JACKSON AREA MPO

2040

Long Range Transportation Plan

December 2012

THIS REPORT WAS FUNDED IN PART THROUGH GRANTS FROM THE FEDERAL HIGHWAY ADMINISTRATION AND FEDERAL TRANSIT ADMINISTRATION, U. S. DEPARTMENT OF TRANSPORTATION. THE VIEW AND OPINIONS OF THE AUTHORS [OR AGENCIES] EXPRESSED HEREIN DO NOT NECESSARILY STATE OR REFLECT THOSE OF THE U. S. DEPARTMENT OF TRANSPORTATION.

JACKSON AREA
METROPOLITAN
PLANNING ORGANIZATION

MAYOR JERRY GIST, MPO BOARD CHAIRMAN
STANLEY T. PILANT, MPO STAFF CHAIRMAN
KEITH C. DONALDSON, TRANSPORTATION
PLANNING COORDINATOR

RESOLUTION
OF THE EXECUTIVE BOARD
JACKSON AREA METROPOLITAN PLANNING ORGANIZATION
APPROVING THE YEAR 2040 LONG RANGE TRANSPORTATION PLAN

WHEREAS, the Jackson Area Metropolitan Planning Organization (MPO) is the organization responsible for transportation planning in the Jackson Area and for the appropriate use of federal transportation funds in the area; and

WHEREAS, the transportation planning process for the Jackson Area is based on a Continuing, Cooperative, and Comprehensive Planning Process and is hereby certified by the Jackson Area Metropolitan Planning Organization as being in compliance with the requirements of 23 CFR Part 450; and

WHEREAS, the Moving Ahead for Progress in the 21st Century (MAP-21) enabling legislation specifies that each Metropolitan Planning Organization (MPO) maintain a current long-range transportation plan to provide the basis for transportation decisions; and

WHEREAS, the Metropolitan Planning Organization hereby certifies that the development of the Long Range Transportation Plan followed the locally adopted public participation process as outlined in the Jackson Area Public Participation Plan, to allow transportation stakeholders and the public an opportunity to review and comment during the development of the plan; and

WHEREAS, the various local, regional, state, and federal agencies involved with transportation planning for the Jackson Area have cooperatively developed the long-range plan in order to provide a more adequate overall transportation system for the planning horizon year of 2040; and

WHEREAS, the Jackson Area MPO Technical Staff reviewed the plan and has recommended their approval to the Executive Board.

NOW, THEREFORE, BE IT RESOLVED that the Jackson Area Metropolitan Planning Organization Executive Board, does hereby approve and adopt the Year 2040 Long Range Transportation Plan as attached hereto.

Resolution duly passed on December 17, 2012.

AUTHORIZED SIGNATURES:

Attest:

Chairman, MPO Executive Board

Transportation Planning Coordinator

Chairman, MPO Executive Staff

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Executive Summary

OVERVIEW

The City of Jackson was designated as a Metropolitan Planning Organization (MPO) in 1982 by the Governor of Tennessee. The MPO planning area includes Madison County, Tennessee in its entirety, and the three municipalities of Jackson, Three Way, and Medon. The City of Jackson is the largest municipality in the MPO area. The MPO boundary and the urbanized area within Madison County are shown in Chapter 1, Figure 1-1.

In order to carry out its responsibilities and meet the requirements of the transportation act passed by Congress in July 2012, called Moving Ahead for Progress in the 21st Century (MAP-21), the MPO produces three major work products: a Long Range Transportation Plan, a Transportation Improvement Program, and a Unified Planning Work Program.

This document is the Long Range Transportation Plan (Plan) as prepared and adopted by the Jackson Area MPO. The Plan is a long range (minimum of 20 year) multimodal strategy and capital improvement program developed to guide the effective investment of public funds in transportation facilities in order to help manage congestion, increase regional mobility options, and coordinate effectively with other community and regional investments. The Plan is updated every five years and may be amended as a result of changes in projected federal, state, and local funding; major investment studies; interstate interchange justification studies; and environmental impact studies.

FUTURE POPULATION AND EMPLOYMENT GROWTH

Over the 30 year horizon of the Plan, future growth in both population and employment will lead to changes in travel patterns to, from, through, and within the MPO area. Understanding future development patterns is key to forecasting the potential impacts on the transportation network. Between 2010 and 2040, the population of the MPO area is expected to grow from approximately 98,300 people in 2010 to nearly 109,500 people in 2040. This projected growth of 11.4% in population will impact travel patterns and increase transportation needs in the MPO area.

In addition to the anticipated growth in population, between 2010 and 2040, employment is expected to grow in the MPO area from approximately 66,500 in 2010 to nearly 99,500 jobs in 2040. This projected growth of 43.7% in employment will change the travel demand on area roads and have a significant impact on travel patterns and transportation needs.

GOALS AND OBJECTIVES

In order to address the demand of the future people and jobs on the transportation system, the following goals and objectives were developed. These goals and objectives are intended to facilitate the development, management, and operation of an integrated, intermodal transportation system that enables the safe, efficient, and economical movement of people and goods. The goals and objectives of the Plan are more fully described in Chapter 2, Table 2-1.

Goal I: Manage and Operate an Efficient Transportation System
Goal II: Promote and Encourage Economic Development
Goal III: Support Environmental Quality and Livability Principles
Goal IV: Support Multi-modal and Mobility Needs
Goal V: Develop a Safe and Secure Transportation System

PUBLIC PARTICIPATION

During the development of the Plan, outreach was undertaken in a variety of ways to ensure involvement and to gather input from other agencies, stakeholders, the freight community, and the community at-large. This input, which was focused on safety concerns, opportunities for improving particular roadway corridors, and suggestions for priority bicycle and pedestrian improvements were incorporated into the development of this Plan. Chapter 13 outlines the public participation process utilized for the development of the Plan and summarizes the comments obtained as a result of the public input process.

ROADWAY RECOMMENDATIONS

As part of the development of the Plan, proposed transportation improvements to address the anticipated congestion have been developed and tested to determine the best scenario to address future traffic growth. These transportation projects, which are more fully outlined in Chapter 4, form the basis for the roadway portion of this Plan. The projects have been organized by the timeframe by which they should be completed in order to maintain satisfactory mobility on the region's major roadways, or if the projects are already under development, the earliest timeframe by which they may be completed.

- Table ES-1 lists projects for completion during 2013-2017.
- Table ES-2 lists projects for completion during 2018-2025.
- Table ES-3 lists projects for completion during 2026-2040.
- Table ES-4 lists additional projects anticipated throughout the planning period.

Table ES-1: Roadway Projects for Completion in 2013-2017

2040 Plan Number	Route	Termini	Description	Cost in Millions (YOE*)
1	US-45 Bypass/ SR-186	US 45E ramps to/from south US 45 Bypass	Interchange modification – widen US 45E ramps to 2 lanes to/from south US 45 Bypass	$3.8
2	US-45 Bypass/ SR-186	Old Hickory Blvd. to Hollywood Drive ramps to/from north	Widen to 6 lanes	$18.2
3	Dr. F.E. Wright Dr.	US-70 (Whitehall St.) to UGN Pkwy.	Widen to 4-lane divided and 5-lane section with bike lanes on both sides	$10.1
4	Skyline Drive	Phase 3 – from Medical Center Dr. to Summar Dr.	Widen from 3 to 5 lanes with sidewalks on both sides	$4.7
5	Campbell St.	Phase 1 – from Ridgecrest Rd. to SR-20 (North Pkwy.)	Widen from 2 to 5 lanes with sidewalks and bike lanes on both sides	$8.7
6	Campbell St.	Phase 2 – from SR-20 (North Pkwy.) to US-45 (Highland Ave.)	Widen from 2 to 4 lanes	$6.1
7	SR-18 (Bolivar Road)	North of Medon-Malesus Road to US-45 (SR-5/Highland Ave)	Widen from 2 to 5 lanes, including realignment at proposed Southern Extension of SR-186 and US-45 Bypass	$34.7
8	SR-5 (N. Highland Ave.)	Intersection of SR-5 (N. Highland Ave.) and Deaderick St.	Modify intersection to a roundabout design	$1.0

**Year of Expenditure (YOE)*

Table ES-2: Roadway Projects for Completion in 2018-2025

2040 Plan Number	Route	Termini	Description	Cost in Millions (YOE*)
9	Southern Extension of US-45 Bypass – (SR-186) – Phase I	US 45 north of Edwards Dr to Airways Blvd (US 70/SR 1).	New 4/5-lane roadway, including interchange with SR-18 realignment	$155.3
10	Dr. F.E. Wright Dr./Christmasville Rd.	From I-40 eastbound ramp to Bedford White Rd.	Widen from 2 to 5 lanes	$15.7
11	Royal St.	Phase 2 – from Lexington Ave. to Lane Ave.	Widen from 2 to 3 lanes with sidewalks and bike lanes on both sides	$9.5
12	Vann Dr. Extension	US-45 (Highland Ave.) to Campbell St.	New 5-lane roadway	$16.8
13	Christmasville Rd.	Bedford White Rd. to Ashport Rd.	Widen to 12-foot travel lanes with 8-foot shoulders (safety improvements)	$3.7

Table ES-3: Roadway Projects for Completion in 2026-2040

2040 Plan Number	Route	Termini	Description	Cost in Millions (YOE*)
14	E. University Pkwy.	US-45 (Highland Ave.) to Cooper Anderson Rd.	Safety improvements, including addition of shoulders	$2.2
15	Southern Extension of US-45 Bypass (SR-186) - Phase II	US-45 north of Edwards Dr to the east side of US-45, opposite Seavers Rd	New 4/5-lane roadway	$230.6
16	I-40	East of SR-223 (Miller Rd./Smith Ln.) to US-412	Widen from 4 to 6 lanes	$20.8
17	I-40	West of SR-138 (Providence Rd) to east of SR-223 (Smith Ln.)	Widen from 4 to 6 lanes	$37.4
18	I-40	US-70 to east of SR-152 (Law Rd)	Widen from 4 to 6 lanes	$37.4
19	Old Humboldt Rd.	Ashport Rd. (north junction) to US-45 Bypass	Widen from 2 to 4 lanes	$12.6
20	Old Medina Rd.	Hopper Barker Rd. to existing 4-lane section north of I-40	Widen from 2 to 4 lanes	$14.5
21	Hollywood Dr.	From existing 4-lane section north of Arlington Ave. to existing four-lane section at Forest Ave.	Widen from 2 to 4 lanes	$13.8
22	Hopper Barker Rd.	US-45 (Highland Ave.) to Old Medina Rd.	Reconstruction and minor widening within existing ROW	$11.7
23	Casey Jones Extension	US-45 Bypass to US-412 (Hollywood Dr.)	New 4/5-lane roadway	$19.5
24	University Pkwy.	Cooper Anderson Rd. to Henderson Rd.	New 2-lane roadway	$10.8
25	Ashport Rd.	US-45 Bypass to Cooper Anderson Rd.	Widen from 2 to 4 lanes	$36.1
26	Ashport Rd.	0.6-mile curve section located between Old Medina Rd. and Christmasville Rd.	Relocate roadway to eliminate curve	$8.4
27	Ashport Rd.	West of US-70 to the US-70/Waynick Rd. intersection	New 2-lane road, relocated	$5.4
28	Ashport Rd.	Windy City Rd. to Old Humboldt Rd.	Widen from 2 to 4 lanes	$7.0

**Year of Expenditure (YOE)*

Table ES-4: Additional Projects Anticipated throughout the Planning Period

2040 Plan Number	Route	Description	Cost in Millions (YOE)
-	Various TSM, ITS and safety improvements	Projects may include intersection improvements (e.g. additional turn lanes and/or signals, signage and lighting; other operational improvements such as signal timing, access management, and projects based on the MPO's Regional ITS Architecture.	$10.0
-	Various bridges	Bridge Replacement / Bridge Rehabilitation	$25.0
-	Various routes	Enhancements to various routes and locations throughout the MPO planning area. Includes projects such as improvements to the bicycle/pedestrian network, trails, scenic byways, landscaping and beautification, mitigation of environmental impacts caused by transportation projects, and restoration of historic transportation facilities.	$9.0

SAFETY RECOMMENDATIONS

In addition to the roadway project recommendations that address capacity, the Plan outlines a range of roadway safety improvements to address a variety of safety concerns. It was the goal of this list to not only improve safety for the current road network, but also to propose projects that would help improve future travel in the Jackson MPO area. Projects recommended for implementation are presented in three tiers (Short-Term, Mid-Term, and Long-Term) based on the timeframe in which the project can expect to be funded, designed, and built. In addition, each tier builds on the previous tier of projects to improve the overall network.

Table ES-5: Short-Term Project Recommendations

Recommendation	Location	Cost*
Install 350 foot acceleration lane	North Parkway ramp onto Keith Short Bypass (US 45 Bypass) Northbound	$149,000
Install 350 foot acceleration lane	Hollywood Drive ramp onto Keith Short Bypass (US 45 Bypass) Northbound	$149,000
Upgrade signalized intersections with LED signal heads.	MPO Area	$46,000 (each)
Closure of Grady Montgomery Drive	Technology Center Drive to existing business entrance	$57,500

**Reflects estimated cost for construction only. Costs represent current (2012) dollar amounts.*

Table ES-6: Mid-Term Project Recommendations

Recommendation	Location	Cost*
Widen Ashport Road to a four lane typical section	Windy City Road to Old Humboldt Road	$3,746,000
Widen Campbell Street to a five lane typical section with continuous center turn lane	Near Ridgecrest Road to North Parkway	$2,987,000
Install two (2) Left Turn Lanes	Intersection of Windy City Road and Old Bells Road	$127,000
Reconfigure intersection	Intersection of Ashport Road and Christmasville Road	$146,000
Widen Christmasville Road to two twelve (12) foot travel lanes with eight (8) foot shoulders	Interstate 40 to Ashport Road	$3,684,000

**Reflects estimated cost for construction only. Costs represent current (2012) dollar amounts.*

Table ES-7: Long-Term Project Recommendations

Recommendation	Location	Cost*
Widen East University Parkway/Cooper Anderson Road	North Highland Avenue to Old Medina Road	$2,360,000

**Reflects estimated cost for construction only. Costs represent current (2012) dollar amounts.*

TRANSIT RECOMMENDATIONS

The Jackson Transit Authority (JTA) operates a fixed-route bus service throughout the MPO area. In addition to the JTA bus service, transit services are also available to the area through the Southwest Human Resource Agency (SWHRA), Greyhound Bus Lines, and a number of other non-profit and private providers. The transit recommendations outlined in this Plan are divided into: 1) Operations/Network Improvements, 2) Capital Improvements, and 3) Transit Planning. These recommendations are summarized below and more fully described in Chapter 6.

Operations/Network Improvements

- Review the city's bus routes on a regular basis to ensure that service efficiency is being maintained as the Jackson area grows and changes.
- Consider establishing a "mini-hub" at Old Hickory Mall, which is a major destination for riders and an area where many of JTA's regular routes intersect.
- Consider the addition of a North Side route, particularly the areas located between the US-45 Bypass corridor and US-45/North Highland Avenue corridor on the north side of I-40.
- Extend bus service along the Ridgecrest Road corridor between North Highland Avenue and Dr. F.E. Wright Drive to provide access to new commercial and residential growth at the Campbell Street and Christmasville Road interchanges with I-40.
- Consider the long-term development of a southern transit route along the Southern Extension of the US-45 Bypass.

Capital Improvements

- Establish a "mini-hub," or small transfer center, at Old Hickory Mall.
- Improve safety and access to bus services by extending Jackson's sidewalk network and upgrading curb ramps to meet ADA standards.
- Continue to replace buses, vans and other transit system vehicles on a regular cycle.
- Increase system efficiency and rider convenience by continuing to implement the transit projects proposed in the regional Intelligent Transportation Systems (ITS) architecture.
- Construct bus shelters at appropriate locations.

Transit Planning

- Initiate an update to the Transit Development Plan within the next two years.
- Update the Coordinated Human Services Transportation Plan regularly to identify any gaps in service, whether geographic, hours of service, or type of rider served.
- Review site plans and large subdivision plats to ensure appropriate design for incorporating transit stops in major new developments.

BICYCLE AND PEDESTRIAN IMPROVEMENTS

Chapter 7 of the Plan outlines the priority of the recommended sidewalk construction projects, sidewalk retrofit projects, bicycle route and improvement projects, and multi-purpose trail projects. Suggested improvements include low-cost measures that yield immediate results, such as sidewalk accessibility retrofit projects, gap-infill of sidewalks to provide missing links in the existing sidewalk system, non-infrastructure projects such as bicycle signage and pavement markings to encourage bicycling, and the re-striping of streets to accommodate bike lanes. Higher-cost measures that are suggested include sidewalk construction on new streets, and the construction of wide curb lanes or four-foot paved shoulders on roads to establish and extend a formalized bikeway system. Other suggested improvements, such as multi-use trails, represent longer-term strategies for transforming the Jackson Urban Area into a truly bicycle and pedestrian friendly community.

Sidewalk Construction Projects

A total of 88 new sidewalk construction projects are recommended. The new sidewalk construction projects build upon the priority projects in *Bicycle and Pedestrian Plan (2005)* and include new recommendations for locations of sidewalks. The recommended new sidewalk pedestrian network includes a set of system improvements to provide pedestrian access to key destinations (i.e schools and parks), to fill major sidewalk gaps in the existing sidewalk system, to create a broader network of sidewalk connectivity and to provide sidewalks on new streets. A map showing the existing sidewalk network with the proposed new sidewalk construction projects is provided in Chapter 7, Figure 7-4.

Sidewalk Retrofit Projects

Sidewalk retrofit projects on a number of existing streets are outlined in the Plan in order to provide an interconnected network of sidewalks and rectify deficiencies related to accessibility of existing sidewalks. Improving pedestrian crossings and deficient ramps at intersections is needed to create high visibility crosswalks and to provide ADA-compliant curb ramps. A map showing the existing sidewalk network and locations of the recommended Sidewalk Retrofit Projects is provided in Chapter 7, Figure 7-5.

Bicycle Route Projects

In order to plan for and establish a formalized bikeway system this Plan includes new recommendations for locations of bicycle route improvements to enhance connectivity to key destinations and to the proposed multi-purpose trails. The proposed bicycle treatment improvements include a range of lower cost options such as bike signage/wayfinding, “Share the Road” pavement markings, restriping of streets by lane removal or lane reduction to provide four foot bike lanes or the restriping of streets by lane removal or lane reduction to provide six foot paved shoulders. More expensive measures, representing longer-term strategies, include the addition of two foot wide curb lanes on urban roads and the addition of four foot paved shoulders on rural sections of roads where the current width of the outside shoulders is too narrow for restriping. Figure 7-6 in Chapter 7 depicts the proposed priorities for bicycle projects.

Multi-Purpose Trail Projects

Multi-purpose trails are off-road facilities intended to provide transportation and recreational benefits to pedestrians and cyclists. The list of multi-purpose trail projects in this Plan builds upon the proposed trails from the previous long range plan and includes the recommendations of new trail projects, as shown in the *Northwest Area Land Use Plan* adopted by the City of Jackson in January 2012 and the potential to locate trails along the TVA utility easement in the northern portion of the Jackson City limits. The Proposed Multi-Purpose Trails are illustrated in Chapter 7, Figure 7-7.

FREIGHT RECOMMENDATIONS

The City of Jackson is located along the I-40 corridor, between Memphis and Nashville, the two largest markets in Tennessee, and within one day's drive from 76% of the major markets in the United States. The existing conditions in the Jackson area are friendly to businesses, especially those involved in manufacturing with large demand for freight activity and locating in Jackson gives companies a strategic advantage in terms of freight movement.

As part of the development of the Plan a review of existing truck traffic, a survey of business involved in freight shipping/receiving, and targeted interviews with organizations involved in freight issues was undertaken. Suggested improvements are outlined in the Plan that include high priority ideas that will yield immediate impacts to efficient freight movement. Since the majority of freight movement in the Jackson area is conducted via ground transport, all of these recommendations are for highway improvements. Measures that will decrease the Jackson area's reliance on trucks and/or reduce its dependence on transport facilities in Memphis may not have as pronounced an effect on local businesses, but should be considered in the long-term plan for freight transport. Incorporated into the Plan are suggestions to:

- Add additional lanes on I-40 to relieve congestion and reduce the probability of crashes,
- Improve the I-40 interchange at both the US-45 Bypass and US-45 (Highland Avenue), and
- Extend the US-45 Bypass to route freight traffic around downtown Jackson.

In addition, the recently enacted federal transportation law (MAP-21), has established a new national freight policy that will result in the designation of a National Freight Network. By July 2013, the U.S Department of Transportation (USDOT) will select up to 27,000 miles of interstates and certain critical rural freight corridors that are considered most important to the safe and efficient movement of freight. The Jackson region should work cooperatively with TDOT to ensure the national designation of I-40, US-45, the US-45 Bypass, US-412 and US-70. Under the new law, interstate highway projects on the National Freight Network will be eligible for 95% federal funding, and projects to improve freight movement on non-interstate routes will be eligible for 90% federal funding, if the projects are identified in the State Freight Plan and if the USDOT certifies that they improve the efficiency of freight movement.

ITS RECOMMENDATIONS

Intelligent Transportation Systems (ITS) are one of the most effective congestion management strategies used to improve the safety and mobility of the transportation system. The National ITS Architecture, a web-based resource developed by the United States Department of Transportation (USDOT), defines ITS as a broad range of wireless and wire-line communications-based information and electronics technologies that may be used singly or integrated together to enhance productivity.

This Plan provides recommendations for ITS projects that build upon recommendations made in the 2035 Plan. The list of project recommendations contained in the Plan builds upon the projects and strategies recommended as part of the *Regional ITS Architecture (2007)* and *Regional ITS Deployment Plan (2007)* developed for the City of Jackson and the Jackson Area MPO. The recommendations outlined in the Plan are based on three deployment timeframes: short-term (5-year planning horizon), mid-term (10-year planning horizon) and long-term (20-year planning horizon). As with any major infrastructure project, successful ITS deployment should be implemented in an incremental fashion.

Short-Term ITS Projects

The projects identified for short-term implementation are those that will provide a visible and positive impact to the safety and efficiency of the transportation system and are feasible from a funding standpoint. It is important to recognize that ITS projects usually necessitate some level of continuous or near continuous operational commitment along with higher levels of maintenance and maintenance responsiveness. Additionally, many ITS projects and systems involve multiple agencies, which will require increased levels of communication, coordination and formal agreements for planning, implementation and operations.

The primary goal of the short-term project recommendations is to improve the efficiency and safety of the arterial street network through the establishment of a traffic operations center (TOC) and a centrally managed signal system that is interconnected with fiber optic cable. The TOC and fiber optic communications network will provide the ability for improved signal coordination and reduced energy consumption and emissions along the regions signalized corridors. Furthermore, it will provide the basis for future expansions of ITS devices, which may include CCTV cameras for faster incident identification and response. Table 9-2 (Chapter 9) contains a listing of projects recommended for short-term implementation.

Mid-Term ITS Projects

The projects identified for mid-term implementation build upon the functionality deployed with the short-term projects. It should be noted that projects referring to system expansion of ITS elements or that rely on a connection to the traffic operations center are dependent on the projects identified for short-term implementation being implemented first.

The primary goal of the mid-term project recommendations is to expand upon the functionalities implemented with the short-term projects. The implementation of field devices such as CCTV cameras, additional vehicle detection equipment, and dynamic message signs will greatly expand the traffic operations, incident management, and information dissemination capabilities of the TOC. The deployment of similar technologies along I-40 in the Jackson region would allow for enhanced incident and emergency management and information sharing capabilities between the City and TDOT. Additionally, the implementation of advanced technologies for public transit operations and will enhance the efficiency and safety of the multi-modal travel experience in the Jackson region. Table 9-3 (Chapter 9) contains a listing of projects recommended for mid-term implementation.

Long-Term ITS Projects

The projects identified for long-term implementation are more strategic in nature and may need to be updated based on the progress achieved with the short- and mid-term projects as well as adjusted for advances in technology. The goal of the long-term recommendations is to expand upon and upgrade the technologies and services implemented with the short- and mid-term project and to continue to ensure that people and goods are moved safely and efficiently in the Jackson region. It is reasonable to expect that information will be provided to travelers in real-time across a wide range of platforms that will allow travelers to make informed decisions regarding routes, travel times, and travel modes. Table 9-4 (Chapter 9) contains a listing of projects recommended for long-term implementation.

SUMMARY

The Long Range Transportation Plan, or "Plan", presented in this document provides a blueprint for transportation investments in the Jackson area over the next 25 years. Based on population and employment trends, land development patterns, and other factors, the Plan is intended to address travel by all modes of the transportation system – passenger vehicles, bicyclists and pedestrians, buses, trucks, trains, and airplanes.

Chapter 1

Introduction

OVERVIEW

Transportation has played a key role in the growth of the City of Jackson and Madison County, both of which have long been hubs of agricultural and industrial production in West Tennessee. According to the history of the city written by Harbert Alexander (available on the city's website), Jackson became the county seat in September 1822, after the Tennessee General Assembly created Madison County. The first railroad appeared in Madison County in 1858 to serve the transportation needs of agriculture production of the area. The presence of the railroads helped to develop a labor base for later industrial development in the area.

Today, the City of Jackson and Madison County offer a wide variety of economic, cultural, healthcare, and educational opportunities for those who live and work in the area. Served by Interstate 40, numerous railroads, and McKellar-Sipes Regional Airport, transportation continues to be important to the future growth of the City of Jackson and Madison County.

ABOUT THE JACKSON AREA MPO

The City of Jackson was designated as a Metropolitan Planning Organization (MPO) in 1982 by the Governor of Tennessee. The Jackson Area MPO, along with the Tennessee Department of Transportation, the Federal Highway Administration and the Federal Transit Administration, works to incorporate continuing, cooperative and comprehensive transportation planning activities in and around the city. These activities include roadway and pedestrian/bicycle projects, as well as improvements to the public transportation system.

The MPO planning area includes Madison County, Tennessee in its entirety, and the three municipalities of Jackson, Three Way, and Medon. The City of Jackson is the largest municipality in the MPO area. The MPO boundary and the urbanized area within Madison County are shown in Figure 1-1. Figure 1-2 shows the changes in the urbanized area from 2000 to 2012.

In order to carry out its responsibilities and meet the requirements of the transportation act passed by Congress in July 2012, called Moving Ahead for Progress in the 21st Century (MAP-21), the MPO produces three major work products: a Long Range Transportation Plan, a Transportation Improvement Program, and a Unified Planning Work Program, as described below.

