	0.4	576	0.13	14.35
E 38th Ave	S Indiana St to S Ohio St	4	0.8	605	0.26	14.20

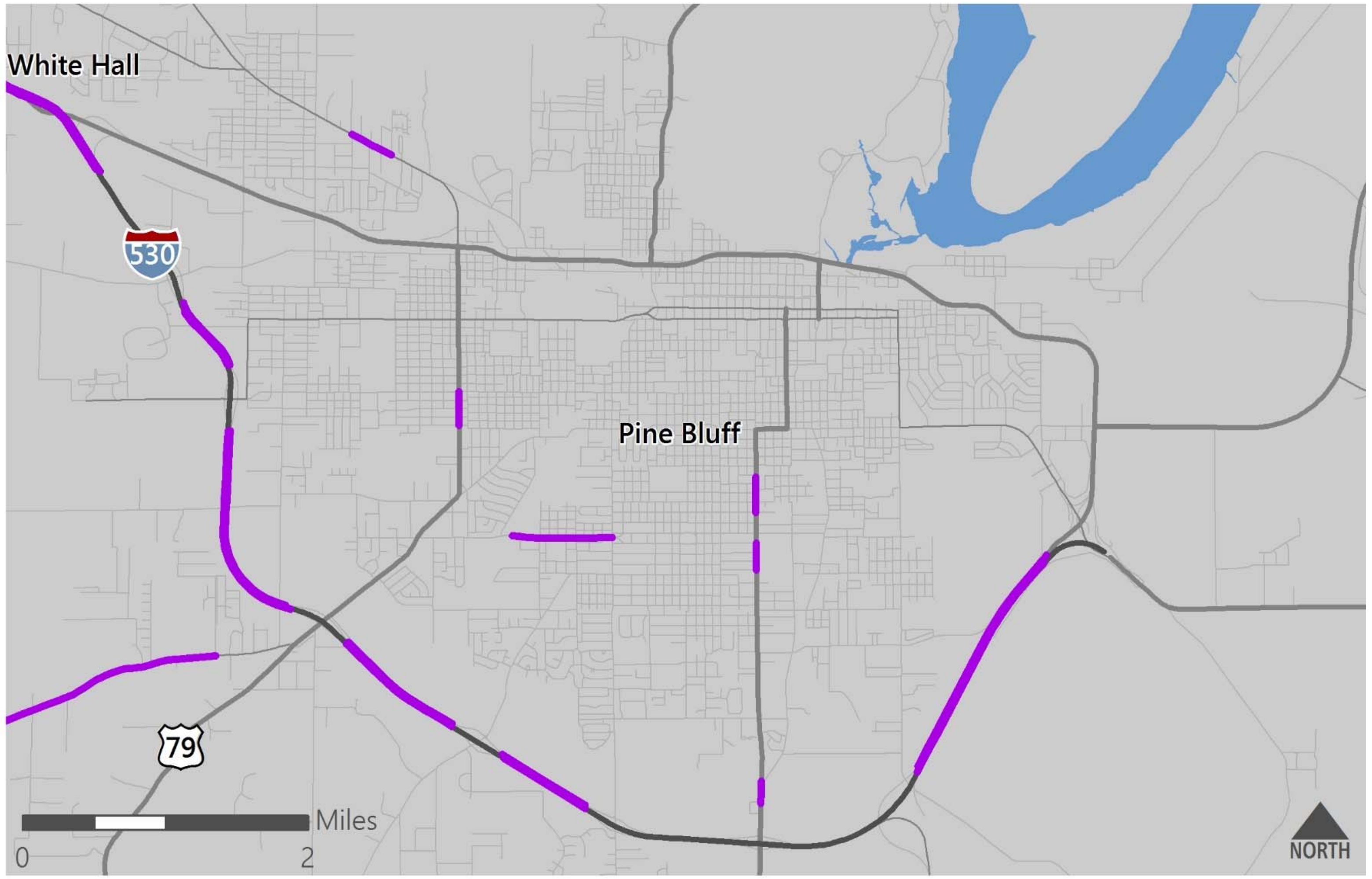
Source: ARDOT, 2020; NSI, 2020

Figure 2.12: High Crash Frequency Areas, 2014-2018

Metropolitan Planning Area



Urban Core



Legend

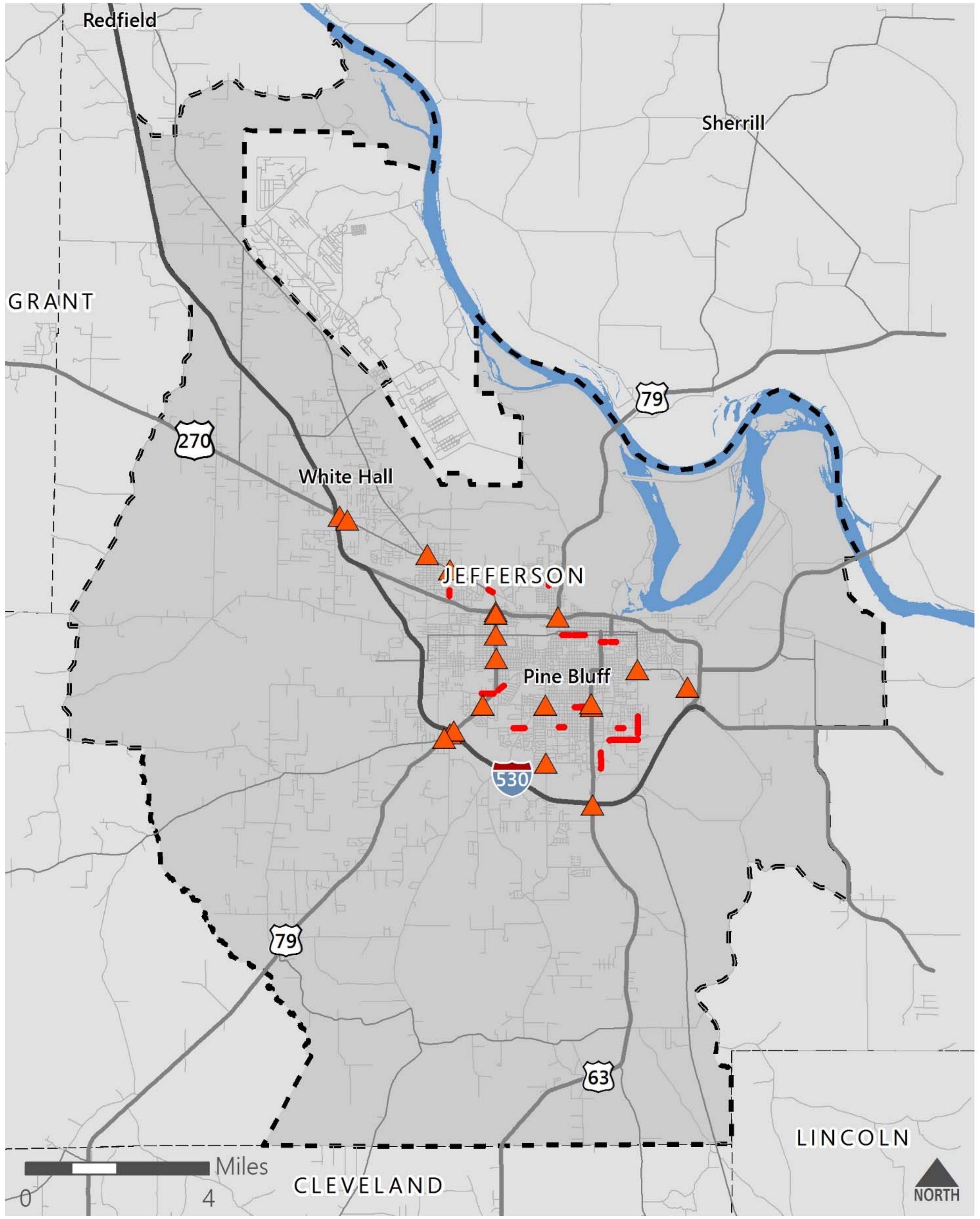
- High Crash Frequency Segment
- Planning Area

Data Sources: ArDOT 2014 - 2018

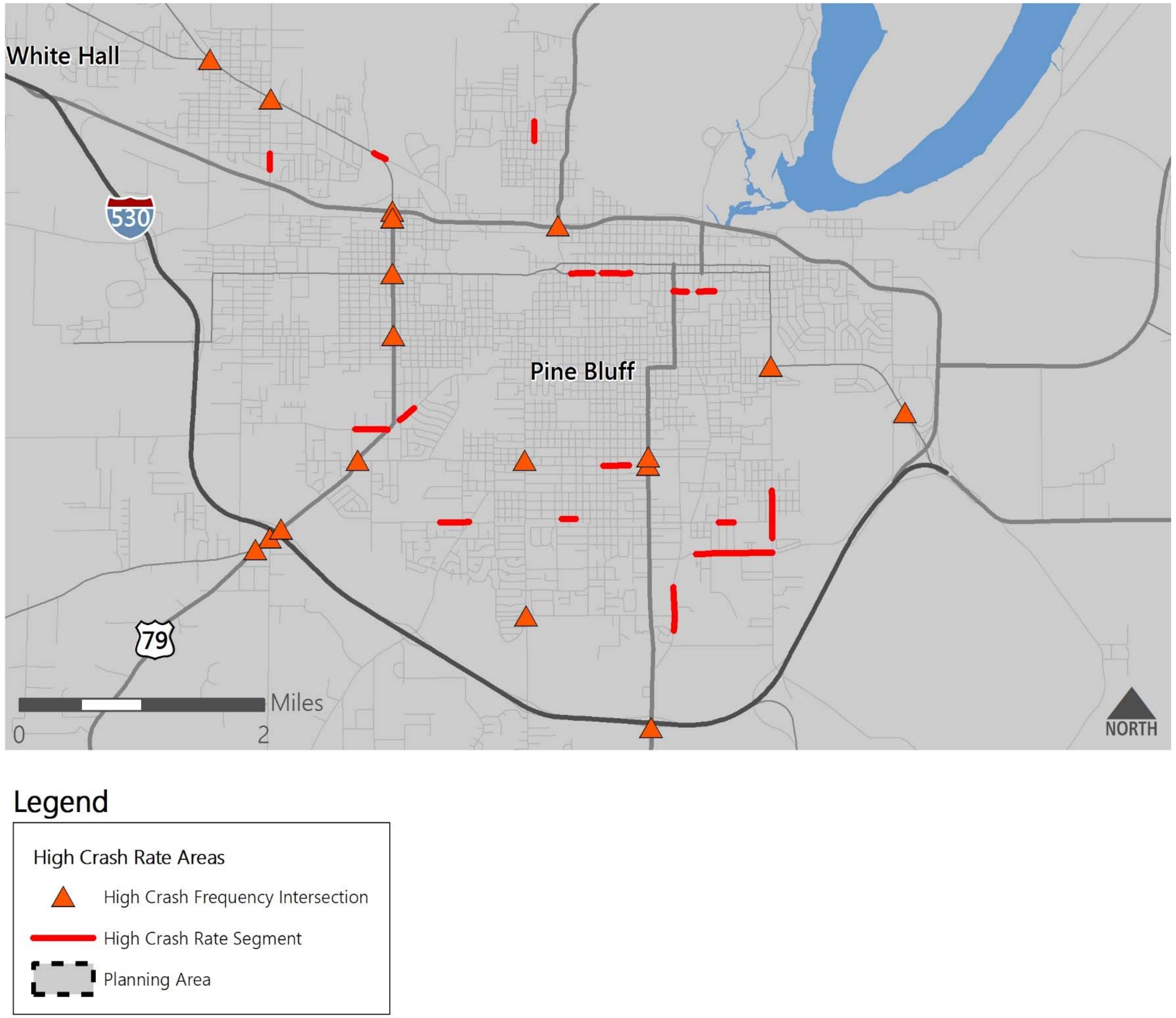
Disclaimer: This map is for planning purposes only.

Figure 2.13: High Crash Rate Areas, 2014-2018

Metropolitan Planning Area



Urban Core



Data Sources: ArDOT 2014 - 2018

Disclaimer: This map is for planning purposes only.

2.7.6 Intersection Crashes

There were nearly 2,600 intersection crashes in the MPA from 2014 to 2018.

32.5%
of crashes in the MPA occur at intersections

Crash Frequencies

Table 2.9 shows the 20 intersections in the MPA with the highest crash frequency and their severity. Table 2.10 shows the collision types that occurred at these intersections. These locations are also displayed in Figure 2.13.

Additional studies should be conducted on these intersections to identify the cause of the crashes and how to reduce the severity and types of crashes they experience.

39.4%
of intersection crashes occur at the Top 20 crash frequency locations

Crash Rates

The intersection crash rate equation is:

$$Intersection\ Crash\ Rate = \frac{N * 10^6}{365 * ADT}$$

Where:

Intersection Crash Rate = crashes per million vehicles entering

N = average annual crash frequency of the intersection

ADT = average daily traffic entering the intersection based on the 2019 Travel Demand Model

Table 2.11 shows the ten (10) intersections with the highest crash frequencies in the study area and their corresponding crash rates.

Table 2.9: Top 20 Intersections with High Crash Frequency by Severity, 2014-2018

Intersection	Total Crashes	Crash Frequency	Fatal injury	Incapacitating injury	Non-incapacitating injury	Possible injury	No apparent injury
US 65B (Martha Mitchell Expwy) at AR 365 (Blake St)	109	21.8	0	1	5	25	78
US 63B (S Olive St) at W 28th Ave	64	12.8	0	0	4	13	47
US 65B (Martha Mitchell Expwy) at US79B (University Dr)	62	12.4	1	0	4	17	40
US 79 (S Camden Rd) at Ryburn Rd	61	12.2	0	0	1	14	46
US 63B (S Olive St) at W 27th Ave	57	11.4	0	1	2	12	42
US 79B (S Blake St) at W 13th Ave	54	10.8	1	0	2	15	36
AR 190 (E Harding Ave) at S Ohio St	54	10.8	0	1	4	17	32
I-530 Northbound Off-Ramp at US 270/AR 365S (Sheridan Rd)	53	10.6	0	0	2	7	44
S Hazel St at W 28th Ave	52	10.4	0	0	0	5	47
AR 365 (Dollarway Rd) at N Hutchinson St	47	9.4	0	0	4	14	29
AR 365 (Dollarway Rd) at AR 365S (Sheridan Rd)/Bryant St/Cheatham Ave	45	9.0	0	0	2	14	29
AR 365S (Sheridan Rd) at Robin Rd/Hospitality Dr	43	8.6	0	0	3	4	36
I-530 Northbound Off-Ramp at US 79/US 79B (S Camden Rd)	40	8.0	0	0	0	11	29
AR 190 (E Harding Ave) at Pine Mall Dr	40	8.0	0	0	6	7	27
US 79B (S Blake St) at W Barraque Ave	39	7.8	0	0	4	10	25
US 79 (S Camden Rd) at AR 54 (Sulphur Springs Rd)	38	7.6	0	0	3	5	30
US 79B (S Blake St) at AR 190 (W 6th Ave)	38	7.6	0	0	2	9	27
US 79B (S Camden Rd) at W 28th Ave	37	7.4	0	0	1	11	25
I-530 Southbound Off-Ramp at US 63/US 63B	36	7.2	0	0	1	14	21
S Hazel St to Country Club Ln	36	7.2	0	0	5	7	24
Total	1,005	201.0	2	3	55	231	714

Source: ARDOT, 2020; NSI, 2020

Table 2.10: Top 20 Intersections with High Crash Frequency by Collision Type, 2014-2018

Intersection	Total Crashes	Crash Frequency	Single Vehicle Crash	Front to Rear	Front to Front	Angle	Sideswipe, Same Direction	Sideswipe, Opposite Direction	Rear to Side	Rear to Rear	Other
US 65B (Martha Mitchell Expwy) at AR 365 (Blake St)	109	21.8	6	65	0	31	7	0	0	0	0
US 63B (S Olive St) at W 28th Ave	64	12.8	3	33	1	17	9	1	0	0	0
US 65B (Martha Mitchell Expwy) at US79B (University Dr)	62	12.4	3	35	0	18	4	1	0	0	1
US 79 (S Camden Rd) at Ryburn Rd	61	12.2	0	9	1	45	3	2	0	0	1
US 63B (S Olive St) at W 27th Ave	57	11.4	1	14	0	35	5	2	0	0	0
US 79B (S Blake St) at W 13th Ave	54	10.8	3	23	0	22	5	0	0	0	1
AR 190 (E Harding Ave) at S Ohio St	54	10.8	2	21	0	19	10	2	0	0	0
I-530 Northbound Off-Ramp at US 270/AR 365S (Sheridan Rd)	53	10.6	1	46	0	5	1	0	0	0	0
S Hazel St at W 28th Ave	52	10.4	0	28	0	16	5	1	0	0	2
AR 365 (Dollarway Rd) at N Hutchinson St	47	9.4	3	15	1	23	4	1	0	0	0
AR 365 (Dollarway Rd) at AR 365S (Sheridan Rd)/Bryant St/Cheatham Ave	45	9.0	3	15	1	21	4	1	0	0	0
AR 365S (Sheridan Rd) at Robin Rd/Hospitality Dr	43	8.6	1	20	0	19	2	1	0	0	0
I-530 Northbound Off-Ramp at US 79/US 79B (S Camden Rd)	40	8.0	0	14	0	24	2	0	0	0	0
AR 190 (E Harding Ave) at Pine Mall Dr	40	8.0	2	9	1	19	6	0	0	2	1
US 79B (S Blake St) at W Barraque Ave	39	7.8	1	13	1	22	1	1	0	0	0
US 79 (S Camden Rd) at AR 54 (Sulphur Springs Rd)	38	7.6	1	13	0	16	7	1	0	0	0
US 79B (S Blake St) at AR 190 (W 6th Ave)	38	7.6	4	23	1	6	4	0	0	0	0
US 79B (S Camden Rd) at W 28th Ave	37	7.4	2	13	0	13	7	1	0	0	1
I-530 Southbound Off-Ramp at US 63/US 63B	36	7.2	1	19	2	12	2	0	0	0	0
S Hazel St to Country Club Ln	36	7.2	3	5	1	25	1	1	0	0	0
US 65B (Martha Mitchell Expwy) at AR 365 (Blake St)	109	21.8	40	433	10	408	89	16	0	2	7
Total	1,005	201.0	6	65	0	31	7	0	0	0	0

Source: ARDOT, 2020; NSI, 2020

Table 2.11: Top 10 High Crash Frequency Intersections and Crash Rates, 2014-2018

Intersection	Total Crashes	Crash Frequency	ADT	Crash Rate
US 65B (Martha Mitchell Expwy) at AR 365 (Blake St)	109	21.8	26,250	2.28
US 63B (S Olive St) at W 28th Ave	64	12.8	17,623	1.99
US 65B (Martha Mitchell Expwy) at US79B (University Dr)	62	12.4	23,803	1.43
US 79 (S Camden Rd) at Ryburn Rd	61	12.2	21,920	1.52
US 63B (S Olive St) at W 27th Ave	57	11.4	19,170	1.63
US 79B (S Blake St) at W 13th Ave	54	10.8	17,992	1.64
AR 190 (E Harding Ave) at S Ohio St	54	10.8	12,958	2.28
I-530 Northbound Off-Ramp at US 270/AR 365S (Sheridan Rd)	53	10.6	16,118	1.80
S Hazel St at W 28th Ave	52	10.4	19,162	1.49
AR 365 (Dollarway Rd) at N Hutchinson St	47	9.4	17,131	1.50

Source: ARDOT, 2020; NSI, 2020

2.8 Roadway Security

> While safety and security are closely related, they are differentiated by the cause of the harm from which the transportation system and its users are being protected.

Safety encompasses the prevention of unintentional harm to system users or their property. This includes vehicular crashes, train derailments, slope failures, sudden destruction of roadways, or non-motorized user injuries. Security involves the prevention, management, and response to intentional harm to the transportation system or its users. This includes:

- theft or dismemberment of elements of the transportation infrastructure,
- assault on users of the system, or
- large-scale attacks intended to completely disrupt the movement of people and goods.

Security concerns can also include natural disasters, acts of violence, and terrorism.

2.8.1 MPO Role in Security

The MPO's main role in planning for security is to coordinate with relevant agencies, such as

- emergency management officials
- police and sheriff's departments
- fire departments
- other first responders

MPOs can take certain measures to improve security prevention, protection, response, and recovery.

2.8.2 Prevention

When discussing security, prevention refers to efforts to limit access to resources that may be compromised or efforts to increase surveillance. Examples of prevention measures include:

- access control systems
- closed circuit television (CCTV) systems
- security alarms
- fencing
- locks
- architectural barriers

The design of facilities and public spaces can also incorporate features that deter security breaches.

2.8.3 Protection

High vulnerability risk facilities should have additional design measures considered. These measures would mitigate potential security risks, should they occur. Protection efforts could also include law enforcement where necessary.

2.8.4 Response

Redundancy of transportation facilities should be encouraged in capital project planning. This assists in emergency evacuations or detours should a particular segment of the transportation network become unavailable. The use of Intelligent Transportation Systems (ITS) to control traffic signals and other controls also assists in responding to security risks.

2.8.6 Recovery

Transportation decision-makers should be familiar with both short-term and long-term recovery plans for the MPA. This includes everything from evacuations to restoring local businesses and neighborhoods. Jefferson County, where the MPA is located, has its own emergency management body and hazard mitigation plans. More information can be found at:

https://www.jeffersoncountyar.gov/office-of-emergency-management

2.8.7 Key Security Participants

As stated previously, the MPO coordinates with relevant agencies and is in a support role when security issues arise. The MPO can serve as a medium of communication between the various agencies involved. Several key participants to the security management process have been identified below.

State and Local Governments

The state agency responsible for security in the region is the Arkansas Division of Emergency Management (ADEM). ADEM provides assistance with:

- response,
- recovery,
- grants,
- funding,
- training,
- and more.

Information on the ADEM's emergency services can be found at:

https://www.adem.arkansas.gov/response

Arkansas Emergency Management Association (AEMA)

An additional partner for emergency management in the state is AEMA. AEMA defines its mission as:

> "The Arkansas Emergency Management Association is dedicated to reducing the risk of loss of life and property by promoting professional development and networking through federal, state, local agencies, private industries and volunteer organizations while advocating the emergency management mission."

More information can be found at the AEMA website, https://arkansas-ema.org/

University of Arkansas at Pine Bluff (UAPB)

The University maintains a Crisis Handbook related to safety and security on campus. The handbook allow the University to react to several types of emergencies, including major storms, tornadoes, flooding, and more.

The UPAB Crisis Handbook can be found at:

http://www.uapb.edu/sites/www/Uploads/University%20Police/UNIVERSITY%20OF%20ARKANSAS%20AT%20PINE%20BLUFF%20Emergency%20Handbook.pdf

2.8.8 Additional MPO Measures

Each MPO is ultimately responsible for crafting a security policy consistent with its goals, state guidance, and the FAST Act. Security must also be considered during the establishment of future MPO goals and the support for MPO funding priorities. The following presents potential areas of focus.

Use of MPO Transportation Model to Assess Evacuation Plans

The TransCAD model developed for this MTP effort can be modified to simulate evacuation events. This can be used to test the effectiveness of existing plans or to improve plans for routing traffic through the MPA.

Use of Area Transit Systems to Support Evacuation Events

The MPO will work with local transit providers to investigate opportunities for the use of transit vehicles to provide for the evacuation of transit dependent populations.

Integration of Intelligent Transportation Systems (ITS) in Evacuation Planning

The MPO supports investment in ITS technologies. The MPO understands the need to study and assess how this technology can be used to assist evacuees in their decision-making and expedite their progress during evacuation events.

2.8.10 Strategic Highway Network (STRAHNET)

The STRAHNET is a portion of the NHS considered vital to the nation's strategic defense. The current STRAHNET is about 61,000 miles long and links military installations with roadways that provide for the mobility of strategic military assets. All Interstate highways, including I-530 within the MPA, are included as part of the STRAHNET. Another route within the MPA, US 65, serves as a STRAHNET route. State route 256 from I-530 to the Arsenal serves as a major STRAHNET connector.

The STRAHNET routes need additional considerations, which include maintenance of bridge capability, pavement conditions, and congestion management. The use of ITS along these corridors, particularly dynamic message signs, will allow for better management of the traffic related to military convoys.

3 Freight

3.1 Introduction

The movement of freight throughout the MPA affects both the regional and national economy. The region is a major generator of freight, as well as a distribution and processing center for many goods. It is home to many freight facilities including Class I railroads and major highways.

3.2 Supporting Plans and Goals

3.2.1 National Freight Goals

The current transportation legislation if the Fixing America's Surface Transportation Act (FAST Act). Per 49 U.S.C. 70101 (b) of the FAST Act, there are ten (10) National Multimodal Freight Policy Goals[2], which are to:

1. Identify infrastructure improvements, policies, and operational innovations that –
    a. Strengthen the contribution of the National Multimodal Freight Network to the economic competitiveness of the United States.
    b. Reduce congestion and eliminate bottlenecks on the National Multimodal Freight Network.
    c. Increase productivity, particularly for domestic industries and businesses that create high-value jobs.
2. Improve the safety, security, efficiency, and resiliency of multimodal freight transportation.
3. Achieve and maintain a state of good repair on the National Multimodal Freight Network.
4. Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Multimodal Freight Network.
5. Improve the economic efficiency and productivity of the National Multimodal Freight Network.
6. Improve the reliability of freight transportation.
7. Improve the short- and long-distance movement of goods that –
    a. Travel across rural areas between population centers.
    b. Travel between rural areas and population centers.
    c. Travel from the Nation's ports, airports, and gateways to the National Multimodal Freight Network.

[2] https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title49-section70101&num=0&edition=prelim

8. Improve the flexibility of States to support multi-State corridor planning and the creation of multi-State organizations to increase the ability of States to address multimodal freight connectivity.
9. Reduce the adverse environmental impacts of freight movement on the National Multimodal Freight Network.
10. Pursue the goals described in this subsection in a manner that is not burdensome to State and local governments.

The *Arkansas State Freight Plan*[3] describes how the State of Arkansas supports the National Multimodal Freight Policy goals.

3.2.2 Arkansas Freight Goals

The ArDOT statewide comprehensive freight plan is the *Arkansas State Freight* Plan[3]. This document establishes the freight planning and performance monitoring activities to be undertaken throughout the state by ArDOT. The state freight plan goals and objectives are:

- Safety and Security
- Improve statewide safety by funding projects that reduce total and serious injury crashes, reduce vulnerability, and improve resiliency of the system
- Economic Competitiveness
- Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness
- Infrastructure Condition
- Invest in existing infrastructure to maintain and preserve the existing system
- Congestion Reduction, Mobility, and System Reliability
- Invest in the mutimodal transprotation system to improve mobility, connectivity, accessibility, and reliability for people and goods.

The freight objectives are multimodal in nature and include components that are relevant for trucking, rail, waterways, air cargo, and pipelines. The objectives also incorporate elements that are key to terminal operators such as inland ports, along with freight facility operators such as distribution centers and manufacturing establishments.

[3] https://www.arkansashighways.com/Trans_Plan_Policy/freight_plan/ArkansasStateFreightPlan_20171204.pdf

3.2.3 MPO Freight Goals

Freight goals for the Pine Bluff MTP are currently in development. These goals, once established, will support the national goals outline above, those of the *Arkansas State Freight Plan*, and the LRTP Goals and Objectives.

3.3 Existing Freight Conditions

3.3.1 Freight Truck Network

Inventory

The MPA contains several roadways that serve freight. The MPA has one Interstate highway (I-530), and one intermodal connector (Port of Pine Bluff). However, these facilities are not designated as part of the National Primary Freight Network (NPFN).[4] However, I-530 is part of the National Multimodal Freight Network (NMFN).[5]

The highways on the Arkansas State Freight Network (ASFN) are divided into four (4) tiers, as shown in Figure 3.1. The base highway freight network includes all highways in the Arkansas Primary Highway Network (APHN).

[4] https://ops.fhwa.dot.gov/freight/infrastructure/ismt/state_maps/states/arkansas.htm
[5] https://www.transportation.gov/sites/dot.gov/files/docs/State_interimMFN_landscape_Arkansas_alt_text.pdf

Figure 3.1: ASFN Highway Freight Network Tiers

Tier 1
- Interstate Highways
- Non-interstate freight highway designated by FHWA
- Intermodal connectors designated by FHWA

Tier 2
- Future Interstate Highways and other future freeways
- Rural principal arterials with greater than 25% truck traffic
- Rural highways serving 850 or more trucks per day
- Urban highways serving 500 or more trucks per day
- Highway son the Four-Lane Grid System
- Other intermodal connectors

Tier 3
- Highways providing redundancy to Interstates and other freeways
- Highways serving 250 or more trucks per day

Tier 4
- Remaining highways on the APHN

The roadways that are designated as freight corridors in the Arkansas State Highway Freight Network are shown in Table 3.1.[6]

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6 https://www.arkansashighways.com/Trans_Plan_Policy/freight_plan/ArkStateFreightPlan_ExecSum%20with%20state%20map.pdf

Table 3.1: ASFN Highways

Highway	Tier	Limits
I-530	1	US 63/US 65/US 79/US 425 to Northern Study Area Limit
US 63	2	I-530 to Eastern Study Area Limit (Concurrent with US 79)
	3	Southern Study Area Limit to I-530
US 63B	4	I-530 to US 65B
US 65	2	Eastern Study Area Limit to I-530
US 65B	2	I-530 (South) to I-530 (North)
US 79	2	I-530 to Eastern Study Area Limit (Concurrent with US 63)
	3	Southern Study Area Limit to I-530
US 79B	3	I-530 to Eastern Study Area Limit
US 270	2	Western Study Area Limit to I-530
US 425	3	Southern Study Area Limit to I-530/US 63/US 65/US 79
AR 54	4	Lee Springs Rd to US 79
AR 190	4	US 79B to I-530/US 63/US 65/US 79/US 425
AR 256	3	I-530 to AR 365
AR 365	3	US 65B/US 79B to Northern Study Area Limit
AR 365S	3	AR 365 to I-530/US 270
AR 530	2	Southern Study Area Limit to I-530

Table 3.2 displays the intermodal freight facilities that serve freight trucks. The MPA also contains several trucking establishments which provide local and long-distance trucking services. The intermodal facilities and major trucking establishments in the MPA are shown in Figure 3.2.

Table 3.2: Intermodal Freight Facilities for Trucks

Name	Modes Served	City
Global Material Services	Rail and truck	Pine Bluff
Tastybird Foods	Rail and truck	Pine Bluff

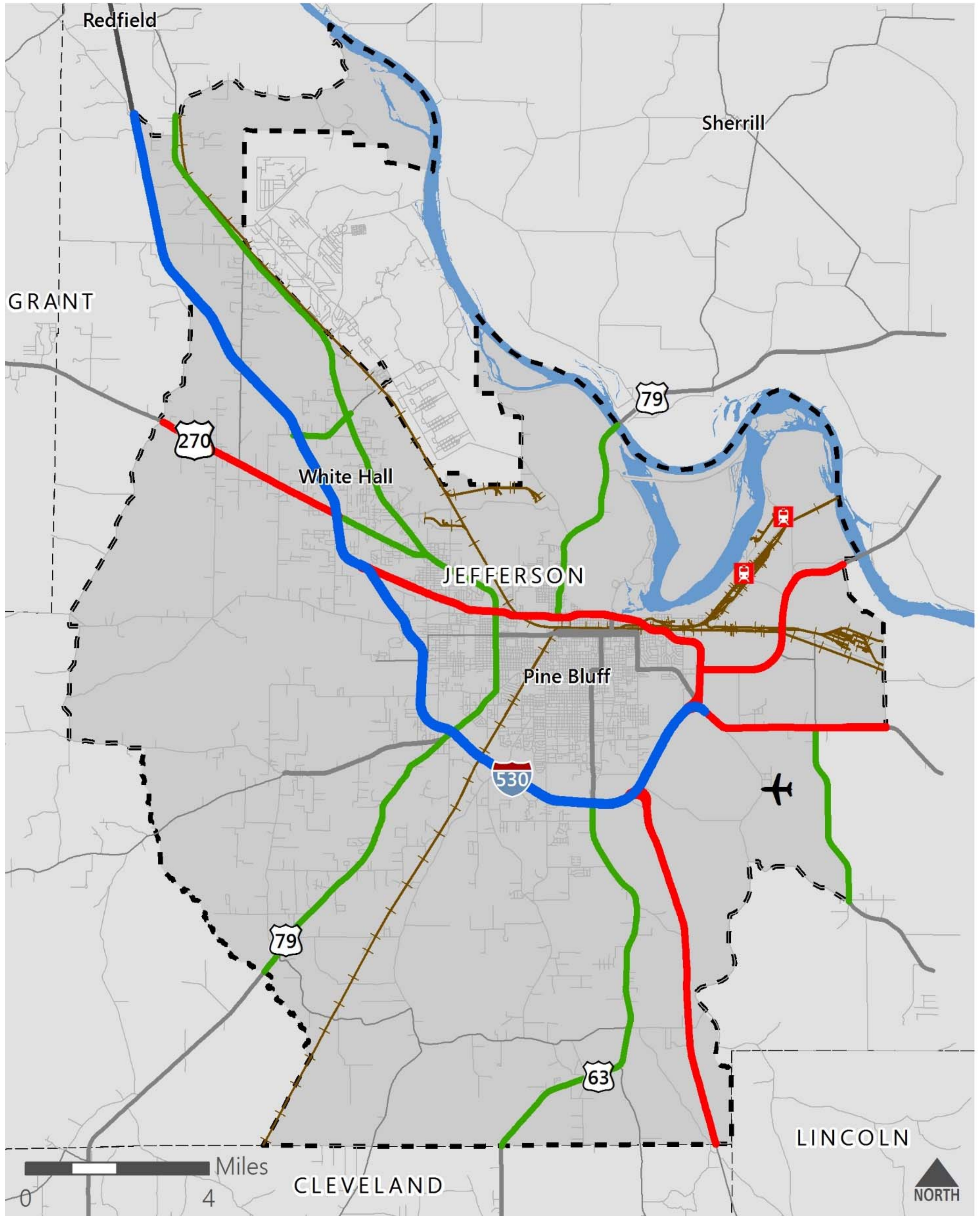
Source: Bureau of Transportation Statistics, 2019 National Transportation Atlas

The daily truck volumes for the MPA's roadways, developed from the Travel Demand Model, for the year 2019 are shown in Figure 3.3. The results indicate that the roadways with the highest truck traffic within the MPA are on:

- I-530 between US 65B (Martha Mitchell Expwy) and Stagecoach Rd
- US 65 between I-530 and US 425
- US 270 between I-530 and Jefferson Pkwy

Figure 3.2: Freight Truck Network and Facilities

Metropolitan Planning Area



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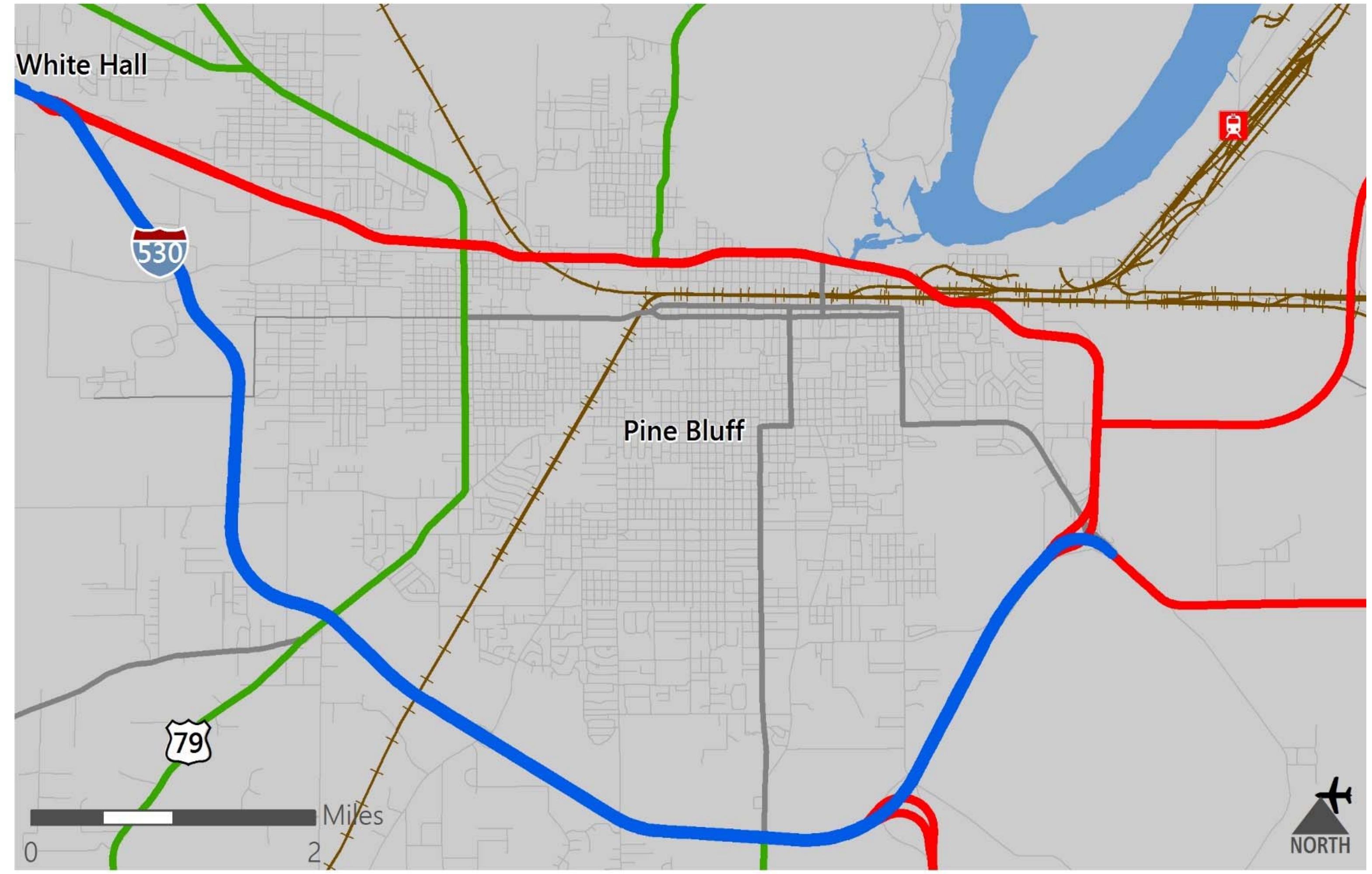


Legend

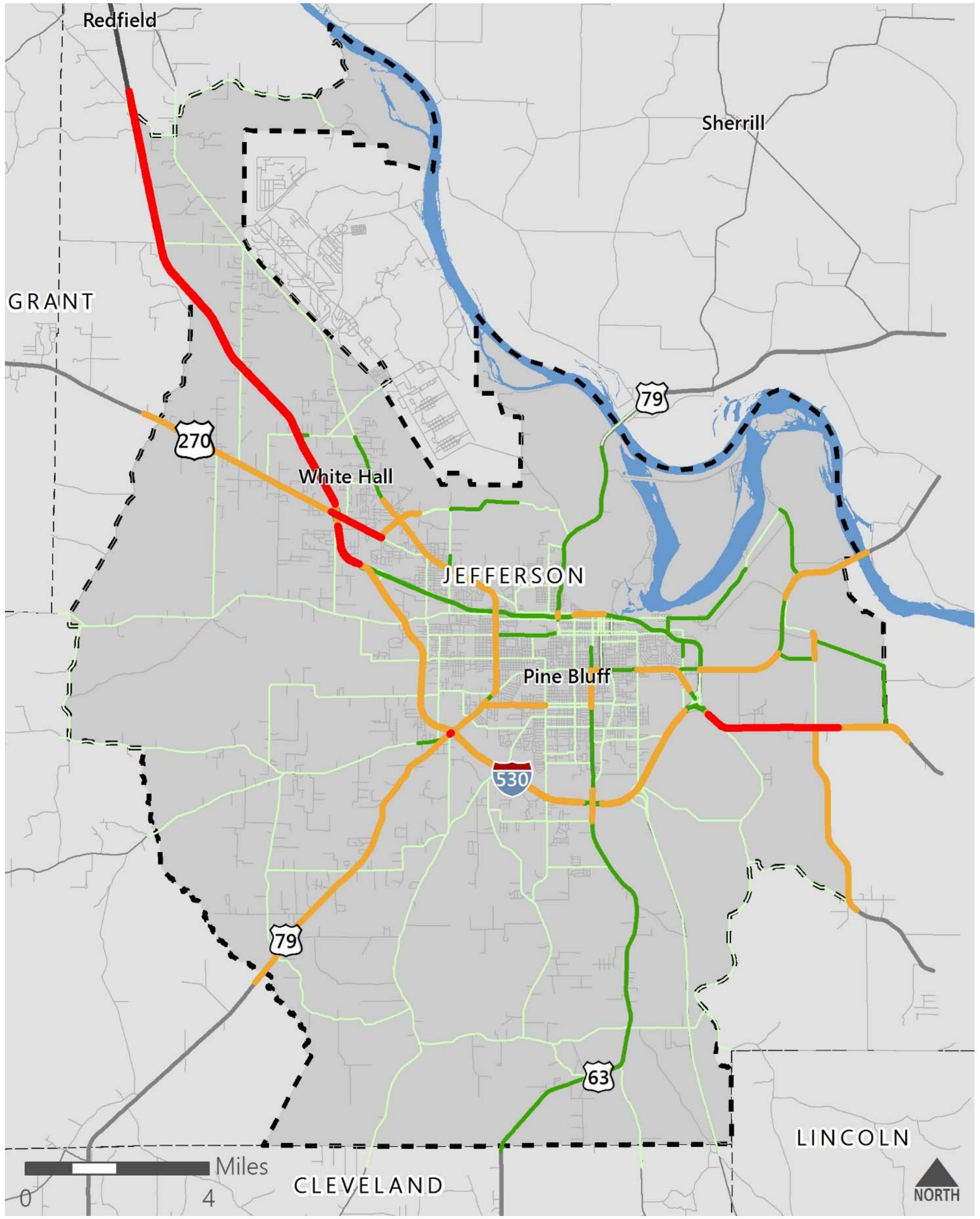
- Tier 1 Hwy Corridor (ASFN)
- Tier 2 Hwy Corridor (ASFN)
- Tier 3 Hwy Corridor (ASFN)
- Tier 4 Hwy Corridor (ASFN)
- Railroad
- Rail/Truck Intermodal Facility
- General Aviation Airport
- Planning Area

Data Sources: 2019 National Transportation Atlas; USDOT; ArDOT

Disclaimer: This map is for planning purposes only.

Figure 3.3: Freight Truck Traffic, 2019

Metropolitan Planning Area



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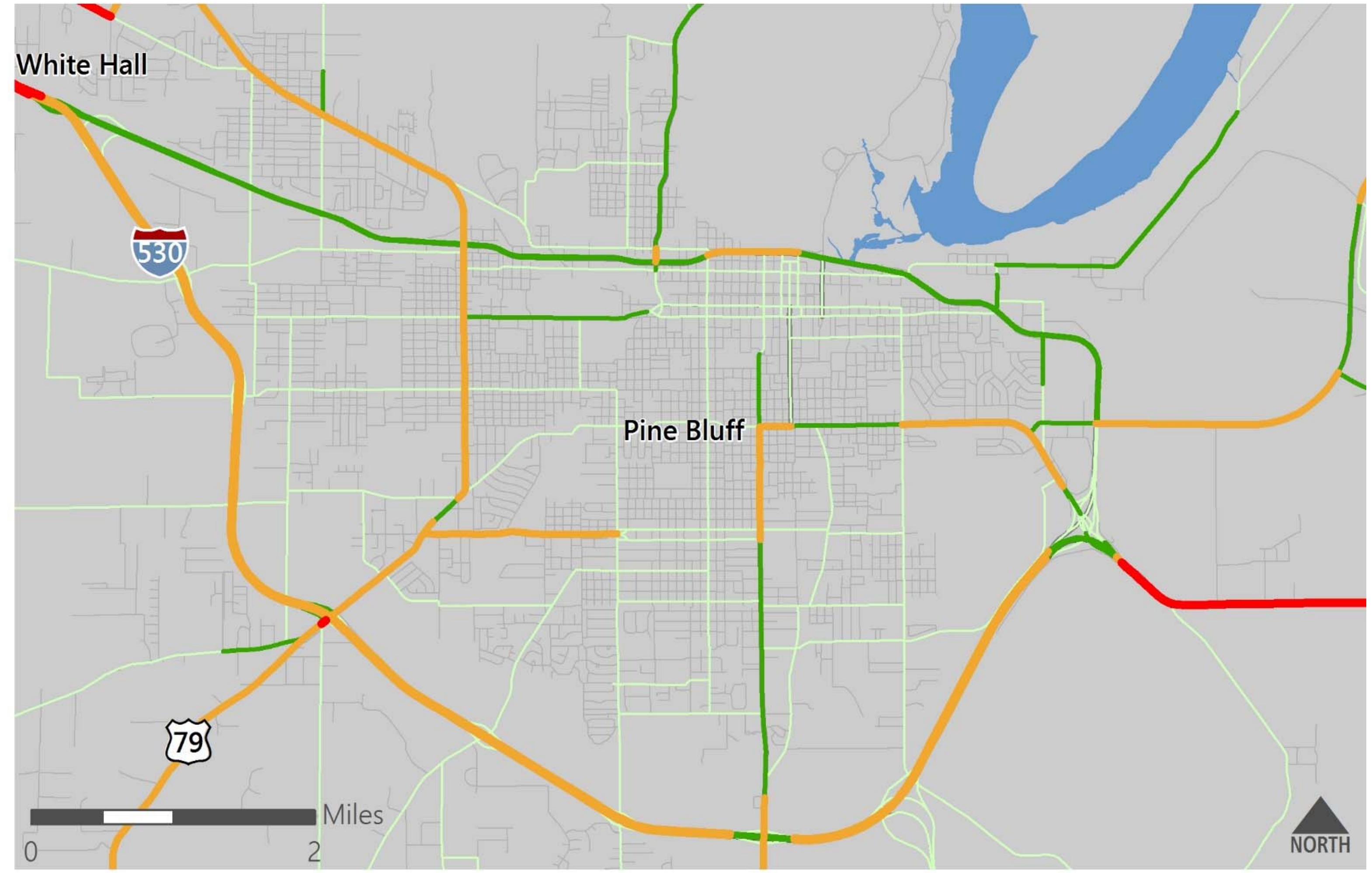


Legend

Estimated Average Daily Trucks

- 0 - 250
- 251 - 500
- 501 - 1,000
- > 1,000
- Planning Area

Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Commodity Flows

Due to the Pine Bluff MPA's size, the FHWA's Freight Analysis Framework (FAF) commodity flow data is not available for the region. However, we can glean some information from the State of Arkansas commodity flows. While the amount of actual commodities being moved through an area likely vary considerably throughout the state, the means of transporting freight is more uniform.

Table 3.3 shows that, in Arkansas, the truck mode accounts for nearly 67 percent of all freight tonnage originating in Arkansas.

Table 3.3: Means of Transporting Freight Originating in Arkansas, 2018

Mode	Thousand Tons	Percent
Truck	156,749	66.6%
Pipeline	52,456	22.3%
Rail	15,420	6.5%
Multiple modes & mail	9,811	4.2%
Water	993	0.4%
Other and unknown	42	<0.1%
Air (includes truck-air)	14	<0.1%
All modes	235,483	100.0%

Source: Freight Analysis Framework 4

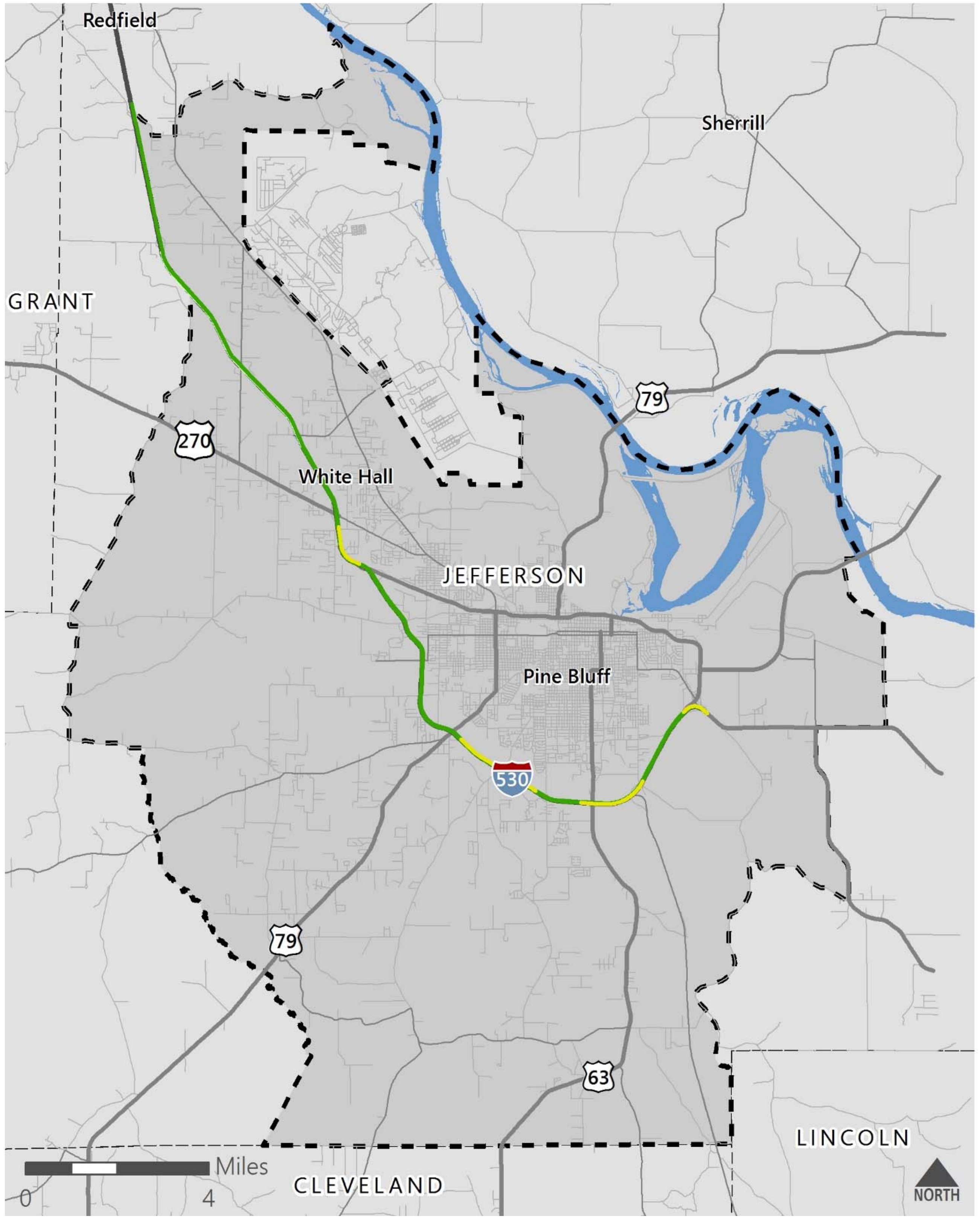
Truck Travel Time Reliability

The FHWA has established a freight performance measure to capture truck travel time reliability on the MPA's Interstate highway system: the Truck Travel Time Reliability (TTTR) index.[7] The 2019 TTTR on each I-530 segment is shown in Figure 3.4. The state's freight performance measures, and the MPO's progress towards them, are discussed in the MPO's Performance Report.

[7] https://www.fhwa.dot.gov/tpm/rule/pm3/freight.pdf

Figure 3.4: Truck Travel Time Reliability, 2019

Metropolitan Planning Area



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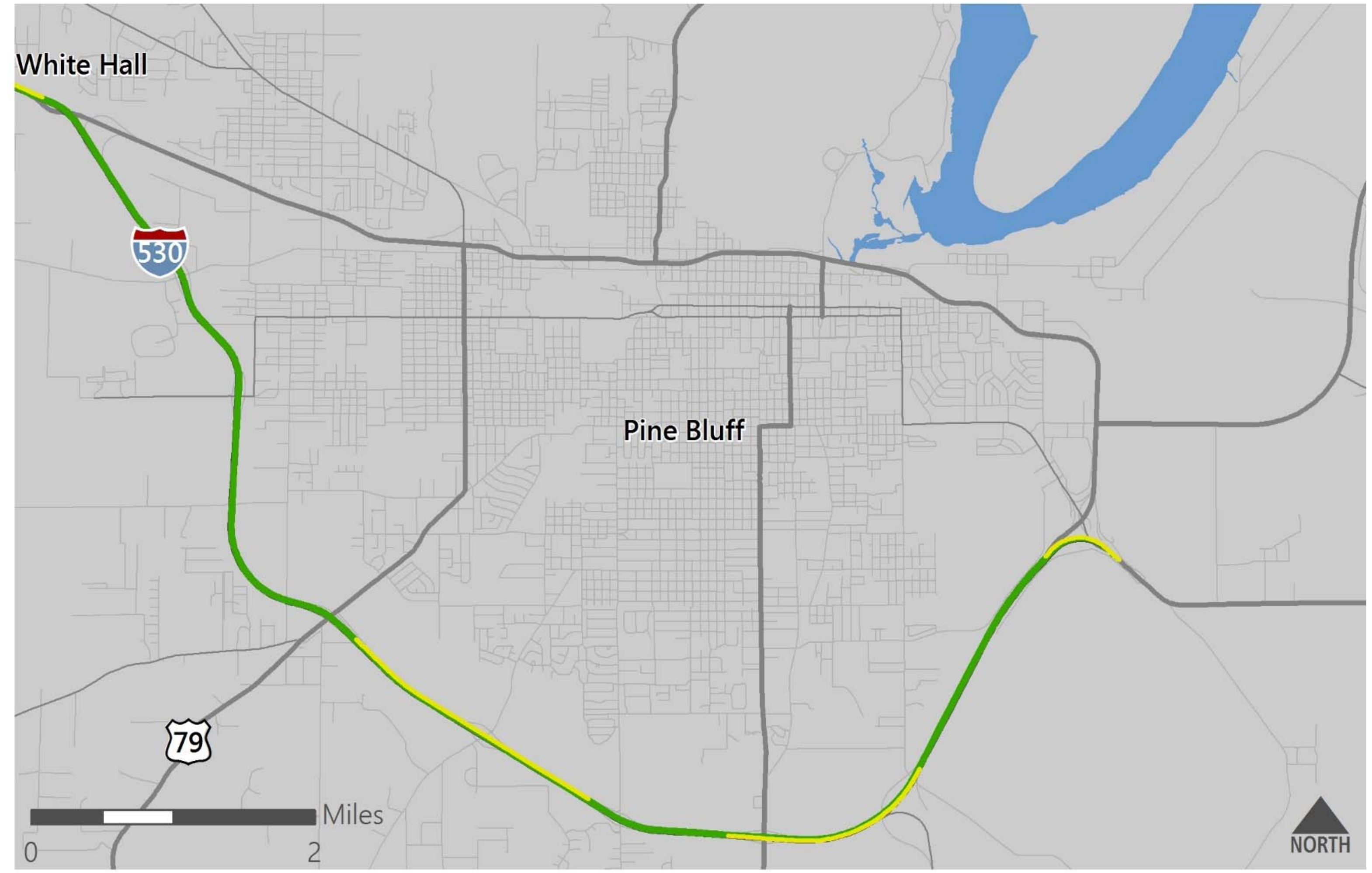


Legend

TTTR

- 1.00 - 1.10
- 1.11 - 1.20
- 1.21 - 1.29
- Planning Area

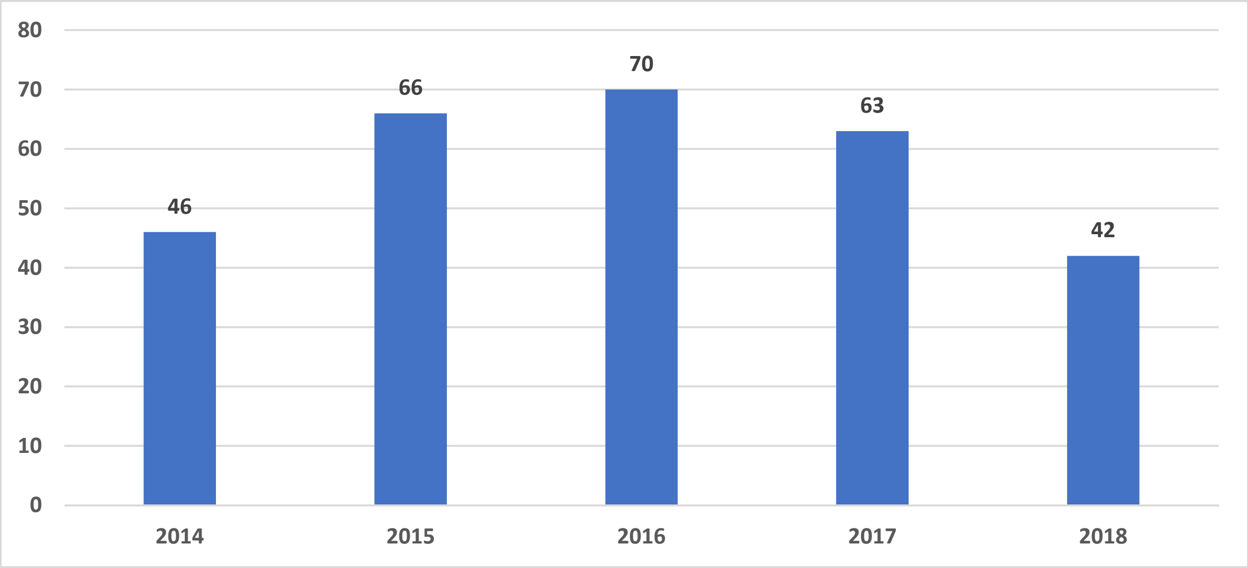
Data Sources: NPMRDS

Disclaimer: This map is for planning purposes only.

<u>Safety</u>

Crashes involving heavy vehicles were analyzed using crash records from 2014 to 2018 obtained from ArDOT. A total of 287 crashes involving heavy vehicles occurred within the Pine Bluff MPA during the five-year study period. Figure 3.5 shows the number of heavy vehicle crashes during the study period.

Figure 3.5: Heavy Vehicle Crashes by Year, 2014 – 2018



Source: ArDOT, 2020; NSI, 2020

Between 2014 and 2018, fatal crashes involving heavy vehicles comprised 0.7 percent of heavy vehicle crashes. However, five (5) percent of all fatal crashes in the study area involved a heavy vehicle.

Since heavy vehicles represented less than four (4) percent of the total crashes, regardless of severity, during the study period, many locations experienced either none or a small number of heavy vehicle crashes. These intersections in the MPA experienced more than five heavy vehicle crashes between 2014 and 2018:

- US 65 at US 425
- US 270 (Sheridan Rd) at AR 104
- US 65B (Martha Mitchell Expwy) at US 63/US 79/Market St

These roadway segments in the MPA experienced at least five heavy vehicle crashes between 2014 and 2018:

- US 65 between 0.36 miles east of Green Meadows Dr and US 425
- I-530 between AR 190 (W 13th St) and Princeton Pike
- I-530 between US 65B (Martha Mitchell Expwy) and US270 (Sheridan Rd)
- US 65 between AR 980 (Grider Field Rd) and Hankins Rd
- I-530 between US 63/US 63B and AR 530
- I-530 between Old Warren Rd and US 79/US 79B (S Camden Rd)

3.3.2 Freight Rail Network

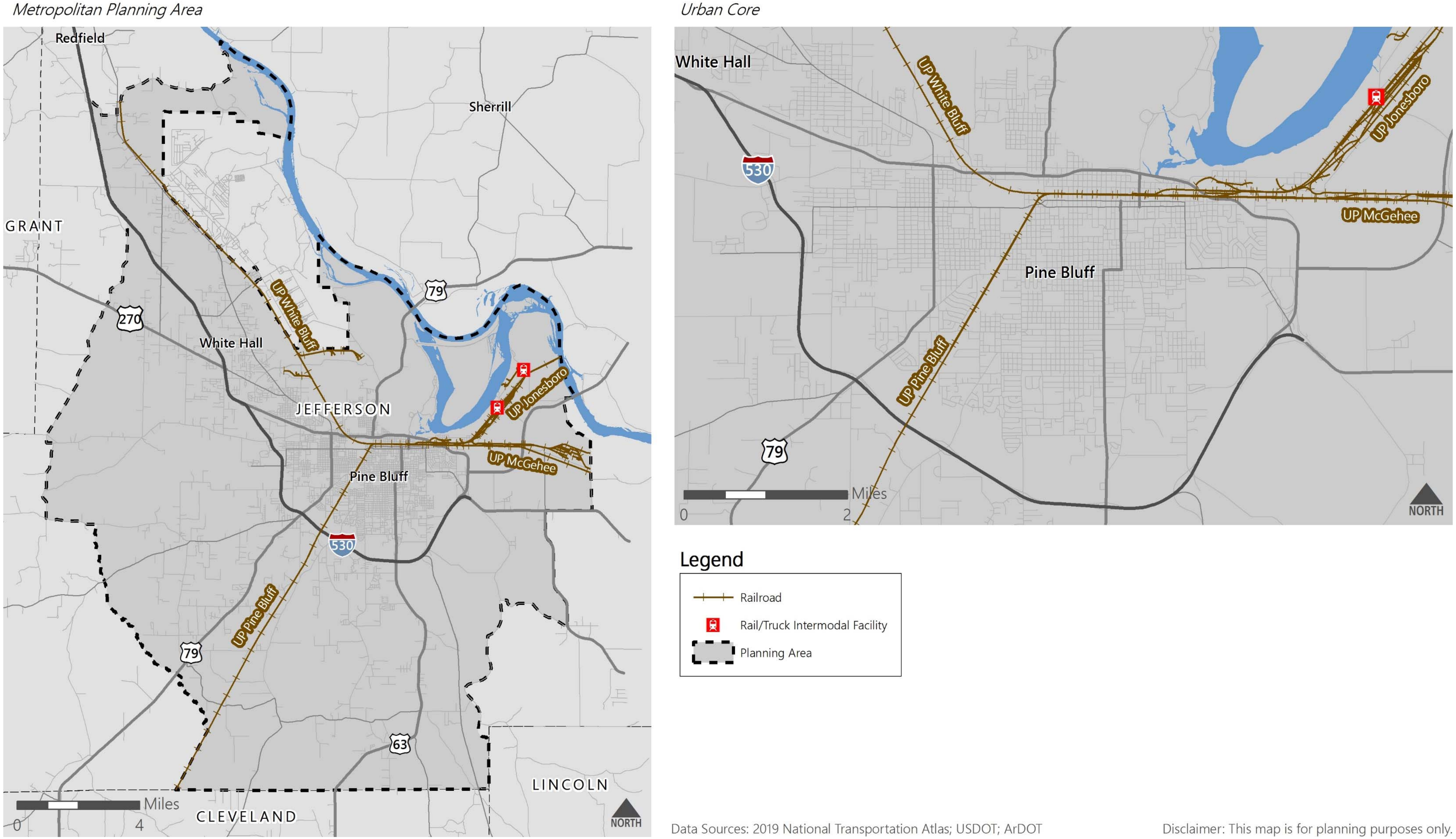
Inventory

The MPA has approximately 42 miles of railroads. There are two Class I railroads in the MPA, both of which are primary routes of the Union Pacific (UP) Railroad. There are four UP subdivisions which serve the MPA, including:

- Jonesboro Subdivision, connecting Pine Bluff northeast to Jonesboro, Arkansas; mostly parallels US 79.
- McGehee Subdivision, connecting Pine Bluff southeast to McGehee, Arkansas; mostly parallels US 65.
- Pine Bluff Subdivision, connecting Pine Bluff southwest to Texarkana, Arkansas; mostly parallels US 79.
- White Bluff Subdivision, connecting Pine Bluff northwest to Little Rock, Arkansas; mostly parallels US 65.

The NPFN does not include railroads. However, the railroads in the MPA are part of the NMFN. The two (2) intermodal terminal facilities listed in Table 3.2 also serve freight rail. Figure 3.6 displays the MPA's railroads and the intermodal terminal facilities.

Figure 3.6: Freight Rail Network and Facilities



Data Sources: 2019 National Transportation Atlas; USDOT; ArDOT

Disclaimer: This map is for planning purposes only.

Volumes

The average number of trains per day on the MPA's railroads, according to the most recent *Arkansas State Freight Plan*[8], are shown in Table 3.4.

Table 3.4: Average Trains per Day on MPA Railroads

Railroad Subdivision	Average Trains per Day
UP Jonesboro	31 – 40
UP McGehee	11 – 20
UP Pine Bluff	21 – 30
UP White Bluff	21 – 30

Source: Arkansas State Freight Plan

Commodity Flows

As shown in Table 3.3, approximately 6.5 percent of freight tonnage that originated in Arkansas in 2018 was transported by rail.

Rail-Automobile Collisions

Between 2014 and 2018, there were two (2) crashes involving an automobile and a train. One (1) crash resulted in possible injuries, and one (1) crash resulted in no apparent injuries. Both crashes occurred on the UP railroad northwest of Pine Bluff.

Train Incidents

According to the Federal Rail Administration (FRA), between 2015 and 2019, there were 31 reported train incidents in the MPA. Incidents include collisions, derailments, and other events involving the operation of on-track equipment and causing reported damage above an established threshold. Table 3.5 summarizes the train incidents in the MPA. All train incidents were in or near the city of Pine Bluff.

[8] https://www.arkansashighways.com/Trans_Plan_Policy/freight_plan/ArkansasStateFreightPlan_20171204.pdf

Table 3.5: Train Incidents

Date	Incident Type	Primary Cause	Severity
January 5, 2015	Side collision	Failure to comply with restricted speed	No Injuries
October 10, 2015	Derailment	Roadbed settled or soft	No Injuries
November 10, 2015	Derailment	Worn flange	No Injuries
December 11, 2015	Derailment	Other rail and joint bar defects	No Injuries
January 19, 2017	Derailment	Broken, missing, or otherwise defective springs	No Injuries
July 1, 2017	Derailment	Passed couplers	No Injuries
July 8, 2017	Obstruction	Broken or defective container	No Injuries
September 30, 2017	Other impacts	Cars left foul	No Injuries
October 5, 2017	Derailment	Broken Rail - Vertical split head	No Injuries
October 10, 2017	Derailment	Rigging down or dragging	No Injuries
October 11, 2017	Derailment	Object or equipment on or fouling track	No Injuries
October 25, 2017	Derailment	Broken Rail - Transverse/compound fissure	No Injuries
December 13, 2017	Raking collision	Switch improperly lined	No Injuries
February 8, 2018	Derailment	Broken Rail - Head and web separation	No Injuries
February 26, 2018	Derailment	Switch improperly lined	No Injuries
March 2, 2018	Other impacts	Classification yard automatic control system retarder failure	No Injuries
March 3, 2018	Other impacts	Shoving movement	No Injuries
April 15, 2018	Derailment	Broken Rail - Vertical split head	No Injuries
May 7, 2018	Other impacts	Shoving movement	No Injuries
May 26, 2018	Other impacts	Human Factor - track	One (1) injury
September 5, 2018	Derailment	Broken Rail - Head and web separation	No Injuries
October 6, 2018	Derailment	Independent (engine) brake, improper use	No Injuries
December 10, 2018	Obstruction	Load shifted	No Injuries
March 5, 2019	Obstruction	Object or equipment on or fouling track	No Injuries
March 9, 2019	Derailment	Rigging down or dragging	No Injuries
March 12, 2019	Other impacts	Shoving movement	No Injuries
April 11, 2019	Other impacts	Switch improperly lined	No Injuries
April 21, 2019	Other impacts	Shoving movement	No Injuries
May 12, 2019	Derailment	Switch previously run through	No Injuries

June 22, 2019	Derailment	Side sill broken	No Injuries
December 10, 2019	Other	Investigation complete, cause could not be determined	No Injuries

Source: Federal Rail Administration

Railroad Crossings and Crossing Control Devices

To avoid collisions, warning/control devices are required at highway-railroad grade crossings. Warning devices are either passive or active. Passive devices include crossbucks, yield or stop signs, and pavement markings. Active devices include flashing lights, bells, and gates, in addition to most passive warning devices. Table 3.6 shows the breakdown of the MPA's public at-grade highway-railroad crossings.

Table 3.6: MPA Public At-Grade Highway-Railroad Crossings

Crossing Type	Number
Active (Flashing lights and gates)	27
Active (Flashing lights, no gates)	5
Passive (Crossbucks and Stop/Yield Signs Only)	12
Total	44

Source: Federal Rail Administration

3.3.3 Air Cargo

Inventory

Historically, only a small amount of freight is typically shipped by air. However, the commodities transported this way tend to be high-value and time sensitive. Also, airports tend to serve as distribution and manufacturing hubs.

There is one (1) public airport in the MPA: Pine Bluff Regional Airport (Grider Field), which serves general aviation. The nearest airport with commercial service is Clinton National Airport in Little Rock, Arkansas.

The total number of aircraft based at Grider Field and the aircraft operations are shown in Table 3.7.[9]

[9] https://www.airportiq5010.com/5010ReportRouter/PBF.pdf

Table 3.7: Based Aircraft and Aircraft Operations at Grider Field

Based Aircraft	Aircraft Operations	Operations for 12 months ending
34	8,900	June 30, 2015

Source: Federal Air Administration

Commodity Flows

There is no cargo data information available for Grider Field.

3.3.4 Waterway Network

Inventory

The major waterway in the MPA is the Arkansas River, which is part of the McClellan-Kerr Arkansas River Navigation System (MKARNS). The MKARNS provides navigation from the Mississippi River in the east to Catoosa, Oklahoma in the west. The USDOT Marine Administration (MARAD) has recently designated the MKARNS as Marine Highway 40 (M-40). The MKARNS is also part of the NMFN.

There is one (1) port facility in the MPA, the Port of Pine Bluff, located on a natural slackwater harbor just off the MKARNS main channel. The port is located in the 372-acre Harbor Industrial District, which includes seven industries, a Corps of Engineers marine terminal, and a U.S. Coast Guard station. Additionally, a 20-acre public terminal owned by the Pine Bluff-Jefferson County Port Authority and operated by Watco Terminal and Port Services offers barge transloading, warehousing, and bulk storage.

Highways that serve the port include US 65B and US 79B, both of which connect to I-530. Rail service is provided by UP Railroad.

Commodity Flows

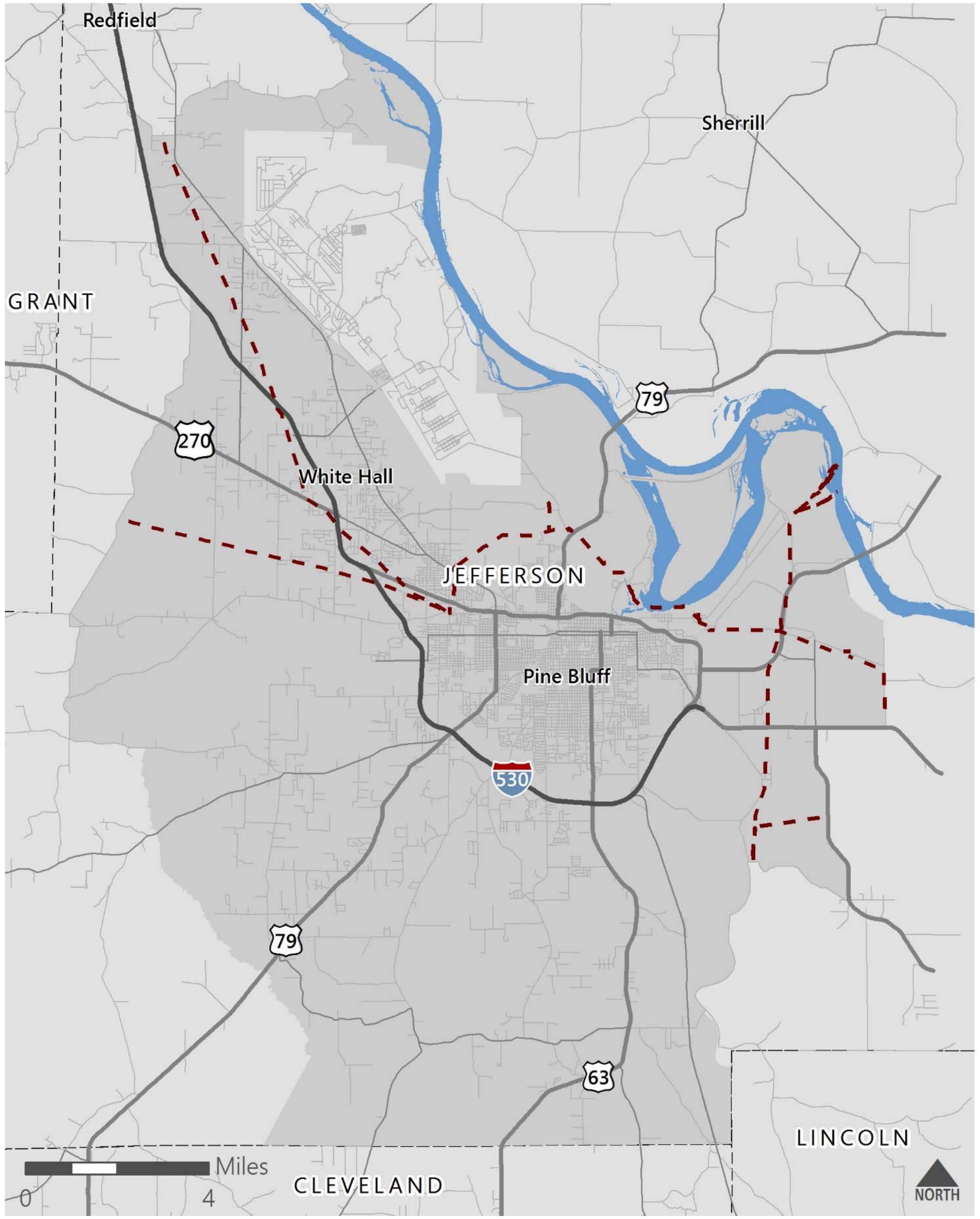
According to the U.S. Army Corps of Engineers (USACE) Waterborne Statistics, approximately 11.2 million tons moved on the Arkansas River within the MPA in 2018.

3.3.5 Pipeline Network

The MPA's pipeline network consists of approximately 64 miles of natural gas pipelines as of 2019. Figure 3.7 shows the MPA's pipeline network.

Figure 3.7: 2019 MPA Pipeline Network

Metropolitan Planning Area



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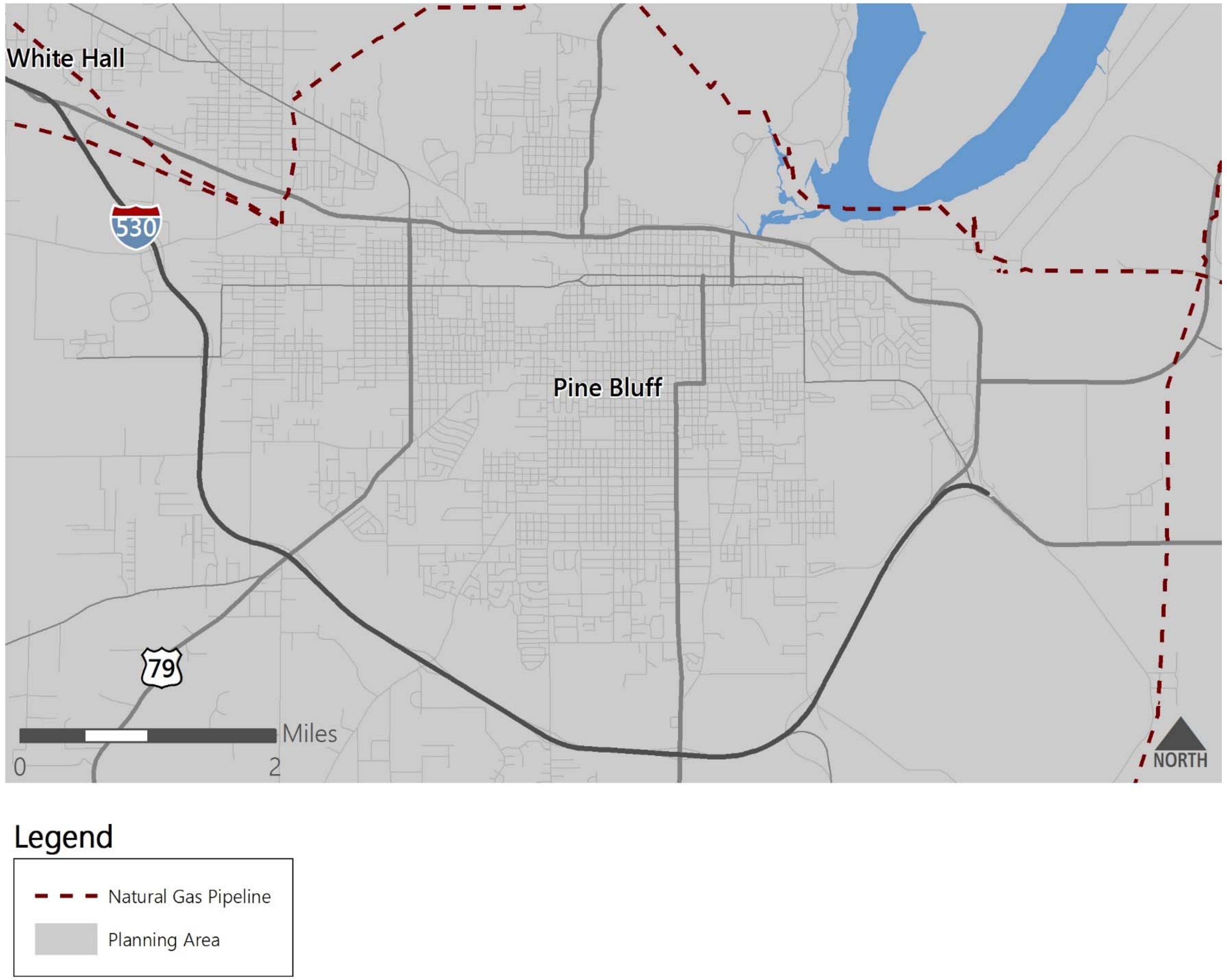


Data Sources: Energy Information Administration

Disclaimer: This map is for planning purposes only.

4 Bicycle and Pedestrian

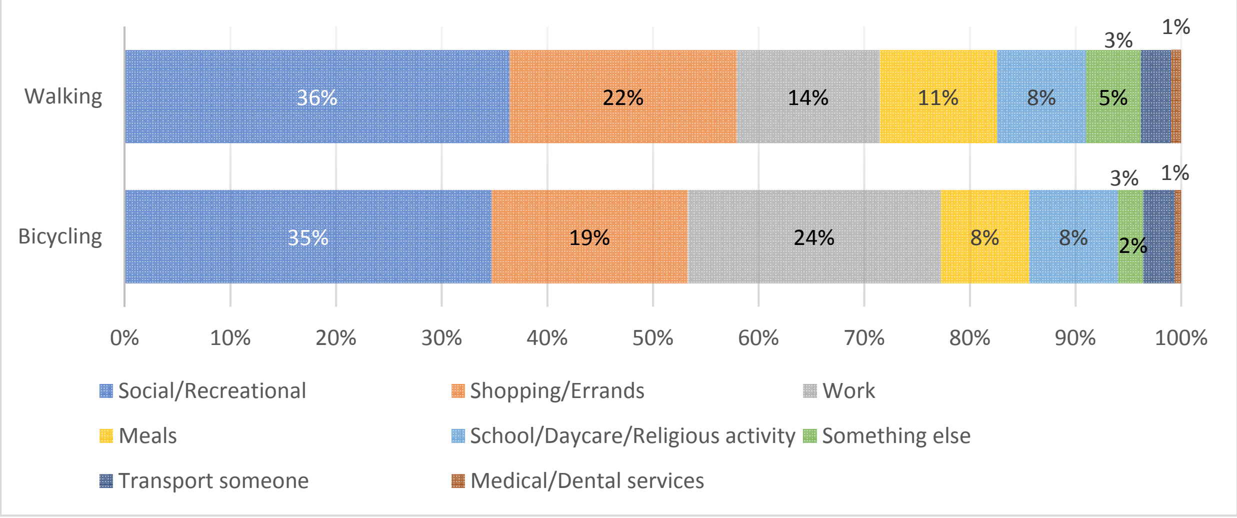
4.1 Introduction

Bicycle and pedestrian conditions are often discussed together as modes of active transportation. However, the two modes greatly differ in their trip purposes and the demographic who walks versus bikes. The 2017 National Household Travel Survey (NHTS) found that walking accounts for only eleven (11) percent of all household trips in small urbanized areas like Pine Bluff, compared to just one (1) percent for bicycling. Pedestrian trips are not only more common, but they are invaluable to those who do not drive and physically cannot or choose not to bicycle.

The predominant trip purpose for both walking and bicycling is social/recreational. Walking has a higher percentage of trips than bicycling for shopping/errands or meals. Bicycling is more frequently utilized for commuting to work, followed by shopping/errands. Over the past few years bicycling has become more utilitarian in small urbanized areas; the percent of bike trips to work increased from 13 percent in 2009 to 24 percent in 2017.

It is important to note that these household travel patterns represent urbanized areas on average, and they may not reflect the Pine Bluff urbanized area.

Figure 4.1: Walking and Bicycling Trip Purposes in Small Metro Areas, 2017



Note: Small Metro Area = under 250,000 residents
Source: National Household Travel Survey, 2017

Walking and bicycling are key transportation options, providing affordable transportation alternatives to many Americans. While Americans have always walked and ridden bikes, creating safe and accessible places for walking and cycling has not always been a priority. The last two to three decades have seen communities make purposeful efforts to plan and install high-quality pedestrian and bicycle facilities. There are four reasons that cities, counties, and states are now focusing on this type of infrastructure:

- safety,
- equity,
- health, and
- economics.

4.1.1 Safety Benefits

According to the Pedestrian and Bicycle Information Center, a joint effort of the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA), pedestrian and bicyclist fatalities from crashes with motor vehicles increased by 32 percent in the ten-year period between 2008 and 2017.[10] This contrasts with traffic fatalities, which decreased over the same period.

It is also important to note that crash data involving pedestrians and bicyclists is incomplete and inconsistent. There is also no official record of bicycle and pedestrian injuries such as how fatalities are tracked by FARS. The lack of good data and the fact that many of these types of crashes are under-reported means that the problem of pedestrian and bicycle safety is substantial.

In order to reduce and eventually eliminate traffic deaths and major injuries, many communities are moving to incorporate Vision Zero policies. These multi-pronged policies use education, enforcement, engineering, and emergency response to change the built environment and influence behavior.

[10] Pedestrian and Bicycle Information Center: http://www.pedbikeinfo.org/factsfigures/facts_safety.cfm

4.1.2 Equity Benefits

Designing communities and transportation systems for cars excludes citizens who do not have regular access to personal vehicles. Vulnerable populations typically own fewer vehicles and have longer commutes. This group includes:

- low-income households,
- minorities,
- children,
- persons with disabilities, and
- older adults.

Essential services and employment can be out of reach for a signification portion of our vulnerable population. Sometimes, transportation alternatives such as walking and bicycling are the only available and affordable transportation choices.

4.1.3 Health Benefits

It is well known that the number of overweight and obese Americans has reached epidemic proportions. The Department of Health and Human Services documents that two-thirds of adults and nearly one in three children are overweight or obese.[11] The downstream effects of this epidemic are reflected in the record numbers of chronic illnesses of diabetes and heart disease. These chronic illnesses dramatically affect both the cost of health care and quality of life.

Along with prevention and medical treatment, regular physical activity is a critical part of the nation's recovery from the obesity epidemic. Making physical activity easy and safe plays a key role in successful strategies to fight obesity.

[11] National Center for Health Statistics:
https://www.cdc.gov/nchs/data/hestat/obesity_adult_13_14/obesity_adult_13_14.pdf
https://www.cdc.gov/nchs/data/hestat/obesity_child_13_14/obesity_child_13_14.pdf

4.1.4 Economic Benefits

Nationwide, research shows that walkability and bikeability contribute to a community's economic prosperity. According to the National Association of Realtors and American Strategies, sixty percent of people polled in 2017 said they would pay more to live in a walkable community.[12]

4.2 Existing Bicycle and Pedestrian Facilities

4.2.1 Sidewalk Facility Coverage

Most of the MPA lacks sidewalks. However, the older areas of Pine Bluff, mostly downtown, have sidewalks. Many of the downtown sidewalks are cracked, in disrepair, and are not compliant with ADA guidelines. Outside of this area, a few subdivisions built prior to the 1970s have sidewalks. AR 365 (Dollarway Dr) in White Hall has sidewalks. Many schools, parks, or municipal buildings have sidewalks and some crosswalks but most of these sidewalks end quickly and are not part of a connected system. Crime, railroads, and busy expressways like US 65B (Martha Mitchell Expwy) create additional obstacles for pedestrians.

Despite the lack of pedestrian infrastructure, the tight urban grid of downtown Pine Bluff is highly amenable to walking. The average block length in downtown is 300 feet, which is often ideal for walking. The street grid also fosters walking with 226 intersections per square mile.[13] Although the sidewalks may be in disrepair, it is easier to repair sidewalks than to change urban form.

The University of Arkansas at Pine Bluff has a large network of sidewalks on its campus. Its main campus is blocked off from cars and has several walking paths connecting campus. Work has also been underway to construct a pedestrian mall along Kennedy Drive using Transportation Alternative Program (TAP) funds and to improve sidewalks along US 79B (University Dr).

The region has several walking trails:

- Lake Saracen Walking Trail: This roughly five (5) mile trail circles Lake Saracen.
- Layher Nature Trail/Bayou Bartholomew Trail: This two (2) mile loop begins at Hazel Street just north of I-530.

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[12] National Association of Realtors: https://www.nar.realtor/sites/default/files/documents/2017%20Topline%20Results.pdf

[13] *Re-Live Downtown Pine Bluff: A Manual (2018):* https://s3.amazonaws.com/uacdc/Re-live+Downtown+Pine+Bluff+-+A+Manual.pdf

- Governor Mike Huckabee Delta River Nature Center: There are four (4) trails between .25 and .75 miles.
- White Hall City Park: There is a paved walking trail through the park.

4.2.2 Bicycle Facility Coverage

Currently the MPA lacks bicycle infrastructure. The City of Pine Bluff designated three (3) bicycle routes in the 1970s by marking parking lanes as bike lanes. However, those markings have largely disappeared, and those lanes have been used for parking. Most growth and development have occurred along the edges of the MPA at a lower density less favorable to bicycling. The close-knit urban grid of downtown could be very amenable to bicycling except that there are few destinations, with parking lots being the most prevalent land use downtown. Other areas that have more popular destinations generally have less land to develop or widen or have a more sprawled density.

Bicycle infrastructure involves not just road facilities but also signage, parking, public education, and bike rental and repair shops. Currently there is little bicycle parking in the MPA. For recreational bicycling, the Pine Bluff Recreation Department offers short-term bicycle rental outside Lake Saracen. Additionally, White Hall has a bicycle shop that supports bicycle maintenance and rental.

4.3 Existing Traffic and Usage Patterns

The 2017 National Household Travel Survey (NHTS) estimates that, each day, about 16 percent of the U.S. population make a trip by walking and three (3) percent do so by biking. However, there is great variation from area to area and person to person. Most notably, people in rural households were much more dependent on driving and people in urban households were more likely to walk or bike.

No information on pedestrian or bicycle traffic is available for the Pine Bluff MPA. The distribution of demand will be discussed later, but for purposes of understanding actual usage of pedestrian and bicycle infrastructure, work and school trips are discussed.

4.3.1 Bicycle and Pedestrian Traffic

As shown in Table 4.1, bicycle and pedestrian trips make up less than three (3) percent of work commute trips in the Pine Bluff MPA. While no one reported bicycling to work, bicycling tends to be underreported and most likely a small number of people in the region do commute by bike.

These figures have changed over time, as seen in Figure 4.2. Historically, Pine Bluff had a dense urban core that supported non-auto transportation; however, automobile use increased as technology advanced and growth shifted to outer lying areas of the region. This shift from denser urban living to sprawled suburbs occurred throughout the United States in the second half of the 1900s. The increased distance between destinations made active transportation less attractive and less feasible.

However, Figure 4.3 shows there is substantial variation within the region in the amount of people walking or biking to work. In the neighborhood west of US 63B (S Olive St) and below W 28th Street almost 40 percent of residents walk or bike to work. Around the University of Arkansas at Pine Bluff, between 14 to 23 percent of residents walk or bike to work. Outside of these areas, walking or biking is less common.

Like commuters, students' mode choices have also shifted from active modes to riding the school bus or car. According to a 2011 report from the National Center for Safe Routes to School, the percent of children five to fourteen years that usually walked or bicycled to school dropped from 48 percent in 1969 to 13 percent in 2009. The study also found that from 1969 to 2009, the percent of children in grades K–8 that lived within one mile of school dropped from 41 percent to 31 percent. Distance from school greatly affects mode choice.

The 2017 National Household Travel Survey found that 80.9 percent of students who lived a quarter mile or closer to school walked or biked, while less than one (1) percent of students walked or biked if they lived more than two miles from school. However, Pine Bluff conducted a Safe Routes to School program in mid-2010s and found that many students in the area did not walk or bike because of:

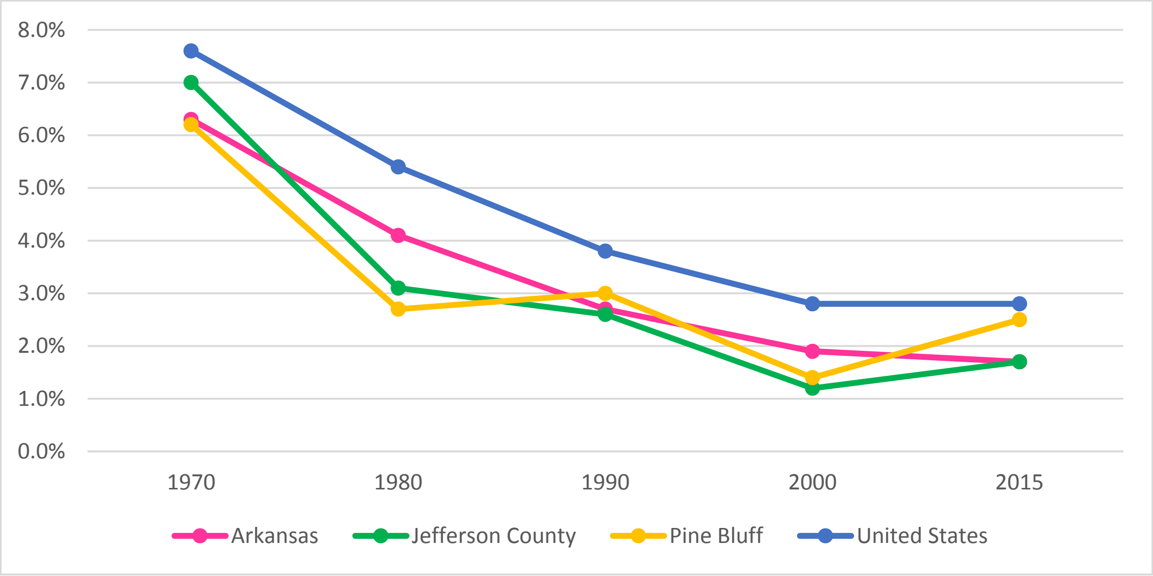
- lack of infrastructure,
- school bus routes cover the city- even for students living less than a mile to school, and
- crime and lack of police presence.

Table 4.1: Commute Mode Share (Percent of Workers Age 16 and Older), 2013-2017

Mode	United States	Arkansas	MPA	Pine Bluff
Drove Alone	76.4%	82.9%	86.4%	86.9%
Carpooled	9.2%	10.5%	7.3%	5.0%
Rode Transit	5.1%	0.4%	0.2%	0.3%
Walked	2.7%	1.7%	1.8%	2.5%
Bicycled	0.6%	0.2%	0.0%	0.0%
Other	6.0%	4.3%	4.3%	5.3%

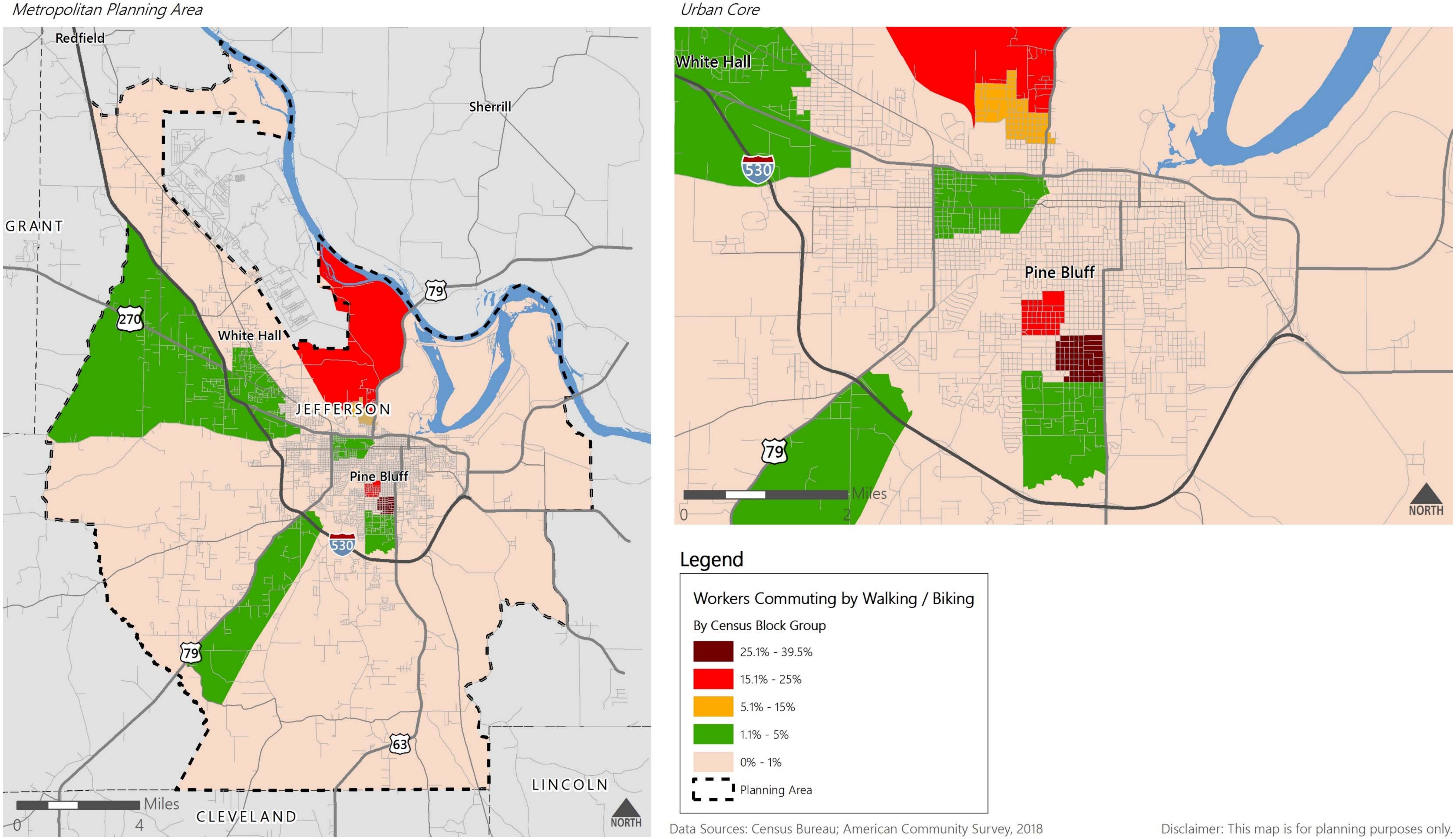
Source: American Community Survey 2013-2017

Figure 4.2: Percentage of Commuters Walking to Work, 1970-present



Source: National Household Geographic Information Systems; American Community Survey 2013-2017

Figure 4.3: Commuting by Walking and Biking in the MPA, 2018



Data Sources: Census Bureau; American Community Survey, 2018

Disclaimer: This map is for planning purposes only.

4.3.2 Bike-Sharing and Scooter-Sharing

There are currently no bike-share or scooter-share services in the MPA.

However, in recent years shared mobility options like bike-sharing and scooter-sharing have become commonplace in urban areas throughout the country. These transportation services are provided publicly, privately, or through public-private partnerships and can be either dock-based or dockless. They can also be powered manually or electric.

Today, the markets for these shared mobility options are mostly in urban centers or in major activity centers like universities. Since these services are usually available to users by the minute or hour, they are typically used for relatively short, one-way trips.

Due to the rapid expansion of these services and a lack of associated infrastructure improvements (e.g. bike facilities or scooter lanes), there have been many reported conflicts with drivers and pedestrians. Many cities have banned these services and others have begun introducing regulations and improving infrastructure to mitigate conflicts.

4.4 Regional Bicycle and Pedestrian Demand Analysis

4.4.1 Latent Demand Score Analysis

In order to better understand the existing potential demand for pedestrian and bicycle trips, a latent demand score analysis was conducted that attempts to illustrate potential demand based on characteristics of the built environment, location of major attractors, and demographics.

The demand analysis is the same for pedestrians and bicyclists. The mapping exercise used fine-grained information to assess an area's potential demand for pedestrian or bicycle trips based on a 0-100 scale. Points were awarded based on the factors summarized in Table 4.2.

Table 4.2: Bicycle and Pedestrian Demand Analysis Factors

Factor	Measure	Maximum Points
Land Use	Population, jobs, and students per acre[1]	40
Demographic	Senior (65+) and youth (<18) population per acre	15
	Households with no vehicle available or on-campus housing units[2] per acre	25
Travel Environment	Intersections per square mile[3]	20
	Total Possible Points	100

[1]Includes all students K-12 and university

[2]On-campus housing units calculated by dividing group quarters dorm population by 2.2

[3]Intersections with at least 4 segments are weighted 2x

4.4.2 Findings

Figure 4.4 shows the results of the latent demand score analysis. Again, this exercise reflects relative potential demand, not absolute demand. Simply put, it shows which areas are most likely to have high or low demand relative to all other areas within the MPA. It does not attempt to quantify the actual number of bicycle or pedestrian trips occurring in these areas.

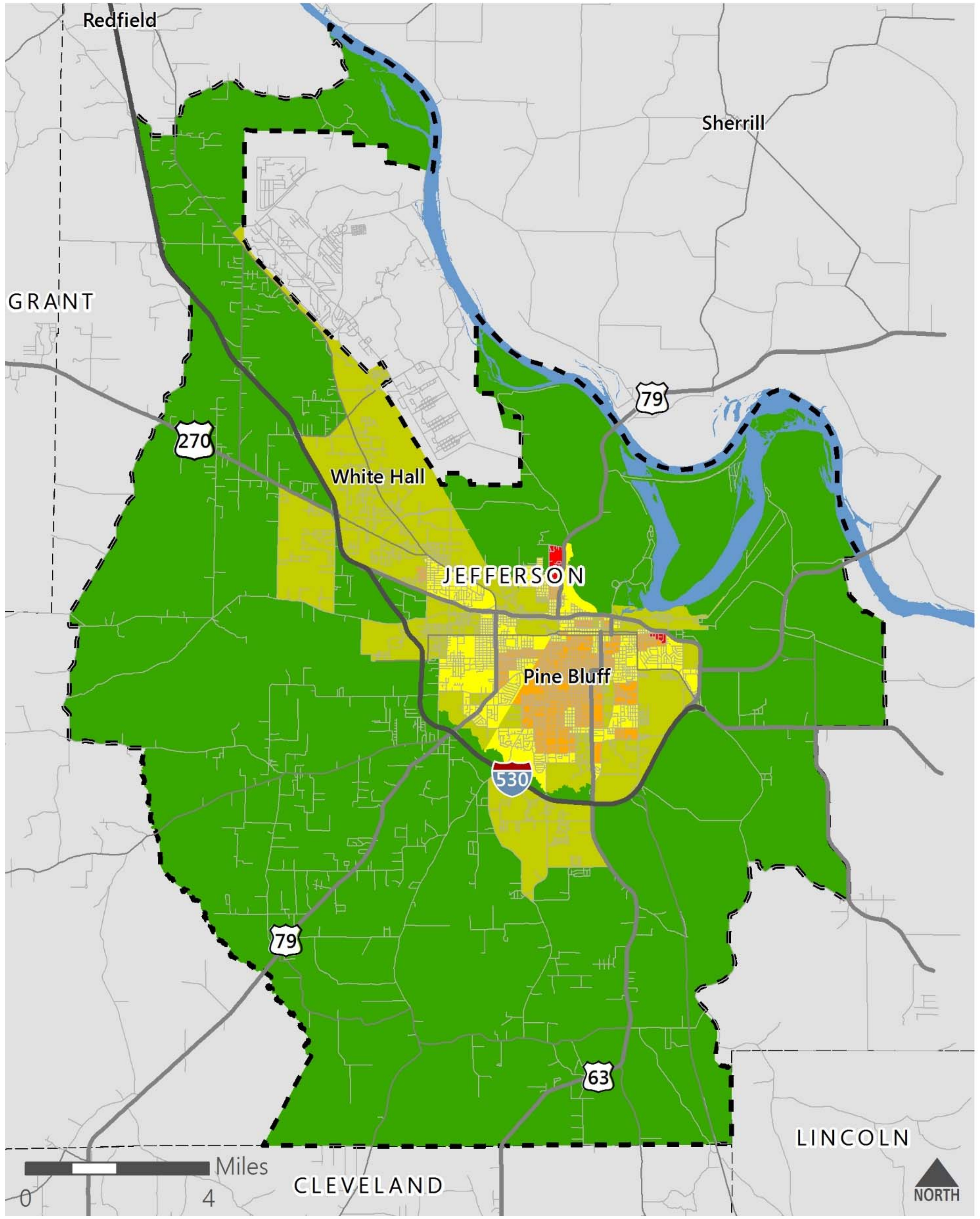
The analysis indicates that most of the downtown core has a high latent demand for walking and biking. Two areas ranked in the top tier of latent demand:

- the University of Arkansas at Pine Bluff and
- the residential neighborhood between E 6th Avenue, E 8th Avenue, S Washington St, and Belmont Drive.

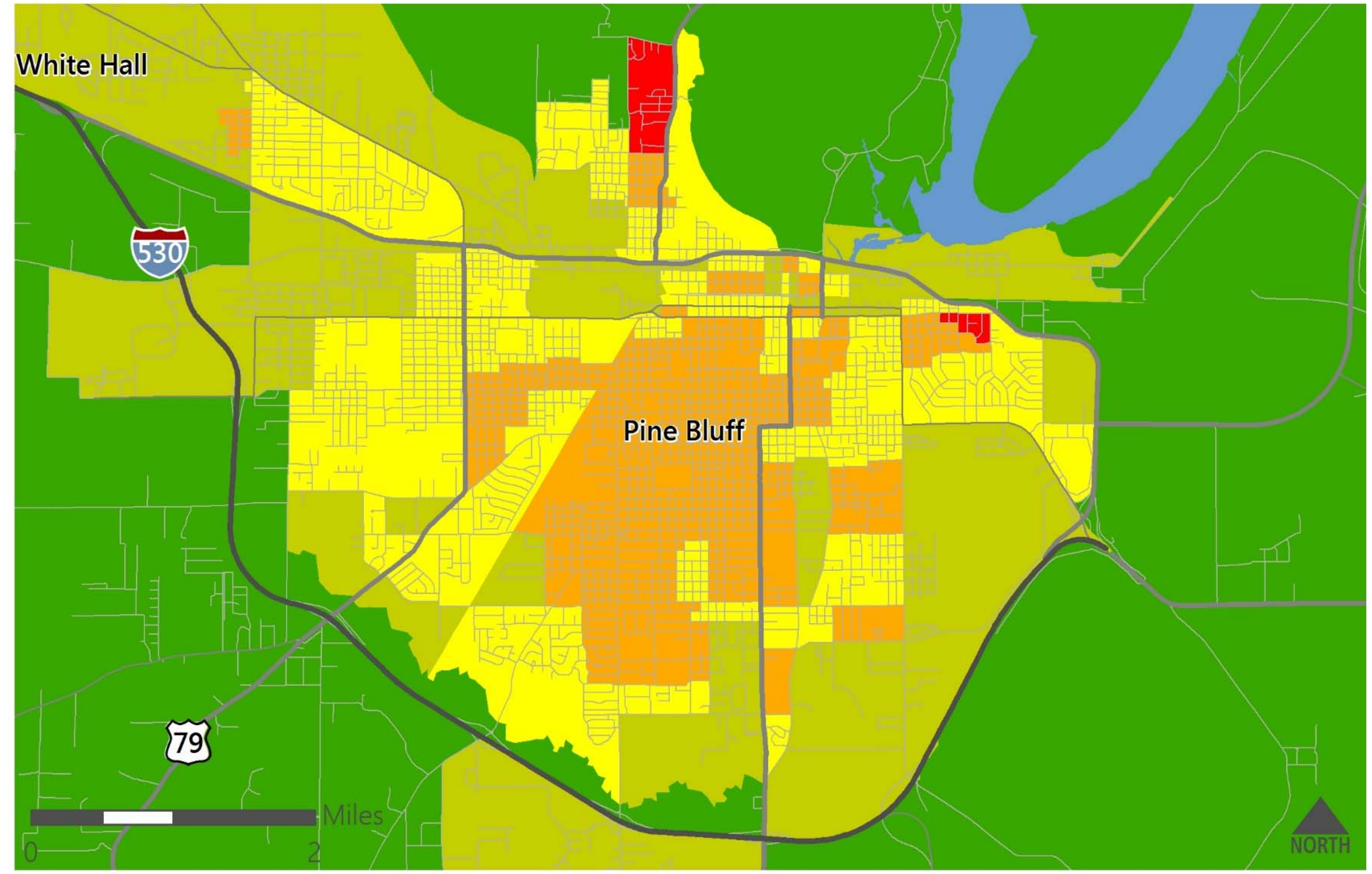
Outside of the downtown core, the residential neighborhood west of N Bryant Street and below Wormack Avenue showed a high level of demand.

Figure 4.4 Bicycle and Pedestrian Demand in the MPA, 2017-2018

Metropolitan Planning Area



Urban Core



Legend

Bike / Ped Demand
- Highest
- High
- Moderate
- Low
- Lowest
- Planning Area

Data Sources: Census Bureau, MPO Staff; Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

4.5 Bicycle and Pedestrian Safety

Collision data can help identify safety issues in the study area. However, vehicular collisions with pedestrians and bicycles are typically under-reported. Research indicates pedestrian collisions may be under-reported to police by as much as 55 percent. Bicycle collisions under-reporting is thought to be even higher.[14]

There are three general categories of issues that contribute to traffic crashes involving bicyclists and pedestrians:

- motorist behavior,
- non-motorist behavior, and
- infrastructure.

Motorist behaviors include speeding, distraction, lack of traffic law awareness, non-compliance with traffic laws, and alcohol or drug impairment.

Non-motorist (i.e., pedestrian and bicyclist) behaviors include lack of traffic law awareness, non-compliance with traffic laws, poor conspicuity, and alcohol or other impairment.

Infrastructure issues include inadequate lighting, signage, crosswalks, or separation between motorists and non-motorists.

The scope of the impact of many these issues can be difficult to quantify. There is some data available. For each reported collision, data is collected for a range of factors. The lighting conditions, location of crash relative to intersections, and severity of injury are documented.

From these data collection efforts, national data indicates pedestrian safety can be improved through discouragement of mid-block crossings and implementation of lighting improvements. In 2017, pedestrians and bicyclists accounted for 18.2 percent of all traffic fatalities nationally. Of these fatalities 75 percent of pedestrian fatalities and 45 percent of bicycle fatalities occurred in dark conditions. Crossing at non-intersections was also a predictor of pedestrian and bicycle fatalities. A majority of pedestrian fatalities, 73 percent, occurred at non-intersections and 58 percent of bicycle fatalities occur at non-intersections. This increased in urban settings where crossing density is higher.

[14] University of North Carolina Highway Research Center. http://www.pedbikeinfo.org/factsfigures/facts_safety.cfm

4.5.1 Bicycle Collision Data

Between 2014 and 2018, 14 bicycle collisions occurred in the MPA. Of the crashes involving bicycles, only 14 percent documented property damage only.

Approximately 71 percent of bicycle collisions occurred at non-intersections, and 64 percent of bicycle collisions occurred in daylight conditions. There were no cyclist fatalities or incapacitating injuries between 2014 and 2018.

0

Bicycle fatalities from 2014 through 2018

4.5.2 Pedestrian Collision Data

12

Pedestrian fatalities from 2014 through 2018

Between 2014 and 2018, 58 pedestrian collisions occurred. There was a fatality or severe injury in 33 percent of the pedestrian-involved crashes. Non-intersection locations accounted for 84 percent of pedestrian-involved collisions, while 43 percent occurred in dark-lit or dark-unlit conditions. Seventy percent of the pedestrian fatalities occurred at non-intersection locations and 90 percent of them occurred in dark-lit or dark-unlit conditions.

4.6 Existing Plans and Initiatives

4.6.1 Statewide Plan

The *Arkansas Bicycle and Pedestrian Transportation Plan* (2017) outlines steps to achieve the state vision of embracing safe bicycling and walking for transportation. The plan also notes that active transportation strengthens physical health, local businesses, and social connections in its communities. The plan sets three goals:

- understand the economic benefits of bicycle and pedestrian-friendly infrastructure,
- develop a statewide Bicycle and Pedestrian Network for both recreation and transportation in municipalities and rural communities, and
- conduct research to guide strategies that would achieve zero pedestrian and bicyclist deaths by 2025.

In 2014 the state project team met with stakeholders in the Pine Bluff area and found that recreational biking and walking is popular in the area, especially around Lake Saracen. This plan identifies US 65 in the southeastern corner of the Pine Bluff area as a Statewide Preliminary Bike Route. Additionally, the plan provides guidance and toolkits for municipalities creating their own bicycle plans.

4.6.2 MPO Plan

The *Metropolitan Transportation Plan 2040* (2015) analyzes the existing condition of bicycling and walking in the MPA and makes the following recommendations for pedestrian improvements:

- Develop sidewalk network for schools in study area, including UAPB and SEARK.
- Install ADA sidewalk improvements along existing sidewalks.
- Inventory downtown sidewalks for repair.
- Address sidewalk needs along commercial and industrial corridors.
- Develop and implement a maintenance program for existing sidewalks.
- Prepare an ordinance requiring sidewalks in new developments.
- Connect the Lake Saracen trail to on-street sidewalks.
- Create safe pedestrian crossings at the railroad by 4^{th} Avenue.

For bicycling, most recommendations encourage bicycling on suitable roads, encourage new construction or reconstruction to meet bicycle standards, and recommend bicycle education for all users of the road. Some specific recommendations include:

- Improve access management along the following corridors to meet bicycle and pedestrian standards: US 63B (S Olive St) north of I-530; AR 365 at White Hall Rd; and Hwy-365B east of I-530.
- Consider bikeways when constructing or reconstructing arterial streets.
- Provide signage for on-street shared roads.
- Increase bicycling by encouraging bike parking, bike registration fees, and safety programs.
- Research the benefits of shared roadways versus striped bike lanes.
- Create a map of roadways suitable for bicycling.

The MPO also produced the *Pine Bluff Area Transportation Study Bicycle Plan* which defines and illustrates different options for bicycle infrastructure and maps designated future bicycle routes.

4.6.3 City of Pine Bluff Plans

Go Forward Pine Bluff (2017) is a strategic plan to improve economic development, education, government, infrastructure, and quality of life in Pine Bluff. Many action steps in this plan involve revitalizing downtown spaces. For example, the plan suggests forming a land bank to acquire abandoned properties to bring them back into active uses. Investments in downtown are amenable to biking and walking because they improve street infrastructure and create denser hub of destinations. Some steps mentioned in this plan related to pedestrians involve:

- Put in new sidewalks and streetlights on the 600-800 Block of Main Street for a proposed Innovation Hub.
- Establish a Downtown Historical District that features a walkable area of cultural and historic destinations.
- Implement mixed-use zoning downtown that fosters retail businesses and residential living in one space. Mixed-use neighborhoods can decrease distances travelled and increase biking and walking.

Some action steps related to biking/walking involve creating:

- a biking/trail system linking Regional Park, Saracen Landing, and proposed Downtown District,
- biking paths through Downtown,
- walking/biking path around Central Park that connects to SEARK, and
- foot bridge over US 65B (Martha Mitchell Expwy).

Re-Live Downtown Pine Bluff A Manual (2018) focuses on one key component of *Go Forward Pine Bluff*: investing in downtown to increase residential and commercial activity. The plan's main goal of increasing density and activity supports active transportation. The plan notes that in 2018 the downtown has 0.75 dwelling units per acre, compared to when the streetcar thrived and there were seven (7) dwelling units per acre. The plan provides a design guide and policies to foster a denser and livelier downtown. It recommends complete streets that serve all modes and infill development of walkable neighborhoods.

The plan proposes the following bicycle and pedestrian improvements:

- bike path parallel to the riverfront,
- pedestrian bridge over US 65B (Martha Mitchell Expwy) along Pine Street,
- bike path along Pine Street,

- bike path along 2nd Avenue,
- bike path along 6th Avenue,
- retrofit State Street as a pedestrian-oriented "slow street",
- ArtWalk (parallel to 4th Avenue) at Main Street,
- 35-foot sidewalk along 8th Avenue for dining and socializing,
- Barraque Street and Pine Street Bridge and Plaza (pedestrian tables),
- 2nd Avenue and Pine Street Theater Row Streetscape improvements,
- shared street along 2nd Avenue and State Street,
- 4th Avenue and Pine Street railroad crossing, and
- 6th Avenue and Pine Street intersection improvements.

The plan also recommends that the city:

- abandons Level-of-Service as the way to evaluate successful roads, except for US 65B (Martha Mitchell Expwy), and to set downtown auto speeds to 20mph,
- converts one-way streets back to two-way,
- plants street trees, and
- retrofits downtown streets to accommodate a connected bicycle lane network.

Pine Bluff Urban Renewal Agency Central City Urban Renewal Plan (2018) was written to reduce blight downtown and to activate unused space. The plan proposes to create an Urban Renewal Area, to survey blight, and to cooperate with several community partners to reactivate vacant spaces.

In order to improve walkability the plan proposes to:

- support the downtown streetscape project planned from US 65B (Martha Mitchell Expwy) to 8th Street, referred to as Primary Pedestrian Corridor,
- enhance existing street crossing at Walnut Street that will connect Lake Saracen to Primary Pedestrian Corridor,
- support development of a pedestrian bridge to and from Lake Saracen,
- repair sidewalks and curbing on 4th Avenue between State Street and Walnut Street, and
- repair sidewalks and curbing on 3rd Avenue between State Street and Walnut Street.

City of Pine Bluff Safe Routes to School (N.d.) plans ways to make walking and biking to and from school safe and sustainable. The program has since been discontinued, but its ideas for improving interest and safe use of biking and walking through programming and signage are still relevant.

4.6.4 University of Arkansas at Pine Bluff (UAPB) Plans

The purpose of the *Campus Master Plan (2015)* is to recommend facility and infrastructure projects that support the University's strategic plan. To improve pedestrian safety the plan recommends a boulevard concept for University Drive that includes new sidewalks, a landscaped median, street trees, light poles, and banners.

UAPB also received Transportation Alternative Program (TAP) funds for a pedestrian mall along John Kennedy Drive.

5 Public Transit

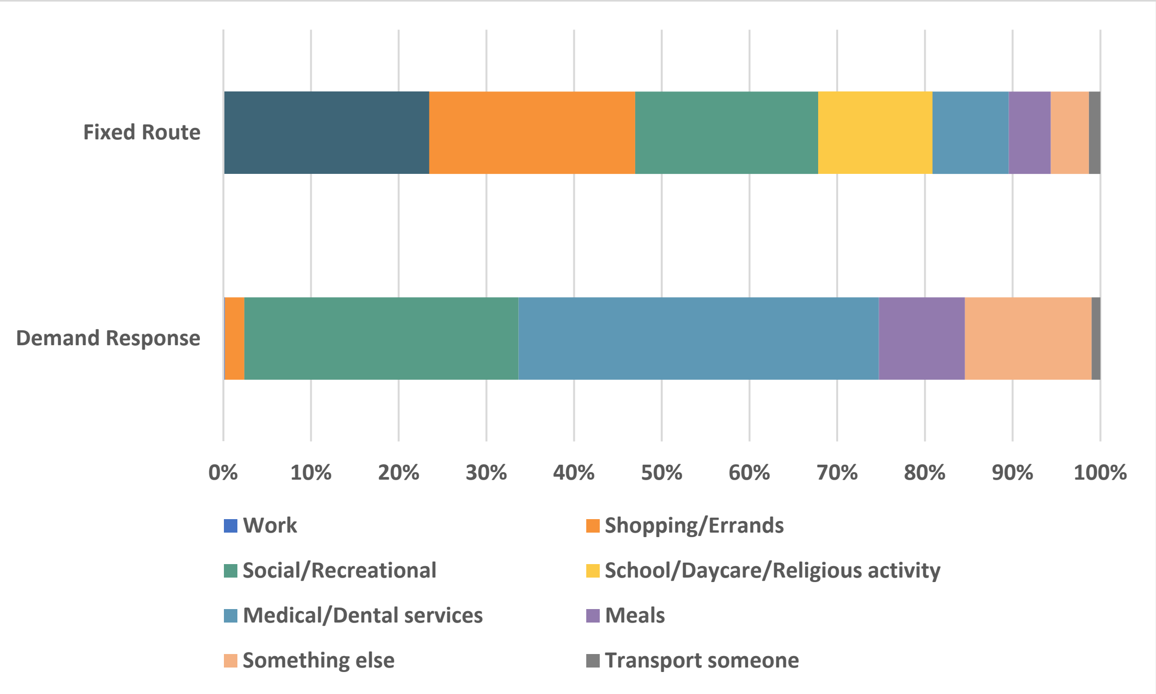
5.1 Introduction

Public transit provides people with access to the places they need to go- work, school, grocery stores, medical facilities, and other destinations. For those that have no other choice, either because of economic or physical limitations, it is a lifeline service. For others, it reduces the burden of transportation costs and serves as a convenient alternative to driving.

Public transit can significantly benefit not just its riders but the entire community by increasing local business access to skilled workers, reducing congestion and emissions, reducing urban sprawl, and fostering walkable communities. However, in small metropolitan areas like the Pine Bluff area, public transit accounts for only 2.5 percent of all trips according to the 2017 National Household Travel Survey.

For those that do use public transit in these areas, trip purposes greatly vary. People riding fixed routes are primarily traveling for work, shopping, or social/recreational purposes. This contrasts with people riding demand route services who are travelling mostly for medical or social/recreational purposes. Ultimately though, trip purposes will depend on the availability of service.

Figure 5.1: Trip Purposes for Transit Riders in Small Metro Areas, 2017



Note: Small Metro Area = under 250,000 residents
Source: 2017 National Household Travel Survey

5.2 City of Pine Bluff Transit (PBT)

Seven transit providers operate in the Pine Bluff MPA. Pine Bluff Transit (PBT) provides fixed and demand route services in the City of Pine Bluff. Several other agencies, most non-profits, utilize federal funding to support low-income, disabled, and elderly populations.

5.2.1 Services Provided

The PBT system operates eight (8) fixed routes Monday through Friday, from 6:00 a.m. to 6:00 p.m. During peak hour the service operates four (4) buses. The routes operate as a hub-and-spoke system, all beginning and ending in downtown Pine Bluff around S Main Street and W 2nd Avenue and extending outwards within the city. Full fare is $1.00, with special prices of $0.80 for students and $.50 for seniors and disabled passengers. Transfers are $.10 for full and student fare. Pine Bluff Transit also has two (2) demand response vehicles providing paratransit service for $2.00. Both the fixed and demand route service areas cover 80 percent of the City of Pine Bluff. Funding for PBT comes from the FTA 5307 category. Table 5.1 shows the frequency of PBT fixed routes and Figure 5.2 shows the current fixed bus routes operated by PBT.

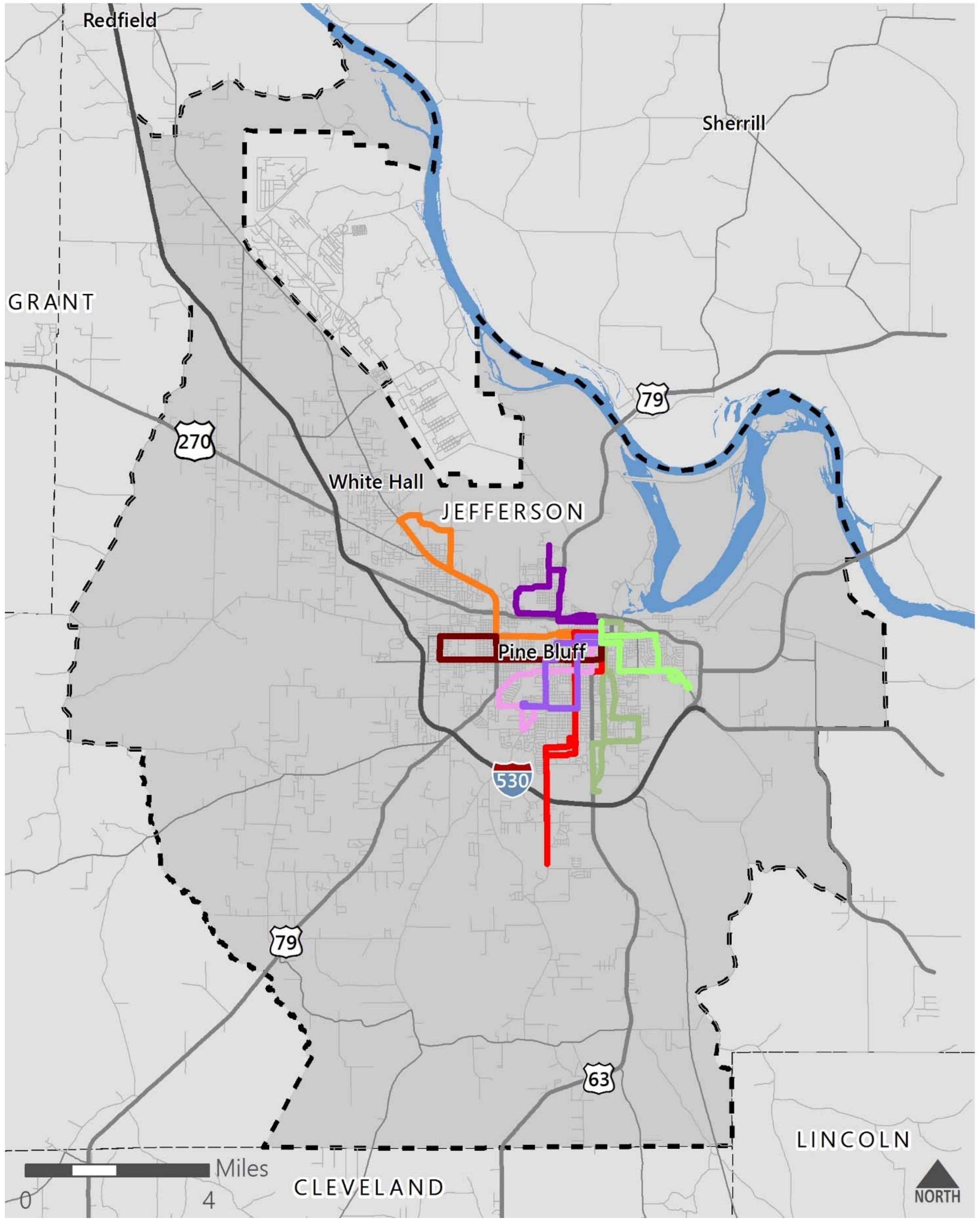
Table 5.1: PBT Fixed Bus Routes and Frequencies

Route	Frequency
13th Avenue	Every 60 minutes 6 a.m. to 10 a.m. Every 120 minutes 12 p.m. to 4:00 p.m.
Cherry Street	Every 60 minutes 6:30 a.m. to 5:30 p.m.
Harding Street	Every 60 minutes 6 a.m. to 9 a.m. Every 120 minutes 9 a.m. to 5 p.m.
Main St/Walmart Super Center	Every 60 minutes 6 a.m. to 6 p.m.
Hazel & 28th St	Every 120 minutes 6:30 a.m. to 4:30 p.m.
17th St & Miramar	Every 120 minutes 7:30 a.m. to 5:30 p.m.
University	Every 60 minutes 6 a.m. to 6 p.m.
Dollarway	Every 60 minutes 6:30 a.m. to 5:30 p.m.

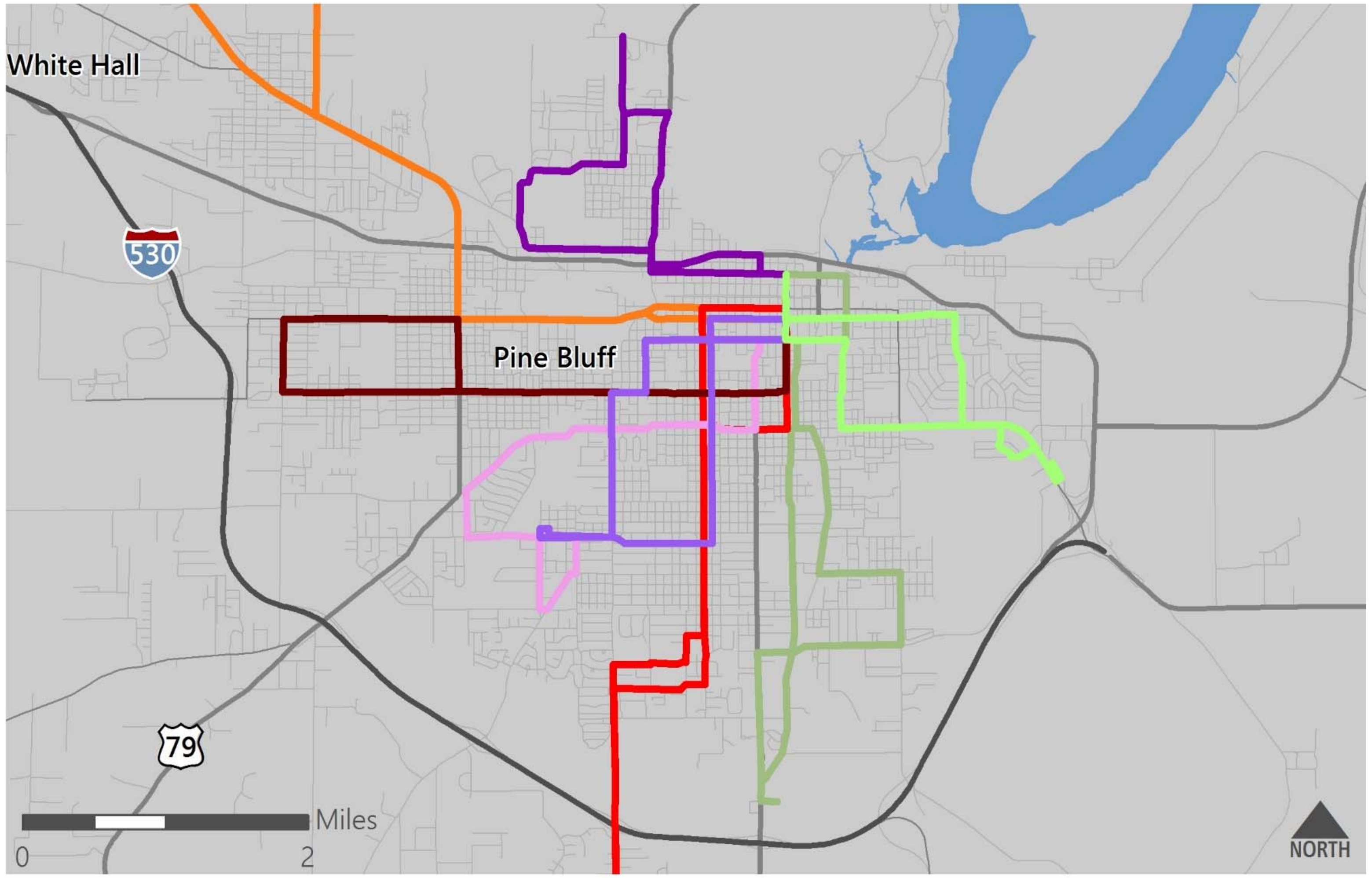
Source: City of Pine Bluff

Figure 5.2: Pine Bluff Transit Fixed Route System

Metropolitan Planning Area



Urban Core



Legend

Routes
- Harding Street
- Main Street/Walmart Supercenter
- 17th and Miramar
- 13th Avenue
- Hazel and 28th
- Cherry Street
- Dollarway
- University
- Planning Area

Data Sources: Pine Bluff Transit

Disclaimer: This map is for planning purposes only.

5.2.2 Ridership Trends

Table 5.2 shows annual ridership for PBT. According to the National Transit Database (NTD), ridership for fixed routes declined by 17 percent from 2014 to 2015, but then overall has grown from 2015 to 2018. In 2014 the University of Arkansas at Pine Bluff cancelled a contract with PBT, making it harder for students to ride the bus, which could partially explain the decrease in ridership. However, from 2015 to 2018 fixed route ridership has increased by nine (9) percent. This increase differs from the national trend of transit ridership decline, which nationally is largely attributed to relatively low gas prices and historically low automobile loan rates. As much of the country has seen a decrease in ridership, it is worth asking why ridership has increased in Pine Bluff and monitoring when 2019 NTD data becomes available if the trend continues.

Demand route ridership has more than doubled since 2014. While ridership decreased by 14 percent from 2014 to 2015, ridership rapidly increased each year since. This large increase is also worth monitoring to understand if this high growth rate will continue and if PBT paratransit services are prepared to fill the rising demand. Rural demand system provider Southeast Arkansas Transit System (SEAT) stopped generating trips in 2018 due to ArDOT restrictions, which could partially explain the sharp increase in trips in 2018.

Table 5.2: PBT Annual Ridership by Mode, 2014-2018

Mode	2014	2015	2016	2017	2018
Fixed Route	80,650	67,098	67,055	76,244	73,511
Demand Route	4,046	3,495	4,505	5,878	8,568
Total	84,696	70,593	71,560	82,122	82,079

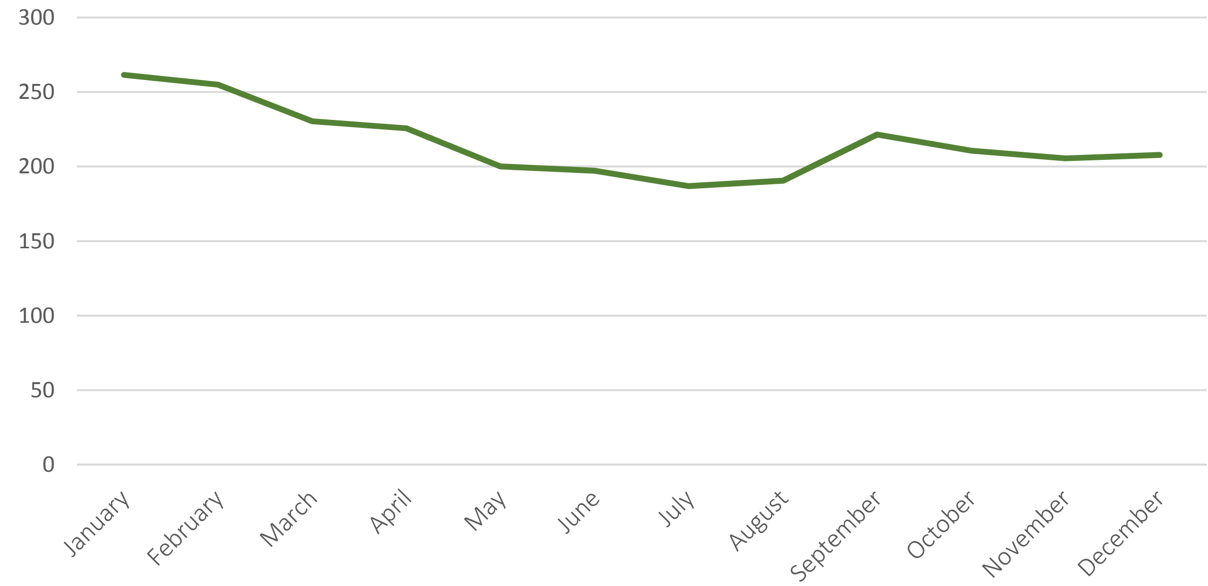
Source: National Transit Database

Figure 5.3 shows how 2019 ridership provided by PBT varied from month to month. Total ridership was highest in January and decreased at a varying pace until July when it began to increase in August and September. Figure 5.4 breaks down the ridership by fare type: regular, student, and reduced fare for disabled or Medicaid riders. Below are the three months of highest ridership for the three different fare types:

- Regular fare: January-March
- Students: February, April, August
- Disabled or Medicaid Riders: February-April

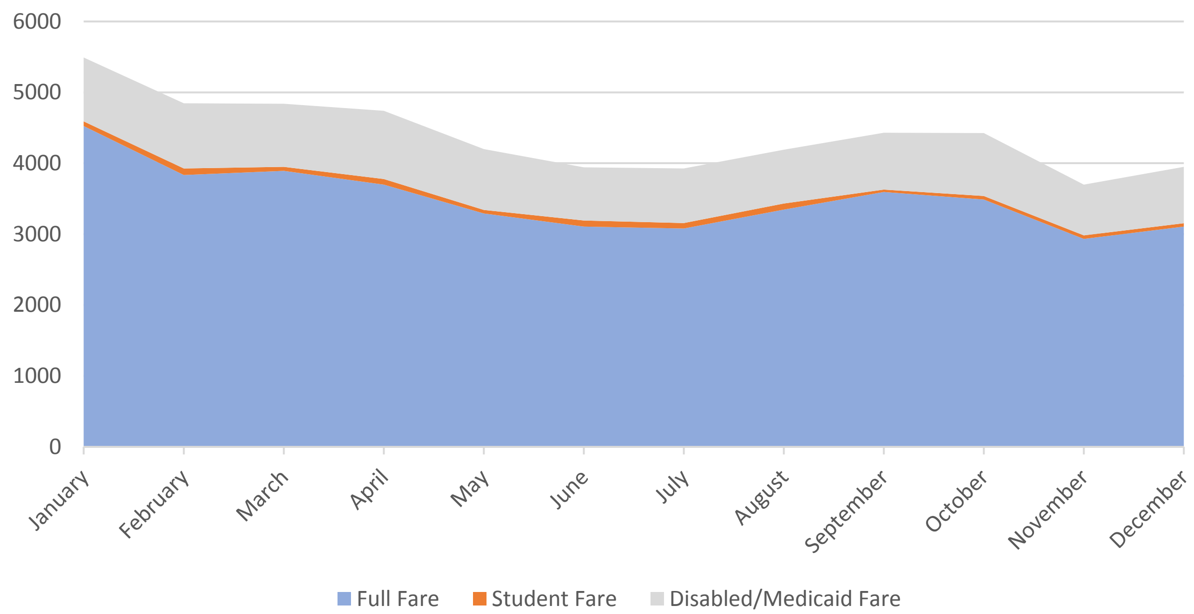
Monthly ridership from previous years can show whether these popular months are consistent year to year.

Figure 5.3: PBT Ridership by Month, 2019



Source: Pine Bluff Transit

Figure 5.4: PBT Monthly Ridership by Fare Type, 2019



Source: Pine Bluff Transit

5.2.3 Operating Trends

The fixed route service provided decreased from 2014 to 2018. Annual vehicle revenue miles decreased 36 percent from 2014 to 2018 and annual vehicle revenue hours decreased by 11 percent. However, since 2015 ridership has increased. This makes the system more productive and cost effective when looking at boardings per revenue mile and revenue hour.

Since 2014 the operating expense per vehicle revenue hour decreased by 27 percent and the operating expense per boarding decreased by 29 percent. This shows that while service offered has decreased, PBT has done more with less, meaning they have increased ridership, productivity, and cost efficiency with less service. This can be positive for a small system trying to be efficient, as long as rider and potential rider needs are met. Figure 5.4 details trends of the PBT Fixed Route System since 2014.

The paratransit system has significantly expanded service in recent years. From 2014 to 2018 the annual vehicle revenue miles per capita grew by 131 percent and annual vehicle revenue hours per capita increased by 112 percent. Productivity also increased as the level of service increased, with a 142 percent jump from 2014 to 2018 in boardings per capita. The paratransit system became more cost efficient with the increased ridership. From 2014 to 2018 the operating expense per vehicle revenue hour decreased 27 percent and the operating expense per boarding decreased by 29 percent. Thus, increased ridership has allowed the system to operate at a lower cost per rider. This is a positive, although there could be a point when increased ridership requires more vans and staffing and cost efficiency decreases. Figure 5.5 details trends of the PBT Demand Route System since 2014.

Table 5.3 PBT Fixed Route Trends, 2014-2018

Indicator	2014	2015	2016	2017	2018	Change (2014-2018)	Trend
General System Statistics							
Urbanized Area Population	51,537	50,622	49,555	48,828	48,828	-5%	▼
Urbanized Area Square Miles	37	37	37	37	37		
Urbanized Area Population Density	1,393	1,368	1,339	1,320	1,320	-5%	▼
Vehicles Operated in Maximum Service	4	7	7	4	4	0%	
Vehicle Revenue Miles	256,937	213,601	208,461	188,636	165,094	-36%	▼
Vehicle Revenue Hours	12,096	12,048	12,480	11,440	10,736	-11%	▼
Boardings	80,650	67,098	67,055	76,244	73,511	-9%	▼
Annual Operating Expense	$1,339,920	$1,355,086	$1,348,953	$835,972	$871,690	-35%	▼
Level of Service							
Vehicle Revenue Miles per Capita*	4.99	4.22	4.21	3.86	3.38	-32%	▼
Vehicle Revenue Hours per Capita*	0.23	0.24	0.25	0.23	0.22	-6%	▼
Productivity							
Boardings per Revenue Mile	0.31	0.31	0.32	0.40	0.45	42%	▲
Boardings per Revenue Hour	6.67	5.57	5.37	6.66	6.85	3%	▲
Boardings per Capita*	1.56	1.33	1.35	1.56	1.51	-4%	▼
Cost Efficiency							
Operating Expense per Vehicle Revenue Mile	$5.21	$6.34	$6.47	$4.43	$5.28	1%	▲
Operating Expense per Vehicle Revenue Hour	$110.77	$112.47	$108.09	$73.07	$81.19	-27%	▼
Operating Expense per Boarding	$16.61	$20.20	$20.12	$10.96	$11.86	-29%	▼

Source: National Transit Database

*Service Area Population

Table 5.4 PBT Demand Route Trends, 2014-2018

Indicator	2014	2015	2016	2017	2018	Change (2014-2018)	Trend
General System Statistics							
Urbanized Area Population	53,495	50,622	49,555	48,828	48,828	-5%	▼
Urbanized Area Square Miles	37	37	37	37	37	0%	
Urbanized Area Population Density	1,393	1,368	1,339	1,320	1,320	-5%	▼
Vehicles Operated in Maximum Service	1	2	2	2	2	100%	▲
Vehicle Revenue Miles	29,320	28,614	31,541	46,894	59,436	103%	▲
Vehicle Revenue Hours	3,024	3,012	3,120	5,460	5,612	86%	▲
Boardings	4,046	3,495	4,505	5,878	8,568	112%	▲
Annual Operating Expense	$77,985	$62,820	$60,843	$88,729	$90,945	17%	▲
Level of Service							
Vehicle Revenue Miles per Capita*	0.60	0.58	0.64	0.96	1.38	131%	▲
Vehicle Revenue Hours per Capita*	0.06	0.06	0.06	0.11	0.13	112%	▲
Productivity							
Boardings per Revenue Mile	0.10	0.12	0.14	0.13	0.14	4%	▲
Boardings per Revenue Hour	1.30	1.16	1.44	1.08	1.53	14%	▲
Boardings per Capita*	0.08	0.07	0.09	0.12	0.20	142%	▲
Cost Efficiency							
Operating Expense per Vehicle Revenue Mile	$2.66	$2.20	$1.93	$1.89	$1.53	-42%	▼
Operating Expense per Vehicle Revenue Hour	$25.79	$20.86	$19.50	$16.25	$16.21	-37%	▼
Operating Expense per Boarding	$19.27	$17.97	$13.51	$15.10	$10.61	23%	▲

Source: National Transit Database

*Service Area Population

5.2.4 Safety and Security Trends

As a recipient of federal transportation funds, Pine Bluff Transit (PBT) is required to report safety and security events occurring on a transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle.

Table 5.5 shows PBT's reported safety and security events from the last five (5) years of available data and compares its incidence rates to the national and state averages of other urbanized area providers. PBT has had no injuries or fatalities in the past five (5) years but does have a higher proportion of events compared to the State of Arkansas and national rates, shown in Table 5.6.

Table 5.5: PBT Safety and Security Events, 2014-2018

	2014	2015	2016	2017	2018	Total
All Events	4	4	1	0	3	12
Fatalities	0	0	0	0	0	0
Injuries	0	0	0	0	0	0

Source: National Transit Database

Table 5.6: Safety and Security Events per 100,000 Vehicle Revenue Miles, 2014-2018

	Pine Bluff Transit	Arkansas Urbanized Area Providers	U.S. Urbanized Area Providers
All Events	0.98	0.32	0.21
Fatalities	0.00	0.01	0.01
Injuries	0.00	0.12	0.26

Source: National Transit Database

5.2.5 Transit Asset Management

All transit agencies receiving federal funding are required to submit asset inventory data, condition assessments, performance targets, and a narrative report to the National Transit Database annually in addition to developing a Transit Asset Management (TAM) plan. Tables 5.7 through 5.10 display this data for PBT.

Federal TAM regulations require transit agencies to address the four asset categories shown in Table 5.7, as applicable to the agency. Tables 5.8 through 5.10 report the inventory and performance of PBT's assets.

Useful Life Benchmark: The expected lifecycle of a capital asset for a particular transit provider's operating environment, or the acceptable period of use in service for a particular transit provider's operating environment.

Note: ULB is distinct from the useful life definition used in FTA's grant programs

Table 5.7: PBT Transit Asset Management Performance Measures, 2018

Asset Category	FTA established Performance Measure	
Rolling Stock	% of revenue vehicles exceeding ULB	Yes
Equipment	% of non-revenue service vehicles exceeding ULB	Yes
Facilities	% of facilities rated under 3.0 on the TERM scale	Yes
Infrastructure	% of track segments under performance restriction	No

Note: ULB = Useful Life Benchmark; TERM is software used to rate facility conditions
Source: NTD Urbanized Area Asset Summary, 2018

Table 5.8: PBT Rolling Stock Inventory and Performance, 2018

Vehicle Type	Active Vehicles with ULB Reported	Active Vehicles Past Useful Life	% Past Life
Bus	4	0	0%
Cutaway Bus	3	0	0%
Van	1	0	0%
Mini-van	3	1	33%
Overall	11	1	9%

Source: NTD Urbanized Area Asset Summary, 2018

Table 5.9: PBT Equipment Inventory and Performance, 2018

Vehicle Type	Vehicles with ULB Reported	Vehicles Past Useful Life	% Past Life
Trucks and other Rubber Tire Vehicles	0	0	0%

Source: NTD Urbanized Area Asset Summary, 2018

Table 5.10: PBT Facility Inventory and Performance, 2018

Asset Category	Facilities with Condition Assessment	% Under 3.0 on TERM Scale	% Below 3
Administrative Office/Sales Office	0	0	0%
Combined Administrative and Maintenance Facility	1	0	0%
Maintenance Facility (Service and Inspection)	0	0	0%

Source: NTD Urbanized Area Asset Summary, 2018

5.2.6 Pine Bluff Accommodations and Accessibility

Information on the number of ADA compliant landing pads and surrounding ADA compliant ramps was unavailable. Most of the older downtown core of Pine Bluff has sidewalks, however many are in poor condition and may not be ADA compliant. Outside of downtown Pine Bluff few areas have sidewalks. Connectivity between public transit and bicycle facilities is also important since bicycling may extend the reach of transit. This is why it is important to have bicycle racks on buses and stops where demand is anticipated.

5.3 Rural and Demand Service Providers

5.3.1 Other Providers

The following agencies in the Pine Bluff MPA utilize FTA 5310 funds to provide service for the elderly or disabled:

- Area Agency on Aging of Southeast Arkansas, Inc.,
- Davis Nursing Center,
- Jefferson Hospital Association,
- Jenkins Memorial Center and Jenkins Industries, Inc., and
- Southeast Arkansas Behavioral Healthcare System, Inc.

5.4 Coordination of Services

In 2018 ARDOT updated its *Statewide Transit Coordination Plan*[15] in order to improve the transit services offered to low-income, elderly, and disabled residents by its many various providers. The plan names benefits of coordination like increasing the range of staff, equipment, and services; increasing cost efficiency; and streamlining data collection and funding requests. These improvements can help provide riders with better service at lower costs. The plan identifies obstacles to coordination and strategies to overcome these obstacles. The plan also quantified transportation needs per county and ranked Jefferson County in the highest tier of transit demand.

5.5 Intercity Transit

The Pine Bluff MPA is served by Jefferson Lines intercity bus that stops in Little Rock and then travels to northwest Arkansas. In Little Rock, riders can transfer to Megabus or Greyhound buses or Amtrak trains to reach destinations within the state and beyond, such as Memphis, Tennessee; St. Louis, Missouri; or Dallas, Texas.

5.6 Transportation Network Companies

A Transportation Network Company (TNC) is a private company that matches passengers with vehicles via websites and mobile apps. These are also referred to as ride-hailing services, with Uber and Lyft the largest of these service providers. Currently, both Uber and Lyft serve the Pine Bluff area.

While these transportation services are not public transit, TNCs are increasingly partnering with the public sector to test new ways to provide public, or subsidized, transportation. These "pilot programs" are still evolving but many focus on providing trips in low-demand areas or times of day or for people with disabilities. TNCs can compete with public transit providers, but there are also ways they could collaborate so the TNC could cover the “last-mile” connection between where public transit service ends and more rural destinations.

[15] http://ardot.gov/public_transportation/ARDOT%20Transit%20Coordination%20Plan%202018.pdf

5.7 Regional Transit Demand Analysis

5.7.1 Transit Demand Analysis

The regional demand analysis uses a GIS-based approach to identify the level of transit service supported throughout the Pine Bluff MPA. There are a number of factors that can be analyzed to evaluate and predict transit demand in an area. Given the availability of data and regional scope of the 2045 MTP, the transit demand analysis focused on the following factors:

Residential density – A higher concentration of housing for residents and visitors in an area creates more potential transit riders in an area. This is especially true of very dense areas, where other factors, such as parking availability or congestion, may further influence demand.

Employment density – A higher concentration of employment in an area creates more potential transit riders in an area. This is especially true of very dense areas. Some studies argue that employment density is even more important for predicting ridership than residential densities.

Activity density – In areas with both residential areas and employment, it is necessary to consider a combined density.

Low-income household density – Low-income persons are more likely to ride transit due to a greater likelihood that they do not have regular access to a vehicle or seek to minimize travel by automobile for economic reasons.

Transit-supportive employment density – Certain industries attract transit riders at a higher level than average. This is partly because some industries, such as retail and food services, employ a disproportionately large number of low-wage jobs. However, it is also important to note that industries like healthcare and higher education often cluster employees at relatively dense "campuses" that can be well served by transit.

Density of adults without a vehicle – Persons without access to a vehicle are more likely to ride transit due to a lack of other options. A person may lack a vehicle because of economic reasons, physical or mental ability, or because of a decision to live a car-free lifestyle.

Table 5.11 shows the Transit Demand Analysis criteria and measurements. An area’s value is calculated for each criterion. Before being assigned a level of service tier, all criteria values are multiplied by an area’s street connectivity factor. Based on these adjusted values, level of service tiers are then assigned, based on industry standard thresholds.

Figure 5.5 illustrates the results of this analysis and the distribution of transit demand throughout the region.

Based upon Figure 5.5, there are three areas within the Pine Bluff MPA that support fixed route service with frequencies of 15 minutes of better:

- Downtown Pine Bluff around the Jefferson County Circuit Court and Lake Saracen,
- Downtown Pine Bluff near Main Street between W 5th and W 6th Avenues, and
- the residential neighborhoods below E 6th Avenue and west of Commerce Road.

All three areas are currently served by PBT routes.

Several areas can support fixed route service with frequencies of 30 minutes or better:

- the residential neighborhood west of Bryant Street above US 65,
- downtown Pine Bluff above the Convention Center where several social services are located,
- the residential neighborhoods below E 21st Avenue and east of S Georgia Street,
- Jefferson Regional Medical Center,
- the neighborhood off Old Warren Road above W 14th Avenue, and
- a large portion of downtown Pine Bluff west of US 63 B (S Olive St) and below W 12 Avenue.

Most of these areas have transit routes that run through or along the edge. The residential area west of Bryant Street is about a fifteen-minute walk from the center of the neighborhood to AR 365 (Dollarway Rd) where the bus runs.

A large portion of the Pine Bluff MPA located inside I-530 can support fixed route services with frequencies of 60 minutes or better, including much of downtown Pine Bluff, the University of Arkansas at Pine Bluff, and the Pines Mall.

Table 5.11: Transit Demand Analysis Criteria and Level of Service Thresholds

Criteria	Measurement	Transit Level of Service				
		On-Demand	Flexible	60 min.	30 min.	15 min.
Residential Density	Households per acre	0 to 1	1 to 2	2 to 4	4 to 7	7+
Employment Density	Employment and college enrollment per acre	0 to 5	5 to 10	10 to 25	25 to 50	50+
Low-Income Residential Density	Households using food stamps per acre	0 to 0.33	0.33 to 0.66	0.66 to 1.33	1.33 to 2.33	2.33+
Transit Supportive Employment Density	Employment per acre for industries with high percentage of workers riding transit	0 to 2.5	2.5 to 5	5 to 12.5	12.5 to 25	25+
Residential Vehicle Availability	Households without vehicle per acre	0 to 0.25	0.25 to 0.5	0.5 to 1	1 to 1.75	1.75+
Activity Density	Sum of highest residential and employment density value	0 to 3.75	3.75 to 7.5	7.5 to 18.75	18.75 to 37.5	37.5+
Street Connectivity	Percentage of intersections that are four-way	33%-50%, multiply values by 1.25; >50%, multiply values by 1.5				

1 Dorms were converted to households assuming an average of 2.2 people per dorm and assumed to be twice as likely as the regional average to receive food stamps or lack a car

2 Industries with high percentage of workers riding transit included NAICS codes: 44-45, 61, 62, 71, and 72

5.7.2 Transit-Dependent Populations

In order to ensure that the needs of the transit-dependent population are being addressed by the transit demand analysis, the concentration of various transit-dependent populations were mapped.

Figure 5.6 illustrates the concentration of households without regular access to a vehicle. There are four pockets that have the highest concentration of households without regular access to a vehicle:

- below the University of Arkansas at Pine Bluff and above King Avenue,
- the neighborhoods between E 29th Avenue, S Ohio Street, E 28th Avenue, and S Georgia Street,
- the neighborhood below E 6th Avenue and west of Belmont Drive, and
- the neighborhoods between Old Warren Road and W 34th Avenue.

Large portions of downtown Pine Bluff, especially between Old Warren Road and S Olive Street, also have high concentrations of households lacking vehicle access.

Figure 5.7 depicts the concentration of low-income households. These households may have access to a car but due to economic reasons are more likely to rely on transit. The distribution of high-density clusters of low-income households is similar to that of households without access to a vehicle.

Figure 5.8 shows the concentration of households that include people with disabilities. These households rely on transit due to physical or mental limitations. The highest concentrations are similar to the concentration of households without a vehicle but there is also a high concentration with households with people with disabilities around:

- Belmont Park between US-65 and E Harding Avenue,
- between E 6th Avenue, E 8th Avenue, S Ohio Street and S Missouri Street, and
- in the neighborhood below W 28th Avenue and east of S Hazel Street.

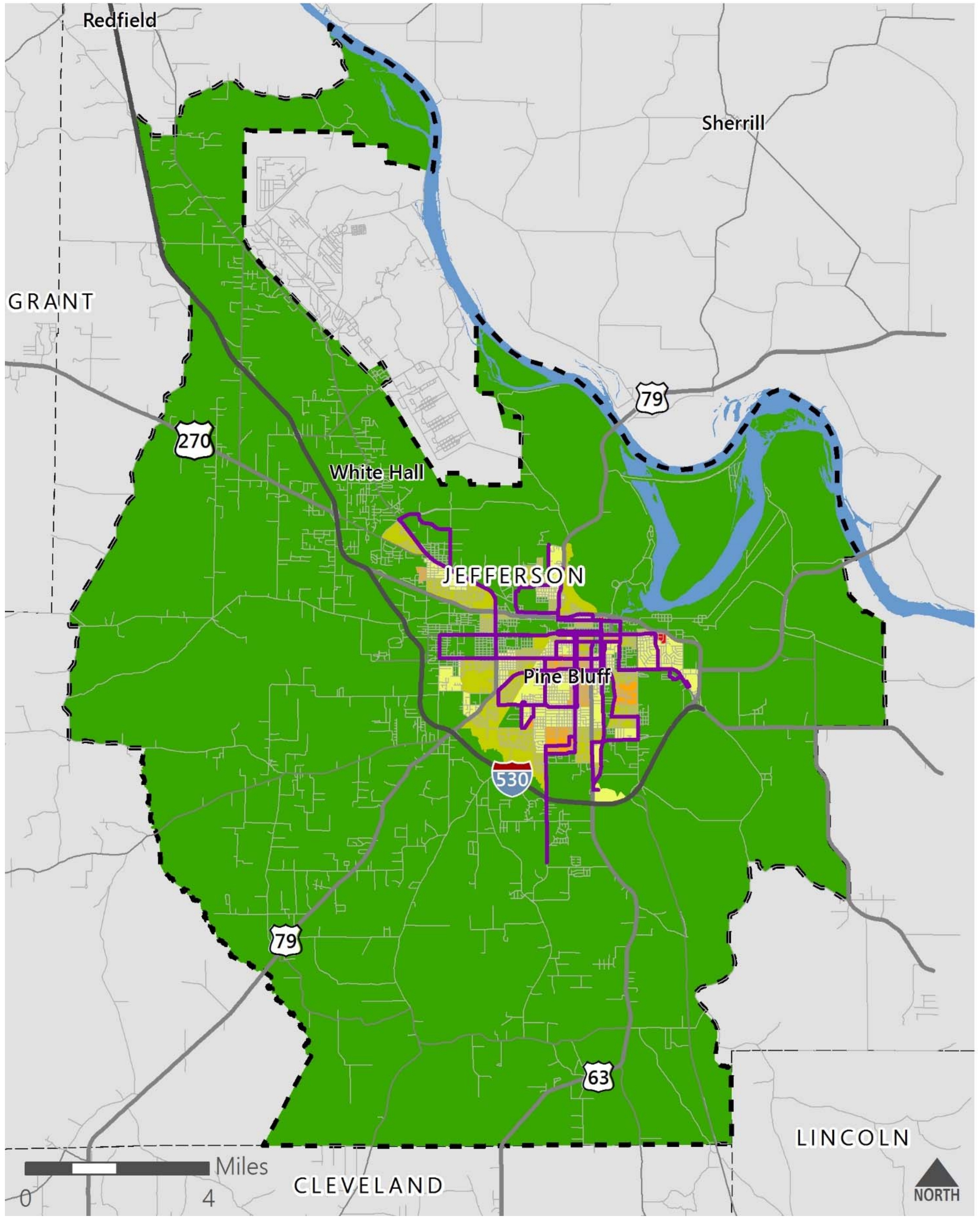
Figure 5.9 shows the concentration of persons aged 65 or older. Like people with disabilities, this population is more likely to rely on transit due to physical or mental limitations. The highest concentrations are located similarly as high concentrations of people with disabilities. However, there is also a high concentration of seniors in:

- downtown Pine Bluff between E 2nd Avenue, Convention Center Drive, and the railroad,
- in the neighborhood surrounding Jefferson Medical Center, and
- in the developments between Ridgeway Road and W 73rd Avenue.

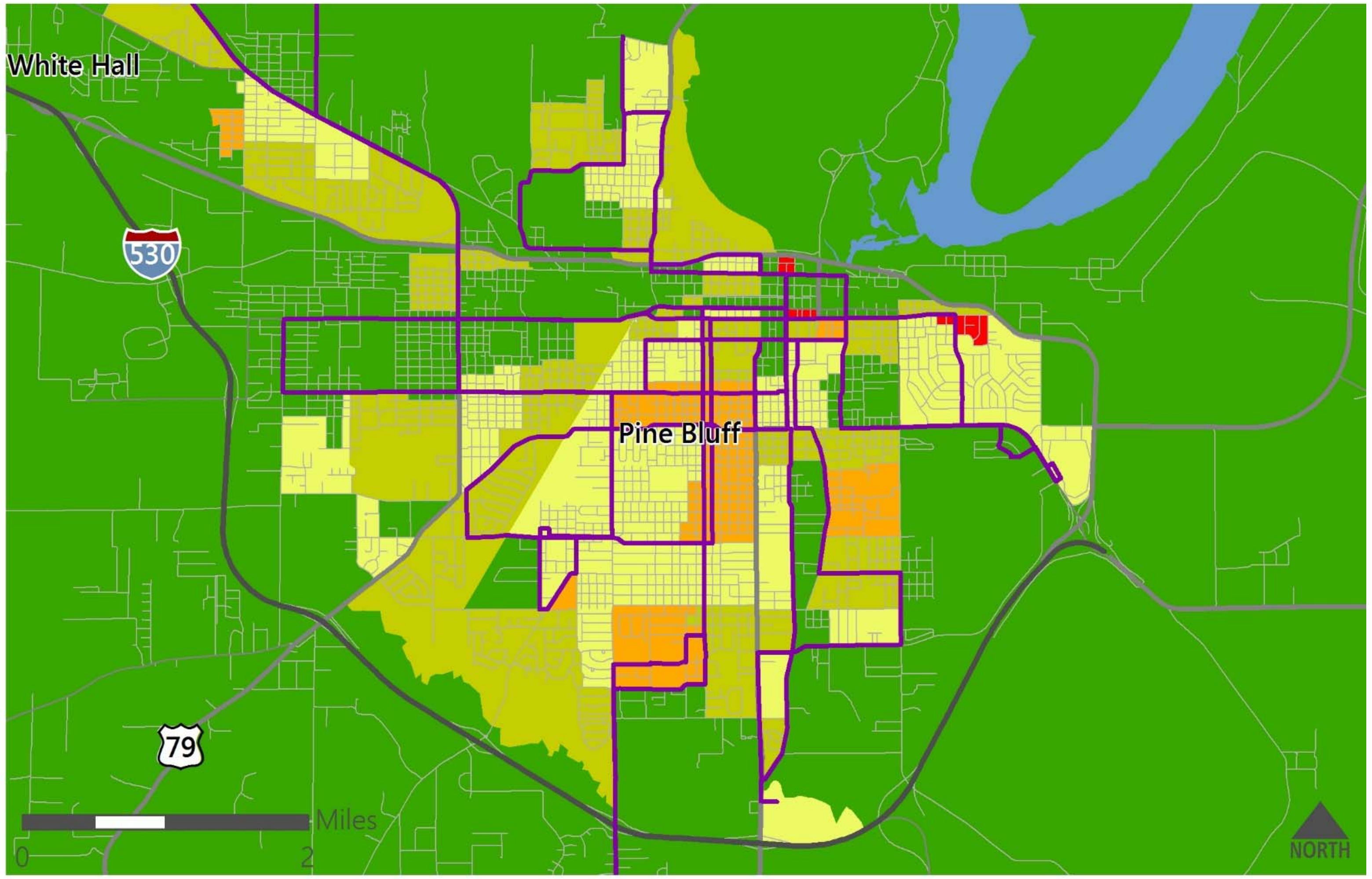
The current PBT fixed routes cover most of these high need areas. However, there could be opportunities to increase frequency or hours of service or alter stops.

Figure 5.5: Transit Demand in the MPA, 2017-2018

Metropolitan Planning Area



Urban Core



Legend

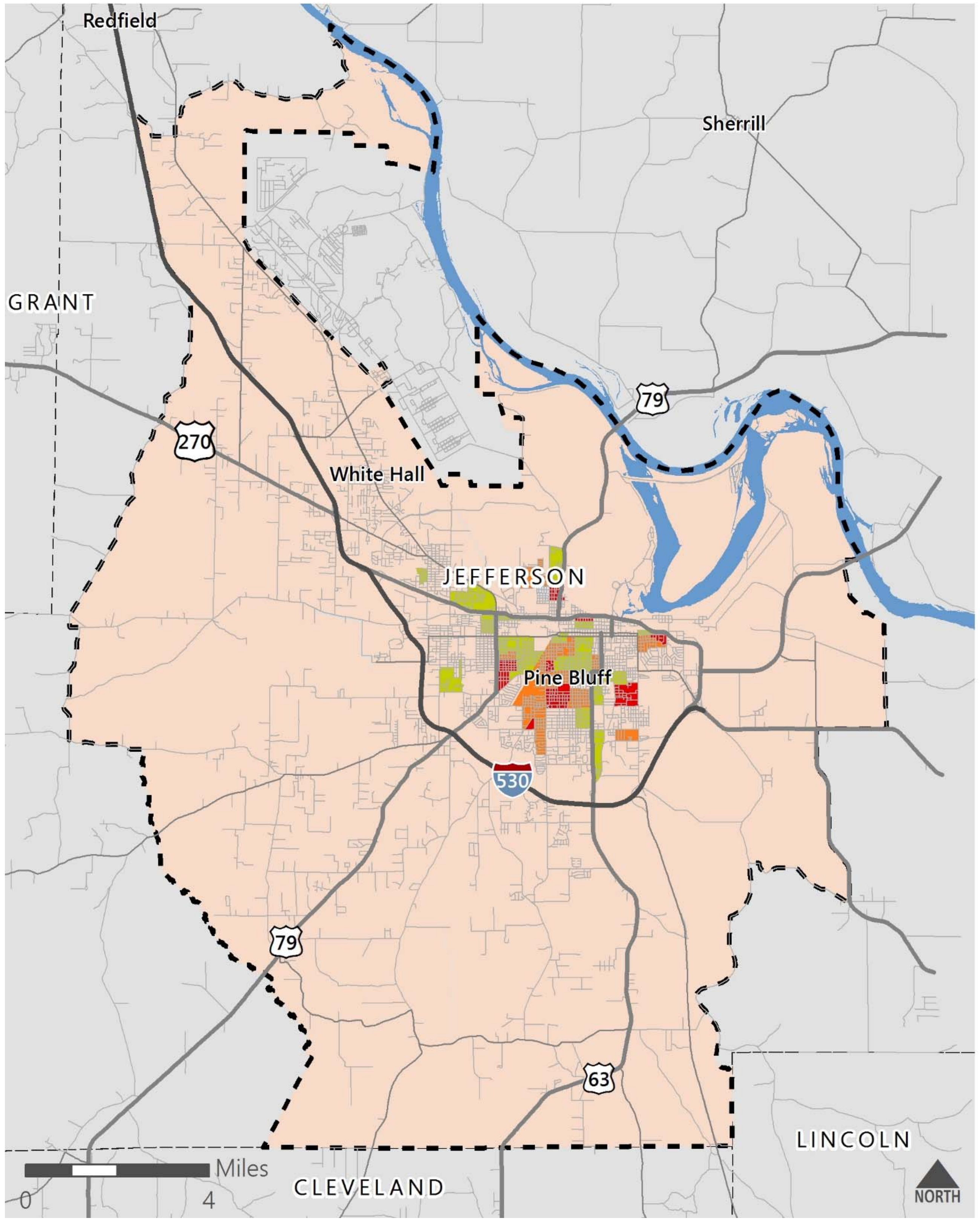
Transit Supported Frequency
- Every 15 minutes
- Every 30 minutes
- Every 60 minutes
- Flexible Service
- On-Demand Service
- Existing Bus Routes
- Planning Area

Data Sources: Census Bureau; MPO Staff; Neel-Schaffer, Inc.

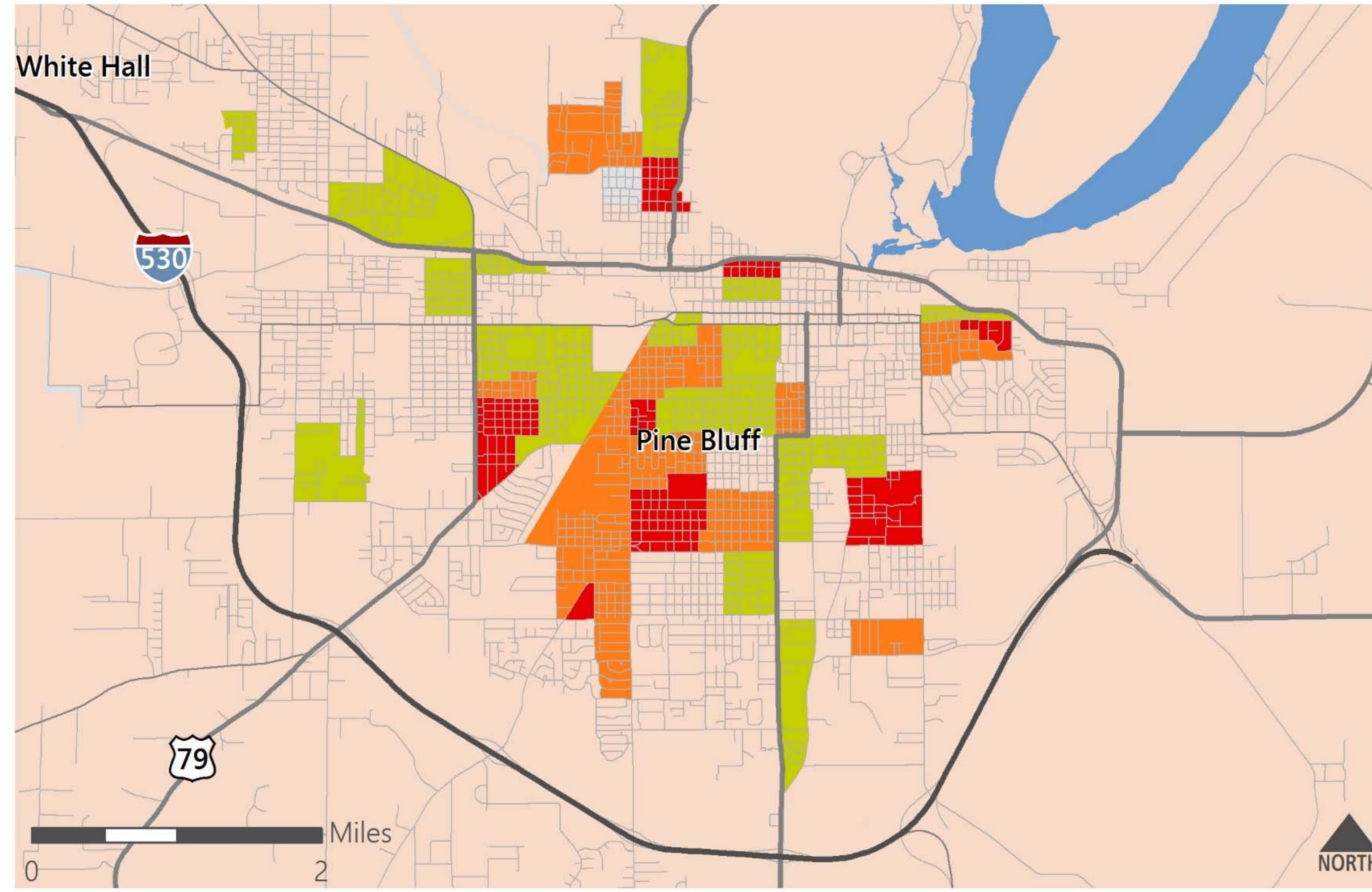
Disclaimer: This map is for planning purposes only.

Figure 5.6: Concentrations of Households with No Vehicle in the MPA, 2017

Metropolitan Planning Area



Urban Core



Legend

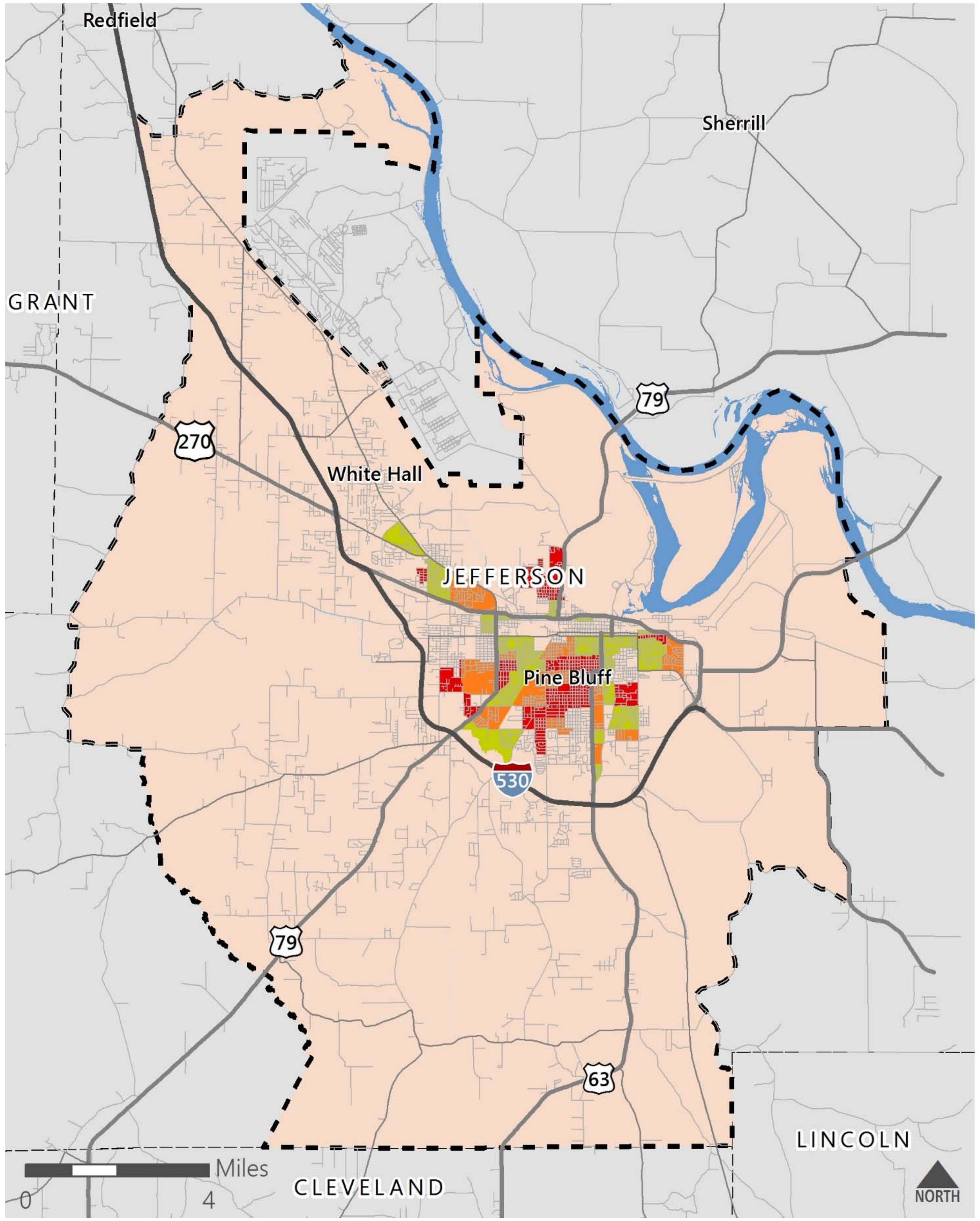
TAZ: Households with No Vehicle Per Acre

- 0.46 - 1.38
- 0.31 - 0.45
- 0.16 - 0.30
- 0.00 - 0.15
- Planning Area

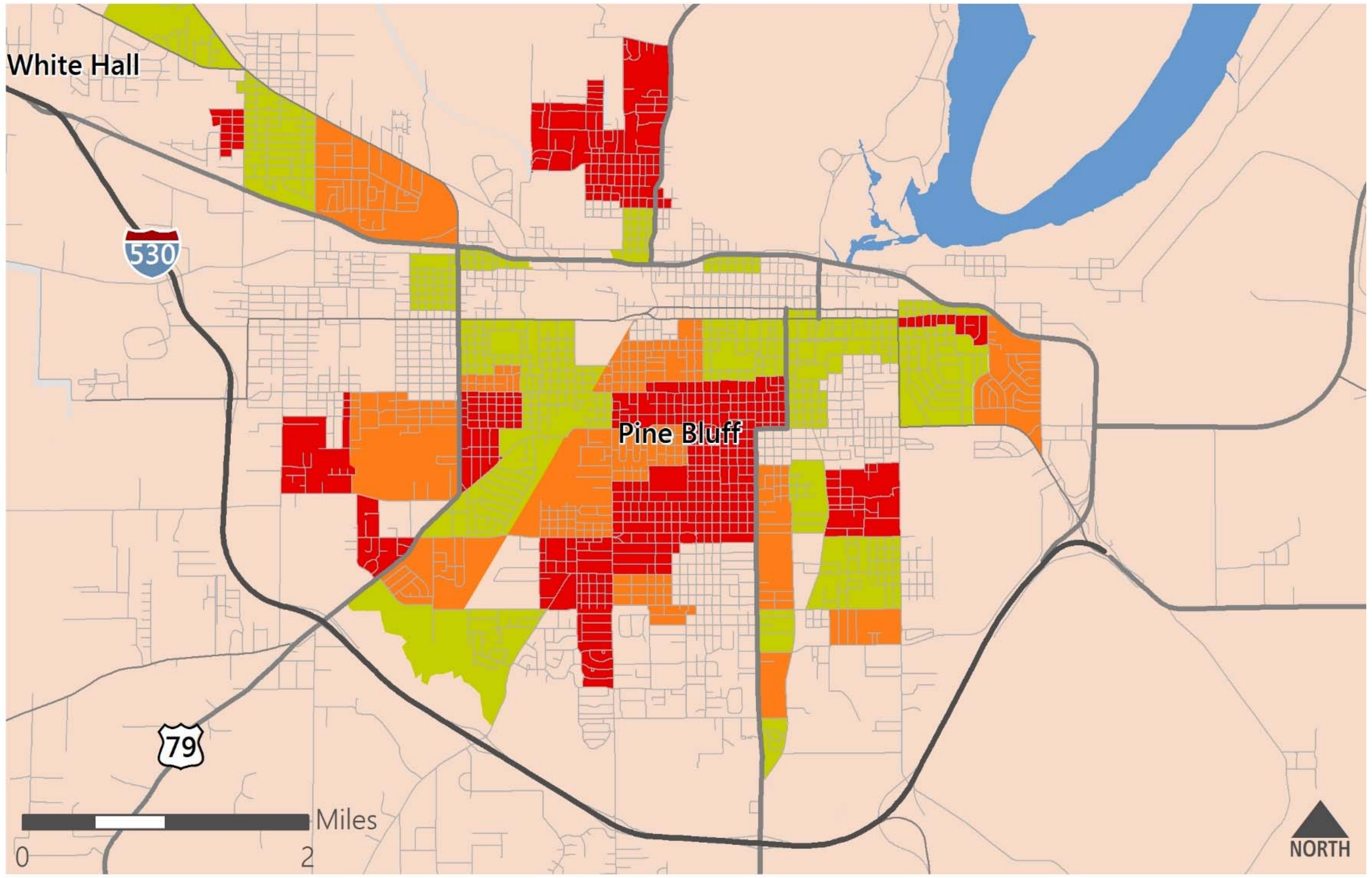
Data Sources: Census Bureau; American Community Survey, 2017; Neel-Schaffer, Inc. Disclaimer: This map is for planning purposes only.

Figure 5.7: Concentrations of Low-Income Households in the MPA, 2017

Metropolitan Planning Area



Urban Core



Legend

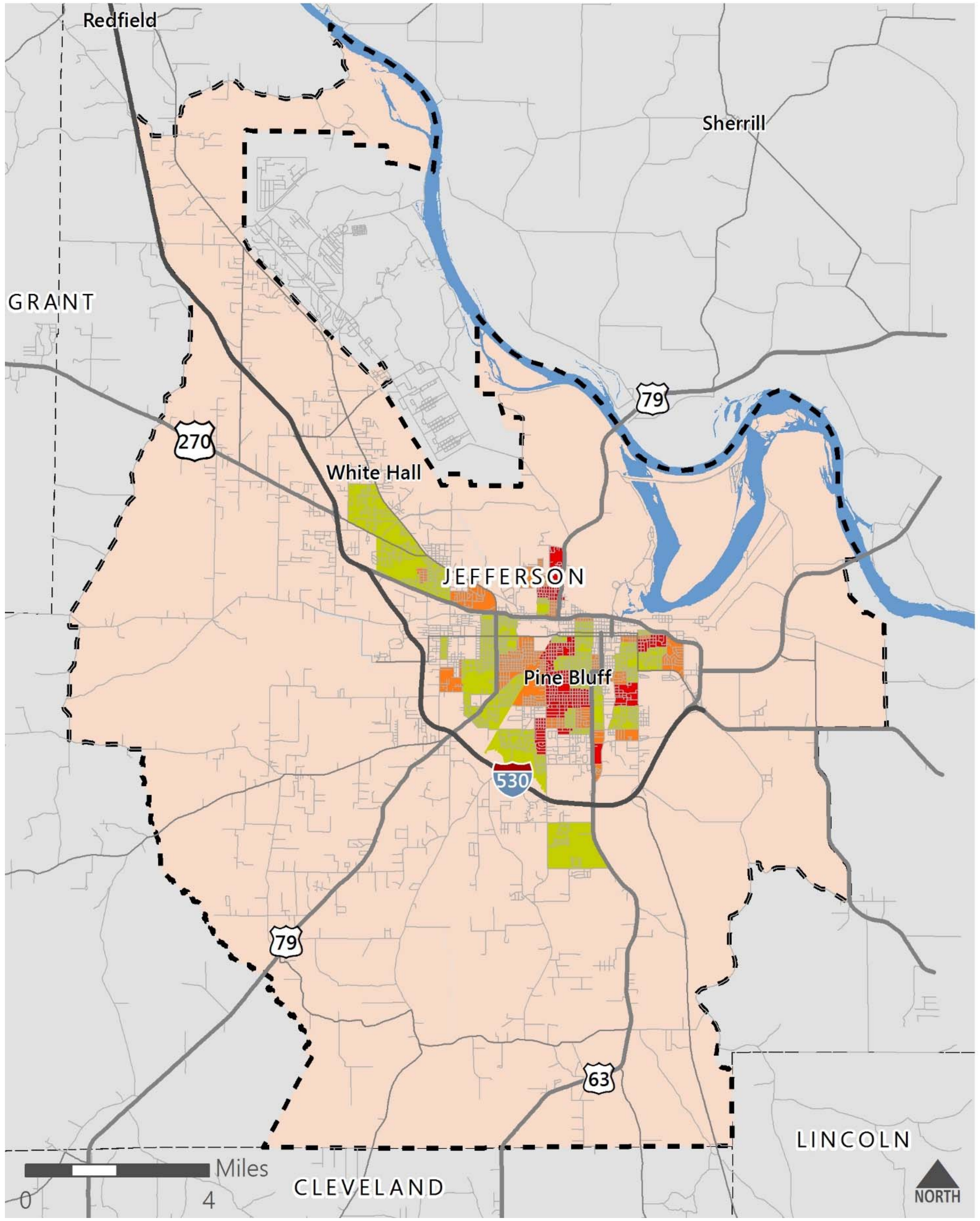
TAZ: Households using Food Stamps per Acre

- 0.61 - 3.34
- 0.41 - 0.60
- 0.21 - 0.40
- 0.00 - 0.20
- Planning Area

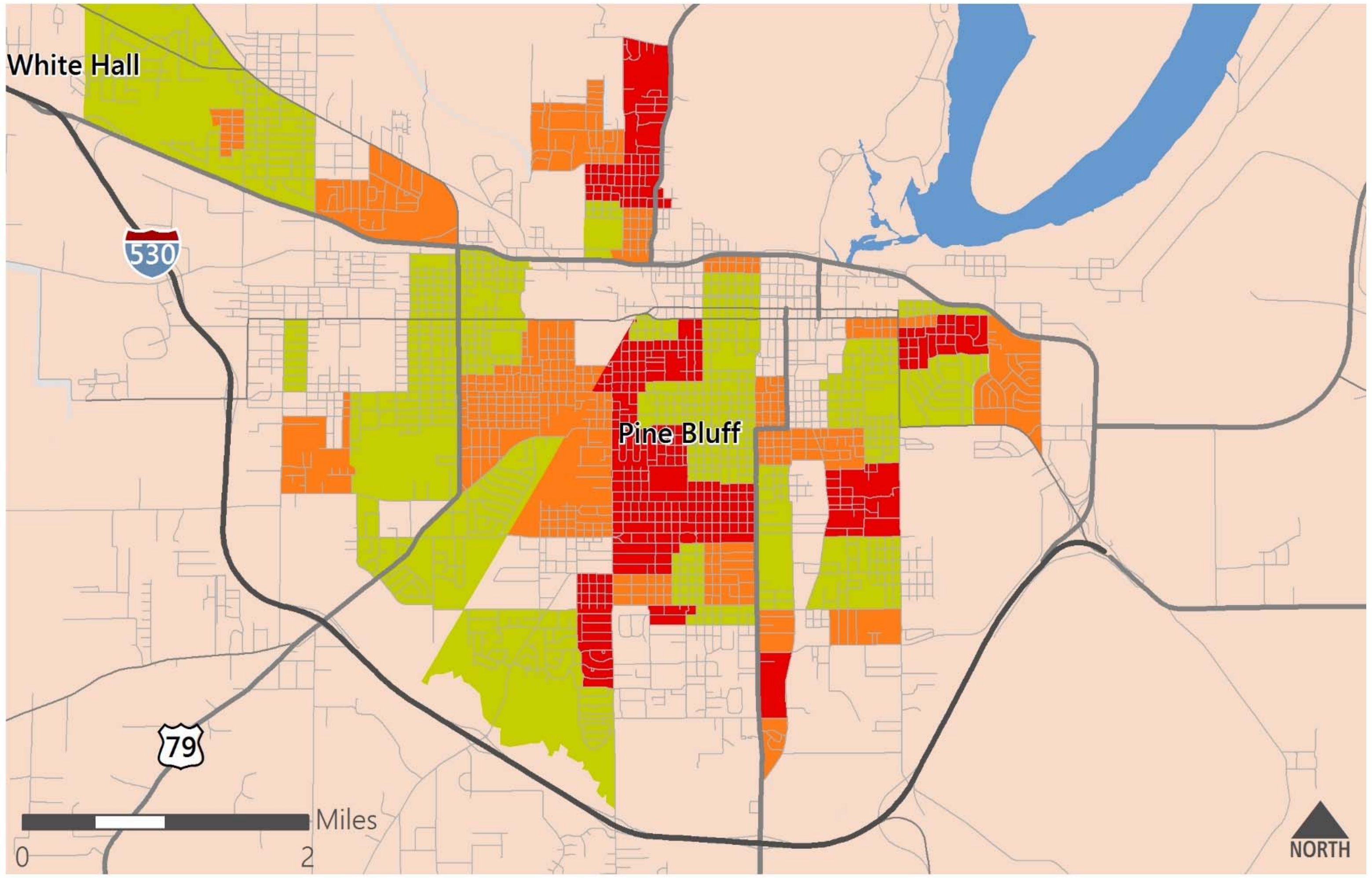
Data Sources: Census Bureau; American Community Survey, 2017; Neel-Schaffer, Inc. Disclaimer: This map is for planning purposes only.