Long Range Transportation Plan

The Long Range Transportation Plan (Plan) is a long range (minimum of 20 year) multimodal strategy and capital improvement program developed to guide the effective investment of public funds in transportation facilities in order to help manage congestion, increase regional mobility options, and coordinate effectively with other community and regional investments. The Plan is updated every five years and may be amended as a result of changes in projected federal, state, and local funding; major investment studies; interstate interchange justification studies; and environmental impact studies.

Transportation Improvement Program

The Transportation Improvement Program (TIP) is a programming document that details a four-year budget of transportation projects. Any project included in the TIP must be consistent with, or be selected from the approved Plan. In addition, the TIP must be fiscally constrained by estimated future revenues.

Figure 1-1: Jackson Area MPO Boundary and Urbanized Area

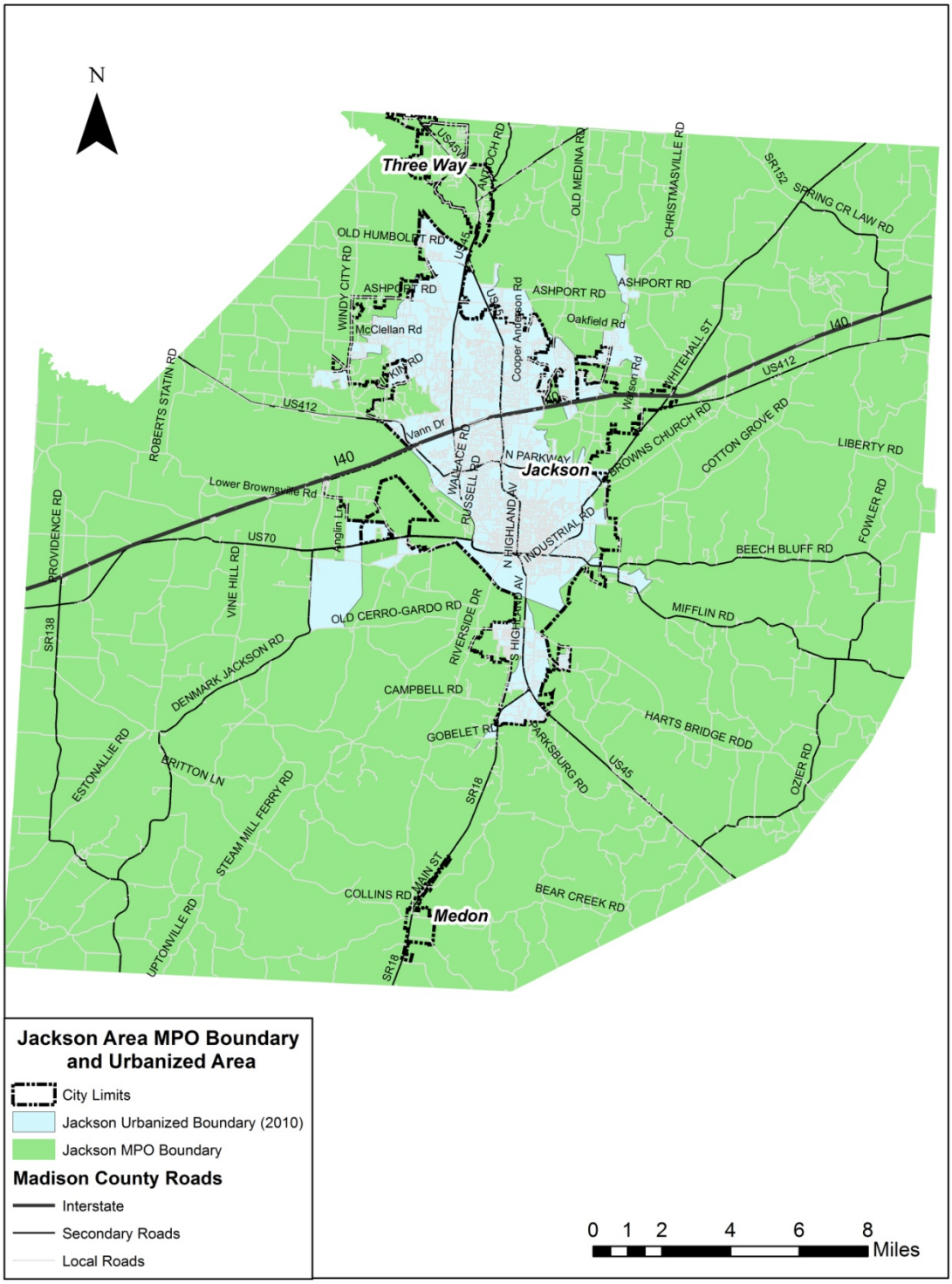
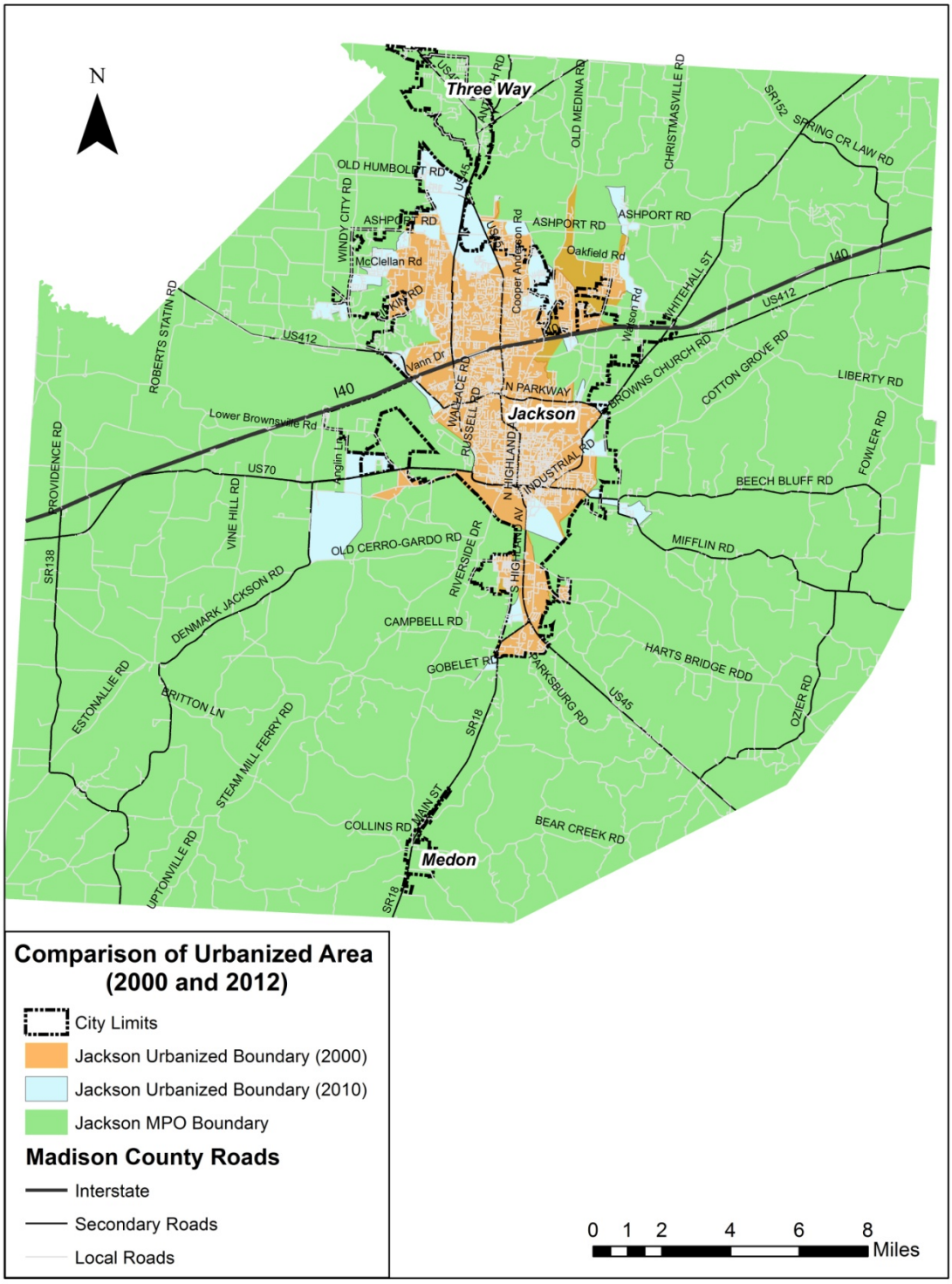


Figure 1-2: Comparison of Urbanized Area (2000 and 2012)



Unified Planning Work Program

The Unified Planning Work Program (UPWP) lists all of the transportation planning activities being carried out by the Jackson Area MPO, including MPO staff work tasks such as data collection and analysis, as well as planning studies that will be carried out in each fiscal year.

LONG RANGE TRANSPORTATION PLAN

The Long Range Transportation Plan, or "Plan", presented in this document provides a blueprint for transportation investments in the Jackson area over the next 25 years. Based on population and employment trends, land development patterns, and other factors, the Plan is intended to address travel by all modes of the transportation system – passenger vehicles, bicyclists and pedestrians, buses, trucks, trains, and airplanes.

The recommended plan is also based on community goals and objectives, federal guidance, financial capability, environmental considerations and public input. It consists of the following chapters:

- Executive Summary
- Chapter 1: Introduction
- Chapter 2: Goals and Objectives
- Chapter 3: Demographics
- Chapter 4: Roadway System
- Chapter 5: Roadway Safety and Security
- Chapter 6: Transit and Passenger Rail
- Chapter 7: Bicycle and Pedestrian
- Chapter 8: Freight and Air Transportation
- Chapter 9: Intelligent Transportation Systems
- Chapter 10: Capital Improvement Program
- Chapter 11: Title VI and Environmental Justice Assessment
- Chapter 12: Environmental Mitigation
- Chapter 13: Public Participation

Legal Basis for the Plan

Federal law requires that metropolitan areas (defined as urbanized areas with a population of greater than 50,000 people, based on the latest U.S. Census) undertake a continuing, comprehensive, and cooperative transportation planning process. The Jackson Area MPO is the governing entity that is charged with carrying out this process for the Jackson area.

The MPO Executive Board consists of chief elected officials from each of the local governments in the MPO's planning area: Jackson, Three Way, Medon, and Madison County, as well as a representative of the State of Tennessee.

Federally Required Planning Factors

The 2040 Plan fulfills the planning requirements of MAP-21 which requires that each MPO develop goals and objectives that comply with the eight planning factors listed in Table 1-1 to ensure consistency with national goals and objectives for transportation planning.

Table 1-1: MAP-21 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 the accessibility and mobility options available to people and for freight.
5. Protect and enhance the environment, promote energy conservation, improve 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.

Six Principles of Livability

In June 2009, the U.S. Department of Housing and Urban Development, U.S. Department of Transportation, and the U.S. Environmental Protection Agency joined together to form the Partnership for Sustainable Communities. This unprecedented agreement to coordinate federal housing, transportation and environmental investments, protect public health and the environment, promote equitable development, and help address the challenges of climate change enables the three agencies to work together more closely than ever before to coordinate federal policies, programs, and resources to help urban, suburban, and rural areas and regions build more sustainable communities.

In addition to the MAP-21 factors, the Jackson Area MPO has considered the Six Principles of Livability (Table 1-2) in the preparation of this Plan.

Table 1-2: Six Principles of Livability

- **Provide more transportation choices** to decrease household transportation costs, reduce our dependence on oil, improve air quality and promote public health.
- **Expand location- and energy-efficient housing choices** for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Improve economic competitiveness of neighborhoods** by giving people reliable access to employment centers, educational opportunities, services and other basic needs.
- **Target federal funding toward existing communities** – through transit-oriented, mixed-use development and land recycling – to revitalize communities, reduce public works costs, and safeguard rural landscapes.
- **Align federal policies and funding** to remove barriers to collaboration, leverage funding and increase the effectiveness of programs to plan for future growth.
- **Enhance the unique characteristics of all communities** by investing in healthy, safe and walkable neighborhoods, whether rural, urban or suburban.

Air Quality Conformity

MAP-21 continues the emphasis that was placed on the relationships among land use, air quality, and transportation (including modes other than automobiles) initiated by the Intermodal Surface Transportation Efficiency Act of 1991 and all subsequent federal transportation legislation. Under Federal metropolitan planning regulations, transportation programs are required to demonstrate conformity with the National Ambient Air Quality Standard (NAAQS) for transportation related pollutants. The Jackson Area MPO study area is currently designated attainment under the Clean Air Act, and therefore a conformity analysis is not required as part of this Long Range Transportation Plan.

Plan Adoption and Amendment Process

As part of the Plan development process, opportunities are provided for public and stakeholder input, which is an important activity in determining transportation needs and priorities, and aids in determining the ultimate recommendations of the Plan. As outlined in the Jackson Area MPO Public Participation Plan, proactive involvement of the public in all phases of the transportation planning process is encouraged.

The Jackson Area MPO technical staff guides the preparation of the Plan in coordination with the Executive Board, the Jackson Transit Authority (JTA), the McKellar-Sipes Regional Airport, and input from the State, FHWA and FTA. Although there is a formal process for the review and adoption of the Plan, the public shall always have the opportunity to suggest transportation projects eligible for inclusion in the Plan. These may be in the form of a letter, email, fax, or comment submitted via the MPO website.

After the technical staff endorses the draft Plan, copies are made available and a public hearing is scheduled to explain the plan and obtain comments and public input. After the public hearing, if any comments are received, those comments are incorporated into the final draft Plan. Once the comments have been addressed, the Jackson Area MPO makes a final endorsement of the Plan to the Executive Board.

After the endorsement by the technical staff of the final Plan draft, a notice is placed in the local newspaper of general circulation stating that copies of the final draft, as endorsed by the technical staff, are available in the City of Jackson Planning Department and on the MPO website for public review and comment.

The notice, which is published a minimum of fourteen (14) days prior to the meeting, specifies the date, time, and location of the forthcoming public hearing where the Plan will be considered by the Executive Board. During the hearing, the public is again afforded the opportunity to provide comments on the Plan. Once all public comments have been addressed and the Executive Board endorses/adopts the Plan, it is forwarded to the appropriate state and federal agencies to ensure compliance with various federal transportation planning requirements. Once compliance with these federal requirements has been determined, the plan becomes an approved document.

Amendments to the Plan must follow the same process and procedures outlined above. Adjustments, such as those that involve a change in funding source or adjustments to funding amounts, or timing, do not require a public input process.

Chapter 13 summarizes the public participation efforts that were undertaken during the development of this Plan.

Plan Implementation

Implementation of project recommendations from the Plan occurs through the programming of transportation improvements as part of the TIP. For projects within the MPO area that are federally or state funded or considered regionally significant, the MPO, in consultation with the appropriate city, county, and state transportation agency determines which projects are to be advanced from the Plan into the MPO's short-term TIP. As mentioned previously, all projects that are added to the TIP for funding and implementation must be consistent with the Plan.

Chapter 2

Goals and Objectives

INTRODUCTION

One of the first steps in the Plan process is the establishment of a purpose. Establishing a clear and well-defined purpose for the Plan ensures that the overall goals and objectives, as well as the resulting transportation projects are the result of a comprehensive, cooperative, and continuing transportation planning program and process.

The purpose of the Jackson Area MPO Plan is:

- To formally identify and coordinate the investments of the various agencies which provide transportation services in the Jackson area, including local governments, the Jackson Transit Authority, Southwest Human Resource Agency, and McKellar-Sipes Regional Airport;
- To identify the projects and programs needed to provide an efficient, effective and functional transportation system to serve all persons in the Jackson area;
- To coordinate land use and transportation activities to ensure functional efficiency and a compatible relationship; and
- To support and encourage private enterprise participation in the development and maintenance of an efficient, effective regional transportation system, in part by providing a proposed schedule for transportation improvements with which private entities can coordinate their investments.

GOALS AND OBJECTIVES

The goals and objectives of the 2040 Plan are listed in Table 2-1. Based on the goals and objectives outlined in the previous 2035 Plan, the goals and objectives outlined in this plan are intended to facilitate the development, management, and operation of an integrated, intermodal transportation system that enables the safe, efficient, and economical movement of people and goods.

Table 2-1: 2040 PLAN Goals and Objectives

Goal I: Manage and Operate an Efficient Transportation System

Manage and maintain a multimodal transportation system to move people and goods in the most effective and efficient manner.

MPO Objectives

A. Select and implement projects based on need, cost effectiveness, and the established goals and objectives.
B. Encourage and support local access management programs that are designed to protect the integrity of the existing roadway network.
C. Ensure open channels for truck movement by reducing traffic congestion and providing alternate truck routes.

D. Implement traffic management techniques that increase the capacity of the transportation system through traffic operations, ride sharing, transit, and coordinated signals.

MAP-21 Planning Factors Addressed

- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.

Goal II: Promote and Encourage Economic Development

Identify transportation projects that support economic growth and strengthen the local economy.

MPO Objectives

A. Increase accessibility to commercial and industrial areas for freight movement.
B. Provide connections between residential areas and employment centers.
C. Provide improved access to commercial areas and tourist destinations.

MAP-21 Planning Factors Addressed

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the accessibility and mobility options available to people and for freight.
- Protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.

Goal III: Support Environmental Quality and Livability Principles

Develop a transportation system that preserves and enhances the natural environment and improves the area's livability.

MPO Objectives

A. Encourage measures that reduce the distance and time that residents and employees must travel in order to carry out their daily activities, as well as reducing the number of trips they must make, through the use of transit and mixed land use patterns that result in employment and shopping opportunities closer to home.
B. Encourage a "Complete Streets" philosophy that streets should balance the needs of multiple users, not only motorists but also transit riders, bicyclists, and pedestrians.

MAP-21 Planning Factors Addressed

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Protect and enhance the environment, promote energy conservation, improve 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.
- Emphasize the preservation of the existing transportation system.

Goal IV: Support Multi-modal and Mobility Needs

Develop a transportation system that enhances connectivity and provides an opportunity for a choice of mode.

MPO Objectives

A. Incorporate sidewalks and bikeways as part of new roadway projects.
B. Encourage the development of sidewalks, bikeways, and greenways.
C. Provide transit, sidewalk, and bikeway connections between residential, commercial, and recreational areas.
D. Encourage a "Complete Streets" philosophy that streets should balance the needs of multiple users, not only motorists but also transit riders, bicyclists, and pedestrians.

MAP-21 Planning Factors Addressed

- Increase the safety of the transportation system for motorized and non-motorized users.
- Protect and enhance the environment, promote energy conservation, improve 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.

Goal V: Develop a Safe and Secure Transportation System

Develop a transportation system for the movement of people and goods that is safe and secure.

MPO Objectives

A. Identify projects and programs to reduce transportation related crashes, injuries, and fatalities.
B. Identify projects and programs to minimize vehicle, pedestrian, bicycle, and rail conflicts.
C. Promote safety and security in the planning design, and construction of roadways, bicycle and pedestrian connections, and other modes.
D. Work cooperatively with federal, state, and local agencies to develop a transportation system that is secure for all users.

MAP-21 Planning Factors Addressed

- 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.
- Promote efficient system management and operation.

Chapter 3

Demographics

INTRODUCTION

Located approximately 85 miles east of Memphis and 130 miles west of Nashville, the City of Jackson and Madison County are considered the hub of agricultural and industrial production in western Tennessee. Jackson serves as the county seat for Madison County, and as an employment, retail, banking, medical and entertainment center for residents of the surrounding counties.

Transportation demand in and around Madison County is directly related to the population, households, and employment patterns that characterize the area. In order to understand current and future transportation needs of the community, the evaluation of demographic, socio-economic, and commuting characteristics is an important part of developing the long-range transportation plan.

CURRENT POPULATION: 2010

In 2010, the City of Jackson had a population of 65,211 people. In comparison, the population for the communities of Medon, Three Way, the City of Jackson, Madison County and the State of Tennessee are shown in Table 3-1. Between 2000 and 2010, Jackson experienced an 8.5% percent increase in population, as compared to 6.6% percent for Madison County and 10.4% percent in Tennessee as a whole. Tables 3-2 through 3-8 compare additional information about the populations of Jackson, Madison County, and the State of Tennessee, including race, ethnicity, gender, median income, language spoken, disability, and low income.

Table 3-1: Population

	2000	2010	% Change 2000-2010
Medon	191	178	-6.8%
Three Way	1,375	1,709	24.3%
City of Jackson	59,643	65,211	8.5%
Madison County	91,837	98,294	6.6%
State of Tennessee	5,689,283	6,346,105	10.4%

Table 3-2: Ethnicity Hispanic/Latino			
	2000	**2010**	**% Change 2000-2010**
City of Jackson	1,289	2,430	88.5%
Madison County	1,572	3,071	95.4%
State of Tennessee	123,838	270,121	118.1%
Data taken from 2000 Census Data File QT-P3 and 2010 Census Data FileQT-P63.			

Table 3-3: Gender						
	2000		**2010**		**% Change 2000-2010**	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
City of Jackson	27,822	31,821	30,149	35,062	8.4%	10.2%
Madison County	44,035	47,802	46,648	51,646	6%	8%
State of Tennessee	2,770,275	2,919,008	3,093,504	3,252,601	11.7%	11.4%
Data taken from 2000 and 2010 Census Data File P12.						

Table 3-4: Median Income			
	2005	**2010**	**% Change 2000-2010**
City of Jackson	$35,168	$35,456	.8%
Madison County	$39,743	$40,178	1.1%
State of Tennessee	$42,943	$43,314	.9%
Data taken from 2005-2009 ACS 5 Year Estimate File S1903 and 2006-2010 ACS 5 Year Estimate File S1903.			

Table 3-5: People Who Speak a Language Other than English at Home			
	2005	**2010**	**% Change 2000-2010**
City of Jackson	3,076	3,310	7.6%
Madison County	3,817	4,124	8%
State of Tennessee	338,683	362,224	7%
Data taken from Characteristics of People by Language Spoken at Home (2005-2009 ACS 5 Year Estimate File S1603 and 2006-2010 ACS 5 Year Estimate File S1603.			

Table 3-6: Disability			
	2008	**2011**	**% Change 2008-2011**
City of Jackson	17%	15.4%	-0.9%
Madison County	16.9%	15.1%	-4.2%
State of Tennessee	16.3%	15.1%	3.7%

Data taken from Sex By Age By Disability Status (2008-2010 ACS 3 Year Estimate Files and 2011 ACS 1 Year Estimate File B18101. Disability is defined as those individuals with hearing, vision, cognitive, ambulatory, or self-care difficulty.

Table 3-7: Low Income			
	2005	**2010**	**% Change 2005-2010**
City of Jackson	23%	22.9%	7.2%
Madison County	18.7%	18.6%	1.5%
State of Tennessee	15.9%	16.5%	6.7%

Data taken for Poverty Status on the Past 12 months (2005-2007 ACS 3 Year Estimate File S1701 and 2006-2010 ACS 5 Year Estimate File S1701).

Table 3-8: Race

	City of Jackson				Madison County				State of Tennessee			
	2000		2010		2000		2010		2000		2010	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Hispanic	1,289	2.2%	2,592	4.0%	1,572	1.7%	3,306	3.4%	123,838	2.2%	290,059	4.6%
White	32,883	55.1%	32,092	49.2%	59,877	65.2%	58,226	59.2%	4,563,310	80.2%	4,921,948	77.6%
Black	25,091	42.1%	29,802	45.7%	29,810	32.5%	35,636	36.3%	932,809	16.4%	1,057,315	16.7%
American Indian and Alaska Native	92	0.2%	103	.2%	150	.2%	184	0.2%	15,152	0.3%	19,994	0.3%
Asian	470	0.8%	757	1.2%	578	0.6%	918	0.9%	56,662	1%	91,242	1.4%
Native Hawaiian and Other Pacific Islander	6	0.0%	19	0%	13	0.0%	31	0%	2,205	0%	3,642	0.1%
Some Other Race	1,101	1.9%	2,438	3.8%	1,409	1.6%	3,299	3.4%	119,145	2.1%	251,964	3.9%
Total Minority	28,049	47.2%	35,711	54.9%	33,532	36.6%	43,374	44.2%	1,249,811	20.9%	1,714,216	27%

Data taken from 2000 and 2010 Census Data File QT-P3.

CURRENT HOUSEHOLDS: 2010

As shown in Table 3-9, the number of households in the City of Jackson, Madison County and the State of Tennessee increased between 2000 and 2010, however; in each case the number of family households grew at a slower rate than nonfamily households (a person living alone or sharing a home exclusively with unrelated people, for example, roommates or unmarried partners). The tables also show that the average household size in the City of Jackson is slightly less than that of either Madison County or the State of Tennessee. Although these figures don't show much change over the ten year timeframe, nationally there is a trend toward smaller household sizes.