Figure 5.8: Concentrations of People with Disabilities in the MPA, 2017

Metropolitan Planning Area



Urban Core



Legend

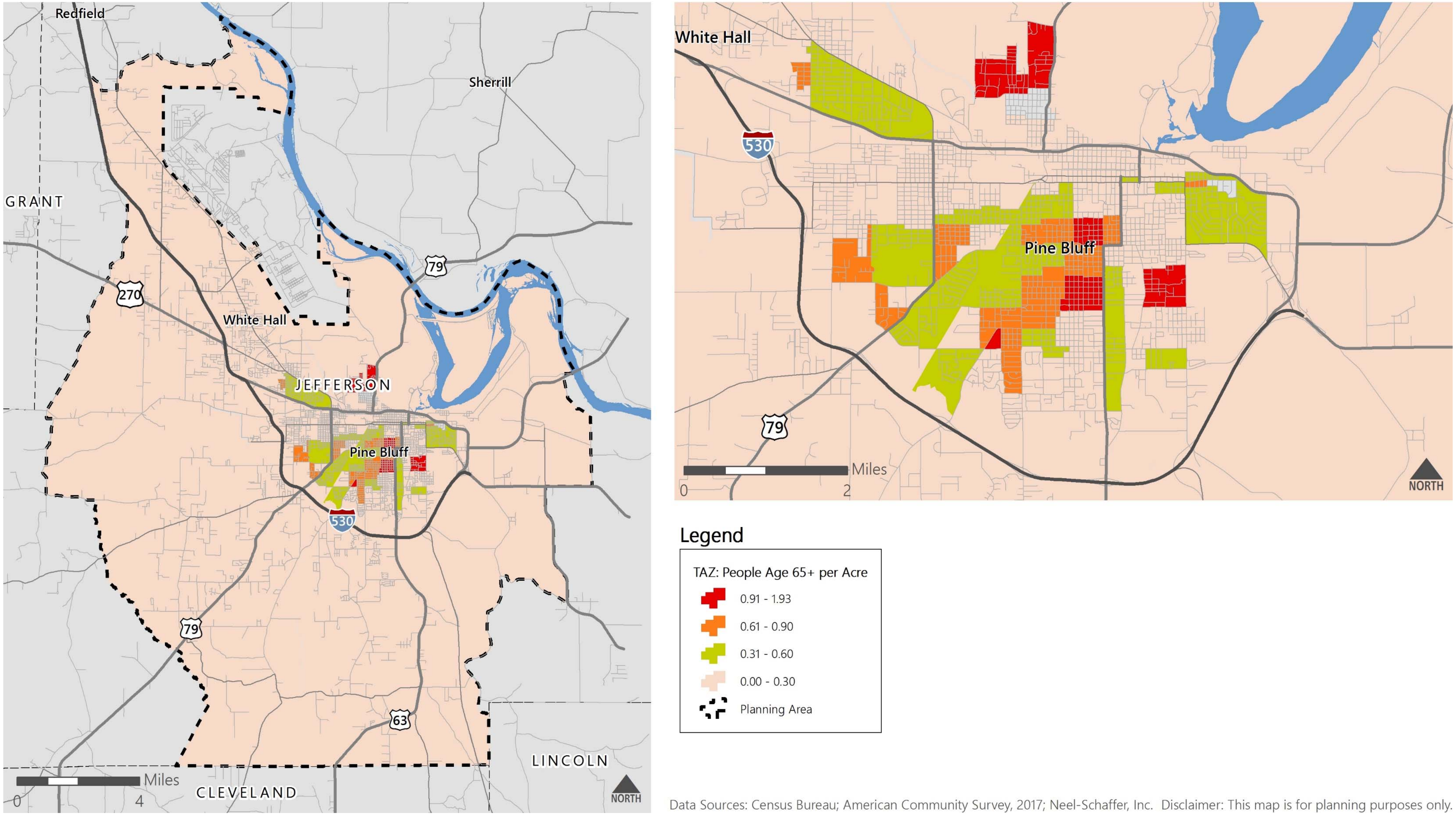
TAZ: Households with a Person with a Disability per Acre

- 0.76 - 2.04
- 0.51 - 0.75
- 0.26 - 0.50
- 0.00 - 0.25
- Planning Area

Data Sources: Census Bureau; American Community Survey, 2017; Neel-Schaffer, Inc. Disclaimer: This map is for planning purposes only.

Figure 5.9: Concentrations of Senior Population in the MPA, 2017

Metropolitan Planning Area *Urban Core*



Legend

TAZ: People Age 65+ per Acre
- 0.91 - 1.93
- 0.61 - 0.90
- 0.31 - 0.60
- 0.00 - 0.30
- Planning Area

Data Sources: Census Bureau; American Community Survey, 2017; Neel-Schaffer, Inc. Disclaimer: This map is for planning purposes only.

5.8 Peer Comparison

A peer comparison is a benchmarking tool that compares a study area to areas with similar conditions. For the most even comparison, the peer group shares characteristics with the study area such as similar population size, geographical region, and type of services offered. Since the 2045 MTP is regional and long-term in nature, the criteria to select peer systems are somewhat different from the typical criteria used by transit agencies in short-range transit development plans. For the MTP, the focus is to compare the entire Pine Bluff urbanized area instead of the service area of a particular agency.

5.8.1 Selection Criteria

Selection criteria utilized intended to highlight urban areas that are very similar to the Pine Bluff urbanized area in terms of urban structure, land use patterns, and demographics. These factors, outside of the type and level of transit service provided, are the primary drivers of transit demand and barriers. By selecting peer areas similar to Pine Bluff in these regards, the MTP can highlight areas that are operating under similar constraints yet producing different results. This is a beginning step that may involve further exploring transit service in other areas and learning from their decisions.

The selection criteria include:

- locations in the South,
- urbanized area size,
- urbanized area population density,
- urbanized area's share of MSA population,
- similar college/university influence,
- similar low-income population,
- similar influence of military and retirement communities, and
- comparable transit service.

Table 5.12 shows the demographics and urban sprawl index of the five selected peer areas using these criteria. The selection criteria and methodology are further outlined below.

Table 5.12: Selected Peer Urbanized Areas

Urbanized Area (UZA)	Population	Population per Square Mile	Percentage of Adults in University	Percentage of Households with Food Stamps	Percentage of Seniors in Population
Pine Bluff, AR	48,828	1,313	29.8	24.0	14.1
Peer Average	*70,904*	*1,414*	*33.6*	*17.9*	*13.9*
Cleveland, TN	80,461	1,474	32.0	17.4	15.0
Jackson, TN	72,101	1,410	13.7	20.3	13.7
Jonesboro, AR	70,458	1,501	38.6	15.3	12.4
Rome, GA	60,595	1,271	30.0	18.7	14.4

Source: Census Bureau, 2010 Census; American Community Survey, 2013-2017

In South Region of United States

Areas outside of the Census Bureau's South Region were removed. This was done because state and local transit funding is lower in this region and the public perception of transit is much lower.

Urbanized Area Size

Peer area urbanized areas must have a 2010 population within plus or minus 65 percent of the Pine Bluff urbanized area. This corresponds to a range from 17,090 to 80,566. Of the Urbanized Areas (UZAs) that fell into this range, Pine Bluff was one of the smallest regions to have a fixed route bus system.

Urbanized Area Population Density

Population density greatly effects demand for transit. Thus, only UZAs whose population per square mile (ppsm) that fell within 20 percent of Pine Bluff's population density of 1,313 ppsm were included. This corresponds to a range from 1,050 to 1,566 ppsm.

UZA's Share of MSA Population

UZAs that have a substantial portion of their overall area that is part of an MSA with another UZA or is contiguous with another UZA are excluded. This is done so that, like Pine Bluff, selected peer UZAs are not part of a larger region with a high level of commuting between multiple urbanized areas. In these more polycentric regions, there would likely be a higher demand for transit.

Similar College/University Influence

UZAs must be within 30 percent of Pine Bluff's percentage of the population 18 and over enrolled in college or graduate school (29.8 percent). This corresponds to a range from 20.9 percent to 38.7 percent.

Similar Low-Income Population

UZAs must be within 40 percent of households receiving food stamps, which corresponds to a range from 14.4 to 33.6 percent. This range is somewhat larger due to the high percentage of households in the Pine Bluff MPA receiving food stamps (24 percent), which is the highest of the peer group.

Similar influence of Military and Retirement Communities

UZAs must be within 25 percent of Pine Bluff's percentage of population that is retired (14.1 percent). This range is from 10.6 percent to 17.6 percent.

Any area with a sizable percentage of workforce in military was removed. The Pine Bluff Arsenal does have a small military population, but this does not affect the region like a larger military base would.

Comparable Transit Service

Of the remaining UZAs, only four (4) areas had what would be considered a small urban, fixed-route system supplemented by paratransit. Other areas were better categorized as a demand response system, which would not lend to comparability to PBT's fixed route system.

Figure 5.10 and Table 5.13 provide service area information and operational characteristics for the primary fixed route transit systems operating in the selected peer urban areas. This information is broken down into transit system characteristics, service supplied and consumed, operating efficiency, and fare revenue. The follow trends can be gleaned from this information:

- Demographics and Land Use:

  Pine Bluff Transit serves one of the lowest regional densities and the smallest population of the peer group. Since larger and denser populations tend to better support transit, this could make it more difficult for Pine Bluff to achieve higher efficiencies when compared to its peers. However, without route information from other agencies, it is not possible to know a more accurate measure of service area density: the density of all areas within a quarter mile of all bus stops.

- Transit System Size:

  Pine Bluff Transit operates the lowest number of vehicles than its peers. Rome Transit Authority is an outlier, operating a much larger system than all the peers with 31 vehicles. The Cleveland Urban Area Transit System Division (CUATS), in Cleveland, TN and the Jonesboro Economical Transportation System (JET) in Jonesboro, AR are closer to Pine Bluff but still operating about twice as many vehicles.

- Service Supplied and Consumed:

  PBT provides less service than its peers. PBT is also the smallest region of the group, so per capita figures can be helpful to look at. PBT supplies similar service as CUATS but is significantly outperformed by RTA and even JTA.

- Cost Efficiency:

  PBT operates one of the least cost-efficient systems. It has the highest operating expense per vehicle revenue mile and per vehicle revenue hour except for RTA, which operates a much larger system. When it comes to operating expense per passenger trip, RTA has the lowest cost because they serve so many passengers but PBT operates the highest because of its lower amount of service- less than any of its peers and more than twice the peer group average.

- Fare Revenue:

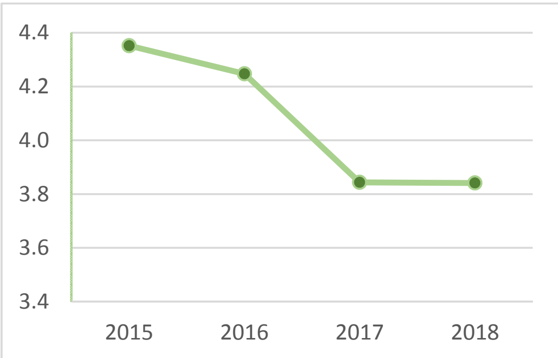
  The average fare of PBT is slightly above the peer average. PBT has the lowest fare recovery rate, similar only to CUATS.

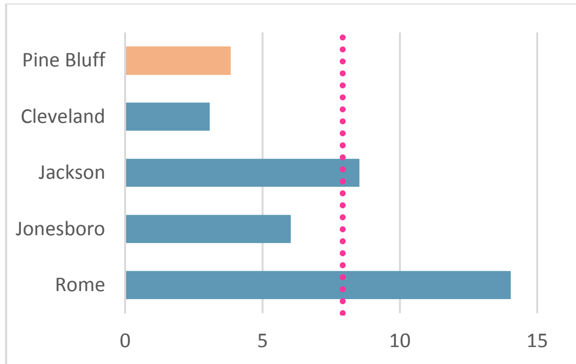
This peer comparison suggests that PBT is providing a lower level of service than many of its peers and with less cost efficiency. The slightly lower population and lower population density of the Pine Bluff region can make transit more difficult to support than some larger or denser areas. However, these peers are still rather similar to Pine Bluff, suggesting that there are ways to improve service or cost efficiency, if not both. Additionally, while the Pine Bluff MPO is the least dense, the PBT service area has the highest population density of the group.

Figure 5.10: Peer Fixed Route System Trends, 2015-2018

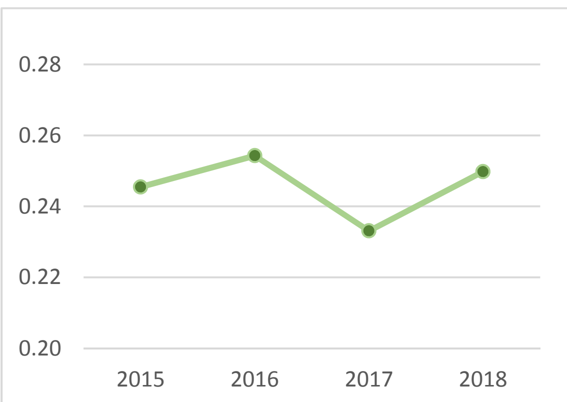
Level of Service Indicators

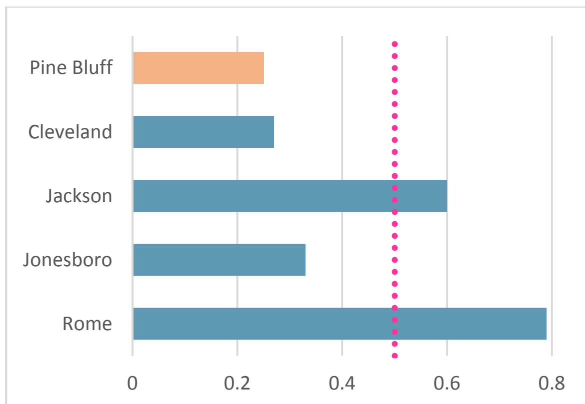
Vehicle Revenue Miles per Capita*





Vehicle Revenue Hours per Capita*



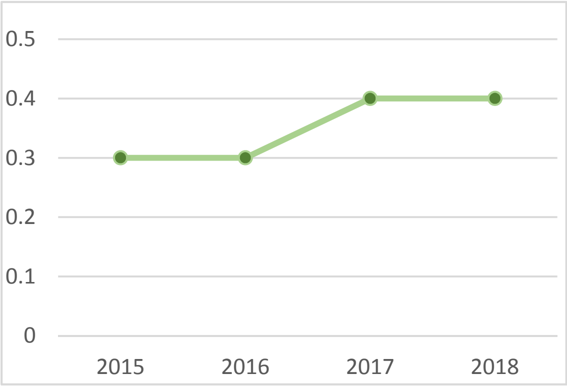


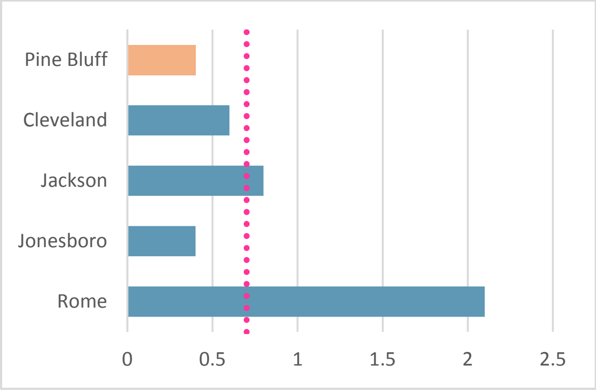
••• Peer Average

*Per Capita Population is the Service Area Population

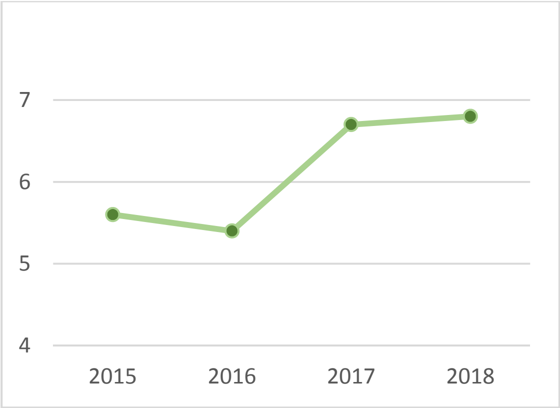
Productivity Indicators

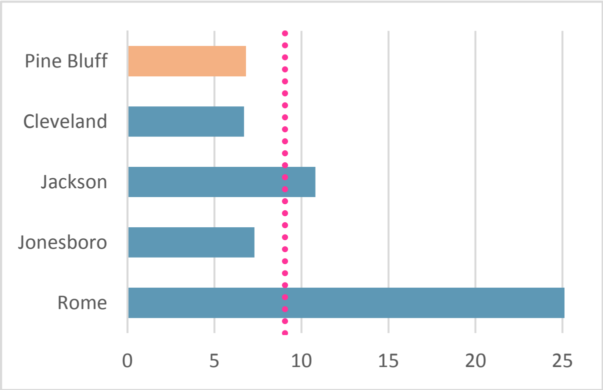
Boardings per Revenue Mile



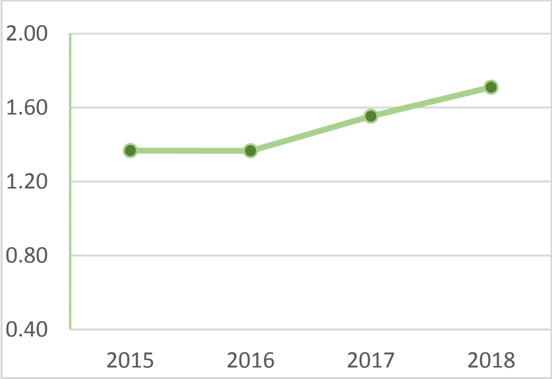


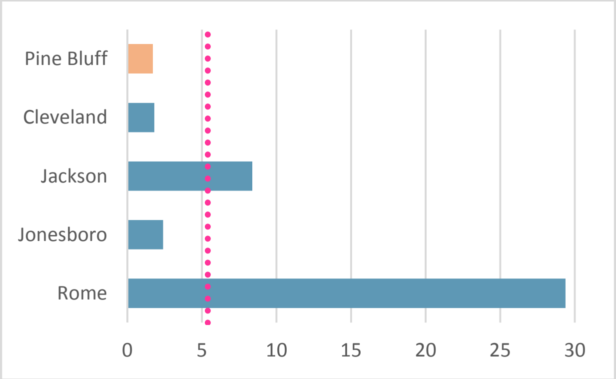
Boardings per Revenue Hour





Boardings per Capita

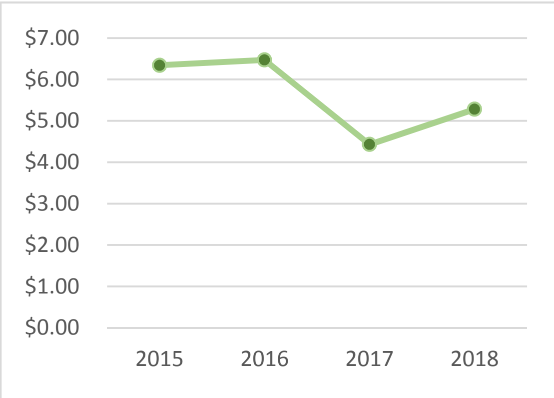


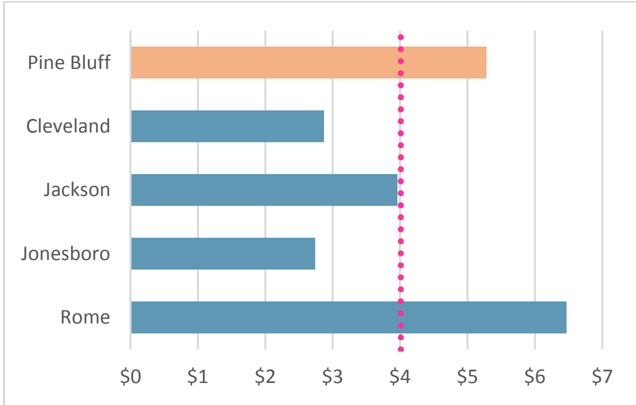


••• Peer Average for Boardings per Revenue Mile; Peer Median for Boardings per Revenue Hour and Boardings per Capita to account for outlier

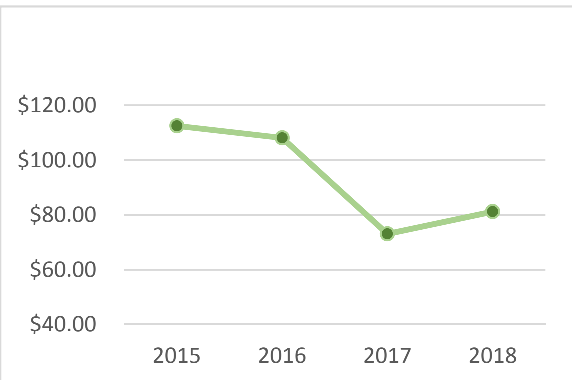
Cost Efficiency Indicators

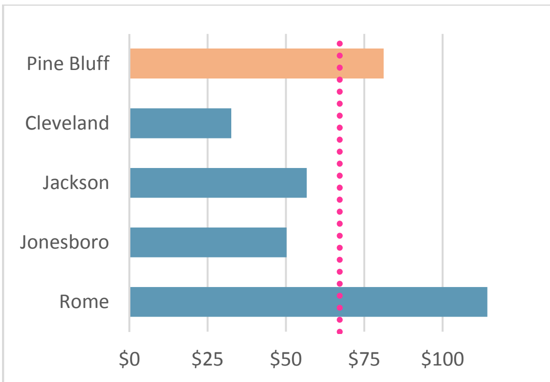
Operating Expense per Vehicle Revenue Mile



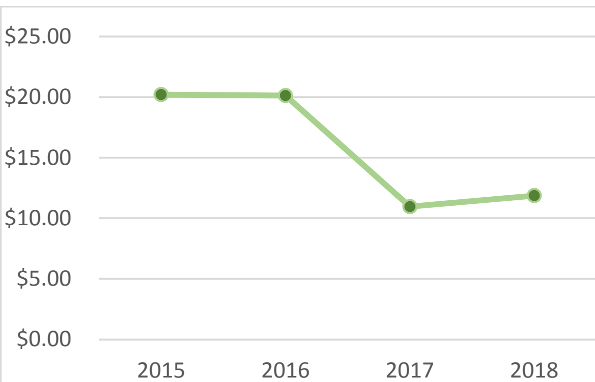


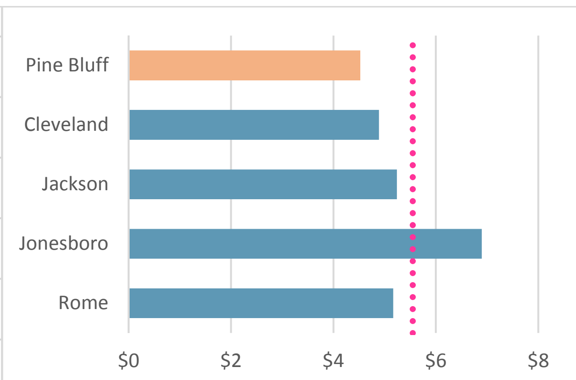
Operating Expense per Vehicle Revenue Hour





Operating Expense per Boarding





••• Peer Average

Table 5.13: Operating Characteristics for Fixed Route Services in Peer Urbanized Areas, 2018

Transit System Characteristics	Pine Bluff	Peer Average	Cleveland, TN	Jackson, TN	Jonesboro, AR	Rome, GA
Transit Agency	Pine Bluff Transit		Southeast Tennessee Human Resource Agency-Cleveland Urban Area Transit System Division	Jackson Transit Authority	Jonesboro Economical Transportation System	Rome Transit Department
Service Area Population	42,982	55,431	66,333	67,265	51,804	36,323
Service Area Square Miles	15	36	24	48	39	32
Service Area Population Density (ppsm)	2,865	846	2,764	1,401	1,328	1,135
Vehicles Operated in Maximum Services	4	14	7	9	8	31
Annual Operating Budget	$871,690	$876,160	$585,330	$2,271,390	$856,484	$3,296,026
Service Supplied and Consumed						
Annual Vehicle Revenue Miles	165,094	399,790	203,820	573,424	312,196	509,719
Annual Vehicle Revenue Hours	10,736	26,003	18,003	40,102	17,069	28,839
Annual Boardings	73,511	436,157	119,772	433,653	124,182	1,067,020
Boardings per Capita	1.5	6.7	1.5	6.0	1.8	17.6
Boardings per Revenue Mile	0.4	1.0	0.6	0.8	0.4	2.1
Boardings per Revenue Hour	6.8	15.4	6.7	10.8	7.3	37.0
Cost Efficiency						
Operating Expense per Vehicle Revenue Mile	$5.28	$4.01	$2.87	$3.96	$2.74	$6.47
Operating Expense per Vehicle Revenue Hour	$81.19	$52.59	$32.51	$56.64	$6.90	$114.29
Operating Expense per Boardings	$11.86	$5.03	$4.89	$5.24	$6.90	$3.09
Fare Revenue						
Average Fare	$0.65	$0.52	$0.27	$0.72	$0.48	$0.61
Farebox Recovery Rate	5.5%	11.5%	5.6%	13.7%	6.9%	19.6%

Source: National Transit Database, 2018 Reporting Information for Bus Services

APPENDIX

3

Transportation Performance Management Report

Draft September 2020

Pine Bluff - White Hall - Jefferson County
Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

Prepared by:

NEEL-SCHAFFER
Solutions you can build upon

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1 Performance Management

The 2045 Metropolitan Transportation Plan (MTP) follows the principles of performance-based planning and programming and related federal regulations laid out in MAP-21 and the FAST Act. These performance-based regulations require all Metropolitan Planning Organizations (MPOs) to track specific transportation performance measures related to national goals and to set targets for these measures.

The scorecard on the following pages displays the MPO's baseline performance, with comparisons to the state's baseline performance and targets. The Southeast Arkansas Regional Planning Commission (SEARPC), the MPO for the region, has chosen to support the state targets set by the Arkansas Department of Transportation (ArDOT).

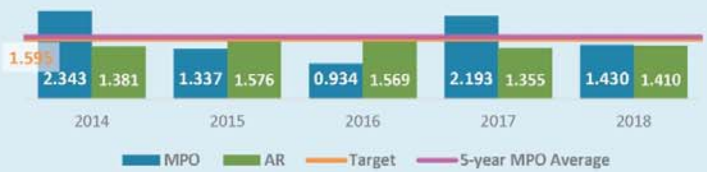
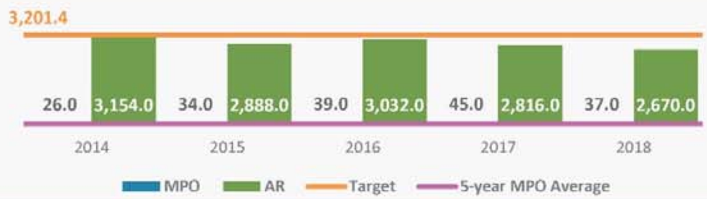
This report also discusses future actions that the MPO can take to improve regional performance and further support state targets.

This report only addresses specific performance measures required by federal transportation performance management regulations. A more complete assessment of current transportation conditions can be found in *Appendix #2: Existing Conditions Analysis*.

Pine Bluff • White Hall • Jefferson County MPO
Transportation Performance Management Scorecard

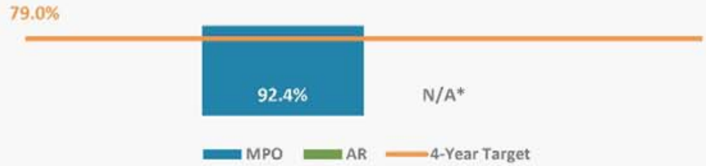
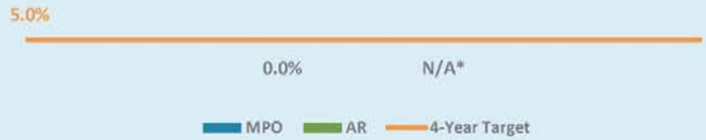
Legend ▸ Target | Good | Needs Improvement | Poor

Safety Performance Measures (PM1)

Measure	ArDOT Calendar Year 2020 Target	5-Year MPO Average	2014-2018 Trends/Results	Score	Analysis
Number of Fatalities	541.2	8.8		Good	The number of fatalities in the MPA has been steady between 2014 and 2018.
Rate of Fatalities (per 100 million Vehicle Miles Traveled)	1.595	1.647		Poor	The MPA's average rate of fatalities exceeds the state target.
Number of Serious Injuries	3,201.4	36.2		Good	The number of serious injuries in the MPA has been steady between 2014 and 2018.
Rate of Serious Injuries (per 100 million Vehicle Miles Traveled)	9.441	6.738		Good	The rate of serious injuries between 2014 and 2018 has been below the state target.
Number of Non-motorized fatalities and serious injuries	300.3	3.8		Good	The number of non-motorized fatalities and serious injuries in the MPA has been steady between 2014 and 2018.

Source: Fatality Analysis Reporting System (FARS); Arkansas Department of Transportation (ArDOT)

Bridge/Pavement Performance Measures (PM2)

Measure	ArDOT 2-Year Target 2020	ArDOT 4-Year Target 2022	2018 Trends/Results	Score	Analysis
Percent of Pavements of the Interstate System in Good Condition	N/A*	> 79.0%			The percent of Interstate pavements in the MPA in good condition exceeds the state target.
Percent of Pavements of the Interstate System in Poor Condition	N/A*	< 5.0%			There were no Interstate pavements in the MPA in poor condition.
Percent of Pavements of the Non-Interstate NHS in Good Condition	> 48.0%	> 44.0%			The percent of Non-Interstate pavements in the MPA in good condition does not meet the state target.
Percent of Pavements of the Non-Interstate NHS in Poor Condition	< 10.0%	< 12.0%			The percent of Non-Interstate NHS pavements in poor condition meets the state target.
Percent of NHS bridges in Good condition by deck area	> 50.0%	> 50.0%			The percent of NHS bridges in good condition by deck area in the MPA meets the state target.
Percent of NHS bridges in Poor condition by deck area	< 6.0%	< 4.0%			The percent of NHS bridges in poor condition by deck area in the MPA meets the state target.

Source: ArDOT; National Bridge Inventory (NBI)

Note: *The FAST Act states that for the first performance period only, the state baseline condition and 2-year targets are not required for the Pavements on the Interstate System measures.

System Performance Measures (PM3)

Measure	ArDOT 2-Year Target 2020	ArDOT 4-Year Target 2022	2018 Trends/Results	Score	Analysis
Percent of Person-Miles Traveled on the Interstate that are Reliable	> 91.0%	> 89.0%			All person-miles traveled on the Interstate in the MPA are reliable.
Percent of Person-Miles Traveled on the Non-Interstate NHS that are Reliable	N/A**	> 90.0%			The percent of person-miles traveled on the Non-Interstate NHS that are reliable in the MPA meets the state target.
Truck Travel Time Reliability (TTTR) Index on the Interstate	< 1.45	< 1.52			The Interstate TTTR Index in the MPA meets the state target.

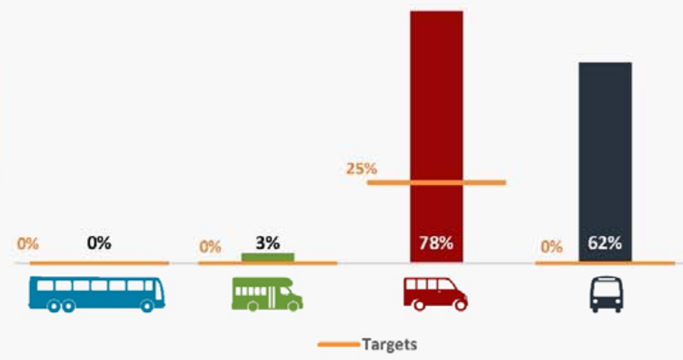
Source: National Performance Management Research Data Set (NPMRDS)

Note: **The FAST Act states that for the first performance period only, the state baseline condition and 2-year targets are not required for the Pavements on the Non-Interstate NHS measures.

Transit Asset Management 2018 Performance and Target

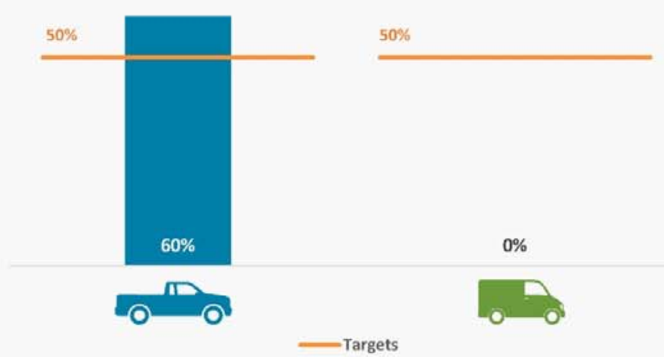
Rolling Stock

Measure	Asset Category	2020 Target	2018 Trends/Results	Score	Analysis
Percentage of revenue vehicles exceeding their Useful Life Benchmark (ULB)	Buses	0%			The percentage of each vehicle exceeding the ULB, except for buses, is greater than the target for each vehicle, indicating an aging transit fleet.
	Cutaway Buses	0%			
	Mini Van	25%			
	Van	0%			



Equipment

Measure	Asset Category	2020 Target	2018 Trends/Results	Score	Analysis
Percentage of non-revenue service vehicles exceeding their ULB	Service Truck	50%			The percentage of service trucks exceeding the ULB is greater than the target. The vans do not exceed the ULB target.
	Van	50%			



Source: National Transit Database (NTD) records for Pine Bluff Transit (PBT) and Area Agency on Aging of Southeast Arkansas (AAASEA)

Transit Asset Management 2018 Performance and Target

Facilities

Measure	Asset Category	2020 Target	2018 Trends/Results	Score	Analysis
Percentage of facilities rated under 3.0 on the Transit Economic Requirements Model (TERM) scale	Combined Administrative and Maintenance Facility	25%	25% 25% 25%	☺	None of the facilities are rated under 3.0 on the TERM Scale.
	Administrative Office/ Sales Office	25%		☺	
	Maintenance Facility (Service and Inspection)	25%	0% 0% 0%	☺	

Infrastructure

Measure	Asset Category	2019-2022 Target	2018 Trends/Results	Score	Analysis

Not Applicable in the Pine Bluff Metropolitan Planning Area

Source: NDT records for PBT and AAASEA

Transit Safety

Measure	Mode	Target	5-Year MPO Average	2014-2018 Trends/Results***	Score	Analysis
Number of Fatalities by mode	Fixed Route Bus	TBD	TBD	TBD	TBD	Safety plans and targets are still under development by transit providers and MPOs.
	Non-Fixed Route Bus	TBD	TBD	TBD	TBD	
Rate of Fatalities per 100,000 Total Vehicle Revenue Miles by mode	Fixed Route Bus	TBD	TBD	TBD	TBD	
	Non-Fixed Route Bus	TBD	TBD	TBD	TBD	
Number of Injuries by mode	Fixed Route Bus	TBD	TBD	TBD	TBD	
	Non-Fixed Route Bus	TBD	TBD	TBD	TBD	

Source: NTD

Note: *** The detailed data by each mode is not yet available for all transit providers in NTD. A summary of all modes is available, but the PTASP regulations require the data to be broken out by mode.

Transit Safety

Measure	Mode	Target	5-Year MPO Average	2014-2018 Trends/Results***	Score	Analysis
Rate of Injuries per 100,000 Total Vehicle Revenue Miles by mode	Fixed Route Bus	TBD	TBD	TBD	TBD	Safety plans and targets are still under development by transit providers and MPOs.
	Non-Fixed Route Bus	TBD	TBD	TBD	TBD	
Number of Safety Events by mode	Fixed Route Bus	TBD	TBD	TBD	TBD	
	Non-Fixed Route Bus	TBD	TBD	TBD	TBD	
Rate of Safety Events per 100,000 Total Vehicle Revenue Miles by mode	Fixed Route Bus	TBD	TBD	TBD	TBD	
	Non-Fixed Route Bus	TBD	TBD	TBD	TBD	

Source: NTD

Note: *** The detailed data by each mode is not yet available for all transit providers in NTD. A summary of all modes is available, but the PTASP regulations require the data to be broken out by mode.

Transit Safety

Measure	Mode	Target	5-Year MPO Average	2014-2018 Trends/Results***	Score	Analysis
Mean Distance Between Major Mechanical Failures by mode	Fixed Route Bus	TBD	TBD	TBD	TBD	Safety plans and targets are still under development by transit providers and MPOs.
	Non-Fixed Route Bus	TBD	TBD	TBD	TBD	

Source: NTD

Note: *** The detailed data by each mode is not yet available for all transit providers in NTD. A summary of all modes is available, but the PTASP regulations require the data to be broken out by mode.

2 Future MPO Actions

2.1 Safety Performance

The MPO meets all the established safety performance targets except for "Rate of Fatalities". It is not uncommon for urban areas, which have higher traffic volumes and an increased rate of crashes, to experience this. However, to support the state targets, the MPO must reduce fatalities and serious injuries on its roadways. Efforts the MPO may undertake to reduce these crashes and reduce fatality and serious injury rates include:

- Keeping roadways and bridges maintained and as congestion-free as possible.
- Working with state and local officials, as well as other safety stakeholders, to reduce fatalities and serious injuries on roadways.
- Coordinating with ArDOT to develop the state's Highway Safety Improvement Program (HSIP).
- Ensuring that transportation projects and safety improvements are coordinated with the state's Strategic Highway Safety Plan (SHSP).
- Identifying safety programs that may be implemented.
- Considering how projects placed in the Transportation Improvement Program will impact safety.

2.2 Bridge/Pavement Performance

The MPO meets the established pavement targets except for "Percent of Pavements of the Non-Interstate NHS in Good Condition". To improve its pavement performance on roadways, the MPO should:

- Prioritize timely repairs and pavement resurfacing on routes with deteriorating pavement conditions when they arise.
- Work with state and local stakeholders to identify and repair pavement cracking, rutting, potholes, etc.
- Reduce or eliminate heavy vehicle traffic on the affected roadways by establishing designated truck routes on roadways with better pavement conditions.
- Use the local Intelligent Transportation Systems (TS) infrastructure to monitor roadway conditions and redirect drivers to less congested routes.
- Employ Travel Demand Management (TDM) strategies.

The MPO meets the state targets for bridge conditions. In order for the MPO to continue meeting the state targets as well as support and improve the state's performance, it will need to place emphasis on repairing bridges that are not in Good condition. The MPA bridges that are not in Good condition should be prioritized through the plan's operation and maintenance budget. This will also increase safety and system performance and avoid costlier repairs in the future.

Where possible, the MPO, in coordination with ArDOT, should apply for applicable federal grants to aid with obtaining funds for bridge repairs and maintenance. While there is no guarantee of receiving federal funding, the grants would allow the MPO to expedite repairs and increase the number of bridges to be repaired to Good condition.

2.3 System Performance

Roadway reliability on the Interstate and non-Interstate NHS routes within the meets the state targets.

The actions the MPO may take to continue supporting the Interstate and non-Interstate NHS reliability are:

- Working with law enforcement to remove crashes from travel lanes, thereby reducing congestion.
- Using ITS to advise motorists of roadway conditions and redirect drivers to less congested routes.
- Implementing signal coordination projects to reduce congestion.
- Scheduling roadway work at off-peak times.
- Employing Travel Demand Management strategies.

The MPA's only Interstate, I-530, has a Truck Travel Time Reliability (TTTR) of 1.15, which meets the state target. To continue to support the state's TTTR target, the MPO should maintain the current TTTR. The MPO can take these actions to maintain the current TTTR:

- Working with law enforcement to remove crashes from travel lanes, thereby reducing congestion.
- Using ITS to advise motorists of roadway conditions and redirecting drivers to less congested routes.
- Implementing signal coordination projects at Interstate ramps to reduce queueing on ramps and promote efficiency.

- Scheduling roadway work at off-peak times.
- Employing Travel Demand Management strategies.
- Using ITS to advise truck drivers of roadway conditions and redirecting them to less congested routes.
- Providing alternative truck routes.

2.4 Transit Asset Management Performance

The overall age of approximately three (3) percent of cutaway buses, 78 percent of minivans, and 62 percent of vans that are operated by Pine Bluff Transit (PBT) and the Area Agency on Aging of Southeast Arkansas (AAASEA) exceed their useful life benchmarks (ULBs). The percentage of these vehicles exceeding their ULBs exceeds the transit targets established by the MPO.

The overall age of 60 percent of service trucks exceeds its ULB, and this percentage of these vehicles exceeding its ULB exceeds the MPO’s targets. There were no vans that exceeded the ULB.

PBT maintains an administrative/maintenance office, and AAASEA maintains an administrative/sales office and a maintenance facility. Of these three (3), none of the buildings rate below a 3.0 on the Transit Economic Requirements Model (TERM) scale. These buildings do not exceed their targets established by the MPO.

2.5 Transit Safety

The Federal Transit Administration (FTA) has added new safety requirements for transit providers in order to satisfy the new Public Transportation Agency Safety Plans (PTASP) rule. The new PTASP rule requires that qualifying transit agencies develop:

- An Agency Safety Plan (ASP), including performance targets
- A Safety Management System (SMS)
- Documentation related to the ASP and SMS as well as the results of the SMS processes and activities.

The FTA states that:

> "The PTASP rule requires transit providers to have their certified agency safety plans in place, which includes the first set of required safety performance targets and share these targets with the MPO no later than July 20, 2020. The MPOs then have 180 days from receipt of the agency performance targets to prepare their initial public transportation safety performance targets."

The FTA also states:

> "Each transit provider is required to review its agency safety plan, annually and update the plan, including the safety performance targets, as necessary.
>
> The MPO is not required to set new transit safety targets each year but can choose to revisit the MPO's safety targets based on the schedule for preparation of its system performance report that is part of the Metropolitan Transportation Plan (MTP). The first MPO MTP update or amendment to be approved on or after July 20, 2021, must include the adopted transit safety targets for the region."

The 2045 Metropolitan Transportation Plan is not required to contain PTSAP related performance measure targets, but the performance metrics that will be tracked in the future are shown in the scorecards above so that Pine Bluff Transit and the MPO may plan accordingly.

APPENDIX

Needs Assessment

4

Draft September 2020

Pine Bluff - White Hall - Jefferson County
Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

Prepared by:

NEEL-SCHAFFER
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1 Introduction

This report discusses transportation needs for the Pine Bluff-White Hall-Jefferson County Metropolitan Planning Area (MPA). It is informed by the analysis of existing conditions in *Technical Report 2: Existing Conditions* and an assessment of future needs based on current trends, existing plans, and public and stakeholder involvement.

2 Special Considerations

Federal regulations require long-range transportation plans to consider resilience and tourism as they relate to transportation.

2.1 Resilience

In the context of this plan, "resilience" is the ability of transportation systems to withstand or recover from extreme or changing conditions and continue to provide reliable mobility and accessibility in the region.

> The impacts of weather, other natural events, or man-made events must be considered in resiliency.

2.1.1 Regional Considerations

The following transportation resiliency needs within the MPA should carefully be considered related to the following regional issues:

- High wind events: The MPA can experience severe thunderstorms that produce damaging winds. Additionally, there is a risk for tornadoes within the MPA as it is located in "Dixie Alley", an area of the Southern United States that is particularly vulnerable to tornadoes. Although the MPA is located well inland from the Gulf of Mexico and Atlantic Ocean, tropical systems can still bring high winds to the MPA. These high wind events can affect transportation systems, such as debris blocking roadways.
- Floods: In the MPA, flooding hazards are typically flash flooding, river or small stream flooding, or flooding from tropical systems that pass through the MPA. Flooding can result in significant damage to transportation systems, such as roads being washed out by floodwaters.
- Snow and Ice: The MPA, like most of the southern United States, does not usually experience significant winter weather. However, even a large enough amount of winter precipitation (snow and ice) can have a significant impact on the MPA's transportation system by having roads and bridges closed due to icy conditions.
- Earthquakes: Earthquakes can result in damages to transportation systems. However, the risk of earthquakes within the MPA is relatively low, and there has not been a reported earthquake within close proximity to the Pine Bluff MPA since at least 2009. Nonetheless,

distant earthquakes, such as those that could occur between Little Rock and Pine Bluff, may still impact transportation systems within the MPA.

2.1.2 Resiliency Needs

Ensuring resiliency involves understanding hazards and identifying mitigation strategies. The MPO should continue to coordinate with local and regional hazard mitigation planners to proactively plan for a transportation system that is responsive to hazards. The MPO should also continue to advocate for best stormwater management practices and green infrastructure in the design of transportation projects.

<u>Stormwater Mitigation</u>

As an area grows and changes, its land use and infrastructure change with it. These changes affect how precipitation events, the product of which is stormwater, affect roadways, homes, runoff, ground water, and more. Stormwater can become ground water through runoff or evaporation. When stormwater becomes runoff, it ends up in nearby streams, rivers, or other water bodies as surface water.

The overall effect precipitation from a storm can have is heavily influenced by land use and development. Any change in these factors will change how stormwater behaves within the area. As areas develop, previously pervious areas, such as, grass, wetlands, and wooded areas, are replaced by impervious surfaces. Examples of developed impervious areas include new roadways, sidewalks, driveways, and parking lots. The increase in impervious areas can significantly decrease the runoff time in an area and lead to an increase in flooding.

Significant rainfall in an urban area within a short amount of time can lead to flash flooding issues for a municipality. This flooding can damage property and create environmental and public health hazards by introducing contaminants into new areas. Without proper drainage and stormwater mitigation efforts, new transportation projects have the potential to exacerbate existing stormwater issues. With well-planned, coordinated efforts and using "green infrastructure" design, projects can create a more natural looking environment and decrease the chances of detrimental stormwater runoff issues. In fact, in some cases, stormwater drainage may even be improved.

Green Infrastructure

Green infrastructure is a cost-effective approach to managing weather events, while providing benefits to the community. When rain falls onto impervious areas, stormwater is forced to drain through gutters, storm sewers, and other collection systems. This runoff may collect trash, bacteria, and other pollutants from the urban environment and introduce them to community at large, creating health risks. Green infrastructure uses vegetation, soils, and other elements to mimic a more natural environment, treating stormwater at its source, using the ground and plants as a filter to eliminate potential pollutants. With an increase in green space, the health benefits to a community are obvious.

A natural environment approach to development positively impacts a community's stormwater drainage system in several ways. It can mitigate flood risk by slowing runoff and reducing stormwater discharge. With less water to divert, the risk of flooding is lower. Green infrastructure may also decrease the needed size of the drainage system, reducing the overall cost of materials, maintenance, and future repairs.

Effective examples of Green Infrastructure, shown in Figure 2.1, include permeable pavements, bioswales or vegetative swales, green streets and alleys, and green parking. Green Infrastructure can also be applied to commercial buildings and residential homes, but when used as stormwater mitigation for transportation development, the health and cost benefits are certainly worth exploring for any community.

Figure 2.1: Green Infrastructure Examples

Source: https://www.epa.gov/green-infrastructure/what-green-infrastructure

Transportation Related Strategies

- During project design, minimize impervious surfaces and alterations to natural landscapes.
- Promote the use of “green infrastructure” and other Low-Impact Development (LID) practices. Examples include the use of rain barrels, rain gardens, buffer strips, bioswales, and replacement of impervious surfaces on property with pervious materials such as gravel or permeable pavers.
- Adopt ordinances that include stormwater mitigation practices, including landscaping standards, tree preservation, and “green streets”.
- Develop a Standard Urban Stormwater Mitigation Plan (SUSMP) at multiple levels; including state, region, and municipality. A SUSMP is a useful tool where municipalities put into writing, requirements for stormwater control measures for development, as well as, redevelopment. Incorporating LID practices into a SUSMP is an effective method of reducing a development’s impact on its environment. Efforts should be made to coordinate these plans, even though multiple agencies would have them in place.

Additional Strategies

- Educate residents, business owners, elected officials, and developers on the impacts of stormwater and how they can assist with mitigation.
- Identify the areas most likely to flood during heavy storm events and prioritize mitigation efforts in that area and areas upstream from it.
- The adoption of open space preservation plans, which will balance land use and local developments with preservation and conservation of the existing open space.
- The establishment of stormwater fees to support the funding of stormwater management projects and practices.
- Reduce the amount of impervious surfaces on residential, commercial, and public properties and offer incentives to encourage the change.

Existing Policies and Considerations

The State of Arkansas has a statewide stormwater management plan that has been published through the Arkansas Department of Transportation (ArDOT). Information about the plan can be found at:

http://www.ardot.gov/stormwater/statewide_swmp.aspx

The MPA is part of the Southeast Arkansas Stormwater Education program. Education efforts, tips, and policies can be found at:

https://www.uaex.edu/environment-nature/water/stormwater/seastormwater/

Jefferson County's Office of Emergency Management is responsible for administering the local Floodplain Management Program and the Storm Water Pollution Prevention Program.

The MPO should coordinate with all of the agencies above to ensure consistency in the plans and ordinances, as well as to create additional documents and policies necessary to mitigate stormwater impacts within the MPA. Additionally, the MPO should work with the Cities of Pine Bluff and White Hall to create their own local Stormwater Management Program or SUSMP.

2.3 Tourism

Leisure and tourism trips are an important consideration in transportation planning. Tourism in Jefferson County accounts for only about two (2) percent of the state's travel-generated payroll, employment, or taxes[1]. However, with its natural beauty, museums, and rich history, Jefferson County has the highest amount of travel-generated employment or tax revenue in the Arkansas "Land of Legends" region.

In 2018, tourism in the county generated $2.69 million dollars in local taxes, a three (3) percent increase from the previous year. The tourism industry also directly employed nearly 1,200 people and generated $21.24 million in payroll for the county.

2.3.1 Major Attractions and Tourist Areas

According to the Pine Bluff Advertising and Promotion Commission, major tourist attractions are related to:

- natural attractions (Delta Rivers Nature Center, Bayou Bartholomew, etc.) and recreation,
- historic and cultural museums, and
- festivals.

Figure 2.2 shows the major tourist destinations listed by the Pine Bluff Advertising and Promotion Commission and the Arkansas' Land of Legends Travel Association. Museums and artistic attractions are located mostly in downtown Pine Bluff. Outdoor attractions are mostly along the MPA's outer edges. Figure 2.2 also shows the locations of hotels and other accommodations as well as the major activity centers for shopping, eating, and drinking. The majority of the hotels and other accommodations are located near:

- the Pines Mall where US 63 meets I-530,
- near Hestand Stadium Fairgrounds around AR 365 (Dollarway Rd and N Blake St),, and
- in White Hall near US 270 (Sheridan Rd) and Hospitality Drive.

[1] Arkansas Tourism Economic Impact (2018), https://gallery.mailchimp.com/f238f0cdf7c12d734ddc65eec/files/aab96a85-fcd2-48bc-8cc1-f52341d5060c/APT_37912_2018_ECONOMIC_IMPACT_REPORT4_FPO.pdf

The major activity centers for shopping, eating and drinking are around:

- US 79 (S Camden Rd) and I-530,
- by AR 365 (B Blake St) and US 65B (Martha Mitchell Expy),
- along US 63B (S Olive St),
- by the Pines Mall,
- in downtown Pine Bluff by Main St, and
- by W 28th Ave and S Hazel St.

2.3.2 Arriving and Departing the Region

Given the lack of commercial air service at the Pine Bluff Regional Airport, most visitors to the region arrive by driving or inter-city transportation.

- The major gateways for driving in the region are I-530, US 79, and US 63.
- Jefferson Lines provides bus service from Pine Bluff to Little Rock and northwest Arkansas.
- In Little Rock, riders can transfer to Megabus or Greyhound buses, Amtrak trains, or the Clinton National Airport.

2.3.3 Traveling Within the Region

Once visitors have arrived to the region, they have several options for traveling around. These options include:

- **Walking:** There are many sidewalks in the downtown area that visitors can use to reach destinations in the urban core, as well as some walking paths like Lake Saracen Trail.
- **Transit:** Pine Bluff Transit provides fixed route service that visitors can take throughout the city.
- **Driving:** Visitors can rent a car from any of the area's car rental companies.
- **Taxis and Transportation Network Companies:** Traditional taxis, Uber, and Lyft are available in the region.
- **Tour Bus:** Visitors also have the option of traveling via tour buses as a group or as individuals.

2.3.4 Tourism Needs

There are many potential strategies to enhance and encourage tourism within the MPA, including the following:

- **Wayfinding:** Even with the prevalence of smartphones and navigation technology, visitors to the region may require wayfinding assistance in some areas. This is especially true near gateways and major points of interests.
- **Expanded Sidewalks and Bike Facilities:** Many visitors to the region may not have a car at their disposal. Improving and expanding sidewalks, bike lanes, and pathways in major tourist areas will improve visitor mobility and reduce the need for additional car traffic. Bicycle rental shops could help supply bicycles to visitors.
- **Improving Public Transportation Information:** Again, many visitors to the region may not have a car at their disposal. Advertising Pine Bluff Transit to visitors and providing updated route and schedule information on the website can make transit more accessible to visitors.
- **Special Event Transportation Management:** Major special events in the region like festivals require temporary solutions such as "contra-flow" traffic on local streets, road closures, detours, special wayfinding, supplemental parking, and shuttles.

Beyond these strategies, the MPO should continue to coordinate with tourism stakeholders to stay abreast of their needs.

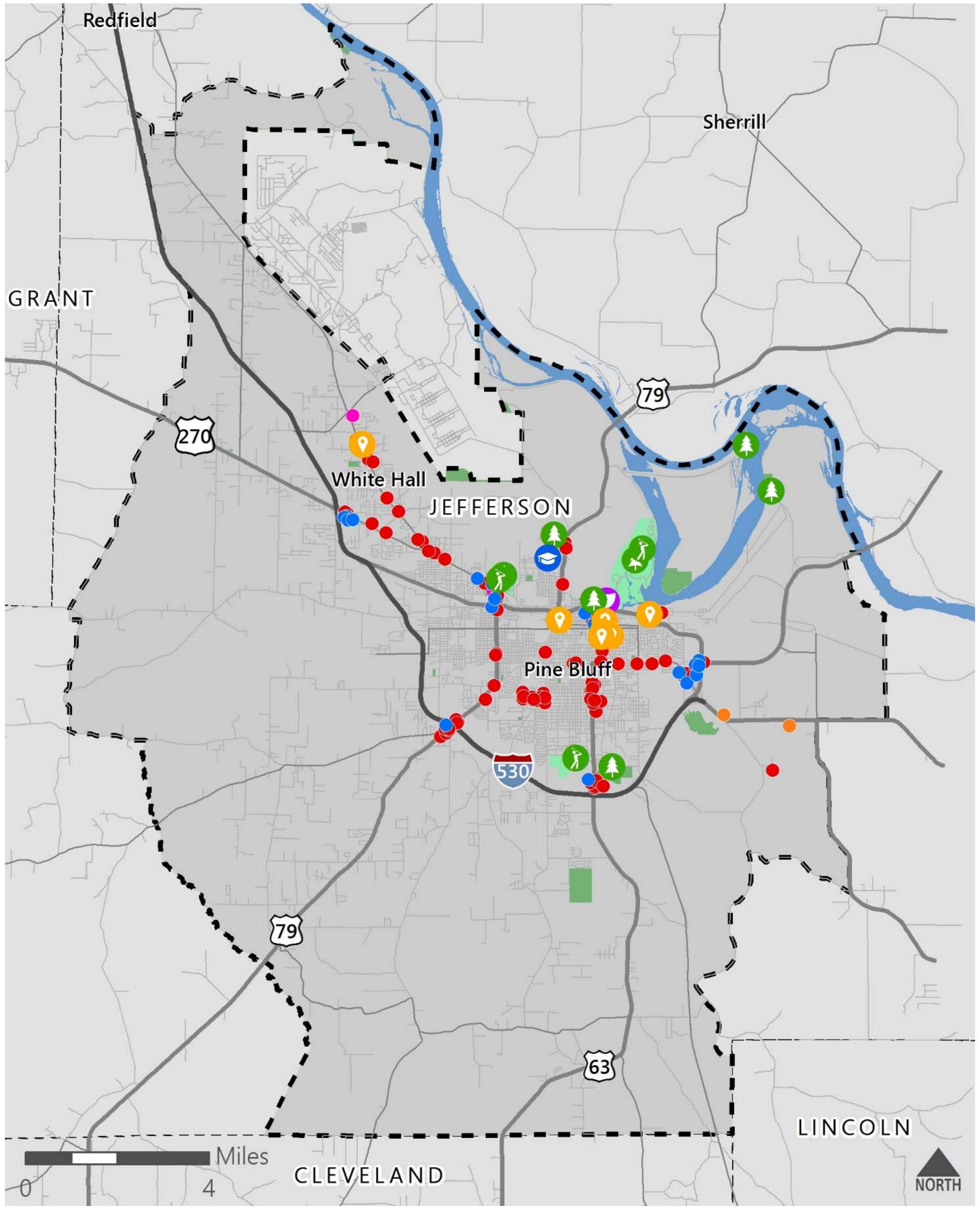
Table 2.1: Major Tourist Destinations

Destination Type	Name
University	H.O. Clemmons Arena
	Simmons Bank Field
	UAPB Museum and Cultural Center
Golf Courses	Harbor Oaks Golf Club
	Jaycee Golf Course
	Pine Bluff Country Club
Museums and Arts	Arkansas Entertainers Hall of Fame
	Arkansas Railroad Museum
	Arts and Science Center for Southeast Arkansas
	Murals of Pine Bluff
	Pine Bluff Convention Center
	Pine Bluff-Jefferson County Historical Museum
	White Hall Museum
Other Places to Play	Crenshaw Springs Water Park
	Hestand Stadium Fairgrounds
	Pine Bluff Aquatics Center
Parks	Byrd Lake Natural Area
	Lake Langhofer
	Martin Luther King Jr Park
	Pine Bluff Regional Park
	Sainte Marie Park
	Saracen Landing
Agritourism	Bayou Bartholomew
	Delta Rivers Nature Center
	Pine Bluff Farmers Market

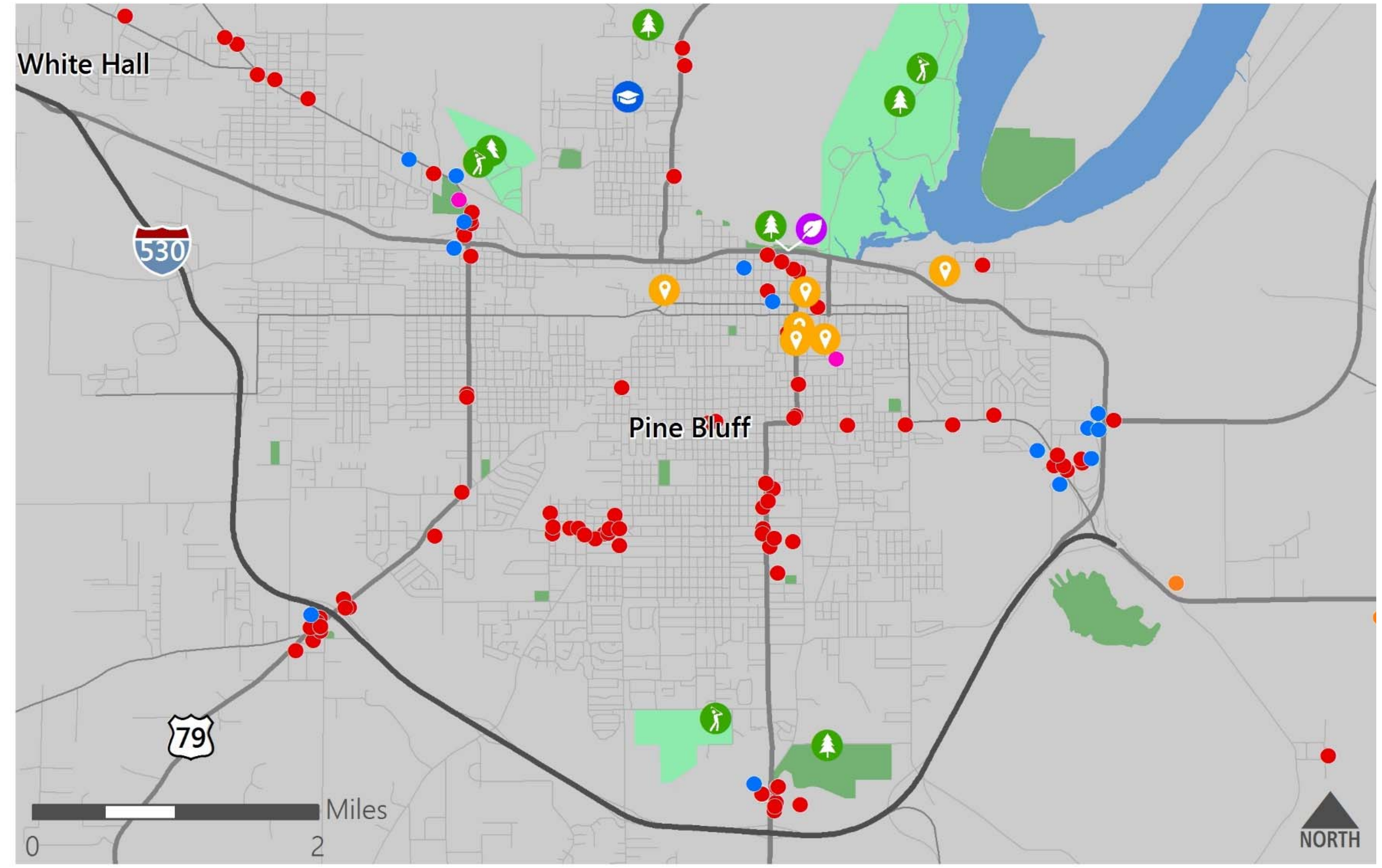
Sources: Arkansas' Land of Legends Travel Association; Pine Bluff Advertising and Promotion Commission

Figure 2.2: Major Tourist Destinations and Areas

Metropolitan Planning Area



Urban Core



Legend

- University Attractions
- Museums and Arts
- Golf Courses
- Parks
- Agritourism
- Hotels
- Shop/Eat/Drink
- RV Parks and Camping
- Other Places to Play
- Planning Area

Data Sources: Arkansas' Land of Legends Travel Association;
Pine Bluff Advertising and Promotion Commission; STR Census; MPO Staff

Disclaimer: This map is for planning purposes only.

3 Emerging Trends

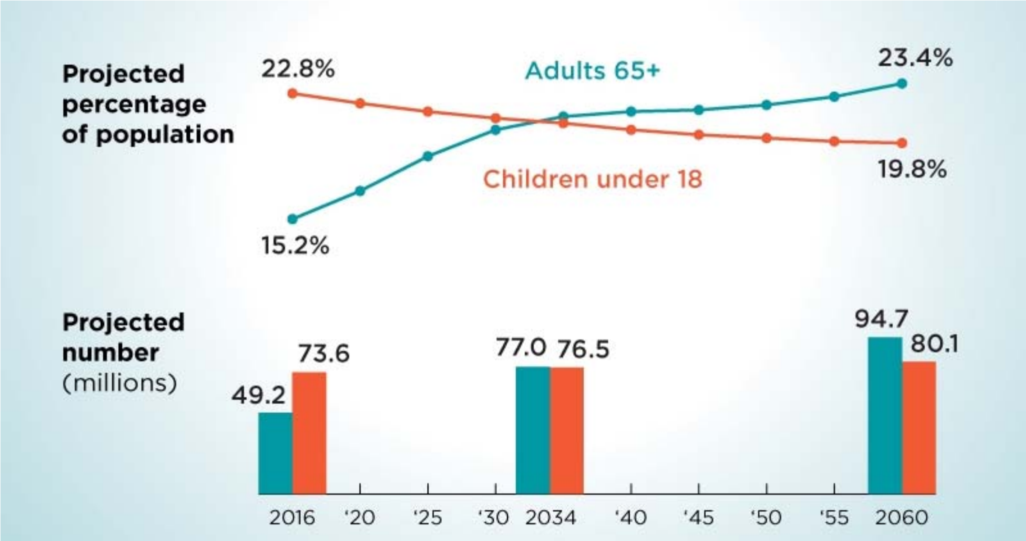
In recent years, travel patterns have changed dramatically due to demographic changes and technological advances. Many of these changes are part of longer-term trends and others are newer, emerging trends.

3.1 Changing Demographics and Travel Patterns

3.1.1 An Aging Population

The population aged 65 or older will grow rapidly over the next 25 years, nearly doubling from 2012 to 2050.[2] This growth will increase the demand for alternatives to driving, especially for public transportation for people with limited mobility or disabilities.

Figure 3.1: Growth in Senior Population



Source: U.S. Census Bureau

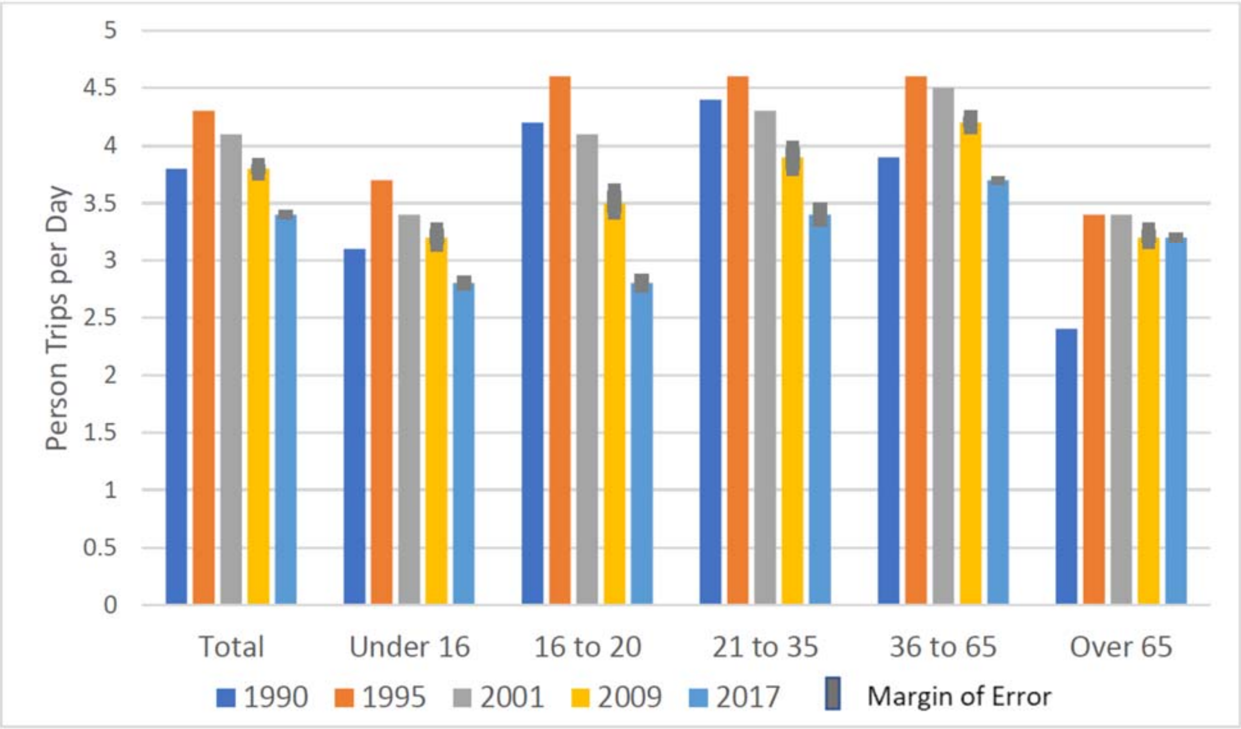
3.1.2 Most People are Traveling Less

Except for people over age 65, all age groups are making fewer trips per day. There are many factors driving this trend, including less face-to-face socializing, online shopping, and working from home.

[2] https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html

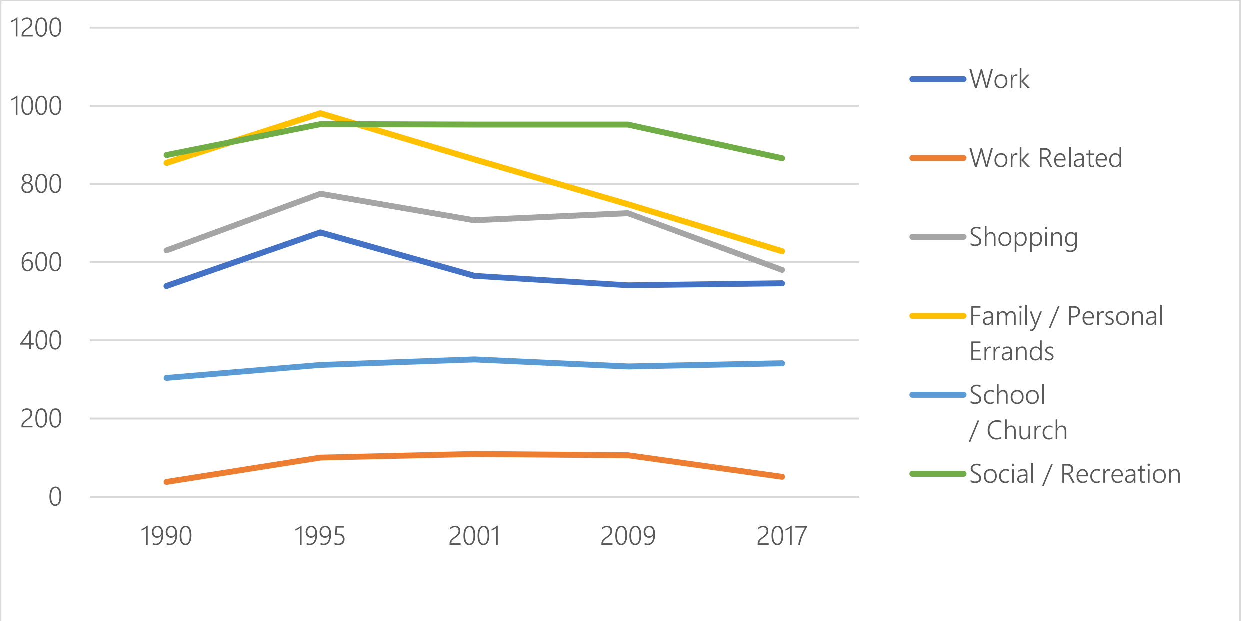
If this trend continues, travel demand may be noticeably impacted. Some major roadway projects may no longer be required and smaller improvements, such as intersection or turn lane improvements, may be sufficient for these needs.

Figure 3.2: Trends in the Average Daily Person Trips by Age



Source: 2017 National Household Travel Survey

Figure 3.3: Trends in the Average Annual Person Trips per Household by Trip Purpose



Source: 2017 National Household Travel Survey

3.2 Shared Mobility

People are increasingly interested in car-free or car-lite lifestyles. In the short-term, people are paying premiums for walkable and bikeable neighborhoods and more frequently using ride-hailing (Uber/Lyft) and shared mobility (car-sharing/bike-sharing) services. In the long-term, car ownership rates could decrease, increasing the need for investments in bicycle, pedestrian, transit, and other mobility options.

A major impetus for the change in travel behavior and reduced reliance on cars is the emergence of shared mobility options. Broadly defined, shared mobility options are transportation services and resources that are shared among users, either concurrently or one after another. They include the following:

- **Bike-sharing and Scooter-sharing (Micromobility)** – These can be dockless or dock/station-based systems where people rent bikes and scooters for short periods of time. Scooters are all electric while bikes may be electric or pedal driven. Examples include Bcycle, Social Bicycles, Lime, Bird, and Jump.
- **Ridesharing/Ride-hailing (Transportation Network Companies)** - Examples include Uber, Lyft, and Via.
- **Car-Sharing** – This includes traditional car sharing, where you rent a company-owned vehicle and peer-to-peer car sharing services. Examples include Zipcar and Turo.

- **Public Transit and Microtransit** – Public transit is itself a form of shared mobility and is evolving to incorporate new mobility options like Microtransit.

Source: Corporate Knights

3.2.1 Micromobility

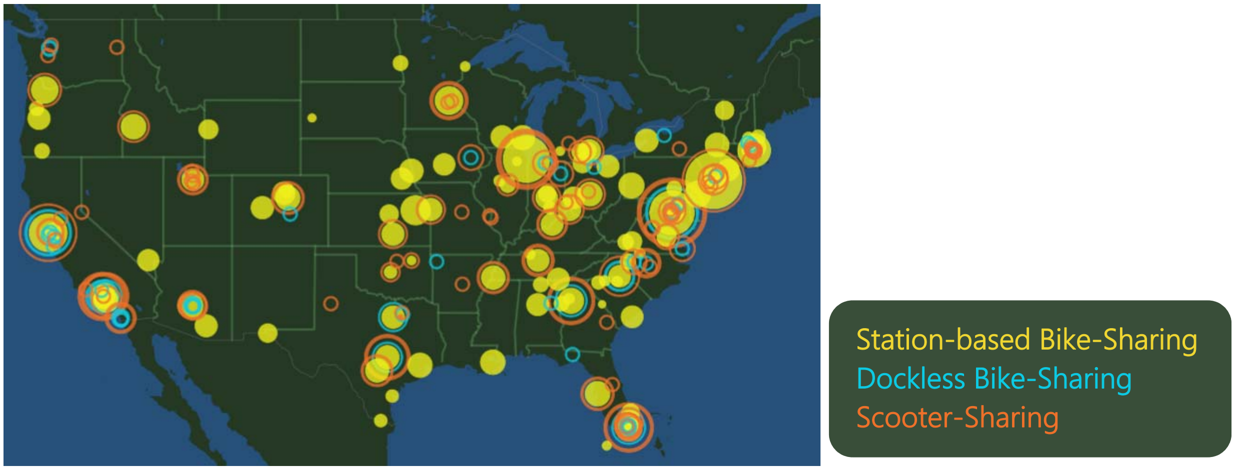
Bike-sharing and scooter-sharing, collectively referred to as micromobility options, are relatively new mobility options and continue to evolve. Modern, station-based bike-sharing emerged around 2010 and dominated the micromobility landscape from 2010 to 2016 until dockless bike-sharing systems emerged. Soon after, in late 2017, electric scooter-sharing emerged and overlapped much of the dockless bike-sharing market.

Today, most bike-sharing and scooter-sharing in the United States occurs in the major urban areas. However, these services are becoming more common in smaller urban areas and around major universities throughout the country.

Survey data from major U.S. cities shows the following micromobility trends[3]:

- People use micromobility services for a variety of trip purposes.
- People use micromobility to travel relatively short distances (1-2 miles) for short durations (10-20 minutes). However, infrequent users of station-based bike-sharing services tend to make longer distance and duration trips.
- Regular users of station-based bike-sharing services are more likely to be traveling to/from work or to connect to transit. They are also more likely to have shorter trip durations and to have cheaper trips.
- People using scooter-sharing services are more likely to be riding for recreational or exercise reasons.

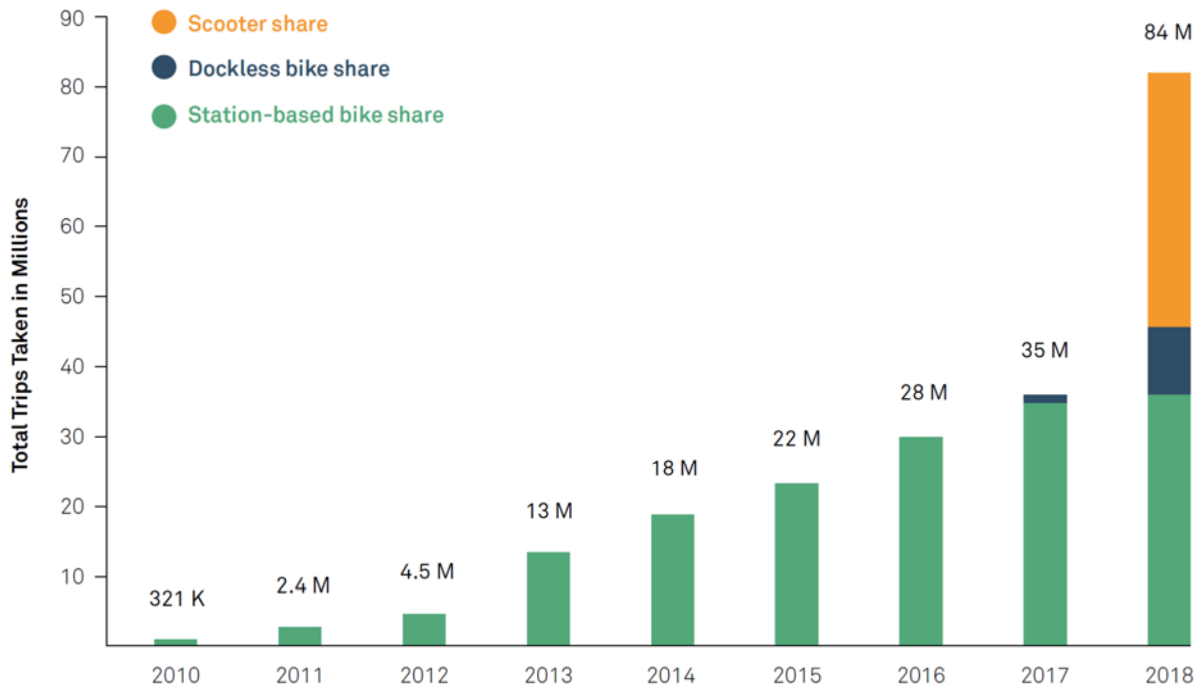
Figure 3.4: Public Bike-Sharing and Scooter-Sharing Systems in United States, 2019



Source: U.S. Department of Transportation, Bureau of Transportation Statistics

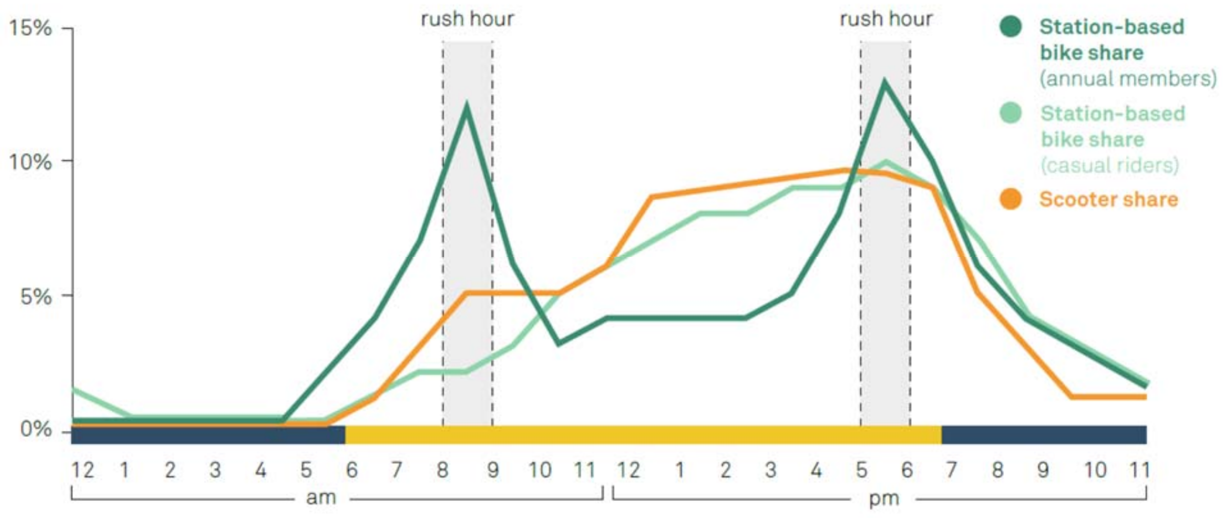
[3] https://nacto.org/wp-content/uploads/2019/04/NACTO_Shared-Micromobility-in-2018_Web.pdf

Figure 3.5: U.S. Micromobility Trips, 2010 to 2018



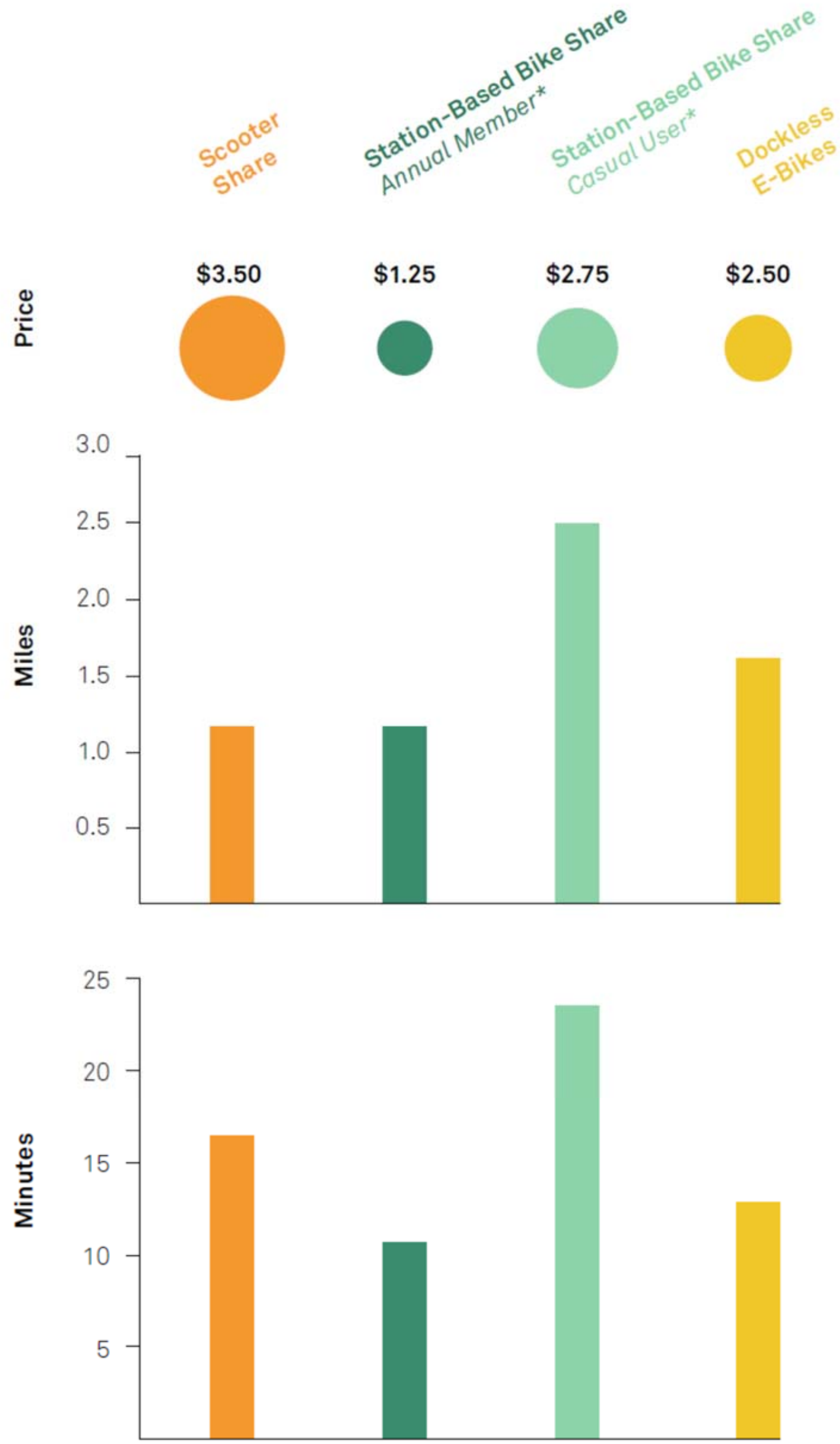
Source: [NACTO]

Figure 3.6: Average Micromobility Trips by Hour



Source: [NACTO]

Figure 3.7: Average Micromobility Trip Characteristics



Source: NACTO

3.2.2 Transportation Network Companies

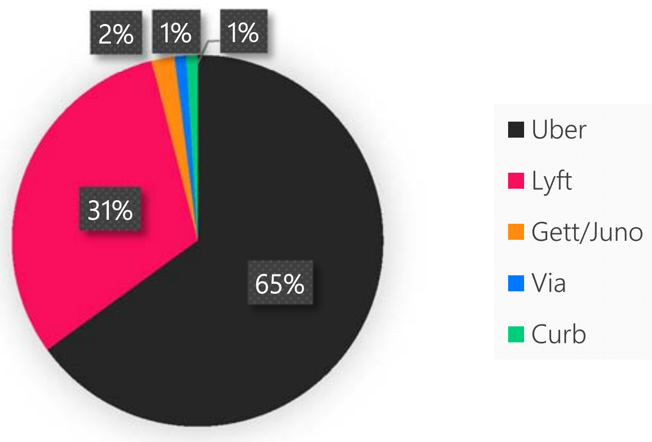
Ride-hailing and ridesharing are the terms typically used to describe the services provided by Transportation Network Companies (TNCs) like Uber and Lyft. These TNCs emerged between 2010 and 2012 and have since grown rapidly, surpassing taxis in many metropolitan areas.

Today, TNCs are operating in most urban areas in the United States, including the Pine Bluff-White Hall area. Outside of these urban areas though, service is limited or non-existent. And even with the growth into most urban areas, some TNC services are still limited to larger markets (e.g. UberPool and Lyft Shared for shared rides) or are being tested in certain markets (e.g. Uber Assist for people with disabilities).

While TNCs continue to evolve, research suggests the following TNC trends[4]:

- Trips are disproportionately work-related and social/recreational.
- Customers are predominantly affluent, well-educated and skew younger.
- The market for TNC trips overlaps the market for transit service. People appear to use it as a replacement for transit when transit is unreliable or inconvenient, as a replacement for driving when parking is expensive or scarce, or to avoid drinking and driving.
- The heaviest TNC trip volumes occur in the late evening/early morning.
- Average trip lengths are around 6 miles with a duration of 20-25 minutes. Trips in large, densely-populated areas tend to be somewhat shorter and slower while trips in suburban and rural areas tend to be somewhat longer and faster.

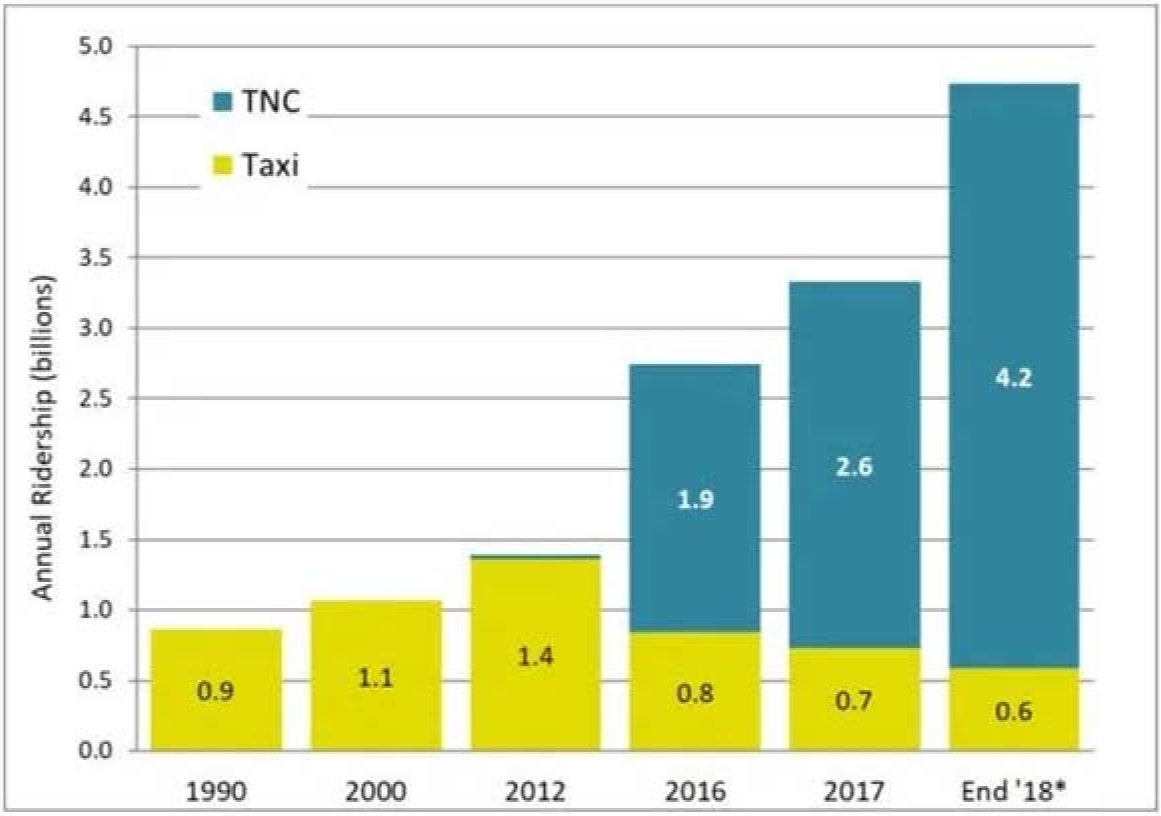
Figure 3.8: U.S. Ridesharing Market Share



Source: Edison Trends

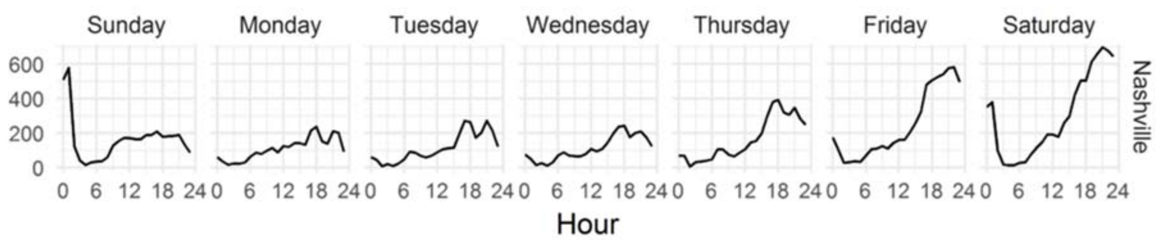
[4] http://www.schallerconsult.com/rideservices/automobility.htm

Figure 3.9: TNC and Taxi Ridership in the U.S., 1990 to 2018



Source: [Schaller Consulting]

Figure 3.10: TNC Ridership by Time of Day in Nashville



Source: [TCRP RESEARCH REPORT 195: Broadening Understanding of the Interplay Among Public Transit, Shared Mobility, and Personal Automobiles]

3.2.4 Car-Sharing

Car-sharing allows for people to conveniently live car-free or car-lite lifestyles and has been shown to increase walking and biking, reduce vehicle miles traveled, increase accessibility for formerly carless households, and reduce fuel consumption.[5]

Car-sharing has been around for decades and has continued to evolve in recent years. Today, there are three models of car-sharing:

- **Roundtrip car-sharing (as station-based car-sharing):** This accounts for the majority of all car-sharing activity. These services, such as Zipcar and Maven, serve a market for longer or day-trips, particularly where carrying supplies is a factor (such as shopping, moving, etc.). These car-share trips are typically calculated on a per hour or per day basis.
- **One-way car-sharing (free-floating car-sharing):** This allows members to pick up a vehicle at one location and drop it off at another location. These car-sharing operations, including car2go, ReachNow, and Gig, are typically calculated on a per minute basis.
- **Peer-to-Peer car-sharing (personal vehicle sharing):** This is characterized by short-term access to privately owned vehicles. An example of P2P car-sharing scheme is Turo.

Due to the varied car-sharing models, there are no typical usage patterns. Some car-sharing trips are short and local while others may be longer distance. Trips can be recurring or infrequent depending on the user.

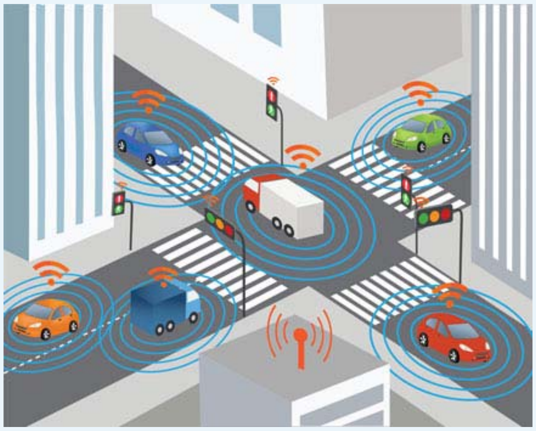
Outside of large urban areas, car-sharing is not that common. However, as connected and autonomous vehicles become more common, it is anticipated that car-sharing will become more widespread.

[5] https://www.planning.org/publications/report/9107556/

3.3 Connected and Autonomous Vehicles (CAV)

Today, most newer vehicles have some elements of both connected and autonomous vehicle technologies. These technologies are advancing rapidly and becoming more common.

Connected Vehicles



Connected vehicles are vehicles that use various communication technologies to exchange information with other cars, roadside infrastructure, and the Cloud.

Communication Types

- **V2I** • Vehicle to Infrastructure
- **V2V** • Vehicle to Vehicle
- **V2C** • Vehicle to Cloud
- **V2X** • Others

vs.

Autonomous Vehicles

Autonomous, or "self-driving" vehicles, are vehicles in which operation of the vehicle occurs with limited, if any, direct driver input.