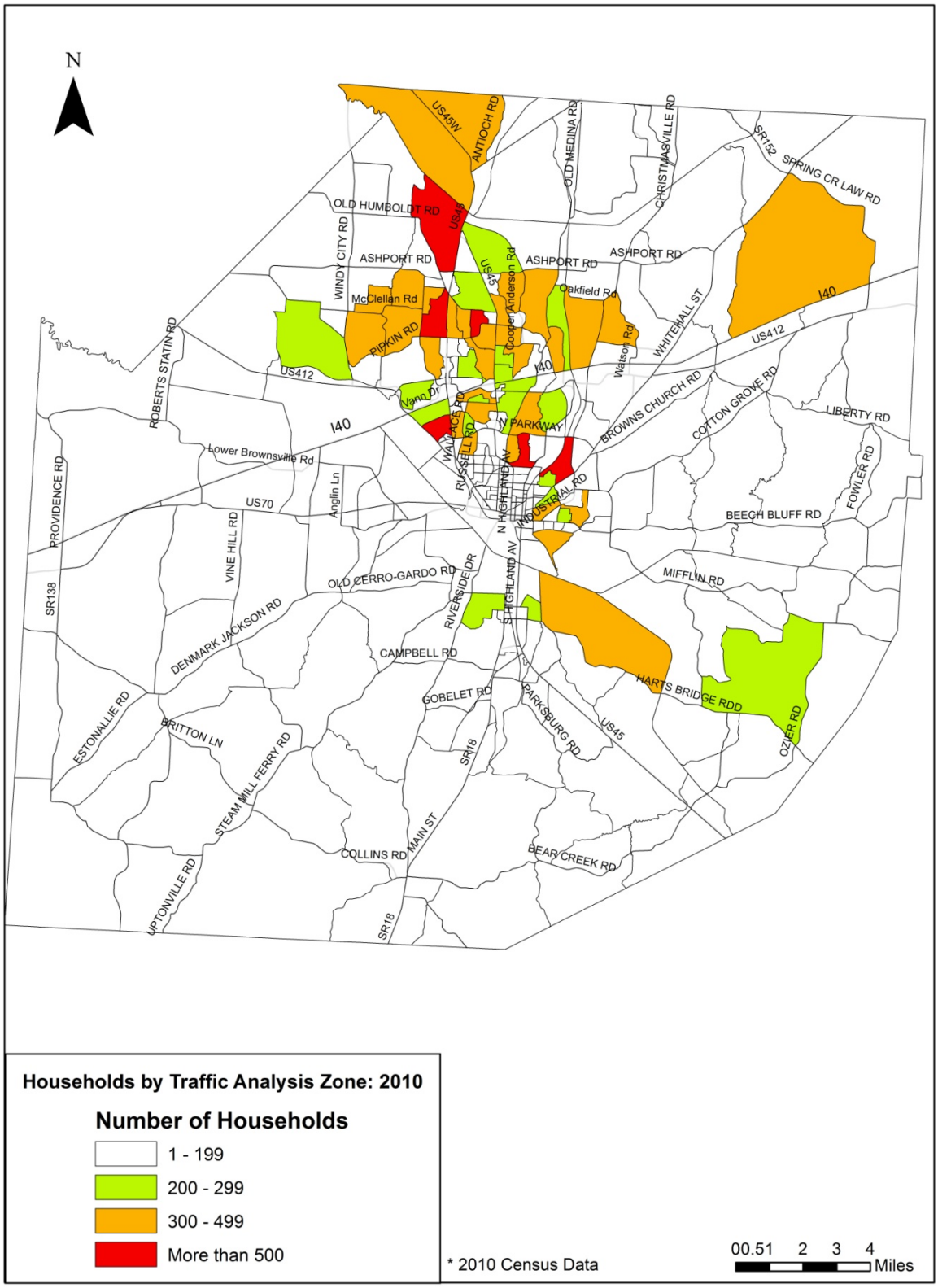
Table 3-9: Household Comparison

Households by Type (Jackson)				
Type of Household	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
Family Households	15,141	64.4%	15,951	63.3%
Nonfamily Households	8,362	35.6%	9,240	36.7%
TOTALS	**23,503**	**100.0%**	**25,191**	**100.0%**
Average Household Size (Persons)	2.4		2.42	

Households by Type (Madison County)				
Type of Household	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
Family Households	24,652	69.3%	25,628	67.3%
Nonfamily Households	10,900	30.7%	12,445	32.7%
TOTALS	**35,552**	**100.0%**	**38,073**	**100.0%**
Average Household Size (Persons)	2.49		2.47	

Households by Type (Tennessee)				
Type of Household	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
Family Households	1,547,835	69.3%	1,676,177	67.3%
Nonfamily Households	685,070	30.7%	814,375	32.7%
TOTALS	**2,232,905**	**100.0%**	**2,490,552**	**100.0%**
Average Household Size (Persons)	2.48		2.48	

Figure 3-1: Households by Traffic Analysis Zone: 2010



CURRENT VEHICLES PER HOUSEHOLD: 2010

As shown in Table 3-10, the number of households with no vehicles in the City of Jackson declined between 2000 and 2010. This decline was reflected in Madison County and the State of Tennessee as well. The City of Jackson does have fewer households with three or more vehicles, which is reflective of the slightly smaller household size in comparison to Madison County and the State of Tennessee.

Table 3-10: Vehicles per Household Comparison

Average Vehicles Per Household (Jackson)				
Number of Available Vehicles	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
No Vehicles	2,950	12.5%	2,350	9.4%
1 Vehicle	9,120	38.8%	9,859	39.5%
2 Vehicles	8,423	35.8%	9,033	36.2%
3 or More Vehicles	3,026	12.9%	3,719	14.9%
TOTALS	**23,519**	**100.0%**	**24,961**	**100.0%**

Average Vehicles Per Household (Madison County)				
Number of Available Vehicles	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
No Vehicles	3,503	9.9%	2,848	7.7%
1 Vehicle	11,378	32.0%	12,793	34.6%
2 Vehicles	14,066	39.6%	13,898	37.5%
3 or More Vehicles	6,605	18.6%	7,481	20.2%
TOTALS	**35,552**	**100.0%**	**37,020**	**100.0%**

Average Vehicles Per Household (Tennessee)				
Number of Available Vehicles	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
No Vehicles	172,002	7.7%	150,812	6.2%
1 Vehicle	721,280	32.3%	789,445	32.3%
2 Vehicles	890,376	39.9%	945,514	38.7%
3 or More Vehicles	449,247	20.1%	557,704	22.8%
TOTALS	**2,232,905**	**100.0%**	**2,443,475**	**100.0%**

COMMUTING TO WORK: 2010

As shown in Table 3-11, the method of commuting for people in the City of Jackson, Madison County, and the State of Tennessee are all very similar. In each instance, there is a very high percentage of persons who drive to work alone with the second highest method of commuting (carpool) a distant second. The high number of people who commute work in their personal vehicle place a large emphasis on maintaining and improving the roadway network in the Jackson area.

Table 3-11: Commuting to Work Comparison

Commuting to Work (Jackson)				
Method of Commuting	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
Drove Alone (Car, Truck, or Van)	21,486	81.8%	23,730	86.1%
Carpooled (Car, Truck, or Van)	3,142	12.0%	2,145	7.8%
Public Transportation (excluding taxicab)	342	1.3%	264	1.0%
Walked	565	2.2%	509	1.8%
Other Means	220	0.8%	192	0.7%
Worked at Home	513	2.0%	729	2.6%
TOTALS	**26,268**	**100.0%**	**27,569**	**100.0%**
Mean Travel Time to Work (minutes)	17.5		18.1	

Commuting to Work (Madison County)				
Method of Commuting	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
Drove Alone (Car, Truck, or Van)	36,082	84.1%	37,239	86.8%
Carpooled (Car, Truck, or Van)	4,575	10.7%	3,297	7.7%
Public Transportation (excluding taxicab)	348	0.8%	365	0.9%
Walked	669	1.6%	555	1.3%
Other Means	376	0.9%	350	0.8%
Worked at Home	831	1.9%	1082	2.5%
TOTALS	**42,881**	**100.0%**	**42,888**	**100.0%**
Mean Travel Time to Work (minutes)	19		19.6	

Commuting to Work (Tennessee)				
Method of Commuting	Census Year			
	2000		2010	
	Number	Percent	Number	Percent
Drove Alone (Car, Truck, or Van)	2,140,377	81.7%	2,290,536	83.2%
Carpooled (Car, Truck, or Van)	328,321	12.5%	280,686	10.2%
Public Transportation (excluding taxicab)	21,168	0.8%	21,318	0.8%
Walked	39,689	1.5%	38,626	1.4%
Other Means	21,351	0.8%	30,121	1.1%
Worked at Home	67,498	2.6%	92,297	3.4%
TOTALS	**2,618,404**	**100.0%**	**2,753,584**	**100.0%**
Mean Travel Time to Work (minutes)	24.5		23.9	

CURRENT EMPLOYMENT: 2010

The largest employment sector in the Jackson-Madison County area is Services (39%), followed by Public Administration (16%) and Manufacturing (15%). In March 2012, Jackson had an unemployment rate of 9.1% and Madison County had an unemployment rate of 8.4% percent, both of which are above the statewide average of 7.9%.

As can be seen in Table 3-12, the Construction and Manufacturing sectors lost jobs statewide as well as in Madison County. The Wholesale Trade sector lost jobs statewide, but slight gains were seen in Madison County. The Retail Trade sector lost jobs statewide as well as in Madison County. The Healthcare, Lodging, and Public Administration sectors all gained jobs statewide as well as in Madison County. Other small industry sectors showed no significant change in to small gains in the number of jobs.

Table 3-12: Employment Comparison

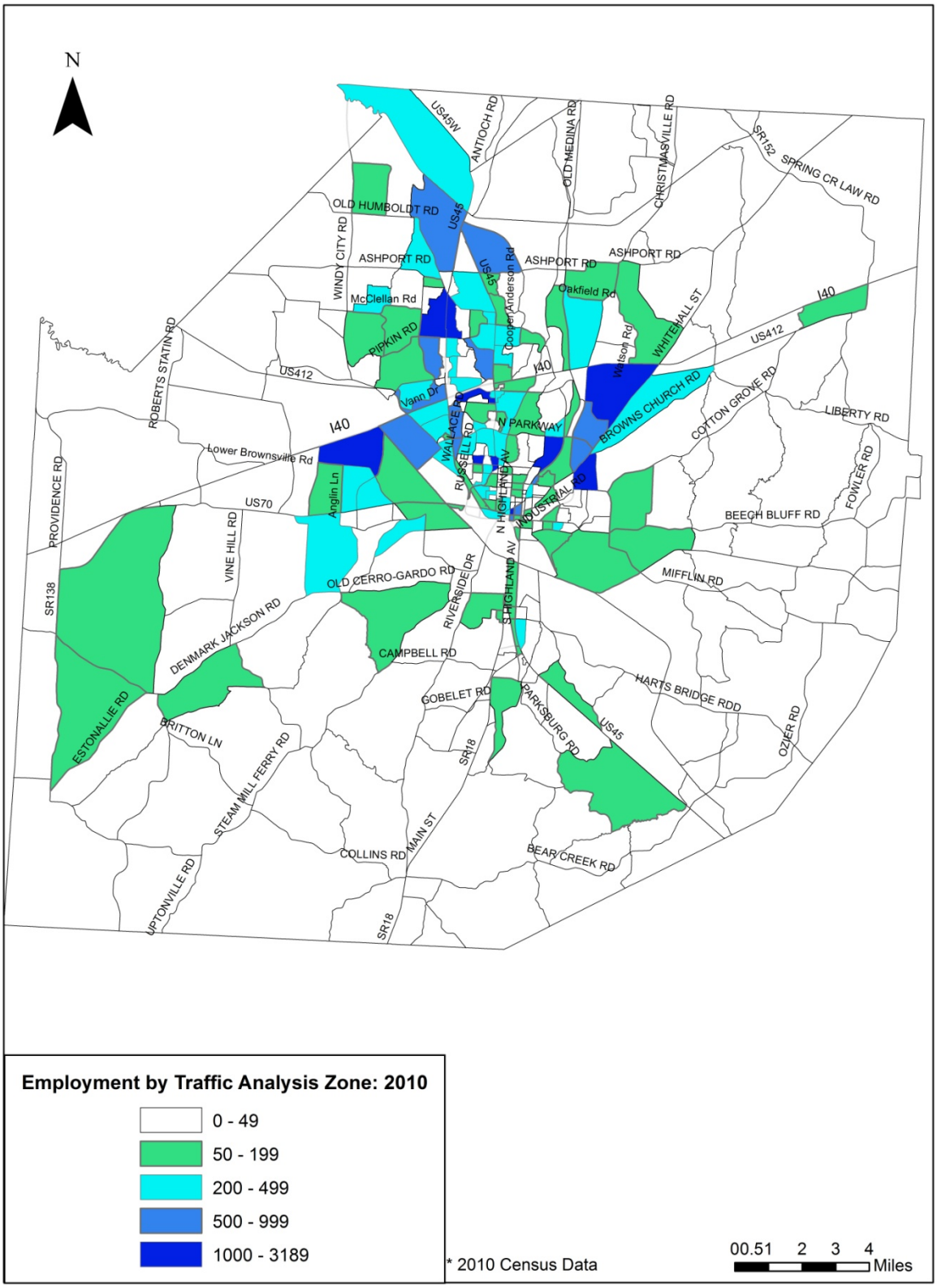
Sector	2005		2010		2005-2010	
	# of jobs	% of total jobs	# of jobs	% of total jobs	# Change	% Change
Agriculture	440	0.7%	1,030	1.6%	590	57%
Mining	50	0.1%	196	0.3%	146	74%
Construction	4,430	7.4%	2,883	4.3%	(1,547)	-54%
Manufacturing	13,150	21.9%	9,866	14.8%	(3,284)	-33%
Transportation	3,296	5.5%	1,523	2.3%	(1,773)	-116%
Wholesale	4,120	6.9%	2,671	4.0%	(1,449)	-54%
Retail	11,270	18.8%	7,429	11.2%	(3,841)	-52%
Financial	3,390	5.7%	4,052	6.1%	662	16%
Services	17,808	29.7%	25,837	38.9%	8,029	31%
Public Administration	1,981	3.3%	10,961	16.5%	8,980	82%
Total Employment	**59,935**		**66,448**		**6,513**	**10%**

According to the Jackson Area Chamber of Commerce, the major employers in the Jackson-Madison area in terms of total employment and manufacturing/distribution employment are:

Table 3-13: Major Employers

Top 10 Overall Employers	Top 10 Manufacturing/Distribution Employers
West Tennessee Healthcare	Delta Faucet Company
Jackson-Madison County School System	Proctor and Gamble Manufacturing
Apria Healthcare	Pinnacle Foods Group
H & M Company, Inc.	Stanley Black and Decker
Delta Faucet Company	TBDN Tennessee Company
Proctor and Gamble Manufacturing	Gerdau
Union University	Armstrong Hardwood Flooring Company
City of Jackson	Perseus Distribution Services
Pinnacle Foods Group	UGN
Regional Hospital of Jackson	Duro Bag

Figure 3-2: Employment by Traffic Analysis Zone: 2010



HIGHER EDUCATION

Jackson's four major colleges and universities and smaller educational institutions attract students and faculty from throughout West Tennessee and generate a sizeable amount of traffic throughout the City of Jackson and Madison County.

Jackson State Community College

Jackson State Community College was established as the first community college in West Tennessee in 1967. With about 4,000 students, Jackson State has the largest enrollment of any college in Jackson. It is located on North Parkway, between downtown Jackson and Interstate 40. Jackson State serves a 14-county area of West Tennessee and does not provide any on-campus housing, which results in students driving to and from campus each day or evening for classes.

Union University

Founded in 1823, Union University is a private, four-year liberal arts institution with approximately 3,900 students. The University is located on the existing US-45 Bypass, north of Interstate 40.

Lane College

Founded in 1882 by the Christian Methodist Episcopal Church, Lane College is a four-year, liberal arts institution enrolling approximately 2,200 students. Lane College is a historically African-American institution located just northeast of downtown Jackson on Lane Avenue.

University of Memphis Lambuth

Lambuth University, the smallest of Jackson's four major schools with 900 students and is located just northwest of downtown Jackson on Lambuth Boulevard. Lambuth University was founded in December 1843 as the Memphis Conference Female Institute. Due to dwindling financial resources Lambuth was forced to cease independent operation in May 2011. However, recognizing the important role the school had played in higher education in West Tennessee, civic leaders and government officials worked to maintain the Lambuth campus as a part of the University of Memphis, a public four-year research university that is part of the Tennessee Board of Regents system. In August 2011 the University began offering classes at the Lambuth campus in Jackson.

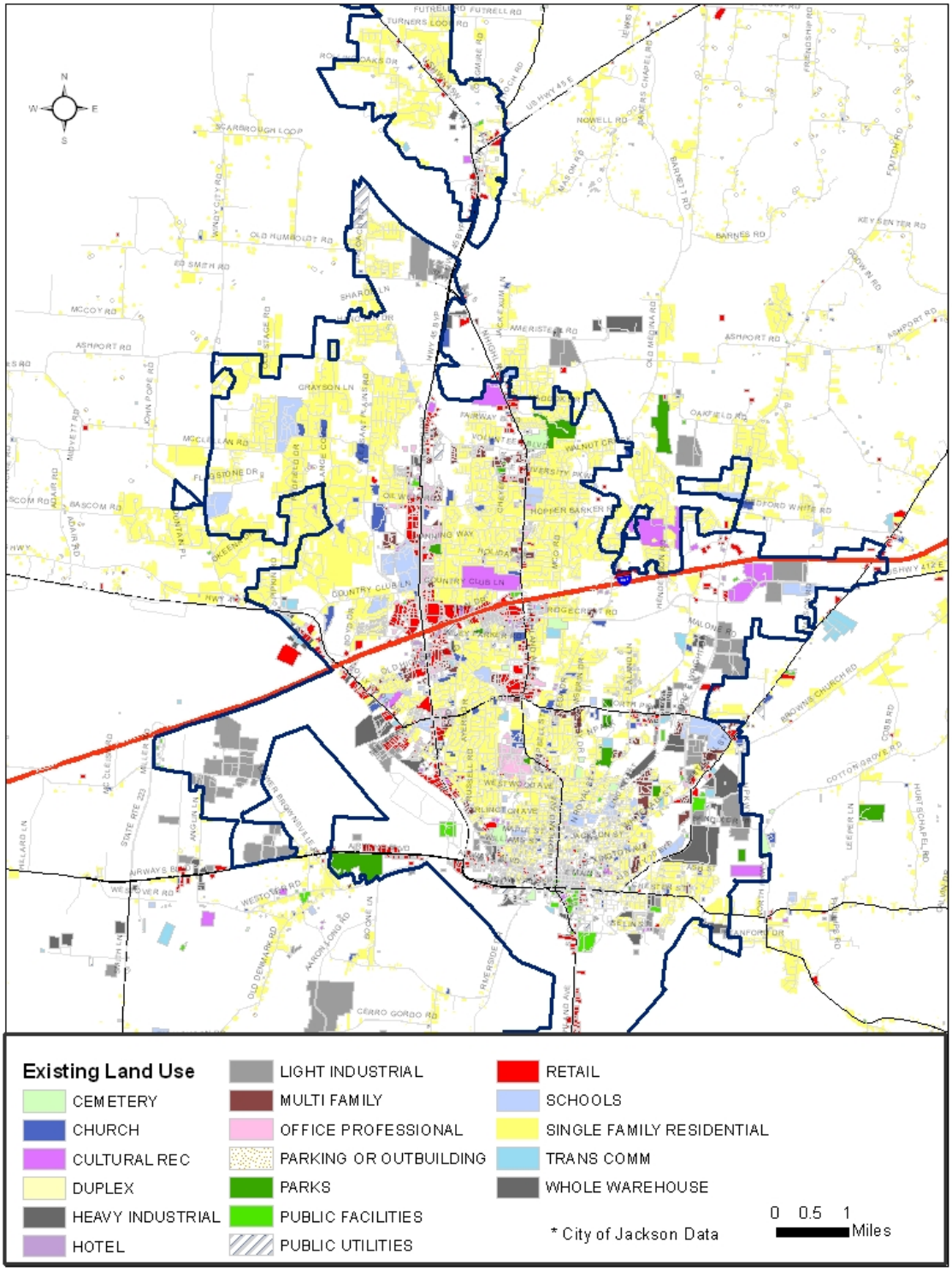
In addition to the four major colleges and universities, Jackson is home to the West Tennessee Business College, a 270-student technical school located on the existing US-45 Bypass just south of Hollywood Drive and the Tennessee Technology Center at Jackson which offers 17 specific fields of study in health care, business assistance and other light and heavy industry occupations. The University of Tennessee also operates a major agricultural research station and associated technology facilities on Airways Boulevard, west of downtown Jackson and abutting the west side of the US 45 Bypass through this area.

CURRENT LAND USE: 2010

Retail and service centers in the City of Jackson have shifted away from the downtown area since completion of the existing US-45 Bypass in 1967. US-45 is the major north-south route through Jackson and runs through the heart of downtown. The US 45 Bypass was intended to alleviate congestion along US-45 by routing some traffic around the downtown area. At the time of construction, downtown served as Jackson's retail and commercial core. The terminus of the existing bypass was located in the downtown area to provide access to this commercial core, and resulted in the bypass serving both local and through traffic.

Rapid development has resulted in a host of auto-oriented, commercial development along the US-45 Bypass and US-45 south of Jackson. Much of the traffic along the existing US-45 Bypass and US-45 is generated externally and the US-45 is the primary commuter route for residents of Chester, Hardeman and McNairy counties. According to US Census data compiled by the Jackson Area Chamber of Commerce, almost 5,000 residents of the counties south of Jackson make a daily commute into Jackson for work. Residents of the southern portion of Madison County also use US-45 to reach Jackson retail and services, but unlike through traffic, these vehicles typically move through the downtown area to reach their destinations, rather than taking the existing US-45 Bypass. Figure 3-3 shows the current land use patterns.

Figure 3-3: Land Use: 2010



Future Population and Employment: 2040

INTRODUCTION

Over the 30 year horizon of the LRTP, future growth in both population and employment will lead to changes in travel patterns to, from, through, and within the MPO area. Understanding future development patterns is key to forecasting the potential impacts on the transportation network. The forecasted future population and employment growth is included in the transportation travel demand model and the process for the projections below is described in detail in Appendix A.

FUTURE POPULATION GROWTH: 2040

Between 2010 and 2040, the population of the MPO area is expected to grow from approximately 98,300 people in 2010 to nearly 109,500 people in 2040. This projected growth of 11.4 % in population (Table 3-14) will impact travel patterns and increase transportation needs in the MPO area.

Table 3-14: Projected Population Growth

	2010	2040	Change	% Change
Population	98,294	109,465	11,171	11.4%

In order to forecast the population growth for the MPO area, the number of existing (2010) and future (2040) households were allocated to the TAZs. The allocation process considered existing concentrations of population/ households as well as areas for potential growth. As can be seen in Figures 3-4 and 3-4a, much of the population growth is projected to occur on the north side of the city, particularly north of Interstate 40, in the northwest area recently annexed by the City of Jackson, and within a broad corridor heading north along the US-45 Bypass to the Town of Three Way.

Figure 3-4: Projected Household Growth by Traffic Analysis Zone: 2010 - 2040

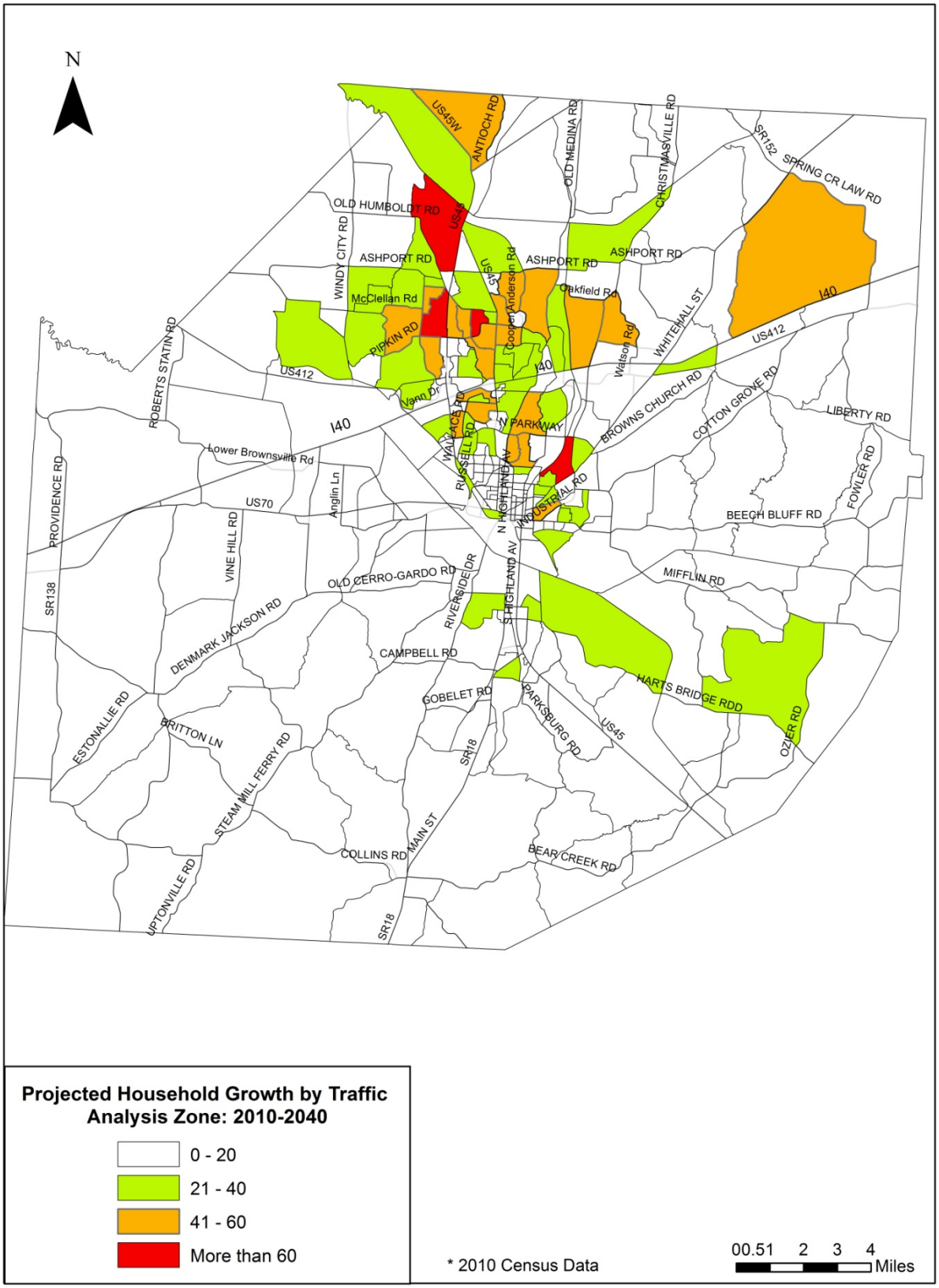
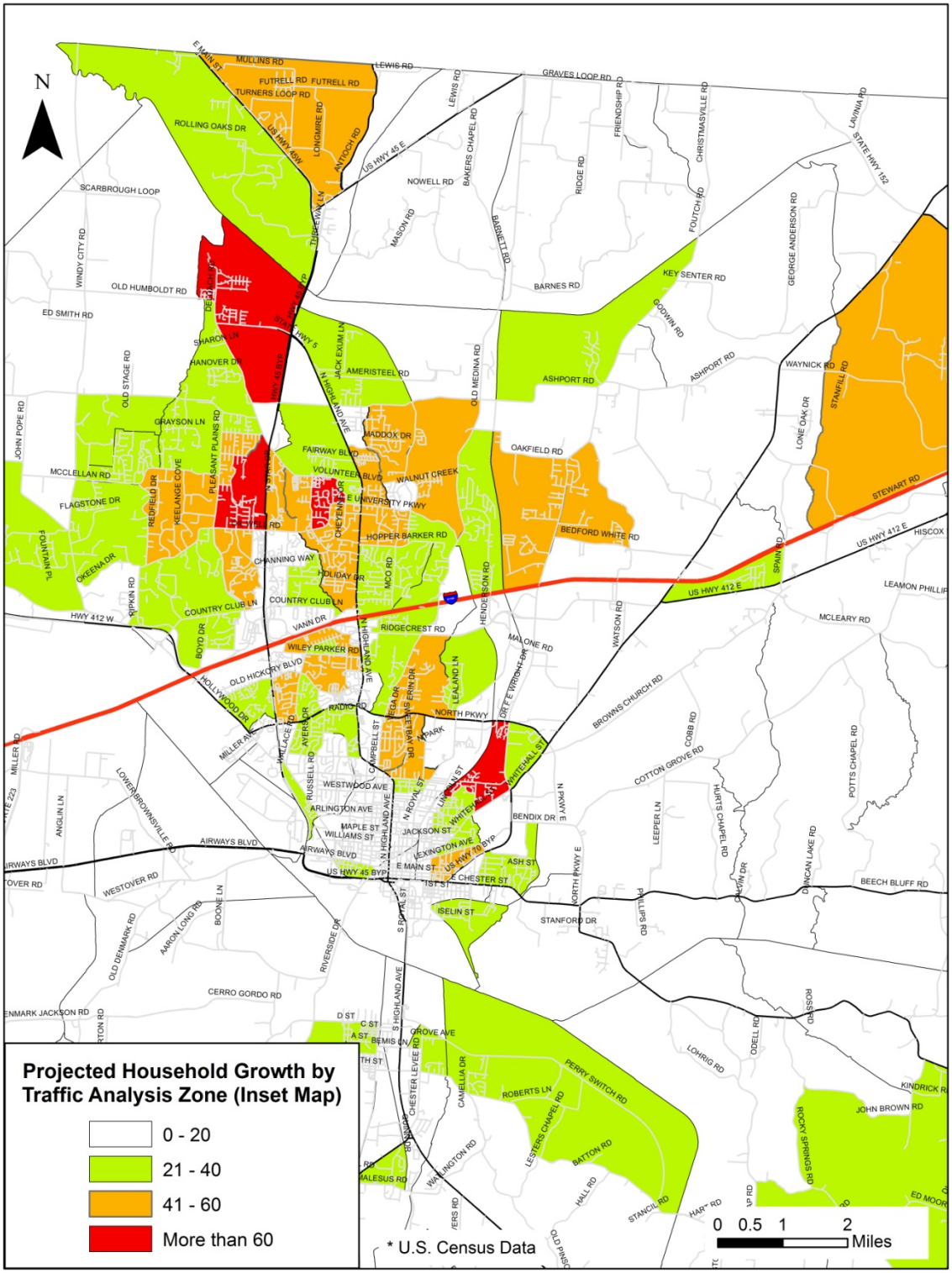


Figure 3-4a: Projected Household Growth by Traffic Analysis Zone (Inset Map)



FUTURE EMPLOYMENT GROWTH: 2040

Between 2010 and 2040, employment is expected to grow in the MPO area from approximately 66,500 in 2010 to nearly 99,500 jobs in 2040. This estimate is based on Woods & Poole projections (2011) and was approved by TDOT planning staff. This projected growth of 43.7% in employment (Table 3-15) will change the travel demand on area roads and have a significant impact on travel patterns and transportation needs. As seen in Table 3-15, future employment in the Jackson region is expected to be consistent with the nationwide shift from a manufacturing based economy to more service sector jobs. This shift will impact the hours during which people travel, and will likely drive a much higher percentage of traffic to areas of the city that are zoned for commercial, office and institutional establishments.