Levels of Automation

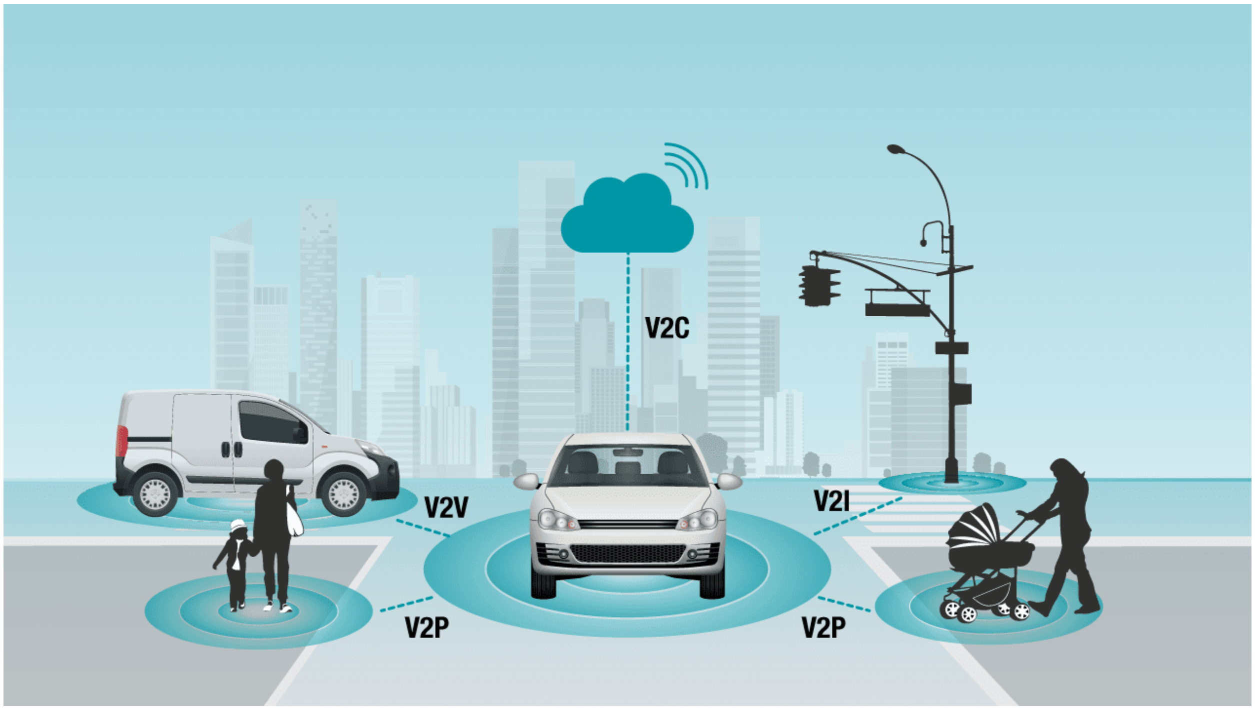
- **1** • Driver Assistance
- **2** • Partial Automation
- **3** • Conditional Automation
- **4** • High Automation
- **5** • Full Automation

3.3.1 Connected Vehicle Communication Types

Connected and autonomous vehicles use multiple communications technologies to share and receive information. These technologies are illustrated in Figure 3.11 and include:

- **V2I: Vehicle-to-Infrastructure** – Vehicle-to-infrastructure (V2I) communication is the two-way exchange of information between vehicles and traffic signals, lane markings and other smart road infrastructure via a wireless connection.
- **V2V: Vehicle-to-Vehicle** – Vehicle-to-vehicle (V2V) communication lets cars speak with one another directly and share information about their location, direction, speed, and braking/acceleration status.
- **V2N/V2C: Vehicle-to-Network/Cloud** – Vehicle-to-network (V2N) communication systems connect vehicles to cellular infrastructure and the cloud so drivers can take advantage of in-vehicle services like traffic updates and media streaming.
- **V2P: Vehicle-to-Pedestrian** – Vehicle-to-pedestrian (V2P) communication allows drivers, pedestrians, bicyclists, and motorcyclists to receive warnings to prevent collisions. Pedestrians receive alerts via smartphone applications or through connected wearable devices.
- **V2X: Vehicle-to-Everything** – Vehicle-to-everything (V2X) communication combines all of the above technologies. The idea behind this technology is that a vehicle with built-in electronics will be able to communicate in real-time with its surroundings.

Figure 3.11: Connected Vehicle Communication Types



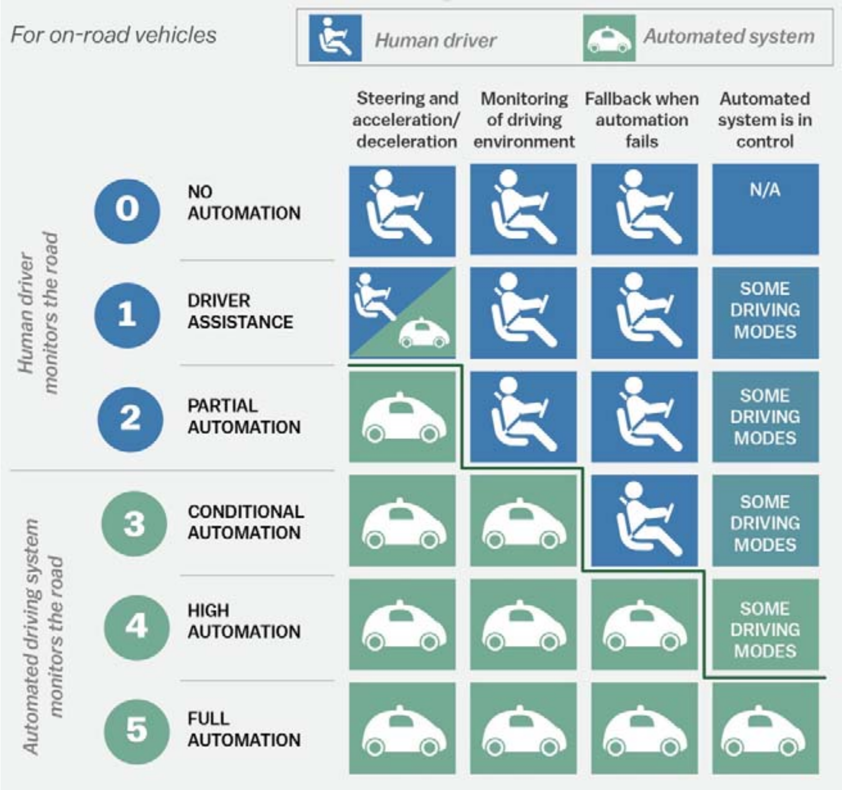
Source: Texas Instruments

3.3.2 Autonomous Vehicle Levels

According to the National Highway Traffic Safety Administration (NHTSA), there are five levels of automation. These levels are illustrated in Figure 3.12 and include:

- **Level 1:** An Advanced Driver Assistance System (ADAS) can sometimes assist the human driver with steering or braking/accelerating, but not both simultaneously.
- **Level 2:** An Advanced Driver Assistance System (ADAS) can control both steering and braking/accelerating simultaneously under some circumstances. The human driver must continue to pay full attention at all times and perform the rest of the driving task.
- **Level 3:** An Automated Driving System (ADS) on the vehicle can perform all aspects of driving under some circumstances. In those circumstances, the human driver must be ready to take back control at any time when the ADS requests the human driver to do so.
- **Level 4:** An Automated Driving System (ADS) on the vehicle can perform all driving tasks and monitor the driving environment – essentially, do all the driving – in certain circumstances. The human need not pay attention in those circumstances.
- **Level 5:** An Automated Driving System (ADS) on the vehicle can do all the driving in all circumstances. The human occupants are just passengers.

Figure 3.12: Levels of Automation



Source: SAE J3016 Levels of Automation (Photo from Vox)

3.3.3 Potential Timeline

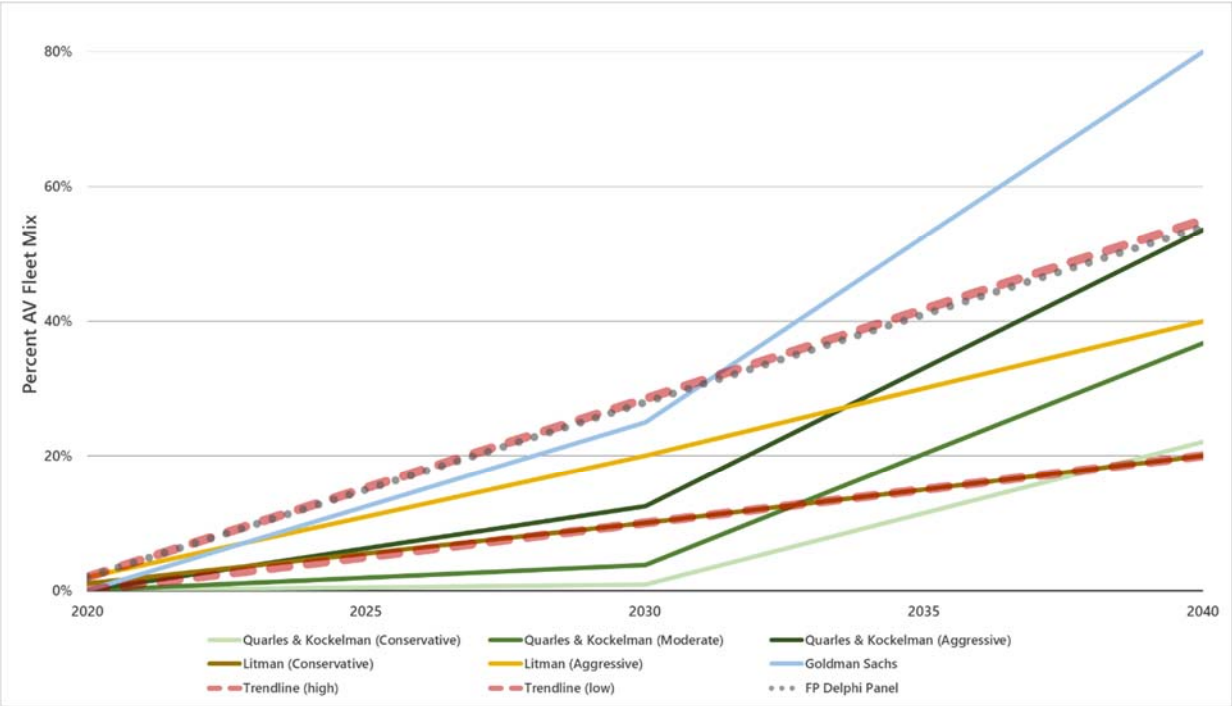
While mid-level connected and autonomous vehicles are already on the market and traveling our roadways, there is uncertainty about the long-term future of these vehicles, especially Level 5, fully autonomous vehicles. However, over the past couple of years, some level of consensus has emerged about the timeline over the next 20 years. [6][7][8]

- Over the next five years, partially automated safety features will continue to improve and become less expensive. This includes features such as lane keeping assist, adaptive cruise control, traffic jam assist, and self-park.
- By 2025, fully automated safety features, such as a "highway autopilot," are anticipated to be on the market.

[6] https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety
[7] http://library.rpa.org/pdf/RPA-New-Mobility-AutonomoUS Vehicles-and-the-Region.pdf
[8] https://www.fehrandpeers.com/av-adoption/

- Through 2030, autonomous vehicles will continue to make up a small percentage of all vehicles on the road due to the large number of legacy vehicles and slow adoption rates resulting from higher initial costs, safety concerns, and unknown regulations.
- By 2040, autonomous vehicles are more common, accounting for 20-50% of all vehicles.

Figure 3.13: Potential Autonomous Vehicle Market Share, 2020 to 2040



Source: Fehr and Peers

3.3.4 Potential Impacts

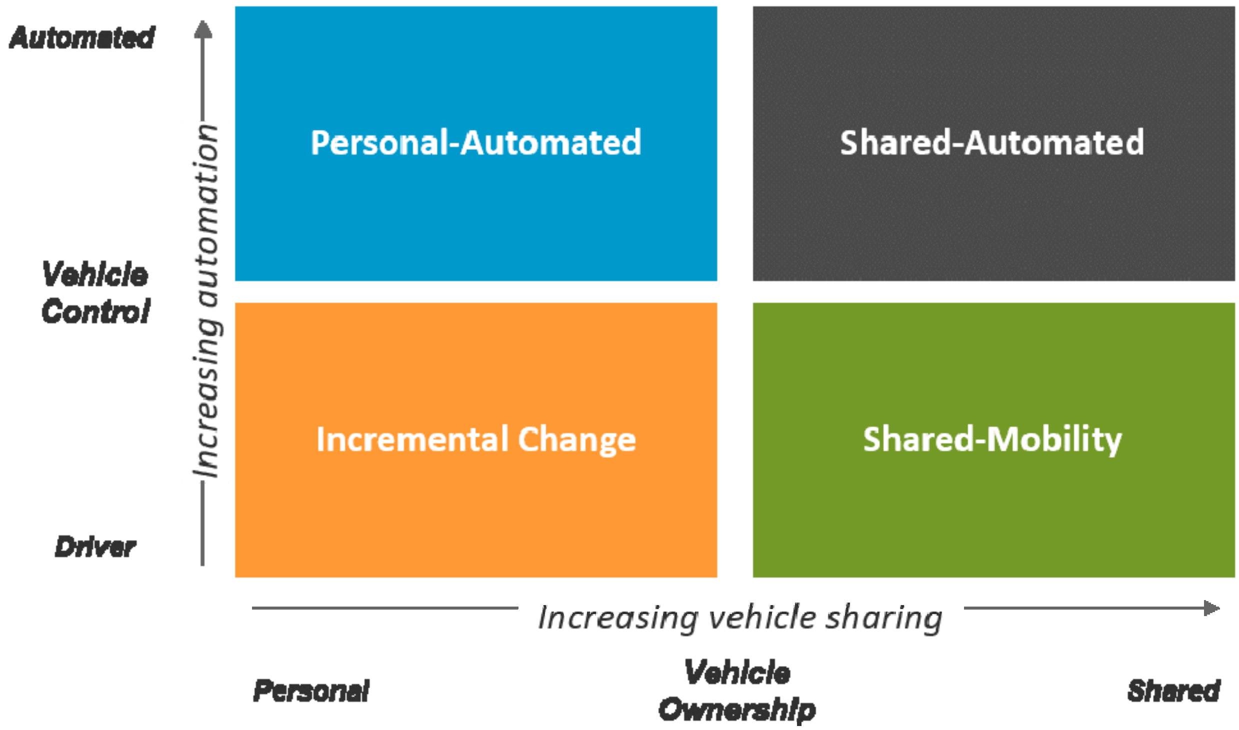
The development of connected and autonomous vehicles will change travel patterns, safety, and planning considerations. Ultimately, the actual impact of these vehicles will depend on how prevalent the technology is and the extent to which vehicles are privately owned or shared.

As shown in Figure 3.14, there are four potential scenarios, each with unique implications for transportation planning.

- **Personal-Automated scenario**: vehicles are highly autonomous and mostly privately owned.
- **Shared-Automated scenario:** vehicles are highly autonomous and mostly shared.

- **Incremental Change scenario:** vehicles are not highly autonomous and are mostly privately owned.
- **Shared-Mobility scenario:** vehicles are not highly autonomous and are mostly shared.

Figure 3.14: Future Mobility Scenarios



Source: U.S. Department of Energy/Deloitte

<u>Safety Impacts</u>

In the long-term, CAV technology is anticipated to reduce human error and improve overall traffic safety. CAVs are capable of sensing and quickly reacting to the environment via:

- External sensors (ultrasonic sensors, cameras, radar, lidar, etc.)
- Connectivity to other vehicles
- GPS

These features allow the CAV to create a 360 degree visual of its surroundings and detect lane lines, other vehicles, road curves, pedestrians, buildings, and other obstacles. The sensor data is processed in the vehicle's central processing unit and allows it to react accordingly. As this technology becomes more common on the roadways, it should result in increased safety by removing human error as a crash factor. However, this can only be achieved when CAVs are in the majority on the road, if not the only vehicles in use.

CAV interactions with bicyclists and pedestrians is a major area of concern that still needs improvement. However, the use of CAV technologies can be applied at intersections by communicating with the traffic lights and crossing signals. This will result in increased safety for bicyclists, pedestrians, and those with mobility needs or disabilities.

Traffic

CAVs have the potential to improve overall traffic flow and reduce congestion, even as they may increase vehicle miles traveled. However, these benefits, such as increased roadway capacity from high-speed cars moving at closer distances, known as platooning, are achieved when CAV saturation is very high.

As a whole, CAVs are likely to increase driving, as measured by Vehicle Miles Traveled (VMT). This increase would come in part from people making longer and potentially more trips, due to the increased comfort of traveling by car. People could perform other tasks, such as working or entertainment, instead of driving and longer trips would become more bearable. The increase in VMT would also come from "dead head" mileage, or the time that vehicles are driving on the road without passengers, before and after picking up people.

Transit

CAV technology has the potential to drastically reduce the cost of operating transit in environments that are safe for autonomous transit. For many agencies, labor is their highest operating expense. While not all routes may be appropriate for autonomous transit, there may be opportunities to create dedicated lanes and infrastructure for autonomous transit and other vehicles. Even with some lines operating autonomously, costs can be lowered and these savings can be used to increase and improve service.

From a reliability standpoint, connected vehicle technology can also improve on-time performance and travel times through applications like Transit Signal Priority (TSP) and dynamic dispatching. TSP is an application that provides priority to transit at signalized intersections and along arterial corridors. Dispatching and scheduling could be improved with dynamic, real-time information that more effectively and efficiently matches resources to demand.

Even with the potential improvements to transit operations, transit ridership could decrease if transportation network companies (e.g. Uber/Lyft) become competitively priced. This could be possible if autonomy allows these private transportation providers to eliminate drivers and reduce their operating costs.

Freight

Both delivery and long-haul freight look to be early adopters of CAV technology, reducing costs and improving safety and congestion.

Freight vehicles will also benefit from CAV technology by allowing them to travel in small groups, known as truck platooning. The use of CAV will safely decrease the amount of space between the platooning trucks thereby allowing consistent traffic flow. Platooning reduces congestion as vehicles travel at constant speed, which results in fuel savings and reduces carbon dioxide emissions.

Land Use and Parking

Autonomous vehicles could dramatically reduce demand for parking, opening this space up for other uses. They may also require new curb-side and parking considerations and encourage urban sprawl.

Autonomous vehicle technology has the potential to reduce the demand for parking in a few ways.

- Shared-Automated: If autonomous vehicles are mostly shared and not privately owned, there will be less need for parking as these vehicles will primarily move from dropping one passenger off to picking up or dropping off another passenger.
- Personal-Automated: If autonomous vehicles are mostly privately owned, it is also possible that they could return home or go to a shared parking facility that is not on site. In this scenario, some parking demand may simply shift from onsite parking to centralized parking.
- Smart Parking: Connected parking spaces allow communication from the parking lot to your vehicle, letting the vehicle know which spaces are available. This reduces the need for circling or idling in search of parking and improves parking management.

If parking demand is reduced, land use planners will need to consider repurposing parking areas. In urban areas, this could mean reallocating curb-side space for pedestrians while allowing for safe passage, pick-ups, drop-offs, and deliveries by AVs. In suburban areas, it could mean redeveloping large surface parking lots and revisiting parking requirements.

Using CAV technology is likely to make longer commutes more attractive and increase urban sprawl unless local land use policy and regulations discourage this.

Big Data for Planning

Connected vehicle technology may provide valuable historical and real-time travel data for transportation planning. Privacy concerns and private-public coordination issues may limit data availability, but this data could allow for very detailed planning for vehicles, pedestrians, and other modes. In addition to traffic data, it could provide valuable origin-destination data.

Furthermore, as CAV technologies continue to develop and be implemented, they can be used to refine regional or state travel demand models. This can be accomplished by:

- Providing additional data that can be used for the calibration of existing travel characteristics.
- Analyzing the data, in before and after method, to understand the effect of pricing strategies on path choice and route assignment.
- Potentially developing long-distance travel data in statewide models since CAVs are continuously connected.
- Potentially providing large amounts of data on commercial vehicles and truck movements to develop freight elements.
- Identifying recurring congestion locations within a region or state.
- Supporting emission modeling by assisting with the development of local input values instead of using Motor Vehicle Emissions Simulator (MOVES) model defaults.

3.4 Electric and Alternative Fuel Vehicles

There has been growing interest and investment in alternative fuel vehicle technologies in recent years, especially for electric vehicles. This renewed interest has also included the transit and freight industries.

Alternative Fuel Vehicles (AFVs) are defined as vehicles that are substantially non-petroleum, yielding high energy security and environmental benefits. These include fuels such as:

- electricity
- hybrid fuels
- hydrogen
- liquefied petroleum gas (propane)
- Compressed Natural Gas (CNG)
- Liquefied Natural Gas (LNG)

- 85% and 100% Methanol (M85 and M100)
- 85% and 95% Ethanol (E85 and E95) (not to be confused with the more universal E10 and E15 fuels which have lower concentrations of ethanol)

3.4.1 Existing Stock of AFVs

The number of AFVs in use across the county continues to increase due to federal policies that encourage and incentivize the manufacture, sale, and use of vehicles that use non-petroleum fuels. According to the 2019 U.S. Energy Information Administration's *Annual Energy Outlook*, the most popular alternative fuel sources today for cars and light-duty trucks in the U.S. are E85 (flex-fuel vehicles) and electricity (hybrid electric vehicles and plug-in electric vehicles).

The U.S. Department of Energy's Alternative Fuels Data Center locator shows that there are no AFV stations in the MPA.

3.4.2 Growth Projections

Long-term projections for electric vehicle and other alternative fuels vary considerably. On the higher end, some projections estimate that electric vehicles will make up 30 percent of all cars in the United States by 2030.[9] The U.S. Energy Information Administration (USEIA) is more conservative, projecting that electric vehicles will make up approximately nine percent of all light-duty vehicles by 2030 and approximately 17 percent by 2045. For freight vehicles, the USEIA projects only a two percent market share for electric vehicles by 2045.

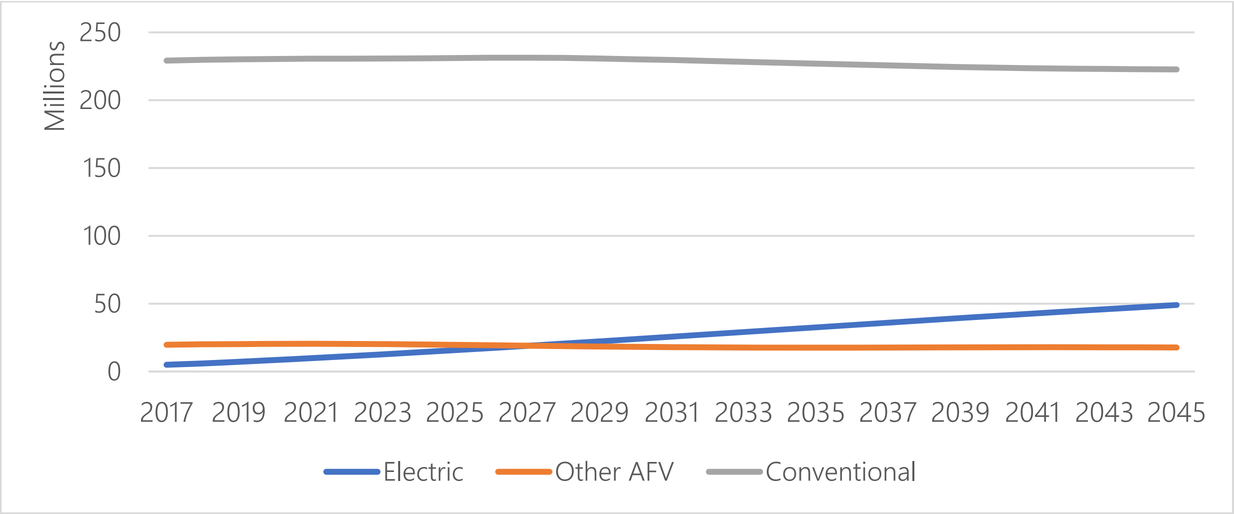
Outside of electric vehicles, which include full electric vehicles and hybrid electric vehicles powered by battery or fuel cell technology, the USEIA does not project other alternative fuels to grow significantly for light-duty vehicles. However, it does anticipate ethanol-flex fuel vehicles to grow significantly for light and medium freight vehicles.

In the United States, electric buses are becoming more common as transit agencies pursue long-term operations and maintenance savings in addition to environmental and rider benefits (less air and noise pollution). While electric buses have many challenges, upfront costs are

[9] https://www.iea.org/publications/reports/globalevoutlook2019/

anticipated to go down and utilization is likely to become more widespread. By 2030, it is anticipated that between 25% and 60% of new transit vehicles purchased will be electric.[10]

Figure 3.15: Light-Duty Vehicles on the Road by Fuel Type, 2017 to 2045



Source: U.S. Energy Information Administration, 2019 Annual Energy Outlook

3.4.3 Potential Impacts

Air Quality Improvement

Electric and other alternative fuel vehicles have the potential to drastically reduce automobile related emissions. While these fuels still have environmental impacts, they can reduce overall lifecycle emissions and reduce direct emissions substantially.

Direct emissions are emitted through the tailpipe, through evaporation from the fuel system, and during the fueling process. Direct emissions include smog-forming pollutants (such as nitrogen oxides), other pollutants harmful to human health, and greenhouse gases (GHGs).

Infrastructure Needs

There may be a long-term need for public investment in vehicle charging stations to accommodate growth in electric vehicles.

Consumers and fleets considering plug-in hybrid electric vehicles (PHEVs) and all-electric vehicles (EVs) benefit from access to charging stations, also known as EVSE (electric vehicle

[10] https://www.reuters.com/article/US transportation-buses-electric-analysi/u-s-transit-agencies-cautioUS on-electric-buses-despite-bold-forecasts-idUSKBN1E60GS

supply equipment). For most drivers, this starts with charging at home or at fleet facilities. Charging stations at workplaces and public destinations may also bolster market acceptance.

Gas Tax Revenues

If adoption rates increase substantially, gas tax revenues will be impacted and new user fees may need to be considered.

Since electric and alternative fuel vehicles use less or no gasoline compared to their conventional counterparts, their operation does not generate as much revenue from a gas tax. The gas tax is one of the primary means that Arkansas uses to fund transportation projects. In order to compensate for the reduced gasoline usage, many states have begun imposing fees on electric and alternative fuel vehicles to recoup lost transportation revenue.[11] In 2019, Arkansas passed legislation increasing the tax on gasoline and diesel and increasing the registration fees on electric and hybrid vehicles.

[11] http://www.ncsl.org/research/energy/new-fees-on-hybrid-and-electric-vehicles.aspx

4 Roadways and Bridges

4.1 Congestion Relief Needs

Given the population and employment growth forecasted to occur by 2045, the Travel Demand Model indicates that the number of person trips in the MPA will go from 273,226 in 2019 to 289,812 in 2045. Most of the trip types grow by nearly the same rate. However, non-home-based trips and trips with one or both ends outside of the MPA are forecasted to grow at a faster rate. These changes are summarized in Table 4.1.

Table 4.1: Person Trips by Purpose, 2018 to 2045

Trip Purpose	2018	2045 (E+C)	Change	Percent Change
Home-Based Work	41,364	42,142	778	1.9%
Home-Based Other	96,922	98,633	1,711	1.8%
Non-Home Based	51,989	60,702	8,713	16.8%
Commercial Vehicle	24,597	26,163	1,566	6.4%
Truck	4,973	5,222	249	5.0%
Internal-External	44,681	47,366	2,685	6.0%
External-External	8,700	9,583	883	10.1%
Total	273,226	289,812	16,586	6.1%

6.1%

Growth in person trips in the MPA from 2018 to 2045

Notes: E+C is future scenario with only Existing and Committed transportation projects. Values do not include special generators.

Source: SEARPC Travel Demand Model, NSI

Table 4.2 shows that if the transportation projects that currently have committed funding are constructed, the centerline miles of the roadway network will not increase since no new roadways are being constructed on the functionally classified system. The table also shows the forecast change in Vehicle Miles Traveled (VMT), Vehicle Hours Traveled (VHT), and Vehicle Hours of Delay (VHD) if only those projects are constructed.

This data indicates that, by 2045, the VMT and VHT within the MPA will increase by approximately seven (7) percent. However, during this same time period the VHD will increase by nearly 17 percent. These changes are the result of a change in person trips and no growth of the roadway network. During the public survey, congestion reduction on the roadway network was identified as the lowest priority for residents and workers. Combined with the relative lack of congestion in the MPA, this results in a lower emphasis placed on congestion reduction during the project scoring process of the MTP.

Table 4.2: Travel Demand Impact of Growth and Existing and Committed Projects, 2018 to 2045

Centerline Miles of Roadways				
Classification	2018 (Existing)	2045 (E+C Projects)	Change	Percent Difference
Interstate	23.3	23.3	0.00	0.0%
Principal Arterial	46.1	46.1	0.00	0.0%
Minor Arterial	85.4	85.4	0.00	0.0%
Major Collector	108.8	108.8	0.00	0.0%
Minor Collector	39.1	39.1	0.00	0.0%
Total	302.7	302.7	0.00	0.0%
Daily Vehicle Miles Traveled (VMT)				
Classification	2018 (Existing)	2045 (E+C Projects)	Change	Percent Difference
Interstate	506,417	574,009	67,592	13.3%
Principal Arterial	366,658	391,455	24,797	6.8%
Minor Arterial	376,404	380,784	4,380	1.2%
Major Collector	172,912	182,280	9,368	5.4%
Minor Collector	9,937	10,700	763	7.7%
Total	1,432,327	1,539,229	106,902	7.5%
Daily Vehicle Hours Traveled (VHT)				
Classification	2018 (Existing)	2045 (E+C Projects)	Change	Percent Difference
Interstate	8,530	9,847	1,317	15.4%
Principal Arterial	8,801	9,317	516	5.9%
Minor Arterial	9,205	9,401	196	2.1%
Major Collector	4,657	4,916	259	5.6%
Minor Collector	258	282	24	9.3%
Total	31,452	33,763	2,311	7.3%
Daily Vehicle Hours of Delay (VHD)				
Classification	2018 (Existing)	2045 (E+C Projects)	Change	Percent Difference
Interstate	469	708	239	51.0%
Principal Arterial	547	569	22	4.0%
Minor Arterial	485	521	36	7.4%
Major Collector	288	290	2	0.7%
Minor Collector	3	3	0	0.0%
Total	1,792	2,091	299	16.7%

Note: E+C is future scenario with only Existing and Committed transportation projects.

Source:SEARPC Travel Demand Model, NSI

Currently, roadways likely to experience future congestion occur mostly near intersections and interchanges in the MPA. By 2045, no roadways experience daily volumes exceeding capacity but some locations likely experience peak hour delays.

Figure 4.1 displays the vehicular traffic in the MPA for 2045 if only the E+C projects are implemented. The number of roadway segments with a volume to capacity (V/C) ratio exceeding 0.7 will remain about the same by 2045, as shown in Table 4.3 and illustrated in Figure 4.2.

It is important to note that not all congested street and highway segments should be widened with additional through lanes or turning lanes. In urban settings, it may be more appropriate to consider ITS improvements or Travel Demand Management (TDM) strategies. Congestion may also be reduced by improving pedestrian, bicycle, and/or transit conditions that will encourage alternative means of transportation.

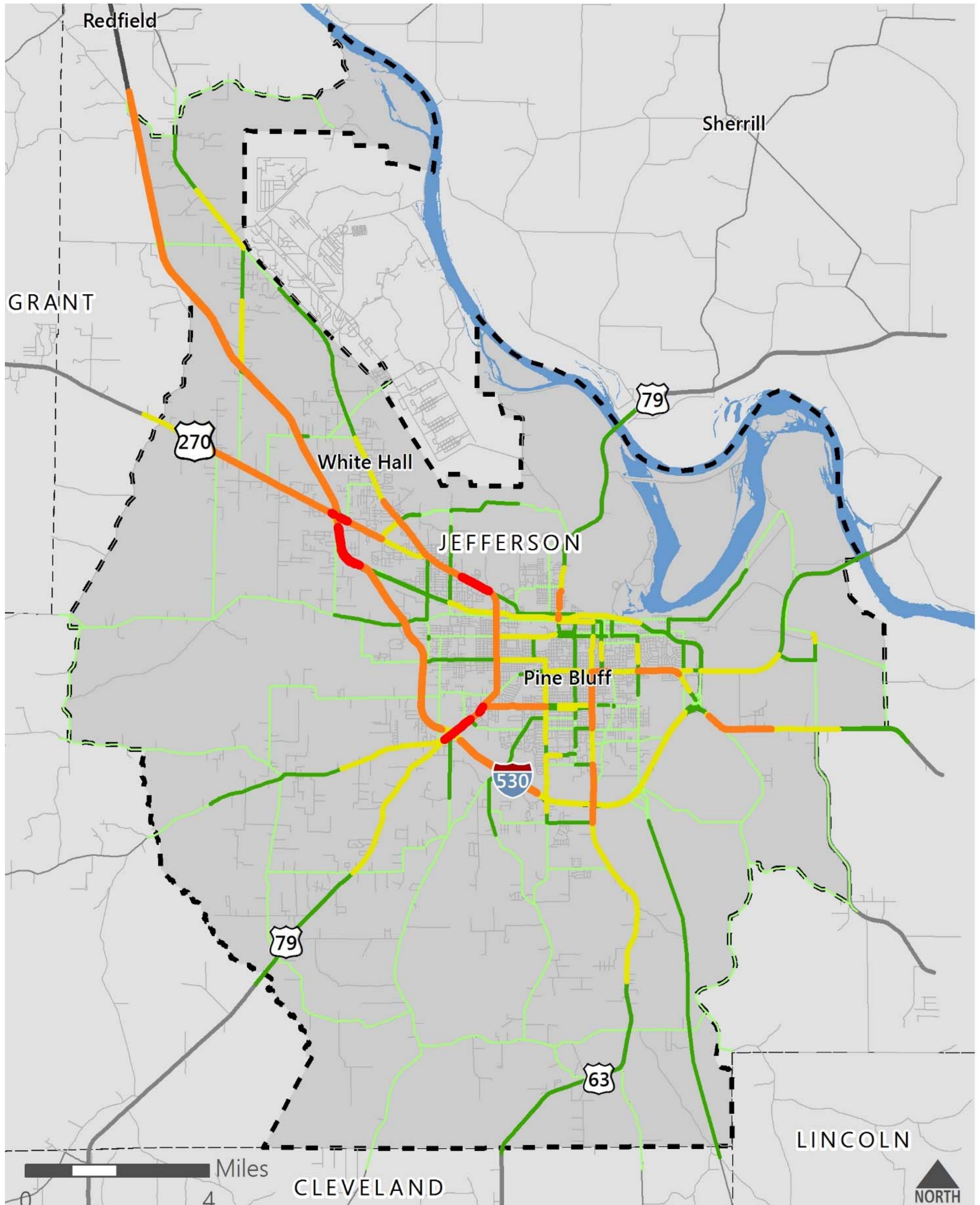
Table 4.3: Roadway Corridors with Volumes Exceeding Capacity, 2045

Roadway	Location	Length (miles)
I-530 SB Off Ramp	US 270 (Sheridan Rd)	0.29
I-530 NB Off Ramp	US 270 (Sheridan Rd)	0.23
US 270 (Sheridan Rd)	End of Center Turn Lane to Monk Rd	0.02
S Blake St	Faucett Rd to Miramar Dr	0.06
S Hazel St	I-530 EB Ramps to I-530 WB Ramps	0.09

Source: SEARPC Travel Demand Model

Figure 4.1: Average Daily Traffic on Roadways, 2045

Metropolitan Planning Area



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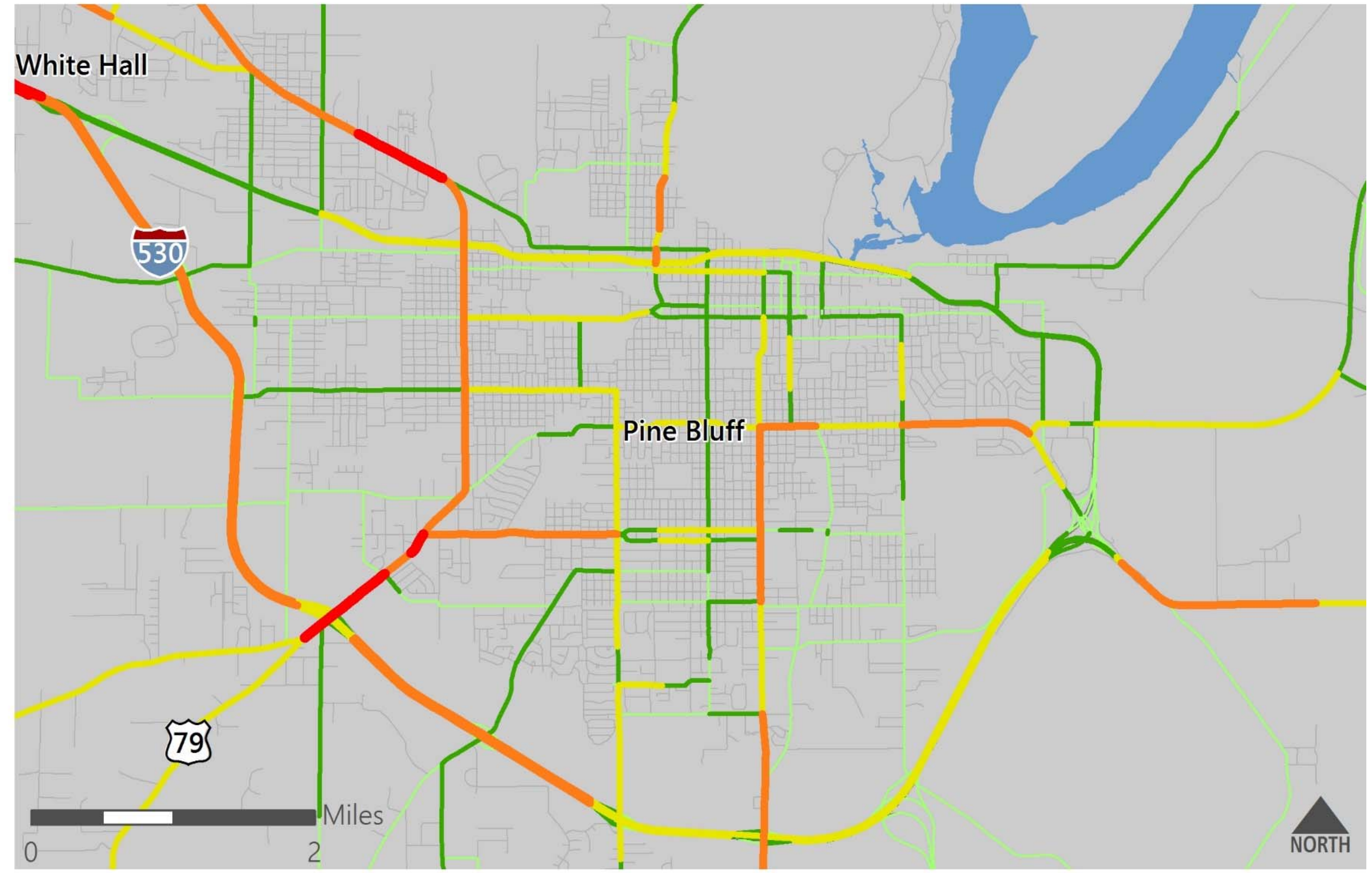


Legend

Volumes - Average Daily Traffic

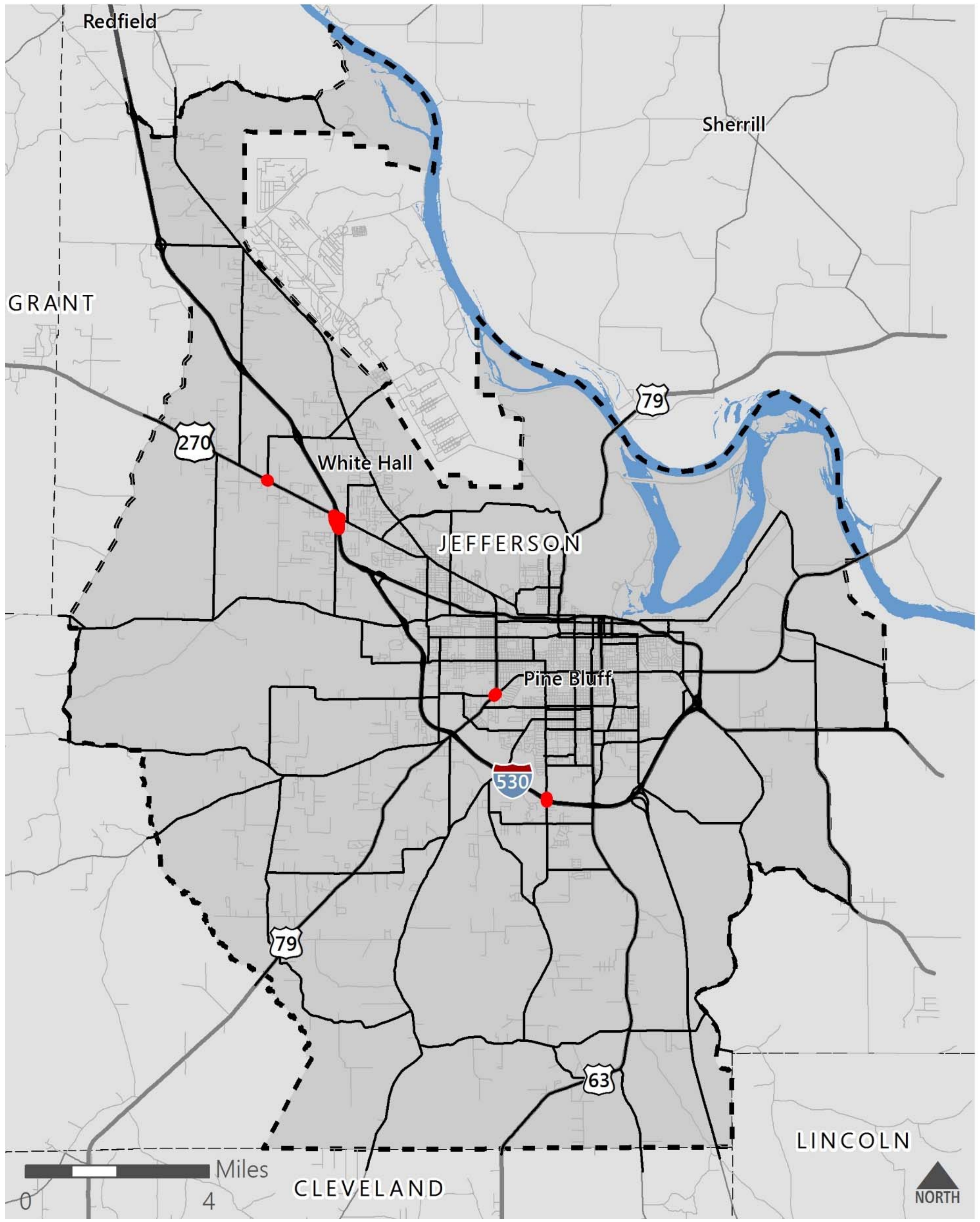
- 0 - 2,500
- 2,501 - 5,000
- 5,001 - 10,000
- 10,001 - 15,000
- > 15,000
- Planning Area

Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Figure 4.2: Roadways with Volume/Capacity Exceeding 0.7, 2045 (Existing + Committed)

Metropolitan Planning Area



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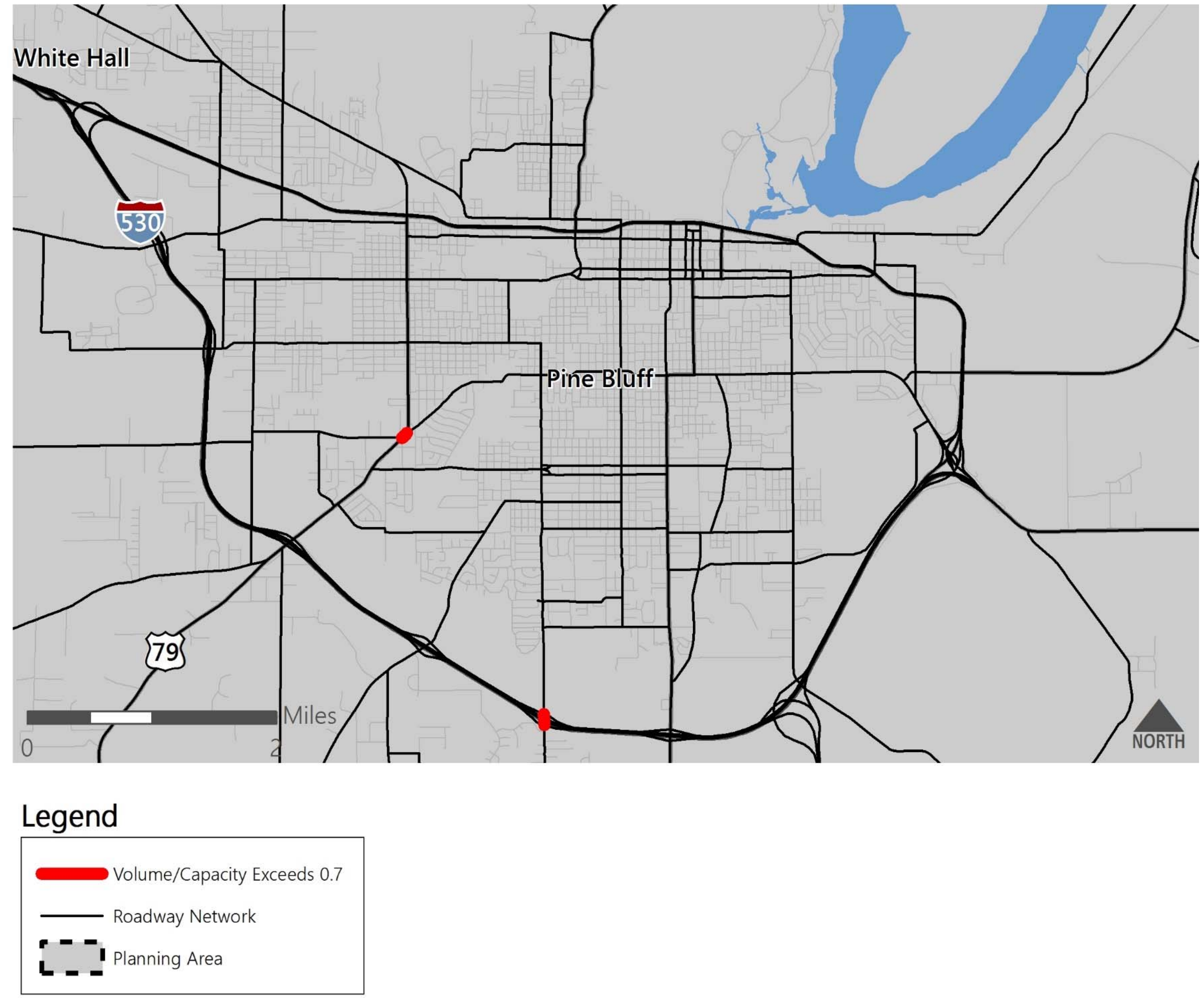


Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

4.1.1 Public and Stakeholder Input

During the public and stakeholder involvement process, respondents were asked to identify the roadways and intersections they felt were most congested. The most often identified of these location types are described below:

- US 79 (S Camden Rd) & AR-54 (Sulphur Springs Rd)
- Watson Chapel, specifically US 79 (S Camden Rd) by the schools
- US 270 through White Hall and with the intersection of I-530

Intersection and Corridor Recommendations

Table 4.4 displays the locations identified through public involvement and engineering review, the observed issues, and recommendations to address the intersection needs.

Table 4.4: Recommended Intersection Improvement Projects

Location	Traffic Control Type	Observed Issues	Short-term Solution	Long-term Solution
US 79 (S Camden Rd) at AR-54 (Sulphur Springs Rd)	Signal	Lack of access management, heavy buildup of land use, turn lane ramps experience congestion during peak periods	Access management study and signal retiming	Intersection redesign study
Watson Chapel at US 79	Stop Sign	Located near busy intersection and schools, two intersections in close proximity	Law enforcement traffic control during peak volume times for churchgoers	Redesign of US 79/Chapel Ln/Pinnacle/Ln area
US 270 through White Hall	Mixed	Peak period traffic experiences slowdown at intersections, particularly at AR-365, no turn bays which could cause additional delays	Signal retiming	Add turn lanes
US 270 at I-530	Mixed	Peak period traffic experiences slowdown east of I-530 due to increased traffic, unrestricted access to roadway, multiple signals nearby	Corridor signal retiming study	Access management study, roadway widening

4.2 Maintenance Needs

4.2.1 Pavement Maintenance

While less than three (3) percent of the MPA's roadways have poor pavement conditions, these roadway segments could eventually experience maintenance needs that will lead to decreased safety or emergency roadway repairs, both of which can increase congestion. Figure 2.6 in *Technical Report 2: Existing Conditions Analysis* displays the pavement conditions of the NHS monitored roadways within the MPA. Particular attention should be given to:

- I-530 from Martha Mitchell Expwy to US 79
- US 79 from Southern Study Area Boundary to Martha Mitchell Expwy
- US 425 from Southern Study Area Boundary to US 65
- Martha Mitchel Expwy from I-530 to US 65
- SR 365 from Northern Study Area Boundary to W Hoadley Rd
- Port Rd from US 65 to Gravity Rd
- W Holland Ave/W Hoadley Rd from I-530 SB Ramps SR 365

These roadways have continuous lengths of poor pavement conditions as well as those in fair condition and should be a priority for roadway maintenance and repaving.

4.2.2 Bridge Maintenance

The existing conditions analysis revealed that there are currently two (2) bridges in Poor condition within the MPA; neither of which are on the National Highway System. Table 4.5 displays the MPA's bridges in Poor condition. Addressing the needs of these bridges will improve safety, reduce maintenance costs, and avoid future bridge shutdowns. Bridges are rated by the NBIS based on the conditions of their decks, superstructure, substructure, and stream channel and channel protection. A bridge is considered to be in Poor condition if any of the above categories are rated "Poor".

Some of these deficient bridges may be improved via the MTP through other transportation projects, such as a roadway widening. Other bridges could instead be improved through line item funding for operations and maintenance. The MPO and ArDOT should prioritize these bridges for improvements as funding becomes available.

Table 4.5: Worst Performing Bridges in Poor Condition

Structure ID	Roadway	Feature Intersecting	Year Built
23442	Beechnut Rd	Nevins Creek	1972
18905	Free Line Rd	Creek	1976

Source: National Bridge Inventory, 2020

4.3 Safety Needs

From 2014 through 2018, there were over 7,800 crashes reported in the MPA. During that timeframe, there were 40 fatal crashes and 145 incapacitating injury crashes. Another 2,479 crashes caused non-incapacitating or possible injuries.

The highest number of crashes in the MPA were angle crashes, followed by single vehicle crashes, front to rear (i.e., "rear end") crashes, and sideswipes. Recommendations for reducing these most common types of crashes are outlined below.

> As traffic continues to increase from 2019 to 2045, historical trends predict that the number of crashes will also increase.

4.3.1 Reducing Angle Crashes

The highest number of crashes in the MPA were angle crashes. These crashes can be caused by a number of factors, such as:

- restricted sight distance
- excessive speed
- inadequate roadway lighting
- poor traffic signal visibility
- inadequate signal timing
- inadequate advance warning signs
- running a red light
- large traffic volumes

In general, the recommendations for reducing side impact and angle collisions include:

- Verify that the sight distance at all intersection approaches is not restricted. Options to alleviate restricted sight distance include removing the sight obstruction and/or installing or improving warning signs.
- Conduct speed studies to determine whether or not speed was a contributing factor. In order to reduce crashes caused by excessive speeding, the speed limit can be lowered

with enforcement, the phase change interval can be adjusted, or rumble strips can be installed.

- Ensure roadway lighting provides sufficient visibility for drivers to see the roadway and the surrounding area.
- Check the visibility of the traffic signal at all approaches. In order to provide better visibility of the traffic signal, options include installing or improving warning signs, overhead signal heads, installing 12” signal lenses, visors, back plates, and/or relocating or adding signal heads.
- Verify that the signal timing is adequate to serve the traffic volumes. Options include adjusting phase change interval, providing or increasing a red-clearance interval, providing progression, and/or utilizing signal actuation with dilemma zone protection.
- Verify that the intersection is designed to handle the traffic volume. If the traffic volumes are too large for the intersection’s capacity, options include adding a lane(s) and retiming the signal.

4.3.2 Reducing Single Vehicle Crashes

Single vehicle crashes are the second most prevalent crash type in the MPA. A number of factors could be the cause for single vehicle crashes, including:

- speeding
- pavement surface conditions
- lighting and pavement markings
- roadway geometry
- signal timing

In general, the recommendations for reducing single vehicle crashes include:

- Conducting speed studies to determine whether or not speed was a contributing factor
- Ensuring roadway lighting provides sufficient visibility for drivers to see the roadway and the surrounding area.
- Ensuring proper application of traffic control devices.
- Verifying proper signal head alignments as well as condition of signal head indications (i.e. lens burn through, LED usage, etc.)
- Verifying that pavement markings are visible during daylight and nighttime hours.
- Verifying that drivers can safely maneuver the roadway geometry.
- Providing a shoulder or increasing the existing shoulder width.
- Relocating fixed objects outside of the clear zone.

- Improving the visibility of fixed objects during nighttime hours.

4.3.3 Reducing Rear End Crashes

The third highest type of crashes in the MPA were rear end crashes which can be attributed to a number of factors, such as:

- driver inattentiveness
- large turning volumes
- slippery pavement
- inadequate roadway lighting
- crossing pedestrians
- poor traffic signal visibility
- congestion
- inadequate signal timing, and/or an unwarranted signal

In general, the recommendations for reducing rear-end crashes include:

- Turning movements present a risk of rear-end crashes due to the difference in speed between turning vehicles and through traffic. By providing a turning lane the slow moving turning vehicles can be separated from the higher speed through vehicles. If a turning lane is not warranted, increasing the turning radius would allow for turning vehicles to make turns at a faster speed and therefore reduce the differential between through movements and turning movements.
- Checking the pavement conditions. Rear-end collisions caused by slippery pavement can be reduced by lowering the speed limit with enforcement, providing overlay pavement, adequate drainage, groove pavement, or with the addition of a "Slippery When Wet" sign.
- Ensure roadway lighting provides sufficient visibility for drivers to see the roadway and the surrounding area.
- Determine if there is a large amount of pedestrian traffic. Pedestrians crossing the roads may impede traffic and force drivers to stop suddenly. If crossing pedestrians are an issue, options include installing or improving crosswalk devices and providing pedestrian signal indications.
- Check the visibility of the traffic signals at all approaches. In order to provide better visibility of the traffic signal, options include installing or improving warning signs, overhead signal heads, installing 12" signal lenses, visors, back plates, or relocating/adding signal heads.
- Verify that the signal timing is adequate to serve the traffic volumes at the trouble intersections. Options include adjusting phase-change interval, providing or increasing a

red-clearance interval, providing progression, and utilizing signal actuation with dilemma zone protection.

- Verify that a signal is warranted at the given intersection.

4.3.4 Reducing Sideswipe Crashes

The fourth highest type of crashes in the MPA were sideswipes, which are caused by factors such as:

- excessive speed
- inadequate roadway lighting
- poor pavement markings
- large traffic volumes
- driver inattentiveness

The recommendations for reducing sideswipes include:

- Check for proper signage around the intersection. Roadway geometry may be confusing for the drivers whom are unfamiliar with the area. Verify that all one-way streets are marked “One-Way” and “No Turn” signs are placed at appropriate locations.
- Verify that pavement markings are visible during day and night hours.
- Verify that the roadway geometry can be easily maneuvered by drivers.
- Evaluate left and right turning volumes to determine if a right turn and/or left turn lane is warranted.
- Ensure roadway lighting provides sufficient visibility for drivers to see the roadway and the surrounding area.
- Verify that lanes are marked properly and provide signage that clearly indicates lane configurations. This can prevent drivers from attempting dangerous last minute lane changes.

4.3.5 Reducing Other Collision Types

The remaining representative crash types can be attributed to incidents involving front to front collisions (“head on collisions”), rear to rear and rear to side collisions (“backing up”), bicycle/pedestrian encounters, fixed objects, jackknife, rollovers, and vehicle defects. Recommendations for increasing the safety and reducing the number of crashes for these crash types include:

- Determine if the speed limit is too high or if vehicles in the area are traveling over the speed limit. Reducing the speed can reduce the severity of crashes and make drivers more attentive to their surroundings.
- Verify the clearance intervals for all signalized intersection approaches and ensure that there is an all red clearance. For larger intersections, it is particularly important to have a long enough clearance interval for vehicles to safely make it through the intersection before the light turns green.
- Check for proper intersection signage. Roadway geometry may be confusing for the drivers whom are unfamiliar with the area. Verify that all one-way streets are marked “One-Way” and “No Turn” signs are placed at appropriate locations.
- Verify that pavement markings are visible during day and night hours.
- Verify that the roadway geometry can be easily maneuvered by drivers.
- Evaluate left and right turning volumes to determine if a turning lane is warranted.
- Ensure roadway lighting provides sufficient visibility for drivers to see the roadway and the surrounding area.
- Check the visibility of the traffic signals from all approaches.
- Verify that lanes are marked properly and provide signage that clearly indicates lane configurations. This can prevent drivers from attempting dangerous last minute lane changes.

4.3.6 High Crash Frequency and High Crash Rate Needs

Technical Report 2: Existing Conditions identified high crash frequency and high crash rate locations within the MPA. These locations were identified in Tables 2.7 through 2.11. Each of these segments or intersections experience either a large amount of crashes in general, or a large amount of crashes for the roadway volume it carries.

The locations listed in those tables, also shown in Table 4.6, should be high priority locations for the MPO to address in order to reduce congestion and increase safety within the MPA. The scope of the MTP does provide for a detailed analysis of the locations, but safety studies can be conducted by the MPO's safety partners for each location to determine the best site-specific crash countermeasures that can be employed.

Table 4.6: High Crash Frequency or Crash Rate Locations in the MPA

Route	Location	Type	Issue
I-530	Gravel Pit Rd to AR 104	Segment	Crash Frequency
W 28th Ave	S Fir St to S Hazel St	Segment	Crash Frequency
US 63B (S Olive St)	W 25th Ave to W 21st Ave	Segment	Crash Frequency
US 63B (S Olive St)	Hudson Ave to W 28th Ave	Segment	Crash Frequency
I-530	Gravel Pit Rd to Stagecoach Rd	Segment	Crash Frequency
W 28th Ave	S Catalpa St to S Fir St	Segment	Crash Frequency
I-530	US 79/US 79B (S Camden Rd) to AR 190 (W 13th St)	Segment	Crash Frequency
I-530	Between US 65B (Martha Mitchell Expwy) Ramps	Segment	Crash Frequency
I-530	US 65B (Martha Mitchell Expwy) to US 270 (Sheridan Rd)	Segment	Crash Frequency
I-530	AR 190 (W 13th St) to Princeton Pike	Segment	Crash Frequency
I-530	Old Warren Rd to US 79/US 79B (S Camden Rd)	Segment	Crash Frequency
I-530	W Holland Ave to AR 104	Segment	Crash Frequency
W 28th Ave	0.05 miles west of S Myrtle St to S Catalpa St	Segment	Crash Frequency
I-530	US 270 (Sheridan Rd) to W Holland Ave	Segment	Crash Frequency
US 63B	Mallard Loop to S Main St	Segment	Crash Frequency
AR 54 (Sulphur Springs Rd)	Temple Rd to Chapel Heights Rd	Segment	Crash Frequency

US 79B (S Blake St)	W 17th Ave to W 13th Ave	Segment	Crash Frequency
I-530	S Hazel St to Old Warren Rd	Segment	Crash Frequency
I-530	AR 530 to US 63/US 65/US 79/US 425/AR 190	Segment	Crash Frequency
AR 365	N Haley St to Cottonwood St	Segment	Crash Frequency
W 34th Ave	0.11 miles east of S Juniper St to Old Warren Rd	Segment	Crash Rate
E 8th Ave	US 63B (S Texas St) to S Morris St	Segment	Crash Rate
L A Prexy Davis Dr	Fluker St to 0.09 miles north of W Reeker Ave	Segment	Crash Rate
Miramar Dr	S Bay St to Jonquil St	Segment	Crash Rate
Rhinehart Rd	AR 365 (N Blake St) to 0.11 miles south of AR 365 (N Blake St)	Segment	Crash Rate
S Main St	Country Club Ln to 0.16 miles north of E 45th Ave	Segment	Crash Rate
E 38th Ave	S Louisiana St to S Indiana St	Segment	Crash Rate
AR 190 (W 6th Ave)	S Locust St to 0.02 miles west of S Linden St	Segment	Crash Rate
Faucett Rd	Crestwood Dr to US 79B	Segment	Crash Rate
S Ohio St	E 34th Ave to E 31st Ave	Segment	Crash Rate
AR 190 (W 6th Ave)	S Cherry St to S Beech St	Segment	Crash Rate
US 63B (E 8th Ave)	S Main St to 0.03 miles east of S State St	Segment	Crash Rate
S Main St	Friendswood to Dr Country Club Ln	Segment	Crash Rate

W 34th Ave	S Cedar St to S Locust St	Segment	Crash Rate
W 28th Ave	S Cherry St to 0.73 miles east of S Elm St	Segment	Crash Rate
N Hutchinson St	Joneswood Dr to W Malcomb St	Segment	Crash Rate
E 34th Ave	S Louisiana St to S Virginia St	Segment	Crash Rate
E 38th Ave	Georgia St to S Louisiana St	Segment	Crash Rate
S Ohio St	T.L. Kimbrel Dr to E 34th Ave	Segment	Crash Rate
E 38th Ave	S Indiana St to S Ohio St	Segment	Crash Rate
US 65B (Martha Mitchell Expwy)	at AR 365 (Blake St)	Intersection	Crash Frequency
US 63B (S Olive St)	at W 28th Ave	Intersection	Crash Frequency
US 65B (Martha Mitchell Expwy)	at US 79B (University Dr)	Intersection	Crash Frequency
US 79 (S Camden Rd)	at Ryburn Rd	Intersection	Crash Frequency
US 63B (S Olive St)	at W 27th Ave	Intersection	Crash Frequency
US 79B (S Blake St)	at W 13th Ave	Intersection	Crash Frequency
AR 190 (E Harding Ave)	at S Ohio St	Intersection	Crash Frequency
I-530 Northbound Off-Ramp	at US 270/AR 365S (Sheridan Rd)	Intersection	Crash Frequency
S Hazel St	at W 28th Ave	Intersection	Crash Frequency
AR 365 (Dollarway Rd)	at N Hutchinson St	Intersection	Crash Frequency

AR 365 (Dollarway Rd)	at AR 365S (Sheridan Rd)/Bryant St/Cheatham Ave	Intersection	Crash Frequency
AR 365S (Sheridan Rd)	at Robin Rd/Hospitality Dr	Intersection	Crash Frequency
I-530 Northbound Off-Ramp	at US 79/US 79B (S Camden Rd)	Intersection	Crash Frequency
AR 190 (E Harding Ave)	at Pine Mall Dr	Intersection	Crash Frequency
US 79B (S Blake St)	at W Barraque Ave	Intersection	Crash Frequency
US 79 (S Camden Rd)	at AR 54 (Sulphur Springs Rd)	Intersection	Crash Frequency
US 79B (S Blake St)	at AR 190 (W 6th Ave)	Intersection	Crash Frequency
US 79B (S Camden Rd)	at W 28th Ave	Intersection	Crash Frequency
I-530 Southbound Off-Ramp	at US 63/US 63B	Intersection	Crash Frequency
S Hazel St	at Country Club Ln	Intersection	Crash Frequency

5 Freight

Freight needs vary by mode. However, all freight projects within the MPA can improve roadway safety and increase economic development of the region.

5.1 Freight Truck Needs

5.1.1 Forecast Growth

Commodity Flows

As mentioned in *Appendix #2: Existing Conditions Analysis*, the Freight Analysis Framework (FAF) commodity flow data is not available for the Pine Bluff MPA. However, statewide FAF commodity flow data for the State of Arkansas can be used to show the expected changes in the means of transporting freight between 2018 and 2045.

Table 5.1 shows the expected changes in commodity flows between 2018 and 2045. According to the FAF, the truck mode is projected to increase tonnage by 52 percent between 2018 and 2045. It is also projected to remain the top mode by commodity flow tonnage; however, the mode's overall tonnage share is projected to decrease from 67 percent in 2018 to 58 percent in 2045.

Table 5.1: Changes in Means of Transporting Freight Originating in Arkansas, 2018 - 2045

Mode	Thousand Tons in 2018	Thousand Tons in 2045	Percent Change 2018 - 2045
Truck	156,749	238,309	52%
Pipeline	52,456	134,867	157%
Rail	15,420	21,324	38%
Multiple modes & mail	9,811	12,043	23%
Water	993	1,428	44%
Other and unknown	42	330	695%
Air (include truck-air)	14	54	290%
All Modes	235,483	408,354	52%

Source: Freight Analysis Framework 4

Volumes

Figure 5.1 illustrates where growth in freight truck traffic is anticipated to be the highest while Figure 5.2 shows the estimated 2045 truck volumes on the MPA's roadway network.

The largest increases in freight truck traffic are on:

- US 270 from Stowe Rd to I-530
- I-530 from US 65B (Martha Mitchell Expwy) to US 270
- AR 365S from I-530 to Jefferson Pkwy
- Jefferson Pkwy from AR 365S to AR 365

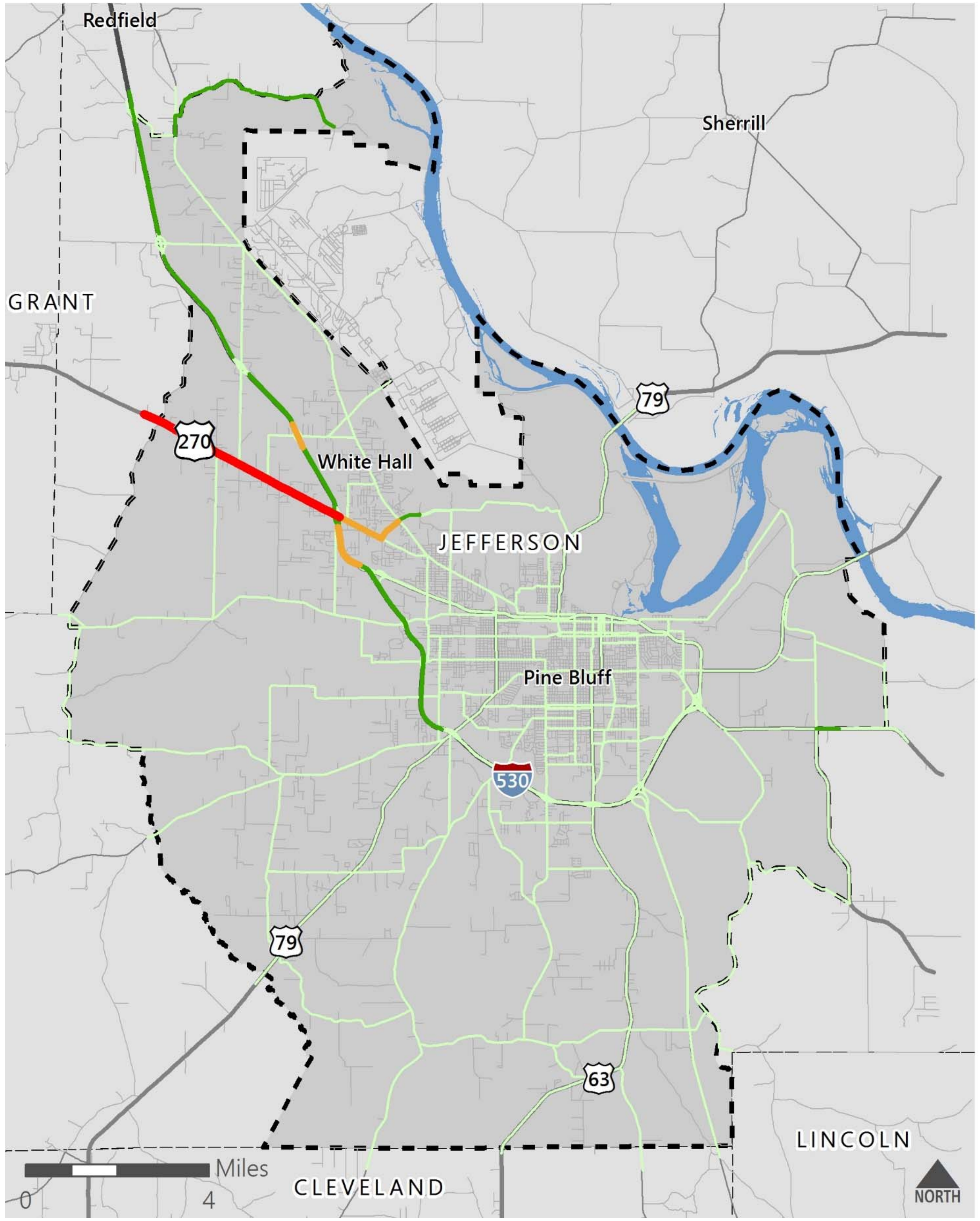
5.1.2 Roadway Capacity and Reliability

One method to address freight truck travel time reliability is through ITS improvements. Beyond ITS improvements, traditional capacity improvements can alleviate congestion-related delay.

Figure 5.3 shows the roadway segments that accommodate a large number of daily truck trips (500 or more) and experience daily volume to capacity ratio of 0.7 of greater in the base year. These segments possess the greatest need for capacity/reliability improvements to improve future freight conditions in the short-term. Figure 5.4 displays the roadway segments that are anticipated to have greater than 500 truck trips per day and experience a volume to capacity ratio of 0.7 or greater. It should be noted that the segment that met the criteria in 2019 is anticipated to see a decrease in truck traffic between 2019 and 2045, no longer carrying 500 or more trucks daily.

Figure 5.1: Freight Truck Growth, 2019 to 2045

Metropolitan Planning Area



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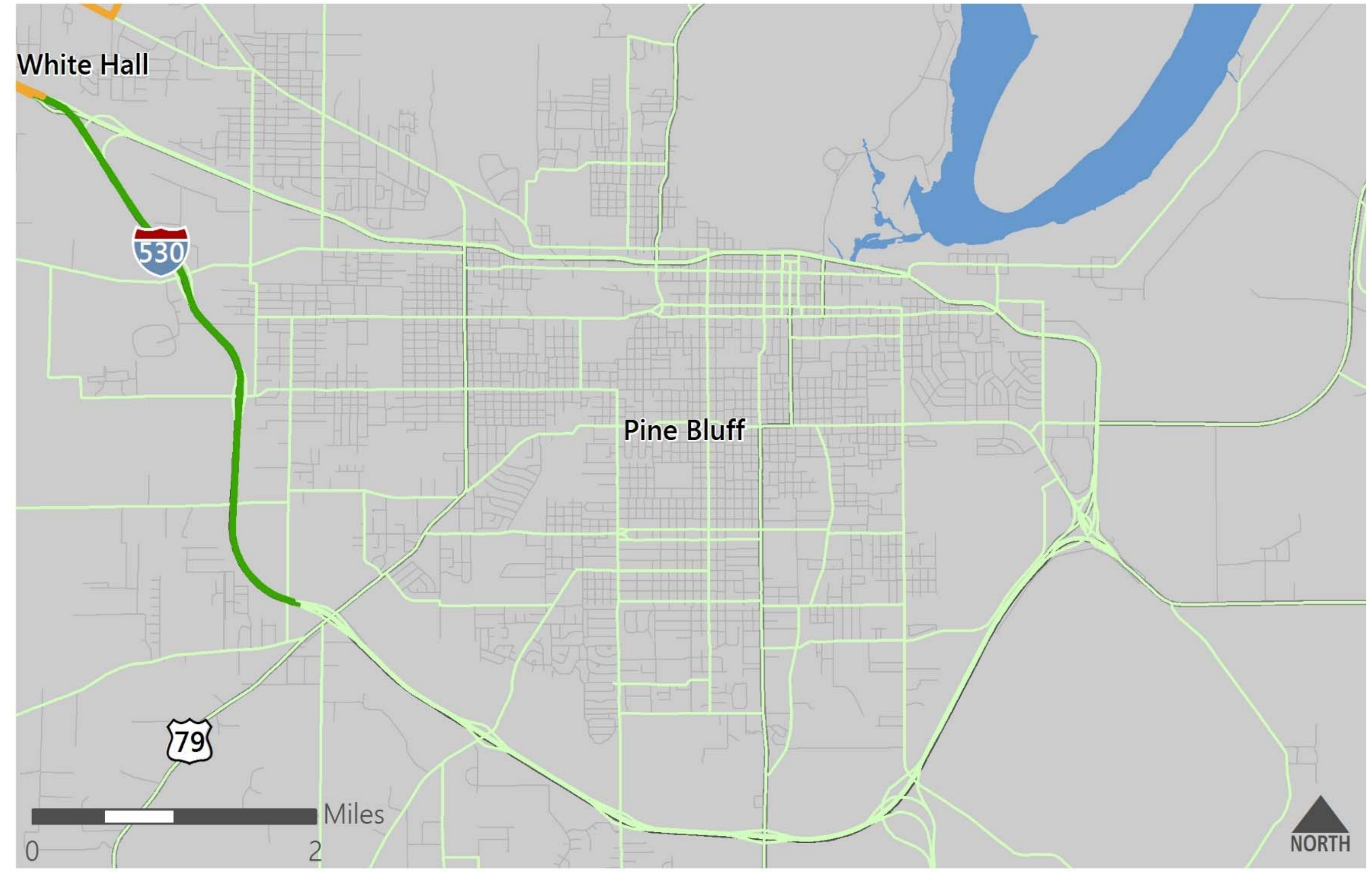


Legend

Change in Estimated Average Daily Trucks (2019 to 2045)

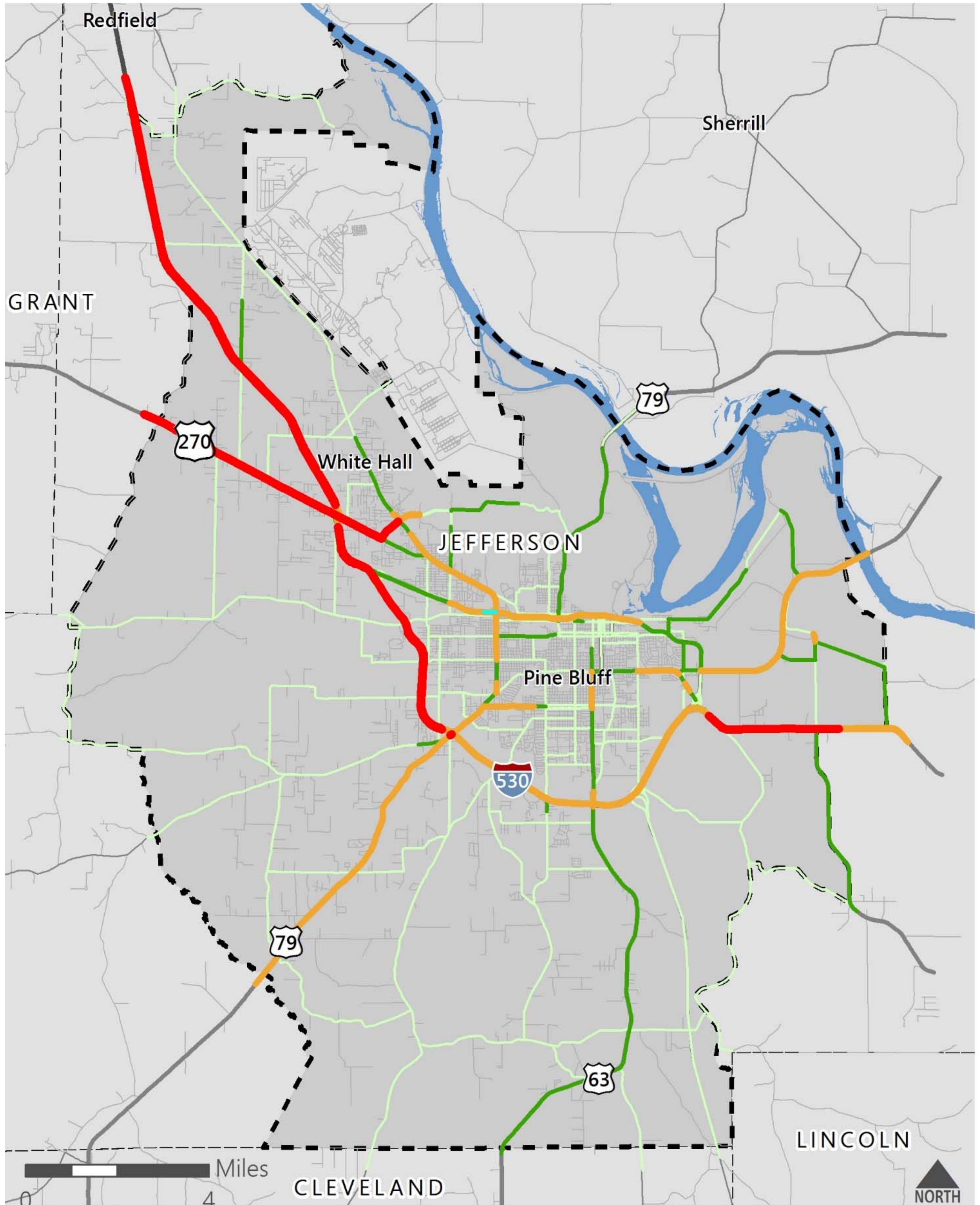
- ≤ 100
- 101 - 200
- 201 - 500
- > 500
- Planning Area

Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Figure 5.2: Freight Truck Traffic, 2045

Metropolitan Planning Area



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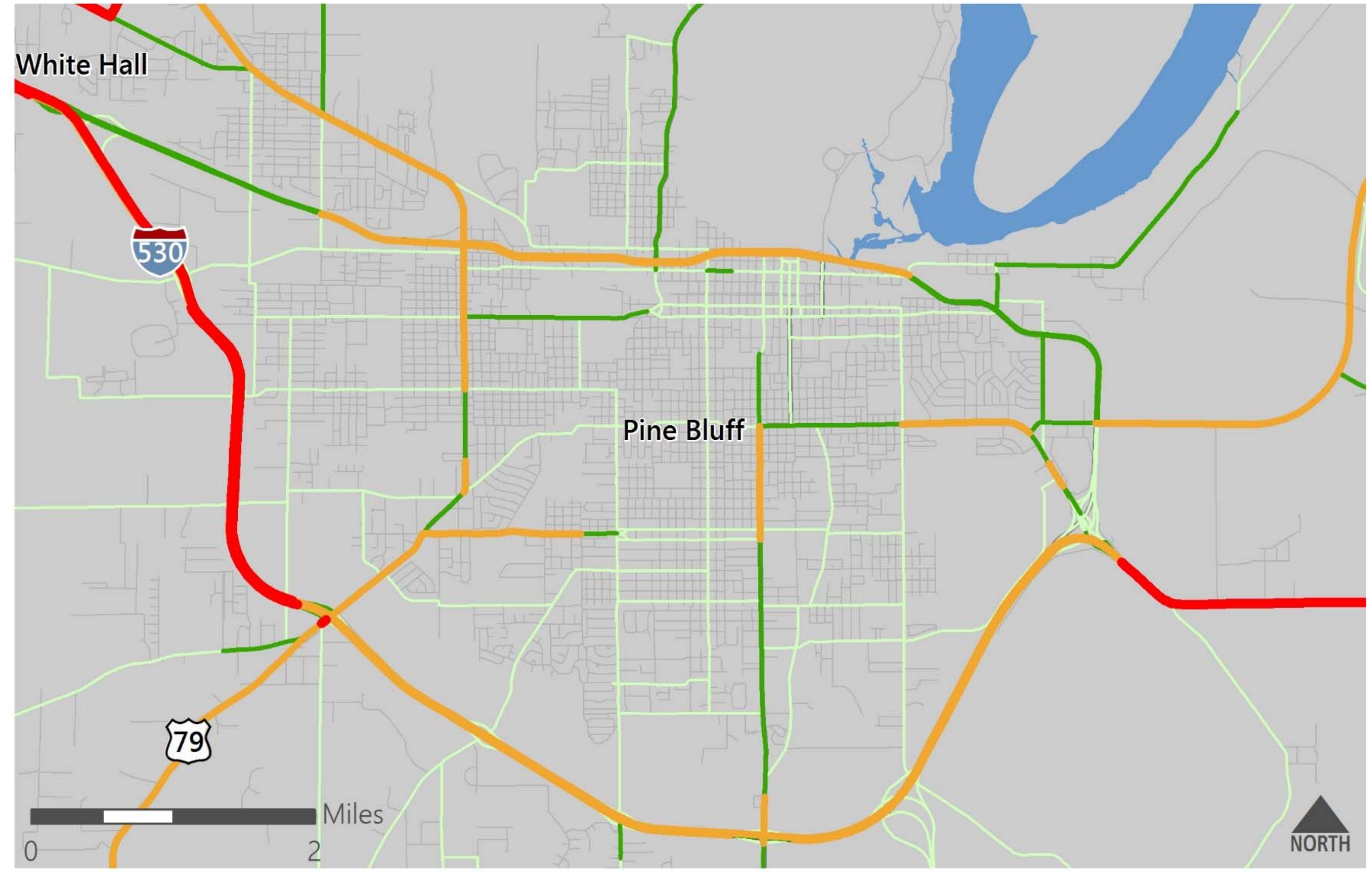


Legend

Estimated Average Daily Trucks (2045)

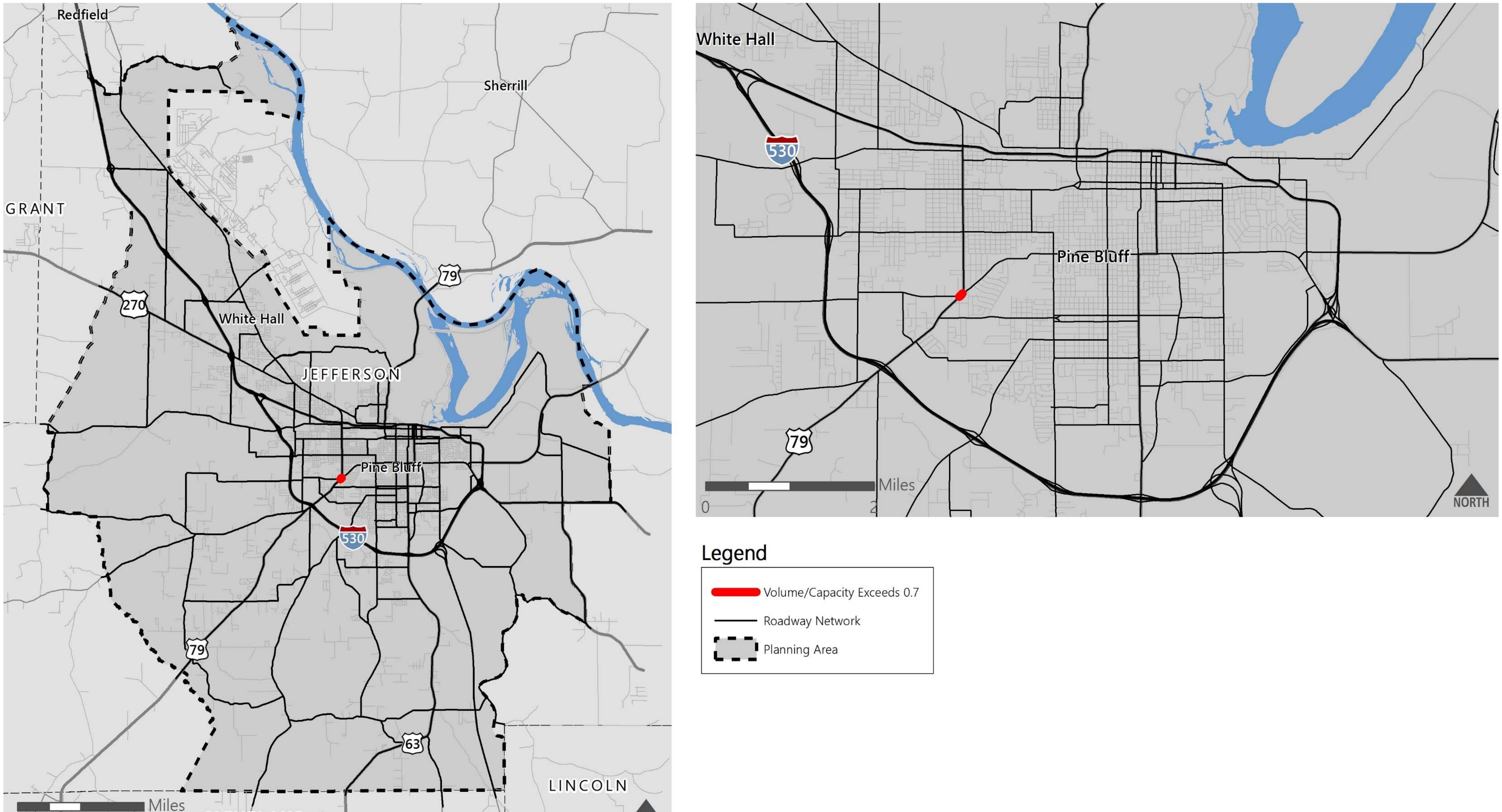
- 0 - 250
- 251 - 500
- 501 - 1,000
- > 1,000
- Planning Area

Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Figure 5.3: Freight Truck Corridors with Volume/Capacity Exceeding 0.7, 2019

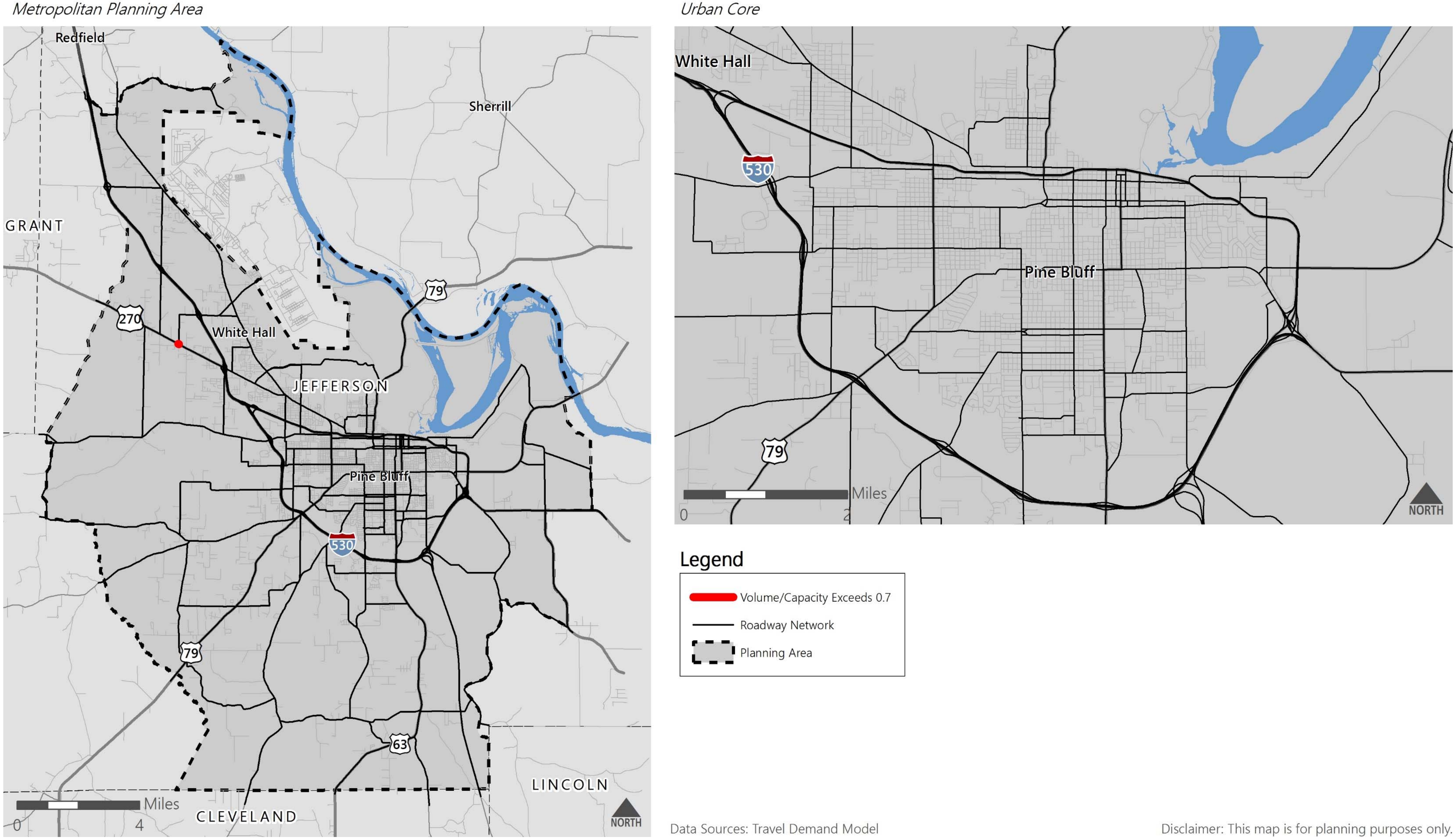
Metropolitan Planning Area | *Urban Core*



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Figure 5.4: Congested Freight Truck Corridors with Volume/Capacity Exceeding 0.7, 2045



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

5.1.3 Truck Partner Challenges and Future Plans

The major challenges facing the MPA's trucking partners is the seasonal availability of trucks. The MPA's trucking partners are currently planning for the expansion of warehouse storage space and for the continued growth in vermiculite ore redistribution.

5.2 Freight Rail Needs

5.2.1 Forecast Growth

Based on the FAF commodity flow data, the commodity flow tonnage shipped by rail is projected to increase by 38 percent between 2018 and 2045.

5.2.2 Rail Capacity and Future Projects

Future rail capacity and related needs can be measured in many ways. However, actual volumes and capacities are not known for all rail segments within the MPA, preventing forecast capacity utilization rates and needs by segment from being developed. The use of rail as a means of freight transportation is becoming a popular mode due to increasing roadway congestion. The *Arkansas State Rail Plan* outlines the future efforts anticipated by the State of Arkansas[12].

The following elements are typically assessed to determine physical rail capacity:

<u>Vertical clearances</u>

Information on vertical clearance of railroad overpasses within the MPA was not available for this plan.

<u>Weight limits</u>

The MPA's railroads are capable of handling car weights of 286,000 pounds throughout the entire region.

<u>Number of tracks</u>

There are approximately 42 miles of rail line in the MPA. Approximately 64 percent of the rail line mileage in the MPA is single track, and 36 percent is multi-track (two or more tracks).

---

12 https://www.arkansashighways.com/Trans_Plan_Policy/state_rail/AR_StateRailPlan_Final_with_Summary.pdf

Traffic control and signaling

The train operations on the MPA's railroads are controlled by a new control system, Positive Traffic Control (PTC), that is designed to automatically stop or slow a train before certain incidents occur. These systems were required to be placed on certain Class I railroads as per the Rail Safety Improvement Act of 2008.

As of November 2018, PTC systems have been installed on the UP railroads in the MPA[13]. Although the near-term operational benefits to a railroad with PTC will be limited since PTC is an overlay system, there will be more long-term benefits since PTC will lay the foundation for dynamic train blocks, which will move with trains and ensure sufficient stopping distances based on train speed and weight characteristics.

Terminal and yard capacity

Information on terminal and yard capacities were not available for this plan.

Rail Line Operating Speed

The average speed that trains move on a corridor impacts capacity and effects railroads' ability to move higher value, time-sensitive goods. Table 5.2 breaks down the railroad crossings by maximum speed. Figure 5.5 illustrates the operating speeds at each crossing within the MPA.