Table 3-15: Projected Employment Growth: 2010 – 2040

Sector	2010	2040	Change	% Change
Agricultural Services	1,030	1,065	35	3.4%
Mining	196	224	28	14.3%
Construction	2,883	3,979	1,096	38.0%
Manufacturing	9,866	10,338	472	4.8%
Transportation	1,523	1,534	11	0.7%
Wholesale	2,671	5,404	2,733	102.3%
Retail	7,429	9,092	1,663	22.4%
Financial	4,052	5,055	1,003	24.8%
Services	25,837	42,522	16,685	64.6%
Public Administration	10,961	16,242	962	3.4%
TOTAL	66,448	95,455	29,007	43.7%

In order to forecast the employment growth for the MPO area, the number of existing (2010) and future (2040) jobs were allocated to the TAZs. Similar to the population and households, the employment was allocated by sector based on 2010 employment distributions as well as other known growth areas. As can be seen in Figures 3-5 and 3-5a, much of the new employment growth is expected to be concentrated in the I-40 corridor. Recognizing that the majority of new jobs created will be in the services sector, strong employment growth is also projected for the areas along the US-45 Bypass and US-45/North Highland Avenue on the north side of the interstate.

Figure 3-5: Projected Employment Growth by Traffic Analysis Zone: 2010 - 2040

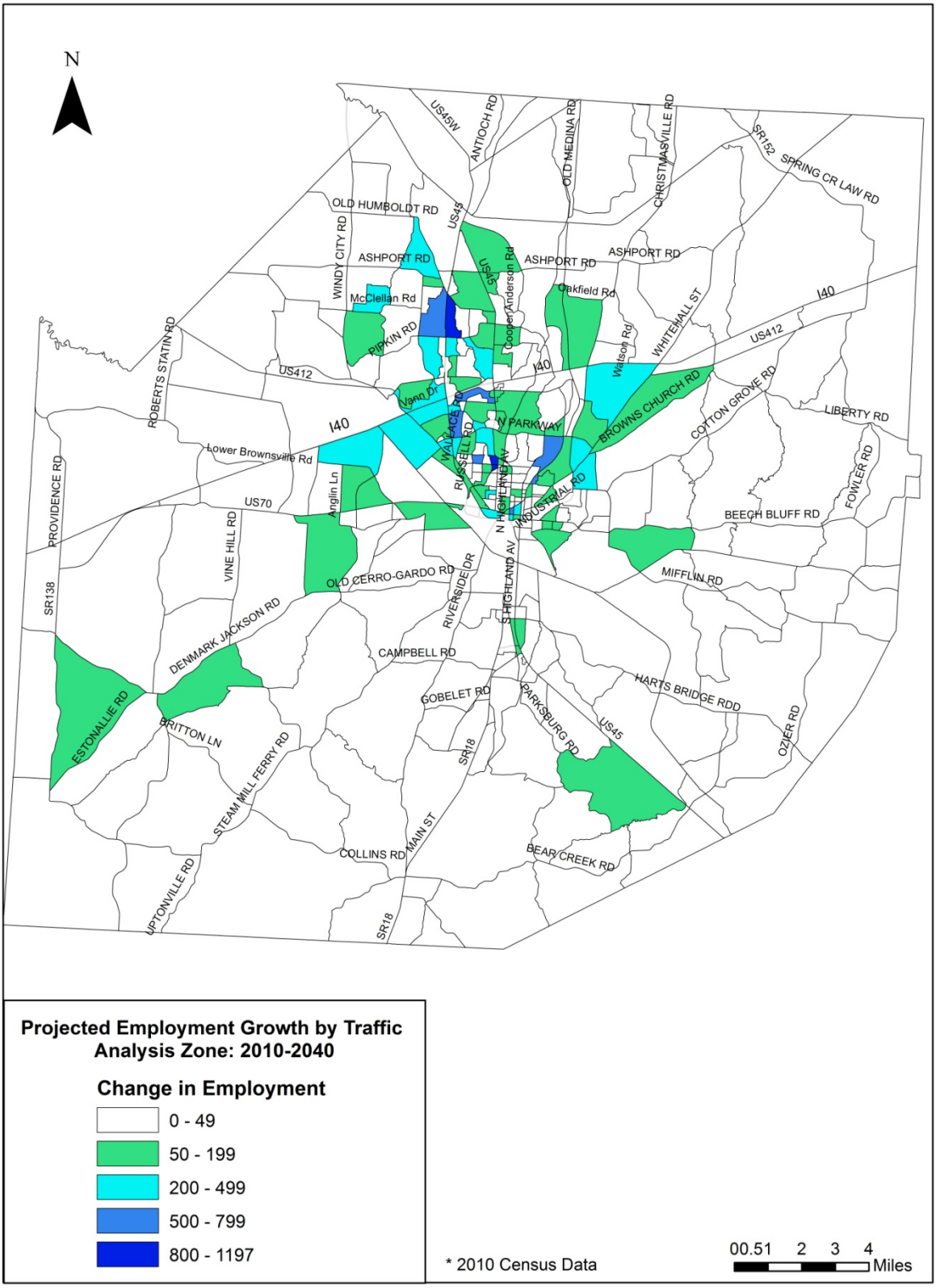
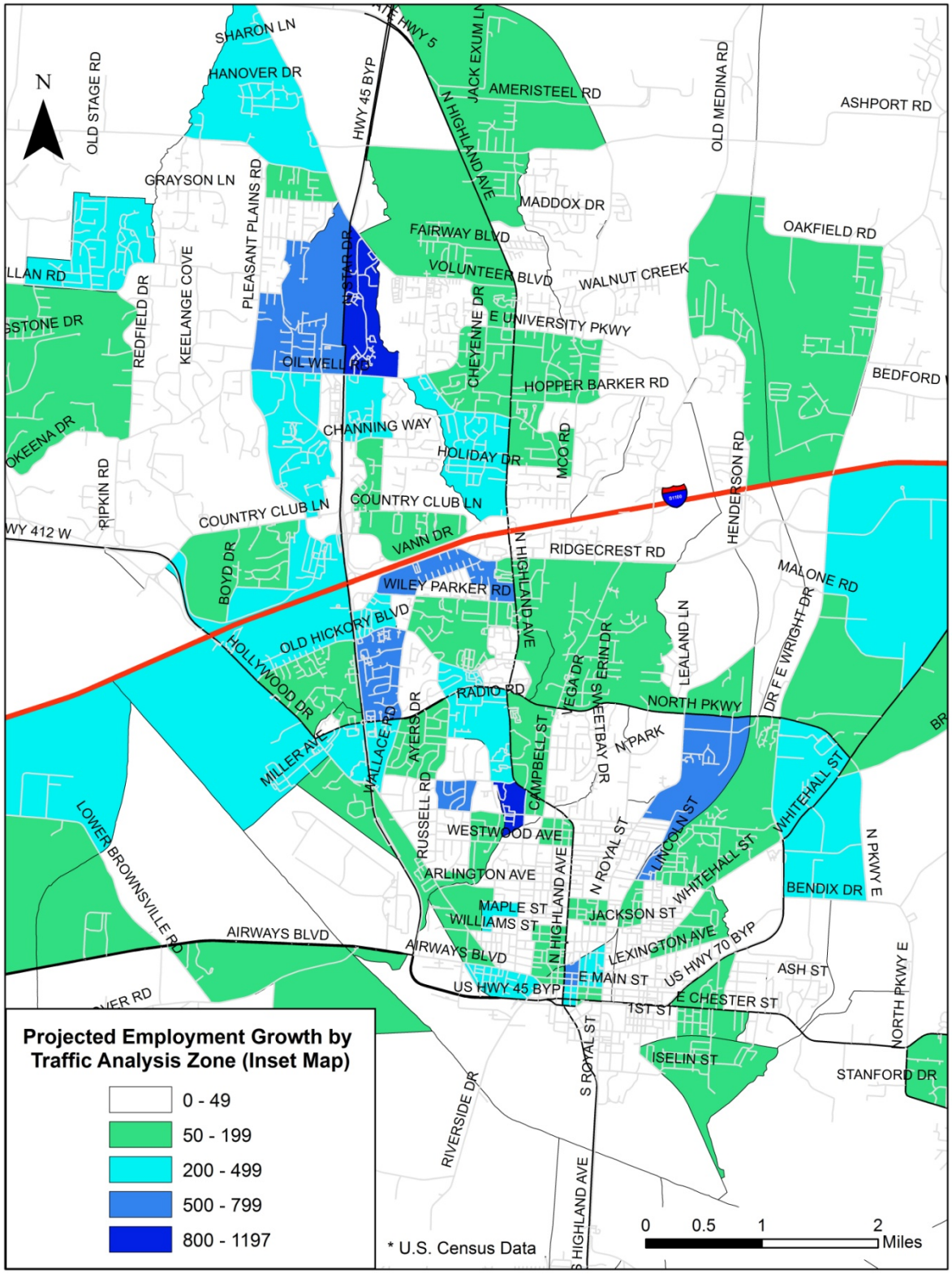
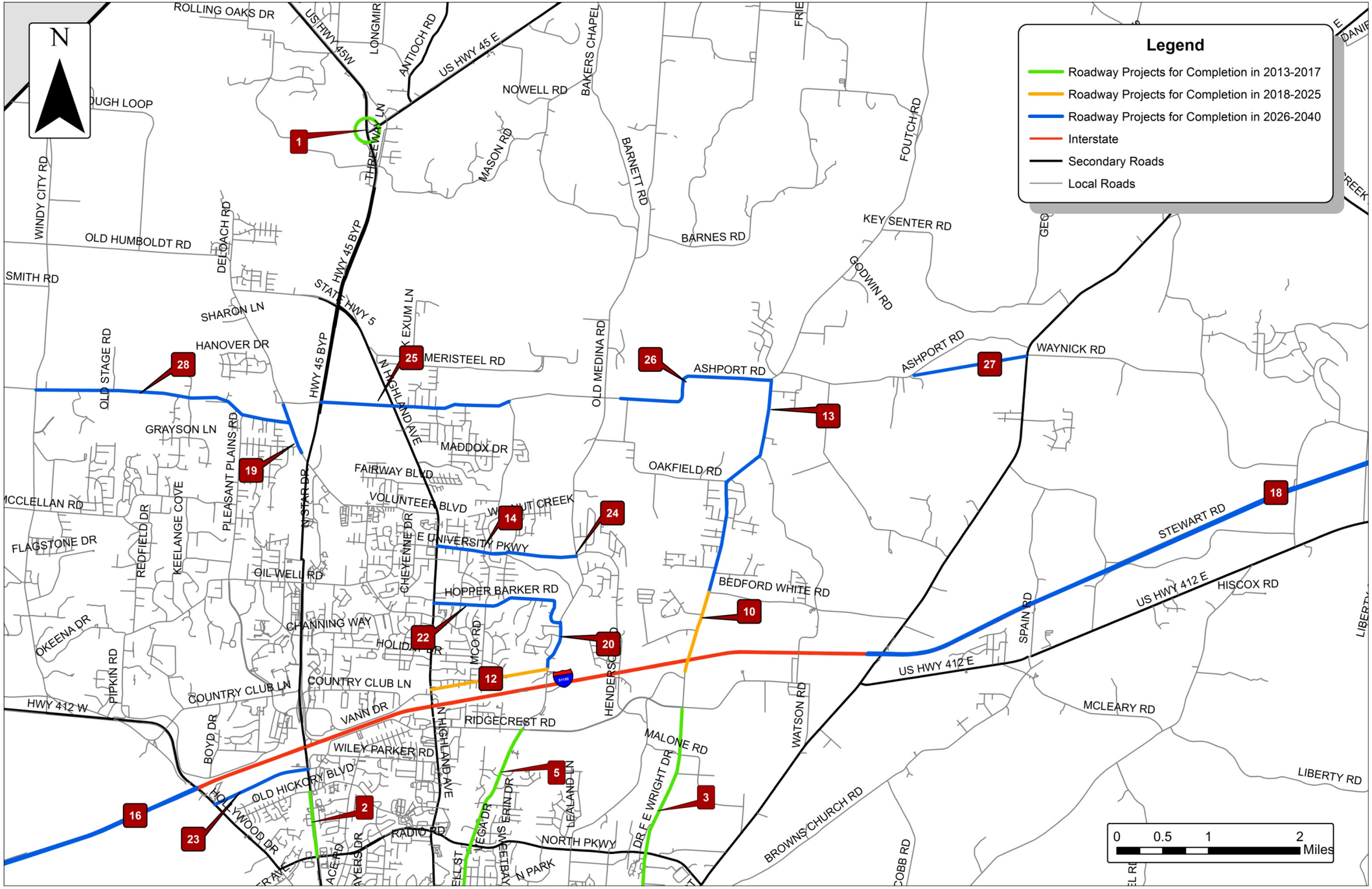


Figure 3-5a: Projected Employment Growth by Traffic Analysis Zone (Inset Map)



Roadway Projects

Completion Year	2040 Plan Number	Previous Project Number	TIP Number	Route	Termini	Sponsor	Miles	Description	Cost in Millions (YOE)	Funding Sources
2013-2017	**1**	T-3		US-45 Bypass/ SR-186	US 45E ramps to/from south US 45 Bypass	TDOT	0.8	Interchange modification - widen US 45E ramps to 2 lanes to/from south US 45 Bypass	$3.8	NHPP, S-STP
2013-2017	**2**	T-5		US-45 Bypass/ SR-186	Old Hickory Blvd. to Hollywood Drive ramps to/from north	TDOT	1.1	Widen to 6 lanes	$18.2	NHPP, S-STP
2013-2017	**3**	N/A	U-STP-43	Dr. F.E. Wright Dr.	US-70 (Whitehall St.) to UGN Pkwy.	City of Jackson	2.2	Widen to 4-lane divided and 5-lane section with bike lanes on both sides	$10.1	U-STP, Local
2013-2017	**4**	J-2	C-2-25	Skyline Drive	Phase 3 - from Medical Center Dr. to Summar Dr.	City of Jackson	0.2	Widen from 3 to 5 lanes with sidewalks on both sides	$4.7	Local
2013-2017	**5**	C-1	C-1-24	Campbell St.	Phase 1 - from Ridgecrest Rd. to SR-20 (North Pkwy.)	City of Jackson	1.3	Widen from 2 to 5 lanes with sidewalks and bike lanes on both sides	$8.7	Local
2013-2017	**6**	J-6		Campbell St.	Phase 2 - from SR-20 (North Pkwy.) to US-45 (Highland Ave.)	City of Jackson	0.8	Widen from 2 to 4 lanes	$6.1	Local
2013-2017	**7**	STP-1		SR-18 (Bolivar Road)	North of Medon-Malesus Road to US-45 (SR-5/Highland Ave)	TDOT	6.3	Widen from 2 to 5 lanes, including realignment at proposed Southern Extension of SR-186 and US-45 Bypass	$34.7	S-STP
2013-2017	**8**	N/A		SR-5 (N. Highland Ave.)	Intersection of SR-5 (N. Highland Ave.) and Deaderick St.	City of Jackson	0.2	Modify intersection to a roundabout design	$1.0	U-STP, Local
2018-2025	**9**	T-9		Southern Extension of US-45 Bypass – (SR-186) - Phase I	US 45 north of Edwards Dr to Airways Blvd (US 70/SR 1).	TDOT, City of Jackson, Madison Co.	5.3	New 4/5-lane roadway, including interchange with SR-18 realignment	$155.3	NHPP, S-STP, U-STP, Local
2018-2025	**10**	J-14		Dr. F.E. Wright Dr. / Christmasville Rd.	From I-40 eastbound ramp to Bedford White Rd.	City of Jackson	0.9	Widen from 2 to 5 lanes	$15.7	U-STP, Local
2018-2025	**11**	C-2	C-3-26	Royal St.	Phase 2 - from Lexington Ave. to Lane Ave.	City of Jackson	0.85	Widen from 2 to 3 lanes with sidewalks and bike lanes on both sides	$9.5	Local
2018-2025	**12**	J-9		Vann Drive Ext	US-45 (Highland Ave.) to Campbell St.	Private	1.3	New 5-lane roadway	$16.8	Private
2018-2025	**13**	M-11		Christmasville Rd.	Bedford White Rd. to Ashport Rd.	Madison Co., City of Jackson	3.3	Widen to 12-foot travel lanes with 8-foot shoulders (safety improvements)	$3.7	U-STP, Local
2026-2040	**14**	M-12		E. University Pkwy.	US-45 (Highland Ave.) to Cooper Anderson Rd.	Madison, City of Jackson	0.8	Safety improvements, including addition of shoulders	$2.2	U-STP, Local
2026-2040	**15**	T-10		Southern Extension of US-45 Bypass (SR-186) - Phase II	US-45 north of Edwards Dr to the east side of US-45, opposite Seavers Rd	TDOT, City of Jackson, Madison Co.	2.23	New 4/5-lane roadway	$230.6	NHPP, S-STP, U-STP, Local
2026-2040	**16**	T-1b (pt)		I-40	East of SR-223 (Miller Rd./Smith Ln.) to US-412	TDOT	2.25	Widen from 4 to 6 lanes	$20.8	NHPP
2026-2040	**17**	T-1c		I-40	West of SR-138 (Providence Rd) to east of SR-223 (Smith Ln.)	TDOT	8.3	Widen from 4 to 6 lanes	$37.4	NHPP
2026-2040	**18**	T-1d		I-40	US-70 to east of SR-152 (Law Rd)	TDOT	6.8	Widen from 4 to 6 lanes	$37.4	IM, NHPP
2026-2040	**19**	J-4		Old Humboldt Rd.	Ashport Rd. (north junction) to US-45 Bypass	City of Jackson	0.7	Widen from 2 to 4 lanes	$12.6	U-STP, Local
2026-2040	**20**	J-5		Old Medina Rd.	Hopper Barker Rd. to existing 4-lane section north of I-40	City of Jackson	0.6	Widen from 2 to 4 lanes	$14.5	U-STP, Local
2026-2040	**21**	J-10		Hollywood Dr.	From existing 4-lane section north of Arlington Ave. to existing four-lane section at Forest Ave.	City of Jackson	0.8	Widen from 2 to 4 lanes	$13.8	U-STP, Local
2026-2040	**22**	J-11		Hopper Barker Rd.	US-45 (Highland Ave.) to Old Medina Rd.	City of Jackson	1.7	Reconstruction and minor widening within existing ROW	$11.7	U-STP, Local
2026-2040	**23**	J-16		Casey Jones Ext	US-45 Bypass to US-412 (Hollywood Dr.)	Private	1.1	New 4/5 lane roadway	$19.5	Private
2026-2040	**24**	M-3		University Pkwy.	Cooper Anderson Rd. to Henderson Rd.	Madison Co., City of Jackson	1.5	New 2-lane roadway	$10.8	U-STP, Local
2026-2040	**25**	M-1		Ashport Rd.	US-45 Bypass to Cooper Anderson Rd.	Madison Co., City of Jackson	2.1	Widen from 2 to 4 lanes	$36.1	U-STP, Local
2026-2040	**26**	M-8		Ashport Rd.	0.6-mile curve section located between Old Medina Rd. and Christmasville Rd.	Madison Co.	0.6	Relocate roadway to eliminate curve	$8.4	U-STP, Local
2026-2040	**27**	M-9		Ashport Rd.	West of US-70 to the US-70/Waynick Rd. intersection	Madison Co.	0.7	New 2-lane road, relocated	$5.4	U-STP, Local
2026-2040	**28**	M-10		Ashport Rd.	Windy City Rd. to Old Humboldt Rd.	Madison Co., City of Jackson	2.9	Widen from 2 to 4 lanes	$7.0	U-STP, Local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Roadway Projects for Completion in 2013-2017
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BARNETT RD
FOUTCH RD
WINDY CITY RD
OLD HUMBOLDT RD
DELOACH RD
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KEY SENTER RD
GEO
SMITH RD
STATE HWY 5
GODWIN RD
SHARON LN
EXUM LN
HANOVER DR
MERISTEEL RD
OLD MEDINA RD
ASHPORT RD
WAYNICK RD
OLD STAGE RD
N HIGHLAND AVE
GRAYSON LN
PLEASANT PLAINS RD
MADDOX DR
FAIRWAY BLVD
OAKFIELD RD
N STAR DR
VOLUNTEER BLVD
WALNUT CREEK
MCCLELLAN RD
KEELANGE COVE
REDFIELD DR
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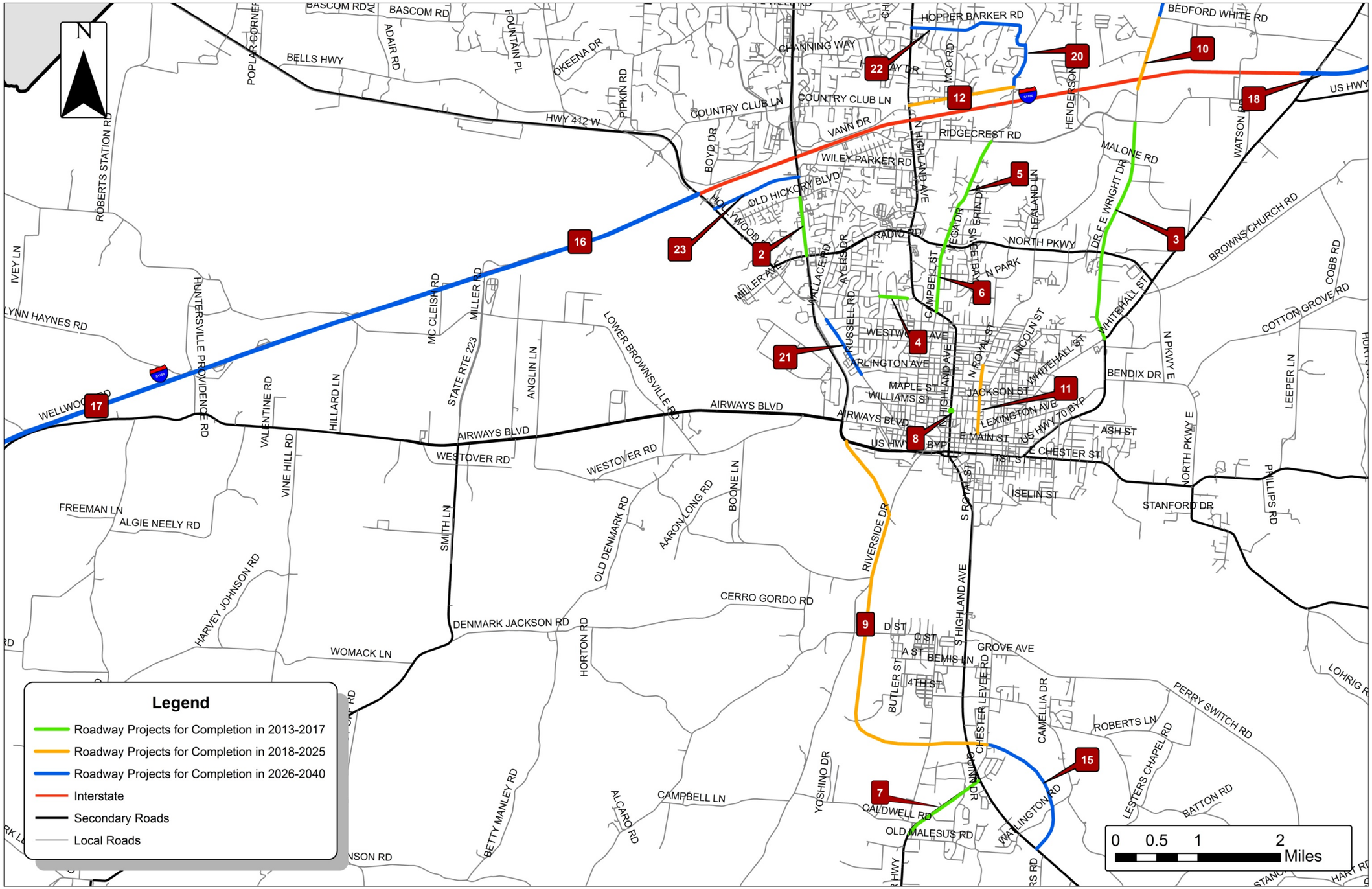
STEWART RD
FLAGSTONE DR
OIL WELL RD
CHEYENNE DR
BEDFORD WHITE RD
HISCOX RD
US HWY 412 E
HOPPER BARKER RD
SPAIN RD
OKEENA DR
CHANNING WAY
HOLIDAY DR
MCO RD
HENDERSON RD
PIPKIN RD
COUNTRY CLUB LN
HWY 412 W
VANN DR
WATSON RD
MCLEARY RD
BOYD DR
RIDGECREST RD
MALONE RD
WILEY PARKER RD
OLD HICKORY BLVD
LEALAND LN
LIBERTY RD
HOLLYWOOD DR
ERIN DR
DR F E WRIGHT DR
BROWNS CHURCH RD
RADIO RD
NORTH PKWY
ACE RD
SYCAMORE DR
VEGA DR
SWEETBRIAR
N PARK
COBB RD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Roadway Projects for Completion in 2013-2017
Roadway Projects for Completion in 2018-2025
Roadway Projects for Completion in 2026-2040
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COUNTRY CLUB LN
CHANNING WAY
HOPPER BARKER RD
BEDFORD WHITE RD
US HWY
RIDGECREST RD
WILEY PARKER RD
OLD HICKORY BLVD
RADIO RD
NORTH PKWY
MALONE RD
BROWNS CHURCH RD
COTTON GROVE RD
COBB RD
WELLWOOD RD
AIRWAYS BLVD
WESTOVER RD
LOWER BROWNSVILLE RD
STATE RTE 223
MILLER RD
MC CLEISH RD
HUNTERSVILLE PROVIDENCE RD
ROBERTS STATION RD
IVEY LN
LYNN HAYNES RD
FREEMAN LN
ALGIE NEELY RD
HARVEY JOHNSON RD
WOMACK LN
DENMARK JACKSON RD
CERRO GORDO RD
CAMPBELL LN
CALDWELL RD
OLD MALESUS RD
WASHINGTON RD
CHESTER LEVEE RD
S HIGHLAND AVE
N HIGHLAND AVE
WESTWOOD AVE
ARLINGTON AVE
MAPLE ST
WILLIAMS ST
JACKSON ST
LEXINGTON AVE
E MAIN ST
US HWY 70 BYP
E CHESTER ST
ISELIN ST
ASH ST
BENDIX DR
WHITEHALL ST
LINCOLN ST
N ROYAL ST
S ROYAL ST
RIVERSIDE DR
STANFORD DR
PHILLIPS RD
LEEPER LN
PERRY SWITCH RD
ROBERTS LN
LESTERS CHAPEL RD
BATTON RD
LOHRIG RD
GROVE AVE
BEMIS LN
D ST
C ST
A ST
4TH ST
BUTLER ST
CAMELLIA DR
YOSHINO DR
ALCARO RD
BETTY MANLEY RD
OLD DENMARK RD
AARON LONG RD
BOONE LN
HORTON RD
SMITH LN
VALENTINE RD
VINE HILL RD
HILLARD LN
ANGLIN LN
POPLAR CORNER
ADAIR RD
FOUNTAIN PL
OKEENA DR
PIPKIN RD
BOYD DR
VANN DR
MCO RD
HENDERSON
DR E E WRIGHT DR
WATSON RD
LEALAND LN
ERIN DR
VEGA DR
BETBAY
N PARK
CAMPBELL ST
WALLACE RD
AVERS DR
RUSSELL RD
MILLER AVE
HOLLYWOOD
N PKWY E
NORTH PKWY E
HART RD

Chapter 4

Roadway System

INTRODUCTION

This chapter provides an overview of the existing roadway system and its current performance. It also describes the process used to model future roadway conditions based on the forecasted changes in population and employment discussed in the previous chapter. Roadways that are currently congested, or are projected to be congested in future years, are identified here in a series of maps.

Proposed transportation improvements to address the anticipated congestion have been developed and tested to determine the best scenario to address future traffic growth, and are outlined in this chapter. These transportation projects, along with proposed timeframes for their implementation, form the basis for the roadway portion of this Plan.

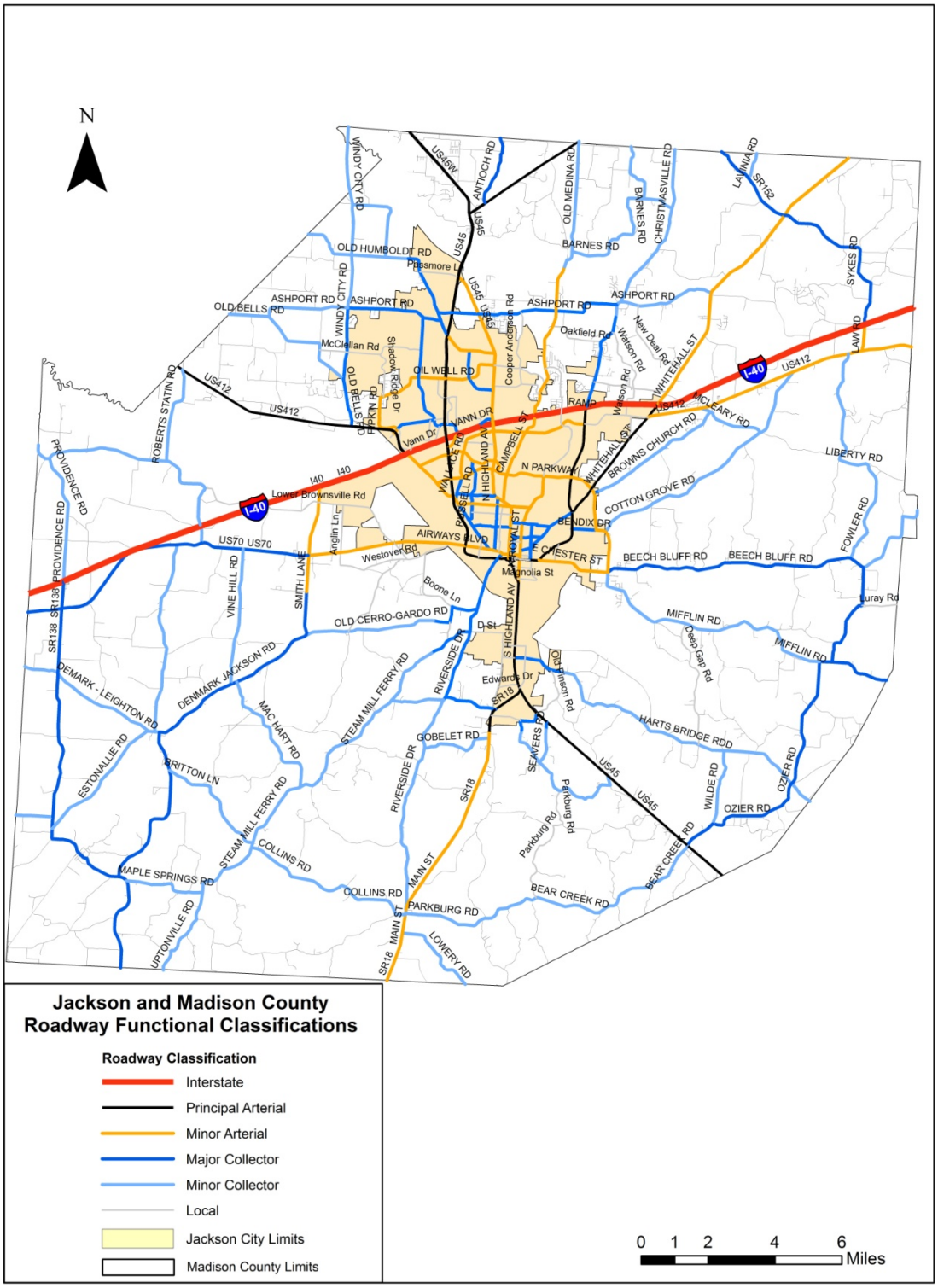
EXISTING CONDITIONS - STREETS AND HIGHWAYS

As in all urbanized areas, the system of streets and highways in the Jackson Area MPO follows a hierarchy of functionality, also known as a functional classification system. At the top of the hierarchy is Interstate 40, which passes east-west through the MPO area. The second level in the hierarchy is arterial routes which often are designed with limited or no access in order to more effectively move thru-traffic. Examples of arterial routes in Jackson include the US 45 Bypass and Highland Avenue. Next are collector streets, which serve an intermediate function of collecting trips to and from the arterials and distributing them among local streets. Ashport Road, Ridgecrest Road and Campbell Street are examples of collector roadways. The primary function of local streets, which are at the bottom of the hierarchy, is to provide access to individual properties. As one moves up the hierarchy from local to collector to arterial to Interstate, speeds generally increase and there is a corresponding decrease in access provided to adjoining properties.

Existing Conditions

The functional classification of streets and highways within the Jackson Area MPO is illustrated in Figure 4-1.

Figure 4-1: Jackson and Madison County Roadway Functional Classifications



In addition to the access afforded by Interstate 40, three national highways (US-45, US-70, and US-412) provide further access to interstate commerce routes and State Route (SR) 1, SR-5, SR-18, SR-43, SR-186, and SR-198 connect the Jackson area to nearly every region of the State of Tennessee.

Among these highways, the most heavily traveled routes in the Jackson area include the I-40 corridor from the eastern city limits to the western city limits, the US-45 Bypass between the northern city limits and the southern city limits, and Highland Avenue (US-45) between University Parkway and Forest Avenue. This determination was based on Annual Average Daily Traffic (AADT) exceeding 20,000 in the year 2011, as provided by the Tennessee Department of Transportation (TDOT).

Table 4-1 illustrates the routes in the Jackson MPO area that currently have the highest volumes of traffic.

Table 4-1: Traffic Volumes on Jackson MPO Roadways

	Route	***Begin Segment***	***End Segment***	***2011 Traffic (AADT)***
1	Highway 45 Bypass	Oil Well Road	Hollywood Bypass	43,270
2	South Highland	Main Street	SR 18	30,757
3	North Highland	Forest Avenue	Vann Drive	24,793
4	Dr. F.E. Wright Drive	Bendix Drive	Interstate 40	15,553
5	East Chester Street	North Highland	Dr. F.E. Wright Drive	14,856
6	SR 20 (US 412)	County Line	W. Forest Avenue	14,777
7	Vann Drive	US 45 Bypass	North Highland	14,483
8	North Parkway	US 45 Bypass	Dr. F.E. Wright Drive	13,952
9	Campbell Road	Interstate 40	North Highland	9,046
10	Royal Street	Chester Street	North Parkway	7,525

** Traffic estimate based on TDOT count stations along route segments noted.*

EVALUATING ROADWAY PERFORMANCE: LEVEL OF SERVICE ANALYSIS

Level of service, or LOS, is a term used to describe how well traffic flows along a given roadway. It is presented in terms of grades A through F, similar to a school report card, where A is the best possible traffic flow and F represents the worst conditions. Figure 4-2 shows graphically how the level of service changes as the number of cars on the road increases. General traffic engineering standards have set the minimum acceptable level of service as D for urban areas and C for rural areas.

In order to determine the LOS of the roadway, a comparison is first made between assigned daily traffic volumes and the capacity of the facility to calculate its volume-to-capacity (V/C) ratio. A roadway's capacity is based on its functional classification, number of lanes, posted speed limit, percent of truck traffic, and geometric characteristics.

Figure 4-2: Graphic Illustration of Roadway Level of Service

	A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
	B	Reasonable free flow operations. The ability to maneuver with the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is high.
	C	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension.
	D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.
	E	At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.
	F	Breakdowns in traffic flow. The number of vehicles entering the highway section exceeds the capacity or ability of the highway to accommodate that number of vehicles. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Although the volume-to-capacity thresholds vary by the functional class of the facility and whether it is classified as urban or rural, the following correlations have been used in this chapter for purposes of communicating future transportation deficiencies to the public.

- LOS A = < 0.25
- LOS B = 0.25 to 0.50
- LOS C = 0.50 to 0.75
- LOS D = 0.75 to 0.90
- LOS E = 0.90 to 1.00
- LOS F = > 1.00

As noted above, LOS A is considered the ideal operating conditions for traffic, and LOS D is typically defined as the minimum acceptable conditions for roadways in urban areas. Many urban drivers are also familiar with LOS E and F through their experience in conditions during morning or afternoon rush hours.

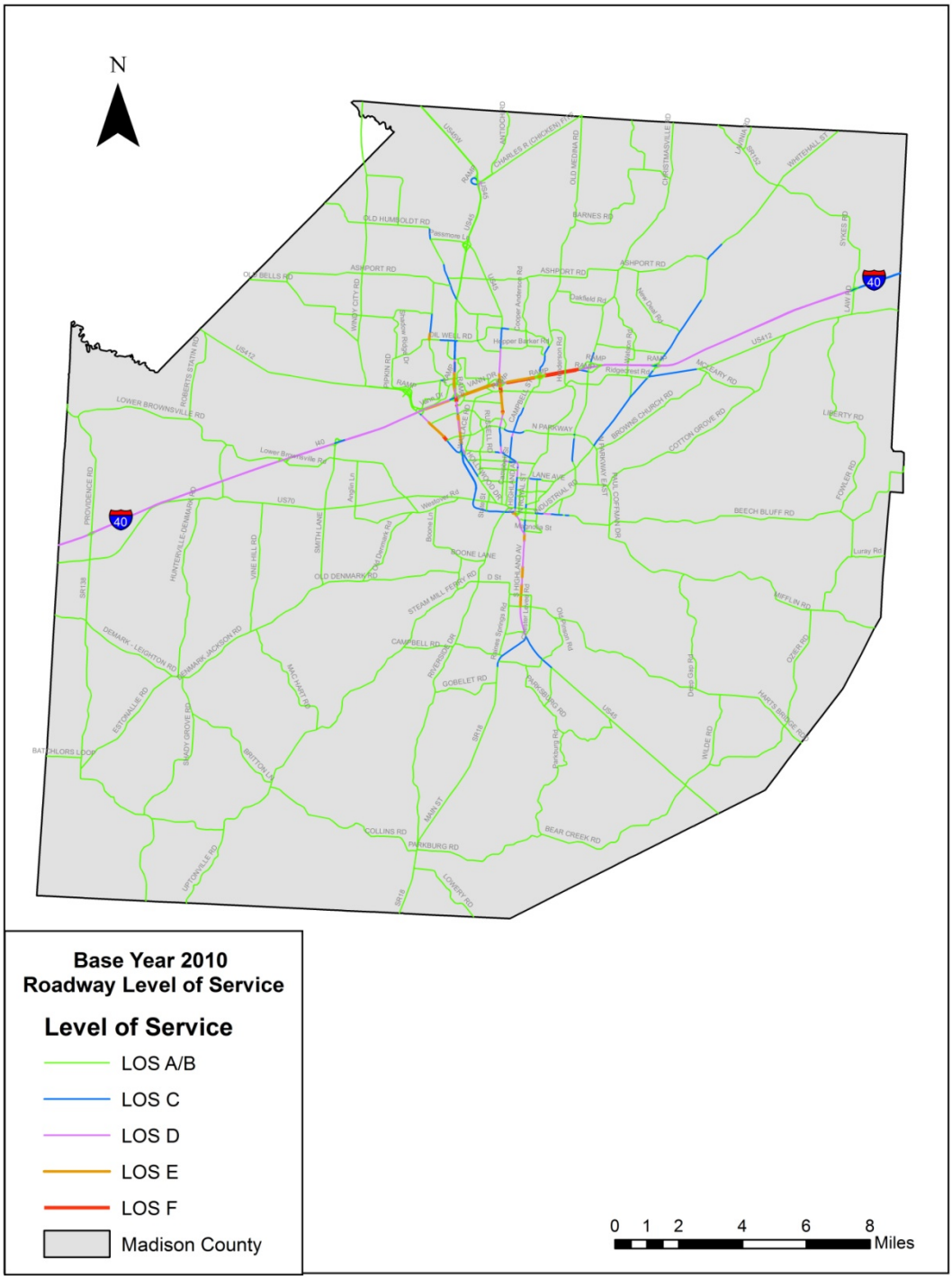
The 2010 base year levels of service for roadways in the Jackson Area MPO are shown in Figure 4-3. Segments shown in orange and red represent areas where roadway level of service is beginning to fall below minimum acceptable conditions.

Interstate 40 is a major east-west corridor with one of the highest percentages in the U.S. of long-haul freight truck activity per mile, and this is reflected in the map of current travel conditions. It is also clear that Interstate 40 plays a key role in the Jackson regional transportation network, based on the heavier usage seen between the Christmasville Road and US-412/Hollywood Road interchanges. Significant percentages of heavy trucks enter and exit I-40 along this section to pick up and deliver freight and goods within Jackson, or to head north or south to reach other counties in rural West Tennessee. (As discussed further in Chapter 8, Jackson's roadway system is experiencing many impacts related to the high volume of pass-through freight traffic.) This area of I-40 also attracts shoppers from throughout the region because of the extensive commercial development that has occurred at the interchanges, including the regional mall to the south as well as rapid retail growth on the north side focused along Vann Drive.

Figure 4-3 shows clearly that the increasing population and employment growth on the north side of I-40 (discussed in Chapter 3) is heavily impacting north-south travel patterns. Significant congestion along the US-45 Bypass and US-45 (Highland Avenue), two of the city's primary north-south corridors, is evident in 2010 base year operating conditions. Unlike the US-45 Bypass, there is no access control on North Highland Avenue, so its congestion issues are related to the number of drivers slowing to make turns, as well as the overall high volume of vehicles.

South of downtown Jackson, the most visible area of concern is along US-45/South Highland Avenue, where motorists are experiencing degrading levels of service at the point where they converge with the heavy traffic stream from the US-45 Bypass. This issue was mentioned frequently by the local business owners and economic development officials interviewed during the development of this Plan. Trucks are able to use the US-45 Bypass to remain separate from other local traffic on the north side of the city; however, the bypass facility ends just as they reach downtown.

Figure 4-3: Base Year 2010 Roadway Levels of Service



FUTURE ROADWAY PERFORMANCE

The Jackson Area MPO's travel demand model is the tool used to identify and analyze future roadway congestion problems. The model essentially divides the region up into various "traffic analysis zones" for purposes of forecasting. As discussed in Appendix A, forecasts were developed for future population and employment for each traffic analysis zone, then used as key inputs into the model. The model's outputs are an approximation of travel demand between zones, or how many people are expected to travel between home, work or school, shopping, doctor's office, and other destinations.

Zones will generate varying levels of traffic based on the numbers of jobs and/or homes they contain. Future traffic projections are also affected by the types of development in a zone. For example, a major regional shopping center will attract several types of trips, including shoppers, the employees who work at the stores, trucks who bring in the food and goods that are sold there, and even the trucks that take away the trash.

Once the level of travel demand is predicted for each zone, the model "loads" the appropriate number of trips onto the existing roadway network. Zones with high travel demand require roadways that have higher capacity, which would typically be an interstate, arterial street or collector street. In zones where population or employment has grown rapidly, a roadway may not be able to meet the additional travel demand without "capacity improvements" – a term which generally includes the addition of new travel lanes, new and modified interchanges, new roadways and roadway extensions. By using the travel demand model, the Jackson Area MPO can make better predictions about which roadways will need capacity improvements, and how soon.

More information about the travel demand model can be found in Appendix A, which provides a very detailed explanation of the process and data used to update and calibrate the MPO's model.

EXISTING + COMMITTED PROJECTS

Even when a new transportation plan is developed, there are always some roadway improvements that are already in some stage of being constructed, or are far enough along in development that they are essentially "committed" to be completed. When a travel demand model is being used, the first step in analyzing future roadway conditions is to identify those "Existing + Committed" (E+C) projects and incorporate them into the existing roadway network for the year 2010. This establishes a "No Build" or a "No Action Condition", which serves as the benchmark for identifying future roadway capacity needs and for evaluating the performance of planned projects.

The list of E+C projects for the Jackson MPO area (Table 4-2) was derived from a review of the Jackson Area MPO Transportation Improvement Program and discussions with the Jackson Area MPO staff. Based on the E+C list of projects, as well as the forecasted population and employment growth, anticipated roadway system deficiencies were identified for 2025 and 2040. These deficiencies serve as a starting point for identifying transportation improvements beyond those currently programmed for completion.

Table 4-2: Existing + Committed Projects for the Jackson MPO Area

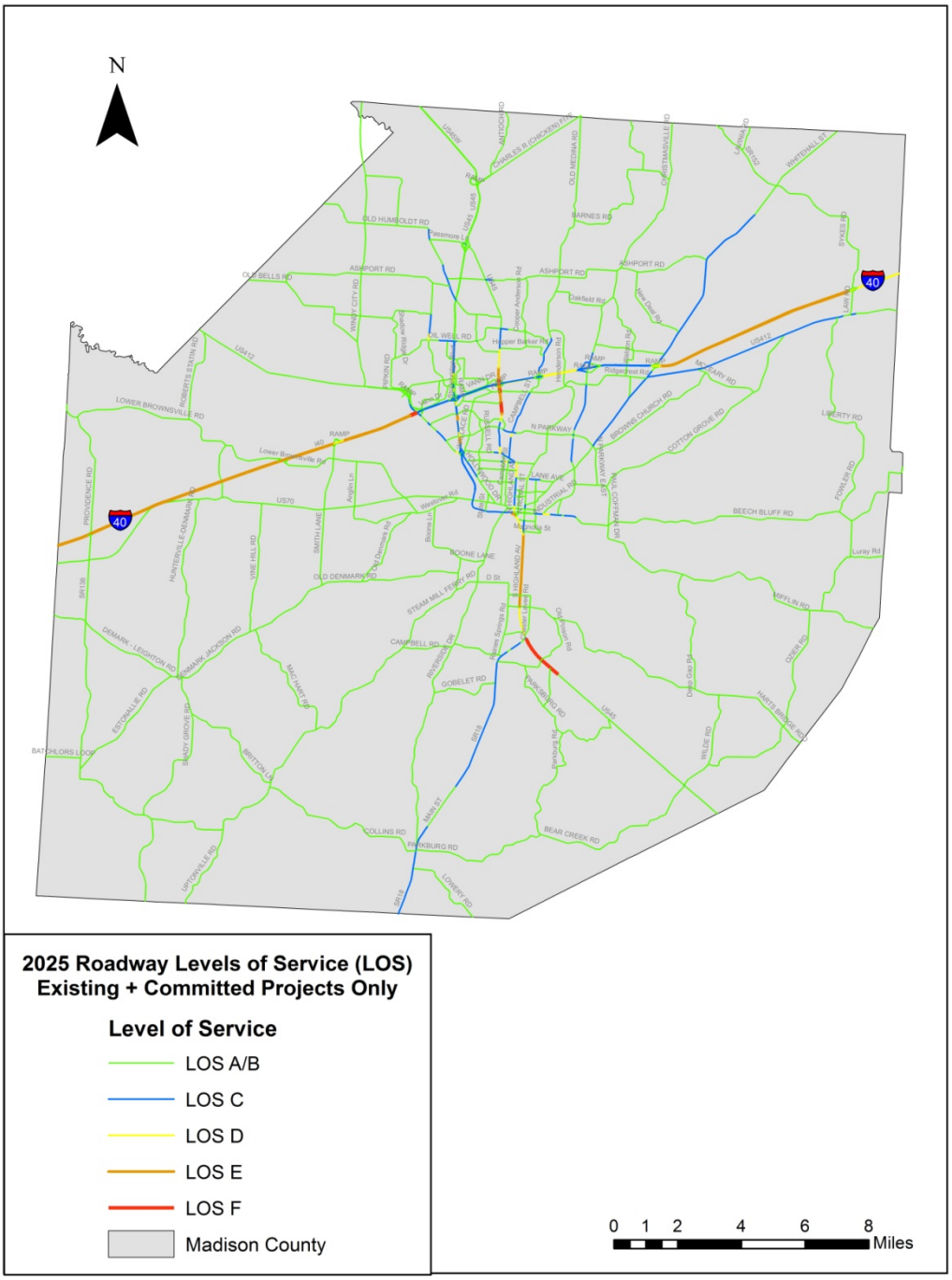
2030 Plan Project Number	Route	Termini	Sponsor	Miles	Description
T-1a, T-6	I-40	US-412 (SR-20, Hollywood Drive) to US-70 (SR-1, Whitehall Street)	TDOT	7.65	Widen from 4 to 6 lanes, including auxiliary lanes between the US-45 Bypass and Highland Avenue interchanges, including modifications to the Highland Avenue interchange. *(NOTE: These two projects, listed separately in the 2030 Plan, have been combined because according to TDOT they will be constructed together.)*
T-4	I-40	Interchange at US-45 Bypass/SR-186	TDOT	0.4	Interchange modification
T-8	US-45 Bypass (SR-186)	From I-40 to Old Hickory Boulevard	TDOT	0.6	Modify I-40 eastbound off-ramp to remove weave to left-turn Carriage House Dr. and align with Casey Jones Lane
J-15	East Chester Street	Phase 2 - Holland St. to Altamont Drive	City of Jackson	0.3	Reconstruct to 3 lanes, including sidewalks and bike lanes on both sides

As Table 4-2 shows, the E+C list does include capacity projects to address some of the congestion problems that were visible in the 2010 Base Year LOS map. A project is under development to widen I-40 within the busiest parts of the city. Interchange modifications are also in development for US-45/Highland Avenue and the US-45 Bypass.

However, the location of new homes and job creation in the Jackson area will continue to drive traffic growth, even after all of the E+C projects have been implemented. Figure 4-4 below shows the roadway sections that will become congested by the year 2025. Although I-40 travel is much improved by the addition of new travel lanes through the heart of the city, operations are deteriorating on the remainder of I-40 through Madison County. Continued growth on the north side also appears to be outpacing the capacity added by the interchange improvements made at US-45/North Highland Avenue, with failing levels of service north of Old Hickory Boulevard. To the south, conditions are also worsening along the US-45/South Highland Avenue corridor south of downtown Jackson.

By the year 2040 if no further action is taken beyond implementing the roadway projects in the E+C list, interstate traffic is choked up for miles on either side of the six-lane section of I-40 through Jackson. US-45/North Highland Avenue is completely over capacity for most hours of the day from Old Hickory Boulevard to Vann Drive, as is US-45/South Highland Avenue for nearly five miles south of downtown.