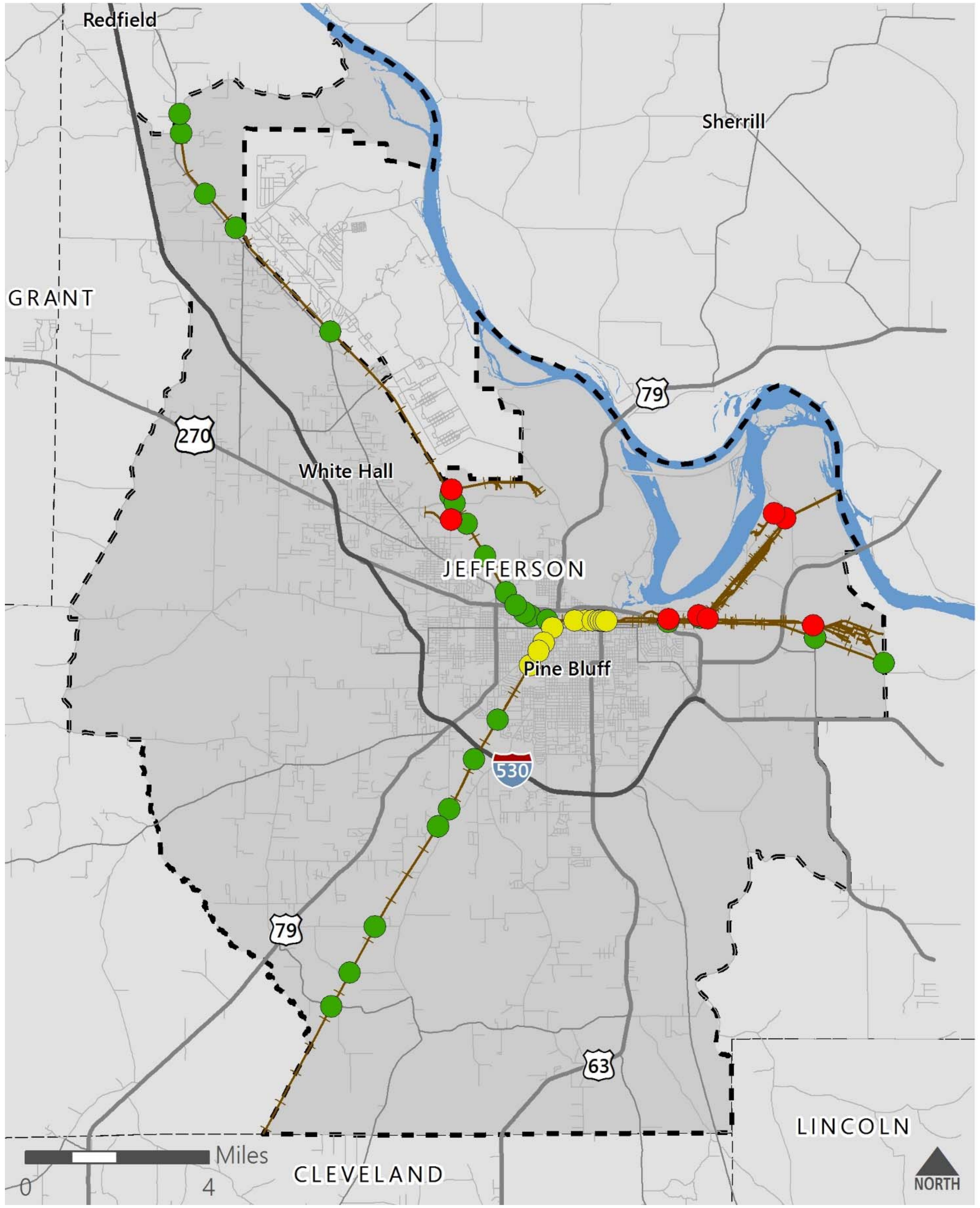
Table 5.2: Maximum Operating Speed at Railroad Crossings in the MPA, 2019

Maximum Operating Speed	Number	Percent
Less Than or Equal To 25 MPH	8	18.2%
26 MPH – 40 MPH	11	25.0%
Greater than 40 MPH	25	56.8%
Total	44	100.0%

13 https://www.up.com/cs/groups/public/@uprr/@newsinfo/documents/up_pdf_nativedocs/pdf_up_media_nov_2018_ptc.pdf

Figure 5.5: Railroad Crossing Speeds

Metropolitan Planning Area



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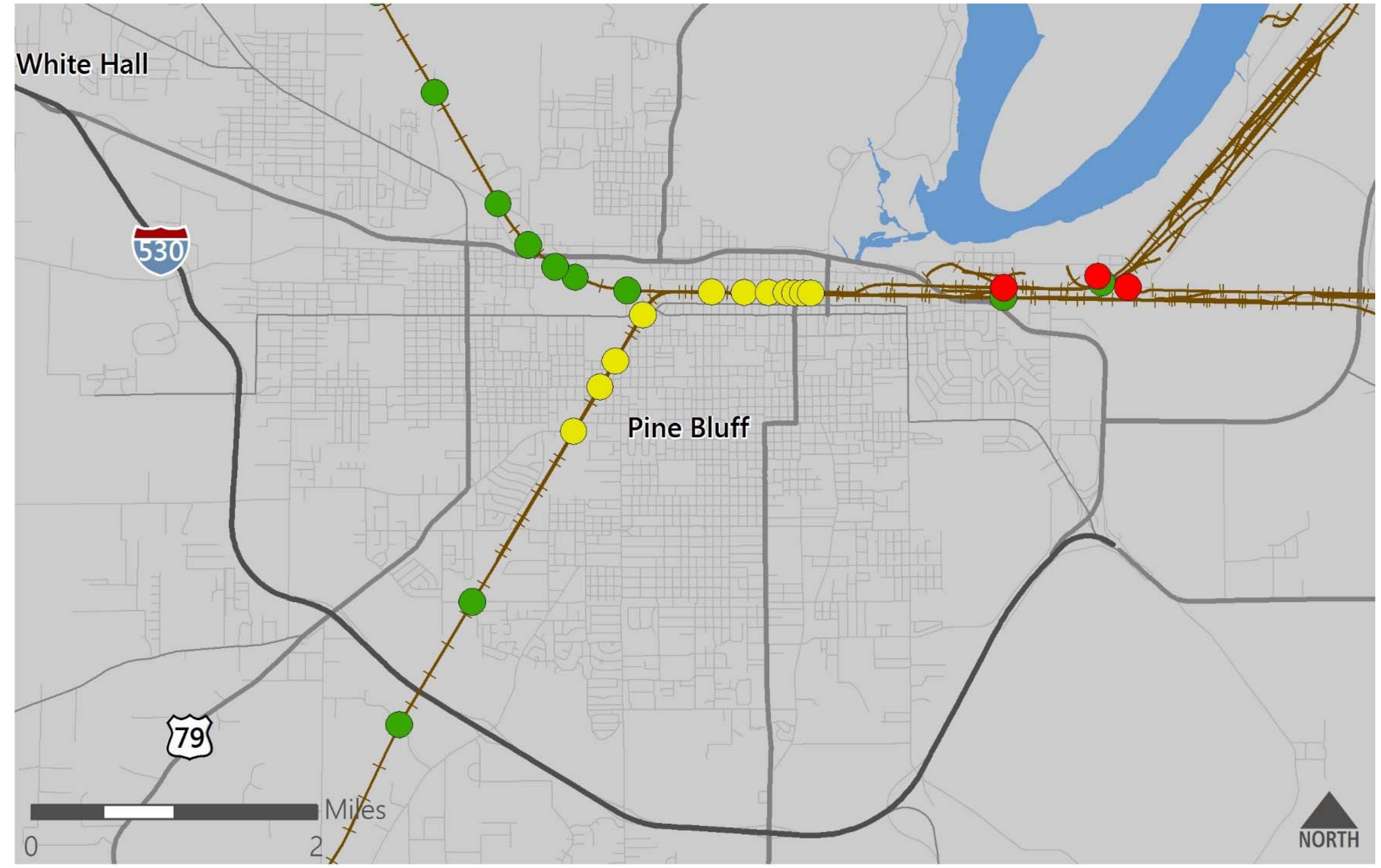

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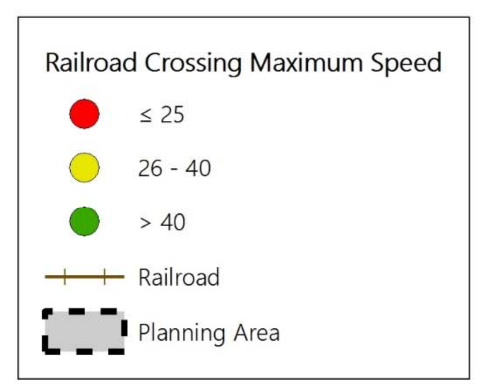


Data Sources: Federal Rail Administration

Disclaimer: This map is for planning purposes only.

5.2.3 Highway-Railroad Crossings

There are 44 public highway-rail grade crossings within the MPA, 12 of which have only passive warning devices (regulatory and warning signs, crossbucks, and pavement markings). The MPA should work with its local rail partners to add active crossing devices to these locations to improve safety.

The State of Arkansas continues its efforts to improve safety at roadway/rail grade crossings. Where warranted, ArDOT continues to create vertical separations between rail lines and roadways. However, these projects are costly and complex to complete. Additionally, ArDOT is seeking innovative solutions to reduce the instances of blocked crossings since they can restrict emergency vehicles from responding to incidents. Altering train operations is one solution that is far less expensive than building new overpasses and underpasses.

5.2.4 Rail Partner Challenges and Plans

The major challenges facing the MPA's freight rail freight partners include:

- Timely delivery of freight
- Timely delivery of empty railcars to fill commodities
- Timely pick up of filled railcars

The continued growth in freight rail traffic may increase these challenges. The MPA's freight rail partners are currently planning for an expansion in vermiculite ore redistribution.

5.3 Air Network Needs

5.3.1 Forecast Growth

According to the FAF, the commodity flow tonnage shipped by air is projected to nearly triple between 2018 and 2045. However, the air mode accounts for less than 0.1 percent of commodity flow tonnage.

5.3.2 Airport Needs and Projects

Access to and from Grider Field is provided via Grider Field Ladd Road from US 65 to the Airport. Currently, the pavement on that roadway segment is in poor condition due to heavy truck traffic. Additionally, there are other issues with the roadway including:

- Several roadway base failures in the past.

- Grider Road intersects US 65 at an angle considerably smaller than 90 degrees.
- The intersection is located in a curve on US 65.
- Safety issues for vehicles turning from Grider Field Ladd Road to US 65.

The Federal Aviation Administration (FAA) has awarded the City of Pine Bluff a grant to straighten a deviation at the south end of the taxiway at Grider Field. This project will correct a non-standard condition that exists at the airport as well as make the taxiway safer.

5.4 Waterway Network Needs

5.4.1 Forecast Growth

According to the FAF, the commodity flow tonnage shipped by water is projected to increase by 44 percent between 2018 and 2045.

5.4.2 Port Projects

There is no information on any planned port projects within the MPA.

5.5 Pipeline Network Needs

5.5.1 Forecast Growth

According to the FAF, the commodity flow tonnage shipped by pipeline is projected to increase by 157 percent between 2018 and 2045. The share of total commodity flow tonnage shipped by pipelines during the same timeframe is projected to increase from 22 percent in 2018 to 33 percent in 2045.

5.5.2 Pipeline Projects

There is no information on any planned pipeline projects within the MPA.

6 Bicycle/Pedestrian

6.1 Infrastructure/Facility Needs

6.1.1 Existing and Future Gaps

Sidewalk and bicycle infrastructure inventories were not available for the MPA. Most of downtown Pine Bluff has sidewalks, although many are in disrepair. Many schools, parks, or municipal buildings have sidewalks and a limited number of crosswalks. In addition, the University of Arkansas at Pine Bluff has a large network of sidewalks. AR 365 (Dollarway Drive) in White Hall has some sidewalk segments. Outside of these areas very few roadways within the MPA have sidewalks. Crime, railroads, and busy expressways like US 65B (Martha Mitchell Expwy) create additional obstacles for pedestrians.

For recreation, the region has several walking trails:

- Lake Saracen Walking Trail,
- Four trails in the Governor Mike Huckabee Delta River Nature Center,
- Layher Nature Trail in Bayou Bartholomew, and
- White Hall City Park.

The MPA currently lacks bicycle infrastructure. The close-knit urban grid of downtown could be very amenable to bicycling. However, most growth and development has occurred along the edges of the MPA at a lower density less favorable to bicycling.

Figure 6.1 shows existing demand for biking and walking based on land use, demographics, and built environment conditions. The methodology for the demand mapping is located in *Technical Report 2: Existing Conditions*. Figure 6.2 shows how bicycle and pedestrian demand may change in the future based on anticipated growth in the region. It is difficult to forecast exactly how growth will impact demand but it can be observed that if current trends continue, future demand will resemble existing demand. However, changes such as an increase in active downtown spaces, increased bicycle and pedestrian infrastructure, and changing demographics could increase future demand.

Based on the existing facilities and both existing and future demand, several major “gaps”, shown in Table 6.1, emerge between demand and supply.

Table 6.1: Major Bicycle and Pedestrian Gap Areas

Gap Area	Gap Type
Residential neighborhood between E 6th Ave, E 8th Ave, and S Washington St	Bicycle and Pedestrian
UAPB campus and surrounding neighborhood	Bicycle
Neighborhood by Wormack Ave and N Bryant St	Bicycle and Pedestrian
Downtown Pine Bluff from the railroad to S Ohio St and above I-530 to US 65B (Martha Mitchell Expy)	Bicycle; Need to upkeep and connect sidewalks
Area around US 79B (S Blake St) and AR 190 (W 13th Ave)	

6.1.2 Public and Stakeholder Input

Stakeholders and the public prioritized roadway maintenance above bicycle and pedestrian needs. When asked specifically about challenges to bicycling and walking, every survey respondent answered that the lack of adequate infrastructure was the biggest challenge. When asked big ideas for improving transportation in the area, a quarter of respondents said they want the region to invest in and construct a connected network of sidewalks. Besides a general request for more bicycle infrastructure and street lighting, the following areas were specifically marked on online mapping or surveys as desirable for bicycle infrastructure:

- A bicycle route from downtown Pine Bluff to White Hall,
- Bicycle infrastructure along US 65B (Martha Mitchell Expwy),
- Bicycle and pedestrian infrastructure along Main St from Lake Saracen to Harding Ave,
- Bicycle and pedestrian crossing from Lake Saracen Ln across US 65B (Martha Mitchell Expwy) to N Pine St, and
- Bicycle infrastructure along US 79B (University Dr) from Downtown Pine Bluff to UAPB.

6.1.3 Existing Plans

In the *Metropolitan Transportation Plan 2040* (2015), the MPO recommended new sidewalks, sidewalk repairs, and pedestrian crossings in a few specific areas. The recommendations aim to increase pedestrian safety and to create a more connected sidewalk network to areas such as schools and the Lake Saracen trail. For bicycles, the MPO produced the *Pine Bluff Area Transportation Study Bicycle Plan* which did not name specific plans but provided potential designs for bicycle infrastructure and mapped future bicycle routes.

The City of Pine Bluff produced three (3) plans to activate downtown spaces and improve quality of life for all residents:

- Go Forward Pine Bluff (2017)
- Re-Live Downtown Pine Bluff A Manual (2018)
- Pine Bluff Urban Renewal Agency Central City Urban Renewal Plan (2018)

Technical Report 1: Existing Conditions lists the high-priority bicycle and pedestrian projects identified in these plans. These projects were considered for recommendations in the MTP.

6.2 Safety Needs

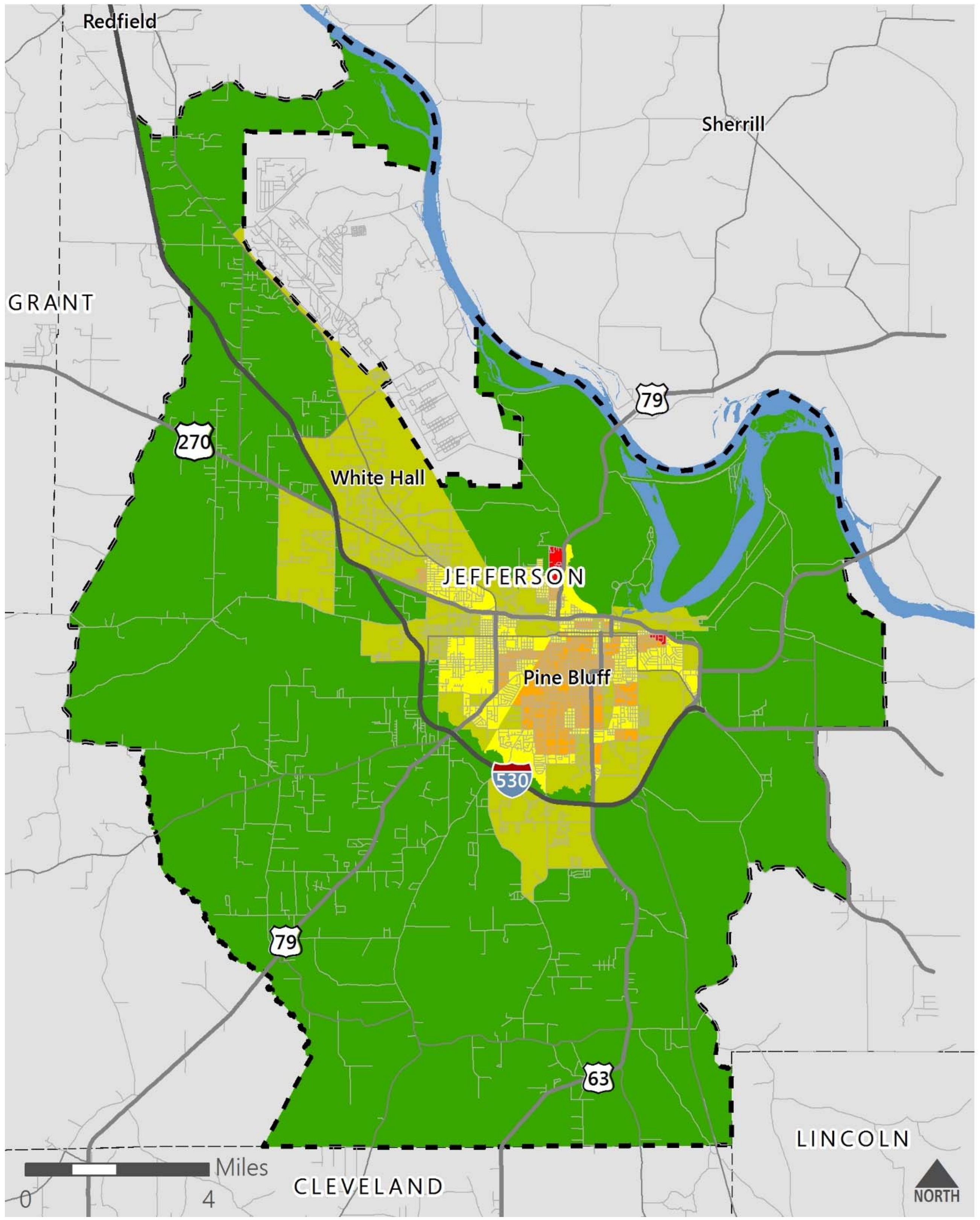
Based on available crash data, 14 bicycle collisions occurred in the MPA from 2014 through 2018 with zero (0) fatalities. There were more pedestrian collisions during this period (58 total), which is common since pedestrian activity is typically higher than bicycle activity. However, these collisions resulted in 12 fatalities over this five-year period.

In order to better understand safety needs, the MPO should work with ArDOT and local police departments to obtain detailed crash records for analysis, where feasible.

Public input indicated a priority for improved bicycle and pedestrian safety. More than half of survey respondents said that safety and comfort are a main challenge to biking and walking.

Figure 6.1: Existing Bicycle and Pedestrian Demand in the MPA, 2017-2018

Metropolitan Planning Area



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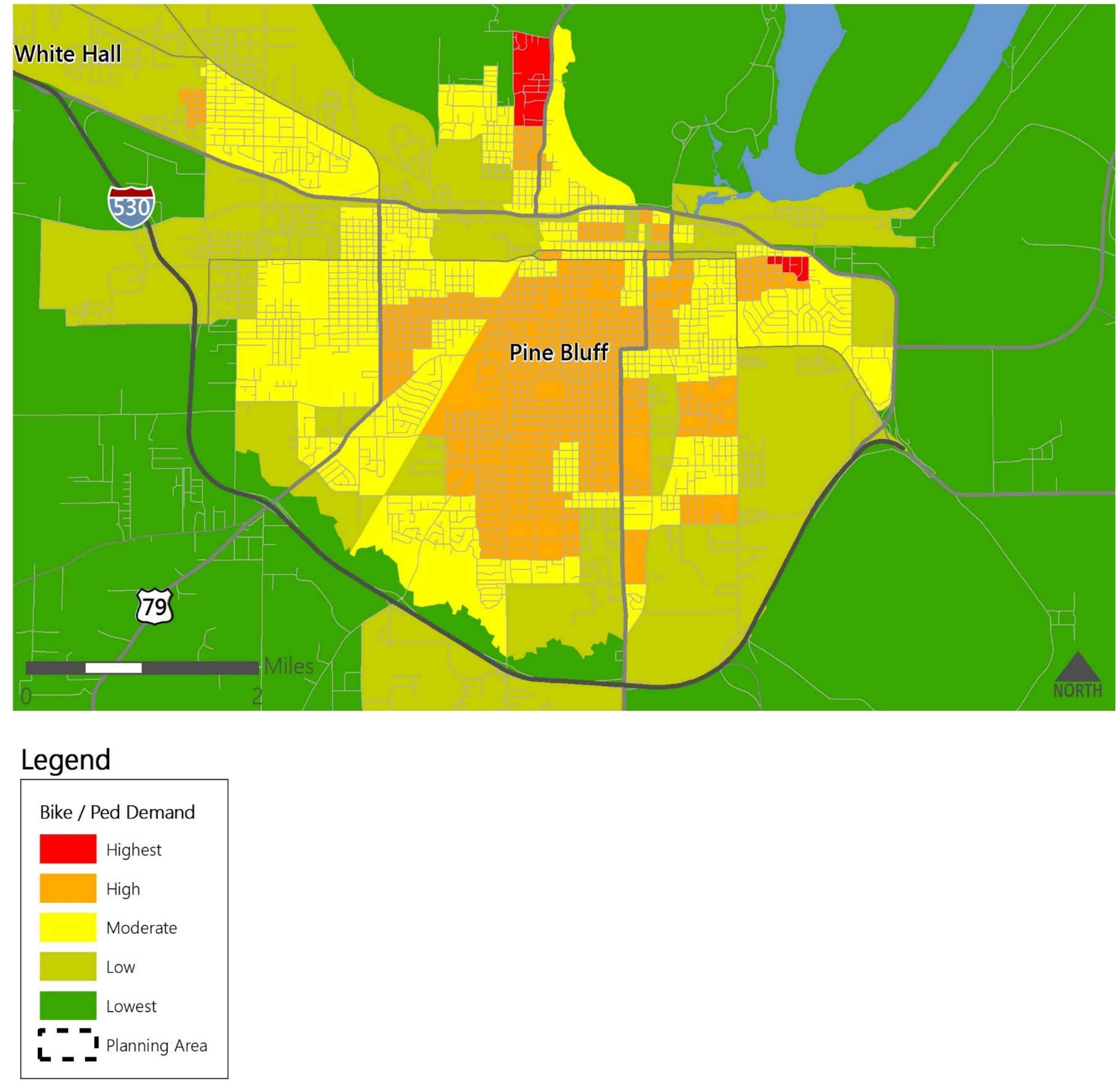
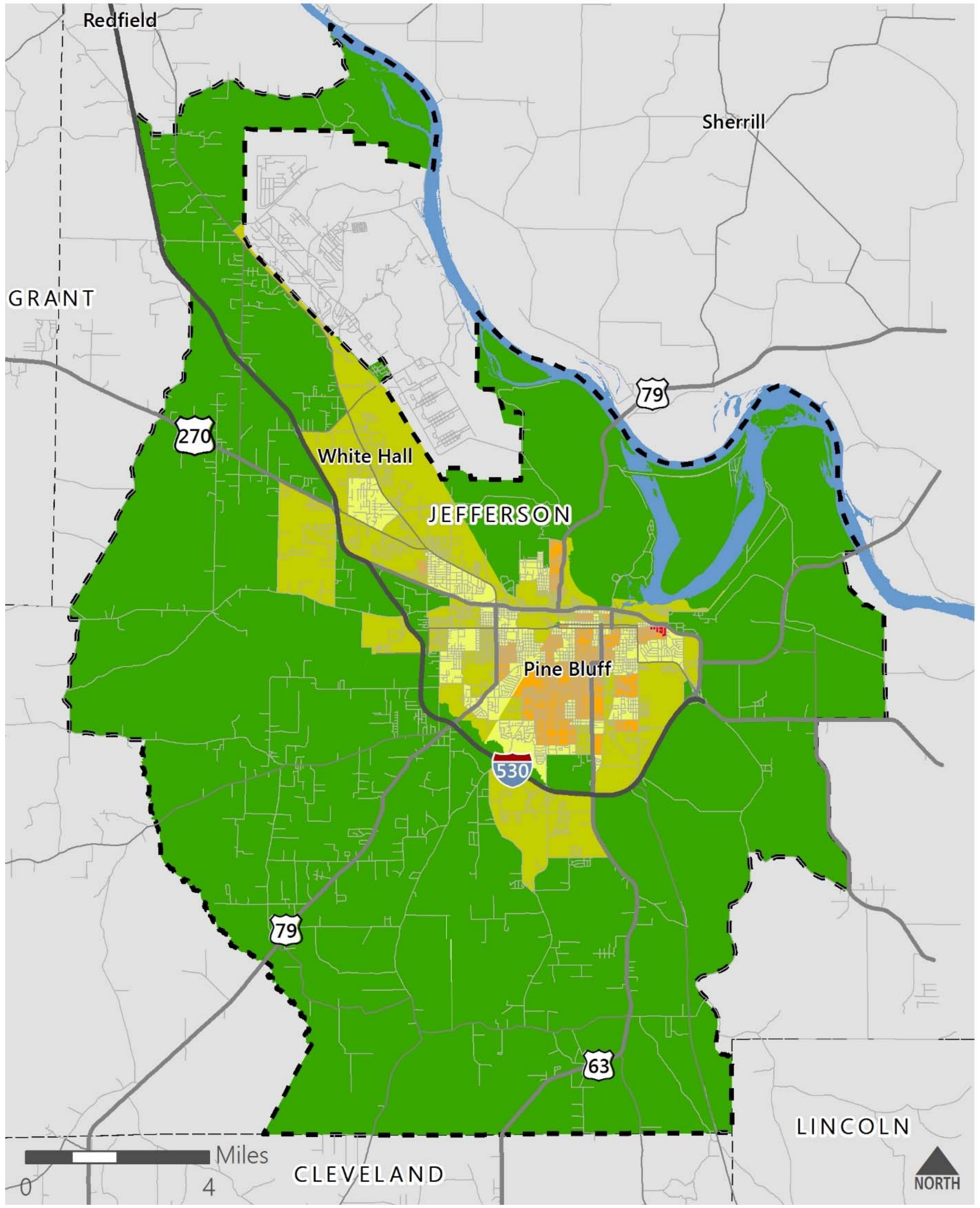


Data Sources: Census Bureau, MPO Staff; Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

Figure 6.2: Future Bicycle and Pedestrian Demand in the MPA, 2045

Metropolitan Planning Area



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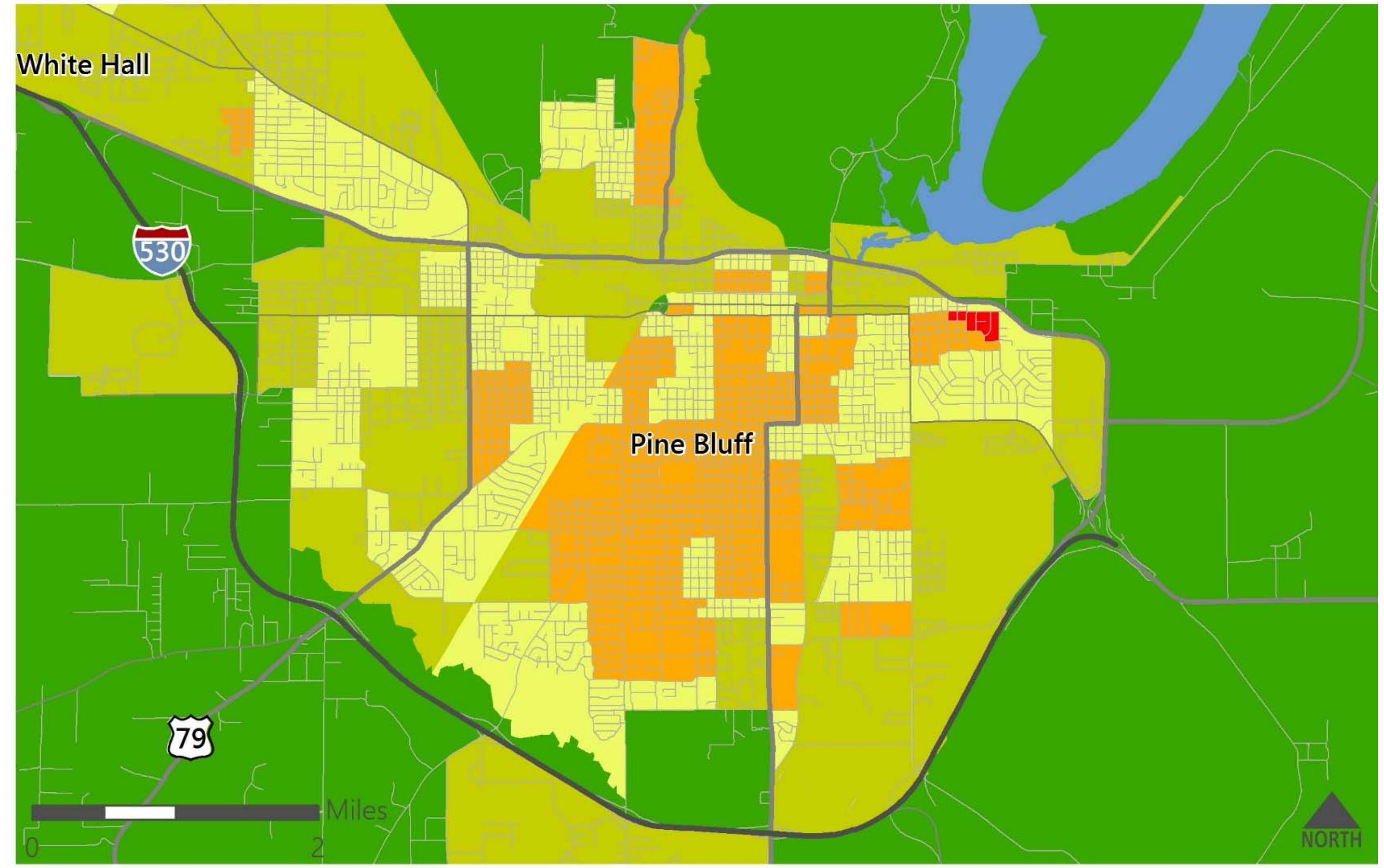


Legend

Bike / Ped Demand

- Highest
- High
- Moderate
- Low
- Lowest
- Planning Area

Data Sources: Census Bureau; MPO Staff; Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

7 Public Transit

7.1 Service Needs

7.1.1 Existing and Future Demand

Figure 7.1 shows the fixed routes for the Pine Bluff Transit System, which runs Monday through Friday, from 6:00 a.m. to 6:00 p.m. with buses running every hour or ever other hour. Figure 7.2 shows existing demand for public transit in the region based on land use, demographic, and built environment conditions. Methodology details can be found in *Technical Report 2: Existing Conditions*.

Figure 7.3 shows how future growth could impact transit demand in the region. While it is difficult to forecast exactly how growth will impact demand, we can make some observations based on areas where new growth will noticeably change the population and employment density.

Based on the existing transit service and the existing and future demand, the following gaps are evident:

Table 7.1: Major Transit Gap Areas

Gap Area	Transit Frequency that can be supported
Area in White Hall below Sheridan Rd by N Bryant St	Every 30 minutes
Area in the West End of Pine Bluff by Oakwood Rd and Faucett Rd	Every 60 minutes
A large portion of downtown Pine Bluff below the railroad	Every 30-60 minutes
Arkansas correctional facilities in White Hall by Princeton Pike and I-530	Every 60 minutes (Future demand)

Additionally, while the current routes cover a large portion of Pine Bluff, these routes run either every hour or every two hours Monday through Friday. Figure 7.2 shows that areas like UAPB and downtown Pine Bluff by Main Street and E 6th Ave can support more frequent transit.

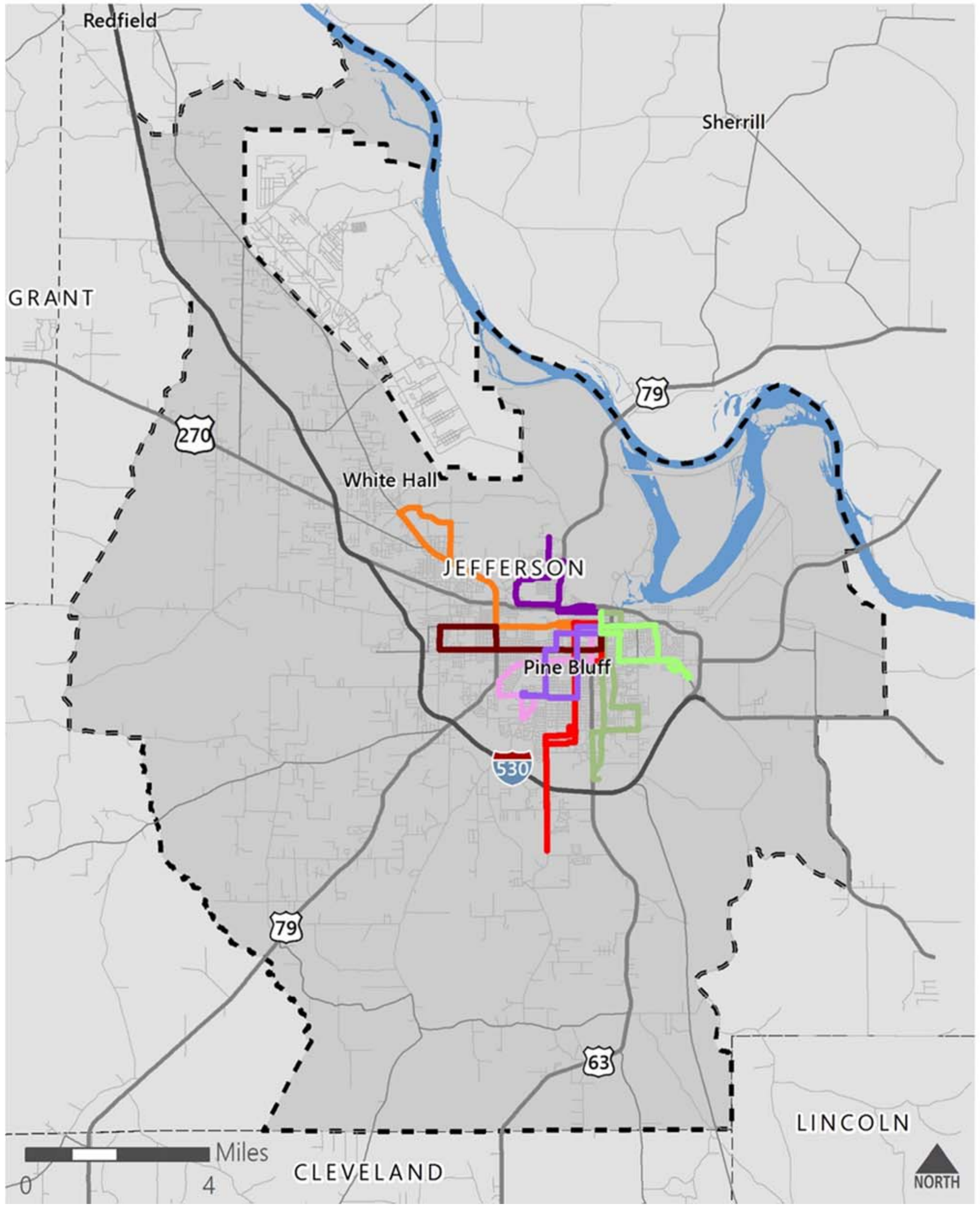
7.1.2 Public and Stakeholder Input

During outreach, almost all survey respondents said that the biggest challenge to riding transit is the limited areas of service, followed by unreliability. Big ideas mentioned for transit were expanding service coverage to include all of Pine Bluff and White Hall and improving routes that also have more stops along the way. Three specific transit ideas were mentioned:

- Expanding transit along Dollarway Road in White Hall,
- Adding transit along US 79 (S Camden Rd) through the Watson Chapel neighborhood, and
- Adding transit to the neighborhood around the intersection of S Hazel Street and Middle Warren Road.

Figure 7.1: Pine Bluff Transit Fixed Route System

Metropolitan Planning Area



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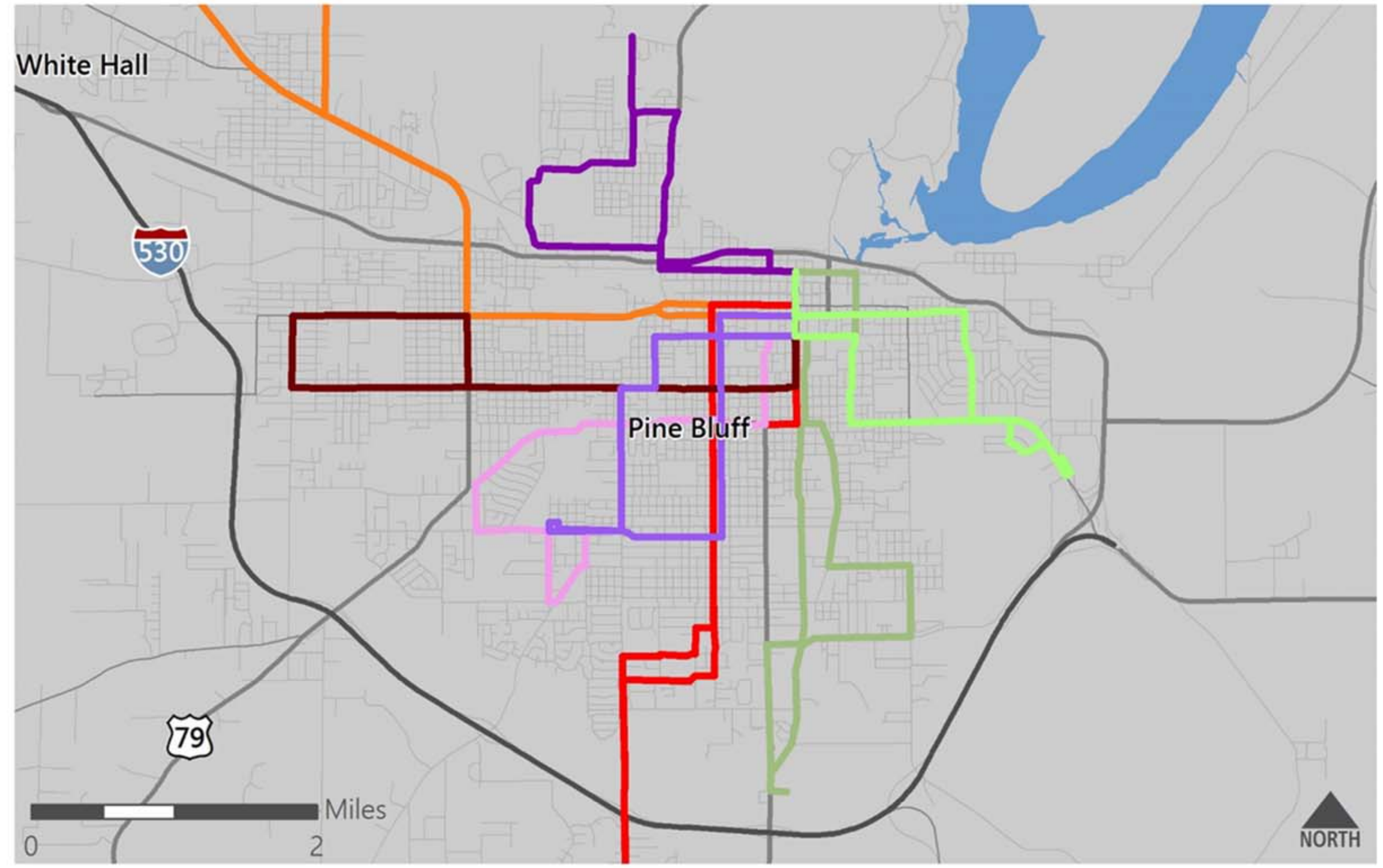
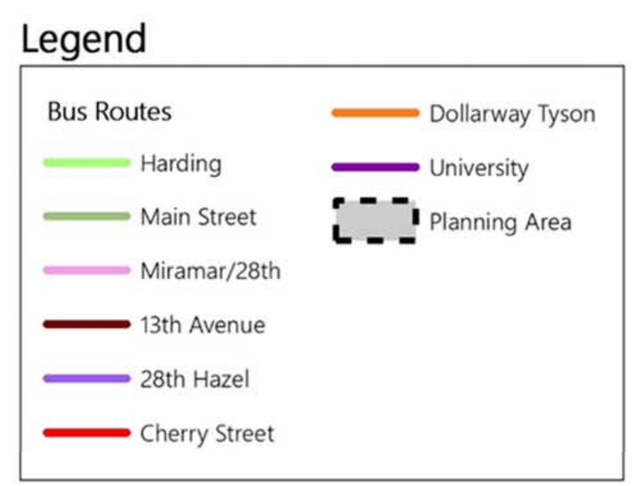
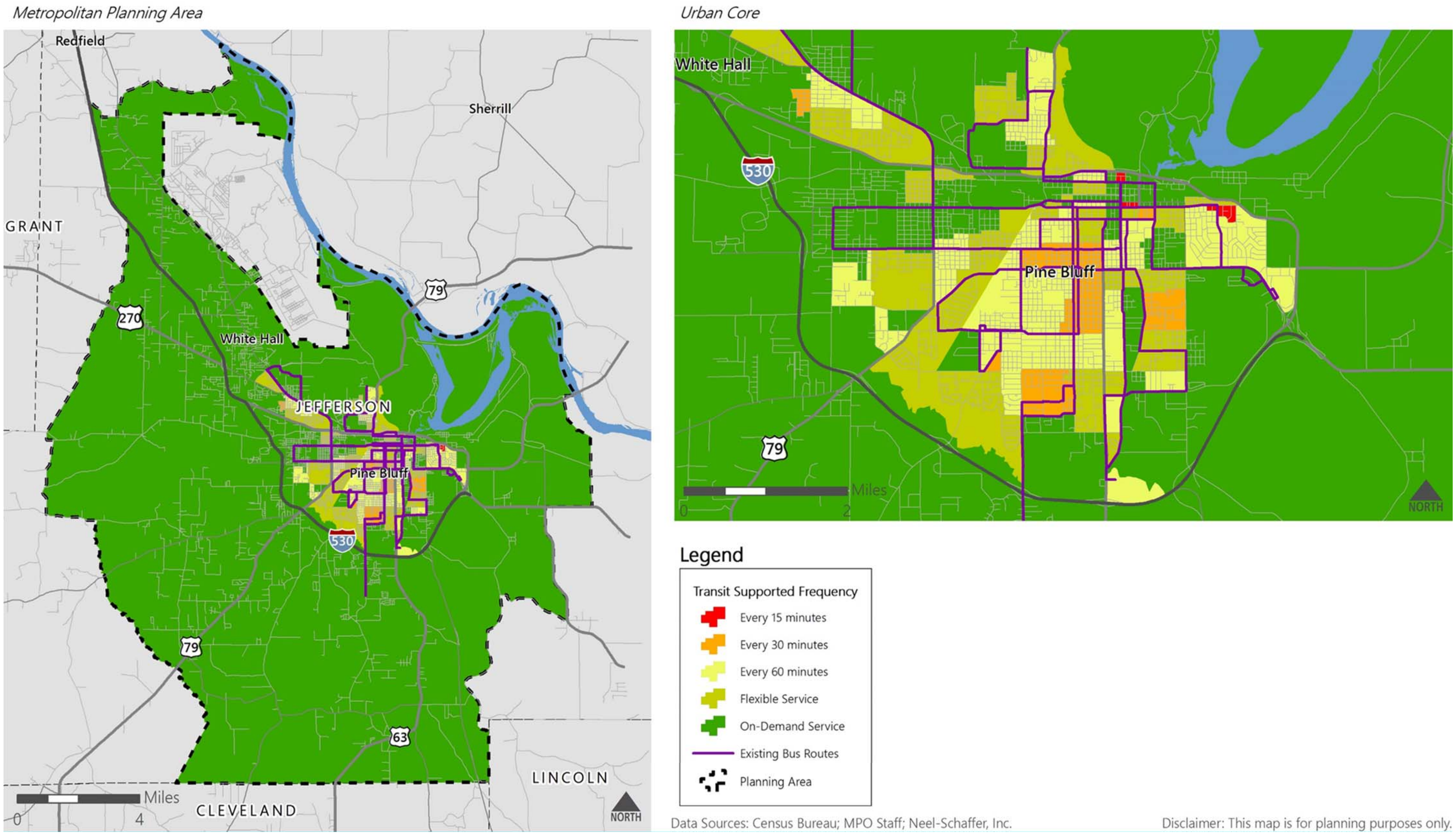




Data Sources: MPO Staff

Disclaimer: This map is for planning purposes only.

Figure 7.2: Existing Transit Demand in the MPA, 2017-2018

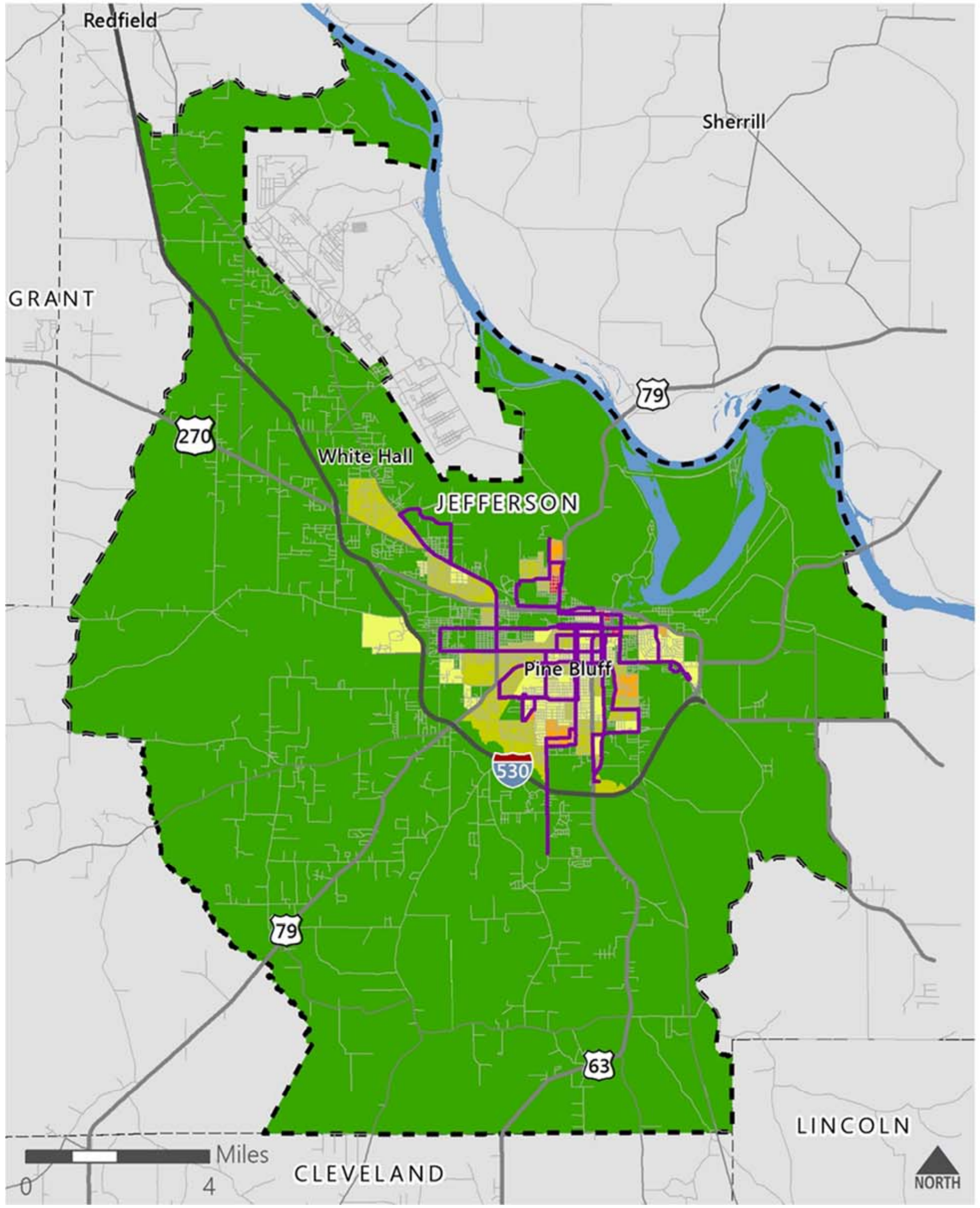


Data Sources: Census Bureau; MPO Staff; Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

Figure 7.3: Future Transit Demand in the MPA, 2045

Metropolitan Planning Area



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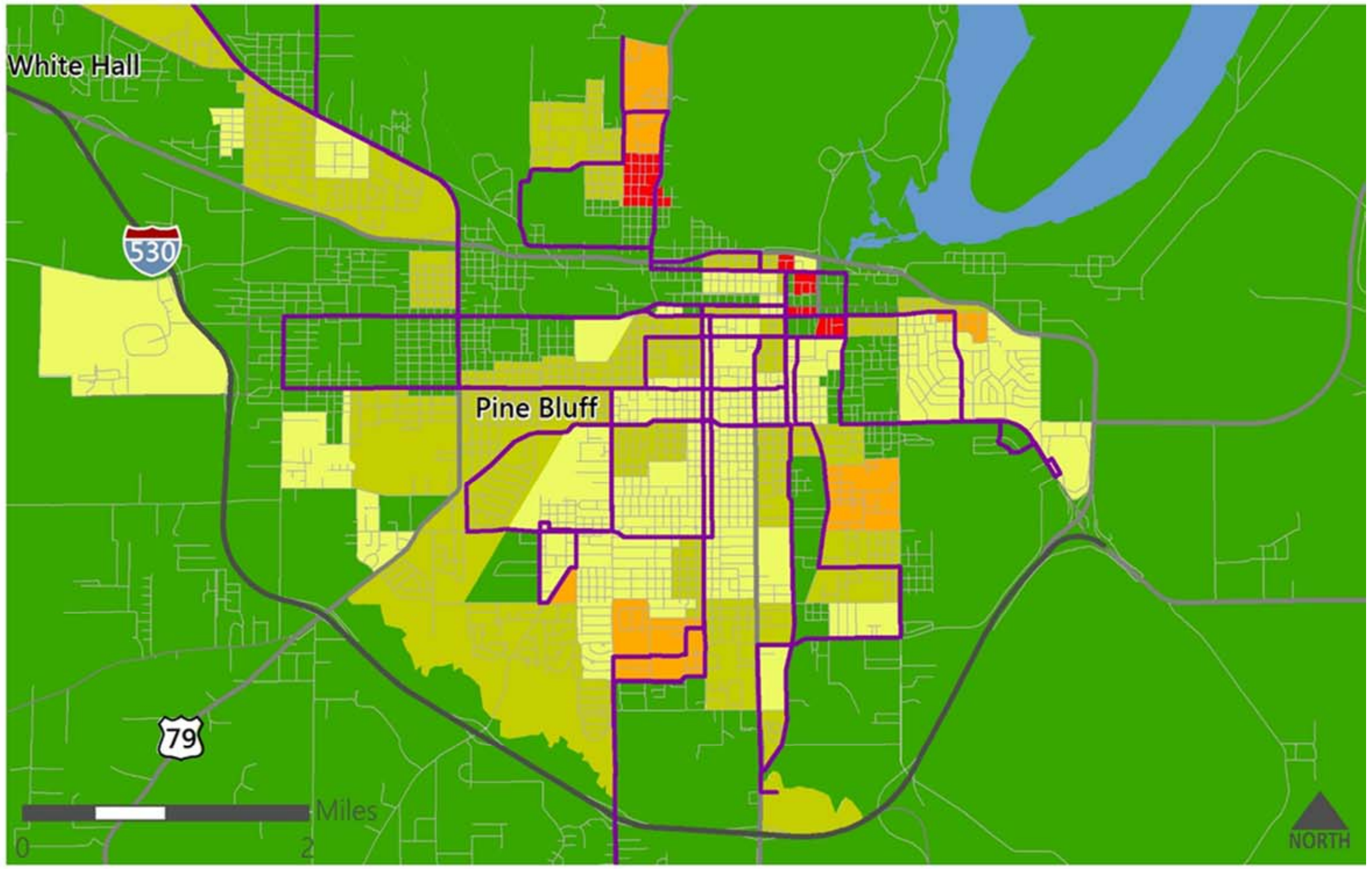

Legend

Transit Supported Frequency
- Every 15 minutes
- Every 30 minutes
- Every 60 minutes
- Flexible Service
- On-Demand Service
- Current Pine Bluff Transit Routes
- Planning Area

Data Sources: Census Bureau; MPO Staff; Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

7.1.3 Existing Plans

The *Statewide Transit Coordination Plan (2018)* aimed to improve the transit services available to low-income, elderly, and disabled residents by the state's various providers. The plan named benefits of coordination like increasing the range of staff, equipment, and services; increasing cost efficiency; and streamlining data collection and funding requests. These improvements can help provide riders with better service at lower costs. The plan identified obstacles to coordination and strategies to overcome these obstacles. The plan also quantified transportation needs per county and ranked Jefferson County in the highest tier of transit demand.

The plan also discussed the benefits of a centralized bus transfer station in downtown Pine Bluff should interest and funds materialize.

The *Jefferson County Transportation Coordination Plan* (2007) identified the following transit needs for the various transit providers in the region:

- late night and weekend transit service, especially for workers,
- expanded transit service outside the urban core,
- increased frequency of fixed route service,
- expanded service area of paratransit service,
- readily available route and timetable information,
- upgraded fleet, and
- local governmental support to adequately fund transit programs.

The plan also acknowledged that over time transportation demands for elderly, disabled, and low- income persons will increase.

7.2 Capital Needs

Of the PBT rolling stock, only one (1) vehicle, or nine (9) percent of the stock, is past its Useful Life Benchmark (ULB), as defined by vehicle age and the default ULB established by the Federal Transit Administration. All four (4) buses are still within their ULB. While actual vehicle lifespans may extend beyond the default ULB based on local roadway and environmental conditions, older vehicles will still need to be replaced on a regular basis over the next 25 years. Efforts should also be made to extend vehicle lifespans beyond their ULB through preventative maintenance.

PBT will need to carefully monitor the frequency of vehicle breakdowns and other road calls. It may become necessary to revisit standard operating procedures and develop a fleet management plan to more efficiently replace, refurbish, and maintain vehicles.

All facilities reported to NTD were in an acceptable condition, scoring a 3.0 or above on the Transit Economic Requirements Model (TERM) Scale.

Table 7.2: PBT Rolling Stock Inventory and Performance

Vehicle Type	Active Vehicles with ULB Reported	Active Vehicles Past Useful Life	% Past Life
Bus	4	0	0%
Cutaway Bus	3	0	0%
Van	1	0	0%
Mini-van	3	1	33%
Overall	11	1	9%

Source: NTD Urbanized Area Asset Summary, 2018

Table 7.3: PBT Equipment Inventory and Performance

Vehicle Type	Vehicles with ULB Reported	Vehicles Past Useful Life	% Past Life
Trucks and other Rubber Tire Vehicles	0	0	0.0%

Source: NTD Urbanized Area Asset Summary, 2018

Table 7.4: PBT Facility Inventory and Performance

Asset Category	Facilities with Condition Assessment	% Under 3.0 on TERM Scale	% Below 3
Administrative Office/Sales Office	0	0	0.0%
Combined Administrative and Maintenance Facility	1	0	0.0%
Maintenance Facility (Service and Inspection)	0	0	0.0%

Source: NTD Urbanized Area Asset Summary, 2018

7.3 Safety Needs

PBT has a slightly higher rate of safety and security events than the state or nation as a whole. However, its overall number of these events is low, averaging between two (2) and three (3) per year, and these events did not result in any injuries or fatalities.

Pine Bluff Transit should continue to measure and monitor its safety performance, per its standard operating procedures for operations and maintenance. This will ensure that any safety needs are identified and that mitigation measures are implemented as needed.

APPENDIX

5

Plan Development

Draft September 2020

Pine Bluff - White Hall - Jefferson County
Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

Prepared by:

NEEL-SCHAFFER
Solutions you can build upon

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1 Introduction

This report describes how the Metropolitan Transportation Plan (MTP) was developed and details the associated information and planning process that was used. It builds on other Appendices and addresses the following topics:

- Public and Stakeholder Involvement
- Existing Plans
- Visioning and Strategies
- Project Development
- Environmental Analysis and Mitigation
- Project Prioritization
- Financial Plan
- Implementation Plan

Figure 1.1: Long Range Transportation Planning Process

2 Public and Stakeholder Involvement Phase 1

The first phase of the planning process was arranged to provide information on transportation priorities and ideas for improvement in the region. It was also an opportunity to meet with key stakeholders and learn about needs and upcoming plans.

Input in this phase was used to develop the vision, goals, and objectives and to identify potential projects to be included in the plan. Input on growth areas was also used in forecasting future socioeconomic data for the regional travel demand model.

2.1 How We Engaged

2.1.1 MTP Stakeholder Advisory Committee

On May 20, 2020 a virtual meeting was held online at 10:00 A.M for the area's stakeholders due to Shelter-in-Place orders enacted as a result of COVID-19. The meeting was conducted on the Zoom platform and via phone. Participants could provide input by:

- calling,
- answering polls,
- emails, and
- Zoom chat.

Fourteen people attended the virtual stakeholder meeting, in addition to project staff. Of this group:

- three (3) people identified as working for government agencies,
- three (3) identified as elected officials, and
- one (1) identified as representing a major employer.

The purpose of this meeting was to learn about priorities, brainstorm ideas for improving transportation, and identify major growth areas.

2.1.2 Public Meeting and Online Survey

Due to the previously mentioned Shelter-in-Place orders, virtual public meetings for the MTP were also conducted using the Zoom Platform.

The meetings were advertised through:

- the Metropolitan Planning Organization (MPO) website,
- Pine Bluff Commercial newspaper,
- Pine Bluff and White Hall city hall buildings,
- MPO Facebook page, and
- 100.3 Deltaplex Radio

Six (6) individuals attended the four (4) virtual public meetings, held on:

- Wednesday, May 20, 2020 from 4:30 PM – 5:00 PM
- Wednesday, May 20, 2020 from 6:00 PM – 6:30 PM
- Thursday, May 21, 2020 from 4:30 PM – 5:00 PM
- Thursday, May 21, 2020 from 6:00 PM – 6:30 PM

The purpose of the public meetings was to introduce the general public to the MTP process and guide them through the online survey, which was available from April 14, 2020 through June 12, 2020. The online survey asked people to weigh-in on five (5) topics that would help planners better understand priorities and needs in the region.

- The first topic asked about general transportation priorities
- The second topic asked about budget allocation priorities
- The third topic asked about areas with perceived safety issues
- The fourth topic asked about areas with perceived high levels of congestion
- The final topic asked about their ideas for improving transportation in the region.

The complications created by COVID-19 and the Shelter-in-Place order prevented usual outreach methods from happening, forcing the use of virtual public meetings. This results in some Environmental Justice communities of concern, notably low-income households, having difficulty an attending the meetings or accessing the survey. To address this issue additional public outreach was conducted and physical copies of the survey were printed and issued to the following places that agreed to distribute them as the Shelter-in-Place orders were lifted:

- White Hall City Hall
- Pine Bluff City Hall
- Gallilee MBC
- Good Faith Carr United Methodist
- Summitt Baptist
- Grace Baptist

There was a total of 20 surveys completed from the online survey and additional public outreach. Survey participants were not required to answer all questions.

Table 2.1: Phase 1 Public and Stakeholder Activity

Activity	People Engaged	Surveys Completed
MTP Advisory Committee Meeting	14	N/A
Public Meeting	6	N/A
Online Survey	11	11
Additional Outreach	9	9
Total	**40**	**20**

2.2 Stakeholder Input

The attendees of the MTP Stakeholder Advisory Committee participated in three exercises.

The first exercise was interactive polling that asked about transportation priorities, challenges, and concerns. Results from the poll are shown in on the following pages and key takeaways include:

- Maintaining the infrastructure within the Metropolitan Planning Area (MPA) is their greatest concern.
- Congestion causes the stakeholders the least amount of concern within the MPA.
- Supporting the movement of goods and freight is another concern within the MPA.

The second exercise asked stakeholders to mark areas where future development is expected to occur to indicate the kind of development it would be (residential, commercial, industrial, recreational, or educational/medical). Figure 2.4 shows these areas of anticipated development.

The third exercise asked stakeholders to mark areas where needed transportation improvements, or planned improvements, in the MPA are. These could include projects for roadways, bicycle and pedestrian infrastructure, transit, freight, or any other transportation need. Figure 2.5 displays the proposed improvements.

Figure 2.1: Transportation Priorities Ranked in Order of Importance

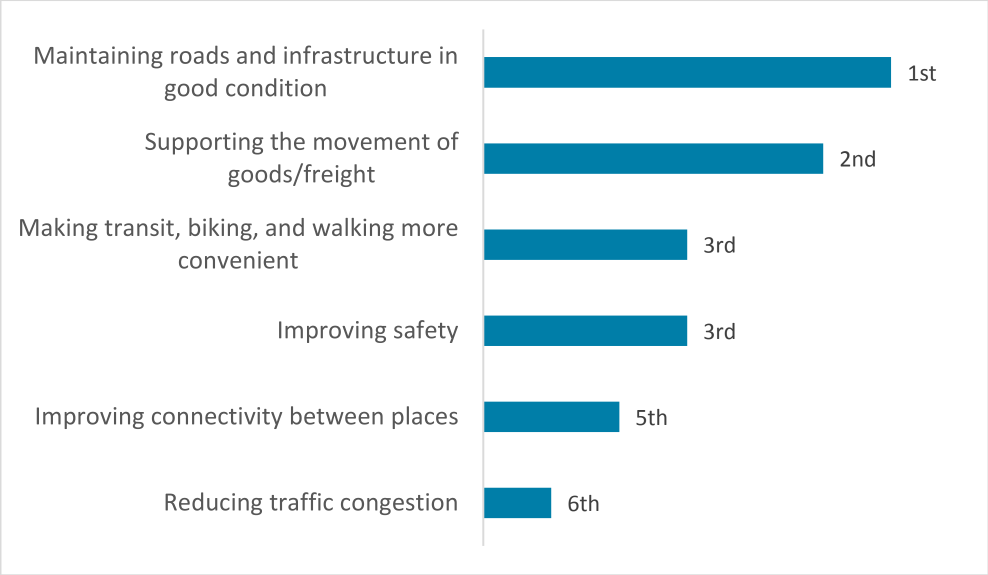


Table 2.2: What is the region's single biggest transportation need?

Transportation Need	Times Mentioned
Improved conditions of local roads (i.e. fix pot holes and striping)	3
Widened Roads (especially leading into metropolitan areas)	2
Improved multimodal transportation, especially for bicyclists and pedestrians for both recreation and commuting trips	2
Increased transportation options and children after 5 P.M. and on weekends	1
Improved drainage during peak rainfall	1
Better connect the area's major anchors	1
Increased transportation funding	1

Figure 2.2: Compared to the last 25 years, how do you think Jefferson County will grow through 2045?

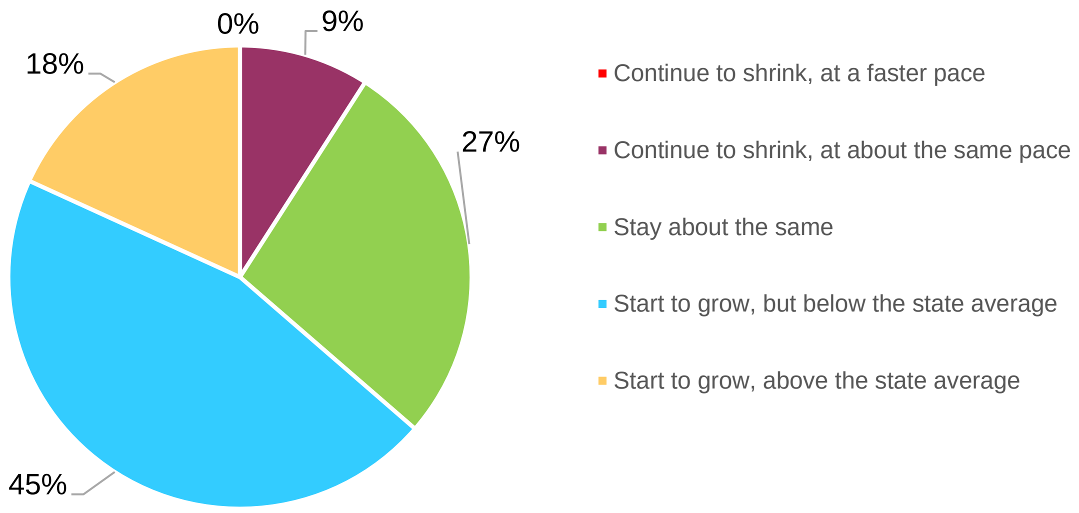


Table 2.3: Most Congested Corridors or Intersections

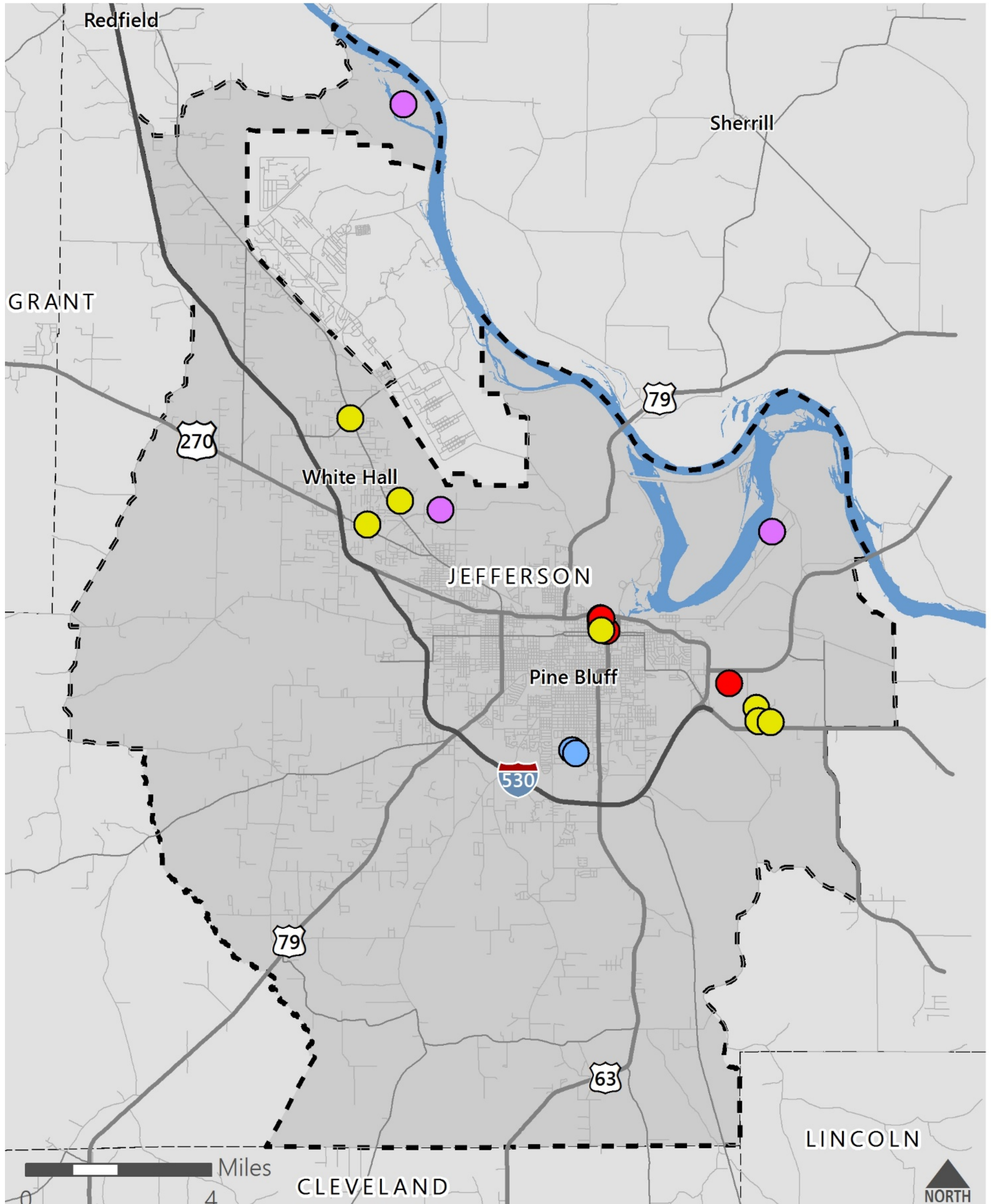
Corridor or Intersection	Times Mentioned
US-79 (S Camden Rd) & Sulphur Springs Rd	5
Sheridan Rd & I-530	1
Olive St & I-530	1
Martha Mitchell Expwy & University Dr	1
Martha Mitchell Expwy & Dollarway Rd	1
US-270 (Sheridan Rd)	1
Olive St southbound	1

Table 2.4: Corridor or Intersection in Most Need of Safety Improvements

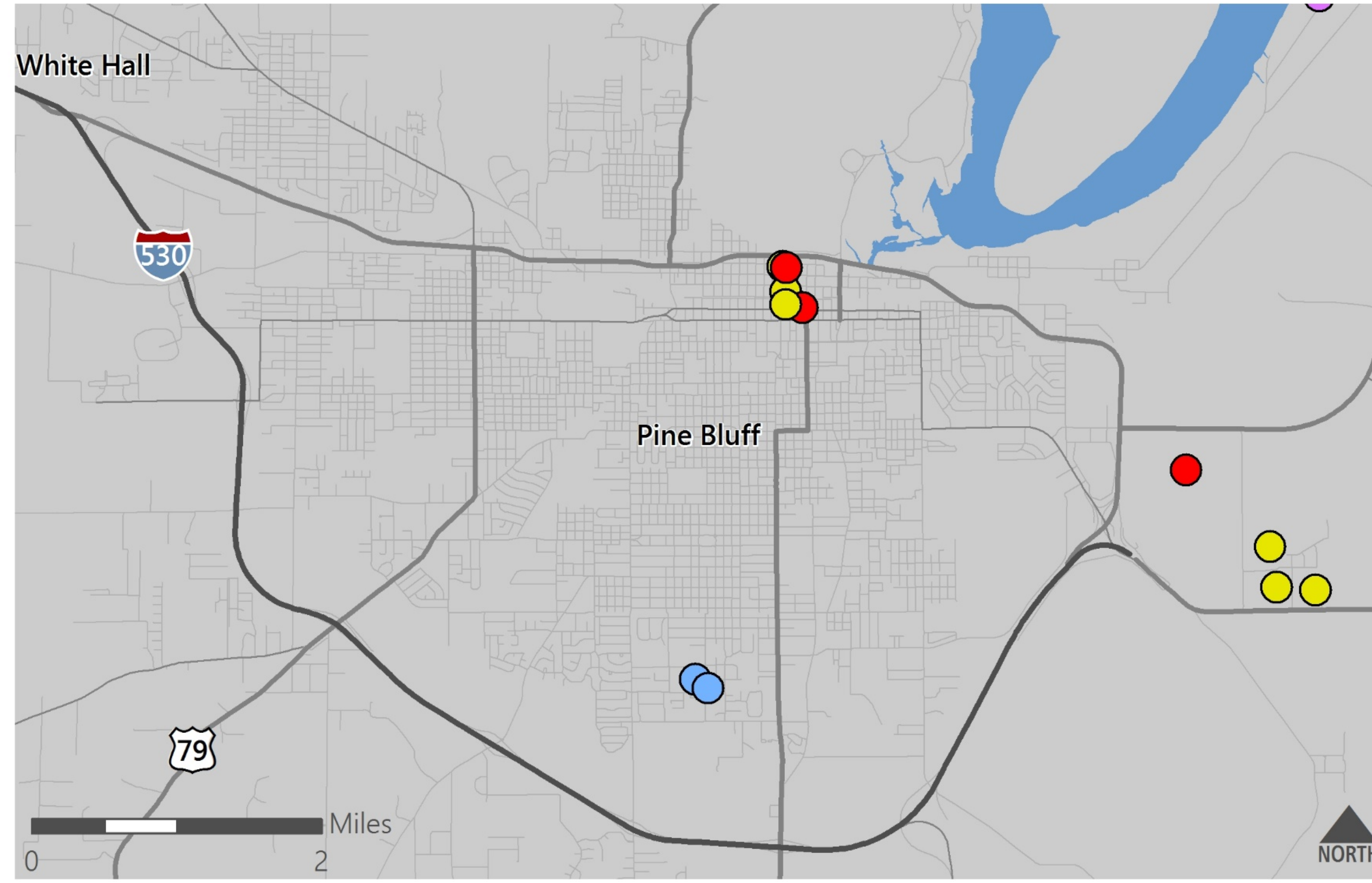
Corridor or Intersection	Times Mentioned	Comments
Old Warren Rd	1	East of I-530 it's very dangerous for bicycles and pedestrians
Crosswalks along Martha Mitchell Expwy	1	From S. Texas St to University Ave
Grider Field Ladd Rd & US-65	1	
US-270 & AR-365 (Sheridan Rd)	1	
W 17th Ave & (US-79) S Blake St	1	
Dollarway Rd & Bryant	1	
Bryant St & AR-365 (Dollarway Rd)	1	
US-79/US-63 & Market St; I-530 & US-65 & E Harding Ave	1	Intersections around Saracen Casino Resort

Figure 2.3: Stakeholder Anticipated Growth Areas

Metropolitan Planning Area



Urban Core



Legend

Major Growth Areas

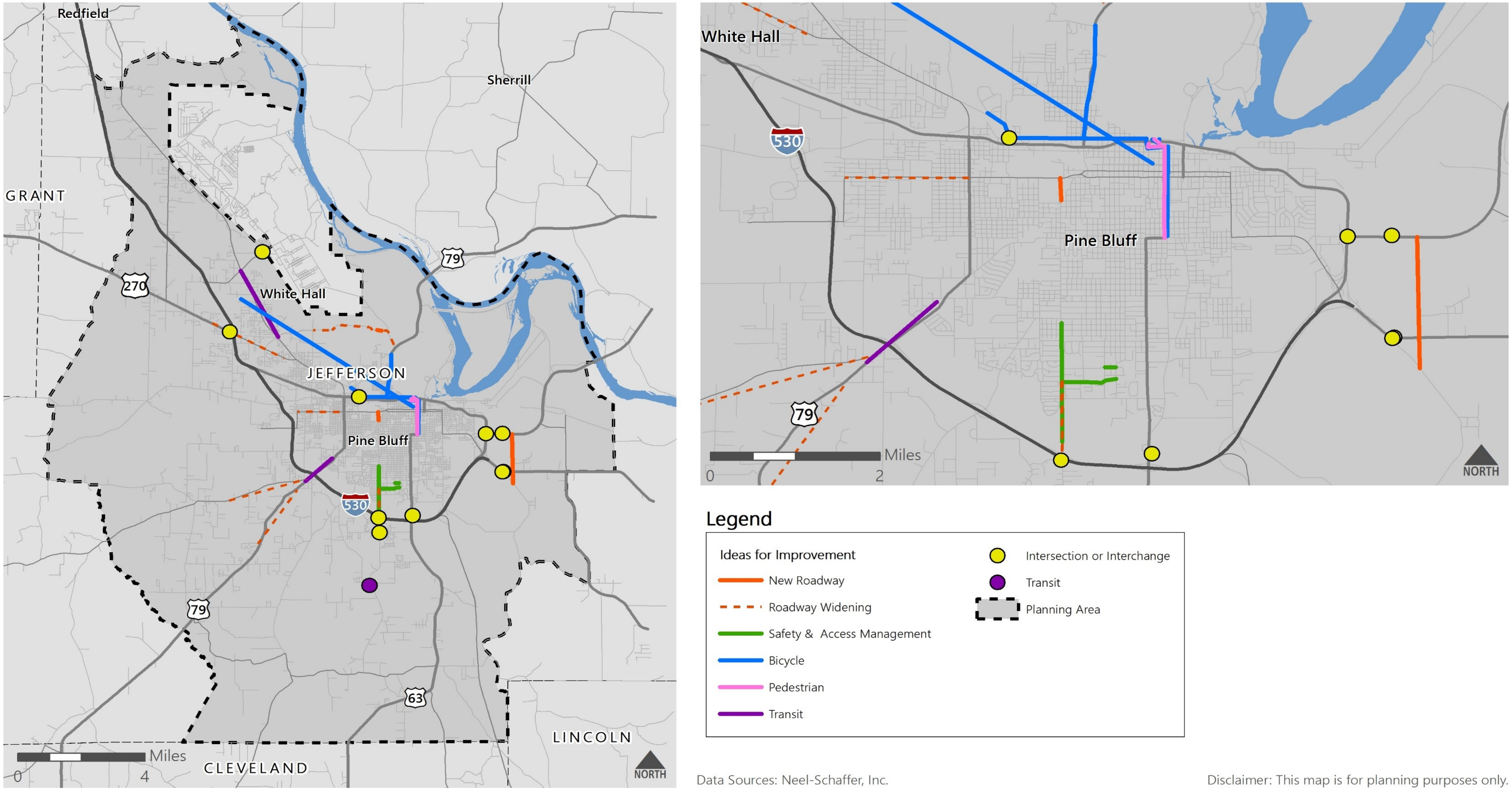
- Commercial
- Industrial
- Medical/Educational
- Residential
- Planning Area

Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

Figure 2.4: Stakeholder and Public Ideas for Transportation Improvements

Metropolitan Planning Area *Urban Core*



Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

2.3 Public Input

The public meeting and online survey asked the public in the region to respond to the following topics that would help planners better understand priorities and needs in the region:

- transportation priorities,
- congested and unsafe corridors and intersections,
- challenges to bicycling, walking, and riding transit, and
- big ideas for improving transportation in the region.

There was a total of 20 online surveys completed. Survey participants were not required to answer all questions.

The table below shows how participation varied by zip code.

Table 2.5: Top Public Survey Respondent Zip Codes

Zip Code	Area	Count
71603	Southwest Pine Bluff and Jefferson County	8
71602	White Hall and northwest Jefferson County	7
71601	Eastern Pine Bluff and Jefferson County, including UAPB	3
Other	Outside Jefferson County	2

2.3.1 Public Priorities Exercise

Participants were asked to independently rank six (6) transportation priorities from 1 to 4, with 1 being least important and 4 being most important. Like the stakeholders, survey respondents ranked maintaining roads and infrastructure as the top priority. The survey respondents then priorizited connectivity and safety. Reducing traffic congestion ranked at the bottom of priorities for both groups.

Figure 2.5: Average Priority Ranking

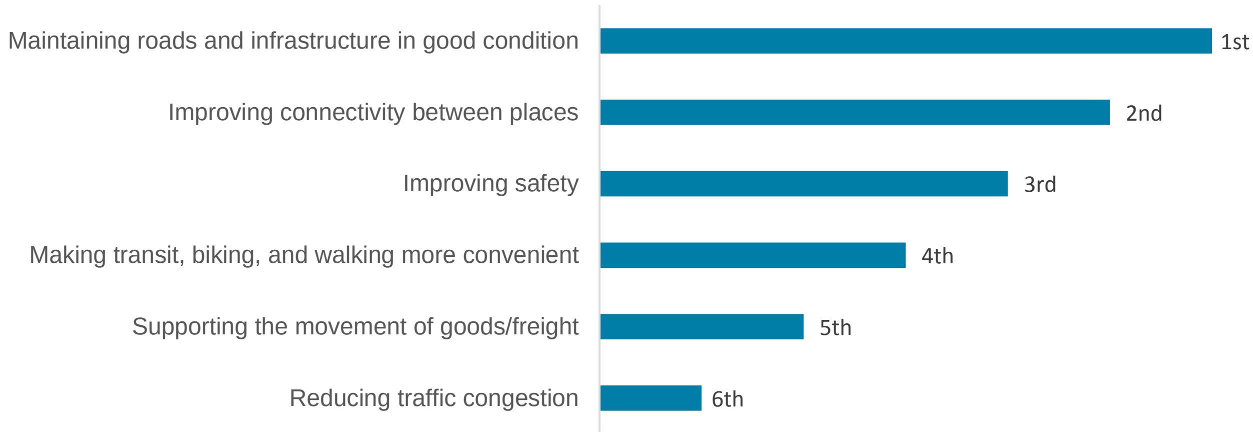


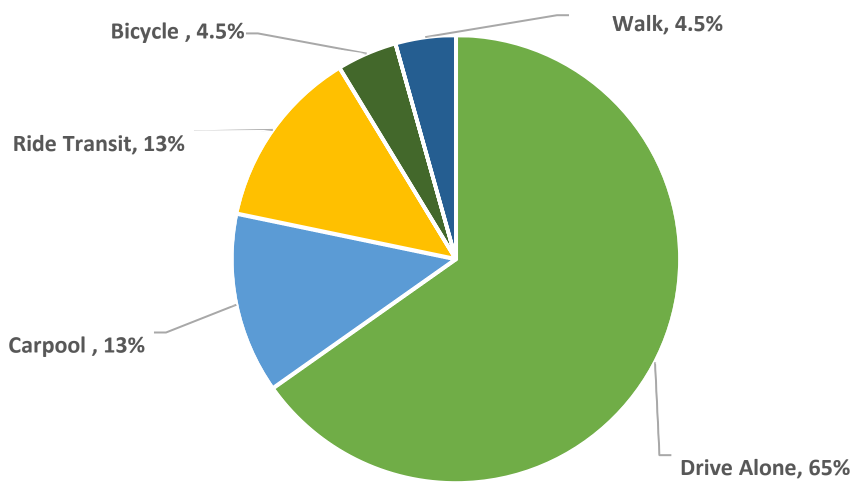
Table 2.6: Votes per Transportation Priority

Priority	1-Least Important	2	3	4-Very Important
Maintaining roads and infrastructure in good condition	0	1	1	18
Improving connectivity between places	0	0	7	12
Improving safety	0	1	8	11
Making transit, biking, and walking more convenient	2	2	6	9
Supporting the movement of goods/freight	1	4	7	6
Reducing traffic congestion	7	4	6	3

2.3.2 Main Mode of Transportation

Participants were asked their main mode of transportation for commuting or running errands. They were allowed to select more than one (1) mode. Driving alone was by far the most popular method, followed by carpooling and riding transit. Of the twenty respondents to the question, only one (1) person said they walk and one (1) said they bike regularly.

Figure 2.6: Public Survey Participants' Main Mode of Transportation



2.3.3 Roadway Concerns Exercise

Respondents were asked which intersection or corridor is most congested during rush hour. The results are shown in the tables below and in Figure 2.7. The most frequently mentioned areas were:

- Watson Chapel by the schools and
- US-270 through White Hall and with the intersection of I-530.

Table 2.7: Most Congested Corridor During Rush Hour

Corridor	Section	Times Mentioned
US-270	From I-530 to Jefferson	2
US-270 (Sheridan Rd)	Through White Hall to McDonald's	2
US-63B (S Olive St)	Between W 27th Ave and W 28th Ave	1
W 28th Ave		1
US-79 Br (Olive St)		1
US-79 (S Camden Rd)	Watson Chapel area by the schools	1
US-65B (Martha Mitchell Expy)	From I-530 to Jefferson	1

Table 2.8: Most Congested Intersection During Rush Hour

Road	Intersection With	Times Mentioned	Comments
US-79 (S Camden Rd)	AR-54	3	Especially at 7:30am and 3:30pm
S Hazel St	W 28th Ave	2	
S Olive St	Mallard Loop	1	Near Walmart and Dollar Tree
W 34th Ave	S Apple St	1	
US-79 (S Camden Rd)	Watson Chapel High School	1	
US-79 (S Camden Rd)	Watson Chapel Jr High School	1	
US-270 (Sheridan Rd)	I-530	1	
US-79 (S Camden Rd)	I-530	1	

Respondents were also asked which roadways are most in need of safety improvements. The results are displayed in the tables below and in Figure 2.8. The comments mentioned corridors and intersections spread across the region with no single area standing out from others.

Table 2.9: Corridor Most in Need of Safety Improvements

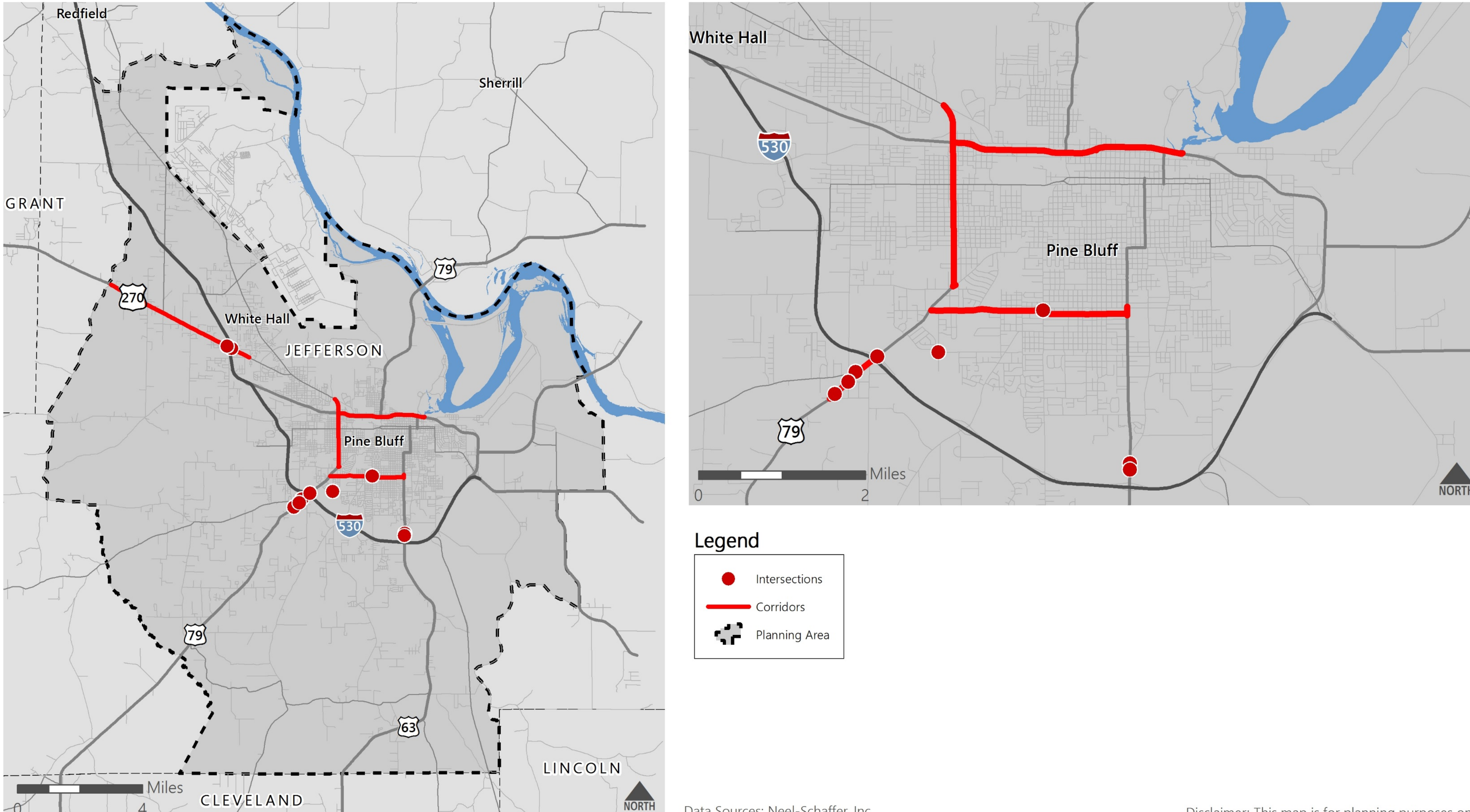
Corridor	Section	Times Mentioned
S Hazel St	From W 42nd Ave to I-530	1
US-270 (Dollarway Drive)	From White Hall to Hestand Stadium	1
US-63B (S Olive St)		1

Table 2.10: Intersection Most in Need of Safety Improvements

Road	Intersection With	Times Mentioned	Comments
US-79 (S Camden Rd)	I-530	2	
US-270 (Sheridan Rd)	Tractor Supply	1	
US-79 (Blake Rd)	Faucett Rd	1	
Airport Dr	Grider Field Rd	1	
US-270 (Sheridan Rd)	Jefferson Pkwy	1	
US-270 (Dollarway Drive)	White Hall Ave	1	Remove the 2 streetlights
US-270 (Dollarway Drive)	Rhinehart Rd	1	
US-63B (S Olive St)	Mallard Loop	1	Near Walmart and Dollar Tree
US-63B (S Olive St)	W 73rd Ave	1	Drivers don't slow behind cars turning right on W 73rd Ave
S Hazel St	W 28th Ave	1	
US-79 (Blake St)	Faucett Rd	1	

Figure 2.7 Most Congested Corridors and Intersections

Metropolitan Planning Area *Urban Core*

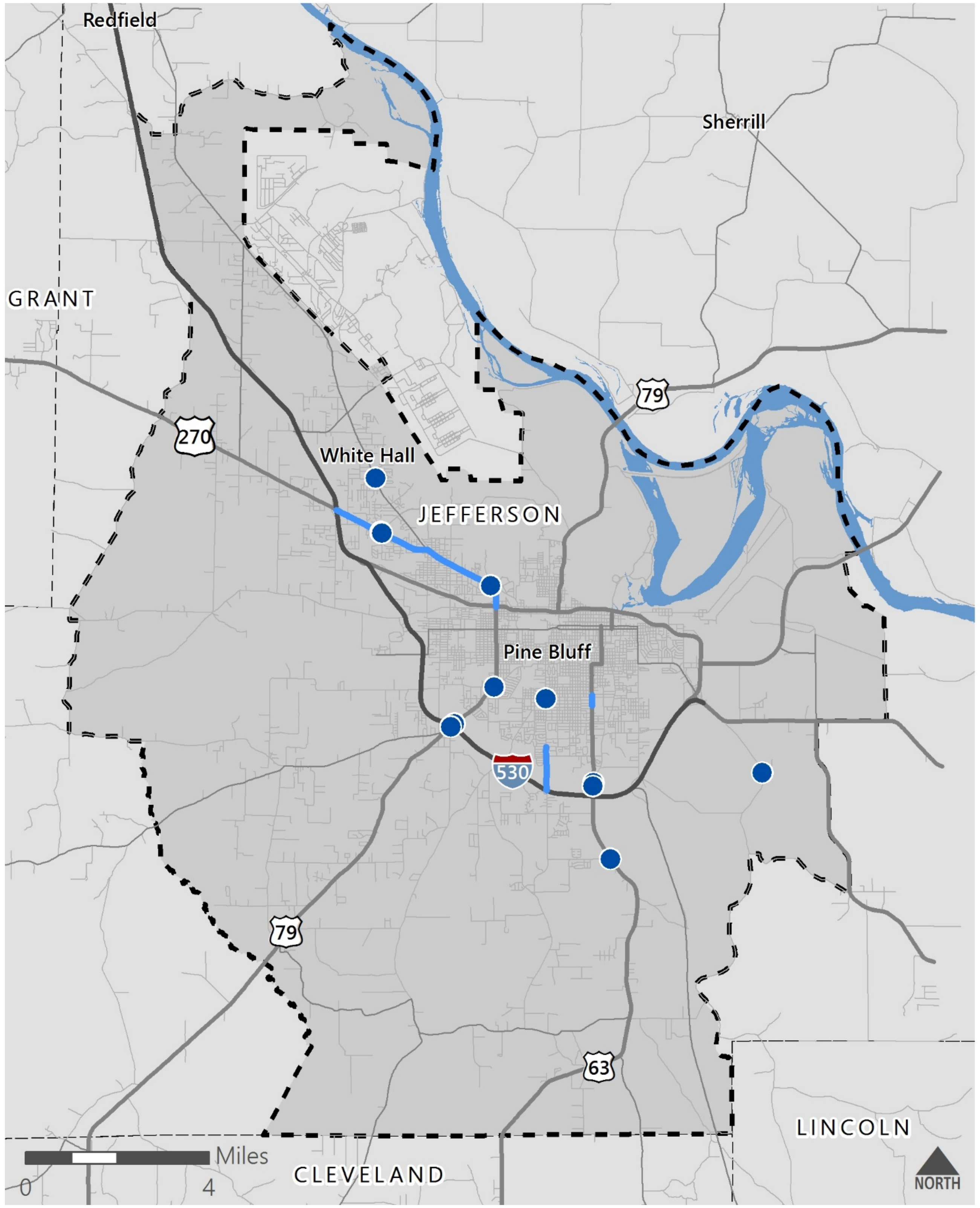


Data Sources: Neel-Schaffer, Inc.