Figure 4-4: 2025 Roadway Levels of Service (LOS) – Existing + Committed Projects Only



Most of the roadway deficiencies identified through the travel demand model analysis are the same congested locations identified when forecasts were done for the 2035 Long Range Transportation Plan. The list of recommended projects from the 2035 Plan was therefore the starting point for this Plan update. As mentioned in the discussion of E+C projects, some of the 2035 Plan projects are already under development. The remaining capacity projects from the 2035 Plan were evaluated against the Goals and Objectives (see Chapter 2) to determine their consistency with the region's goals. Each project was evaluated according to these criteria:

Goal I: Manage and Operate an Efficient Transportation System

- ✓ Improves an Existing Route
- ✓ Integrates ITS Technology
- ✓ Improves an Alternate/Parallel Route
- ✓ Addresses Corridor Congestion

Goal II: Promote and Encourage Economic Development

- ✓ Accommodates/Anticipates Freight Movement
- ✓ Located Near Existing Development (Residential, Commercial, Industrial)
- ✓ Provides New/Improved Access to Planned Growth Area
- ✓ Located in High Job Growth Area

Goal III: Support Environmental Quality and Livability Principles

- ✓ Improves Accessibility and/or Connectivity to Existing Development
- ✓ Helps Reduce the Length/Frequency of Automobile Trips
- ✓ Incorporates Streetscaping/Enhancements
- ✓ Has Minimal Impacts on the Social and/or Natural Environment
- ✓ Provides Accessibility for Low-Income and/or Minority Communities

Goal IV: Support Multi-modal and Mobility Needs

- ✓ Includes Transit Accommodations
- ✓ Includes Pedestrian Improvements
- ✓ Includes Bicycle Improvements
- ✓ Provides a Connection Between Multiple Transportation Modes

Goal V: Develop a Safe and Secure Transportation System

- ✓ Addresses a High Crash Location/Corridor
- ✓ Addresses Pedestrian and/or Bicycle Safety
- ✓ Increases Safe Travel to Nearby School
- ✓ Improves the Safety of Freight/Passenger Movements
- ✓ Addresses Security/Emergency Responsiveness

Plans: Consistency with Local/Regional Plans

- ✓ Local/Regional Comprehensive Plan
- ✓ Local/Regional Bicycle & Pedestrian Plan
- ✓ ITS Architecture Plan
- ✓ Strategic Highway Safety Plan

After reviewing each project against the selection criteria, the following additional issues were identified for further testing and evaluation in this Plan.

- *Campbell Street*: The 2035 Plan included a project to widen Campbell Street from 2 to 4 lanes from North Highland Avenue to North Parkway (SR-20), and from 2 to 5 lanes from North Parkway (SR-20) to just south of Ridgecrest Drive. The remaining section of Campbell Street, from Ridgecrest Drive to I-40, is currently 5 lanes. As part of the 2040 Plan modeling was performed to evaluate the extent to which traffic congestion issues could be addressed by widening Campbell Street to a 3-lane facility instead. The results indicate that traffic operations on Campbell Street itself are not significantly impacted by the change. However, from a network standpoint it appears that Campbell Street plays a role as an alternative north-south route to Highland Avenue. Using the 3-lane scenario for Campbell Street, level of service on North Highland worsens from E to F for the section between Wiley Parker Road and Ridgecrest Road.

- *McClellan Road*: The portion of McClellan Road from Pleasant Plains Road to Windy City Road is located within the Northwest Annexation Area that was recently annexed into the Jackson city limits. Concerns have been expressed by area residents about roadway congestion related to drop-off/pick-up times and other school related events at Trinity Christian Academy and the University School of Jackson, both of which use the McClellan Road corridor. Analysis of this location does not show future traffic volumes reaching a level that would result in a recommendation to add additional vehicle lanes. However, there are other strategies that could help address localized congestion during these peak times. To encourage parents/students to safely walk or ride their bikes to these two private schools, future sidewalks and bicycle facilities along McClellan Road connecting the various residential subdivisions with the schools have been recommended in the Plan as a Tier 3 priority, with connections to Windy City Road and Pleasant Plains Road, both of which are also ranked as Tier 3 priorities. It is also recognized that the construction of these sidewalks and bicycle facilities would likely require some widening or reconfiguration of McClellan Road.

- Royal Street: Royal Street is identified in the list of routes in the Jackson MPO area that have the highest traffic volumes (Table 5-1). The portion of Royal Street from East Chester Street to Lexington Avenue (Phase I) was previously widened and the section from Lexington Avenue to Lane Avenue (Phase II) is undergoing rehabilitation of the existing cross-section, including replacing concrete curb and sidewalk, along with drainage improvements, and new paving/striping. As part of the development of the Plan the section of Royal Parkway from Lane Avenue to North Parkway was analyzed, but this analysis did not show future traffic volumes reaching a level that would result in a recommendation to add additional vehicle lanes. This portion of Royal Street is recommended in the Plan as a Tier 1 priority bicycle and pedestrian project. The construction of sidewalks and/or bicycle facilities along the portion of Royal Street from Lane Avenue to North Parkway would likely require some widening or reconfiguration of the roadway. These bicycle and pedestrian improvements could also provide improved access for transit riders to the Royal Street bus route that is currently operated by JTA.

- *Southern Bypass Extension*: The 2035 Plan did not include the Southern Bypass Extension, a proposed extension of the US-45 Bypass to begin at US-70/Airways Boulevard and rejoin US-45/South Highland Avenue at a point north of Edwards Drive. The Jackson Area MPO has worked with TDOT to complete a Transportation Planning Report for this project and is nearing completion of the Environmental Assessment (see Figure 4-5). The route is proposed as a 4/5-lane access-controlled roadway.

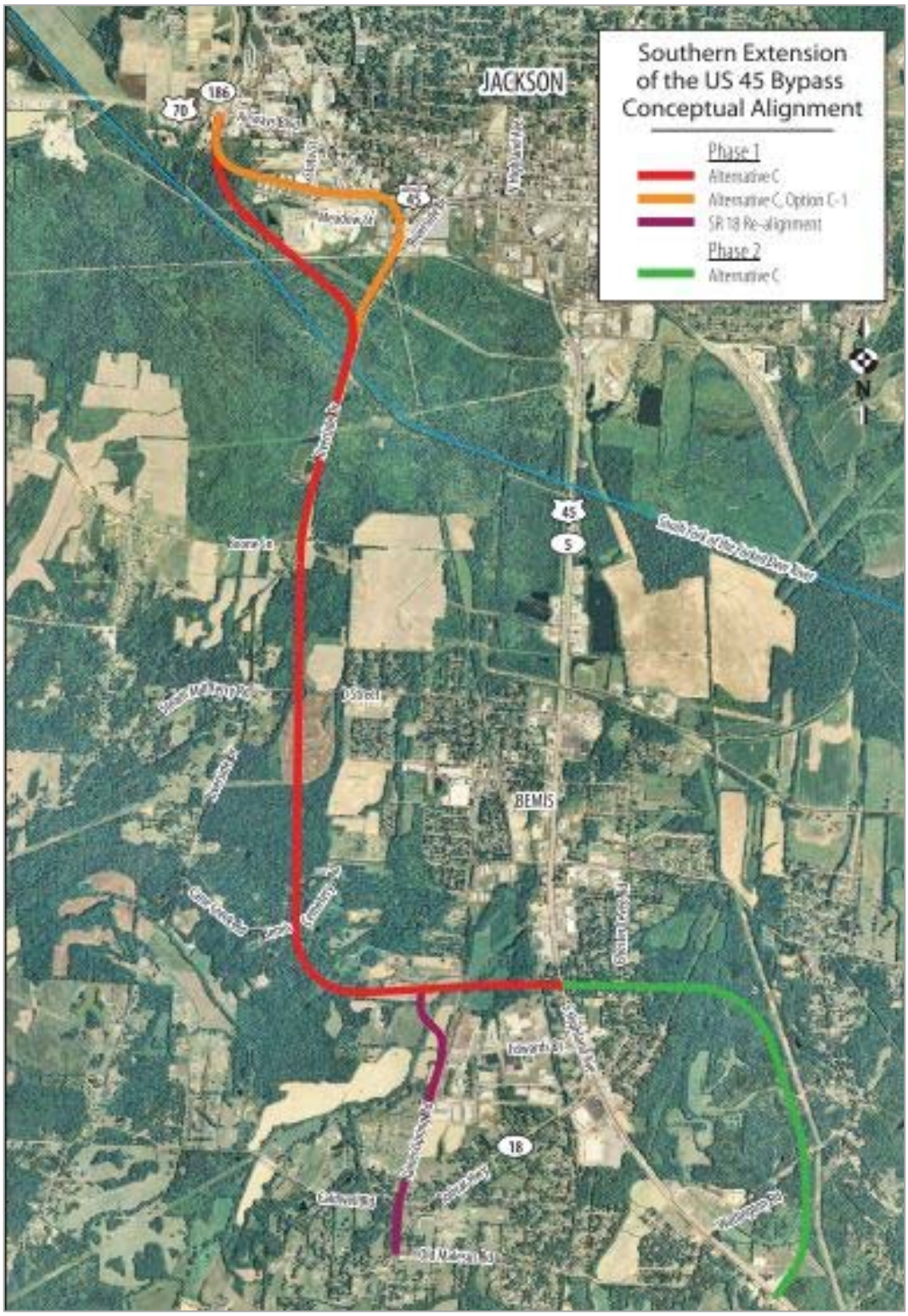
  Since this is the most sizable roadway capacity project being proposed in Jackson over the next 25 years, the future roadway network was modeled with and without the bypass extension to illustrate the level of benefits that could be expected from such a major financial investment.

  Without the Southern Bypass Extension, traffic falls to LOS E by 2025 on US-45/South Highland Avenue between Magnolia Street and Harts Bridge Road. By 2040 the same section is at LOS F, a very serious condition for a route described by freight stakeholders as the only trucking route to reach points south of Jackson. South of the SR-18/Bolivar Highway junction, US-45/South Highland Avenue has already reached LOS F by 2025.

  Completion of the Southern Bypass Extension results in LOS B on US-45/South Highland Avenue between Magnolia Street and Harts Bridge Road in the year 2025, falling slightly to LOS C by 2040.

- *North Highland Avenue:* The travel demand model was used to perform a "select link" analysis for North Highland Avenue to analyze the origins and destinations of the traffic using this section of roadway. The objective was to evaluate whether capacity improvements to other north-south corridors across the city might alleviate some congestion on North Highland Avenue. The analysis indicates that the majority of trips using North Highland Avenue have origins and/or destinations concentrated within a short distance of that corridor. Unless they use another north-south corridor located close to North Highland Avenue (such as Campbell Street), it appears that drivers would not consider an alternate route because they would perceive it as going too far out of their way.

Figure 4-5: Location Map, Proposed Southern Bypass Extension



Programmed and Planned Projects

The list of projects on the following page (Table 4-3) is proposed to address the future transportation deficiencies identified through the modeling and evaluation process. The projects have been organized by horizon according to the timeframe by which they should be completed in order to maintain satisfactory mobility on the region's major roadways, or if the projects are already under development, the earliest timeframe by which they may be completed.

Note that major projects may be initiated earlier than the period for which they are listed to be completed. For example, design work is already underway for the SR-18/Bolivar Highway widening project, with right-of-way acquisition scheduled for fiscal year 2015. Given the size of the project and number of parcels to be acquired, the most likely schedule for the project would have construction ending sometime after 2017.

- Table 4-3 lists projects for completion during 2013-2017.
- Table 4-4 lists projects for completion during 2018-2025.
- Table 4-5 lists projects for completion during 2026-2040.

Figures 4-6 and 4-7 show the resulting LOS for the MPO's roadway network for 2025 and 2040, reflecting conditions after various projects have been implemented in the horizon years shown.

Table 4-3: Roadway Capacity Projects for Completion in 2013-2017

2040 Plan Number	Route	Termini	Description	Cost in Millions (YOE*)
1	US-45 Bypass/ SR-186	US 45E ramps to/from south US 45 Bypass	Interchange modification – widen US 45E ramps to 2 lanes to/from south US 45 Bypass	$3.8
2	US-45 Bypass/ SR-186	Old Hickory Blvd. to Hollywood Drive ramps to/from north	Widen to 6 lanes	$18.2
3	Dr. F.E. Wright Dr.	US-70 (Whitehall St.) to UGN Pkwy.	Widen to 4-lane divided and 5-lane section with bike lanes on both sides	$10.1
4	Skyline Drive	Phase 3 – from Medical Center Dr. to Summar Dr.	Widen from 3 to 5 lanes with sidewalks on both sides	$4.7
5	Campbell St.	Phase 1 – from Ridgecrest Rd. to SR-20 (North Pkwy.)	Widen from 2 to 5 lanes with sidewalks and bike lanes on both sides	$8.7
6	Campbell St.	Phase 2 – from SR-20 (North Pkwy.) to US-45 (Highland Ave.)	Widen from 2 to 4 lanes	$6.1
7	SR-18 (Bolivar Road)	North of Medon-Malesus Road to US-45 (SR-5/Highland Ave)	Widen from 2 to 5 lanes, including realignment at proposed Southern Extension of SR-186 and US-45 Bypass	$34.7
8	SR-5 (N. Highland Ave.)	Intersection of SR-5 (N. Highland Ave.) and Deaderick St.	Modify intersection to a roundabout design	$1.0

**Year of Expenditure (YOE)*

Table 4-4: Roadway Capacity Projects for Completion in 2018-2025

2040 Plan Number	Route	Termini	Description	Cost in Millions (YOE*)
9	Southern Extension of US-45 Bypass – (SR-186) – Phase I	US 45 north of Edwards Dr to Airways Blvd (US 70/SR 1).	New 4/5-lane roadway, including interchange with SR-18 realignment	$155.3
10	Dr. F.E. Wright Dr./Christmasville Rd.	From I-40 eastbound ramp to Bedford White Rd.	Widen from 2 to 5 lanes	$15.7
11	Royal St.	Phase 2 – from Lexington Ave. to Lane Ave.	Widen from 2 to 3 lanes with sidewalks and bike lanes on both sides	$9.5
12	Vann Dr. Extension	US-45 (Highland Ave.) to Campbell St.	New 5-lane roadway	$16.8
13	Christmasville Rd.	Bedford White Rd. to Ashport Rd.	Widen to 12-foot travel lanes with 8-foot shoulders (safety improvements)	$3.7

**Year of Expenditure (YOE)*

Table 4-5: Roadway Capacity Projects for Completion in 2026-2040

2040 Plan Number	Route	Termini	Description	Cost in Millions (YOE*)
14	E. University Pkwy.	US-45 (Highland Ave.) to Cooper Anderson Rd.	Safety improvements, including addition of shoulders	$2.2
15	Southern Extension of US-45 Bypass (SR-186) - Phase II	US-45 north of Edwards Dr to the east side of US-45, opposite Seavers Rd	New 4/5-lane roadway	$230.6
16	I-40	East of SR-223 (Miller Rd./Smith Ln.) to US-412	Widen from 4 to 6 lanes	$20.8
17	I-40	West of SR-138 (Providence Rd) to east of SR-223 (Smith Ln.)	Widen from 4 to 6 lanes	$37.4
18	I-40	US-70 to east of SR-152 (Law Rd)	Widen from 4 to 6 lanes	$37.4
19	Old Humboldt Rd.	Ashport Rd. (north junction) to US-45 Bypass	Widen from 2 to 4 lanes	$12.6
20	Old Medina Rd.	Hopper Barker Rd. to existing 4-lane section north of I-40	Widen from 2 to 4 lanes	$14.5
21	Hollywood Dr.	From existing 4-lane section north of Arlington Ave. to existing four-lane section at Forest Ave.	Widen from 2 to 4 lanes	$13.8
22	Hopper Barker Rd.	US-45 (Highland Ave.) to Old Medina Rd.	Reconstruction and minor widening within existing ROW	$11.7
23	Casey Jones Extension	US-45 Bypass to US-412 (Hollywood Dr.)	New 4/5-lane roadway	$19.5
24	University Pkwy.	Cooper Anderson Rd. to Henderson Rd.	New 2-lane roadway	$10.8
25	Ashport Rd.	US-45 Bypass to Cooper Anderson Rd.	Widen from 2 to 4 lanes	$36.1
26	Ashport Rd.	0.6-mile curve section located between Old Medina Rd. and Christmasville Rd.	Relocate roadway to eliminate curve	$8.4
27	Ashport Rd.	West of US-70 to the US-70/Waynick Rd. intersection	New 2-lane road, relocated	$5.4
28	Ashport Rd.	Windy City Rd. to Old Humboldt Rd.	Widen from 2 to 4 lanes	$7.0

**Year of Expenditure (YOE)*

Figure 4-6: 2025 LOS (includes E+C and Plan projects)

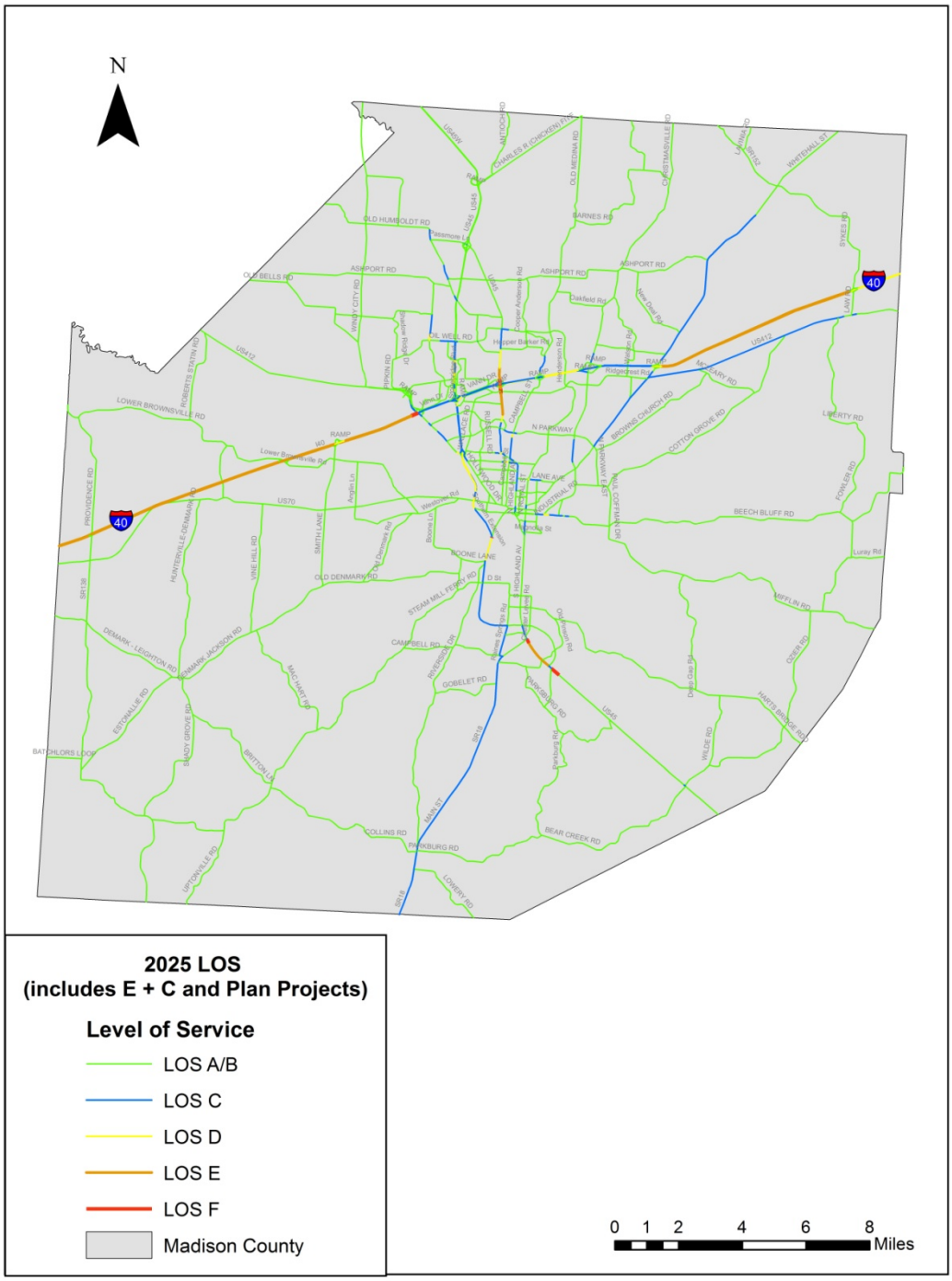
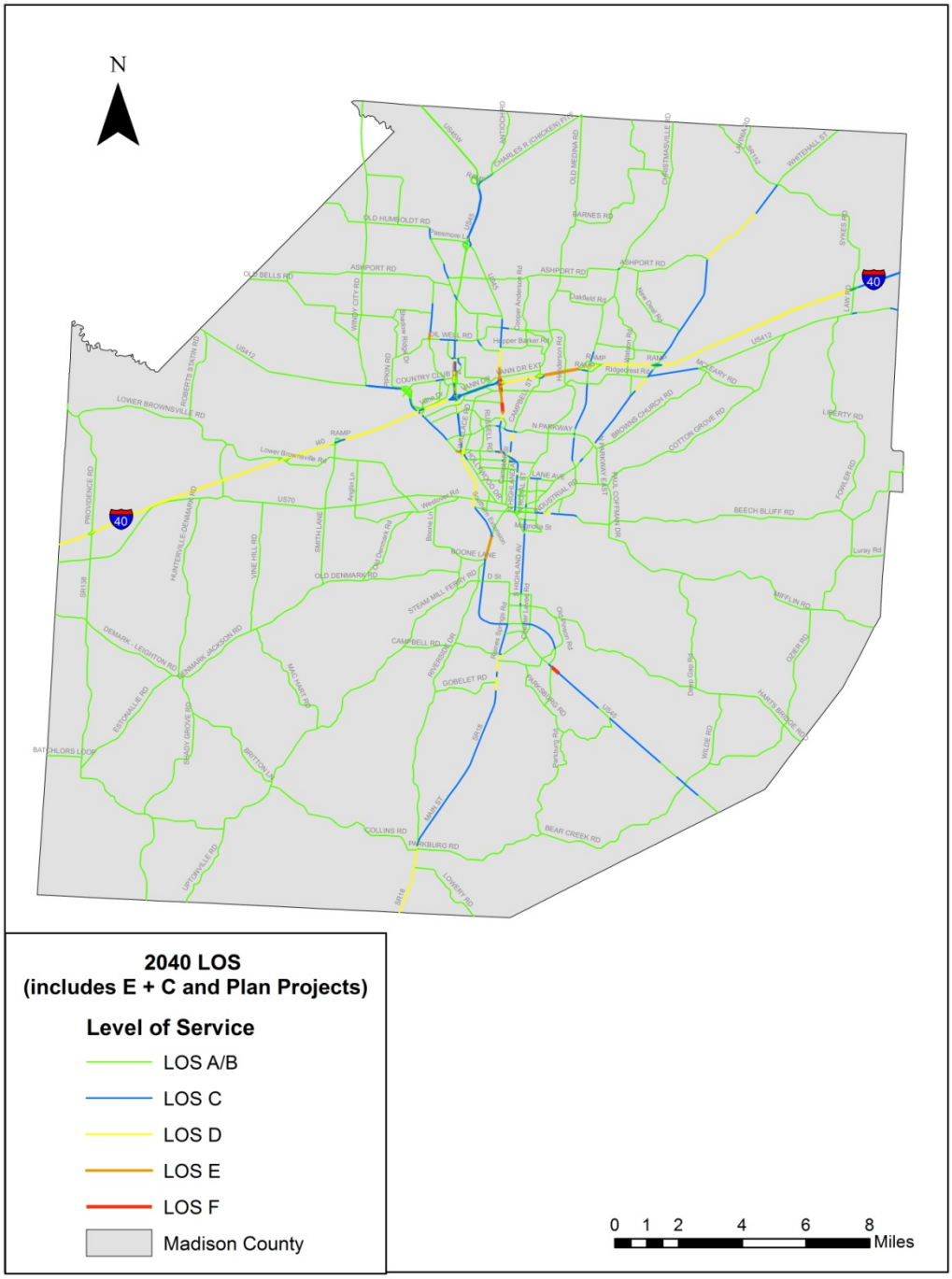


Figure 4-7: 2040 LOS (includes E+C and Plan projects)



It can be seen from the previous two maps that most, but not all, transportation deficiencies in the MPO area can be fully addressed through widening or other capacity improvements.

The widening of Interstate 40 to the west and east of Jackson's central area is programmed to occur after the year 2025 based on the Tennessee Department of Transportation's I-40/81 Corridor Plan. The 2025 LOS map indicates that the interstate may reach LOS E before further improvements occur. Discussions between the Jackson Area MPO and TDOT should occur as the state undertakes its next update to the I-40/81 Corridor Plan, to review data assumptions and the potential for scheduling I-40 widening projects earlier.

The other notable remaining issue is the Highland Avenue corridor between Interstate 40 and downtown Jackson. Further road widening on this corridor is unlikely to occur for a number of reasons: (1) the expense of purchasing land from multiple commercial developments; (2) the inability to acquire right-of-way from historic properties; (3) buildings abut the existing right-of-way in the downtown area; and (4) the inability to acquire right-of-way in the wetlands area located south of downtown. As a result, a series of Intelligent Transportation Solutions (ITS) specific to the Highland Avenue corridor have been developed and are presented in Chapter 9 of this Plan.

Chapter 5

Safety and Security

INTRODUCTION

Transportation safety impacts the community regardless of whether citizens travel by personal vehicle, public transit, or walking. The goal of the proposed projects outlined in this section is to provide improved safety features throughout the MPO area that, once implemented, will benefit a large percentage of the population. The 2035 Plan utilized crash data to develop a list of improvement projects for the MPO area. In total, 75 intersections were selected for further investigation based on the high crash rates documented at these intersections.

The locations identified in the previous plan were one part of the development of the safety analysis which undertook a broader approach to addressing safety concerns. This approach included the assessment of:

- Roadway network flow;
- Pedestrian safety along routes;
- Effects of estimated growth on the existing network;
- Accommodations for other modes of transportation (ex. Bicyclists, etc);
- Vehicle safety; and
- Congestion reduction

Including the above listed factors expanded the type and size of projects that were recommended. Not only were spot locations reviewed, but longer roadway segments were included to provide a benefit to a larger area. A network and/or segment approach will allow the MPO to incorporate multiple benefits with one project. For instance, a widening project could not only benefit the flow of vehicles through the network, but also provide the opportunity to incorporate facilities for use by pedestrians or bicyclists. It can also promote the development of an area through business investment or residential community growth.

By definition arterial routes carry larger amounts of traffic than collector or local routes. By recommending strategic improvements to these same collector and local routes, they can serve as an alternate to the currently more congested segments in the MPO area and better serve the community as it continues to grow. Increasing the visibility of intersections along these same strategic routes through signal modification can also provide the driver a safer intersection and route to travel through.

To develop the recommendations contained in this section, previously identified safety projects, the goals and objectives of the State of Tennessee Strategic Highway Safety Plan, as well as crash data gathered from the Tennessee Department of Transportation (TDOT) and the Tennessee Department of Safety (TDOS) were reviewed and evaluated. This information was combined with input from local stakeholders to prioritize the listing of safety projects for the MPO area.

State of Tennessee Strategic Highway Safety Plan

The stated goal of the State of Tennessee Strategic Highway Safety Plan is to achieve fewer than 900 fatalities annually by the end of 2012. In order to accomplish this goal, the plan incorporates various strategies to both educate the traveling public and increase safety measures on public roads. The Tennessee Strategic Highway Safety Committee, consisting of members from TDOT, TDOS, the Tennessee Department of Health (TDH), Governor's Highway Safety Office (GHSO), Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), Tennessee Trucking Association, Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), and the District Attorney's Office, implements eight emphasis areas for safety improvements throughout the state. The emphasis areas include:

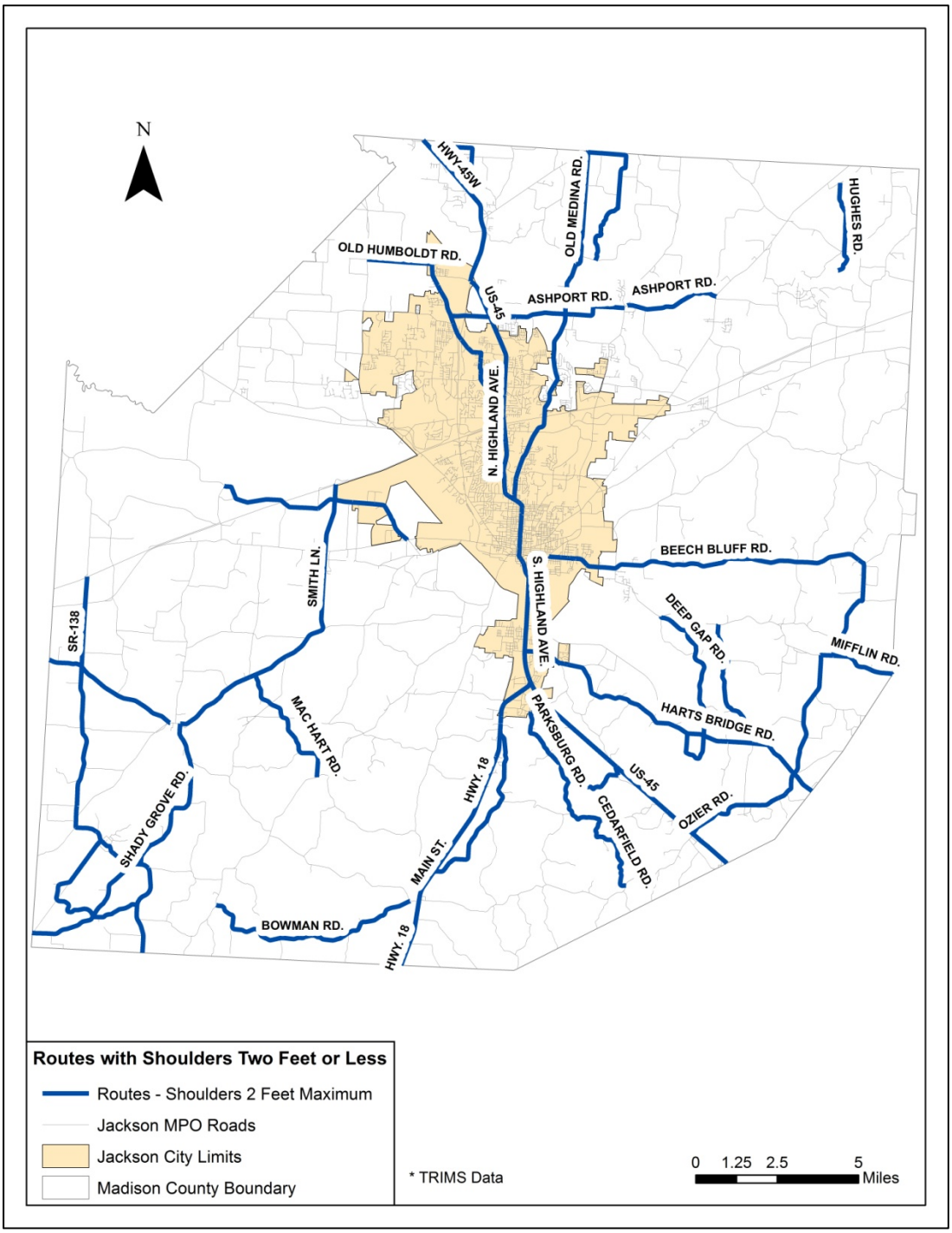
- Improve Decision Making Process and Information Systems
- Keep Vehicles in the Proper Lane and Minimize the Effects of Leaving the Travel Lane
- Improve Intersection Safety
- Improve Work Zone Safety
- Improve Motor Carrier Safety
- Improve Driver Behavior
- Legislation
- Educational Programs

These focus areas provide a multifaceted approach to increasing driver safety. Through the incorporation of safety improvement measures, increased driver education, and legislation the goal is to reduce the number of fatal and serious injury crashes that occur each year throughout the state.

Identification of Roadways with Narrow Shoulders

TDOT's Tennessee Roadway Information Management System (TRIMS) database was used to develop and map a list of routes in the MPO area with shoulder widths of two feet or less. According to the database there are currently over 710 miles of roadway in the MPO area that have shoulders of two feet or less. The two foot threshold was chosen in part due to the minimal stabilized recovery area a vehicle would have once leaving the travel lane (wider shoulders or lane widths can provide vehicles additional area to correct lane departure). Narrow shoulders also provide a smaller area for bicycle or pedestrian travel. In addition to the traveling public, more narrow shoulders limit the implementation of certain safety appurtenances, such as rumble strips. As shown in Figure 5-1, multiple routes throughout the county are included.

Figure 5-1: Routes with Shoulders Two Feet or Less



Identification of Roadways with High Traffic Volumes

Because traffic volume and congestion contribute to the location of crashes, the historical traffic count data provided by TDOT was also reviewed. Table 5-1 illustrates the routes in the Jackson MPO area that currently have the highest volumes of traffic.

Table 5-1: High Traffic Volumes

	Route	Begin Segment	End Segment	2011 Traffic (AADT)
1	Highway 45 Bypass	Oil Well Road	Hollywood Bypass	43,270
2	South Highland	Main Street	SR 18	30,757
3	North Highland	Forest Avenue	Vann Drive	24,793
4	Dr. F.E. Wright Drive	Bendix Drive	Interstate 40	15,553
5	East Chester Street	North Highland	Dr. F.E. Wright Drive	14,856
6	SR 20 (US 412)	County Line	W. Forest Avenue	14,777
7	Vann Drive	US 45 Bypass	North Highland	14,483
8	North Parkway	US 45 Bypass	Dr. F.E. Wright Drive	13,952
9	Campbell Road	Interstate 40	North Highland	9,046
10	Royal Street	Chester Street	North Parkway	7,525

** Traffic estimate based on TDOT count stations along route segments noted*

Identification of Crashes

TDOS has a record of 3,361 crashes in Madison County, for Calendar Year 2011 (CY 2011). Of these 3,361 crashes, 22 were fatal. Table 5-2 below provides a more detailed listing of the crash types for CY 2011. Based on the information provided, the majority of incidents were rear end (33%) or angle (23%) crashes. This data corresponds to the comments made during the local stakeholder meeting (see the following section). Congestion on major routes was noted to be a contributing factor to numerous crashes in the MPO area. With over 50% of the reported crashes for CY 2011 falling into rear end or angle crashes, the goal of certain project recommendations was to incorporate measures aimed at reducing crashes in these two categories.

Table 5-2: Madison County Crashes (2011)

Manner of Collision at First Harmful Event	2011	% of Total
Not Collision with Motor Vehicle in Transport	855	25.4
Front to Rear (Rear-End)	1,111	33.1
Head On	76	2.3
Angle	786	23.4
Sideswipe, Same Direction	348	10.4
Sideswipe, Opposite Direction	92	2.7
Rear to Side	25	0.7
Rear to Rear	10	0.3
Other	38	1.1
Unknown	20	0.6
Total	**3,361**	**100.0**

Local Stakeholder Meeting

Local stakeholder input is vital to better understand and confirm the crash data and historical information that was gathered for the MPO area. A meeting with local stakeholders was held at City Hall in Jackson on March 8, 2012. The meeting was an open discussion format where participants were invited to share their first-hand experience and knowledge regarding safety issues. Table 5-3 lists the meeting attendees.

Table 5-3: Stakeholder Meeting Attendees

Name	Organization
Keith Donaldson	Jackson Area MPO
Wayne Arnold	Jackson Fire Department
Eric Turner	Madison County Fire Department
Ron Adams	City of Jackson Police
Mandy White	Jackson Chamber of Commerce
Randy McKinnon	TLM Associates
Cindy Melton	Jackson Madison County Airport Authority
Steve Smith	Jackson Madison County Airport Authority
George Flew	Jackson Energy Authority
Travis Franklin	Jackson Transit Authority
Bart Walls	Madison County Highway Department
Scott Pate	TDOT Region 4 Traffic
Scott Chandler	City of Jackson Engineering
Don Despain	Tennessee Highway Patrol

After a short introduction, the attendees were asked to discuss locations throughout the MPO area that could benefit from safety improvements (the improvement topics were not limited to only geometric improvements). The group was also asked to discuss locations that might need further investigation. During the discussion county and city maps were utilized to note the locations identified. Later analysis used the information gathered from the meeting participants to select corridors or intersections that had multiple occurrences. Crash data was also provided by the City of Jackson Police Department at the meeting.

RECOMMENDATIONS

Based on all of the data gathered and input from local stakeholders the following recommendations were developed. These recommendations incorporate both geometric and crash data, current (2011) traffic volumes, stakeholder input, and the projected growth in the MPO area. The project list below incorporates a range of safety improvements to address a variety of safety concerns and is not solely based on crash history. It was the goal of this list to not only improve safety for the current road network, but also to propose projects that would help improve future travel in the Jackson MPO area.

Projects recommended for implementation are presented in three tiers (Short-Term, Mid-Term, and Long-Term) based on the timeframe in which the project can expect to be funded, designed, and built. In addition, each tier builds on the previous tier of projects to improve the overall network.

Short-Term Safety Project Recommendations

The Short-Term projects promote spot safety improvements. These projects are smaller and more localized, and benefit areas shown to have both high traffic volumes and the potential for more severe crashes. Due to the traffic volumes in a majority of these areas, the reduction in severity and occurrence of crashes will have a significant benefit to traffic flow.

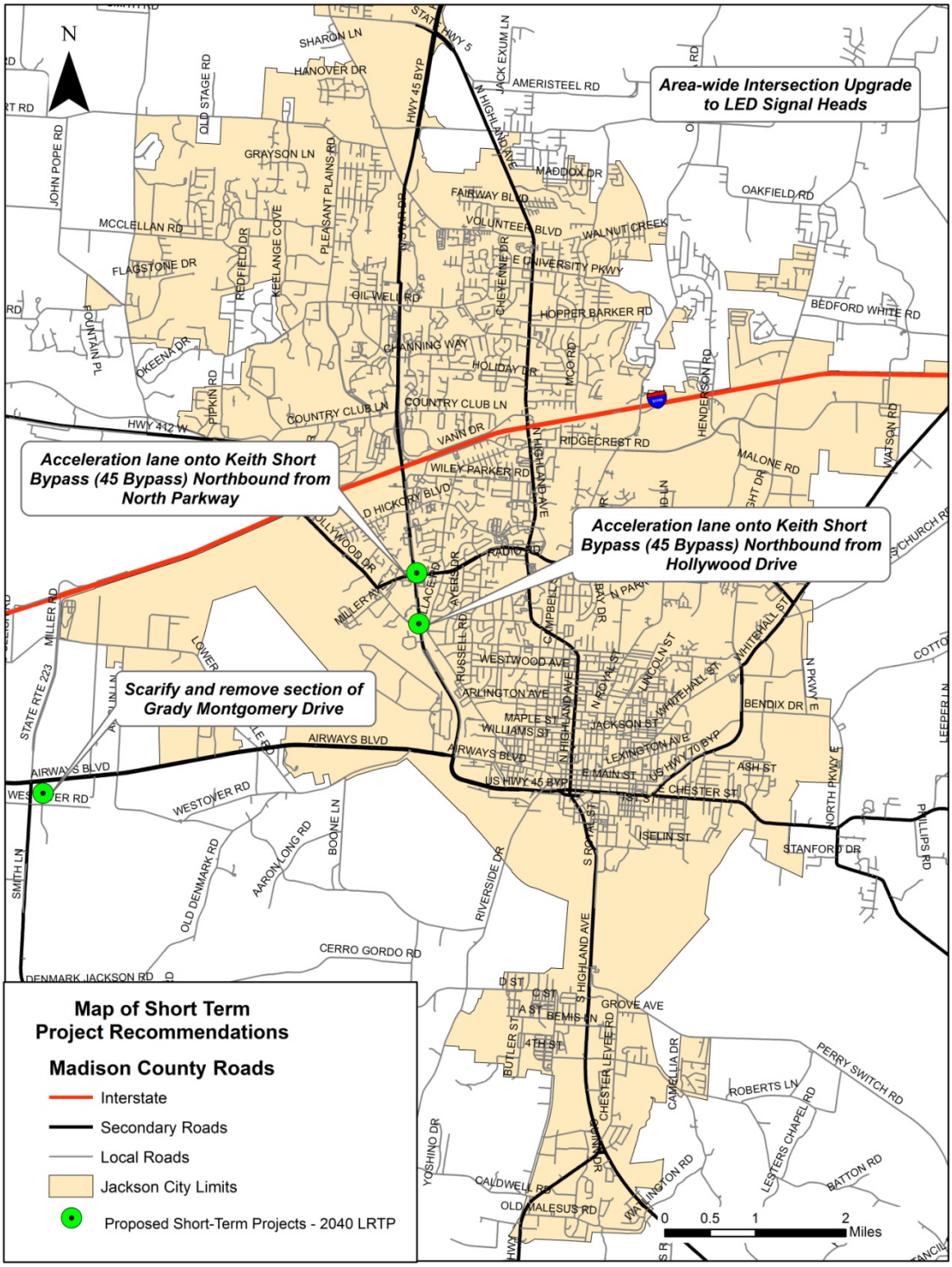
Table 5-4: Short-Term Project Recommendations

Recommendation	Location	Cost*
Install 350 foot acceleration lane	North Parkway ramp onto Keith Short Bypass (US 45 Bypass) Northbound	$149,000
Install 350 foot acceleration lane	Hollywood Drive ramp onto Keith Short Bypass (US 45 Bypass) Northbound	$149,000
Upgrade signalized intersections with LED signal heads.	MPO Area	$46,000 (each)
Closure of Grady Montgomery Drive	Technology Center Drive to existing business entrance	$57,500

* Reflects estimated cost for construction only. Costs represent current (2012) dollar amounts.

- The construction of two (2) acceleration lanes for traffic entering the Keith Short Bypass (US 45 Bypass), at Hollywood and North Parkway, will provide vehicles increased distance to merge onto the US 45 Bypass. The current configuration provides vehicles little merge area and no acceleration lane onto the US 45 Bypass. Vehicles are directed to merge immediately with bypass traffic while looking back to determine if an appropriate gap exists. The additional length is recommended to provide both a longer transition and to provide the driver with additional acceleration length, minimizing unanticipated braking by merging vehicles.
- Grant funding provided the mechanism for the conversion of single bulb signal heads to LED signal heads at sixty-six (66) intersections in the MPO area in 2011. LED signals provide better visibility and require less energy to operate than traditional bulb assemblies. Additionally, the inclusion of back plates provides increased area to reduce the effects of sun when drivers are traveling either east or west in early morning or late afternoon. Increased visibility and awareness provided by the implementation of LED signals is recommended to reduce the failure of the driver to properly visualize and interpret traffic signals resulting in sudden stops or red light running. It is recommended to continue the conversion of the remaining 43 (109 total) signalized intersections in the MPO area to LED signal heads.
- The closure of Grady Montgomery Drive provides a single entrance to the McKellar-Sipes Regional Airport and the Tennessee Technology Center at Jackson while removing a two way stop intersection. Noted in the local stakeholder meeting on March 8, 2012, the removal of this access and intersection will provide a safer, more easily monitored entrance into the airport and eliminate an intersection noted by stakeholders to be difficult to interpret.

Figure 5-2: Map of Short-Term Project Recommendations



Mid-Term Safety Project Recommendations

The Mid-Term projects begin to directly incorporate the anticipated growth within the MPO area. As residential and commercial growth continues to occur, the need for increased attention to routes with more narrow lanes or deficient geometrics will persist. As these deficient routes are improved, they will aid in providing alternate routes of travel for the community.

Table 5-5: Mid-Term Project Recommendations

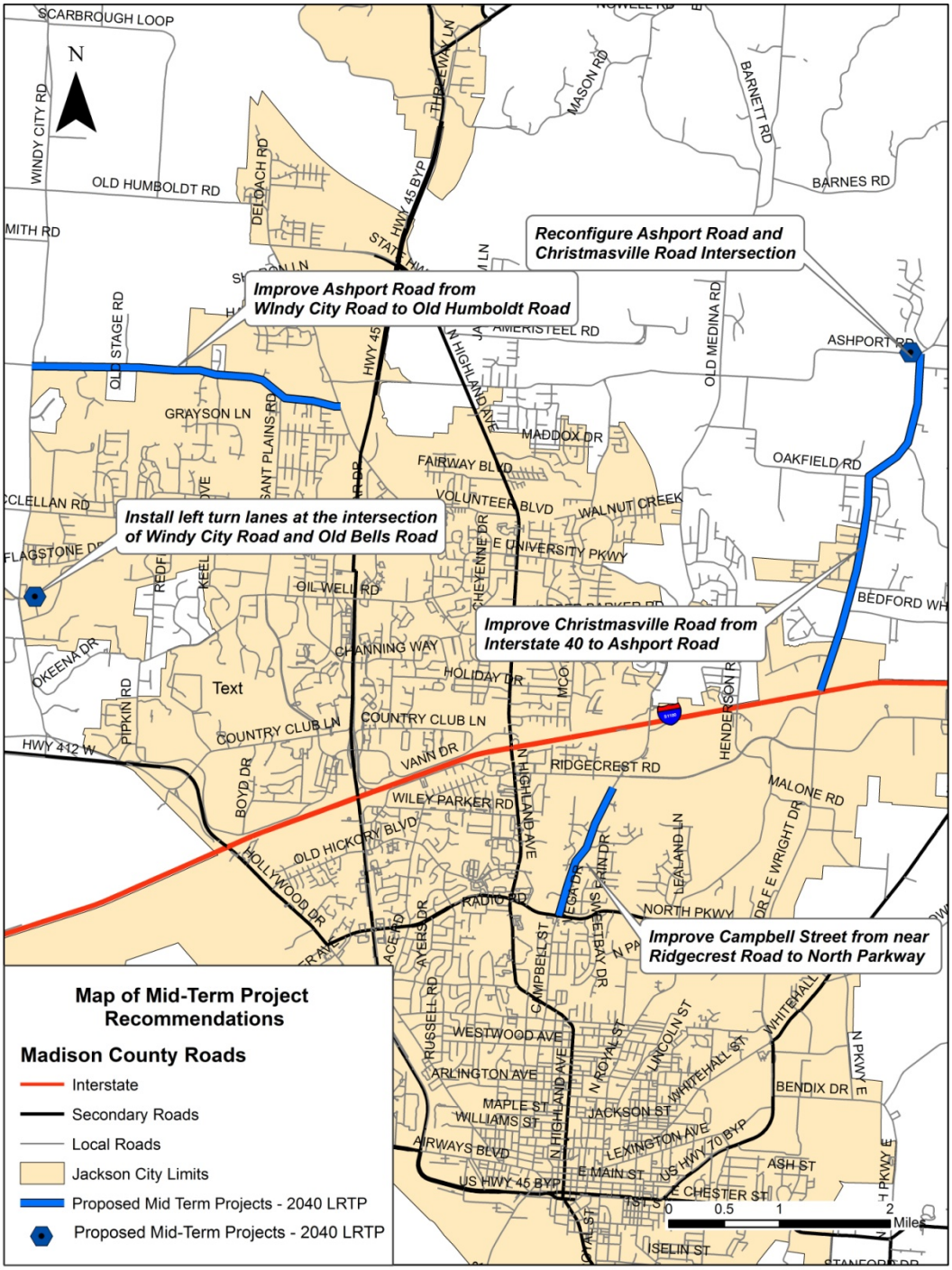
Recommendation	Location	Cost*
Widen Ashport Road to a four lane typical section	Windy City Road to Old Humboldt Road	$3,746,000
Widen Campbell Street to a five lane typical section with continuous center turn lane	Near Ridgecrest Road to North Parkway	$2,987,000
Install two (2) Left Turn Lanes	Intersection of Windy City Road and Old Bells Road	$127,000
Reconfigure intersection	Intersection of Ashport Road and Christmasville Road	$146,000
Widen Christmasville Road to two twelve (12) foot travel lanes with eight (8) foot shoulders	Interstate 40 to Ashport Road	$3,684,000

* Reflects estimated cost for construction only. Costs represent current (2012) dollar amounts.

- Ashport Road is an east-west two lane road connecting ultimately to Christmasville Road on the east side of Jackson. Multiple subdivision entrances are currently located along this section of Ashport Road. As constructed, Ashport Road provides little to no stabilized shoulder. The recommendation to widen Ashport Road to three lanes provides improved shoulder area, the potential to accommodate bicyclists, and a turn lane for the existing and potential residential developments along the route.
- The Campbell Street improvement continues an existing widening project. The project is proposed to connect with the existing widening and continue to North Parkway.
- The addition of turn lanes at the intersection of Windy City Road and Old Bells Road was previously recommended in the 2035 Jackson LRTP. A review of the area found no stabilized shoulders and a geometric alignment that leaves northbound approach traffic on Old Bells Road stopping to turn left to continue on Old Bells Road. In addition to the geometric alignment of the intersection, a main entrance for Trinity Christian Academy, a private school for grades pre-kindergarten through 12th grade, is directly across from Old Bell Road. This facility has the potential to produce larger than average numbers of turning traffic during school hours or special events.
- Christmasville Road and Ashport Road intersect at a “Y” with little marking or signage to direct the driver as to which vehicle has the right of way. The recommendation is to construct a “T” intersection with westbound Ashport Road being brought to a stop and Christmasville Road continuing as a free-flow movement.
- Christmasville Road was noted at the Stakeholder meeting to be narrow with little to no shoulders. A field review found the description appropriate. Widening Christmasville Road allows larger vehicles including buses additional lane width to travel in while bringing this section of road to current design

standards for the amount of volume. The additional lane and shoulder width allows area bicyclists to travel more safely.

Figure 5-3: Map of Mid-Term Project Recommendations



Long-Term Safety Recommendations

The Long-Term projects highlight routes that either currently experience proportionally large traffic volumes or are expected to fall within growth areas of the MPO area. These projects will require considerable attention, given the unique situations they present to stakeholder agencies when implementing the proposed plan.

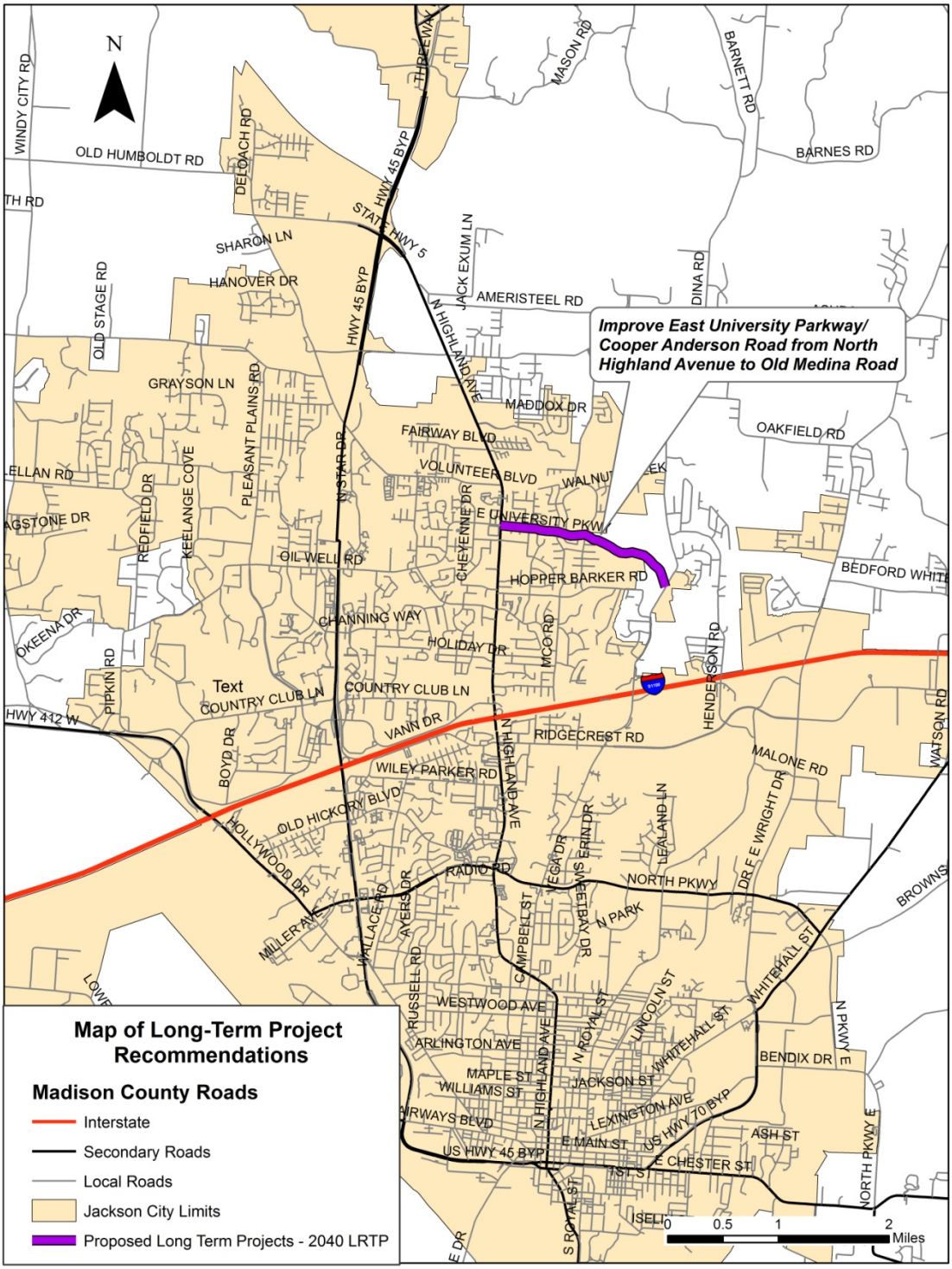
Table 5-6: Long-Term Project Recommendations

Recommendation	Location	Cost*
Widen East University Parkway/Cooper Anderson Road	North Highland Avenue to Old Medina Road	$2,360,000

* Reflects estimated cost for construction only. Costs represent current (2012) dollar amounts.