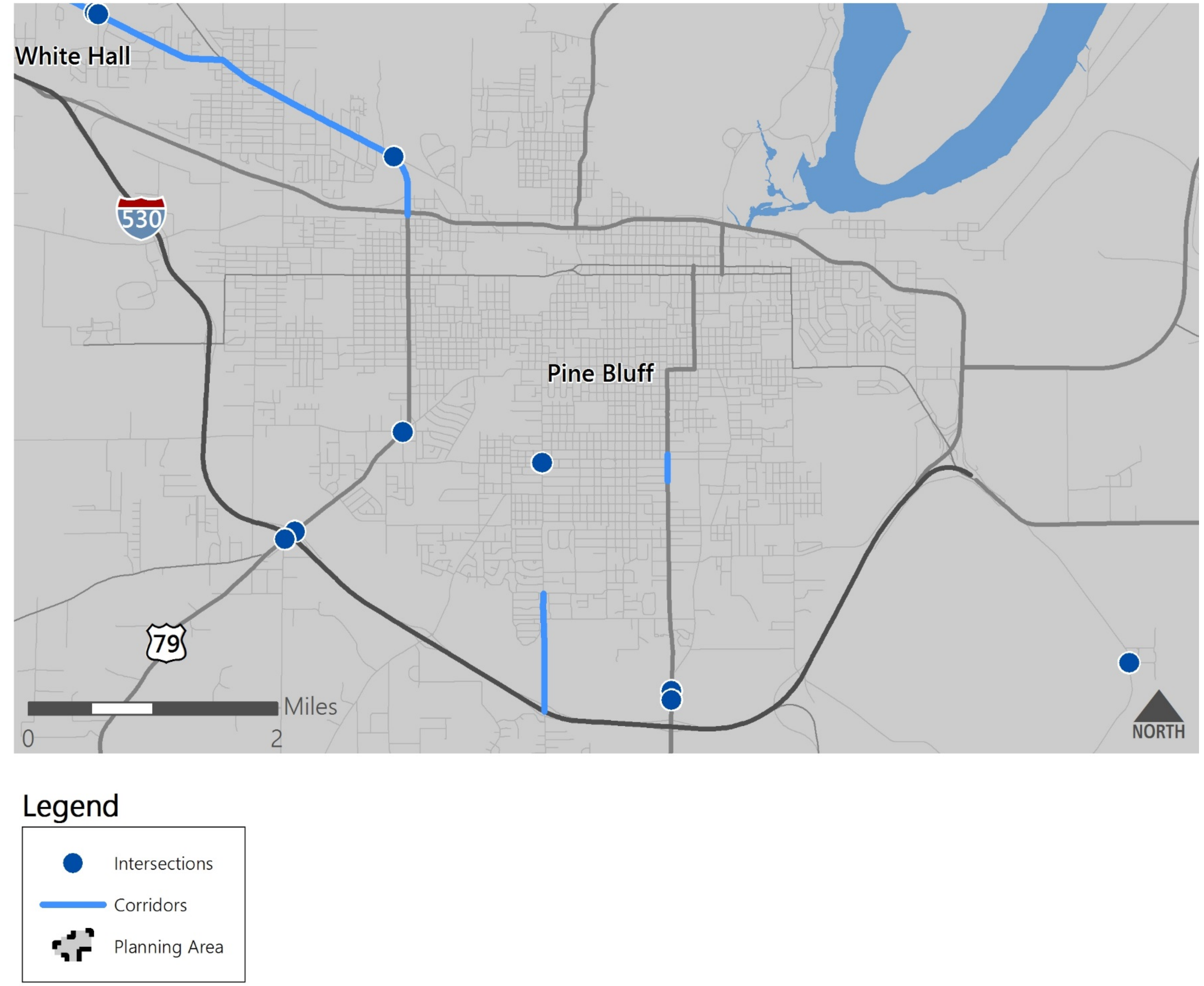
Disclaimer: This map is for planning purposes only.

Figure 2.8 Corridors and Intersections Most In Need of Safety Improvements

Metropolitan Planning Area



Urban Core



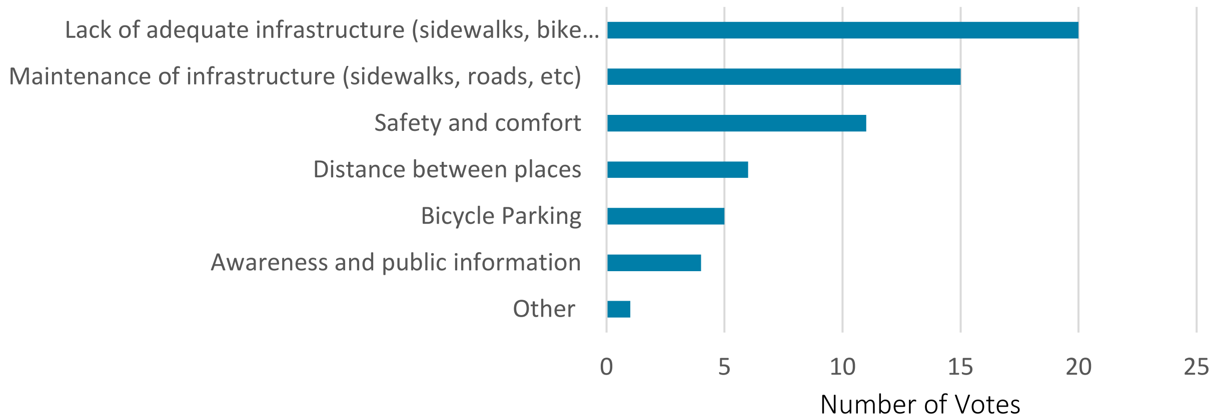
Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

2.3.4 Biggest Challenges to Bicycling and Walking

Respondents were asked to choose three (3) of the biggest challenges to bicycling and walking. Not all respondents chose three (3) challenges. All respondents selected "Lack of adequate infrastructure" as a big challenge, followed by the "Maintenance of infrastructure."

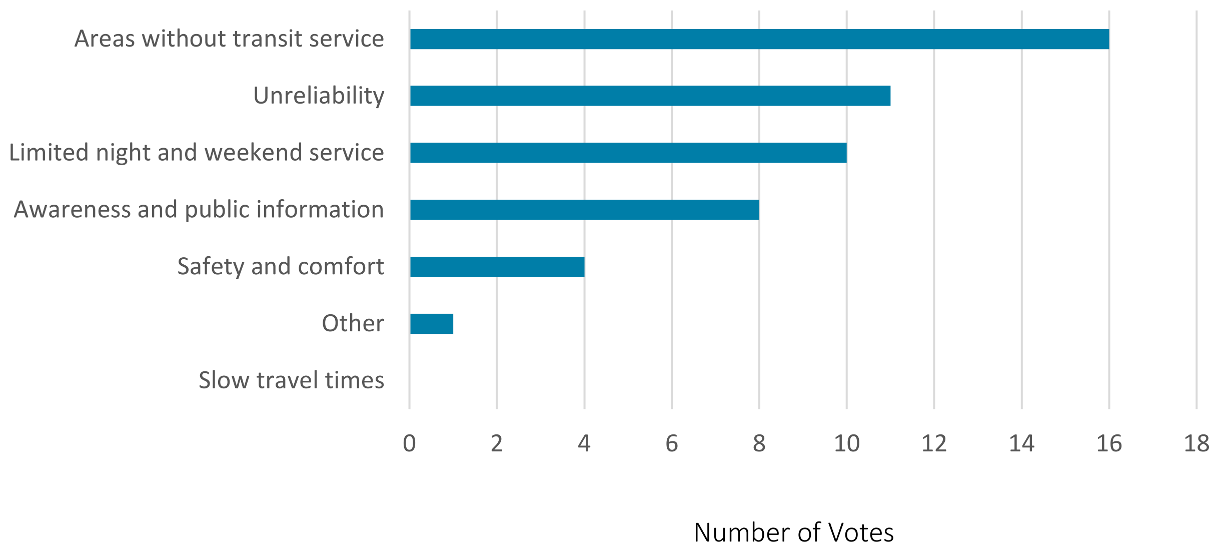
Figure 2.9: Public Survey Biggest Challenges to Biking and Walking



2.3.5 Biggest Challenges to Riding Transit

Respondents were asked to choose three (3) of the biggest challenges to riding transit. The top challenge was the sparse availability of transit. Of the respondents, most reported that driving alone is their main form of transportation so this response may differ among transit riders.

Figure 2.10: Public Survey Biggest Challenges to Riding Transit



2.3.6 Big Ideas Exercise

Respondents were also asked an open-ended question, "What BIG IDEAS do you have for improving transportation in the region? Think about getting around by all modes- driving, riding transit, walking, biking, etc." Almost all participants answered this question. The two (2) ideas most frequently voiced were to fix and maintain roads and to build a connected sidewalk network.

Table 2.11: Big Ideas to Improve Transportation

Transportation Mode	Idea	Times Mentioned
Roadways	Fix potholes and maintain roads	5
	Dedicate sales tax to local roads	2
	Improve the coordination of traffic lights	1
	Add a traffic light on Hwy-270 by Tractor Supply	1
	Coordinate services and ideas	1
Transit	Expand service area coverage to all of Pine Bluff and White Hall	2
	Improve transit routes and add more stops along routes	2
	Fix and maintain buses so they do not break down	1
	Provide more sheltered seating at transit stops	1
Bicycle and Pedestrian	Invest and build a connected network of sidewalks	5
	Create bicycle trails and infrastructure	1
	Provide bicycle infrastructure along Olive Street	1
	Improve street lighting	1

3 Public and Stakeholder Involvement Phase 2

During this phase, the public and stakeholders reviewed the draft plan and provided input to refine and finalize the plan.

3.1 How We Engaged

3.1.1 Public Review Phase

On August 6, 2020, the MPO published the draft MTP for public review, soliciting comments. Advertisements for the public review phase were placed in/on:

- the MPO's email distribution list,
- Facebook,
- the comprehensive plan mailing list, and
- local print media.

Advertisements and emails announcing the public review phase are displayed in the appendix.

3.2 Public Input

Comments received from the public review phase and ArDOT are displayed in the appendix.

4 Review of Existing Plans

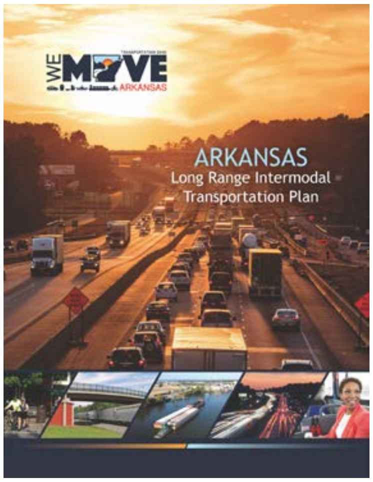
In preparing this document, relevant plans from the state, MPO, county, and municipal level were reviewed. Key takeaways regarding transportation are summarized on the following pages.

A consistent theme of planning for growth emerged across the various plans, as well as an increased interest in bicycle and pedestrian transportation and expanding transit.

Table 4.1: Plans Reviewed

Plan	Agency
Arkansas Long Range Intermodal Transportation Plan (2017)	ArDOT
Metropolitan Transportation Plan 2040 (2015)	SEARPC
Strategic Highway Safety Plan (2017)	ArDOT
Arkansas State Freight Plan (2017)	ArDOT
Arkansas State Rail Plan (2015)	ArDOT
Arkansas Bicycle and Pedestrian Transportation Plan (2017)	ArDOT
Statewide Transit Coordination Plan (2018)	ArDOT
Go Forward Pine Bluff (2017)	City of Pine Bluff
Pine Bluff Urban Renewal Agency Central City Urban Renewal Plan (2018)	City of Pine Bluff
Campus Master Plan (2015)	University of Arkansas at Pine Bluff

4.1 Arkansas Long Range Intermodal Transportation Plan (LRITP) (2017)



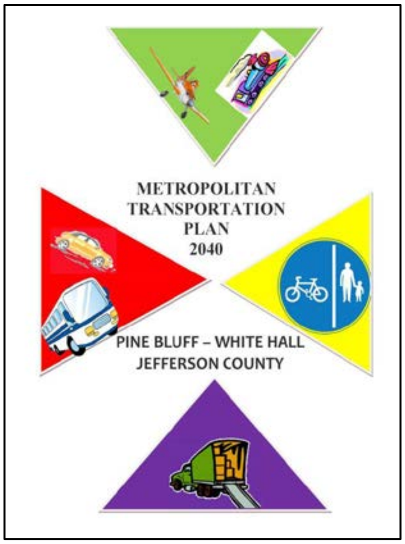
This statewide plan considers the mobility for people and freight across all modes in the state and identifies statewide trends and needs in order to select and prioritize projects. The Arkansas LRITP is a comprehensive document that provides an in-depth review of the State's transportation inventory and defines goals, objectives, policies, investment strategies, and performance measures by which to guide investment in Arkansas' infrastructure.

A key concern of the plan is the physical condition of the roadways, with roadways in fair or poor condition in need of maintenance and repaving. The Pine Bluff-White Hall area is no exception to this and contains roadways in need of new surfaces.

The LRITP also calls for increased funding in Intelligent Transportation Systems (ITS) which would benefit roadways like I-530 within the MPA. Safety is also addressed in the state plan in an effort to reduce crashes and fatalities.

Additional bicycle/pedestrian facilities and transit expansion are identified within the LRITP, a theme commonly heard during stakeholder consultation and public input within the MPA. Working with ARDOT would allow the MPO and the State to coordinate these efforts.

4.2 Metropolitan Transportation Plan 2040 (2015)



The Metropolitan Transportation Plan (MTP) is developed by the MPO every five (5) years in coordination with regional partners, in this case, the City of Pine Bluff, the City of White Hall, Jefferson County, stakeholders, and the general public. Their input and an analysis of existing conditions, current demand, and future demands helps the MPO to identify and prioritize transportation improvements.

The plan aims to improve mobility and accessibility of people and for freight throughout the region while protecting the environment and ensuring safety, quality of life, and economic development. The report used previous plans, public input, census data, GIS mapping, and traffic forecasting.

A key component of the plan is providing constrained and visionary transportation projects. Given limited resources, the project list was carefully scrutinized to determine priorities and strategies. Additionally, the MTP 2040 was used to develop an initial list of test projects for this MTP effort before adding stakeholder and public input projects to that list.

The MTP 2040 included:

- A study on existing transit services and demand, including recommendations.
- A discussion of the benefits of a centralized bus transfer station in downtown Pine Bluff should interest and funds materialize.
- Recommendations for the area's sidewalk network, focusing on school areas, downtown Pine Bluff, and key commercial corridors.
- Strategies to encourage bicycling on roadways and new construction or reconstruction of current bicycle facilities on the roadways.

4.3 Strategic Highway Safety Plan (SHSP) (2017)

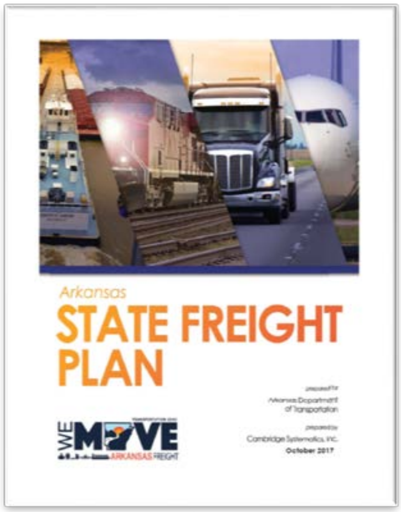
This statewide plan is the culmination of a joint effort from various federal, state, and local agencies organizations in Arkansas. Its purpose is to set a direction for future safety efforts. The SHSP is applicable to all organizations that have a role in addressing highway safety in Arkansas. The SHSP emphasis areas and strategies address the four "E's" (Engineering, Education, Enforcement, and Emergency Services) of highway safety.

The ultimate goal of the Arkansas Highway Safety Steering Committee is zero (0) fatalities and serious injuries. The performance goals to support strategies of the SHSP include:

- Reduce the number of fatalities in Arkansas by 485 by 2022.
- Reduce the fatality rate in Arkansas to 1.43 by 2022.
- Reduce the number of serious injuries in Arkansas to 3,055 by 2022.
- Reduce the serious injury rate in Arkansas to 9.82 by 2022.
- Reduce the number of non-motorized fatalities and serious injuries to 131 by 2022.

To meet the 2022 goals, the SHSP is comprised of five (5) Critical Emphasis Areas and seventeen (17) Primary Emphasis Areas, described in *Appendix # 1: Existing Conditions*.

4.4 Arkansas State Freight Plan (2017)



This statewide plan:

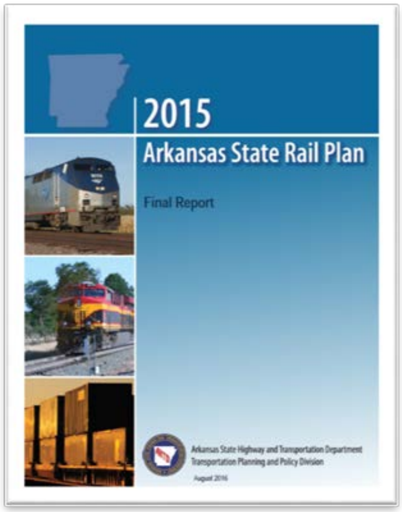
- identifies key issues in the state freight system,
- highlights its main commodities and modes,
- details the economic impact of freight movement in the State,
- describes characteristics of the existing network and the National Freight Network Designations, and
- provides for project identification, project screening, and a freight investment plan with goals and monitoring tools.

Freight volumes in Arkansas, across all modes, are projected to grow by more than 40 percent between 2015 and 2040. The movement of those goods will be impacted by many forces, including emerging technologies, shifting populations, changes in national policy, and trends in international trade. Planning for those opportunities and challenges is an essential step toward delivering a safe, reliable, and competitive freight system for the future.

The tonnage moved in Arkansas is also projected to grow by 40 percent between 2013 and 2040. Most commodities are projected to see a growth in tonnage between 2013 and 2040; however, coal and petroleum products are projected to see a decrease in tonnage between 2013 and 2040.

The report details the project identification for potential improvements to the freight infrastructure system using several merit criteria based on the Goals and Objectives of the Plan. It concludes with a discussion of funding of freight improvement projects and the relationship of the National and State goals with objectives and strategies.

4.5 Arkansas State Rail Plan (2015)



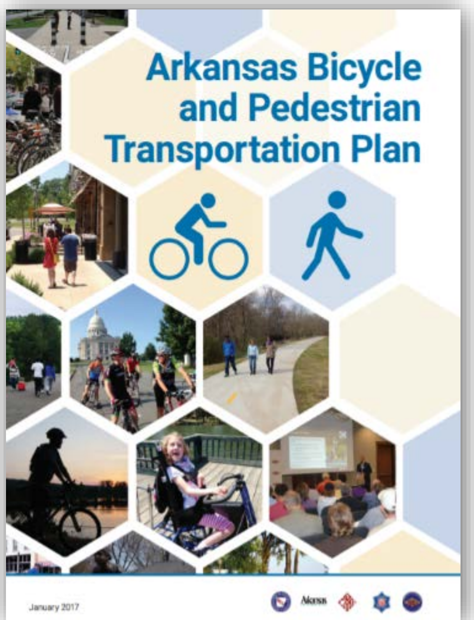
This statewide plan focuses on freight rail, intercity passenger rail, and commuter rail. It has been prepared to conform to the requirements of the Passenger Rail Investment and Improvement Act (PRIIA), which requires each state to have an approved rail plan as a condition of receiving future federal rail funding for either passenger or freight improvements.

Arkansas has 2,662 miles of active rail lines, which are classified as either Class I or Class III. The Pine Bluff MPA is served by Union Pacific Railroad, one of the state's three (3) Class I railroads which provide long-distance transportation.

The Arkansas State Rail Plan gives the following:

- An overview of the role of rail in Arkansas' Transportation System
- A description and inventory of the Arkansas Freight Rail System
- A description and inventory of passenger rail services in Arkansas
- The performance analysis of the Arkansas Rail Network
- The financing for rail projects and services in Arkansas
- Ongoing programs to improve safety and security of the Arkansas Rail System
- The economic impact of rail transportation in Arkansas
- Trends and forecasts that impact rail in Arkansas
- Rail service needs and opportunities in Arkansas
- Proposed passenger rail improvements
- Proposed freight rail strategies and initiatives
- Arkansas' Long-Range rail service and investment program
- Coordination and review.

4.6 Arkansas Bicycle and Pedestrian Plan (2017)



The *Arkansas Bicycle and Pedestrian Transportation Plan (2017)* outlines goals and steps to support bicycling and walking for transportation. The plan also notes that active transportation strengthens physical health, local businesses, and social connections in its communities. The plan sets three goals:

- Understand the economic benefits of bicycle and pedestrian-friendly infrastructure.
- Develop a statewide Bicycle and Pedestrian Network for both recreation and transportation in municipalities and rural communities.
- Conduct research to guide strategies that would achieve zero pedestrian and bicyclist deaths by 2025.

The plan finds that across the state cyclists want improved on-street bicycling conditions. Other priorities include motorist education about cycling laws and sharing the road, increased enforcement of traffic laws, increased roadway maintenance, and improved wayfinding.

In 2014 the state project team met with stakeholders in the Pine Bluff area and found that recreational biking and walking is popular in the area, especially around Lake Saracen. This plan identified US 65 in the southeastern corner of the Pine Bluff area as a Statewide Preliminary Bike Route. Additionally, the plan provides guidance and toolkits for municipalities creating their own bicycle plans.

4.7 Jefferson County Transportation Coordination Plan (2007)

The *Jefferson County Transportation Coordination Plan* (2007) identifies the following transit needs for the various transit providers in the region:

- late night and weekend transit service, especially for workers,
- expanded transit service outside the urban core,
- increased frequency of fixed route service,
- expanded service area of paratransit service,
- readily available route and timetable information,

- upgraded fleet, and
- local governmental support to adequately fund transit programs.

The plan also acknowledged that over time transportation demands for elderly, disabled, and low- income persons will increase.

4.8 Go Forward Pine Bluff (2017)

Go Forward Pine Bluff (2017) is a strategic plan to improve economic development, education, government, infrastructure, and quality of life in Pine Bluff. Many action steps in this plan involve revitalizing downtown spaces. For example, the plan suggests creating a land bank to acquire abandoned properties to bring them back into active uses. Investments in downtown are amenable to biking and walking by both creating a hub for destinations that are located close together and by improving infrastructure on the street.

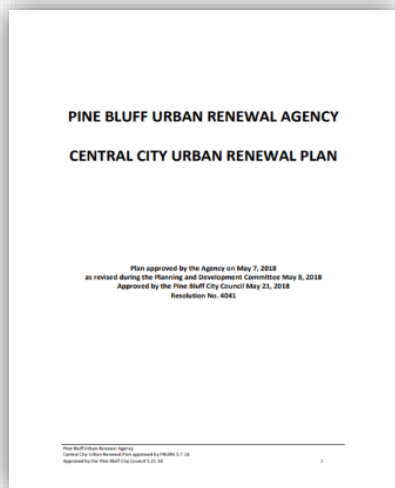
Some steps mentioned in this plan related to pedestrians involve:

- putting in new sidewalks and streetlights on the 600-800 Block of Main Street for a proposed Innovation Hub,
- establishing a Downtown Historical District that features a walkable area of cultural and historic destinations, and
- creating mixed-use zoning in Downtown that fosters retail businesses and residential living in one space. Mixed-use neighborhoods can decrease distances travelled and increase biking and walking.

Some action steps related to biking/walking involve creating:

- a biking/trail system linking Regional Park, Saracen Landing, and proposed Downtown District,
- biking paths through Downtown,
- walking/biking path around Central Park that connects to SEARK, and
- footbridge over US-65B (Martha Mitchell Expy).

4.9 Central City Urban Renewal Plan (2018)



Pine Bluff Urban Renewal Agency Central City Urban Renewal Plan (2018) was written to reduce blight downtown and activate unused space. In order to improve walkability the plan proposes to:

- Support the downtown streetscape project planned from US 65B (Martha Mitchell Expy) to 8th Street, referred to as the Primary Pedestrian Corridor.
- Enhance existing street crossing at Walnut Street that will connect Lake Saracen to the Primary Pedestrian Corridor.
- Support the development of a pedestrian bridge to and from Lake Saracen.
- Repair sidewalks and curbing on 4th Avenue between State Street and Walnut Street.
- Repair sidewalks and curbing on 3rd Avenue between State Street and Walnut Street.

4.10 UAPB Campus Master Plan (2018)

The purpose of the Campus Master Plan (2015) is to recommend facility and infrastructure projects that support the University's strategic plan. To improve pedestrian safety the plan recommends a boulevard concept for University Drive that includes new sidewalks, a landscaped median, street trees, light poles, and banners.

UAPB also received Transportation Alternative Program (TAP) funds for a pedestrian mall along John Kennedy Drive.

5 Visioning and Strategies

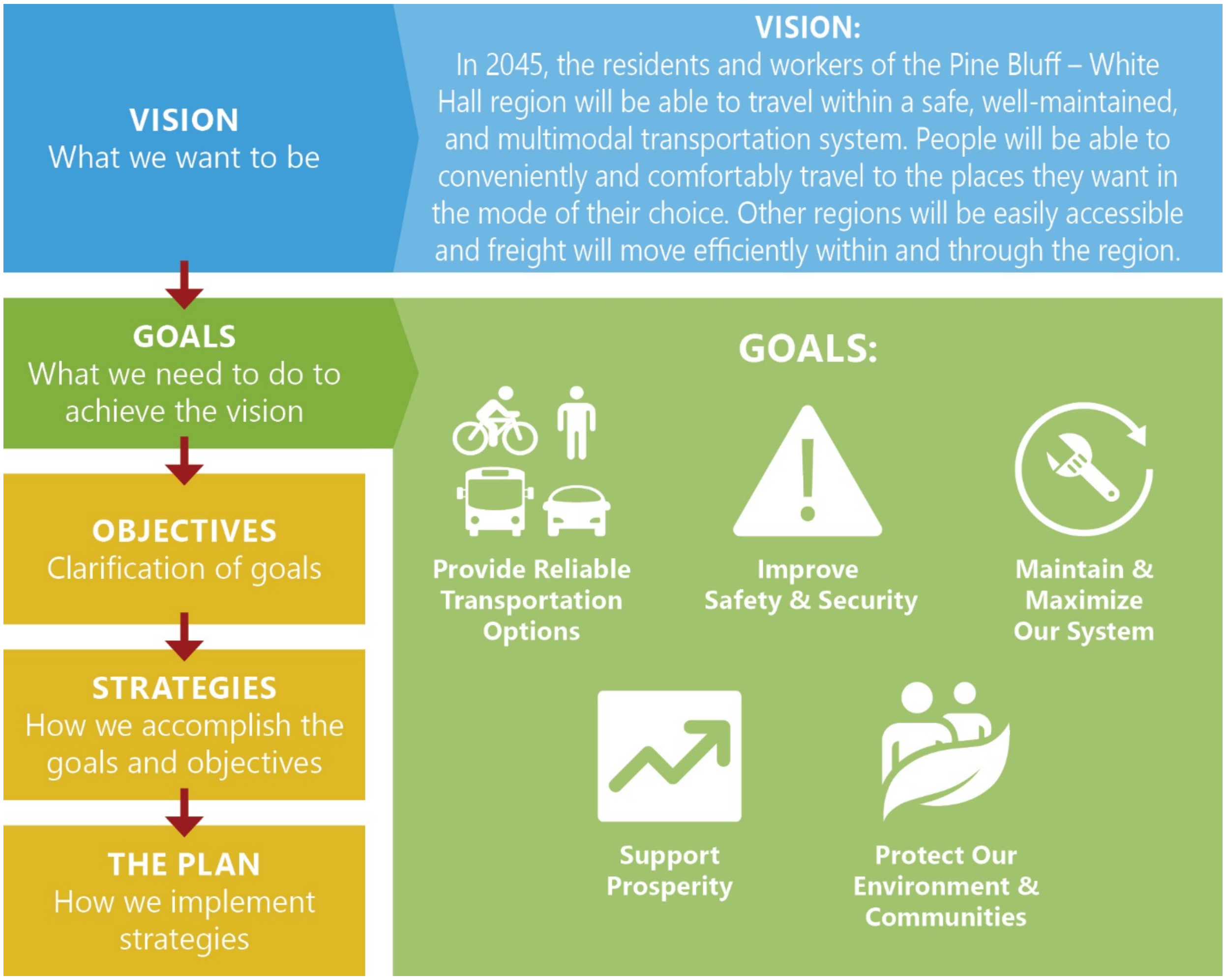
Using the public and stakeholder input, a long-term vision was developed followed by supporting goals and objectives. These goals and objectives are consistent with national goals set forth in federal transportation legislation.

5.1 Vision and Strategic Framework

The graphic below shows the long-term vision, goals, and objectives for the Metropolitan Planning Area. These reflect local priorities as well as national transportation goals.

The graphic also illustrates the overall strategic framework and how the goals and objectives support the vision. Strategies and the implementation plan address the goals and objectives and are discussed later.

Figure 5.1: Vision and Strategic Framework



5.2 Goals and Objectives

For each goal, objectives were identified that clarify and expand upon the goal statement. These activity-based objectives are used later to identify specific strategies that help the MPO achieve its stated goals.

Goal: Provide Reliable Transportation Options

TO.1 Reduce roadway congestion and delay
TO.2 Make more areas in the region walkable and bikeable
TO.3 Expand and improve transit to meet the needs of the region
TO.4 Support convenient and affordable access to surrounding airports and regions

Goal: Improve Safety and Security

SS.1 Redesign corridors and areas with existing safety and security needs
SS.2 Coordinate with local and state stakeholders to improve enforcement of traffic regulations, transportation safety education, and emergency response
SS.3 Encourage the use of Intelligent Transportation Systems and other technology during disruptive incidents, including evacuation events

Goal: Maintain and Maximize Our System

MM.1 Maintain transportation infrastructure and assets in a good state of repair
MM.2 Reduce demand for roadway expansion by using technology to efficiently and dynamically manage roadway capacity

Goal: Support Prosperity

SP.1 Pursue transportation improvements that are consistent with local plans for growth and economic development
SP.2 Support local businesses and industry by ensuring efficient movement of freight by truck, rail, and other modes
SP.3 Address the unique needs of visitors to the region and the impacts of tourism
SP.4 Promote context-sensitive transportation solutions that integrate land use and transportation planning and reflect community values

Goal: Protect Our Environment and Communities

EC.1 Minimize or avoid adverse impacts from transportation improvements to the natural environment and the human environment (historic sites, recreational areas, environmental justice populations)
EC.2 Encourage proven Green Infrastructure and other design approaches that effectively manage and mitigate stormwater runoff
EC.3 Work with local and state stakeholders to meet the growing needs of electric and alternative fuel vehicles
EC.4 Increase the percentage of workers commuting by carpooling, transit, walking, and biking

5.2.1 Relationship with Planning Factors

Federal legislation requires the Long Range Transportation Plan to consider the following ten (10) planning factors:

1) Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2) Increase the safety of the transportation system for motorized and non-motorized users;
3) Increase the security of the transportation system for motorized and non-motorized users;
4) Increase accessibility and mobility of people and freight;
5) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6) Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7) Promote efficient system management and operation;
8) Emphasize the preservation of the existing transportation system;
9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
10) Enhance travel and tourism.

Table 5.1 shows how these planning factors are addressed by each goal area.

5.3 National Goals and Performance Measures

Following federal legislation and rulemaking, the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) have moved to performance-based planning and have established national goals and performance measures. These national goals and performance measures are summarized below.

The MTP goals and objectives are consistent with these national goals and federal performance measures, as indicated in Table 5.1.

- **Safety** - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
    - Number of fatalities
    - Rate of fatalities
    - Number of serious injuries
    - Rate of serious injuries
    - Number of non-motorized fatalities and serious injuries
- **Infrastructure Condition** - To maintain the highway infrastructure asset system in a state of good repair
    - Percentage of Interstate pavements in Good condition
    - Percentage of Interstate pavements in Poor condition
    - Percentage of non-Interstate NHS pavements in Good condition
    - Percentage of non-Interstate NHS pavements in Poor condition
    - Percentage of NHS bridges by deck area in Good condition
    - Percentage of NHS bridges by deck area in Poor condition
- **Congestion Reduction** - To achieve a significant reduction in congestion on the National Highway System
    - Annual hours of peak-hour excessive delay per capita*
    - Percent of non-single-occupant vehicle travel
- **System Reliability** - To improve the efficiency of the surface transportation system
    - Percent of the person-miles traveled on the Interstate that are reliable
    - Percent of the person-miles traveled on the non-Interstate NHS that are reliable

- **Freight Movement and Economic Vitality** - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
    - o Truck Travel Time Reliability (TTTR) Index
- **Environmental Sustainability** - To enhance the performance of the transportation system while protecting and enhancing the natural environment.
    - o Total emissions reduction*
- **Transit Asset Management** - To maintain transit assets in a state of good repair.
    - o Percentage of track segments that have performance restrictions
    - o Percentage of revenue vehicles that exceed useful life benchmark
    - o Percentage of non-revenue vehicles that exceed useful life benchmark
    - o Percentage of facilities rated less than 3.0 on TERM Scale

**only required for areas designated as nonattainment or maintenance for certain pollutants*

5.3.1 Current Performance

The MPO is supporting the State of Arkansas' adopted performance targets for the required federal performance measures and is monitoring performance for these measures over time. The graphic below summarizes existing conditions within the MPA for these performance measures.

For more detailed information, see *Appendix # 3: Transportation Performance Management*.

Figure 5.2: Current Transportation Performance Overview

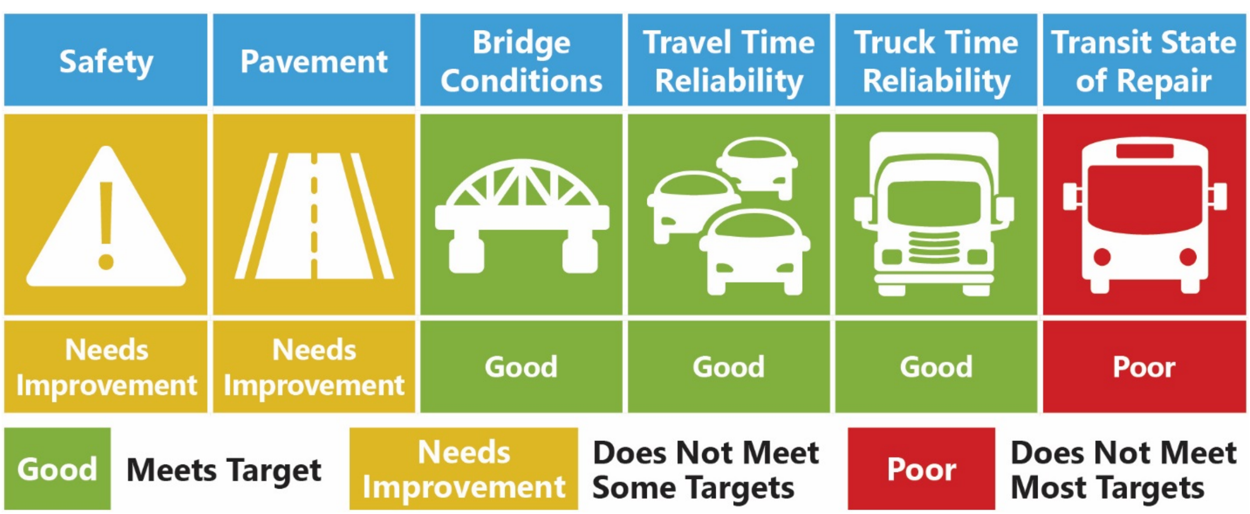


Table 5.1: Relationship between Goals, Objectives, Performance Measures, and Federal Planning Factors

Goals	Objectives	Performance Measures	Federal Planning Factors
Goal 1: Provide Reliable Transportation Options	TO.1 Reduce roadway congestion and delay TO.2 Make more areas in the region walkable and bikeable TO.3 Expand and improve transit to meet the needs of the region TO.4 Support convenient and affordable access to surrounding airports and regions	NHS Travel Time Reliability > Percent of the person-miles traveled on the Interstate that are reliable > Percent of the person-miles traveled on the non-Interstate NHS that are reliable Freight Reliability > Truck Travel Time Reliability (TTTR) Index	(1) Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency (4) Increase accessibility and mobility of people and freight (6) Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight (9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
Goal 2: Improve Safety and Security	SS.1 Redesign corridors and areas with existing safety and security needs for all modes SS.2 Coordinate with local and state stakeholders to improve enforcement of traffic regulations, transportation safety education for all users, and emergency response times and incident management SS.3 Encourage the use of Intelligent Transportation Systems and other technology during disruptive incidents, including evacuation events	Safety > Number of fatalities > Rate of fatalities > Number of serious injuries > Rate of serious injuries > Number of non-motorized fatalities and serious injuries	(2) Increase the safety of the transportation system for motorized and non-motorized users (3) Increase the security of the transportation system for motorized and non-motorized users
Goal 3: Maintain and Maximize Our System	MM.1 Maintain transportation infrastructure and assets in a good state of repair MM.2 Reduce demand for roadway expansion by using technology to efficiently and dynamically manage roadway capacity	Bridge Conditions > Percentage of NHS bridges by deck area in Good condition > Percentage of NHS bridges by deck area in Poor condition Pavement Conditions > Percentage of Interstate pavements in Good condition > Percentage of Interstate pavements in Poor condition > Percentage of non-Interstate NHS pavements in Good condition > Percentage of non-Interstate NHS pavements in Poor condition Transit Asset Management > Percentage of revenue vehicles that exceed useful life benchmark > Percentage of non-revenue vehicles that exceed useful life benchmark > Percentage of facilities rated less than 3.0 on TERM Scale	(7) Promote efficient system management and operation (8) Emphasize the preservation of the existing transportation system

Goal 4: Support Prosperity	SP.1 Pursue transportation improvements that are consistent with local plans for growth and economic development SP.2 Support local businesses and industry by ensuring efficient movement of freight by truck, rail, and other modes SP.3 Address the unique needs of visitors to the region and the impacts of tourism SP.4 Promote context-sensitive transportation solutions that integrate land use and transportation planning and reflect community values	These are process-related objectives and do not have any associated federal performance measures.	(1) Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency (4) Increase accessibility and mobility of people and freight (5) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns (6) Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight (10) Enhance travel and tourism
Goal 5: Protect Our Environment and Communities	EC.1 Minimize or avoid adverse impacts from transportation improvements to the natural environment and the human environment (historic sites, recreational areas, environmental justice populations) EC.2 Encourage proven Green Infrastructure and other design approaches that effectively manage and mitigate stormwater runoff EC.3 Increase the percentage of workers commuting by carpooling, transit, walking, and biking	These are process-related objectives and do not have any associated federal performance measures.	(5) Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns (9) Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation

5.4 Strategies

These strategies, identified from a technical needs assessment and stakeholder and public input, will help the region achieve the transportation goals previously stated.

Responsibly Improve Roadway System

Funding for new roads and widening roads is limited. The MPO will prioritize roadway expansion projects that have a high benefit/cost ratio.

Improve and Expand Public Transportation

Improve existing transit services in the City of Pine Bluff. Explore additional funding options and consider expanding transit services to the City of White Hall and beyond.

Rapidly Expand Biking and Walking Infrastructure

There were frequent comments from public input were for better walking and biking conditions. The MPO should encourage more bicycle and pedestrian projects and encourage bicycle and pedestrian improvements as part of planned roadway projects.

Prioritize Maintenance

The MPO should proactively address pavement conditions, bridge conditions, and transit asset management. Additional studies may be worthwhile to collect maintenance data on roadways outside of the National Highway System. Maintenance needs were the most often identified needs in the stakeholder consultation and public input.

Establish a Safety Management System

The typical traffic safety program includes a crash record system, identification of hazardous locations, engineering studies, selection of countermeasures, prioritization of projects, planning and implementation, and evaluation.

Monitor Emerging Technology Options

Transportation technology is changing rapidly but much is still uncertain. The MPO should continue to monitor trends in emerging mobility options and consider partnerships with mobility companies and pilot programs as appropriate.

6 Project Development

This chapter summarizes how committed and potential transportation projects were identified and how cost estimates were developed for these projects.

6.1 Project Identification

6.1.1 Roadway Projects

A preliminary list of roadway projects was developed for both capacity and non-capacity roadway projects. Each list included the following:

- All projects included in the current Transportation Improvement Program (TIP)
- All projects from the 2040 MTP
- Projects addressing needs frequently cited in public input
- Projects identified in stakeholder consultation and in existing plans
- Projects that addressed any remaining needs identified in the Needs Assessment

The list of projects was refined with stakeholders and some projects were removed or modified in scale/scope based on feasibility assessments.

6.1.2 Bicycle and Pedestrian Projects

The previous MTP did not identify specific bicycle and pedestrian projects. Instead, the MPO will continue to work with its local partner agencies to identify and prioritize bicycle and pedestrian projects along high priority bicycle and pedestrian corridors. While further study is needed before deciding on specific projects, Table 6.1 provides some project ideas that came from previous plans, the public input process, or the demand analysis presented in *Appendix # 4: Needs Assessment*.

Although *Appendix # 4: Needs Assessment* shows a few high demand areas for bicycling and walking, most of the region depends on private vehicles for transportation and many bicycle and pedestrian trips begin and end with vehicles. Given this context, the following strategies can guide project prioritization:

- Identify mechanisms for funding sidewalk upgrades and maintenance, inventory existing sidewalks, and prioritize these upgrades.
- New sidewalks or multi-use paths should connect existing trails with schools and parks.

- Implement elements of the bicycle education strategies written in the existing *Bicycle and Pedestrian Plan* and *MTP 2040*.
    - Create signage for the designated bicycle routes and study whether bicycle lanes could be suitable in popular areas.

Additionally, bicycle and pedestrian improvements must be part of the overall design phase of all projects and included unless restrictions apply, consistent with FHWA guidance.

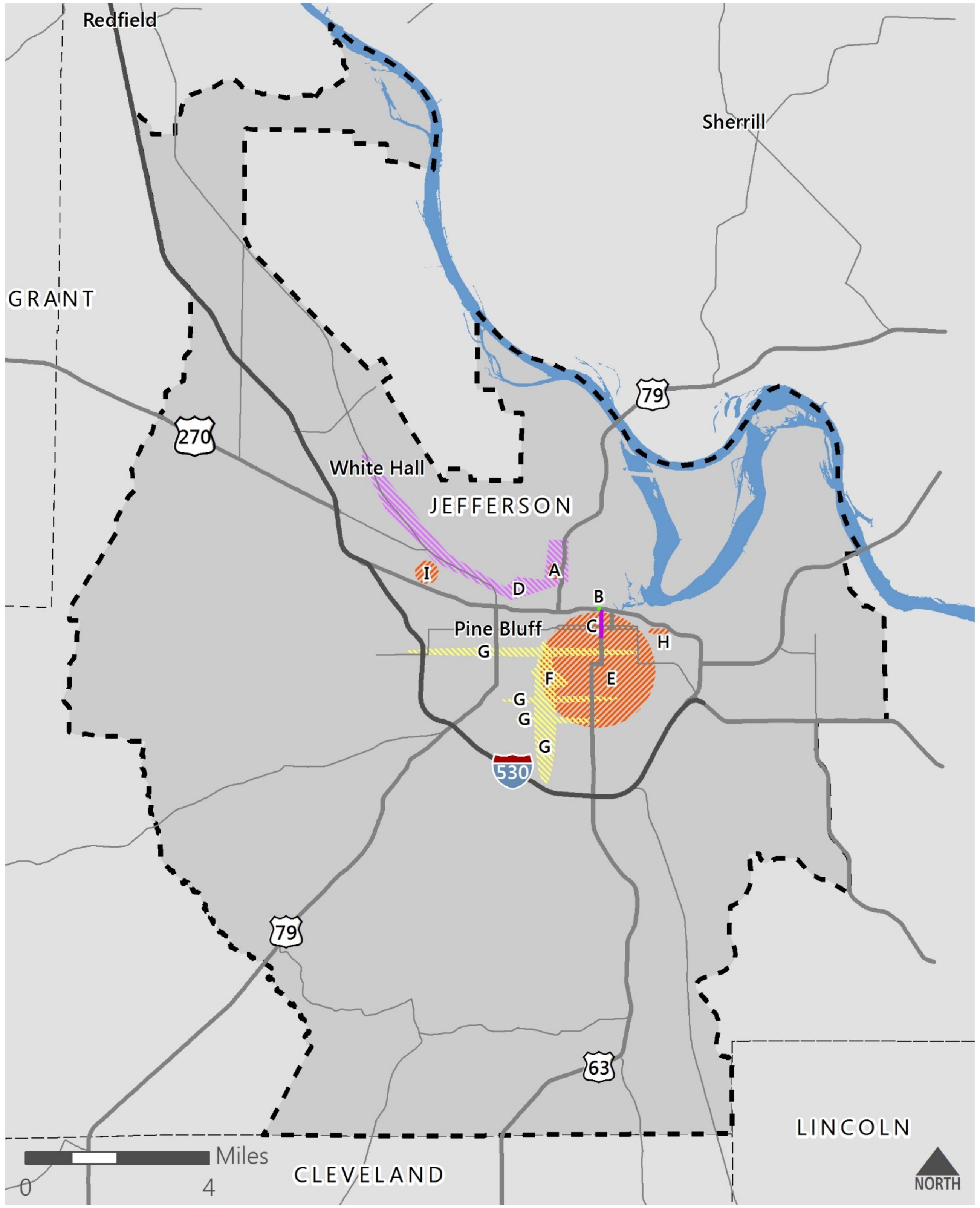
Table 6.1 lists some project ideas and their rationale. Figure 6.1 displays study areas for the projects. The letters labelling the projects in Figure 6.1 correspond to the projects listed in Table 6.1

Table 6.1: Ideas for Bicycle and Pedestrian Projects

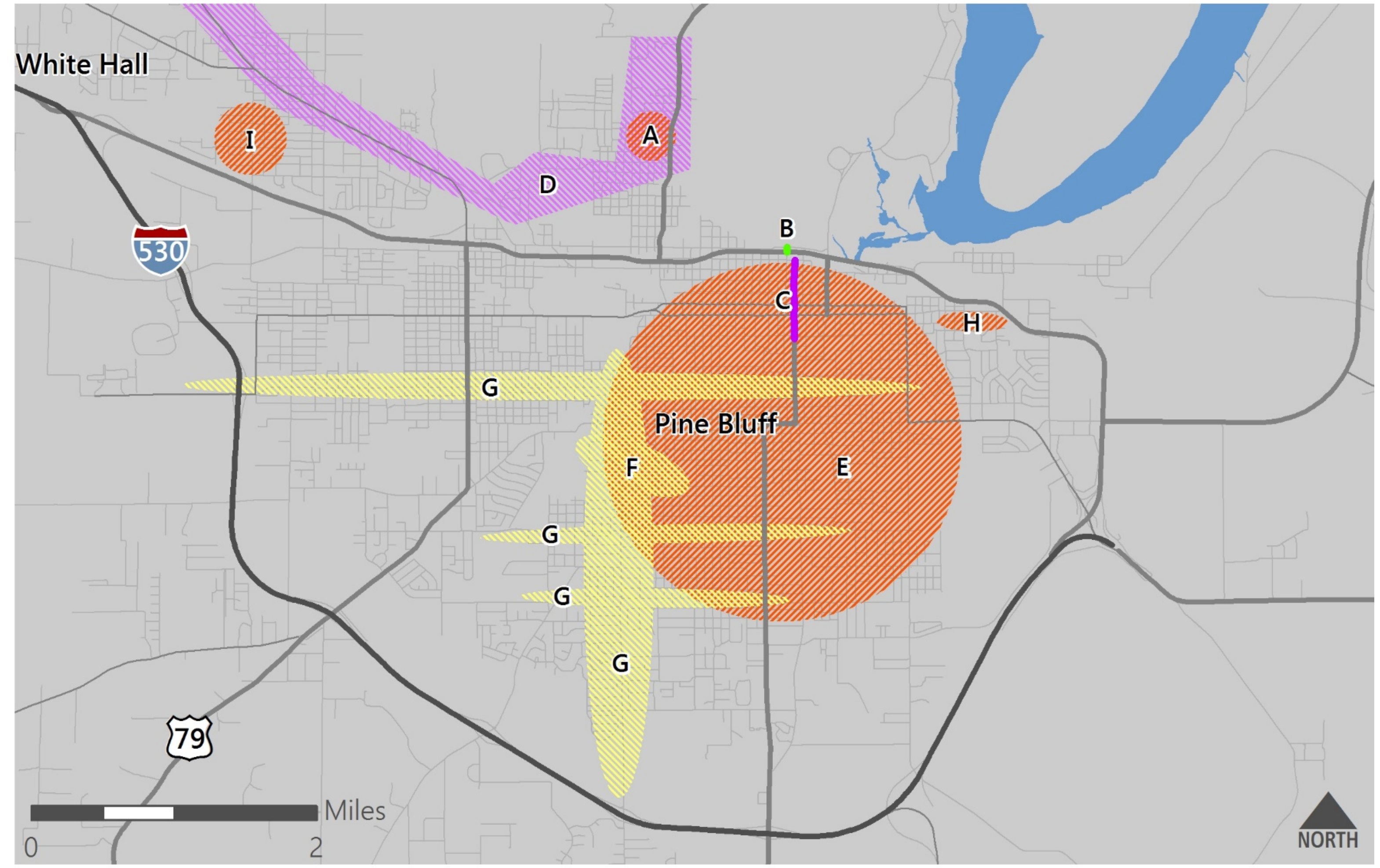
Label in Figure 6.1	Project	Location	Rationale		
			Previous Plans	Demand Mapping	Public Input
A	Improved sidewalk network with streetlights	Through UAPB campus area and University Drive	X	X	X
B	Footbridge	From Lake Saracen Landing over US 65B (Martha Mitchell Expy) to N Pine St	X		X
C	Bicycle infrastructure	Main St, from the courthouse to E 8th Ave	X	X	X
D	Bicycle infrastructure	From Lake Saracen Trail, connecting to UAPB and Morehead Middle School, ending in White Hall around White Hall Ave	X	X	X
E	Improved sidewalks	Pine Bluff CBD	X	X	
F	Multi-use path	Around SEARK campus and Central Park	X		
G	Multi-use path	Entergy Transmission rights-of-way	X		(Public asked for general multi-use paths)
H	Improved sidewalks	Neighborhood between E 6th Ave, E 8th Ave, and S Washington St		X	
I	Sidewalks	Neighborhood around Wormack Ave and Bryant St		X	

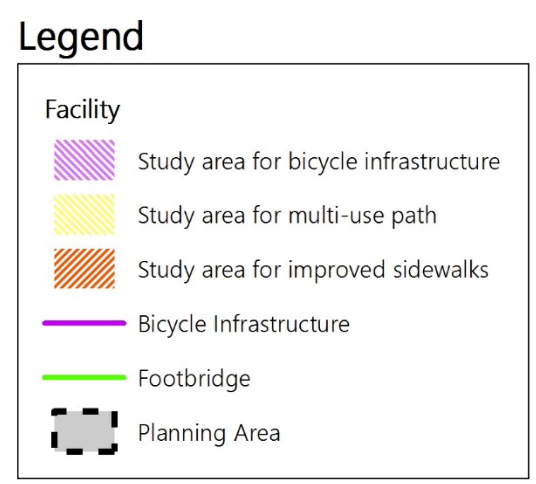
Figure 6.1: Ideas for Bicycle and Pedestrian Projects

Metropolitan Planning Area



Urban Core





Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

6.1.3 Transit Projects

At a minimum, the MTP assumes that existing transit services will continue to operate at current levels and that vehicles will be kept in a good state of repair.

The Needs Assessment also revealed the need to increase frequency of service to some areas currently serviced by Pine Bluff Transit and provide reliable service, whether fixed or alternative, to some areas with high demand not currently served, such as White Hall. The Needs Assessment also showed a need to increase marketing and outreach of existing services. To address these needs, the MTP recommends a Transit Study. This study should be conducted before the next MTP update and recommendations should be incorporated into the 2050 MTP.

6.2 Estimating Project Costs

6.2.1 Roadway Project Cost Estimates

Cost estimates for some projects were created by analyzing the project costs in the previous Pine Bluff MTP and the new Tri-Lakes 2045 MTP. For the remaining projects, order-of-magnitude cost estimates were developed using values borrowed from recently conducted analysis in Mississippi. These typical cost estimates for various types of improvements are shown in Table 6.2 and reflect the total cost of the project, including right-of-way acquisition, engineering, and construction.

Table 6.2: Typical Roadway Costs by Improvement Type

Improvement Type	Average Cost (2020 dollars)	Unit
New 2 Lane Roadway	$3,065,000	Mile
New 3 Lane Roadway	$5,740,000	Mile
Arterial Widening	$6,750,000	Mile
Center Turn Lane	$5,800,000	Mile
Reconstruction	$2,200,000	Mile
Overlay	$1,195,000	Mile
ITS	$434,000	Mile
New Bridge	$3,570,000	Each
Traffic Signal	$1,155,000	Each
RR Crossing	$204,000	Each
Intersection Improvement	$918,000	Each
Interchange Improvement	$6,375,000	Each
RR Overpass	$6,885,000	Each

Source: PBATS MTP 2040, Tri-Lakes MTP 2045, Mississippi
Note: Values are shown in 2020 dollars using 2% inflation

6.2.2 Transit Project Cost Estimates

The annual cost of operating public transit in the MPO was taken from the current levels of expenditures shown in the TIP. These costs were in 2019 dollars and an inflation factor of two (2) percent was used for future years.

Capital transit projects for FY 2019 were provided in the TIP and these were used as provided. Future capital costs were estimated by assuming that all vehicles will be replaced by 2025 and that after that, they will be replaced on a regular cycle based on FTA useful life benchmarks. Vehicle replacement costs were based on PBT's TAM and are shown below. The same inflation factor of two (2) percent was used for future years. Table 6.3 displays the costs of typical transit capital improvements in 2020 dollars.

Table 6.3: Typical Transit Capital Costs by Improvement Type

Asset Class	Replacement Cost (2020 dollars)	FTA Useful Life Benchmark
Bus	$416,000	14 years
Cutaway	$156,000	10 years
Minivan	$56,160	8 years
Van	$46,800	8 years

Source: PBT Transit Asset Management Plan (September 2018)

Note: Assumes 2% inflation per year from 2018 listed costs.

7 Environmental Analysis and Mitigation

7.1 The Environment and MTP

The plan must consider the impacts of transportation on both the natural and human environment. By providing appropriate consideration of environmental impacts early in the planning process, the plan increases opportunities for inter-agency coordination, enables expedited project delivery, and promotes outcomes that are more environmentally sustainable.

Table 7.1 shows resources typically considered in environmental impact evaluations. This chapter will focus on these resources and their implications in the Pine Bluff region.

Table 7.1: Typical Environmental Resources Evaluated

Resource	Importance
HAZMAT Sites	Health hazards, costs, delays, liability for both state and federal projects on either existing or acquired right-of-way
Air Quality	Public health, welfare, productivity, and the environment are degraded by air pollution
Noise	Noise can irritate, interrupt, and disrupt, as well as generally diminish the quality of life
Wetlands	Flood control, wildlife habitat, water purification; applies to both state and federally funded projects
Threatened and Endangered Species	Loss of species can damage or destroy ecosystems, to include the human food chain
Floodplains	Encroaching on or changing the natural floodplain of a water course can result in catastrophic flooding of developed areas
Farmlands	Ensure conversion compatibility with state and local farmland programs and policies
Recreation Areas	Quality of life; neighborhood cohesion
Historic Structures	Quality of life; preservation of the national heritage
Archaeological Sites	Quality of life; preservation of national and Native American heritage
Environmental Justice	To avoid, minimize, or mitigate disproportionately high impacts on minorities and low-income populations; basic American fairness

Source: ArDOT

7.2 Air Quality and Change in Climate

7.2.1 Transportation and Air Quality

Highway vehicles and non-road equipment, such as farm and construction equipment, gasoline-powered lawn equipment, and power boat and outdoor motors are mobile sources of air pollutants, some of which are known or suspected by the Environmental Protection Agency (EPA) to cause cancer or other serious health and environmental effects. Gas powered engines release nitrogen dioxide and Volatile Organic Compounds (VOC), which chemically react in the presence of heat and sunlight to form ground-level ozone. Ground-level ozone can trigger a variety of health problems such as asthma and can also have harmful effects on sensitive vegetation and ecosystems. Mobile sources also contribute to climate change when combustion of fossil fuels release nitrous oxide and carbon dioxide.

The EPA regulates vehicle emissions and fuel efficiency through its vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy (CAFE) standards. It also regulates and monitors pollutants considered harmful to public health and the environment through the National Ambient Air Quality Standards (NAAQS) authorized by the Clean Air Act (1970). The EPA has set NAAQ's standards for six principal "criteria" pollutants. These are listed in Table 7.2 along with the current standards.

In 2015, the EPA revised the primary and secondary ozone standards to 70 parts per billion (ppb), down from the current 75 ppb, and retained their indicators (O_3), forms (fourth-highest daily maximum, averaged across three consecutive years) and averaging times (eight hours). The Pine Bluff MPA is not anticipated to immediately be affected by 70 ppb standard. Therefore, it was recommended that Jefferson County be designated as Unclassifiable/Attainment for the 2015 NAAQS.

> Transportation conformity is a process required of MPOs pursuant to the Clean Air Act Amendments of 1990 (CAAA of 1990) to ensure that Federal funding and approval are given to those transportation activities that are consistent with air quality goals.

The CAAA require that transportation plans, programs, and projects in nonattainment or maintenance areas that are funded or approved by the FHWA be in conformity with the State Implementation Plan (SIP) which represents the state's plan to either achieve or maintain the NAAQS for a particular pollutant.

If Jefferson County ever exceeds NAAQ standards and is designated as a nonattainment or maintenance area, the MTP will be subject to a conformity analysis. If this were to occur in the future, the transportation model, which forms the basis of transportation decision-making, provides numeric outputs that may be utilized in regional air quality modeling.

Table 7.2: National Ambient Air Quality Standards (NAAQS) as of 2020

Pollutant	Primary/Secondary	Averaging Time	Level	Form
Carbon Monoxide	primary	8-hours	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	primary and secondary	Rolling 3-month average	0.15 µg/m3	Not to be exceeded
Nitrogen Dioxide	primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	primary and secondary	Annual	53 ppb	
Ozone	primary and secondary	8-hours	0.070 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution	primary	Annual	12.0 µg/m3	annual mean, averaged over 3 years
	secondary	Annual	15.0 µg/m3	annual mean, averaged over 3 years

	primary and secondary	24-hours	35 µg/m3	98th percentile, averaged over 3 years
	primary and secondary	24-hours	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide	primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	secondary	3-hours	0.5 ppm	Not to be exceeded more than once per year

Source: EPA

7.2.2 Change in Climate

The current scientific belief holds that the planet is going through a period of warming. This changing trend in climate is believed to be caused by the increase in greenhouse gases (GHGs), which has only been increased through human behavior through the use of fossil fuels. According to the EPA, the transportation sector generated the largest share of GHG emissions in the United States in 2018, responsible for over 28 percent. The MPO understands the need for air quality within the area and is taking several steps to address this new challenge.

7.2.3 Effects of Climate Change

As the Pine Bluff MPA is inland and away from the coast, rising sea levels and hurricanes are not considered a direct concern of the area. However, these events can impact the area over time. The most obvious and immediate effect of climate change has been the increased global temperature, which has a large impact on the transportation system. The increased heat warps the steel of railroad tracks, stresses bridge joints, and affects pavement conditions. Pavement that has been softened by heat to which it was never designed can buckle and rut under high truck volumes. This in turn creates a need for further maintenance and the use of more material, which itself is carbon-based.

The rising temperatures are not the only major impact that has been observed with the recent climate change. Storms have been rising in intensity with the shift in the climate and "Superstorms" such as Hurricanes Katrina, Sandy, and Harvey are becoming a more regular occurrence. Arkansas has seen direct impacts of weather extreme amplification recently in the historic flooding of Fort Smith and River Valley in the spring of 2019.

Recent storms with a high intensity over a short period of time are becoming common and can result in flash floods. These flash floods trap motorists and deposit large amounts of water on the impervious surfaces of the roadways. This water eventually becomes surface runoff, which can pool and damage a roadway's substructure. This impact is worse near major rivers, leading to potential disasters that can affect roadways and other infrastructure.

A strategy that the MPO can employ to deal with this need is the increased inspection of bridges and roadways. This will ensure that the infrastructure is structurally sound and that erosion from storms has not degraded it. Drainage for the infrastructure is also important and should be inspected to ensure that roadways will not contribute to runoff.

7.2.4 Climate Change Strategies

The transportation system is the largest contributor to GHGs, contributing over one-quarter of the total amount. These gases come from vehicle emissions and air conditioning. Vehicle emissions are increased when a vehicle is idling and less efficient. This contribution to GHGs makes the transportation sector a priority to address climate change. There are several strategies that may be employed in order to reduce the impact of transportation on climate change.

Introducing Low-Carbon Fuels

This strategy explores the use of fuels from alternative sources which produce less carbon and are more efficient. These fuels include ethanol, biodiesel, natural gas, and more. Additional low-carbon fuels include alternatives such as hybrids, electric vehicles, and hydrogen fuel. The local transit systems have been making the switch to hybrid buses to reduce emissions.

Reduction of High-Carbon Activities

Single occupancy vehicles and motorcycles are comparatively inefficient modes of transportation that produce GHGs. Strategies can be implemented that encourage transportation users to choose alternative transportation modes which reduce the emissions on the transportation system. These include the use of carpooling, increased transit ridership, and the reduction of unnecessary trips.

The construction and maintenance of transportation systems can also contribute to GHGs, as many of the products used in these processes are carbon-based. The use of lower-carbon materials during construction and maintenance would aid with this strategy.

Improving System Efficiency

The transportation network is the system by which people, goods, and services are moved through the area. This strategy encourages the use of an efficient transportation system to reduce travel time, reduce idling vehicles, and increase quality of traffic operations. This can be achieved through the use of:

- Intelligent Transportation Systems,
- traffic signal retiming and coordination,
- Travel Demand Management, and
- other means to reduce congestion and idling vehicles.

<u>Additional Strategies</u>

The strategies listed above cover the key methods that can be used to reduce the effect of GHGs from transportation sources. The following strategies may also be deployed:

- Reducing the amount of travel necessary for transportation users
- Increasing vehicle occupancies for all modes
- Establishing transportation pricing
- Encouraging non-vehicular travel
- Promoting trip-chaining
- Improved freight logistics
- Using LED lights in traffic signals

7.3 Environmental Regulations

7.3.1 Planning Requirements

Federal regulations (23 C.F.R. §450) require the MTP to address environmental concerns by consulting with relevant stakeholder agencies and discussing potential environmental mitigation activities.

The plan should involve consultation with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation. This should include a comparison of the plan with State conservation plans or maps and inventories of natural or historic resources, if this information is available.

The plan must discuss types of potential environmental mitigation activities related to the implementation of the plan. This includes potential areas for these activities to occur and activities which may have the greatest potential to mitigate the effects of the plan projects and strategies. Mitigation activities do not have to be project-specific and can instead focus on broader policies, programs, and strategies. The discussion must involve consultation with federal, state, and tribal land management, wildlife, and regulatory agencies.

7.3.2 Defining Mitigation

The National Environmental Policy Act (1970), or NEPA, established the basic framework for integrating environmental considerations into federal decision-making. Federal regulations relating to NEPA (40 C.F.R. 1508) define mitigation as:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

7.4 The Natural Environment

7.4.1 Wetlands, Waterways, and Flooding

Transportation projects were evaluated for proximity to wetlands, impaired waters, flood zones, and navigable waters. While transportation projects should be sensitive to all bodies of water, these water bodies merit special attention for the following reasons:

- Wetlands have many environmental benefits, most notably:
    - water purification,
    - flood protection,
    - shoreline stabilization,
    - groundwater recharge,
    - streamflow maintenance, and
    - fish and wildlife habitat.

- Impaired waters are already too polluted or otherwise degraded to meet the state water quality standards.
- Both wetlands and impaired waters are protected by the Clean Water Act.

- Encroaching on or changing the natural floodplain of a water course can result in catastrophic flooding of developed areas.
- Structures built across navigable waterways must be designed in consultation with the Coast Guard, as required by the Coast Guard Authorization Act of 1982.

Figure 7.1 displays the proposed MTP transportation projects along with the location of wetlands and impaired waters. Figure 7.2 displays the proposed MTP transportation projects and flood zones.

Navigable waterways are defined as waters that have been used in the past, are now used, or are susceptible to use as a means to transport interstate or foreign commerce up to the head of navigation. The Arkansas River is the only navigable waterway within the MPA that is part of the U.S. Army Corps of Engineers Navigable Waterway Network.

Mitigation

This early in the planning stage, there are not enough resources available to assess project level impacts to specific wetlands. As individual projects proceed through the ArDOT project delivery process and NEPA process, it is anticipated that project sponsors will:

- Ensure that transportation facilities constructed in floodways will not increase flood heights
- Take steps to avoid wetland and flood zone impacts where practicable
- Consider strategies which minimize potential impacts to wetlands and flood zones
- Provide compensation for any remaining unavoidable impacts through activities to restore or create wetlands
- Projects near impaired waters should consider measures to improve the quality of these waters.

Spotlight: Stormwater Mitigation

In urban areas, unmanaged stormwater often leads to excessive flooding. This flooding can damage property and create environmental and public health hazards by introducing contaminants into new areas. Without proper drainage and stormwater mitigation efforts, new transportation projects have the potential to exacerbate existing stormwater issues.

Transportation Related Strategies

- During project design, minimize impervious surfaces and alterations to natural landscapes.
- Promote the use of "green infrastructure" and other low-impact development practices. Examples include the use of rain barrels, rain gardens, buffer strips, bioswales, and replacement of impervious surfaces on property with pervious materials such as gravel or permeable pavers.
- Adopt ordinances that include stormwater mitigation practices, including landscaping standards, tree preservation, and "green streets".
- Develop a Standard Urban Stormwater Mitigation Plan at multiple levels; including state, region, and municipality. Efforts should be made to coordinate these plans, even though multiple agencies would have them in place.

7.4.2 Wildlife

The test projects were evaluated for proximity to identified critical habitat areas for threatened and endangered species and wildlife refuges. The Endangered Species Act of 1973, as amended, was enacted to provide a program for the preservation of endangered and threatened species. The Act provides protection for the ecosystems upon which these species depend for their survival. All federal agencies or projects utilizing federal funding are required to implement protection programs for designated species and to use their survival.

Additionally, Section 4(f) of the Department of Transportation (DOT) Act of 1966 affords protection to wildlife or waterfowl refuges when USDOT funds are invested in a project.

An endangered species is a species in danger of extinction throughout all or a significant portion of its range. A threatened species is a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Proposed species are those which have been formally submitted to Congress for official listing as threatened or endangered.

Species may be considered endangered or threatened when any of the five (5) following criteria occur:

- The current/imminent destruction, modification, or curtailment of their habitat or range
- Overuse of the species for commercial, recreational, scientific, or educational purposes
- Disease or predation
- The inadequacy of existing regulatory mechanisms
- Other natural or human-induced factors affect continued existence.

Table 7.2 lists species classified as endangered, threatened, or recovered within the MPA. Figure 7.3 displays the proposed MTP transportation projects along with the location of identified critical habitat areas. There are no wildlife or waterfowl refuges in the Metropolitan Planning Area.

Mitigation

Preliminary planning undertaken within the context of development of the MTP does not include resources sufficient to assess project specific impacts to species habitats. As projects are carried forward through the ArDOT project delivery process, the NEPA process, design, construction, and projects will be developed in consultation with U.S. Fish and Wildlife Service and Arkansas Game and Fish Commission. Where feasible, actions which impact critical habitats will be avoided.

Table 7.2 Species Identified under Endangered Species Act in Jefferson County, AR

Group	Common Name	Scientific Name	Status
Birds	Bald eagle	Haliaeetus leucocephalus	Recovery
	Piping Plover	Charadrius melodus	Threatened
	Least tern	Sterna antillarum	Endangered
Clams	Winged Mapleleaf	Quadrula fragosa	Endangered
	Rabbitsfoot	Quadrula cylindrica cylindrica	Threatened

Source: U.S. Fish and Wildlife Service, Environmental Conservation Online System; National Marine Fisheries Service (NOAA Fisheries)




Table 7.3 displays the test projects that would impact wetlands and/or flood zones within the study area.

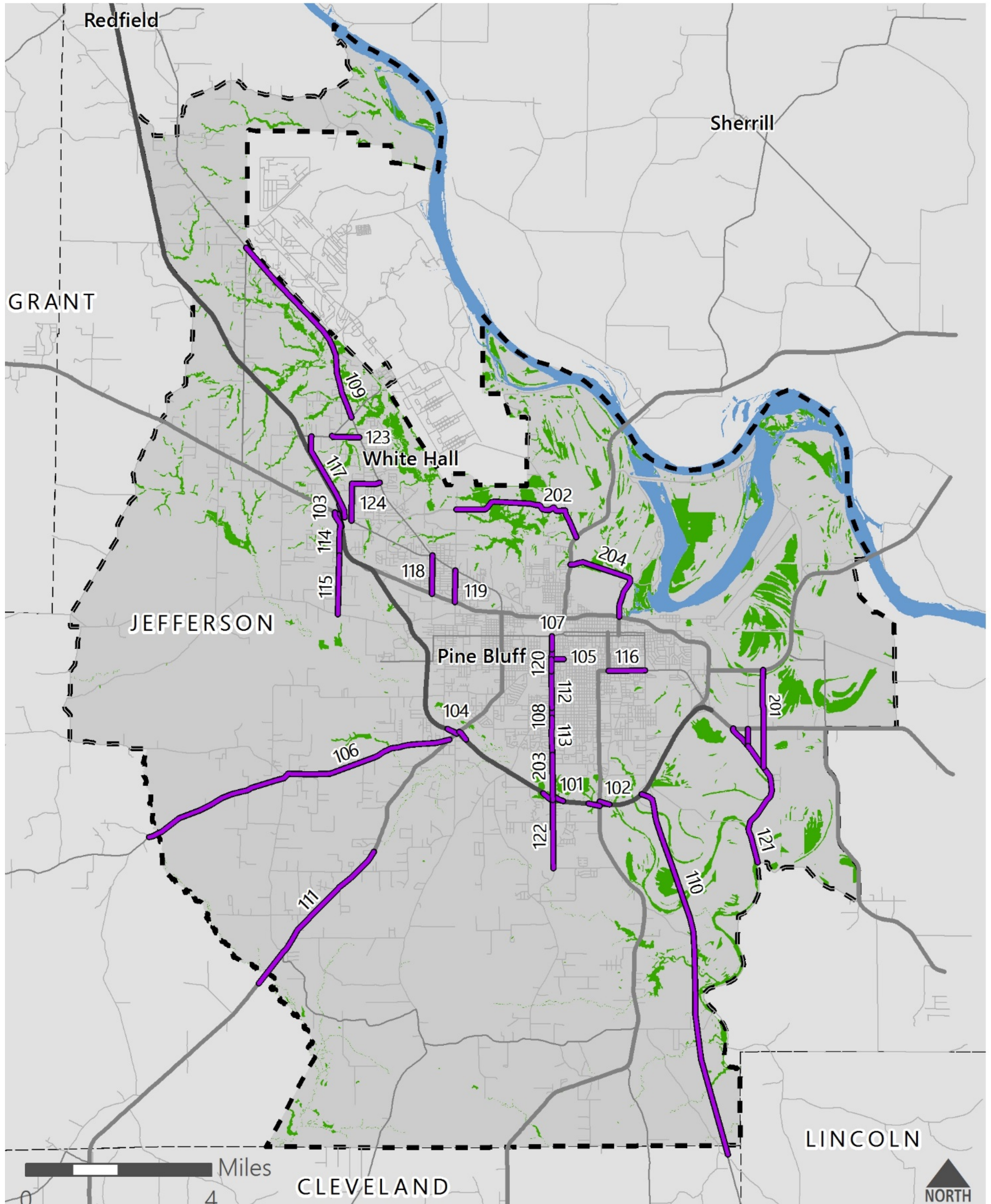
Table 7.3: Test Projects Impacting Wetlands or Floodplains

Project ID	Route	Description	Location	Wetlands	Flood plains
101	I-530	Widen to 2 Lanes	Hazel St Exit Ramps	Yes	Yes
102	I-530	Widen to 2 Lanes	US 63 (S Olive St) Exit Ramps	Yes	Yes
103	I-530	Widen to 2 Lanes	US 270	Yes	Yes
104	I-530	Widen to 2 Lanes	US 79 (S Camden Rd)	Yes	Yes
105	W 13th Ave	Widen to 4 Lanes	Hazel St to Hickory St	No	Yes
106	Hwy 54 (Sulphur Springs Rd)	Widen to 4 Lanes	Study Area Boundary to US 79	Yes	Yes
107	Hazel St Extension	Center Turn Lane/New 3-Lane Roadway	W 13th Ave to Hwy 190 (W 6th Ave)	No	Yes
108	Hazel St	Widen to 5 Lanes	31st Ave to 28th Ave	No	Yes
109	Hwy 365 (Dollarway Rd)	Center Turn Lane	Hwy 104 to Hwy 256	Yes	Yes
110	Hwy 530	Widen to 4 Lanes	Study Boundary Area to I-530	Yes	Yes
111	US 79 (S Camden Rd)	Widen to 4 Lanes	Study Boundary Area to Suburbia Dr	Yes	Yes
112	Hazel St	Widen to 5 Lanes	28th Ave to 17th Ave	No	Yes
113	Hazel St	Widen to 5 Lanes	42nd Ave to 31st Ave	No	Yes
114	Claude Rd	Center Turn Lane	White Hall City Limits to US 270	Yes	Yes
115	Claude Rd	Center Turn Lane	Princeton Pike to White Hall City Limits	Yes	Yes

116	Harding Ave	Widen to 5 Lanes	Main St to Ohio St	No	Yes
117	Caney Rd	New 2 Lane Roadway	Hwy 365 to Hwy 256	Yes	Yes
118	Bryant St	Center Turn Lane	US 65B (Marth Mitchell Expwy) to Hwy 365 (Dollarway Rd)	No	Yes
119	Hutchinson St	Center Turn Lane	US 65B (Marth Mitchell Expwy) to Hwy 365 (Dollarway Rd)	No	Yes
120	Hazel St	Widen to 5 Lanes	17th Ave to 13th Ave	No	Yes
121	Grider Field (Ladd Rd)	Center Turn Lane/ New 3 Lane Roadway	Hwy 980 to US 65	Yes	Yes
122	Hazel St	Center Turn Lane	W 73rd Ave to I-530	Yes	Yes
123	W Holland Ave	Widen to 4 Lanes	W Hoadley Rd to Hwy 356	Yes	Yes
124	Robin St/White Hall Rd	Center Turn Lane	Hwy 365 B (Sherridan Rd) to Hwy 365 (Dollarway Rd)	Yes	Yes
201	North-South Connector	New 2 Lane Roadway	Grider Field Ladd Rd to US 63	Yes	Yes
202	Jefferson Hwy/ McFadden Rd	Widen to 4 Lanes	N Hutchinson St to US 79	Yes	Yes
203	Hazel St	Widen to 5 Lanes	I-530 to W 42nd Ave	Yes	Yes
204	University/Lake Saracen Bypass	New 2 Lane Roadway	US 65 B (Martha Mitchell Expwy) to US 79 B (University Dr)	Yes	Yes

Figure 7.1: Wetlands and Waterways

Metropolitan Planning Area



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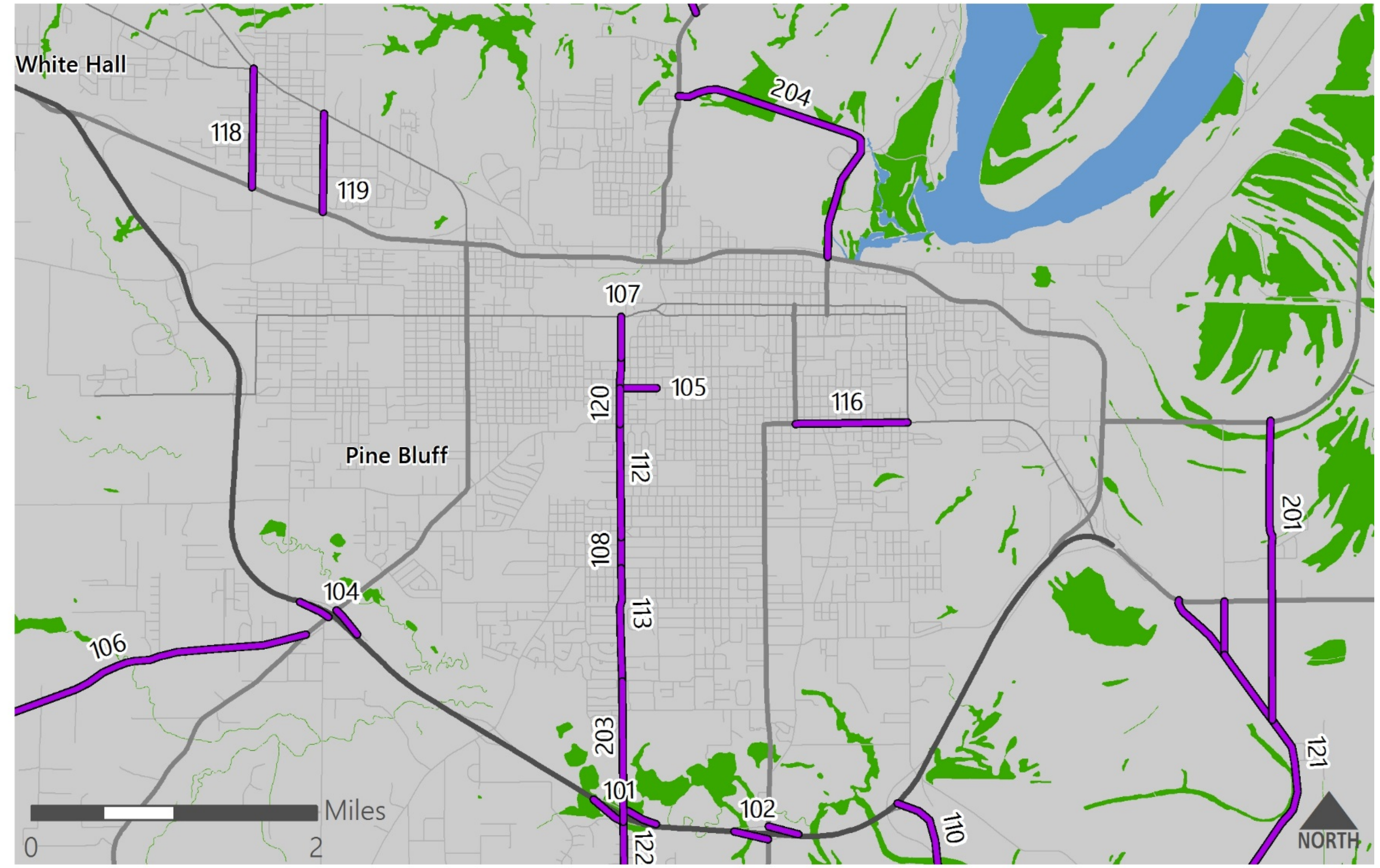


Legend

Wetlands and Waters

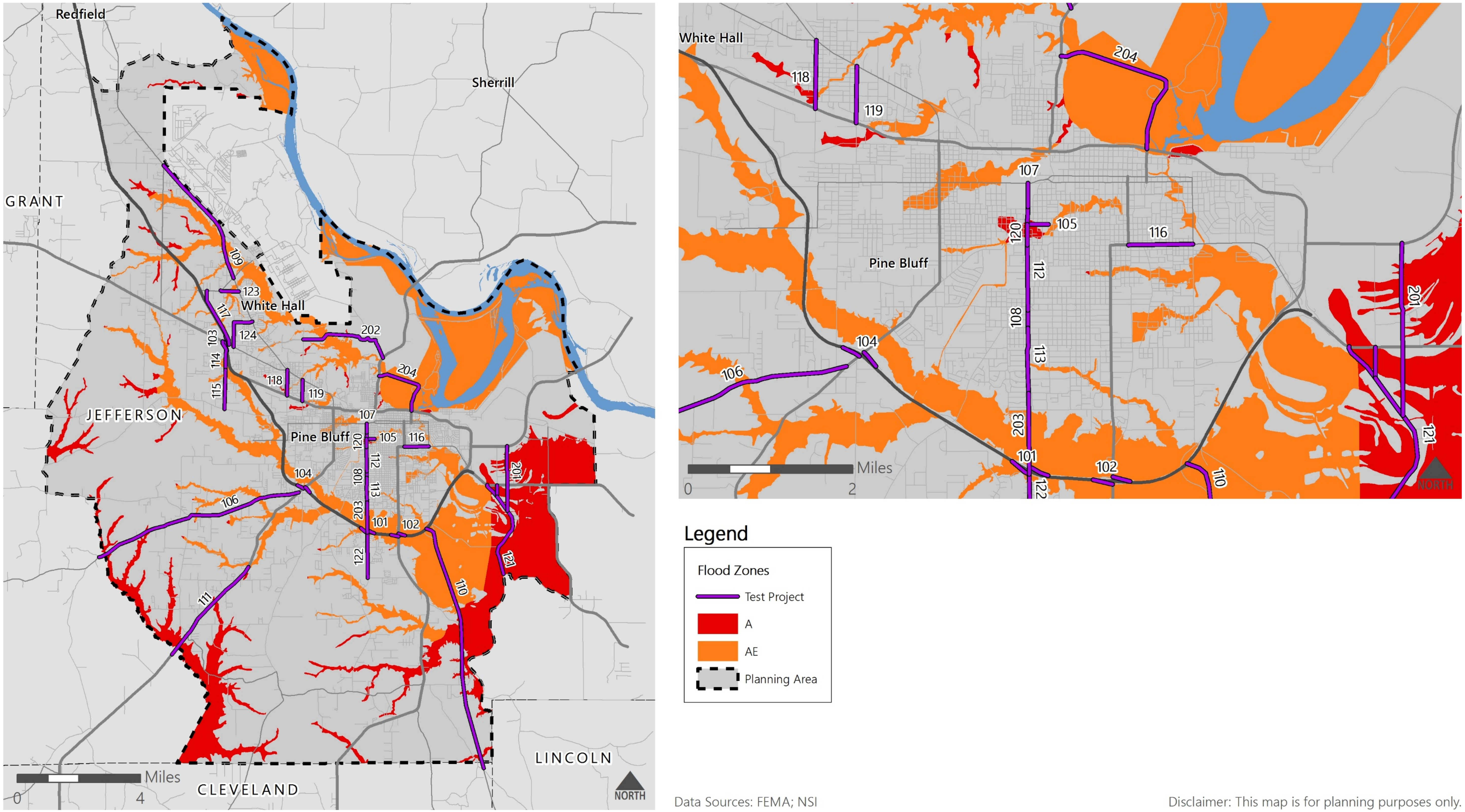
- Test Project
- Wetlands
- Water Boundary
- Planning Area

Data Sources: NWI; NSI

Disclaimer: This map is for planning purposes only.

Figure 7.2: Flood Zones

Metropolitan Planning Area *Urban Core*

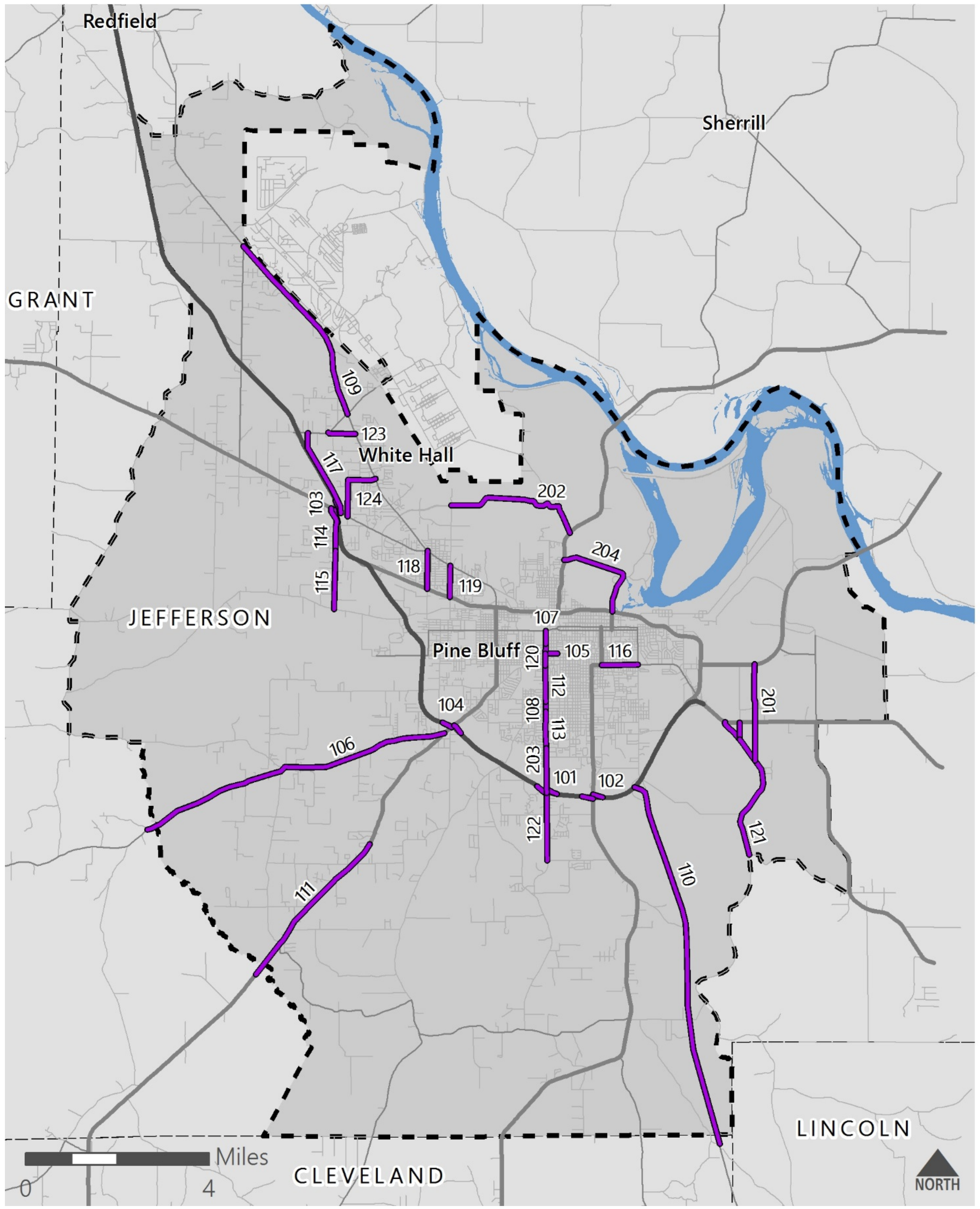


Data Sources: FEMA; NSI

Disclaimer: This map is for planning purposes only.

Figure 7.3: Critical Habitats

Metropolitan Planning Area



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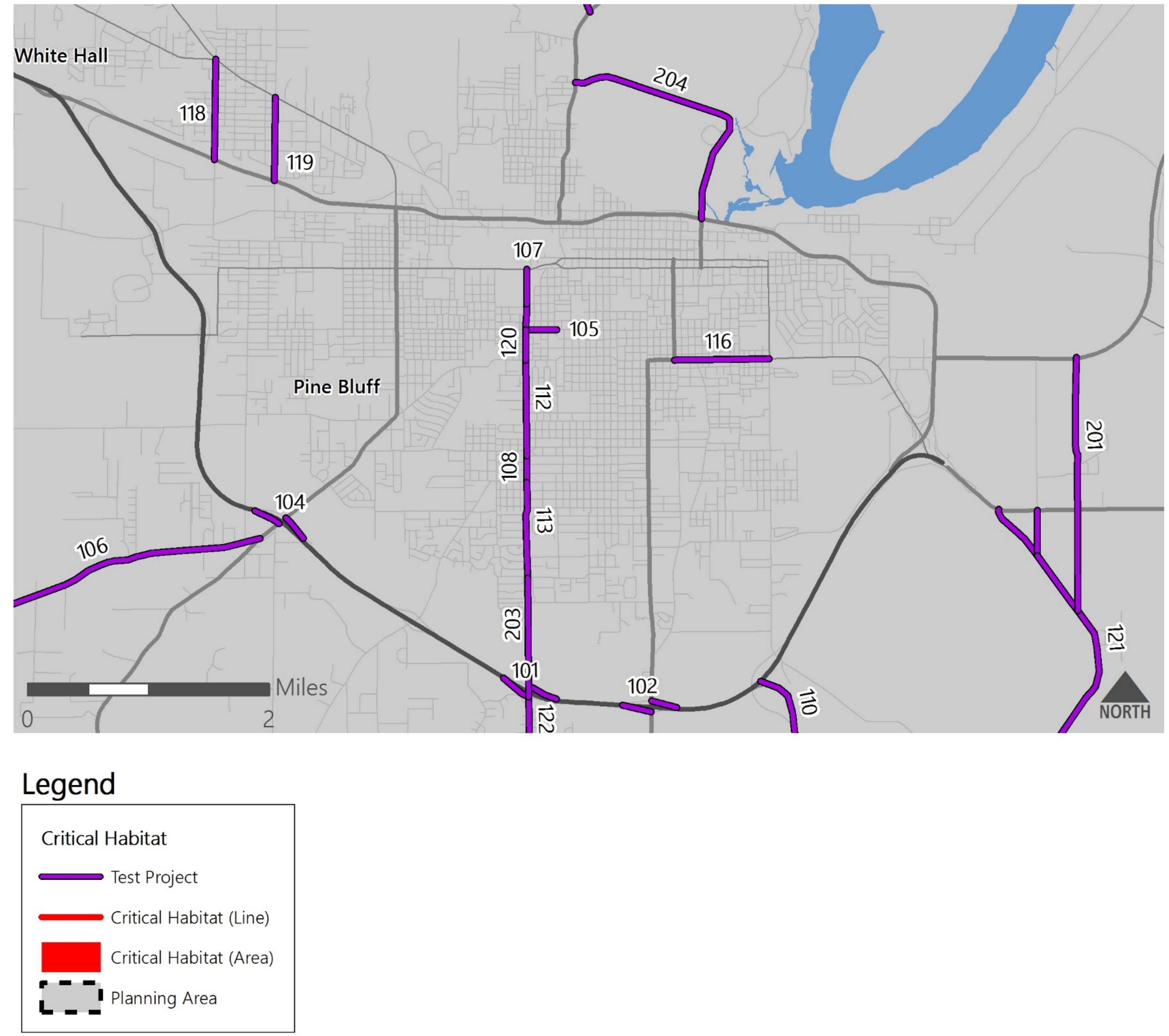


Data Sources: FWS; NSI

Disclaimer: This map is for planning purposes only.

7.5 The Human Environment

7.5.1 Historic and Recreational Resources

The test projects were evaluated for proximity to historic sites and publicly-owned recreational facilities. Section 4(f) of the Department of Transportation (DOT) Act of 1966 affords protection to publicly-owned parks and recreation areas and all historic sites listed or eligible for listing on the National Register of Historic Places (NRHP) when USDOT funds are invested in a project.

In order to be eligible for the NRHP, a district, site, building, structure, or object must possess:

- integrity of location,
- design,
- setting,
- materials,
- workmanship,
- feeling,
- association, and
- generally must be at least 50 years old.

It will also be evaluated by the following criteria:

- association with events that have made a significant contribution to the broad patterns of our history; or
- association with the lives of significant persons in or past; or
- embodiment of the distinctive characteristics of a type, period, or method of construction, or representative of the work of a master, or possession of high artistic values, or representative of a significant and distinguishable entity whose components may lack individual distinction; or
- provision or likelihood to provide information important in history or prehistory.

Figure 7.4 displays all historic sites listed on the National Register and State Register. It is important to note the State Register properties are not necessarily protected by Section 4(f) regulations unless they meet NRHP eligibility. Furthermore, there may be additional properties not listed on either register which are eligible for the NRHP. Note that Figure 7.4 excludes all historic features deemed 'restricted' or 'sensitive', such as sensitive archaeological sites.

Figure 7.4 also displays all publicly-owned parks and recreation areas deemed significant by a review of public agency websites.

Mitigation

Projects will be developed in consultation with the State Historic Preservation Office (SHPO) and to the extent practicable, actions which adversely impact NRHP properties and publicly-owned recreation areas will be avoided. When historic properties are adversely affected, mitigation will include data recovery as appropriate to document the essential qualities of the historic resources. When publicly-owned recreation areas are adversely affected, appropriate compensation will be provided.

7.5.2 Potentially Hazardous Materials

Accidents, spills, leaks, and past improper disposal and handling of hazardous materials and wastes have resulted in contamination of many sites across the country.

The Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA), commonly known as Superfund, was enacted in 1980 and:

- established prohibitions and requirements concerning closed and abandoned hazardous waste sites,
- provided for liability of persons responsible for releases of hazardous waste at these sites, and
- established a trust fund to provide for cleanup when no responsible party could be identified.

CERCLA also enabled the revision of the National Contingency Plan, which established the National Priorities List (NPL).

The NPL is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. It is intended primarily to guide the EPA in determining which sites warrant further investigation.

While there are no sites listed on the National Priorities List in the MPA, there is one cleanup site identified by the EPA: Pine Bluff Arsenal, as illustrated in Figure 7.5. These cleanup sites were evaluated for inclusion in the NPL and identified using the EPA’s Cleanups in My Community database. This database includes cleanup sites, facilities and properties for which EPA collects information by law, or voluntarily via grants.

Mitigation

At this stage in project development, it is determined there are no impacts requiring mitigation regarding potentially hazardous properties. However, when applicable, transportation projects affected by or affecting potentially hazardous properties will be evaluated during the ArDOT project delivery process, the NEPA process, design, and construction.

7.5.3 Environmental Justice Populations

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed in 1994. It reaffirms the intent of Title VI of the Civil Rights Act of 1964, NEPA, and other federal laws, regulations, and policies by establishing the following Environmental Justice (EJ) principles for all federal agencies and agencies receiving federal funds, such as MPOs:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Figure 7.6 shows areas in the MPA where low-income households make up a greater share of the overall population. The overall percentage of the population living in poverty is calculated for all block groups in the MPA, which is 36.9%.

Similarly, Figure 7.7 shows areas in the MPA where minority populations make up a greater share of the overall population. The overall percentage of minority population is calculated for the entire MPA, which is 69.2%.

Mitigation

In an attempt to prevent disproportionately high and adverse effects on minority or low-income populations early in the planning process, the MPO should encourage high community and stakeholder engagement in the design phase of projects. This is especially important for projects that are located in areas with a disproportionately high minority and/or low-income population. Figures 7.6 and 7.7 illustrate transportation projects in relation to disproportionately high minority or low-income populations, but in-depth discussions need to be held to further explore the potential negative impacts in these communities.

7.5.4 Historical Urban Development

The historical urban development of the MPA breaks down the likely distribution of historic and other cultural resources. Figure 7.8 shows that the areas with the greatest concentrations of historical housing structures, or those at least 50 years old, are in the center of the City of Pine Bluff. There are likely smaller concentrations not revealed by historic centers of many of the smaller municipalities within the MPA. This information is merely intended to illustrate general patterns.

7.5.5 Land Cover

The land cover of the MPA is illustrated in Figure 7.9 and summarized in Figure 7.10. According to this information, developed areas only account for 19% of the land in the MPA. Forested and pasture lands make up 46% of the land area.

7.5.6 Other Community Impacts

In addition to the community impacts already discussed, a transportation project may produce various impacts to public spaces, residences, and businesses. These impacts may relate to property, noise, or other issues and many will not be well understood until a project is substantially advanced.

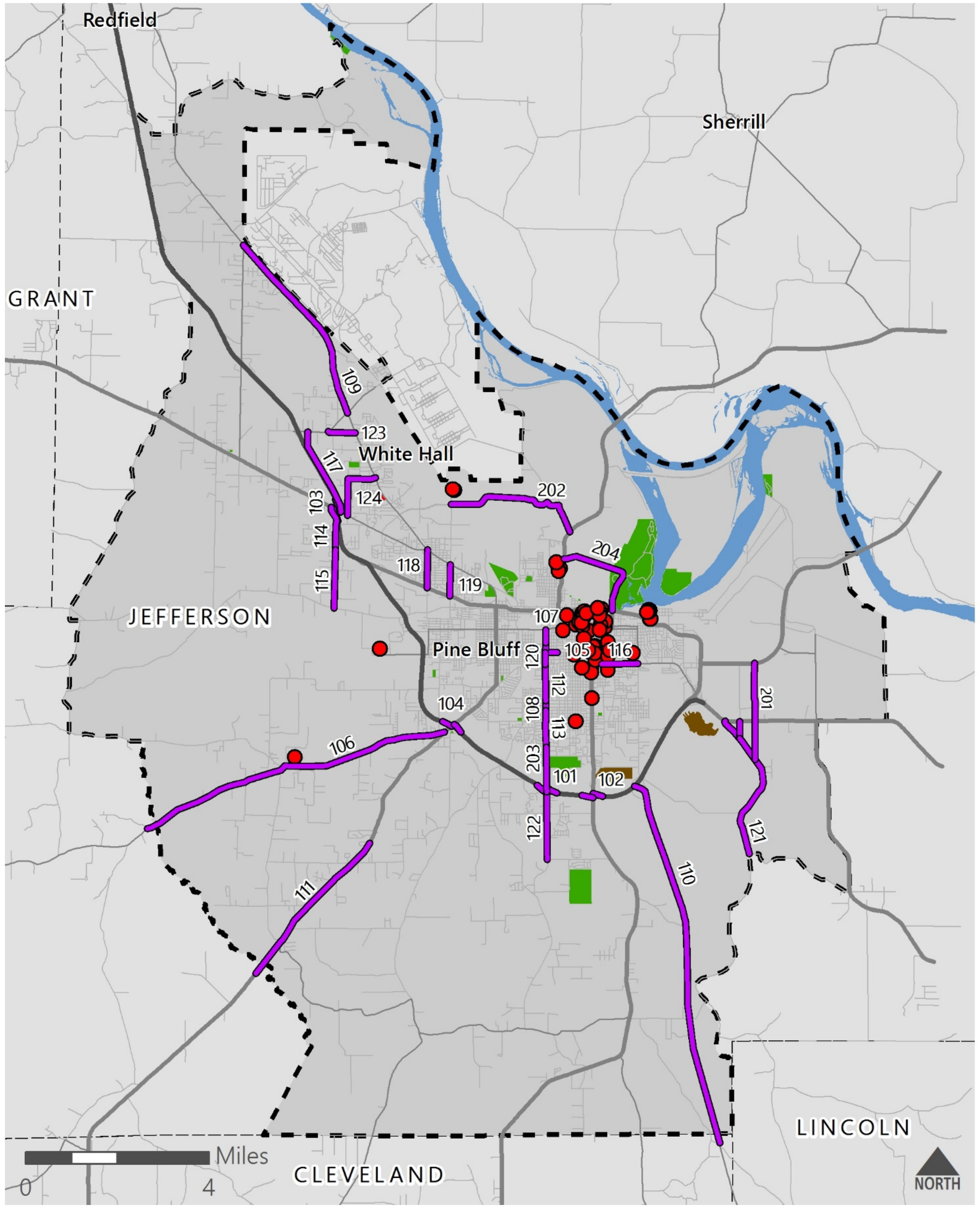
<u>Mitigation</u>

Impacts associated with specific projects will be assessed in conformance with local, state, and federal regulations, NEPA guidance, and the ArDOT project delivery process.

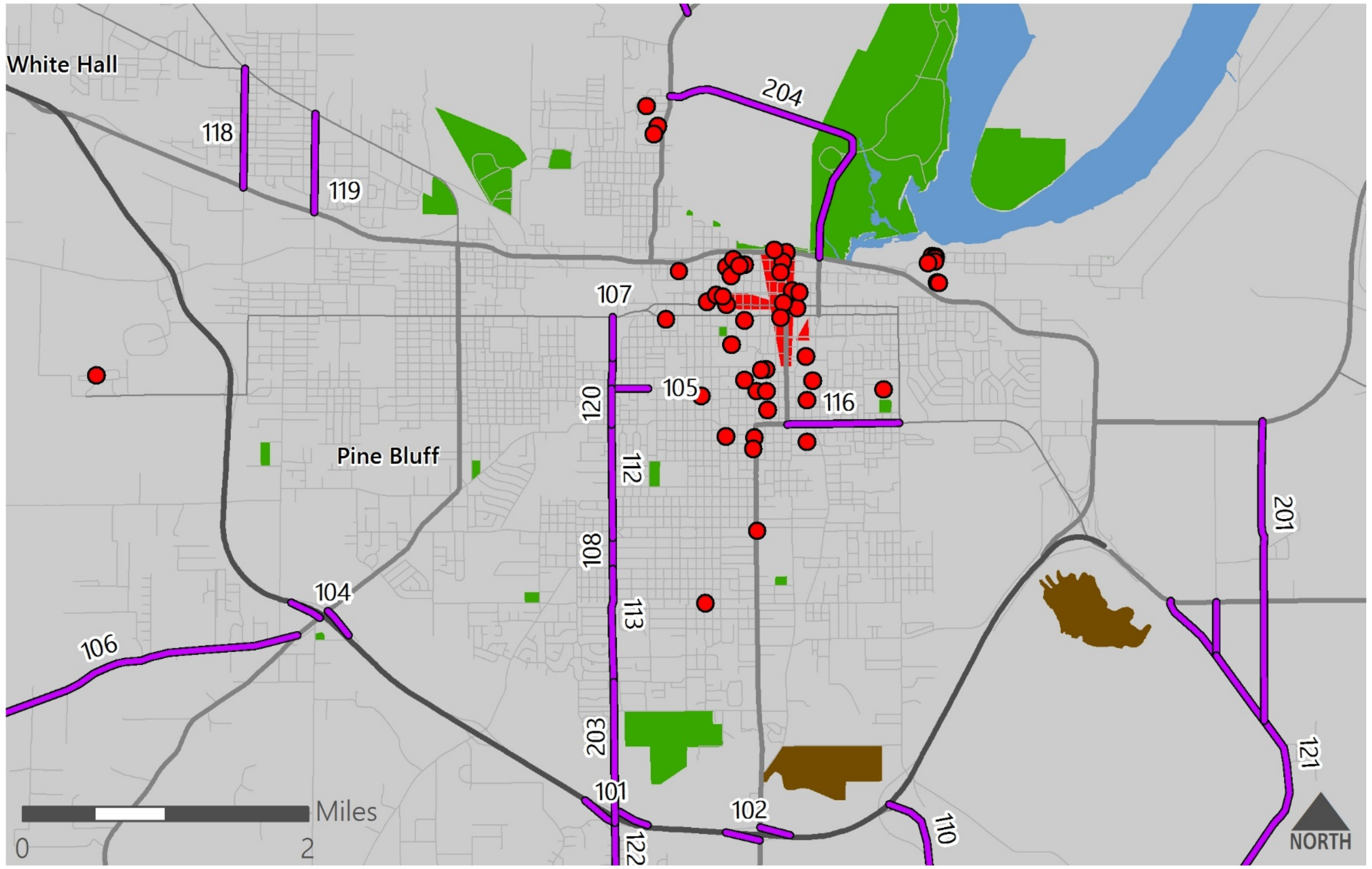
Certain impacts, such as those associated with an increase in traffic related noise, can potentially be mitigated. Also, to the extent practicable, projects should be developed using Context Sensitive Solutions.

Figure 7.4: Historic and Recreational Resources

Metropolitan Planning Area



Urban Core



Legend

Historic and Recreational Resources

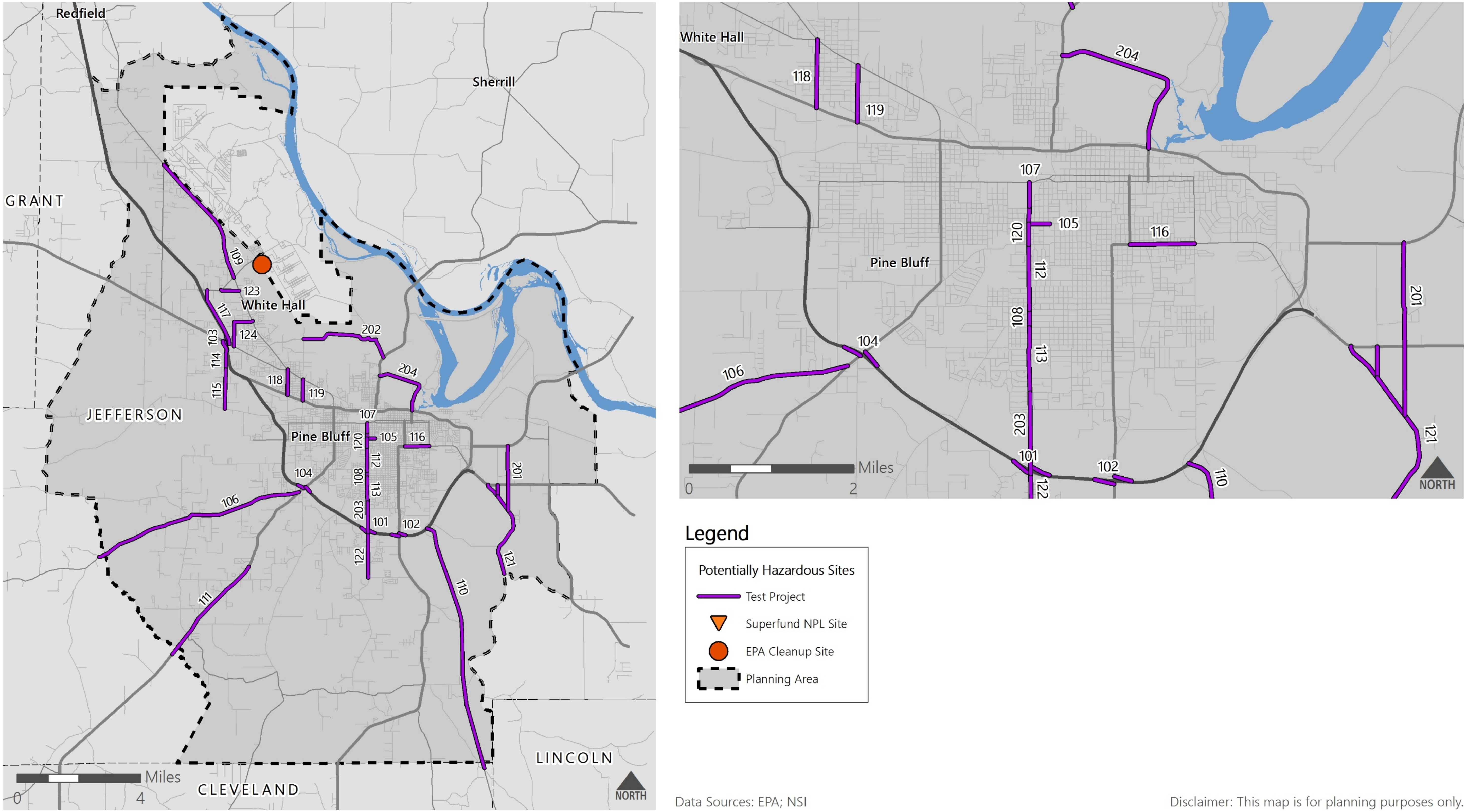
- Test Project
- National Register Historic Location (Point)
- National Register Historic Location (Area)
- Local, City, or County Park
- Natural Area
- Planning Area

Data Sources: NPS (NRHP) ; Arkansas GIS Office

Disclaimer: This map is for planning purposes only.

Figure 7.5: Potentially Hazardous Sites

Metropolitan Planning Area | *Urban Core*

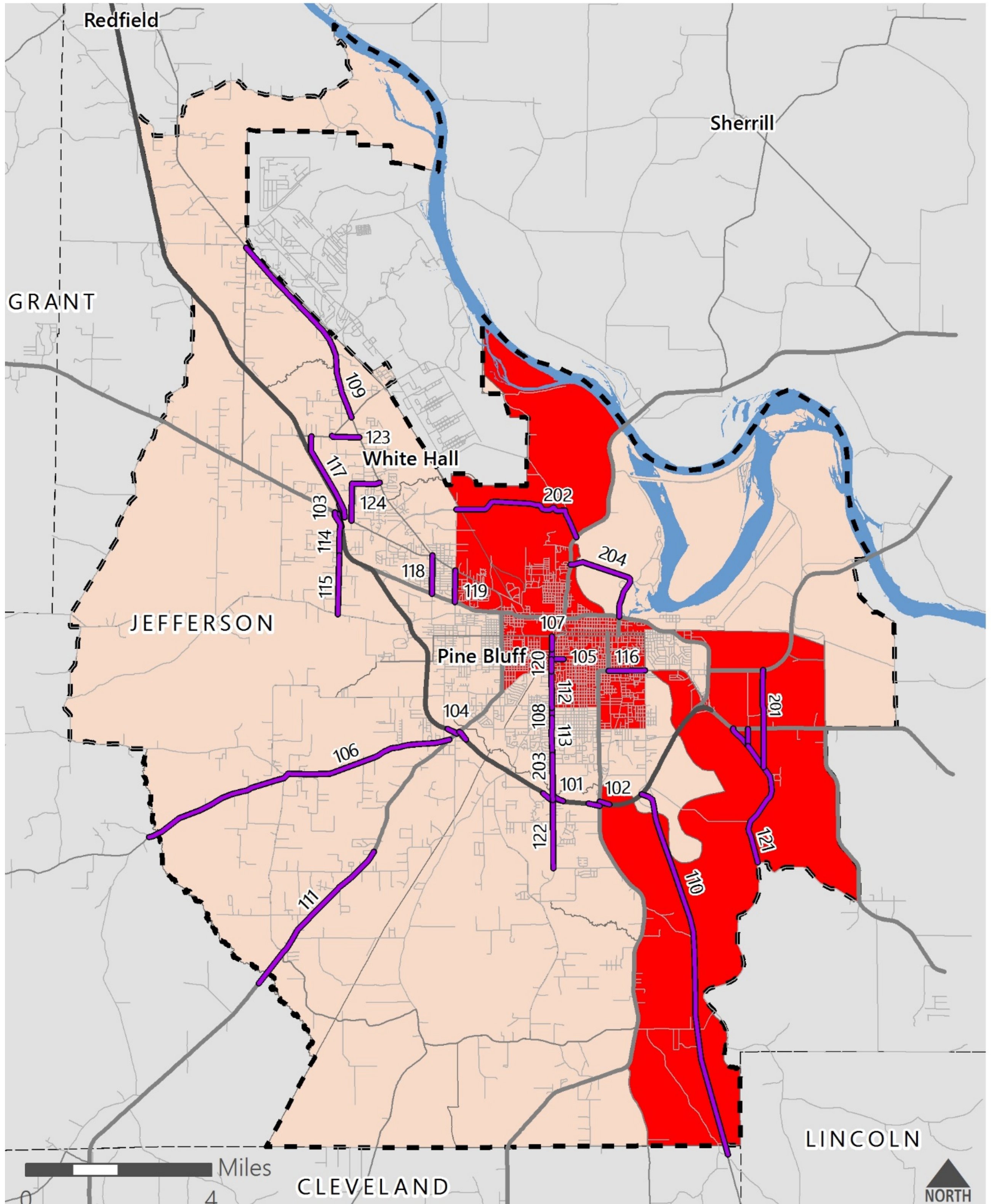


Data Sources: EPA; NSI

Disclaimer: This map is for planning purposes only.

Figure 7.6: Low Income Populations

Metropolitan Planning Area



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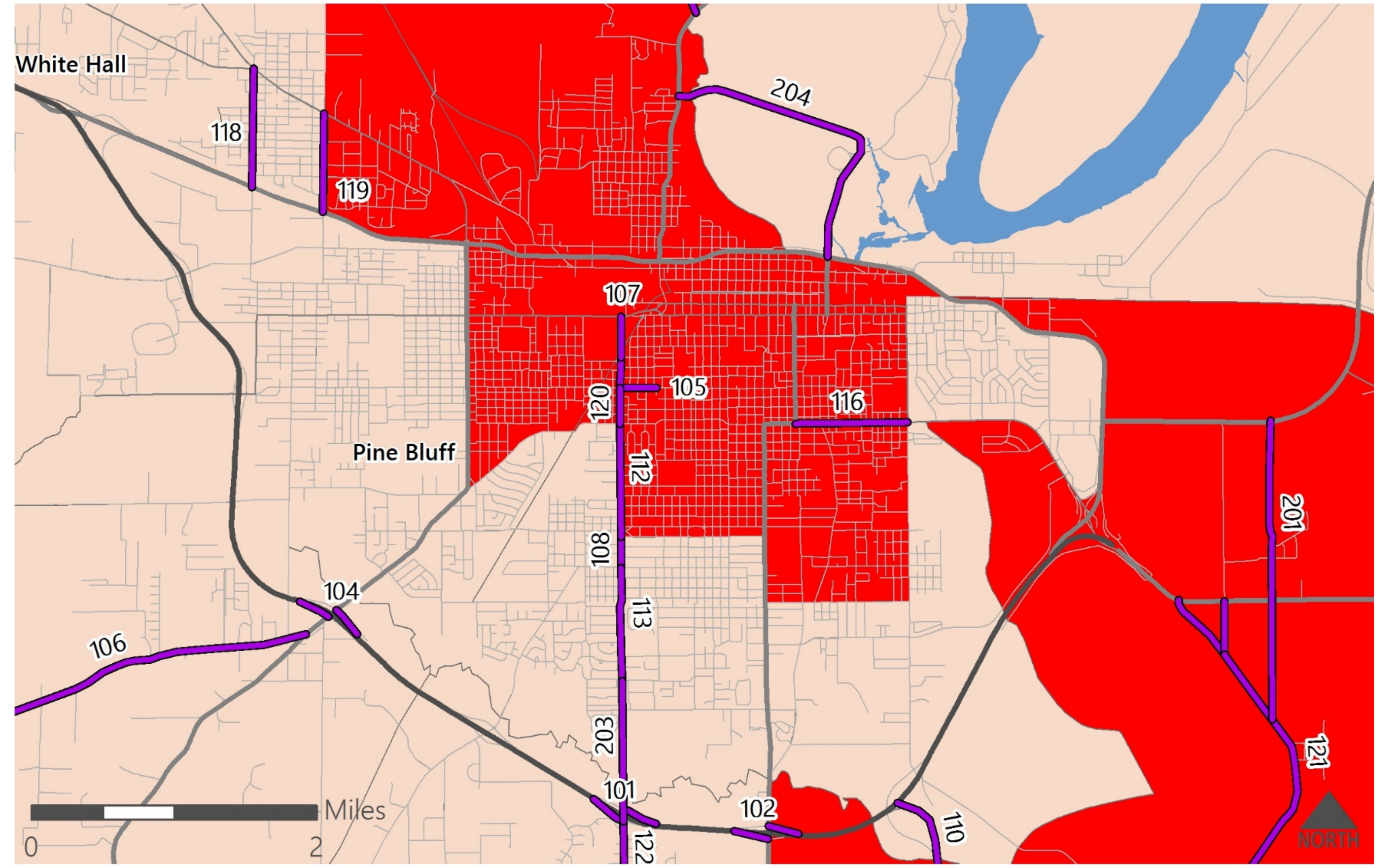


Legend

Low Income Populations (Block Group Level)

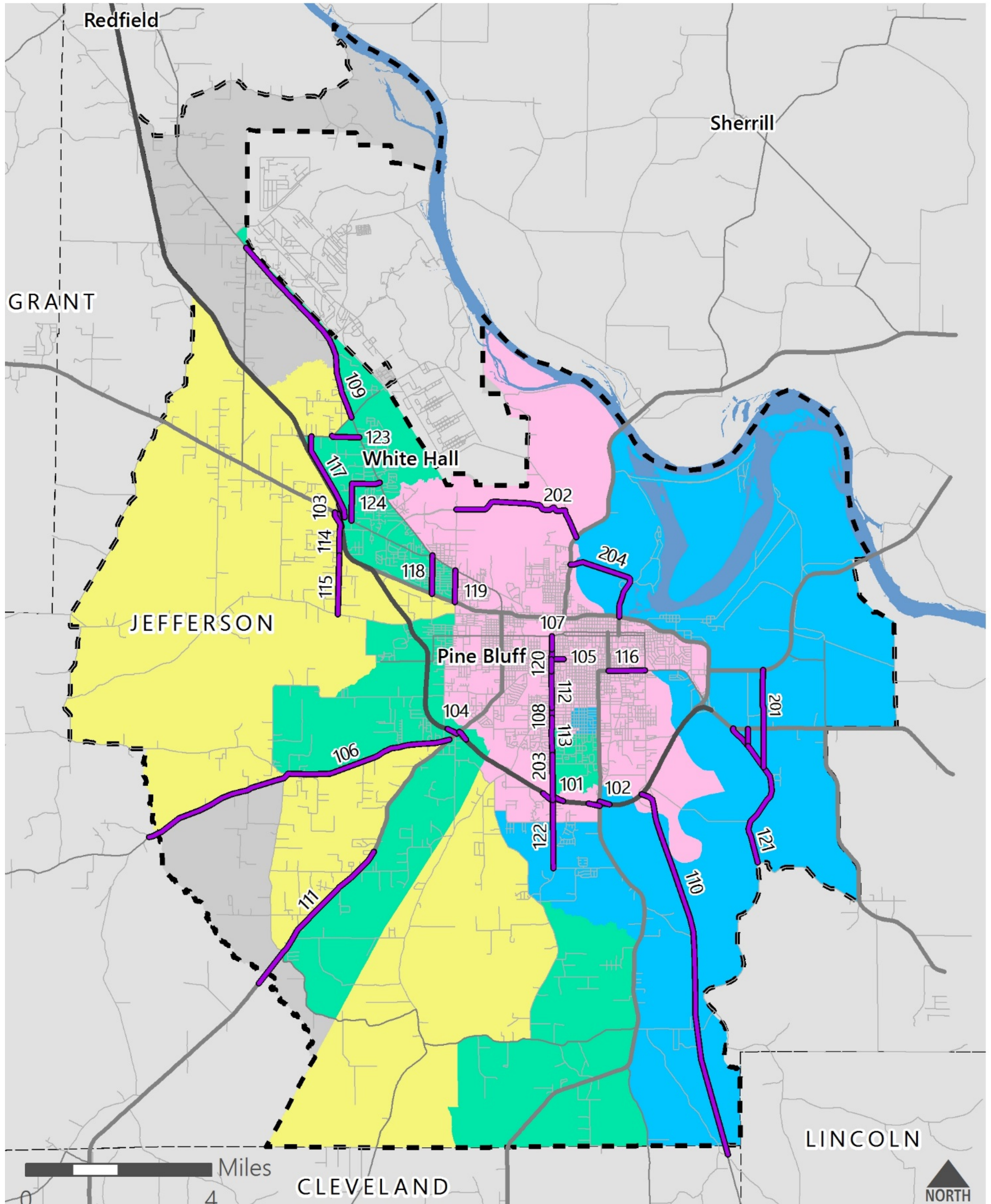
- Test Project
- Low Income Population (<60% Median Income)
- > 60% Median Income
- Planning Area

Data Sources: HUD; NSI

Disclaimer: This map is for planning purposes only.

Figure 7.7: Minority Populations

Metropolitan Planning Area



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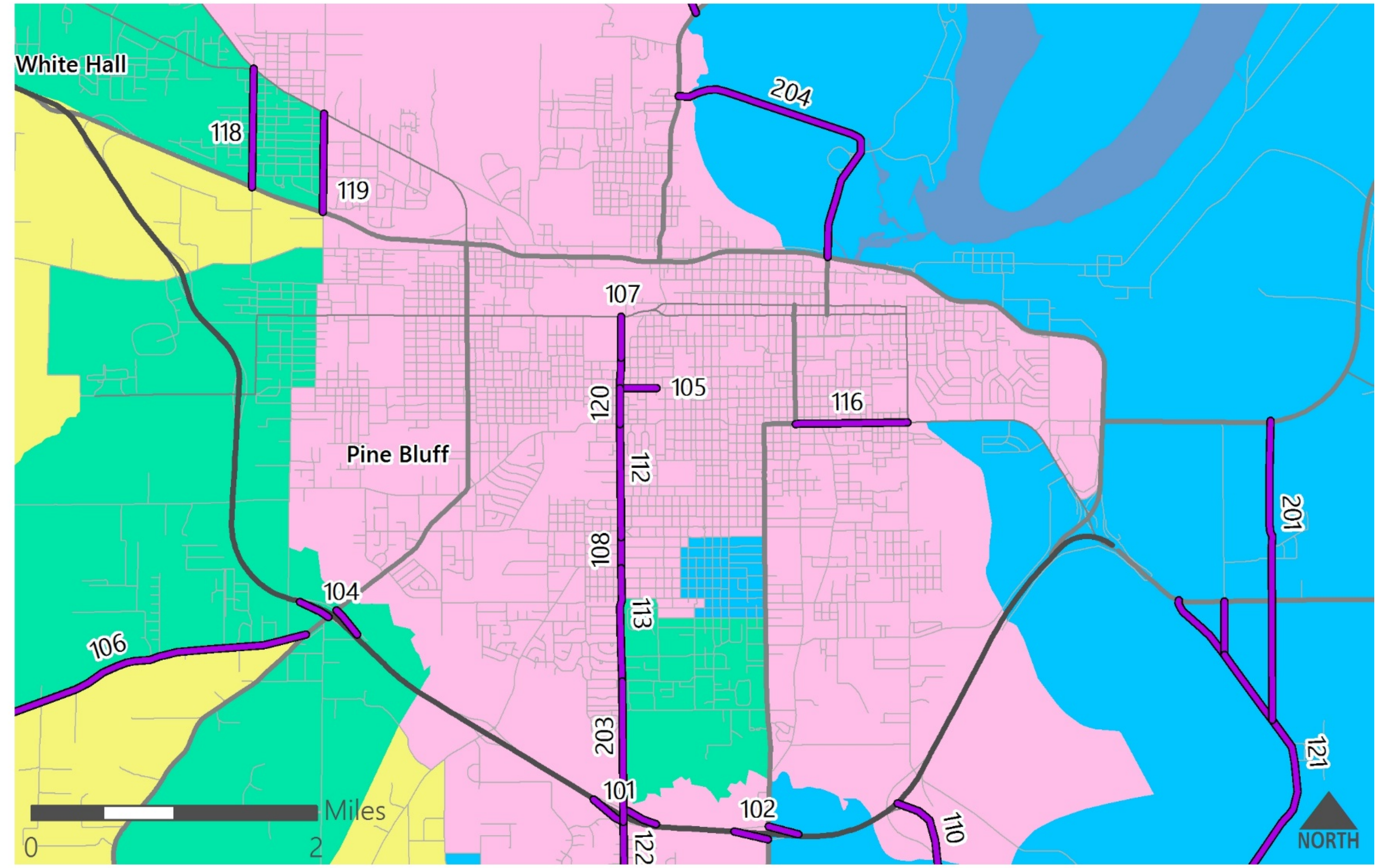


Legend

Percent Minority (Block Group Level)

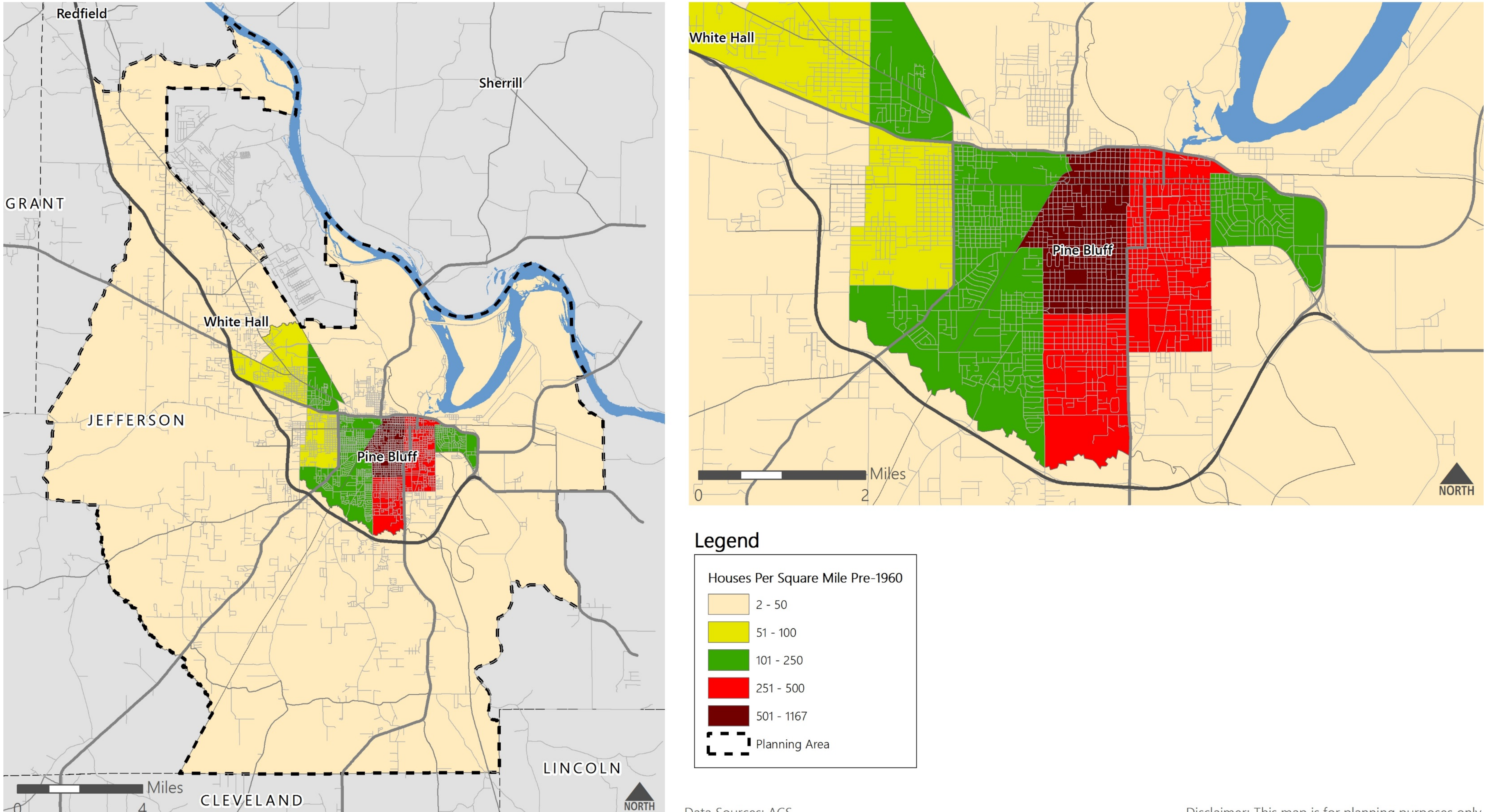
- Test Project
- 6 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- Planning Area

Data Sources: ACS; NSI

Disclaimer: This map is for planning purposes only.

Figure 7.8: Concentration of Housing Built Pre-1960

Metropolitan Planning Area *Urban Core*

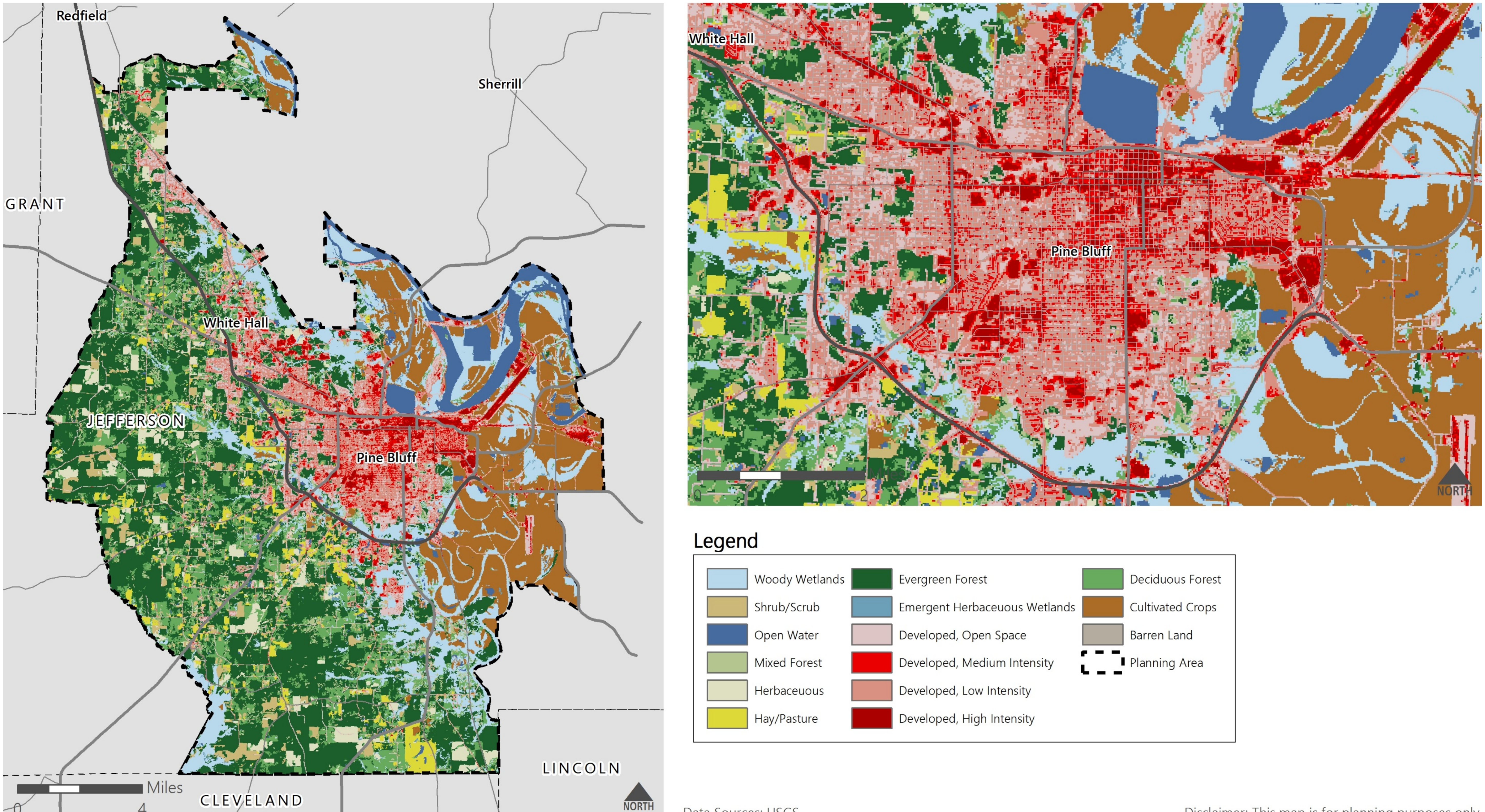


Data Sources: ACS

Disclaimer: This map is for planning purposes only.

Figure 7.9: Land Cover Classification

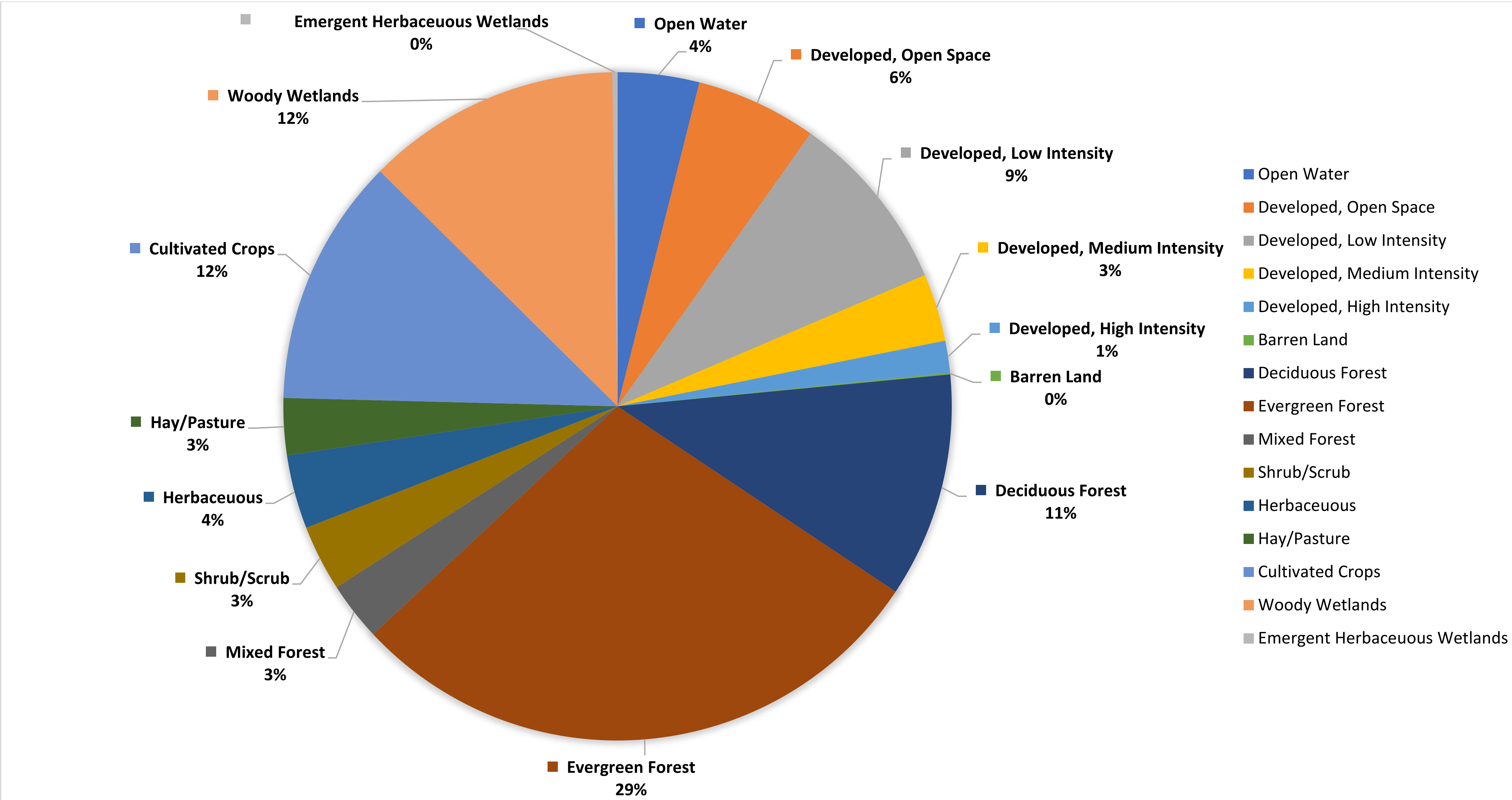
Metropolitan Planning Area | *Urban Core*



Data Sources: USGS

Disclaimer: This map is for planning purposes only.

Figure 7.10: Land Cover Classification Breakdown



8 Project Prioritization

Roadway capacity projects were prioritized based on the goals and objectives stated earlier in this MTP. Non-capacity roadway projects, such as safety and maintenance projects, were not prioritized. Instead, the MPO will continue to identify and prioritize these projects on a regular basis with local governments.

8.1 Roadway Capacity Project Prioritization

To maximize the amount of limited funding available within the MPA, roadway capacity projects were prioritized. Table 8.1 shows the criteria and weights that were utilized to prioritize the identified roadway capacity projects. This methodology is intended to support the previously stated goals and objectives.

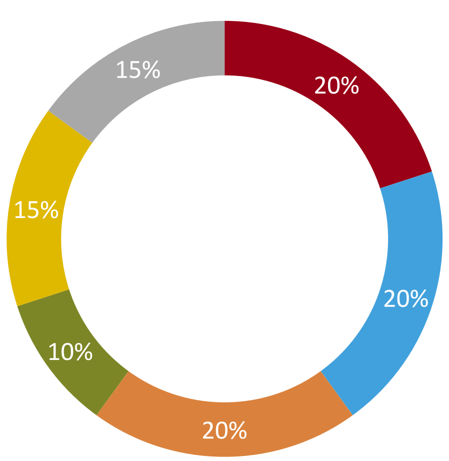
The results of this prioritization exercise are shown in Table 8.2 and illustrated in Figure 8.1.

8.2 Bicycle and Pedestrian Project Prioritization

The MPO will collaborate with local governments to select and prioritize bicycle and pedestrian projects. Table 6.1 provides ideas for bicycle and pedestrian projects based on the needs assessment and public input.

Table 8.1: Project Prioritization Methodology for Roadway Capacity Projects

Criterion	Rationale	Measure	Scoring Scale (Points Possible)				
			0	5	10	15	20
Congestion Reduction	Prioritize projects that reduce congestion.	Reduction in Vehicle Hours of Delay from baseline conditions (Existing + Committed Network)	Points awarded in increments of 5 based upon logical breaks in the delay reduction data				
Benefit Cost Ratio	Prioritize projects with congestion reduction benefits exceeding construction costs and maximize limited federal funds.	Benefit/Cost Ratio: annual dollars saved from delay reduction divided by project cost.	Points awarded in increments of 5 based upon logical breaks in the benefit/cost ratio data				
Safety Benefits	Prioritize projects that will improve safety conditions.	Qualitative assessment based on crash data, bridge conditions, and engineering analysis.	Minimal safety benefits	Some safety benefits	Moderate safety benefits	Significant safety benefits	Very significant safety benefits
Bicycle and Pedestrian Benefits	Prioritize projects that will allow for incidental bike/ped improvements.	Existing Roadway: identified bike/ped need in MPO Bike/Ped Plan or in local bike/ped plans. New Roadway: proximity to urbanized area (only roadways that do not restrict bike/ped activity)	Minimal demand (or along Interstate or Expressway)	Some demand	Moderate demand	Significant demand	Very significant demand
Freight Benefits	Prioritize projects that benefit the movement of goods.	Reduction in Truck Hours of Delay from baseline conditions (Existing + Committed Network). Designation as part of the statewide freight network.	Points awarded in increments of 5 based upon logical breaks in the truck delay reduction data. Projects that are part of the Tier 1 State Freight Network (SFN) automatically receive maximum points. Projects on the Tier 2 SFN automatically receive 15 points. Projects on the Tier 3 SFN automatically receive 10 points. Projects on the Tier 4 SFN automatically receive 5 points.				
Supports Existing Plans	Prioritize projects that have been vetted in locally-adopted plans or existing studies and plans.	In locally-adopted plan, previous MTP, or existing study/plan.	Not in previous plan or study	In previous MTP OR existing study/plan (not in comprehensive plan)	In previous MTP AND existing study/plan (not in comprehensive plan) OR in local comprehensive plan		



Project Scoring Breakdown

- Congestion Reduction
- Benefit Cost Ratio
- Safety Benefits
- Bicycle and Pedestrian Benefits
- Freight Benefits
- Supports Existing Plans

Table 8.2: Project Prioritization Results for Roadway Capacity Projects

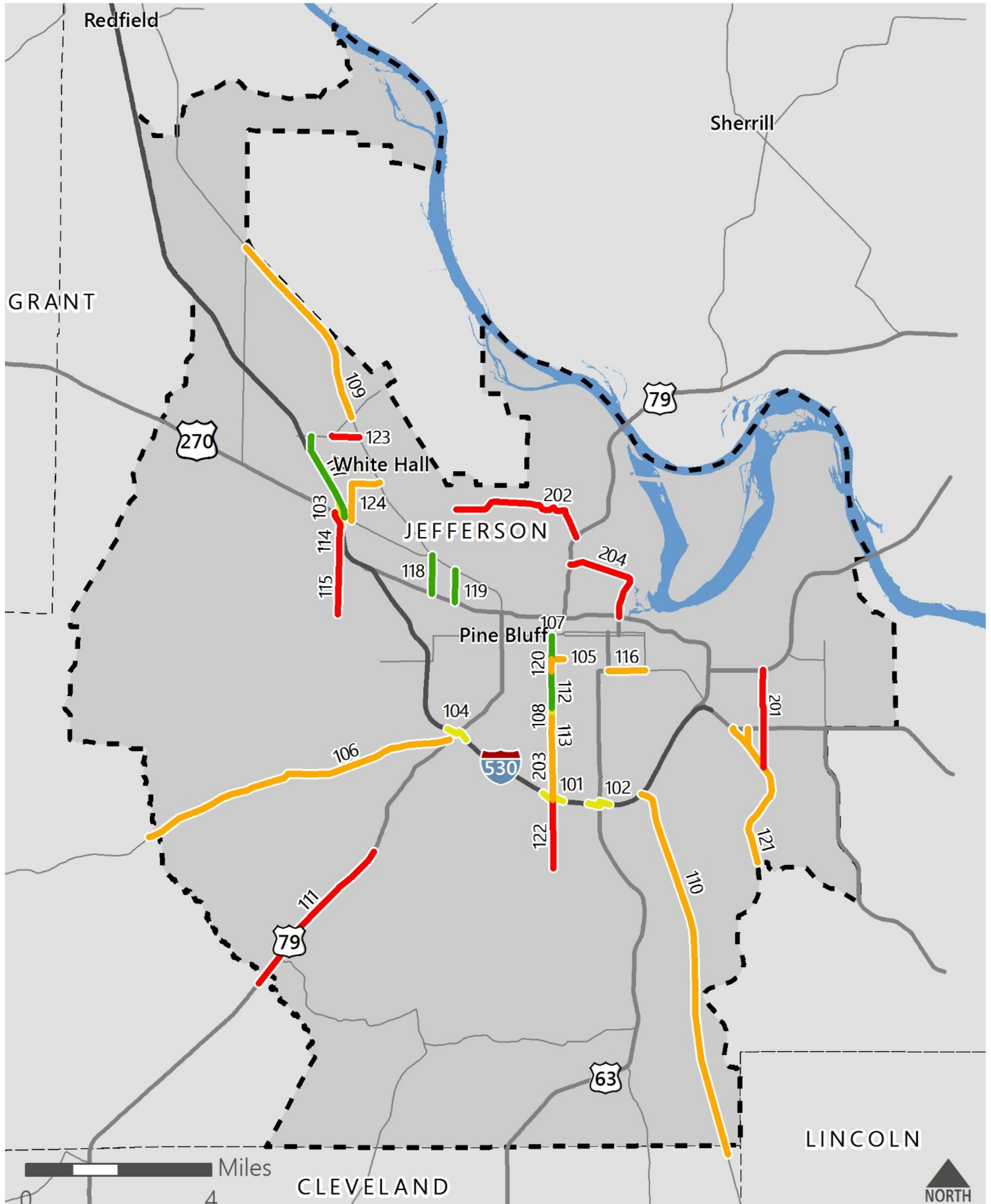
Project ID	Location	Limits	Length (miles)	Improvement	Project Scoring (Points Awarded)						Total Score
					Congestion Reduction	Benefit Cost Ratio	Safety Benefits	Bike/Ped Benefits	Freight Benefits	Supports Existing Plans	
107	Hazel St Extension	W 13th Ave to Hwy 190 (W 6th Ave)	0.50	Center Turn Lane; New 3 Lane Roadway	0	20	5	15	0	5	45
117	Caney Rd	Hwy 365 to Hwy 256	1.94	New 2 Lane Roadway	0	0	15	5	20	5	45
124	Robin St/White Hall Rd	Hwy 365 B (Sherridan Rd) to Hwy 365 (Dollarway Rd)	1.41	Center Turn Lane	10	0	15	15	0	5	45
112	Hazel St	28th Ave to 17th Ave	0.79	Widen to 5 Lanes	10	10	0	15	0	5	40
118	Bryant St	US 65B (Martha Mitch Expwy) to Hwy 365 (Dollarway Rd)	0.83	Center Turn Lane	0	0	20	15	0	5	40
119	Hutchinson St	US 65B (Martha Mitch Expwy) to Hwy 365 (Dollarway Rd)	0.69	Center Turn Lane	0	5	20	10	0	5	40
203	Hazel St	I-530 to W 42nd Ave	0.99	Widen to 5 Lanes and New Bridge	10	0	20	10	0	0	40
101	I-530	Hazel St Exit Ramps	--	Widen to 2 Lanes	0	0	10	0	20	5	35
102	I-530	US 63 (S Olive St) Exit Ramps	--	Widen to 2 Lanes	0	0	10	0	20	5	35
103	I-530	US 270	--	Widen to 2 Lanes	0	0	10	0	20	5	35
104	I-530	US 79 (S Camden Rd)	--	Widen to 2 Lanes	0	0	10	0	20	5	35
108	Hazel St	31st Ave to 28th Ave	0.22	Widen to 5 Lanes	0	15	0	15	0	5	35
121	Grider Field - Ladd Rd	Hwy 980 to US 65	3.23	Center Turn Lane; New 3 Lane Roadway	10	0	20	0	0	5	35
105	W 13th Ave	Hazel St to Hickory St	0.25	Widen to 4 Lanes	0	10	0	15	0	5	30
109	Hwy 365 (Dollarway Rd)	Hwy 104 to Hwy 256	4.43	Center Turn Lane	0	0	10	5	10	5	30
110	Hwy 530	Study Area Boundary to I-530	8.14	Widen to 4 Lanes	0	0	5	5	15	5	30
120	Hazel St	17th Ave to 13th Ave	0.25	Widen to 5 Lanes	0	10	0	15	0	5	30
106	Hwy 54 (Sulphur Springs Rd)	Study Area Boundary to US 79	6.95	Widen to 4 Lanes	10	0	5	0	5	5	25
113	Hazel St	42nd Ave to 31st Ave	0.79	Widen to 5 Lanes	0	5	0	15	0	5	25
116	Harding Ave	Main St to Ohio St	0.79	Widen to 5 Lanes	0	5	0	15	0	5	25
111	US 79 (S Camden Rd)	Study Area Boundary to Suburbia Dr	3.79	Widen to 4 Lanes	0	0	0	0	10	5	15

123	W Holland Ave	W Hoadley Rd to Hwy 356	0.60	Widen to 4 Lanes	0	5	0	5	0	5	15
114	Claude Rd	White Hall City Limits to US 270	0.96	Center Turn Lane	0	0	0	5	0	5	10
115	Claude Rd	Princeton Pike to White Hall City Limits	1.27	Center Turn Lane	0	0	0	5	0	5	10
122	Hazel St	W 73rd Ave to I-530	1.47	Center Turn Lane	0	0	0	5	0	5	10
201	North-South Connector	Grider Field Ladd Rd to US 63	2.11	New 2 Lane Roadway	0	0	10	0	0	0	10
202	Jefferson Hwy/McFadden Rd	N Hutchinson St to US 79	3.15	Widen to 4 Lanes	0	0	0	0	5	0	5
204*	University/Lake Saracen Bypass	US 65 B (Martha Mitchell Expwy) to US 79 B (University Dr)	2.21	New 2 Lane Roadway	0	0	0	0	0	0	0

*: Project 204 was added after project scoring and was not evaluated as part of the process.

Figure 8.1: Project Prioritization Results for Roadway Capacity Projects

Metropolitan Planning Area



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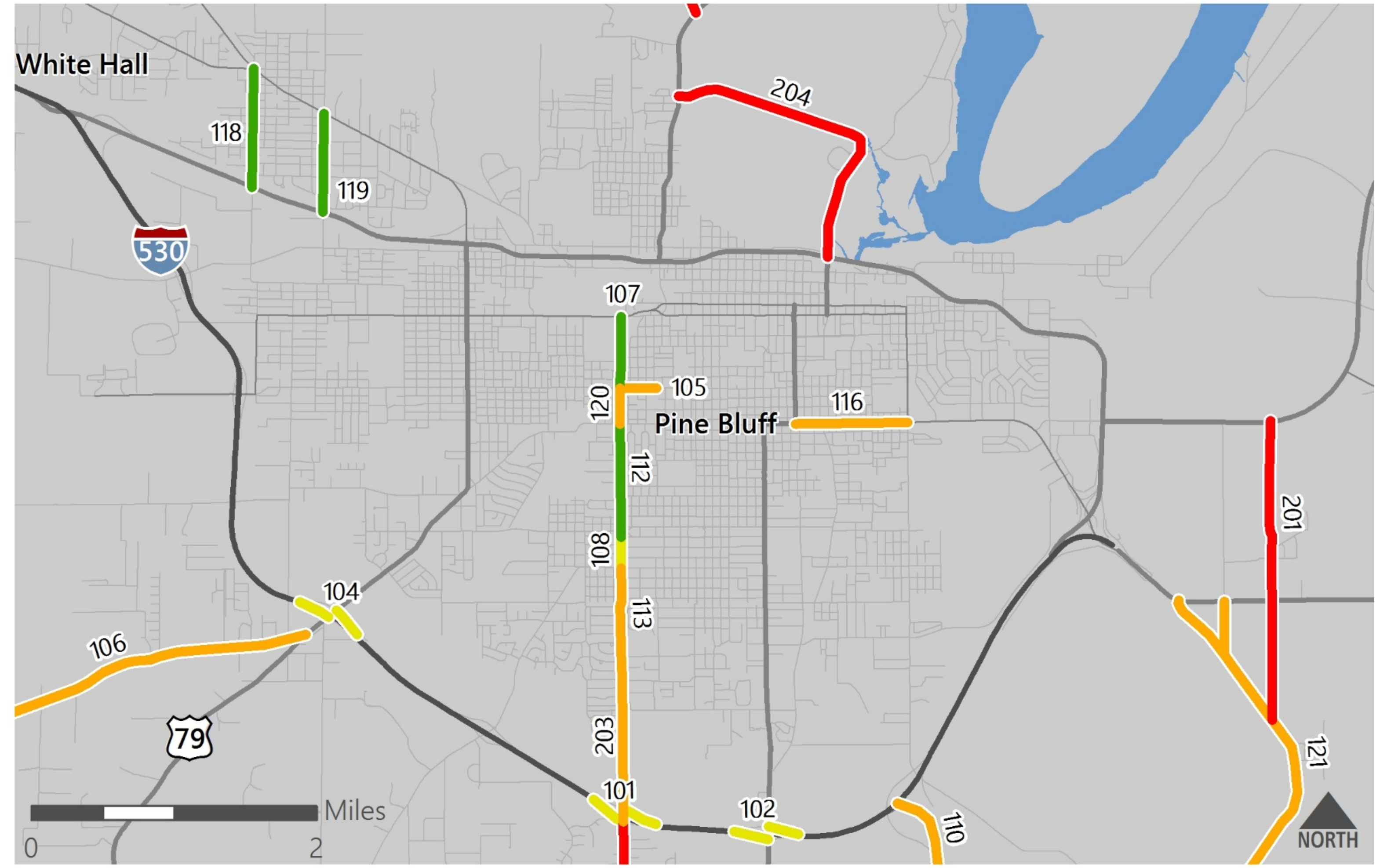


Legend

Candidate Projects

Total Score

- 36 - 45
- 31 - 35
- 16 - 30
- 0 - 15
- Planning Area

Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

9 Financial Plan

Federal legislation requires the MTP to be fiscally constrained. In order to demonstrate fiscal constraint, the costs of programmed projects must not exceed the amount of funding that is reasonably expected to be available.

This chapter reviews available funding sources and forecasts the amount of funding that can reasonably be anticipated to be available for transportation projects and programs in the MPA through 2045. Forecasts used in this chapter are for planning purposes only and do not commit any jurisdiction or agency to provide a specific level of funding.

9.1 Roadway Funding

9.1.1 Federal Funding Sources

Federal funding for transportation is authorized through the current transportation bill (FAST Act) and includes several major "formula" programs and discretionary programs. While "formula" programs may change somewhat in future transportation bills, they have been relatively stable over time.

National Highway Performance Program (NHPP)

Overview: The NHPP provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan.

Eligible Activities: Projects or programs supporting progress toward the achievement of national performance goals for improving infrastructure condition, safety, congestion reduction, system reliability, or freight movement on the NHS.

Federal Share: 90 percent for most projects on the Interstate System and 80 percent elsewhere.

Surface Transportation Block Grant Program (STBG)

Overview: The STBG provides flexible funding that may be used for just about any type of transportation-related project. FAST Act continues the regulation that 50 percent of a state's STBG apportionment is sub-allocated to areas based on their relative share of the total state population, with the other 50 percent available for use in any area of the state. These sub-allocations to the urban areas are called attributable funds.

Eligible Activities: Most transportation projects are eligible for STBG funding. See 23 U.S.C. 133(b)(15) for details.

Federal Share: 90 percent for most projects on the Interstate System and 80 percent elsewhere.

Highway Safety Improvement Program (HSIP)

Overview: The HSIP seeks to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance.

Eligible Activities: Safety projects that are consistent with the State's strategic highway safety plan (SHSP) and that correct or improve a hazardous road location or feature or address a highway safety problem.

Federal Share: 90 percent except as provided in 23 U.S.C. 120 and 130.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

Overview: The CMAQ program provides a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the NAAQS for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas).

Note: The Pine Bluff-White Hall-Jefferson County area currently does not qualify for CMAQ funds because it is in attainment of air quality standards. However, should that change in the future, the MPO would become eligible for CMAQ funding.

Eligible Activities: Projects or programs that are likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution.

Federal Share: 90 percent for most projects on the Interstate System and 80 percent elsewhere.

National Highway Freight Program (NHFP)

Overview: The NHFP seeks to improve the efficient movement of freight on the National Highway Freight Network (NHFN) and support national freight related goals.

Eligible Activities: Generally, NHFP funds must contribute to the efficient movement of freight on the NHFN and be identified in a freight investment plan included in the State's freight plan.

Federal Share: 90 percent for most projects on the Interstate System and 80 percent elsewhere.

9.1.2 State and Local Funding Sources

State Funding

State transportation revenues come from fuel taxes and fees and vehicles taxes and fees. The fuel excise tax is the state's largest funding source for roadway projects.

Property, Sales, and Income Taxes

Taxation contributes the most revenue to local governments in the United States. Property taxes, sales taxes, and income taxes are the most common and biggest sources of local government tax revenue. Taxes may be levied by states, counties, municipalities, or other authorities.

User Fees

User fees are fees collected from those who utilize a service or facility. The fees are collected to pay for the cost of a facility, finance the cost of operations, and/or generate revenue for other uses. User fees are commonly charged for public parks, water and sewer services, transit systems, and solid waste facilities. The theory behind the user fee is that those who directly benefit from these public services pay for the costs.

Special Assessments

Special assessment is a method of generating funds for public improvements, whereby the cost of a public improvement is collected from those who directly benefit from the improvement. In some instances, new streets are financed by special assessment. The owners of property located adjacent to the new streets are assessed a portion of the cost of the new streets, based on the amount of frontage they own along the new streets.

Special assessments have also been used to generate funds for general improvements within special districts, such as central business districts. These assessments may be paid over a period of time rather than as a lump sum payment.

Impact Fees

New developments create increased traffic volumes on the streets around them. Development impact fees are a way of attempting to place a portion of the burden of funding improvements on developers who are creating or adding to the need for improvements.

Bond Issues

Property tax and sales tax funds can be used on a pay-as-you-go basis, or the revenues from them can be used to pay off general obligation or revenue bonds. These bonds are issued by local governments upon approval of the voting public.

9.1.3 Forecasting Available Funds

In the 2040 MTP, the Arkansas Department of Transportation (ArDOT) forecasted the amount of federal and state funding that the MPO can reasonably expect to be available for roadway projects over the next 25 years. The previous MTP also forecasted the amount of available local funding. These forecasts, using a two (2) percent inflation, were used to develop forecast funding to 2045. MPO dedicated funding is assumed to be split into 25 percent for capacity projects and 75 percent for overlays, bridges, operations and maintenance, additional capacity spending if necessary, and more.

Table 9.1 displays the anticipated annual funding in the MPA by year. Using the assumptions above, the amount of federal funding reasonably expected to available for roadway projects in the MPO through 2045 is as follows:

- Capacity Projects
    - Stage 1 (2020-2025) - $26,803,140
    - Stage 2 (2026-2035) - $52,233,826
    - Stage 3 (2035-2045) - $63,672,742
- Non-Capacity and Flexible Spending
    - Stage 1 (2020-2025) - $80,409,420
    - Stage 2 (2026-2035) - $156,701,478
    - Stage 3 (2035-2045) - $191,018,227

Table 9.1: Total Forecast Annual Funding

Southeast Arkansas Regional Planning Commission - 2045 Metropolitan Transportation Plan Forecast Available Funding												
	National Highway Performance Program			Surface Transportation Block Grant			Highway Safety Improvement Program	National Highway Freight Program	Local			Total
Year	Pavement Preservation	Bridge	System Reliability	STBG Flex	STBG Off-System Bridge	Transportation Alternatives	HSIP	NHFP	City of Pine Bluff	City of White Hall	Jefferson County	Total
2020	$3,188,344	$2,929,824	$723,387	$7,458,944	$479,744	$165,485	$774,846	$828,772	$218,092	$28,230	$230,511	$17,026,179
2021	$3,252,110	$2,988,420	$737,855	$7,608,123	$489,339	$168,795	$790,343	$845,347	$221,556	$28,697	$234,470	$17,365,056
2022	$3,317,153	$3,048,189	$752,612	$7,760,286	$499,126	$172,171	$806,150	$862,254	$225,020	$29,163	$238,430	$17,710,552
2023	$3,383,496	$3,109,152	$767,664	$7,915,492	$509,109	$175,614	$822,273	$879,499	$228,657	$29,652	$242,588	$18,063,196
2024	$3,451,166	$3,171,335	$783,017	$8,073,801	$519,291	$179,127	$838,719	$897,089	$187,398	$25,220	$214,221	$18,340,384
2025	$3,520,189	$3,234,762	$798,678	$8,235,277	$529,677	$182,709	$855,493	$915,031	$191,146	$25,725	$218,506	$18,707,192
2026	$3,590,593	$3,299,457	$814,651	$8,399,983	$540,270	$186,363	$872,603	$933,332	$194,969	$26,239	$222,876	$19,081,336
2027	$3,662,405	$3,365,447	$830,944	$8,567,983	$551,075	$190,091	$890,055	$951,998	$198,868	$26,764	$227,333	$19,462,963
2028	$3,735,653	$3,432,755	$847,563	$8,739,342	$562,097	$193,892	$907,856	$971,038	$202,845	$27,299	$231,880	$19,852,222
2029	$3,810,366	$3,501,411	$864,514	$8,914,129	$573,339	$197,770	$926,013	$990,459	$206,902	$27,845	$236,518	$20,249,266
2030	$3,886,573	$3,571,439	$881,805	$9,092,412	$584,806	$201,726	$944,533	$1,010,268	$211,040	$28,402	$241,248	$20,654,252
2031	$3,964,304	$3,642,868	$899,441	$9,274,260	$596,502	$205,760	$963,424	$1,030,474	$215,261	$28,970	$246,073	$21,067,337
2032	$4,043,591	$3,715,725	$917,429	$9,459,745	$608,432	$209,875	$982,692	$1,051,083	$219,566	$29,550	$250,994	$21,488,683
2033	$4,124,462	$3,790,039	$935,778	$9,648,940	$620,600	$214,073	$1,002,346	$1,072,105	$223,958	$30,141	$256,014	$21,918,457
2034	$4,206,952	$3,865,840	$954,494	$9,841,919	$633,013	$218,354	$1,022,393	$1,093,547	$228,437	$30,743	$261,135	$22,356,826
2035	$4,291,091	$3,943,157	$973,583	$10,038,757	$645,673	$222,721	$1,042,841	$1,115,418	$233,006	$31,358	$266,357	$22,803,963
2036	$4,376,912	$4,022,020	$993,055	$10,239,532	$658,586	$227,176	$1,063,698	$1,137,726	$237,666	$31,985	$271,684	$23,260,042
2037	$4,464,451	$4,102,461	$1,012,916	$10,444,323	$671,758	$231,719	$1,084,972	$1,160,481	$242,419	$32,625	$277,118	$23,725,243
2038	$4,553,740	$4,184,510	$1,033,175	$10,653,209	$685,193	$236,354	$1,106,671	$1,183,690	$247,267	$33,278	$282,660	$24,199,748
2039	$4,644,815	$4,268,200	$1,053,838	$10,866,274	$698,897	$241,081	$1,128,805	$1,207,364	$252,213	$33,943	$288,314	$24,683,743
2040	$4,737,711	$4,353,564	$1,074,915	$11,083,599	$712,875	$245,902	$1,151,381	$1,231,512	$257,257	$34,622	$294,080	$25,177,417
2041	$4,832,465	$4,440,635	$1,096,413	$11,305,271	$727,132	$250,821	$1,174,408	$1,256,142	$262,402	$35,315	$299,962	$25,680,966
2042	$4,929,114	$4,529,448	$1,118,341	$11,531,376	$741,675	$255,837	$1,197,897	$1,281,265	$267,650	$36,021	$305,961	$26,194,585
2043	$5,027,697	$4,620,037	$1,140,708	$11,762,004	$756,509	$260,954	$1,221,854	$1,306,890	$273,003	$36,741	$312,080	$26,718,477
2044	$5,128,251	$4,712,438	$1,163,522	$11,997,244	$771,639	$266,173	$1,246,292	$1,333,028	$278,463	$37,476	$318,322	$27,252,846
2045	$5,230,816	$4,806,686	$1,186,793	$12,237,189	$787,071	$271,496	$1,271,217	$1,359,688	$284,033	$38,226	$324,688	$27,797,903
2020-2025	$20,112,457	$18,481,682	$4,563,212	$47,051,924	$3,026,286	$1,043,901	$4,887,824	$5,227,994	$1,271,867	$166,687	$1,378,725	$107,212,559
2026-2035	$39,315,988	$36,128,138	$8,920,202	$91,977,469	$5,915,807	$2,040,627	$9,554,756	$10,219,723	$2,134,853	$287,312	$2,440,428	$208,935,303
2036-2045	$47,925,970	$44,039,998	$10,873,676	$112,120,022	$7,211,335	$2,487,512	$11,647,195	$12,457,786	$2,602,373	$350,232	$2,974,869	$254,690,969
Total	$107,354,416	$98,649,818	$24,357,090	$251,149,415	$16,153,427	$5,572,040	$26,089,775	$27,905,503	$6,009,093	$804,232	$6,794,022	$570,838,832
Notes:	Forecast funding is projected to grow at a 2% annual inflation rate. A local half-cent sales tax is set to expire in 2023.											

9.2 Bicycle and Pedestrian Funding

This section addresses funding for independent, or stand-alone bicycle and pedestrian projects. Funding for bicycle and pedestrian improvements that are part of other projects (roadway, transit, etc.) are addressed in other sections.

9.2.1 Federal Funding Sources

Transportation Alternatives (TA) Set-Aside

Overview: This set-aside program within the STBG program mentioned in Section 9.1.1 includes all projects and activities previously eligible under the now-defunct Transportation Alternatives Program (TAP). This program is administered by the State.

Eligible Activities: Pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity.

Federal Share: 90 percent for most projects on the Interstate System and 80 percent elsewhere.

"Flex" Funding

Other federal roadway and public transit funding sources are also flexible enough to fund construction of bicycle and pedestrian facilities. Still, most funding from these sources do not go to bicycle and pedestrian projects.

9.2.2 State and Local Funding Sources

State and local funding sources for bicycle and pedestrian projects are the same as those listed in Section 9.1.2.

9.2.3 Forecasting Available Funds

Funding forecasts for independent bicycle and pedestrian projects are based on the TA set-aside. MPA TA funding was forecast based on the previous MTP's forecast Transportation Alternatives Program (TAP) funding. TAP funding was converted to the TA set-aside in the FAST Act; however, the MPO may receive additional money than the previous TAP funds as a result. Additional funds for bicycle and pedestrian projects can be obtained through the non-capacity and flexible funding identified earlier.

Using the assumptions above, the amount of federal TA funding reasonably expected to be available for bicycle and pedestrian projects in the MPO through 2045 is as follows:

- Stage 1 (2020-2025) - $1,043,901
- Stage 2 (2026-2035) - $2,040,627
- Stage 3 (2035-2045) - $2,487,512

9.3 Public Transit Funding

9.3.1 Federal Funding Sources

There are many federal funding sources for public transit. Most of these sources are programs funded by the Federal Transit Administration (FTA) and administered by the State.

Urbanized Area Formula Grants (Section 5307)

Overview: This formula-based funding program provides funds for capital and operating assistance for transit service in urbanized areas with populations greater than 50,000 and for transportation-related planning.

Eligible Activities: Funds can be used for planning, engineering, design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; computer hardware/software; and operating assistance in urbanized areas under 200,000 in population or with 100 or fewer fixed-route buses operating in peak hours. Activities eligible under the former Job Access and Reverse Commute (JARC) program, which provided services to low-income individuals to access jobs, are now eligible under the Urbanized Area Formula program.

Federal Share: 80 percent for capital projects, 50 percent for operating assistance, and 80 percent for ADA non-fixed route paratransit service.

Other FTA Grant Programs

The FTA has several other funding sources that each address specific issues. Most of these are more limited in funding and are competitive programs, meaning that applicants must compete for funding based on the merits of their project.

More details can be found at https://www.transit.dot.gov/grants

Flexible, Non-FTA Funds

Surface Transportation Block Grant Program (STBG): Provides funding that may be used by states and localities for a wide range of projects to preserve and improve the conditions and performance of surface transportation, including highway, transit, intercity bus, bicycle and pedestrian projects.

National Highway Performance Program (NHPP): Funds may only be used for the construction of a public transportation project that supports progress toward the achievement of national performance goals for improving infrastructure condition, safety, mobility, or freight movement on the NHS and which is eligible for assistance under chapter 53 of title 49, if: the project is in the same corridor as, and in proximity to, a fully access-controlled NHS route; the construction is more cost-effective (as determined by a benefit-cost analysis) than a NHS improvement; and the project will reduce delays or produce travel time savings on the NHS, as well as improve regional traffic flow. Local match requirement varies.

Congestion Mitigation and Air Quality Program (CMAQ): Provides funding to areas in nonattainment or maintenance for ozone, carbon monoxide, and/or particulate matter. States that have no nonattainment or maintenance areas still receive a minimum apportionment of CMAQ funding for either air quality projects or other elements of flexible spending. Funds may be used for any transit capital expenditures otherwise eligible for FTA funding as long as they have an air quality benefit.

9.3.2 State and Local Funding Sources

State and local funding sources include the same potential sources as those outlined in Section 9.1.2. In 2019 state funds composed about nine (9) percent of funding sources and the City of Pine Bluff provided about twenty (20) percent. Fare revenue and advertising revenue are also important local funding sources but are relatively small; 2019 fare revenues contributed four (4) percent of funding sources.

9.3.3 Forecasting Available Funds

Forecasts were developed for the Section 5307 federal transit program that is utilized in the region. Additional funds are also available in 2020 through the CARES Act; however, these funds are one-time use and are non-recurring. The funds for the Pine Bluff UZA are apportioned by the FTA and are added to the Stage 1 available funds.

The following assumptions are utilized:

- The region will receive 100 percent of annual Section 5307 funding allocated to the Pine Bluff, AR Urbanized Area.
- Federal funding for these programs is inflated two (2) percent annually. This is consistent with long-term annual increases in FTA program funding.
- Additional CARES Act funds, valued at $2,190,687, are one-time use and will only occur during Stage 1.

The following levels of federal funding for public transit in the MPO can be expected through 2045:

- Stage 1 (2020-2025) - $7,073,122 for operating and capital projects (includes CARES Act funds)
- Stage 2 (2026-2035) - $9,544,223 for operating and capital projects
- Stage 3 (2036-2045)- $11,634,354 for operating and capital projects

10 Implementation Plan

Based on the amount of funding anticipated in the financial plan, this section presents the recommended Implementation Plan. This plan advances the strategies previously outlined and incorporates the results of the project prioritization process.

10.1 Fiscally Constrained Plan

The fiscally constrained plan is the list of transportation projects that best address the needs of the region with the limited funding available. All other projects are "unfunded" and are listed later as visionary projects.

10.1.1 Roadways

Over the next 25 years, the MPO plans to implement a variety of roadway capacity projects (adding lanes or new roadways) and roadway non-capacity projects.

The MPO receives funding from many federal sources and provides local funding in addition to federal funding. Based on the forecast funding, approximately $571 million in funds will be available to the MPO for roadway projects from 2020 to 2045.

Table 10.2 list all roadway capacity projects, existing bike/ped projects, and non-capacity line items in the fiscally constrained plan. The roadways capacity projects are mapped in Figure 10.3.

Table 10.1 displays the effect of the fiscally constrained capacity projects when compared to only implementing projects that are currently funded.

Figure 10.1: Fiscally Constrained Roadway Projects

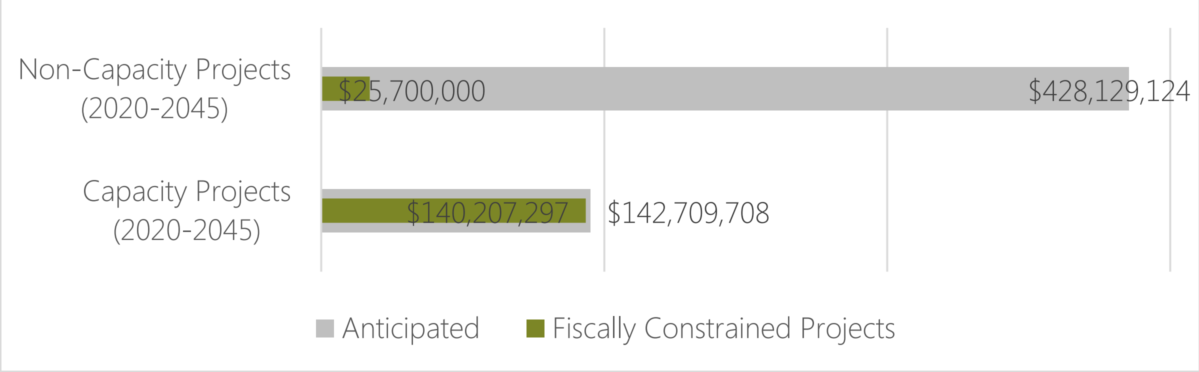


Table 10.1: Travel Impacts of Fiscally Constrained Roadway Capacity Projects

	2045 Existing and Committed	2045 Fiscally Constrained Roadway Capacity Projects	Difference	Percent Difference
Vehicle Miles Traveled	1,684,575	1,685,347	772	0.0%
Vehicle Hours Traveled	43,454	43,394	-60	-0.1%
Vehicle Hours of Delay	2,091	2,067	-24	-1.1%

Source: SEARPC Regional Travel Demand Model; NSI

10.1.2 Bicycle and Pedestrian

In addition to bicycle and pedestrian improvements included with planned roadway projects, the region will continue to fund stand-alone bicycle and pedestrian projects.

The major federal source for bicycle and pedestrian projects is the Transportation Alternatives (TA) Set-Aside program, administered by ArDOT. Based on historical funding levels, this plan assumes that approximately $5.6 million in federal TA funds will be available to the MPO from 2020 to 2045. The MPO currently has no TA-funded projects and local governments should continue to apply for these projects.

While the MTP does not identify specific bicycle and pedestrian projects beyond those listed in the Transportation Improvement Program, it encourages discussion among local governments and the MPO to plan and implement projects using TA Set-Asides funding.

10.1.3 Public Transit

Over the next 25 years, the region will continue to provide fixed route service in Pine Bluff and plans to study expanding service in the region.

If recent funding levels continue, the region will have enough federal funding to continue operating its fixed-route service at current levels. The main limitation to expanding service will be local funding to match and exceed federal funding; however, the 2020 CARES Act funding can help fill in funding gaps.

Figure 10.2: Fiscally Constrained Transit Projects (Federal Funding Only)

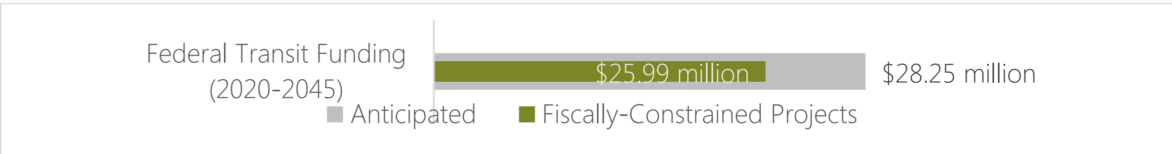


Table 10.2: Fiscally Constrained Roadway Projects

MTP ID	Stage	Roadway	Limits	Length (Miles)	Type	Description	Year of Expenditure (YOE)	Total Cost (2020$)	Total Cost (YOE)	Design Considerations
1	Stage 1	US 270 & Hwy 365S (Sherridan Rd)	Hwy 104 to Hwy 365	4.59	●	Widen to 5 Lanes	TIP	$15,000,000	$15,000,000	
2	Stage 1	US 79 (S Camden Rd)	Couch Ln to Suburbia Dr	2.38	●	Widen to 4 Lanes	TIP	$5,500,000	$5,500,000	
3	Stage 1	Hwy 190 (S Franklin St/W 6th Ave)	I-530 to Hwy 79B (S Blake St)	2.09	●	Center Turn Lane	TIP	$3,500,000	$3,500,000	
4	Stage 1	Hwy 190 (Ohio St)	11th Ave to Harding Ave	0.39	●	Center Turn Lane	TIP	$1,700,000	$1,700,000	
5	Stage 1	Pine St; Barraque Ave; Main St	Martha Mitchel to Barraque; Walnut St to Main St; Barraque Ave to 4th Ave	0.49	●	Road Diet	TIP	COMPLETE	COMPLETE	
BP-1	Stage 1 NC	Hwy 270 & Hwy 365S	Hwy 104 to Hwy 365S	4.59	●	Add Sidewalks	TIP	$15,000,000	$15,000,000	
BP-2	Stage 1 NC	US 79	Couch Ln to Suburbia	2.38	●	Add Sidewalks	TIP	$5,500,000	$5,500,000	
BP-3	Stage 1 NC	US 190	I-530 to Hwy 79B	2.09	●	Add Sidewalks	TIP	$3,500,000	$3,500,000	
BP-4	Stage 1 NC	US 190	11th Ave to Harding Ave	0.39	●	Add Sidewalks	TIP	$1,700,000	$1,700,000	
BP-5	Stage 1 NC	Pine St; Barraque Ave; Main St	Martha Mitchel to Barraque; Walnut St to Main St; Barraque Ave to 4th Ave	0.49	●	Streetscape	TIP	COMPLETE	COMPLETE	
LI-1	Stage 1 NC	Line Item	Non-Capacity Projects and Flexible Funding	--	●	Various	Stage 1 Total	$54,709,420	$54,709,420	
107	Stage 2	Hazel St Extension	W 13th Ave to Hwy 190 (W 6th Ave)	0.50	● ●	Center Turn Lane; New 3 Lane Roadway	2026	$2,883,200	$3,246,951	EJ
117	Stage 2	Caney Rd	Hwy 365 to Hwy 256	1.94	●	New 2 Lane Roadway	2027	$5,946,100	$6,830,200	
124	Stage 2	Robin St/White Hall Rd	Hwy 365 B (Sherridan Rd) to Hwy 365 (Dollarway Rd)	1.41	●	Center Turn Lane	2029	$8,178,000	$9,773,467	EJ
203	Stage 2	Hazel St	I-530 to W 42nd Ave	0.99	●	Widen to 5 Lanes and New Bridge	Stage 2 Middle	$10,252,500	$12,622,718	EJ | EC
121	Stage 2	Grider Field - Ladd Rd	Hwy 980 to US 65	3.23	● ●	Center Turn Lane; New 3 Lane Roadway	Stage 2 Middle	$18,734,000	$23,065,008	EJ | EC
LI-2	Stage 2 NC	Line Item	Non-Capacity Projects and Flexible Funding	--	●	Various	Stage 2 Total	$156,701,478	$156,701,478	
101	Stage 3	I-530	Hazel St Exit Ramps	--	●	Widen to 2 Lanes	Stage 3 Middle	$6,375,000	$9,567,644	EJ | EC
108	Stage 3	Hazel St	31st Ave to 28th Ave	0.22	●	Widen to 5 Lanes	Stage 3 Middle	$1,485,000	$2,228,698	EJ

109	Stage 3	Hwy 365 (Dollarway Rd)	Hwy 104 to Hwy 256	4.43	●	Center Turn Lane	Stage 3 Middle	$25,694,000	$38,561,732	**EC**
120	Stage 3	Hazel St	17th Ave to 13th Ave	0.25	●	Widen to 5 Lanes	Stage 3 Middle	$1,687,500	$2,532,612	**EJ** | **EC**
123	Stage 3	W Holland Ave	W Hoadley Rd to Hwy 356	0.60	●	Widen to 4 Lanes	Stage 3 Middle	$4,050,000	$6,078,268	
LI-3	Stage 3 NC	Line Item	Non-Capacity Projects and Flexible Funding	--	●	Various	Stage 3 Total	$191,018,227	$191,018,227	

Note 1: YOE (Year of Expenditure) costs assume a 2% annual inflation rate.

Note 2: Bicycle and pedestrian improvements must be part of the overall design phase of all projects and included unless restrictions apply consistent with FHWA guidance.

Note 3: Stage 1 refers to the region's short-term plan, 2020-2025.
Stage 2 refers to the region's mid-term plan, 2025-2035.
Stage 3 refers to the region's long-term plan, 2036-2045

Note 4: NC after a stage refers to non-capacity and flexible funding projects

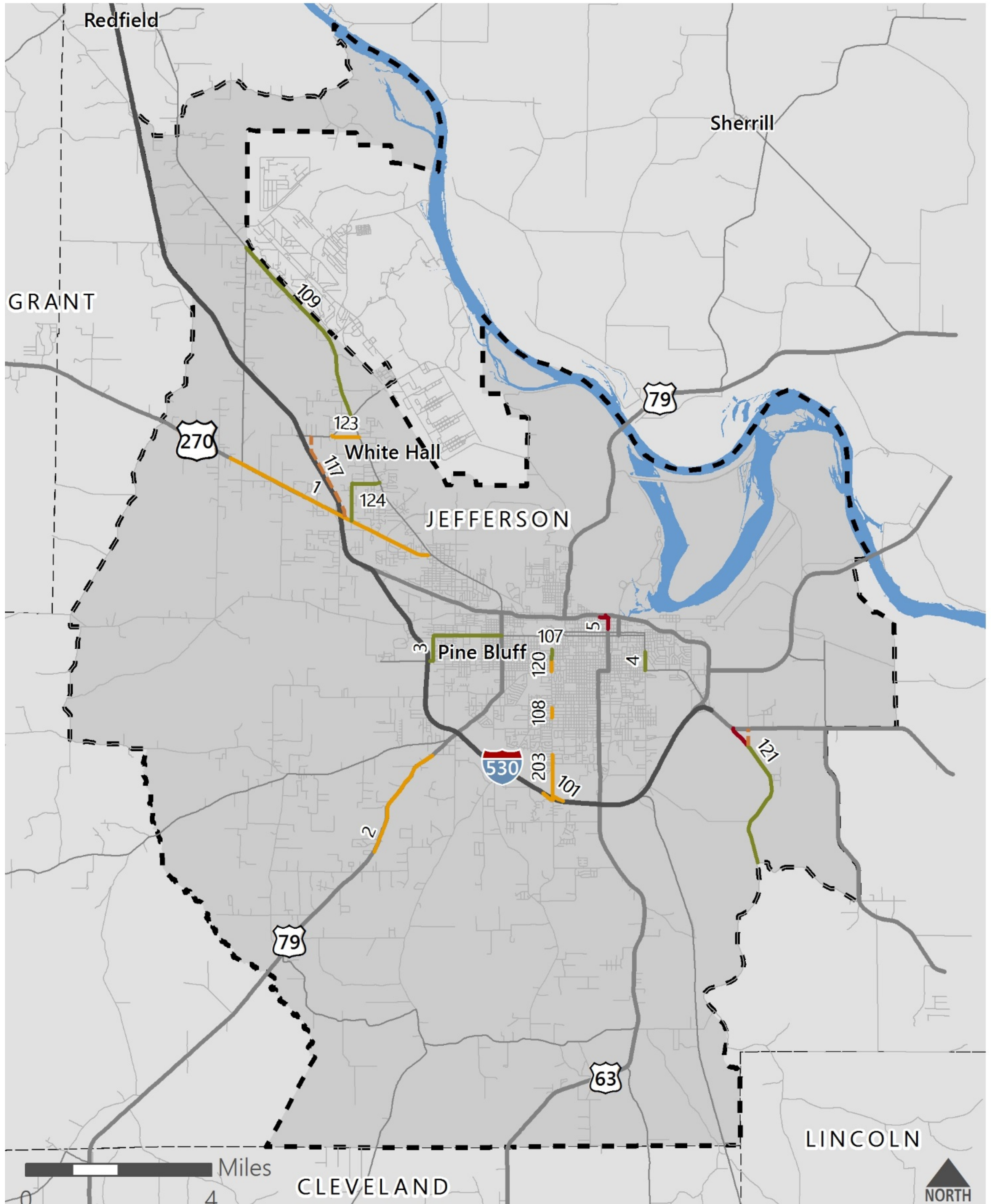
Note 5: Stage 2 Middle and Stage 3 Middle refer to YOE costs at the middle of Stages 2 and 3, consistent with regulations and ArDOT procedure after the first 10 years of the MTP.

Improvement Type: ● New Roadway ● Widening ● Turning Lane ● Other/Multiple

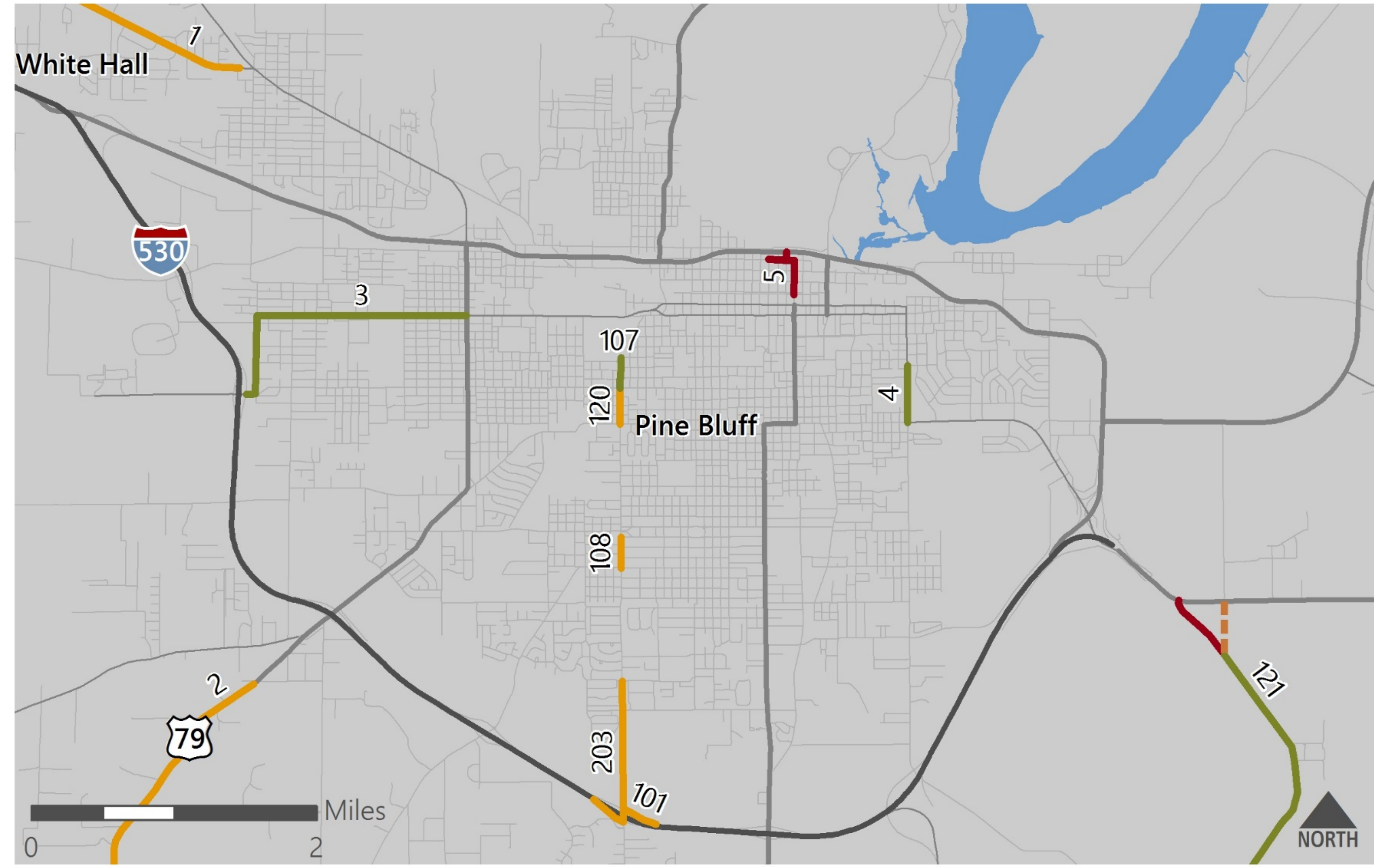
Design Considerations: EJ – Potential Concern for Environmental Justice Impacts
EC – Potential Concern for Environmental and Community Impacts

Figure 10.3: Fiscally Constrained Roadway Capacity Projects

Metropolitan Planning Area



Urban Core



Legend

Project Type

- New Roadway
- Widening
- Turning Lane
- Other/Multiple
- Planning Area

Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

Table 10.3: Fiscally Constrained List of Transit Projects

MTP ID	TIP ID	Description	Type	Fiscal Year	Total Cost (YOE)[1]	Federal Cost (YOE)[1]
PT-1	PBT001	SECTION 5307 PBT TRANSIT OPERATING ASSISTANCE	● Operating	2020	$766,000	$383,000
PT-2	PBT002	SECTION 5307 PBT CAPITAL- PREVENTIVE MAINTENANCE	● Capital	2020	$258,000	$206,000
PT-3	PBT003	SECTION 5307 PBT CAPITAL- PARATRANSIT SERVICE	● Capital	2020	$153,000	$122,000
PT-4	PBT004	SECTION 5307 PBT CAPITAL- ROLLING STOCK/SUPPORT EQUIPMENT	● Capital	2020	$51,000	$41,000
PT-5	PBT005	SECTION 5307 CAPITAL- PLANNING	● Capital	2020	$25,000	$20,000
PT-6	PBT001	SECTION 5307 PBT TRANSIT OPERATING ASSISTANCE	● Operating	2021	$780,000	$390,000
PT-7	PBT002	SECTION 5307 PBT CAPITAL- PREVENTIVE MAINTENANCE	● Capital	2021	$263,000	$210,000
PT-8	PBT003	SECTION 5307 PBT CAPITAL- PARATRANSIT SERVICE	● Capital	2021	$156,000	$125,000
PT-9	PBT004	SECTION 5307 PBT CAPITAL- ROLLING STOCK/SUPPORT EQUIPMENT	● Capital	2021	$53,000	$42,000
PT-10	PBT005	SECTION 5307 CAPITAL- PLANNING	● Capital	2021	$26,000	$21,000
PT-11	PBT001	SECTION 5307 PBT TRANSIT OPERATING ASSISTANCE	● Operating	2022	$796,000	$398,000
PT-12	PBT002	SECTION 5307 PBT CAPITAL- PREVENTIVE MAINTENANCE	● Capital	2022	$268,000	$214,000
PT-13	PBT003	SECTION 5307 PBT CAPITAL- PARATRANSIT SERVICE	● Capital	2022	$159,000	$127,000
PT-14	PBT004	SECTION 5307 PBT CAPITAL- ROLLING STOCK/SUPPORT EQUIPMENT	● Capital	2022	$53,000	$42,000
PT-15	PBT005	SECTION 5307 CAPITAL- PLANNING	● Capital	2022	$26,000	$21,000
PT-16	n/a	SECTION 5307 PBT TRANSIT OPERATING ASSISTANCE	● Operating	2023-2045	$23,448,000	$11,724,000
PT-17	n/a	SECTION 5307 PBT CAPITAL- PREVENTIVE MAINTENANCE	● Capital	2023-2045	$7,898,000	$6,306,000
PT-18	n/a	SECTION 5307 PBT CAPITAL- PARATRANSIT SERVICE	● Capital	2023-2045	$4,683,000	$3,734,000
PT-19	n/a	SECTION 5307 PBT CAPITAL- ROLLING STOCK/SUPPORT EQUIPMENT	● Capital	2023-2045	$1,561,000	$1,255,000
PT-20	n/a	SECTION 5307 CAPITAL- PLANNING	● Capital	2023-2045	$765,000	$612,000
PT-21	n/a	TRANSIT EXPANSION FEASIBILITY STUDY	● Study	2021	$125,000	$0[2]

[1] YOE (Year of Expenditure) costs assume a 2% annual inflation rate for transit projects and rounds to the nearest thousands of dollars.

[2] The 2020 CARES Act funds may be used for this cost. $2,190,687 is apportioned for the Pine Bluff UZA.

Improvement Type: ● Operating ● Capital ● Study

10.2 Visionary (Unfunded) Projects

Visionary projects are identified projects that are unfunded or unprogrammed in the fiscally constrained list of projects.

10.2.1 Visionary Roadway Capacity Projects

> Unfunded projects could become funded with additional funding or if the fiscally constrained plan is changed.

Unfunded roadway capacity projects are not necessarily less important or effective; they just cannot be accommodated within the fiscally constrained budget. This may be due to project costs or overall feasibility.

Table 10.4 shows the list of visionary roadway capacity projects and Figure 10.4 maps these projects.

10.2.2 Visionary Roadway Non-Capacity Projects

These projects include those that can be programmed within the line-item budget for non-capacity projects but for which funds are unavailable. Local agencies should consider these projects as high priorities and should seek federal and state funding for these projects on a regular basis through coordination with the MPO and ArDOT when additional funds are available.

10.2.3 Visionary Bicycle and Pedestrian Corridors

The fiscally constrained plan has a line-item for non-capacity and flexible funding. This line item includes the Transportation Alternatives set-aside and can be used to fund local bicycle and pedestrian projects. Local agencies should consult stakeholders and the MPO to develop projects when ArDOT releases a call for TA project grant applications. Project ideas listed in Table 6.1 would be acceptable candidates for TA Set-Aside funding.

Table 10.4: Visionary Roadway Capacity Projects

MTP ID	Stage	Roadway	Limits	Length (Miles)	Type	Description	Total Cost (2020$)	Design Considerations
112	Vision	Hazel St	28th Ave to 17th Ave	0.79	● Widening	Widen to 5 Lanes	$5,332,500	EJ
118	Vision	Bryant St	US 65B (Martha Mitch Expwy) to Hwy 365 (Dollarway Rd)	0.83	● Turning Lane	Center Turn Lane	$4,814,000	EJ | EC
119	Vision	Hutchinson St	US 65B (Martha Mitch Expwy) to Hwy 365 (Dollarway Rd)	0.69	● Turning Lane	Center Turn Lane	$4,002,000	EJ
102	Vision	I-530	US 63 (S Olive St) Exit Ramps	--	● Widening	Widen to 2 Lanes	$6,375,000	EJ | EC
103	Vision	I-530	US 270 Exit Ramps	--	● Widening	Widen to 2 Lanes	$6,375,000	
104	Vision	I-530	US 79 (S Camden Rd) Exit Ramps	--	● Widening	Widen to 2 Lanes	$6,375,000	EJ
105	Vision	W 13th Ave	Hazel St to Hickory St	0.25	● Widening	Widen to 4 Lanes	$1,687,500	EJ
110	Vision	Hwy 530	Study Area Boundary to I-530	8.14	● Widening	Widen to 4 Lanes	$54,945,000	EJ | EC
106	Vision	Hwy 54 (Sulphur Springs Rd)	Study Area Boundary to US 79	6.95	● Widening	Widen to 4 Lanes	$46,912,500	EC
113	Vision	Hazel St	42nd Ave to 31st Ave	0.79	● Widening	Widen to 5 Lanes	$5,332,500	EJ
116	Vision	Harding Ave	Main St to Ohio St	0.79	● Widening	Widen to 5 Lanes	$5,332,500	EJ | EC
111	Vision	US 79 (S Camden Rd)	Study Area Boundary to Suburbia Dr	3.79	● Widening	Widen to 4 Lanes	$25,582,500	EC
114	Vision	Claude Rd	White Hall City Limits to US 270	0.96	● Turning Lane	Center Turn Lane	$5,568,000	EC
115	Vision	Claude Rd	Princeton Pike to White Hall City Limits	1.27	● Turning Lane	Center Turn Lane	$7,366,000	EC
122	Vision	Hazel St	W 73rd Ave to I-530	1.47	● Turning Lane	Center Turn Lane	$8,526,000	EJ
201	Vision	North-South Connector	Grider Field Ladd Rd to US 63	2.11	● New Roadway	New 2 Lane Roadway	$6,467,150	EJ | EC
202	Vision	Jefferson Hwy/McFadden Rd	N Hutchinson St to US 79	3.15	● Widening	Widen to 4 Lanes	$21,262,500	EJ | EC
204	Vision	University/Lake Saracen Bypass	US 65 B (Martha Mitchell Expwy) to US 79 B (University Dr)	2.21	● New Roadway	New 2 Lane Roadway	$13,913,650	EJ | EC

Note: Bicycle and pedestrian improvements must be part of the overall design phase of all projects and included unless restrictions apply consistent with FHWA guidance.

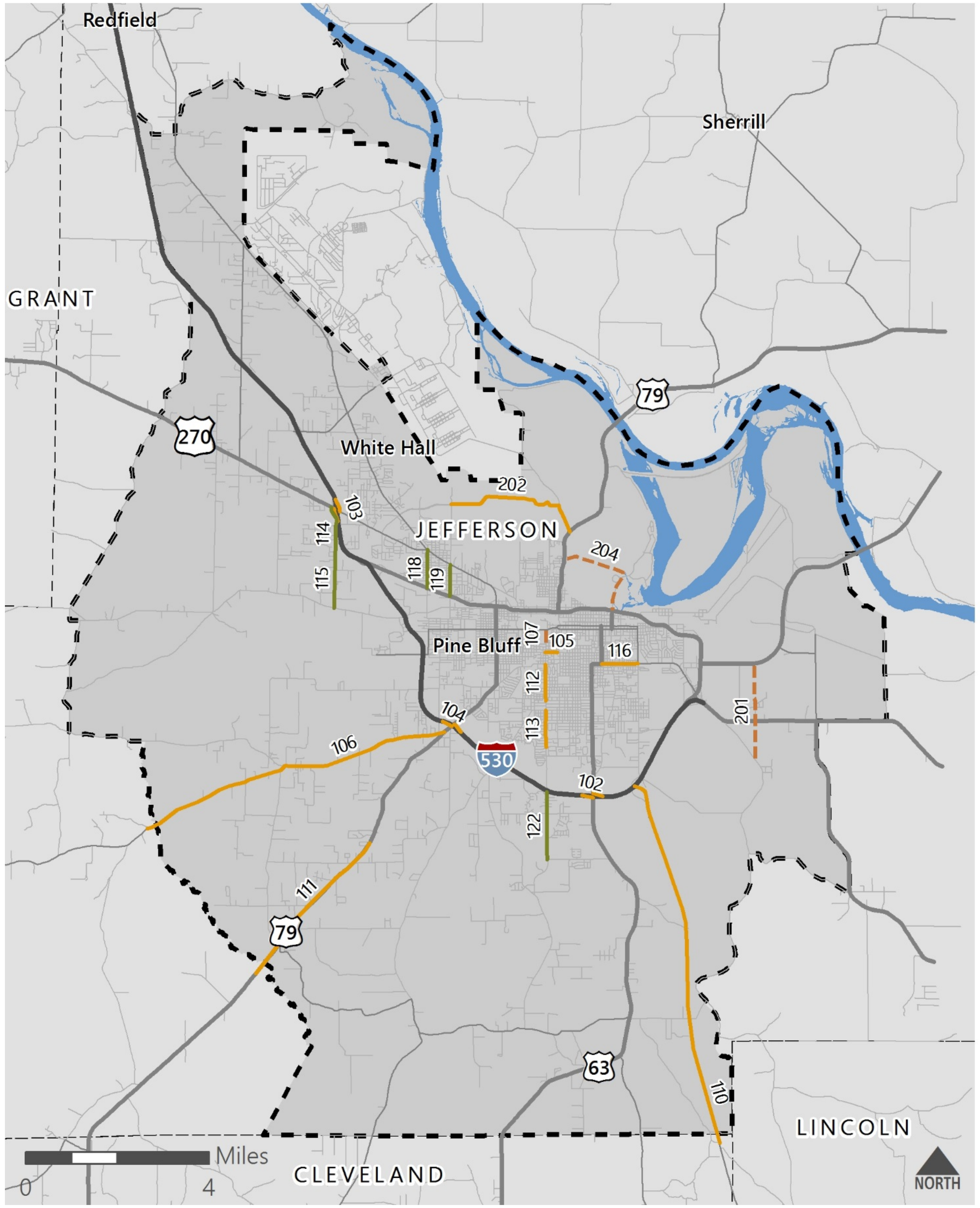
Note 2: Vision projects are unfunded needs and as such do not have a Year of Expenditure associated with them. Costs are shown in 2020 dollars.

Improvement Type: ● New Roadway ● Widening ● Turning Lane ● Other/Multiple

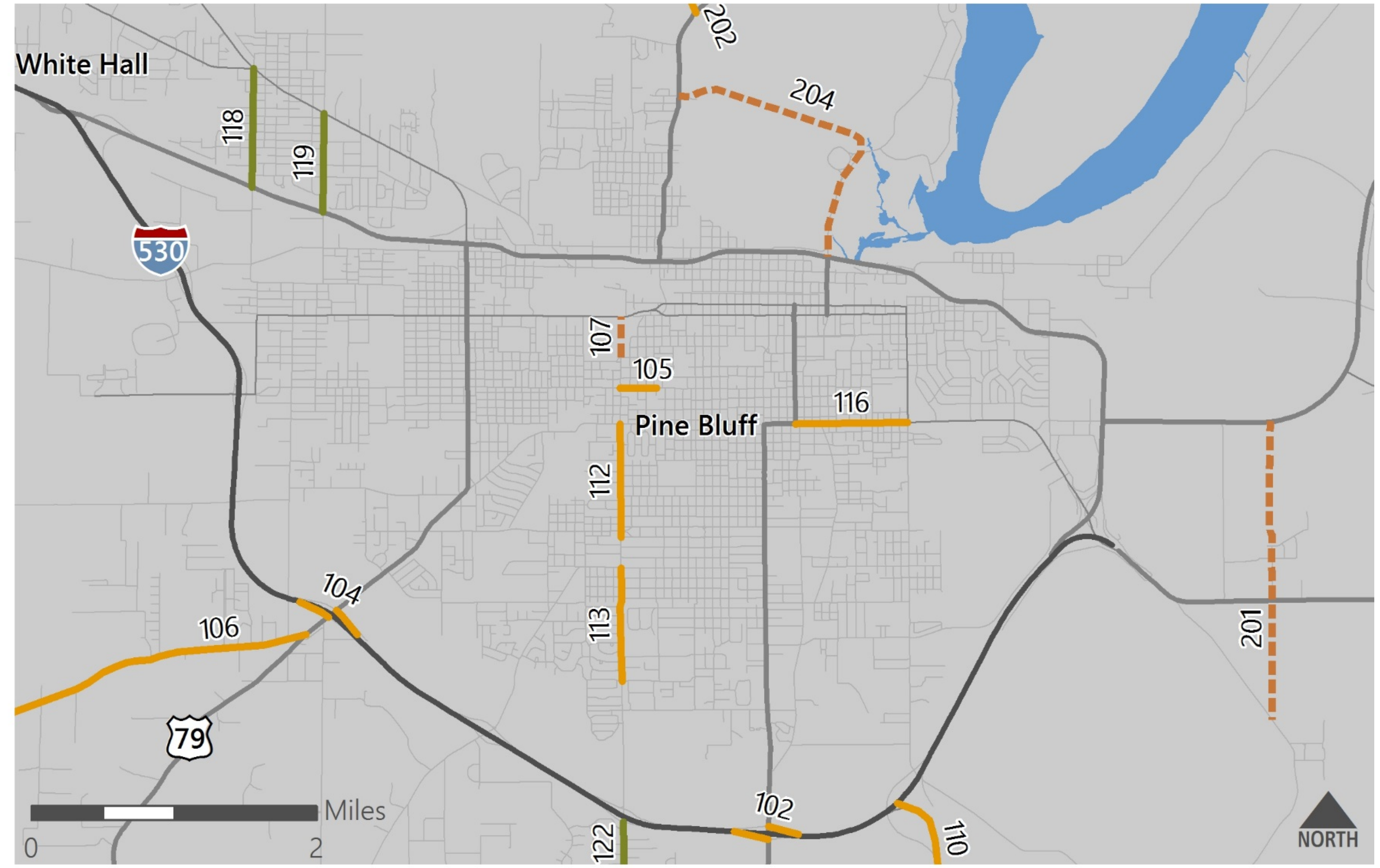
Design Considerations: **EJ** – Potential Concern for Environmental Justice Impacts **EC** – Potential Concern for Environmental and Community Impacts

Figure 10.4: Visionary Roadway Capacity Projects

Metropolitan Planning Area



Urban Core



Legend

Project Type

- New Roadway
- Widening
- Turning Lane
- Other/Multiple
- Planning Area

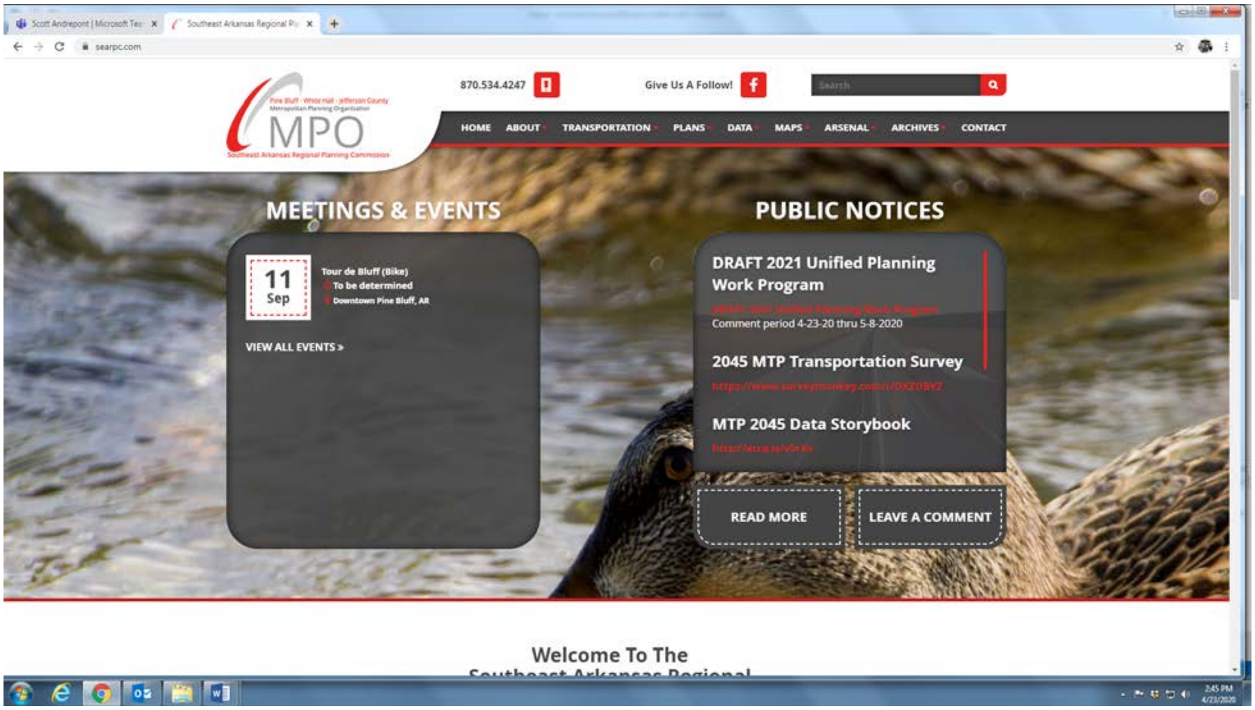
Data Sources: Neel-Schaffer, Inc.

Disclaimer: This map is for planning purposes only.

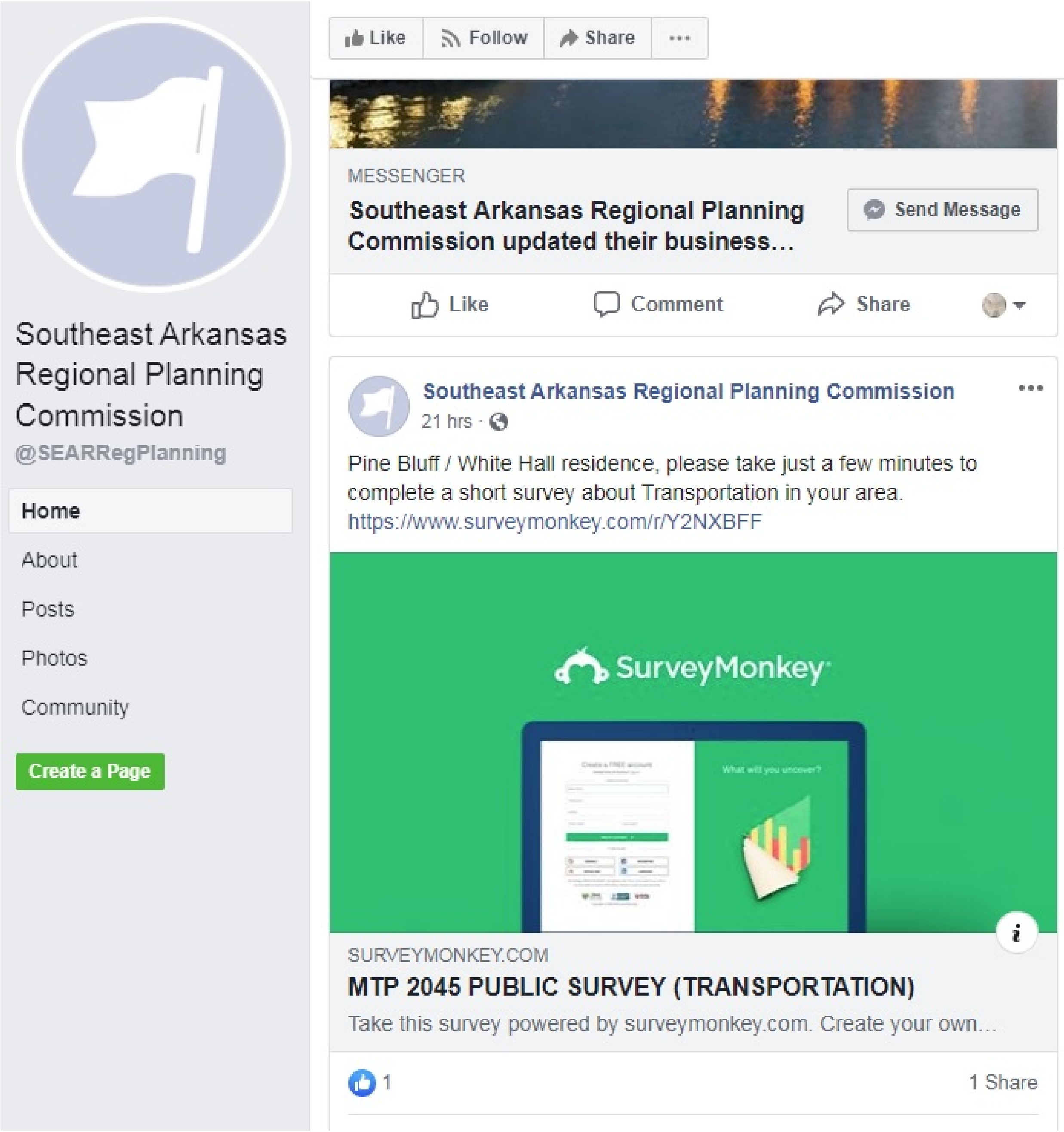
Appendix: Public/Stakeholder Outreach Record

Public Input Survey Advertisements

SEARPC Website



SEARPC Facebook Page



Public Input Survey Format

4/15/2020 MTP 2045 PUBLIC SURVEY (TRANSPORTATION)

Pine Bluff - White Hall - Jefferson County Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

MTP 2045 PUBLIC SURVEY (TRANSPORTATION)

The Pine Bluff / White Hall, Arkansas region is developing a roadmap for improving transportation over the next 25 years. Help us plan for the future by participating in this short survey!

OK

1. **Please provide your home ZIP code:**

- ◯ 71601
- ◯ 71602
- ◯ 71603

0 of 8 answered

https://www.surveymonkey.com/r/Y2NXBFF?fbclid=IwAR1jAn2rwxRfcXrpjb45qAECX7Uh7xaiEvjHjx6Ndm5UlglgQxSB-MhVkRY 1/5

2. **Which of these ways do you regularly commute or run errands?**

☐ Drive Alone

☐ Carpool or Ride with someone else

☐ Walk

☐ Bicycle

☐ Ride the bus, paratransit, or other public transit

☐ Other

----

3. **Read these TRANSPORTATION PRIORITIES for the Pine Bluff / White Hall urbanized region.**
Which prioroties are more important to you?

	1 - Least important	2	3	4 - Most important
Improving connectivity between places?	☐	☐	☐	☐
Reducing trafic congestion	☐	☐	☐	☐
Improving safety	☐	☐	☐	☐

0 of 8 answered

	1 - Least important	2	3	4 - Most important
Maintaining roads and infrastructure in good condition	☐	☐	☐	☐
Making transit, biking and walking more convenient	☐	☐	☐	☐
Supporting the movement of goods/freight	☐	☐	☐	☐

4. **In your experience, what is the Pine Bluff / White Hall urbanized region's MOST CONGESTED roadway or intersection during rush hour?** (example: University Drive near 5th Avenue)

5. **In your experience, what roadway or intersection in the Pine Bluff / White Hall urbanized region has the greatest need for SAFETY IMPROVEMENTS?** (example: University Drive near 5th Avenue))

0 of 8 answered

6. **What are the Pine Bluff / White Hall urbanized region's THREE (3) biggest challenges for biking and walking?**

- ☐ Lack of adequate infrastructure (sidewalks, bike paths, etc.)
- ☐ Bicycle parking
- ☐ Distance between places
- ☐ Maintenance of infrastructure (sidewalks, roads, ect.)
- ☐ Safety and comfort
- ☐ Awareness and public information
- ☐ Other

---

7. **What are the Pine Bluff / White Hall urbanized region's THREE (3) biggest challenges for riding transit?**

- ☐ Areas without transit service
- ☐ Limited night and weekend service
- ☐ Slow travel times
- ☐ Unreliability
- ☐ Safety and comfort

0 of 8 answered

☐ Other

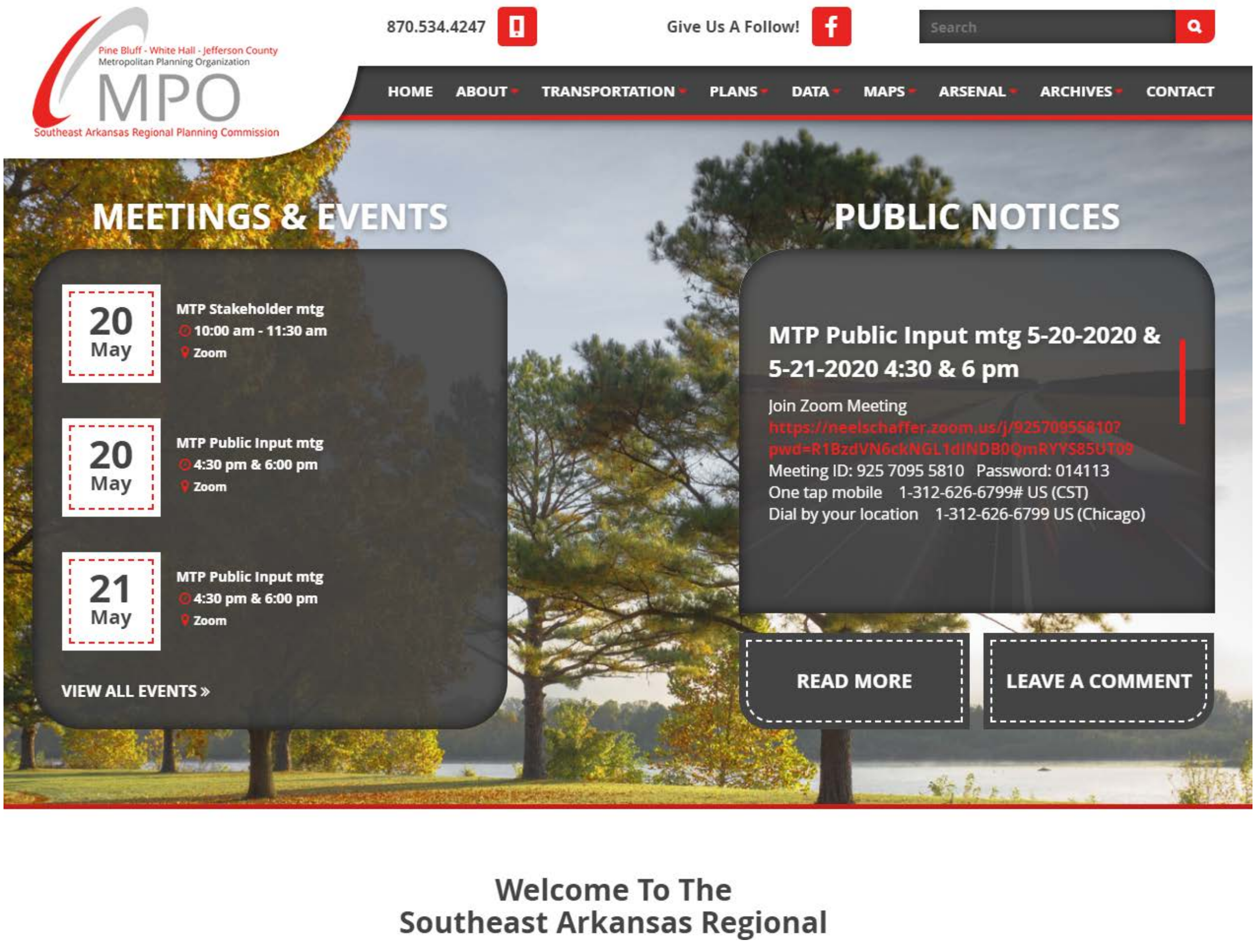
8. What (BIG IDEAS) do you have for improving transportation in the Pine Bluff / White Hall urbanized region? Think about getting around by al modes - driving, riding transit, walking, biking, etc.

DONE

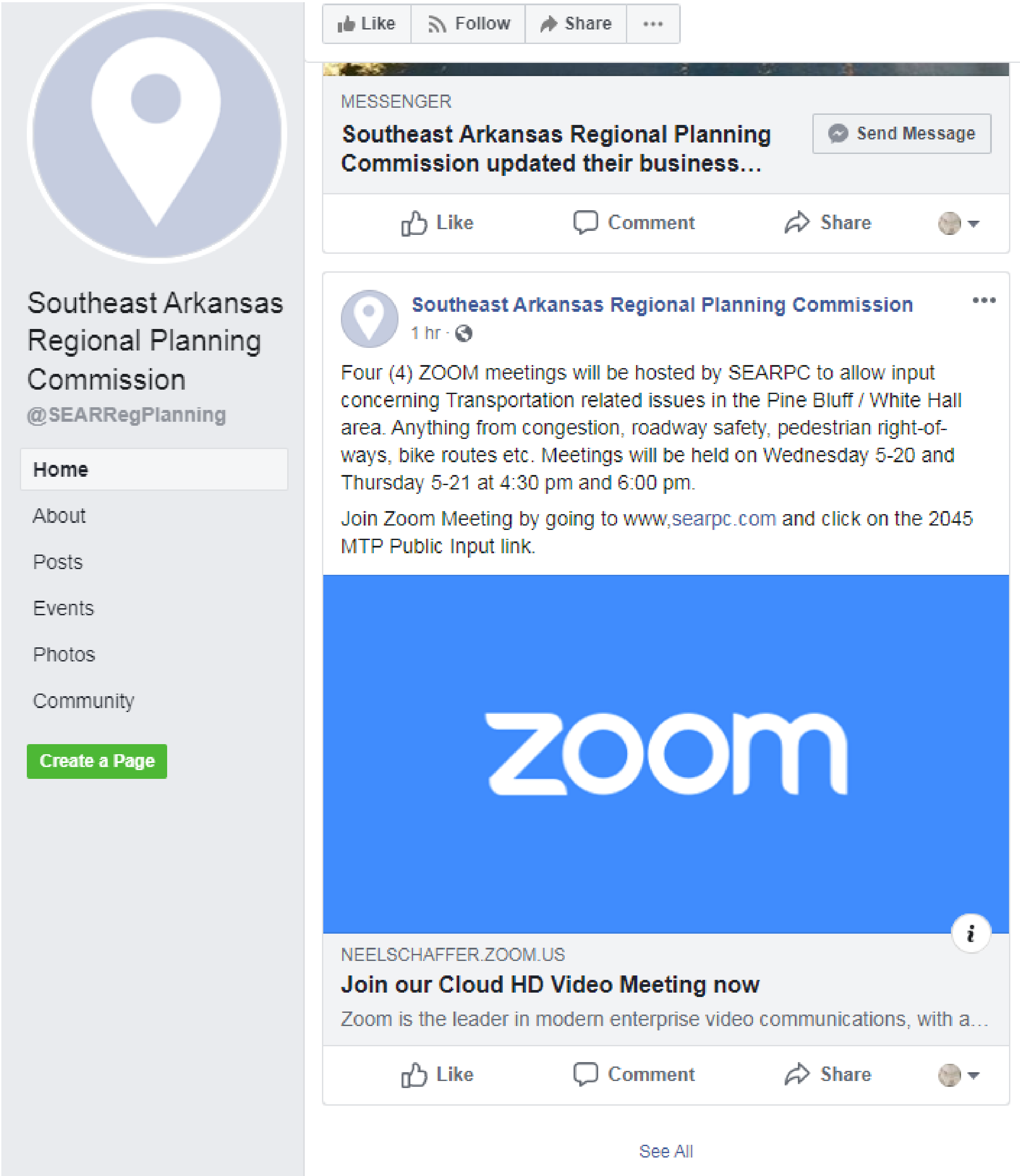
0 of 8 answered

Public Meeting Advertisement – Round 1

SEARPC Website



SEARPC Facebook Page



Pine Bluff Commercial Print Advertisement

TRANSPORTATION FOR THE FUTURE

STREETS BIKING TRANSIT

PUBLIC MEETING

will be held using Zoom

on Wednesday, May 20th, 2020 from 4:30 – 6:30 to review the

Pine Bluff – White Hall 2045 Metropolitan Transportation Plan

Information will be provided, and public input is requested on the future transportation plans for your Metropolitan area.

Provide your input in matters concerning:

- Traffic flow
- Streets and Highways
- Congestion
- Bike and Pedestrian Trails
- Transit
- Rails and Freight

To join go to SEARPC.com and click on the link to MTP Zoom meeting.

Meeting ID: 925 7095 5810 Password: 014113

One tap mobile: 1-312-626-6799 (CST) Dial in option: 1-312-626-6799 US (Chicago)

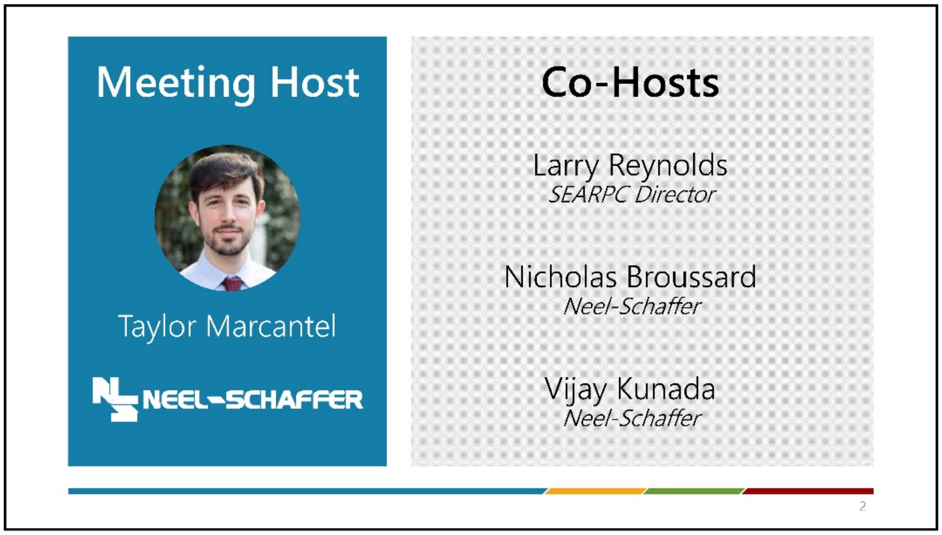
https://neelschaffer.zoom.us/j/92570955810?pwd=R1BzdVN6ckNGL1dINDB0QmRYYS85UT09

Public Meeting – Round 1 Attendees

Meeting Time	Name	Email
May 20; 4:30 PM	Cornelius Hall	catch58.ch@gmail.com
	Joy R. Blankenship	
	Steven Miller	
May 20; 6:00 PM	Cornelius Hall	catch58.ch@gmail.com
May 21; 4:30 PM	Nancy	nancy@jeffersoncountalliance.com
May 21; 6:00 PM	Cassandra	

Public Meeting – Round 1 Presentation

6/24/2020



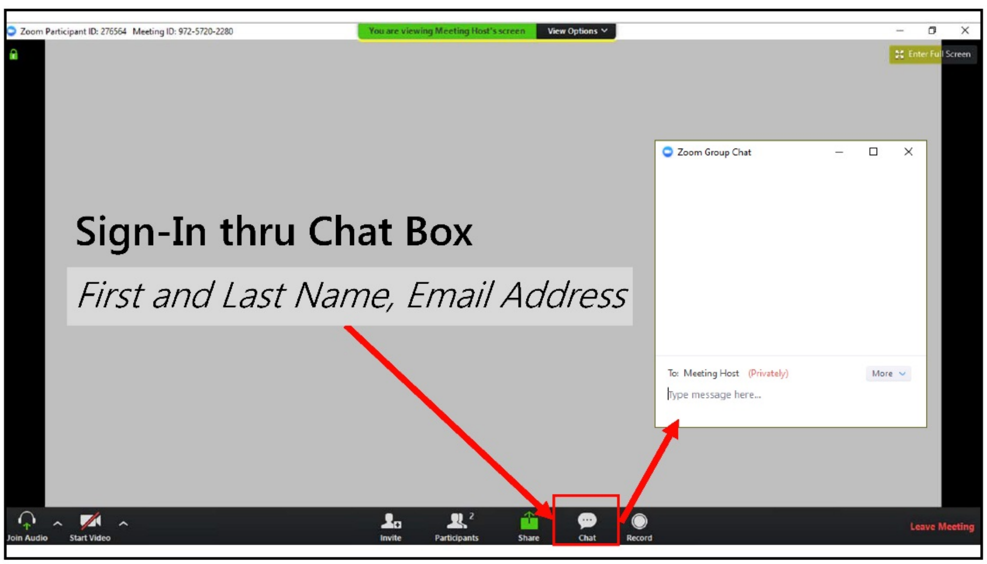
1

6/24/2020

Housekeeping

- Meeting is being recorded
- You are Muted
- Use Chat Box
- Questions will be addressed at end

3



2

6/24/2020

Agenda

1. The Planning Area
2. What is the MTP?
3. Project Timeline
4. Input Opportunities

5

The Planning Area

6

3

Planning Area

- Includes census-defined Urbanized Area
- Plus area expected to urbanized within 20 years

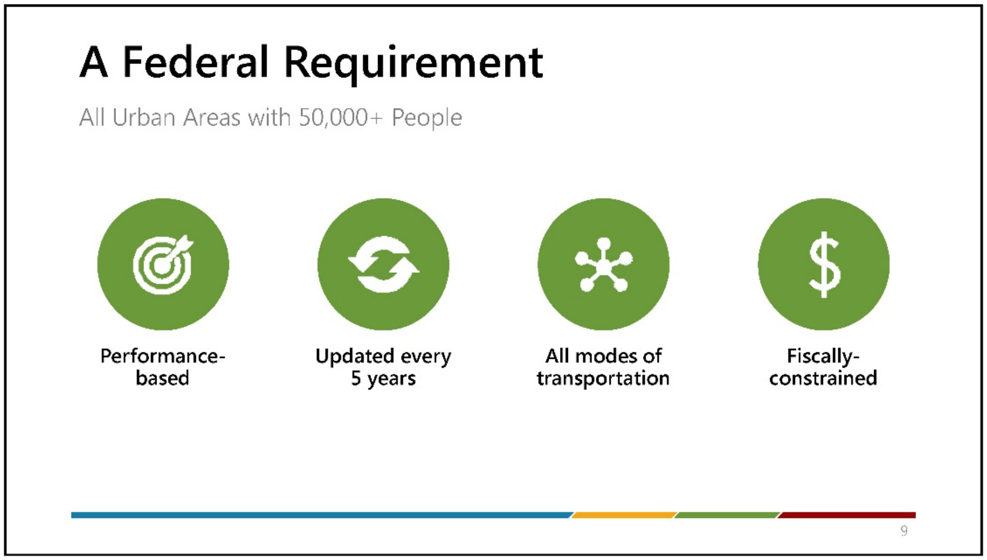
7

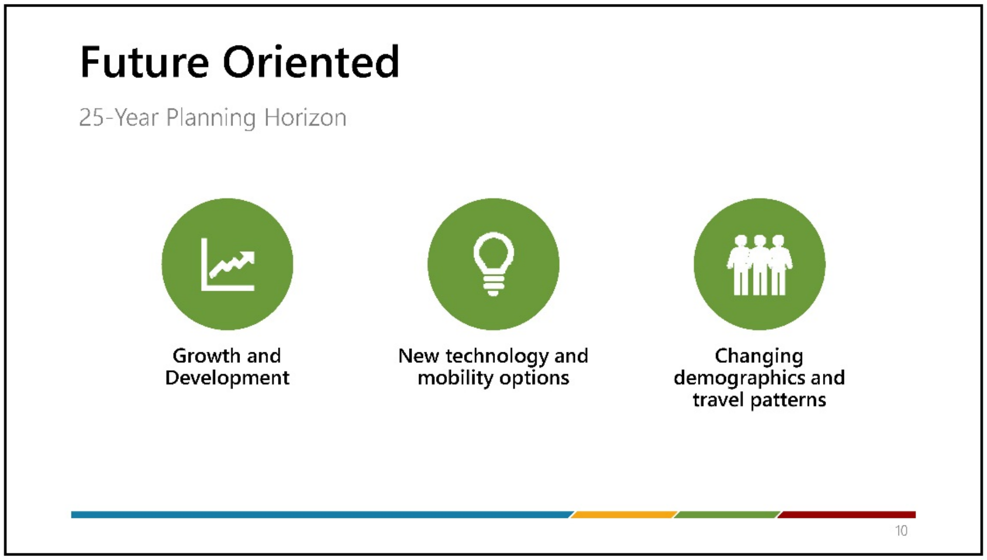
What is the MTP?

Metropolitan Transportation Plan

8

6/24/2020

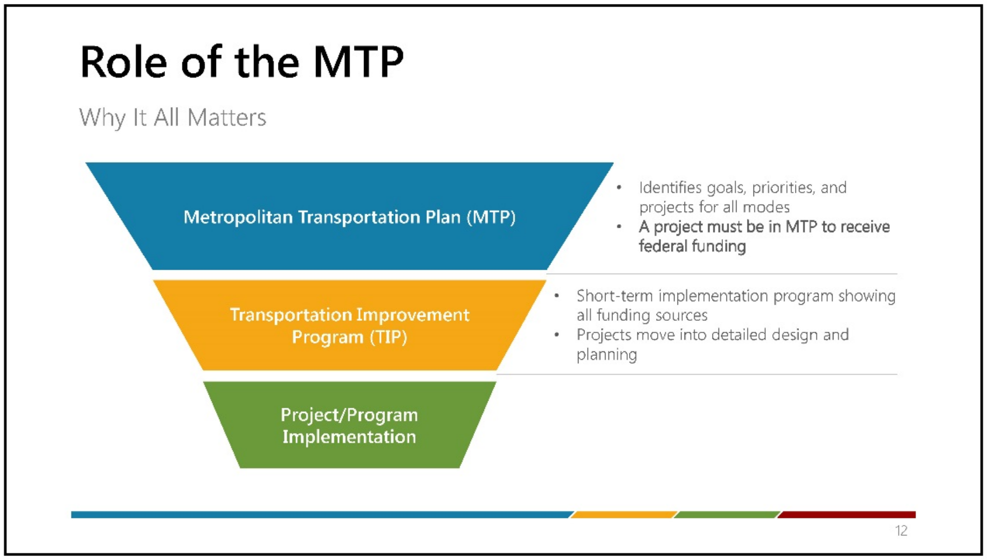

A Federal Requirement
All Urban Areas with 50,000+ People
Performance-based
Updated every 5 years
All modes of transportation
Fiscally-constrained
9


Future Oriented
25-Year Planning Horizon
Growth and Development
New technology and mobility options
Changing demographics and travel patterns
10

5

6/24/2020


Community and Stakeholder Driven
Input That Matters
Priorities and Plans
Ideas
Feedback
11


Role of the MTP
Why It All Matters
Metropolitan Transportation Plan (MTP)
Identifies goals, priorities, and projects for all modes
A project must be in MTP to receive federal funding
Transportation Improvement Program (TIP)
Short-term implementation program showing all funding sources
Projects move into detailed design and planning
Project/Program Implementation
12

6

6/24/2020

Project Timeline

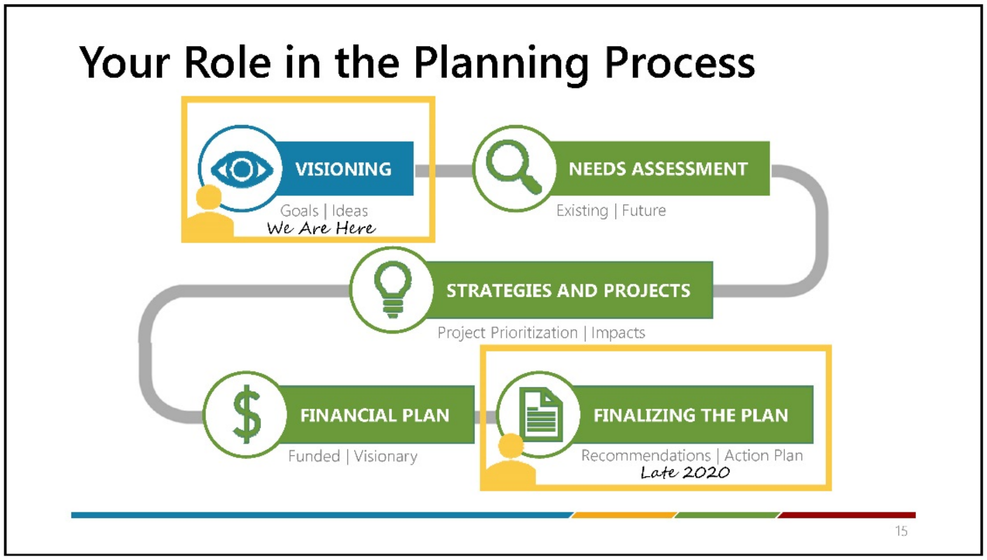
13

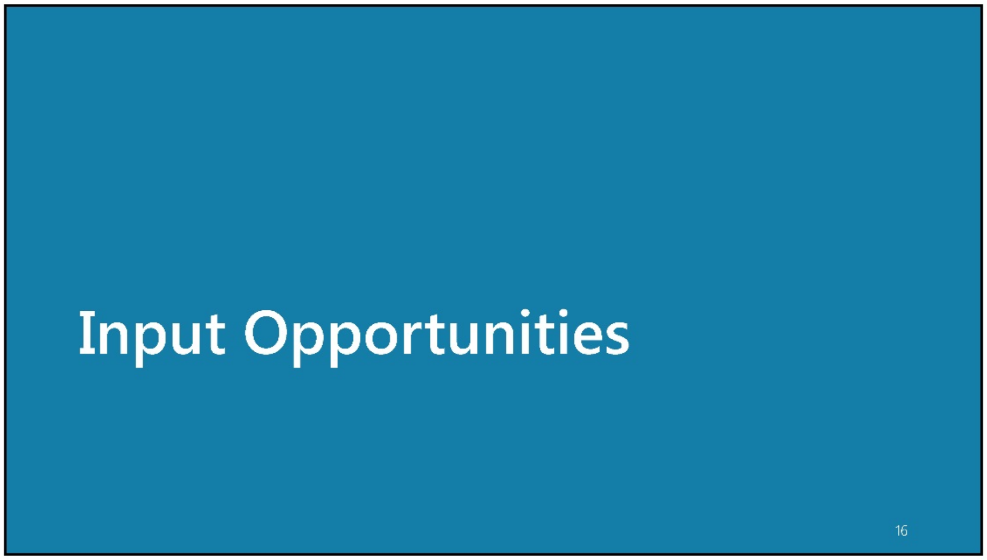
Project Timeline

14

7

6/24/2020


Your Role in the Planning Process
VISIONING
Goals | Ideas
We Are Here
NEEDS ASSESSMENT
Existing | Future
STRATEGIES AND PROJECTS
Project Prioritization | Impacts
FINANCIAL PLAN
Funded | Visionary
FINALIZING THE PLAN
Recommendations | Action Plan
Late 2020
15


Input Opportunities
16

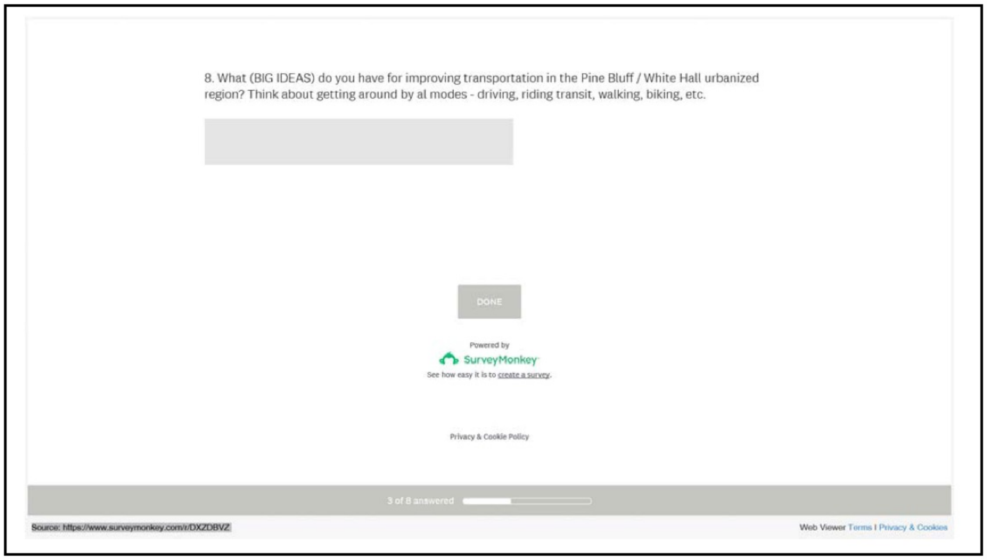
8

6/24/2020

How to Provide Input

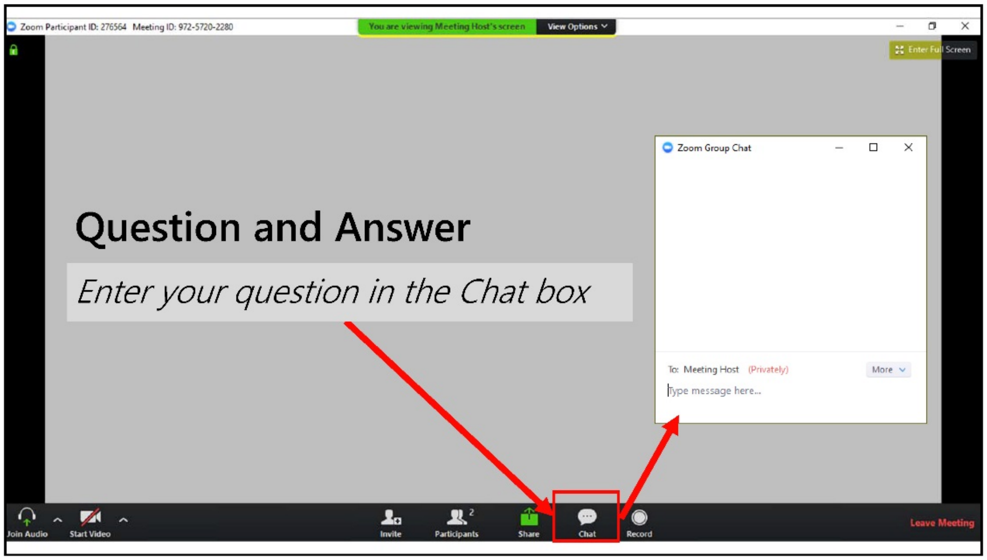
- Complete online survey at:
  https://www.surveymonkey.com/r/DXZDBVZ
  Recommended
- Email comments to:
  larryreynolds@cablelynx.com
- Mail comments to:
  SEARPC
  Attn: 2045 MTP
  1300 Ohio Street, Suite B, Pine Bluff, Arkansas 71601

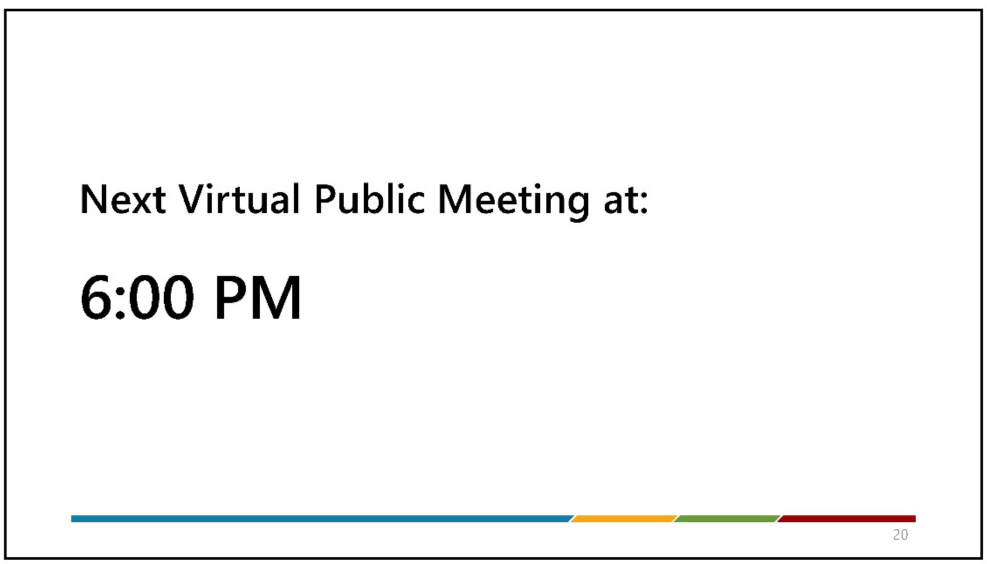
17



9

6/24/2020


Zoom Participant ID: 276564 Meeting ID: 972-5720-2280
You are viewing Meeting Host's screen
View Options
Enter Full Screen
Question and Answer
Enter your question in the Chat box
Zoom Group Chat
To: Meeting Host (Privately)
More
Type message here...
Join Audio
Start Video
Invite
Participants
Share
Chat
Record
Leave Meeting


Next Virtual Public Meeting at:
6:00 PM
20

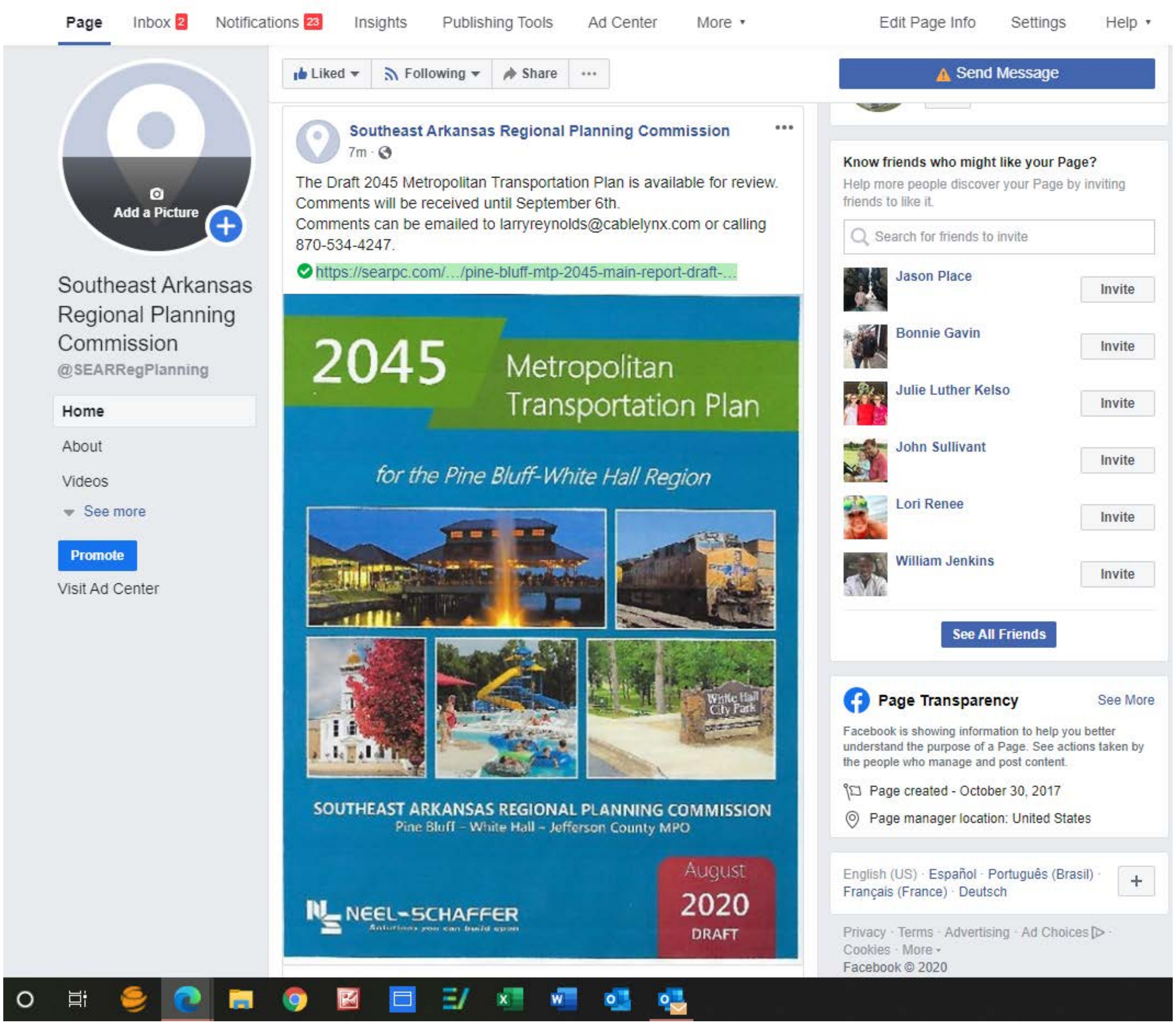
10

Stakeholder Consultation Attendees

Name	Affiliation	Email
Ivan Whitfield	City of Pine Bluff	whitfieldivan@yahoo.com
James House	Resident	jchouse@cablelynx.com
Nicholas Broussard	NSI	nicholas.broussard@neel-schaffer.com
Vijay Kunada	NSI	vijay.kunada@neel-schaffer.com
Taylor Marcantel	NSI	taylor.marcantel@neel-schaffer.com
Allison Thompson	Alliance (Chamber)	allison@jeffersoncountyalliance.com
Sunny Farmahan	ArDOT	sunny.farmahan@ardot.gov
Gerald Robinson	Jefferson County Judge	countyjudge@jeffersoncountyar.gov
Joni Alexander	Pine Bluff Council	joni.m.alexander@gmail.com
Pam Jenkins	County Judge Chief of Staff	countyjudge@jeffersoncountyar.gov
Stuart Hee	Go Forward Pine Bluff	stuart.lee@catalyticoz.com
Kenneth Fisher	MPO Technical Committee	nowelts@sbcglobal.net
Larry Reynolds	SEARPC	LarryReynolds@cablelynx.com
Karen Blevins	Jefferson County OEM	karen.blevins@adem.arkansas.gov
Ryan Watley	Go Forward Pine Bluff	watleyryan@goforwardpb.org
Anthony Hunter	ArDOT Planning	antony.hunter@ardot.gov
LV		

Public Input – Round 2

Facebook Advertisement



Comprehensive Plan Mailing List

From: Larry Reynolds
To: Allison J. H. Thompson (allison@jeffersoncountyalliance.com); angela.l.parker@arkansas.gov; bdunn@seark.edu; cockrumleigh@goforwardpb.org; "Fisher Kenneth (novelts@sbcglobal.net)"; jgordonreese@yahoo.com; Joni Alexander (joni.m.alexander@gmail.com); "joyray@sbcglobal.net"; ksergeant@pbpd.org; larrym@cityofpinebluff.com; "Louann Nisbett (lanisbett@sbcglobal.net)"; "Matt Mosler"; mayor@cityofpinebluff.com; Nancy McNew; Rosalind Mouser (Rosalind.Mouser@simmonsbank.com); Ryan Watley; Samuel Glover (sglover@cityofpinebluff.com); Shauwn Howell (shauwnhowell@cityofpinebluff.com); Stuart Hee (stuart.hee@catalyticoz.com); thomasb@jrmc.org; Will Jenkins (amazingrestorations@yahoo.com); Thomas, Brian
Subject: Comprehensive Plan update
Date: Wednesday, August 05, 2020 4:36:00 PM

To All Comprehensive Plan Steering Committee members:

I received an update from Julie (Crafton Tull) regarding the Comprehensive Plan. There were 10 steps in the plan development. Six of ten have been completed with step 8 being the Comprehensive Plan report. Steps 9 and 10 are the Land Development Code review and rewrite.
The file sent was restricted to one download; therefore, I downloaded it and added it the opening page of our website **www.searpc.com** . Step 6 was the **Comprehensive Plan Draft Elements** which is the document on the website for review. If there are any comments please let me know. Again this is the **Draft, so please review and make comments and/or suggestions.** All correspondence will be forwarded to Crafton Tull and I will maintain a log. The Plan Elements were created from the Technical Assessment that was produced following the charette's and subsequent meetings.

Step 7 is the implementation Plan and will require a Steering Committee meeting (due to COVID it may be via Zoom). Step 8 includes

a. Draft Plan Development
b. Client presentation and review
c. Steering Committee meeting
d. Final Report Development
e. Adoption process.

On another matter, while you are on the Southeast Arkansas Regional Planning website, take a look at the **Draft 2045 Metropolitan Transportation Plan**. This plan is required to be updated every 5 years in order to receive federal highway and transit funds. We are now in the 30-day public review and comment period (ends September 6th), so please do not hesitate to comment on this matter as well.

If you would like to discuss either item please give me a call at 870-534-4247.

Larry Reynolds
Director
larryreynolds@cablelynx.com

MPO Mailing List

From: Larry Reynolds

To: Allison J. H. Thompson (allison@jeffersoncountyalliance.com); Andy Lunsord (andy.lunsford@whitehallar.org); Anthony Hunter (Anthony.Hunter@ardot.gov); "beaver.johnson@whitehallar.org"; Bruce Lockett (brucenlockett@gmail.com); Bryan Swinney (Bryan.Swinney@ardot.gov); countyjudge@jeffersoncountyar.gov; "david.beck@whitehallar.org"; "Deric Wyatt (deric.wyatt@ardot.gov)"; Donald Hatchet (ddhatche@sbcglobal.net); Doug Hale; "Fisher Kenneth (novelts@sbcglobal.net)"; "Foster Joel (joel.foster@whitehallar.org)"; Glen Brown , Jr (glenbrownjr@yahoo.com); James House (jchouse@cablelynx.com); Jimmie Lee Fisher Sr. (pastorjlf215@att.net); Jimmy Dill (jdill@pineblufftitle.com); Joni Alexander (joni.m.alexander@gmail.com); Karen Blevins (karen.blevins@adem.arkansas.gov); Ken Smith; Lloyd Holcomb (loyd_holcomb@yahoo.com); Mary Pringos (Pinellas2800@gmail.com); mayor@cityofpinebluff.com; Noel Foster; Ricky Rhoden (rrhoden@cityofpinebluff.com); Rosalind Mouser (Rosalind.Mouser@simmonsbank.com); Ryan Watley; Steven Mays (stevenmays@rocketmail.com); Stuart Hee (stuart.hee@catalyticoz.com); Sunny.Farmahan@ardot.gov; Whitfield Ivan (Whitfieldivan@yahoo.com); Win Trafford (wintrafford@gmail.com); Althea Hadden (ahadden@cityofpinebluff.com); bdunn@seark.edu; Bill Brumett (billbrumett@cablelynx.com); Carolyn Jackson; "cshaw@cityofpinebluff.com"; David Ferrell (david@huntersrefuge.com); David Wilbert (David.Wilbert@sbcglobal.net); Deborah Davis; "dprice@pbpd.org"; dreams1958@gmail.com; "dsadler@nelsonarchgroup.com"; Eddie Parsley (eparsley@sbcglobal.net); enright_mj@yahoo.com; gregg1@cityofpinebluff.com; Jesse Turner (PBICVR@aol.com); jgordonreese@yahoo.com; Joy Blankenship; ksergeant@pbpd.org; "Lakishia"; larrym@cityofpinebluff.com; LaTasha Woods; lelan.stice@gmail.com; Leon Crumblin; Liddell Mary (marylddll@yahoo.com); Lori Walker; "Louann Nisbett (lanisbett@sbcglobal.net)"; Marcus Graydon (mgraydon@cityofpinebluff.com); Mays Earl and Ora (1211gemini@gmail.com); McCorvey James (jmccorvey@pinebluff.com); Mchael Gilliard (mgilliard@pinebluff.com); "Melissa Freeman"; Nancy McNew; Patricia Hargrove (phargrove@seaedd.org); rhonda@jeffersoncountyalliance.com; Richard Taylor (rtaylor@nelsonarchgroup.com); Ricky Doucey; salinda.hayden@jeffersoncountyoem.com; Sampson Donald (dsampson.pbha@yahoo.com); Samuel Glover (sglover@cityofpinebluff.com); Sandy Truman (sandywhc@cebridge.net); Scott Floretta (flopersco1@yahoo.com); Shauwn Howell (shauwnhowell@cityofpinebluff.com); stevenm@cityofpinebluff.com; Taggert Maurice (mtaggart@cityofpinebluff.com); Terence Mitchnee (jackandjillcelebrate@yahoo.com); Tony Barr (tbarr@aaasea.org); Trudy Redus (saracenlanding@att.net); Vickie Conaway (vickiec@cityofpinebluff.com); Wayne Easterly (wayne_easterly@yahoo.com); Will Jenkins (amazingrestorations@yahoo.com); "Deric Wyatt"; "Scott Ray"; dray@pinebluffpolice.com; "karen.quarles@adem.arkansas.gov"; Sandra Graves (countyroad@cablelynx.com); Valera McDaniel (Valera.McDaniel@dot.gov)

Cc: "Nicholas Broussard"

Subject: Draft 2045 Metropolitan Transportation Plan

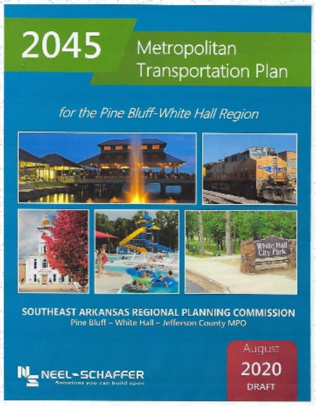
Date: Friday, August 07, 2020 11:57:00 AM

Attachments: image004.emz
image007.png

Hello everyone. I hope everyone is staying safe!

This email is to notify each of you that the Draft 2045 Metropolitan Transportation Plan (MTP) is available for review and public comment at:

https://searpc.com//images/uploads/20200805/pine-bluff-mtp-2045-main-report-draft-v1-47856.pdf



Larry Reynolds
Director
larryreynolds@cablelynx.com

Pine Bluff Commercial Legal Ad Order

Ad Number	Ad Type	Production Method	Production Notes
0001356266-01	S-Legal 9C Liner-21i	AdBooker	

External Ad Number	Ad Attributes	Ad Released	Pick Up
		No	

Ad Size	Color
2 X 3.71"	

Ad Content

The Southeast Arkansas Regional Planning Commission shall be receiving comments and public input on the Draft 2045 Metropolitan Transportation Plan. The Plan is a federally required document for Metropolitan areas that receive federal funding for transportation projects including roadways, public transit, and bike / pedestrian ways. It serves as a roadmap for addressing the region's transportation needs for the next 25 years.

Copies of the Draft 2045 MTP are available for view at www.searpc.com, Pine Bluff City Hall 200 E. 8th Avenue, Pine Bluff, AR 71601; White Hall City Hall, 101 Parkway Drive, White Hall, AR 71602; and at the Jefferson County Judge's Office, 101 E. Barraque, Pine Bluff, AR 71601.

With restrictions in place due to COVID-19 it is preferred that the Plan be reviewed online at www.searpc.com . If this is not convenient, please contact the Southeast Arkansas Regional Planning Office at 870-534-4247 to request a Draft copy.

If you have any questions concerning the Draft 2045 Metropolitan Transportation Plan, please contact Larry Reynolds at 870-534-4247.

Comments may be sent to:

1. SEARPC
1300 S. Ohio Street, Suite B
Pine Bluff, AR 71601
2. emailed to: larryreynolds@cablelynx.com
3. by calling 870-534-4247 (SEARPC office)

The comment period will remain open until 4:30 pm September 5th, 2020 or thirty (30) days following publication of this legal notice.

Product	Placement	Position
PB-PBC	Legal Ads	Liner - Can Wrap
PB-PBCommercial Online	Legal Ads	Liner - Can Wrap

Comments and Responses

Comment	Source	Response
Please add a north/south route connecting Martha Mitchell Expwy to downtown.	Stakeholders	This project has been added as Project 204.
Reference to data being mentioned should be provided. Example of this would be page 24 projected funding of $571 million but does not refer to where that number is coming from, I am assuming it is coming from one of the technical report but that should be referenced as the source of the numbers. Same goes for Population and Jobs projects on page 12, the source of the data need to referenced when using the data.	ArDOT	References to the mentioned data in the main report will be provided in the final draft.
We are assuming that all technical documents will be part for the final document as an appendix, assuming most of the MTP document, data and narrative is being derived from these technical documents, it will be helpful if these documents are indexed in the appendix and referenced in the sections as needed, this will create a good flow to the documents instead of we trying to find the reference ourselves from the technical documents.	ArDOT	As noted in previous response, references to the mentioned data in the main report will be provided in the final draft. Due to the size of the technical reports and the intention to keep the main report to a manageable number of pages to engage the non-technical readers, we will make the technical reports available electronically for download along with the main report. Printed copies of the main report will reference the electronic reports for more information.

APPENDIX

6

Transportation Systems Management and Operations

Draft September 2020

Pine Bluff - White Hall - Jefferson County
Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

Prepared by:

NEEL-SCHAFFER
Solutions you can build upon

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1 Transportation System Management Operations

1.1 Introduction

This report documents some of the existing Transportation System Management Operations (TSMO) strategies currently in place in the Pine Bluff Metropolitan Planning Area (MPA). It also displays potential TSMO strategies that could be implemented.

The main goal of deploying TSMO strategies is to manage existing roadway infrastructure more efficiently using existing resources. The following strategies can be implemented as part of a TSMO strategic plan to reduce congestion and increase the safety and efficiency of the transportation system.

- Intelligent Transportation Systems (ITS) Architecture
- Existing TSMO Strategies
- Work Zone Management
- Traffic Incident Management
- Connected and Automated Vehicle Deployment
- Management of Mobility, Reliability, and Efficiency
- Multimodal Coordination

1.2 Background Plans and Studies

Associated studies and procedures have influenced and shaped the development of this plan in a number of ways. They are summarized below:

- Intra-department agreements – These agreements identify stakeholders in ITS architecture development. Effective ITS involves the integration of multiple stakeholders and their transportation systems.
- Standard operating procedures – these procedures define the roles and responsibilities of the participating stakeholders in the region and the willingness of agencies to accept their roles and responsibilities. The roles and responsibilities include (but are not limited to) areas such as:
    - Arterial Management
    - Emergency Management

- Incident Management
- Transit Management
- Traveler Information
- Maintenance and Construction

- ITS Deployment Study – these studies include proposed ITS projects identified as part of the regional ITS architecture along with their service and geographic scope and total cost.
- Transportation Improvement Program (TIP) – reviewing the most recent Pine Bluff Regional ITS Architecture, no dedicated funding source for ITS projects was identified in the TIP for the Pine Bluff region.
- Traffic Incident Management Plan – these plans provide a roadmap for providing incident detection capabilities to help manage both planned and unexpected events and help mitigate the impact to the transportation network.

1.3 ITS Architecture

A major component of any successful TSMO strategy is the incorporation of existing and future ITS. The use of ITS provides advanced information and communication technology that improves transportation safety and mobility and enhances productivity. It also encompasses a broad range of wireless and wire line communications-based information and electronics technologies. When integrated into the transportation system's infrastructure, and vehicles, these technologies relieve congestion, improve safety, and enhance productivity. Since TSMO is an approach to relieve congestion, improve safety, and enhance mobility, it is important to review the ITS plan first. These systems will provide the technology needed to achieve these goals. The Pine Buff – White Hall Regional ITS Architecture provides a blueprint for managing the transportation network holistically and to optimize existing and future infrastructure. The plan states that:

> "The Pine Bluff Regional ITS Architecture is a roadmap for transportation systems integration for the Southeast Arkansas Regional Planning Commission (RPC), which covers the southeast portion of Arkansas (including Pine Bluff, White, Hall, and the Pine Bluff Arsenal), over the next 20 years. The Pine Bluff – White Hall Regional ITS Architecture has been developed through a cooperative effort by the Region's transportation agencies, covering all surface transportation modes and all roads in the Region."

The chief agency leading ITS efforts in the State of Arkansas is the Arkansas Department of Transportation (ArDOT). Within the State, ArDOT has a number of intra-department agreements with other (local) stakeholder organizations where there is a frequent need to exchange information. This exchange is mainly based on the needs coming from one department or the other.

1.4 Existing TSMO Strategies

The main objective of deploying TSMO strategies is to use the current capacity of the roadway network as efficiently as possible. However, congestion sometimes prevents the current system from operating efficiently during peak periods. To use the full capacity of the existing network, it is important to mitigate bottlenecks and reduce congestion. Congestion is generally categorized into recurring and non-recurring congestion. Recurring congestion is typically attributed to bottlenecks or poor traffic signal operations, while non-recurring congestion is typically associated with work zones, crashes, adverse weather, or special events.

A review of existing strategies in place in the Pine Bluff MPA was conducted and summarized below.

- Incident Management: Incidents are currently identified and managed by local authorities. At this time, there are no plans for a more robust traffic incident management system in the Pine Bluff region.

1.5 TSMO Strategy Recommendations

TSMO strategies have been used for several years but have mostly been associated and applied under other programs. Examples of existing traffic incident programs include:

- Local Emergency Operation Centers
- Jefferson County Sheriff's Office (Dispatch Center)
- IDriveArkansas Website
- City of Pine Bluff Department (Dispatch Center)

Work Zone Management

Work zone management (WZM) involves organizing and operating areas impacted by road construction to minimize traffic delays and maintain safety for workers and travelers. Traffic conditions are generally monitored using CCTV, cameras controlled using DMS, Highway Advisory Radio (HAR), gates, and barriers. Through the implementation of TSMO, the Iowa Department of Transportation evaluated ITS in work zones (so-called "smart" work zones), which included speed sensors, travel time sensors, queue detection trailers, and DMS. Between congestion and crash reductions, the smart work zones resulted in a benefit-cost ratio of 2.1:1 when new equipment was purchased and 6.9:1 without equipment costs.

The following are opportunities in which TSMO can help enhance WZM:

- Completing Federal Highway Administration (FHWA) Capability Maturity Model (CMM) framework for WZM.
- Inclusion of work zone ITS technology for dynamic management (dynamic queuing, variable speed limits, dynamic lane merge, entering/exiting construction vehicle notification) and work zone traffic signal adjustments can help manage traffic to improve worker and motorist safety and minimize traffic delays.
- Use connected vehicle (CV) applications, such as Work Zone Traveler Information, to monitor and aggregate work zone data. Additionally, Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE) is a CV application that warns on-scene workers of vehicles with trajectories or speeds that pose a high risk to their safety. It also warns drivers passing an incident zone if they need to slow down, stop, or change lanes. These applications can help organize and operate work zone areas.
- Work Zone Traveler Information and INC-ZONE connect vehicles to infrastructure. Therefore, it is important to prepare regional infrastructure to communicate with vehicles.
- Coordinate work zone information with other groups such as traffic management and maintenance and construction centers. For example, keeping communications open among local public works construction activity, ArDOT District activities, and the ArDOT ITS Section (responsible for traffic management) can achieve this goal.
- Provide work zone speeds and delays status to the motorist before they reach the work zones.
- Prioritize smart work zone needs by prioritizing them in areas with ITS gaps.
- Provision of funding for work zone ITS on projects should be discussed and allocated early in the project development process.

Traffic Incident Management

The goal of Traffic Incident Management (TIM) is to detect, verify, respond to, and clear traffic incidents in a manner that provides the road user with least disruption possible. Detection can either be manual (typically via CCTV) or automated. Once an incident is detected, it is managed by either construction or emergency responders. These activities are typically coordinated at a regional TMC. This centralizes the response and helps traffic operations personnel respond appropriately to confirmed decisions. These responses include modifications in traffic control strategy and resource coordination among center subsystems.

Through the implementation of TSMO, The Pennsylvania DOT implemented Incident Response Management, which reduced incident response times by 8.7 minutes, incident clearance times by 8.3 minutes, and hours of delay by 547,000 hours per year. This resulted in a total monetary savings of $6.5 million per year. Many organizations have also appointed a local incident commander who ensures the reliability of TIM measures being implemented and takes charge of incident scenes.

The following are opportunities in which TSMO can help enhance TIM:

- Complete FHWA CMM framework for the TIM.
- Have a central information hub — for example, the planned regional TMC for Monroe — will improve detection and response to traffic incidents in real time.
- This faster response will also help disseminate incident information to other travelers to reduce travel delays.
- The planned TMC can also coordinate with other subsystems such as: Monroe Police Department, tow trucks, or other field services, as part of the emergency plan.
- Use CV application, such as Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG), which provides input to responders on vehicle routing, staging, and secondary dispatch decisions, which can assist with the clearing of traffic incidents.
- Establish a multi-disciplinary incident review committee with various first responders (e.g., police, fire, medical) to grade operations on incidents and train their staff accordingly.
- Use data logged at the regional TMC (e.g., number of incidents per year, average incident clearance times) to inform data-driven decisions.
- Extend the Motorist Assistance Patrol (MAP), which assists motorists by providing various services and restoring the interstate to peak traffic capacity, to the Monroe metropolitan area.
- Have a TIM coordinator and allowing them to collaborate with Pine Bluff TMC, city and state police departments, and MAP to share best practices.

Connected and Automated Vehicles Deployment

The main goal of the CAV TSMO plan is to deploy CAV infrastructure progressively. That is, deploy it in stages proportional to the self-driving technology introduced by car manufacturers. Advancing the Monroe region's TSMO capabilities will rely on the deployment of emerging transportation technologies such as CAV. Additionally, a strong TSMO program will help this region best leverage these technologies to the benefit of the road users. Currently, CAV infrastructure does not exist in the Pine Bluff region.

Many states have taken initiative in developing a CAV strategic plan based on their respective needs, and few have considered CAV as a TSMO Business Area. For example, the Michigan Department of Transportation (MDOT) has developed a CAV Strategic Program and established CAV contacts/ambassadors in each of the MDOT regions. Through this program, the groundwork has been laid to integrate ITS, signals, and CAV for operability, and MDOT's CAV group also coordinates with the TSMO Data Working Group to determine relevant systems and data elements and the opportunity for CAV data inclusion and use.

Some of the opportunities where TSMO can help enhance CAV technology are described below:

- Data exchange and storage will be a key feature of efficient CAV technology. Developing a plan that will determine the data collection and storage plan is important to region's development.
- Integrate CAV systems with signals and other ITS technology in the Pine Bluff MPA (for instance, add new CV2X devices at future ITS device locations).
- Obtain direction from ArDOT management to have each work area work independently with the CAV group to share data, information, and interoperability.
- Coordinate with the TSMO Data Working Group to identify relevant systems and data elements and the opportunity for CAV data inclusion and use.

Management of Mobility, Reliability, and Efficiency

While TSMO strategies are typically focused on reducing the frequency of congestion on freeways and arterials, other ways of finding efficiency involve reducing delays associated with various functional activities. ArDOT has developed statewide programs and initiatives to address these challenges in recent years, but implementation of a TSMO program alongside these existing efforts can enhance and integrate these activities, improving safety and mobility in the region.

Some of the opportunities where TSMO can help manage mobility, reliability, and efficiency are described below:

- Complete FHWA CMM framework for road weather, planned special event, traffic signal, work zone, and traffic incident management.
- Use connected vehicle application such as Dynamic Speed Harmonization, which aims to recommend harmonious speeds in response to congestion, incidents, and road conditions to maximize throughput, reduce crashes, and improve system reliability.
- Implement Queue Warning — an application that warns drivers of existing or potential queues ahead in real time — helps to reduce delays and improve mobility.
- Implement Weather Response Traffic Information — an application that uses real-time data and communications systems to warn motorists during severe weather events, thereby enhancing operations as part of road weather management.
- In a special event, applications such as Emergency Communications and Evacuation are useful in addressing the needs of evacuees with and without special needs or their own transportation.
- Review adverse weather planning documents with stakeholders to make updates as necessary.
- Deploy environmental sensors on and around the roadway to collect weather conditions.
    - The Pine Bluff MPA can also use sensor systems located on maintenance and construction vehicles to collect these data. These data can be used to process the information and inform decisions on operations. A regional TMC can work on integrating this road weather sensor technology into existing systems and technologies to share information quickly with stakeholders and improve traffic management during weather events.
- Future ITS deployments in ArDOT District 2 (the Pine Bluff region) may help address extreme weather-related issues and leverage the strength of the systems to enhance operation during evacuations.
- Quantify resiliency metrics associated with weather events to understand scope and potential countermeasures.
- Develop a budget of resources and a business case for safety and reliability during adverse weather.
- A regional TMC can track a wide range of events, which is useful in understanding how the system is behaving during special events.

    - Through TSMO collaboration, a working group can be developed that will coordinate with responders and event planners to prepare for system unreliability.
- Integrate a Traffic Information System Dashboard into existing ArDOT District 2 systems and technology.
- Collaborate with the public and event planners to encourage active transportation and transit to and from events.
- Identify locations without communication and cross-reference with projects nearby to prioritize locations for adding communications.
- Deploy Automated Traffic Signal Performance Metrics (ATSPMs) and integrate findings from the database with maintenance ticketing processes.
- Provide training and collaboration opportunities between ArDOT District 2 Traffic Operations and the City of Pine Bluff (and other locals as applicable) to extend benefits of dynamic signal timing improvements.

Multi-Modal Coordination

Communication among transit and traffic agencies is important in improving multi-modal service coordination. Traveler convenience at transit transfer points and clusters (a collection of stops, stations, or terminals where transfers can be made conveniently) can be increased with multi-modal coordination among transit agencies, which improves operating efficiency.

Some of the opportunities where TSMO can help manage mobility, reliability, and efficiency are described below:

- Freight and transit are important modes of transportation; therefore, their interaction and integration are important as a part of TSMO strategy.
- Using a CV application (such as Freight-Specific Dynamic Travel Planning and Performance) enhances traveler information systems, which address specific needs (such as wait times at ports, road closures, work zones, and route restrictions) can play an important role in multi-modal coordination.
    - Coordination among public transportation providers and travelers can be enabled with the Connection Protection application, which improves the probability of successful transit transfers.
- There is a need to share a transit transfer service information between multi-modal transportation service providers and transit agencies.

    - ArDOT District 2 traffic operations and local entities can coordinate to work on this.
- Establish a group that will identify potential operations-related multi-modal performance measures.
- Identify crash locations and/or corridors that require high reliability (e.g., transit or freight corridors) to better coordinate safety efforts that affect multiple modes of transportation.

1.6 Conclusion

This document has explored some existing and potential TSMO strategies for the Pine Bluff MPA. The main goal of deploying TSMO is to manage existing roadway infrastructure more efficiently using existing resources. TSMO strategies have been used for several years but have mostly been associated and applied under other roadway and technology-focused programs. A review of existing strategies in place in the Pine Bluff region was conducted, and it was found that incident management is currently a strategy practiced in the Pine Bluff region. Some other potential strategies that could be implemented in the future include Work Zone Management, Traffic Incident Management, Connected and Automated Vehicle Deployment, Mobility Management, and Multi-Modal Coordination. Utilization of these strategies may lead to more efficient transportation operations overall and a well-managed transportation system.

APPENDIX

Federal Compliance Checklist

7

Draft September 2020

Pine Bluff - White Hall - Jefferson County
Metropolitan Planning Organization
MPO
Southeast Arkansas Regional Planning Commission

Prepared by:

NEEL-SCHAFFER
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1 Introduction

The Southeast Arkansas Regional Planning Commission (SEARPC), the regional Metropolitan Planning Organization (MPO), is responsible for developing and carrying out a continuing, cooperative, and comprehensive (3-C) transportation planning process in the metropolitan area.

The Metropolitan Transportation Plan (MTP) is a part of this 3-C planning process and has specific requirements set forth in federal legislation. These requirements are the focus of this appendix.

2 Federal Compliance Checklist

This checklist demonstrates how the 2045 MTP complies with federal requirements for metropolitan transportation plans as set forth in 23 U.S.C. 134 and 23 CFR 450.324.

✓ 1.) The long-range transportation plan has no less than a 20-year planning horizon.

The Plan has a 25-year planning horizon, ending in 2045.

✓ 2.) The plan includes both long-range and short-range strategies/actions that provide for the development of a safe and integrated multimodal transportation system to address current and future transportation demand.

The Plan contains short-range and long-range strategies identified in *Appendix #5: Plan Development* and the main MTP document.

✓ 3.) If the applicable State Implementation Plans (SIPs) include transportation control measures (TCMs), the MPO should coordinate the plan development with process for developing the TCMs.

The active SIP does not contain any TCMs.

✓ 4.) The MPO, the State(s), and the public transportation operator(s) shall validate data used in preparing other existing modal plans for providing input to the plan. The Plan shall use the latest available estimates and assumptions for population, land use, travel, employment, congestion, and economic activity. The Plan shall include current and projected transportation demand of persons and goods to the horizon year of the plan.

The MPO, the State, and public transportation operators validated and provided data used in preparing modal elements. The Plan uses up-to-date socioeconomic data and projects future demand as discussed in *Appendix #1: Modeling and Forecasting*. It also uses outside projections of demand to supplement this data, where available.

5.) The MPO planning process shall provide for the implementation of projects and strategies that address the following planning factors:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase the security of the transportation system for motorized and non-motorized users;
- Increase accessibility and mobility of people and freight;
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation;
- Emphasize the preservation of the existing transportation system;
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation;
- Enhance travel and tourism.

The planning factors listed above guided the development of the Plan. They influenced the questions asked during the Stakeholder Consultation and Public Involvement process and were used in developing goals and objectives. They were also used to develop the project scoring criteria used to select the fiscally constrained projects. Further information can be found in *Appendix #2: Existing Conditions*, *Appendix #4: Needs Assessment*, and *Appendix #5: Plan Development*.

6.) The plan shall include existing and proposed transportation facilities that serve important national and regional transportation functions over the period of the transportation plan.

The existing and proposed facilities are discussed in *Appendix #2: Existing Conditions*, *Appendix #4: Needs Assessment*, and *Appendix #5: Plan Development*.

7.) The plan shall include a description of the performance measures and performance targets used in assessing the performance of the transportation system, and a report on progress achieved in meeting the performance targets.

The MPO's performance measures and progress in meeting the performance targets is discussed in *Appendix #3: Transportation Performance Measures*. Measures of effectiveness of the existing transportation system are discussed in *Appendix #2: Existing Conditions*. The effectiveness of the future system with only Existing Plus Committed projects is discussed in *Appendix #4: Needs Assessment*. The effectiveness of the future system with the Existing Plus Committed projects and the proposed fiscally constrained projects is discussed in *Appendix #5: Plan Development*.

8.) The plan shall include operational and management strategies to improve the performance of existing transportation facilities to relieve congestion and maximize the safety and mobility.

The Plan features strategies for improving operations, management, safety, and mobility. These are discussed in *Appendix #4: Needs Analysis*, *Appendix #5: Plan Development*, and *Appendix #6: Transportation Systems Management and Operations*.

9.) The plan shall include consideration of the results of the congestion management process, including the identification of SOV projects.

The SEARPC is not designated as a Transportation Management Area and is not required to maintain a congestion management process.

10.) The plan shall include an assessment of capital investment and other strategies to preserve the existing and future infrastructure, provide for multimodal capacity increases based on regional priorities and needs, and reduce the vulnerability of the existing transportation infrastructure to natural disasters.

The Plan addresses regional priorities and capital investment in *Appendix #5: Plan Development*. *Appendix #4: Needs Assessment* evaluates multimodal needs, preservation needs, and natural disaster mitigation needs.

11.) The plan shall include transportation and transit enhancement activities, including consideration of the role that intercity buses may play in reducing congestion, pollution, and energy consumption.

The Plan includes transportation and transit enhancement activities and details can be found in *Appendix #5: Plan Development*.

12.) The plan shall include a description of existing and proposed transportation facilities in sufficient detail and include cost estimates.

The existing transportation facilities within the region are discussed in *Appendix #3: Existing Conditions*. The proposed transportation facilities, including cost estimates, are discussed in *Appendix #5: Plan Development*.

13.) The plan shall include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities.

Environmental mitigation activities and potential areas to conduct them are discussed in *Appendix #5: Plan Development*.

14.) The MPO shall consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan. The consultation shall involve, as appropriate, a comparison of transportation plans with State conservation plans or maps, if available.

Environmental consultation is described in Appendix #5: Plan Development.

15.) The plan shall include a financial plan that demonstrates how the plan can be implemented and includes:

- Cooperatively- developed estimates of costs and revenue sources reasonably expected to be available to adequately operate and maintain the highways and public transit (in "year of expenditure dollars")
- Recommendations on any additional financing strategies to fund projects and programs included in the plan.

The financial plan is discussed in *Appendix #5: Plan Development* and includes these requirements.

16.) The metropolitan transportation plan should integrate the priorities, goals and strategies in the State's Highway Safety plans and Improvement programs, and public transportation agency safety plans.

Strategies to increase transportation safety are discussed in *Appendix #4: Needs Assessment* and *Appendix #5: Plan Development*. The MPO's progress towards the state's safety performance measures and how to support the state targets set in the Highway Safety Improvement Plan are discussed in *Appendix #3: Transportation Performance Measures*.

17.) The plan shall demonstrate that stakeholders were given the opportunity to comment on the plan based on the MPO's Public Participation Plan; (Including representatives of public transportation employees, public ports, freight shippers, providers of freight transportation services, private providers of transportation (including intercity bus operators, employer-based commuting programs, such as carpool program, vanpool program, transit benefit program, parking cash out program, shuttle program, or telework program), representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled).

The efforts undertaken to involve the stakeholders and general public as part of the planning process are detailed in *Appendix #5: Plan Development*.

18.) The plan shall demonstrate consultation with agencies involved in: a) tourism; b) natural disaster risk reduction.

Agencies involved with tourism or natural disasters and response have been included in the stakeholder consultation, described in *Appendix #5: Plan Development*.

19.) The plan was made readily-available for public review in electronically accessible formats.

The Appendices were available for download on request and the main MTP document was made readily-available for public review and details can be found in *Appendix #5: Plan Development*.

20.) Visualization techniques were used to describe the plan.

The Plan features a variety of graphs, tables, infographics, and maps to display key information within the various Appendices and main MTP document.

21.) Air quality conformity determination on any updated or amended transportation plan in accordance with the Clean Air Act and EPA regulations.

Since the SEARPC planning area is not a Maintenance or Nonattainment Area for air quality standards it is not subject to air quality conformity analysis or the associated documents and processes.