- East University Parkway/Cooper Anderson Road was noted as a heavily traveled bicycle route. This route is not currently designated a bike route by the State of Tennessee. This heavily residential route has little to no stabilized shoulders and numerous private driveways and subdivision entrances. The proposed widening will provide a facility capable of handling the potential for future growth in this area. It will also provide an additional improved east-west route for traffic, reducing volume on other neighboring routes.

Figure 5-4: Map of Long-Term Project Recommendations



Additional Spot Safety Improvements

Additional spot safety improvements are popular throughout the country for their lower cost and shorter construction times. Rather than improve the entire route, improvements can be targeted to more critical areas and can be implemented where an entire road improvement project could not be completed. Some of these safety improvements include but are not limited to:

- The addition of turn lanes
- New pavement striping
- Raised pavement markers to delineate the route
- The addition of acceleration or deceleration lanes
- The installation of LED traffic signals to provide greater signal visibility, lower operating costs, and extend the signal life
- Providing additional signage or increasing sign size or reflectivity
- Repaving
- The realignment of intersections
- Minor geometric improvements

SECURITY

In the last decade, security has become a core issue in state-wide and metropolitan transportation planning. The nation's transportation system plays a valuable role in facilitating local and national security plans. The National Highway System (NHS) and the Strategic Highway Network (STRAHNET) are examples of how transportation infrastructure can play a critical role in security planning. The Federal Bureau of Investigation consistently places public transportation systems at the top of the critical infrastructure protection agenda.

To ensure that security is a core consideration throughout the transportation planning process, MAP-21 requires the incorporation of security planning into the Long Range Transportation Plan. The following subsections provide an assessment of current security plans and programs within the Jackson MPO area. The Jackson MPO emphasizes safety and security throughout the transportation planning process.

Critical National Highway System Facilities

The NHS is approximately 16,000 miles of roadway that are important to the nation's economy, defense and mobility. STRAHNET is the network of highways in the NHS that are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes. The Jackson MPO contains several important NHS and STRAHNET facilities and the MPO incorporates these security facilities into their transportation planning process, including:

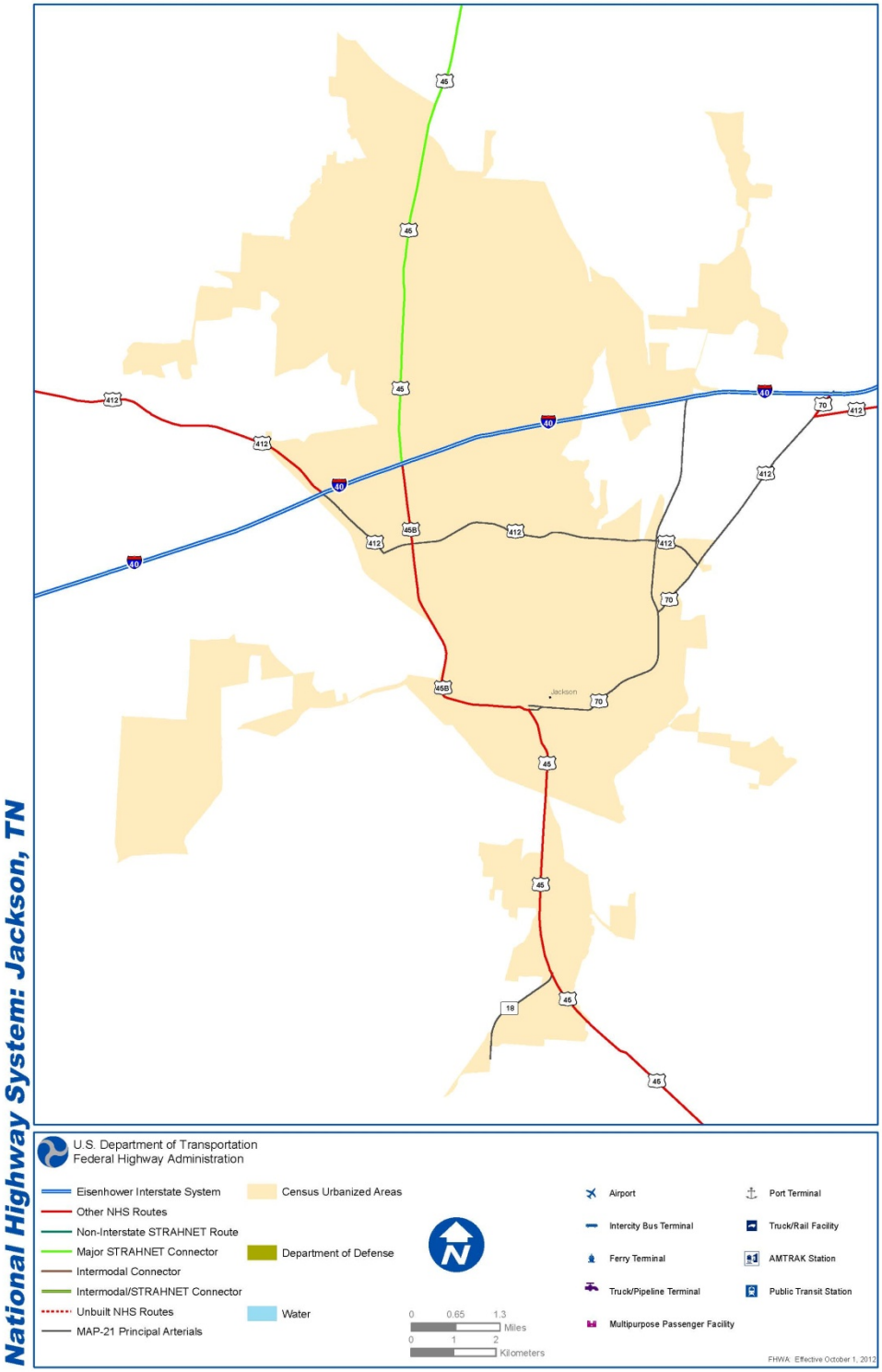
- Interstate 40 (I-40) is an interstate in the NHS that travels through Jackson and Madison County, connecting to Nashville to the east and Memphis to the west
- U.S. Highway (Hwy) 412, which runs northwest from I-40
- U.S. Hwy 45, which runs south from the Jackson Central Business District (CBD)
- U.S. Hwy 45, running north from I-40 and the Jackson CBD, is designated a "Major Connector" in the STRAHNET system due to its connection from I-40 and Jackson to the Milan Army Ammunition Plant

Figure 5-5 shows the Jackson area transportation system elements and defense facilities that are part of the NHS.

Transit System Security and Emergency Preparedness Plan

To establish the importance of security and emergency preparedness, the Jackson Transit Authority (JTA) developed a System Security and Emergency Preparedness (SSEP) Program Plan in 2004. The plan focuses on establishing responsibilities for security and emergency preparedness, identifying a methodology for documenting and analyzing potential security and emergency preparedness issues and developing a management system through which JTA can track their progress in resolving those issues. Since the adoption of the plan, JTA has not experienced any major incidents or loss of life. Marginal incidents involving minimal vehicle or financial losses are discussed at quarterly safety meetings held with the staff. Staff also receive regular training on issues such as winter preparedness, proper handling of items left at the transfer station, and hazardous spills. JTA also coordinates with the local emergency management agency and has committed to share its resources if called upon.

Figure 5-5: Jackson National Highway System Elements



Chapter 6

Transit and Passenger Rail

INTRODUCTION

Public transportation has played a major role in providing mobility for residents of Jackson and the surrounding area for more than a century. As far back as 1887, public transportation was available to city residents through the use of mule-drawn cars. In 1897, the Jackson Power & Line Company established an active electric street car service which evolved into the existing fixed-route bus service which is operated by the Jackson Transit Authority (JTA).

In addition to the JTA bus service, transit services are also available to the area through the Southwest Human Resource Agency (SWHRA), Greyhound Bus Lines, and a number of other non-profit and private providers, as discussed in the following sections.

JACKSON TRANSIT AUTHORITY

Created in April 1966, the Jackson Transit Authority (JTA) manages and operates the public transportation services throughout the city. Fixed route bus service has been available in Jackson since an electric street car service was established in 1897. In 1939, the electric street cars were replaced by twelve gasoline powered buses. Throughout the years, the system changed ownership and management several times, but by 1966 the system had become the publicly owned system, managed by the JTA, that it is today.

JTA's services include eight fixed bus routes and a demand-response service known as "The Lift" which provides service to all riders unable to ride the regular fixed route service because of a disability.

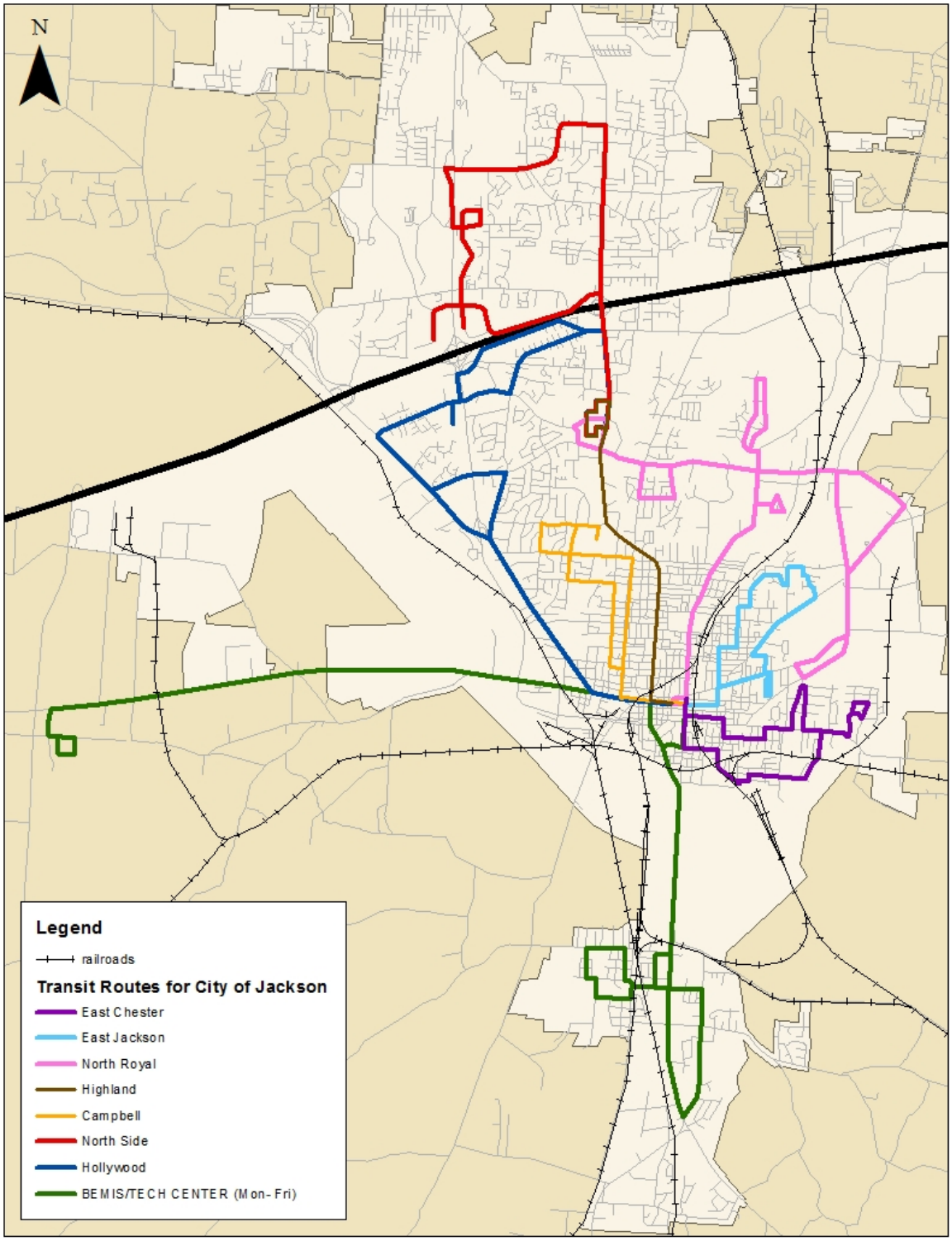
Fixed Route Service

Fixed route service operates Monday through Saturday from 6:00 AM to 10:30 PM with no Sunday service. Daily service (from 6:00 AM to 6:00 PM) is provided on 30 minute headways for the Campbell, East Chester, Highland and East Jackson routes, and on 60 minute headways for the Hollywood, North Royal, Bemis, Tech Center and Northside routes. For evening service (6:00 PM to 10:30 PM), all routes change to 60 minute headways except the Bemis and Tech Center routes, which do not operate after 6:00 PM.

Currently, the full fare for the fixed route bus service is $1.00. Student fares are $0.75 and seniors, disabled citizens and Medicare Card Holders with a JTA ID are $0.50. Children under four are free and transfers are free. JTA also offers a variety of pre-paid fare incentives. This service is provided to citizens who meet certain criteria and who schedule a reservation in advance.

Fixed route service corridors include downtown Jackson and adjacent residential areas. The Highland route, the East Jackson route and the Hollywood route carry the greatest numbers of riders within the fixed route system. Figure 6-1 shows the current bus routes that serve the City of Jackson.

Figure 6-1: JTA Routes (2012)



The Lift

"The Lift" is a curb-to-curb, demand-response transportation service for the mobility impaired within the City of Jackson. "The Lift" service operates within the corporate city limits of Jackson and is operated by JTA in addition to regular bus service. Curb-to-curb service means the bus will not drive on to private property, but must stay on public streets and areas. Drivers are allowed only to assist persons on and off the vehicle. Reservations are required for "The Lift" and must be made with a 24 hour advance notice or by 3:30 p.m. the day before.

Ridership on "The Lift" service has declined over the same period that ridership has increased on JTA's fixed routes. There are a number of factors that may have caused this shift, including the recent economic downturn. Seniors and disabled persons, who are the primary clients for "The Lift," may have reduced or even eliminated discretionary trips in order to conserve funds, resulting in fewer riders.

The declining ridership on "The Lift" may also be related to the evolving TennCare system. TennCare covers the cost of transportation needed in connection with a patient's medical appointments. As the system has evolved, there are now numerous contractors that TennCare uses to provide this transportation, of which JTA is only one. When a TennCare patient needs a ride to a medical appointment, he/she calls a central dispatch agency which then determines which of its contractors will provide the service. It is therefore possible that some of the riders who previously used "The Lift" to get to medical appointments are being referred to other private and non-profit providers in the Jackson area.

The distribution of TennCare trips is likely to be impacted as a result of legislation recently passed by the Tennessee General Assembly. The legislation established a Transportation Coordination Committee that is charged with improving coordination efforts among state agencies that provide transportation services.

Southwest Human Resources Agency

The Southwest Human Resources Agency (HRA), a regional agency headquartered in Chester County, provides public transportation services in areas of Madison County that lie outside the Jackson city limits.

Southwest HRA also offers daily transportation between Jackson/Madison County and the other seven counties in its service area (Figure 6-2) for a fare of $10.00 per passenger per round trip. Riders must schedule a reservation 48 hours in advance. In addition, the HRA has contracts to operate a set of routes that serve senior citizen centers in the region, with a current fare of $1.00 per passenger per round trip.

Southwest HRA provides transportation Monday through Friday from 6:00 AM to 6:00 PM. Service is not available on Sundays or holidays, with the exception of trips provided for dialysis patients.

With the recent expansion of the Jackson area's urbanized boundary following the 2010 Census, there are certain areas of the county that were formerly designated as rural and therefore qualified for service from SWHRA. Those areas are now considered urban, and coordination needs to occur among the region's transit agencies to ensure continued service. Coordination on these and other issues occurs informally on a daily basis, and more formally through the periodic update of the Coordinated Human Services Transportation Plan, described further in the following section.

Figure 6-2: Southwest HRA Service Area

(from Southwest HRA website)

Other Special Service Providers

The Jackson region has a wide range of public, private and non-profit organizations that each offer transportation to clients of human services programs such as seniors, students and other youth, the disabled, and low-income persons, as well as to medical and long-term care services and facilities.

Many of these human services programs and facilities are regionally located in Jackson/Madison County, which has two hospitals, more than 50 professional clinics including psychological, cancer and rehabilitation; nursing homes; and long term care facilities. The county is also home to the West Tennessee Cerebral Palsy Center, Madison Haywood Developmental Center, and Goodwill. Educational facilities in Jackson/Madison County include Lane College, Lambuth University, Union University, Jackson State Community College, The Star Center, the Technology Center and West Tennessee Business College.

To promote cooperation and ensure that federal funds are being spent as efficiently as possible, the Federal Transit Administration requires these agencies to work together to develop a Coordinated Human Services Transportation Plan. Jackson/Madison County prepared its first coordinated plan in 2007 and recently updated it this year.

TennCare Vendors

As noted above, a number of area agencies have contracts with the State of Tennessee to provide special TennCare transportation service to citizens who qualify for subsidized or free medical care, including the cost of medical trips. Vendors currently include JTA and Southwest HRA, the Northwest and Delta HRAs, and the local ambulance and EMS agencies for several cities and counties in southwest Tennessee, as well as Tri-County Transportation, BTW Transportation, Diamond Cab, Joy Transportation, and Med Care Ambulance.

Many area churches operate vans to pick up their members for various church-sponsored activities. Some nursing homes and group living facilities also have regularly scheduled trips for residents to shop or visit a doctor.

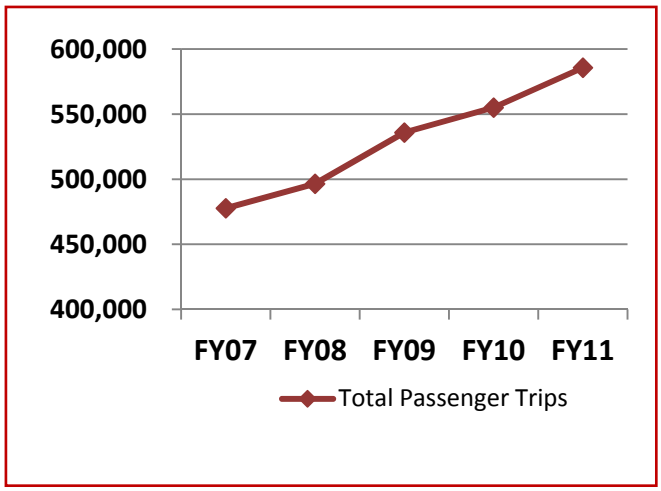
Coach USA also provides a fee-based charter service in Madison County, using standard over-the-road buses.

Trends in Transit Use

Bus ridership in Jackson has increased by more than 20% over the past five years, with a total of 585,734 passenger trips made in fiscal year 2011 (Figure 6-3). In fact, Jackson's vehicle revenue-hours per capita are higher than the average achieved by urban areas more than three times its size. Because of this performance, JTA has been designated by the Federal Transit Administration as a "Small Transit Intensive City" and receives some additional federal transit funds (Section 5307). Jackson is the only city in Tennessee with this designation.

Some of the increase in JTA's ridership reflects a larger national trend in which transit agencies across the U.S. saw their ridership grow as a result of spikes in gasoline prices from 2006 to 2008. More people in Tennessee and the U.S. also started using transit during the economic downturn that started in 2008, as citizens sought ways to conserve on fuel costs.

Figure 6-3: Growth in Bus Ridership in Jackson



However, recent growth in Jackson's transit ridership also results from successfully meeting the new demand for evening hours. As the region's employment base has changed, so has its transportation needs. More than 40% of those who use public transportation to get to work in Madison County are employed in service occupations, according to 2006-2010 American Community Survey data. Service employees' work schedules often differ from the standard manufacturing shift or "office hours." Nearly 60% of public transit users in Jackson reported they leave home at 9 AM or later to travel to work.

JTA has been able to fund extended hours on several bus routes by obtaining grant funds from the federal Job Access/Reverse Commute grant program.

Geographic changes in the Jackson area also have implications for future demand for transit services. Continuing growth on the north side of Interstate 40 and south of I-40 in the vicinity of the Campbell Street interchange (Exit 85) will likely warrant the extension of fixed-route service to these areas within the next ten years.

Transit-Dependent Populations

Certain groups traditionally use transit in greater numbers than the population at large, including minorities, senior citizens, and low-income persons. The maps on the following pages have been developed from Census data collected in Madison County at the block group level during 2005-2010.

Senior citizens, defined as persons 65 years of age or greater, are present in about 23% of the households in Madison County. Figures 6-4 and 6-5 show where transit routes currently operate in relation to areas where the proportion of seniors is higher than the countywide average. Although the central part of the city is well-served, Figure 6-5 makes it clear that many of the county's senior citizens live outside the service area of JTA's bus routes. However, many of them are located in rural communities where low population densities make it impossible for JTA to provide fixed route service in a cost-effective manner. Continuing coordination among Southwest HRA, JTA and other private/nonprofit transit providers is essential to ensure that these citizens can continue to visit Jackson for routine shopping, doctor's visits, and leisure activities even if they become physically unable to drive.

Figures 6-6 and 6-7 show areas where a relatively high percentage of residents are minorities, defined by the U.S. Census as non-white persons. Since census data indicates that transit usage is higher in these areas, this factor was considered in evaluating potential transit demand. About 39% of the county's households are non-white, so Figures 6-6 and 6-7 depict areas with minority population higher than that average. As seen in Figure 6-6, the areas with highest minority population are located in the core of the City of Jackson, particularly east of Royal Street, and on the western edge of the city in the area bounded by I-40, the South Fork of the Forked Deer River, and the US-45 Bypass. Both areas are relatively well-served by bus routes, geographically and in terms of available hours of service.

Low-income persons are shown in Figure 6-8. It should be remembered that some of the households that fall into this category are one or two-person households headed by senior citizens, so some "double counting" may result from looking at both factors. It is important not to lose sight of the transit needs of low-income persons who are not senior citizens because in many cases transit is essential to their ability to participate in the workforce. Reliable and affordable transportation enables them to get and keep a job, and therefore helps preserve the region's economic health.

Figure 6-4: **Areas with High Senior Citizen Population (City inset)**

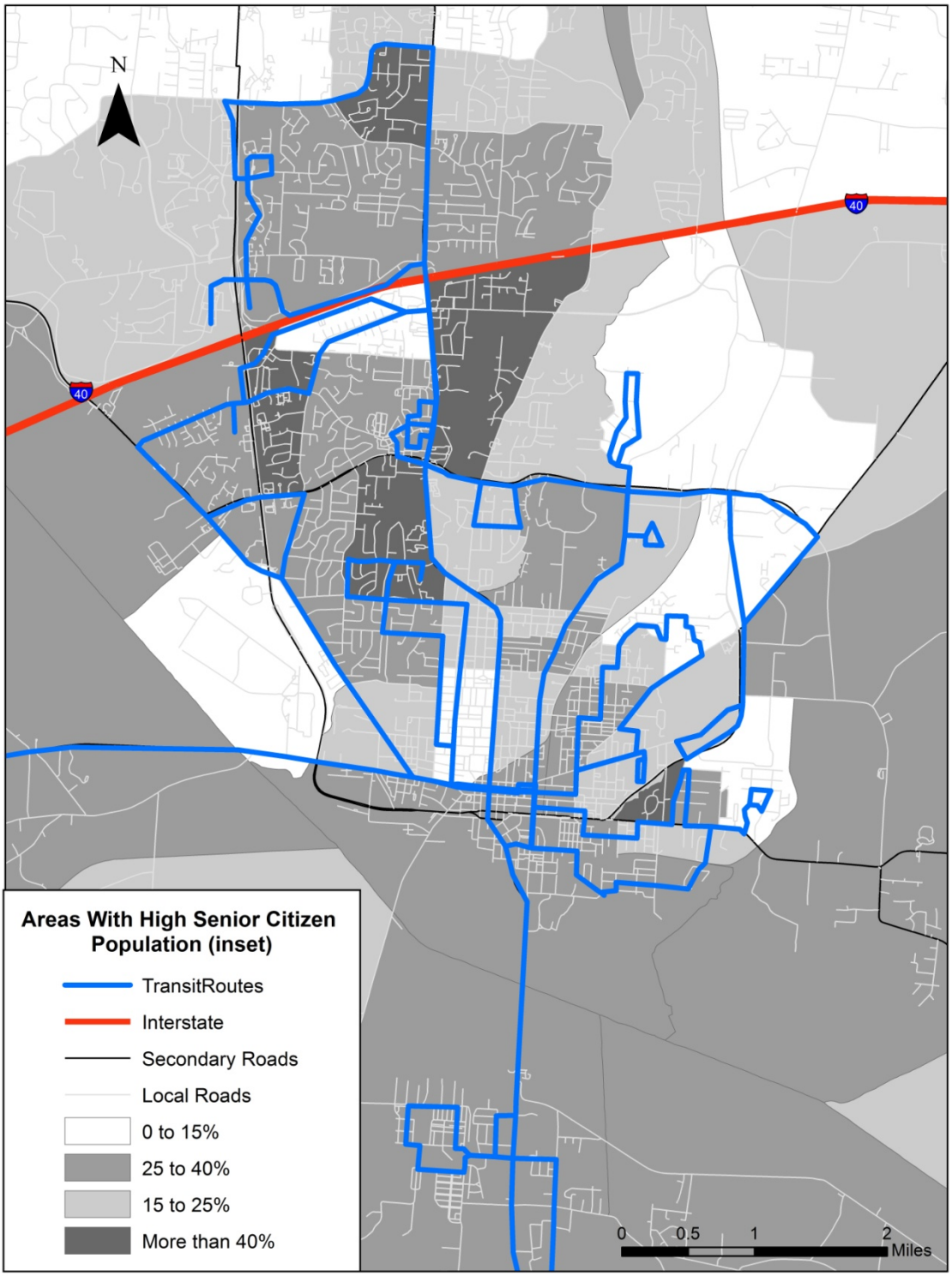


Figure 6-5: **Areas with High Senior Citizen Population (Countywide map)**

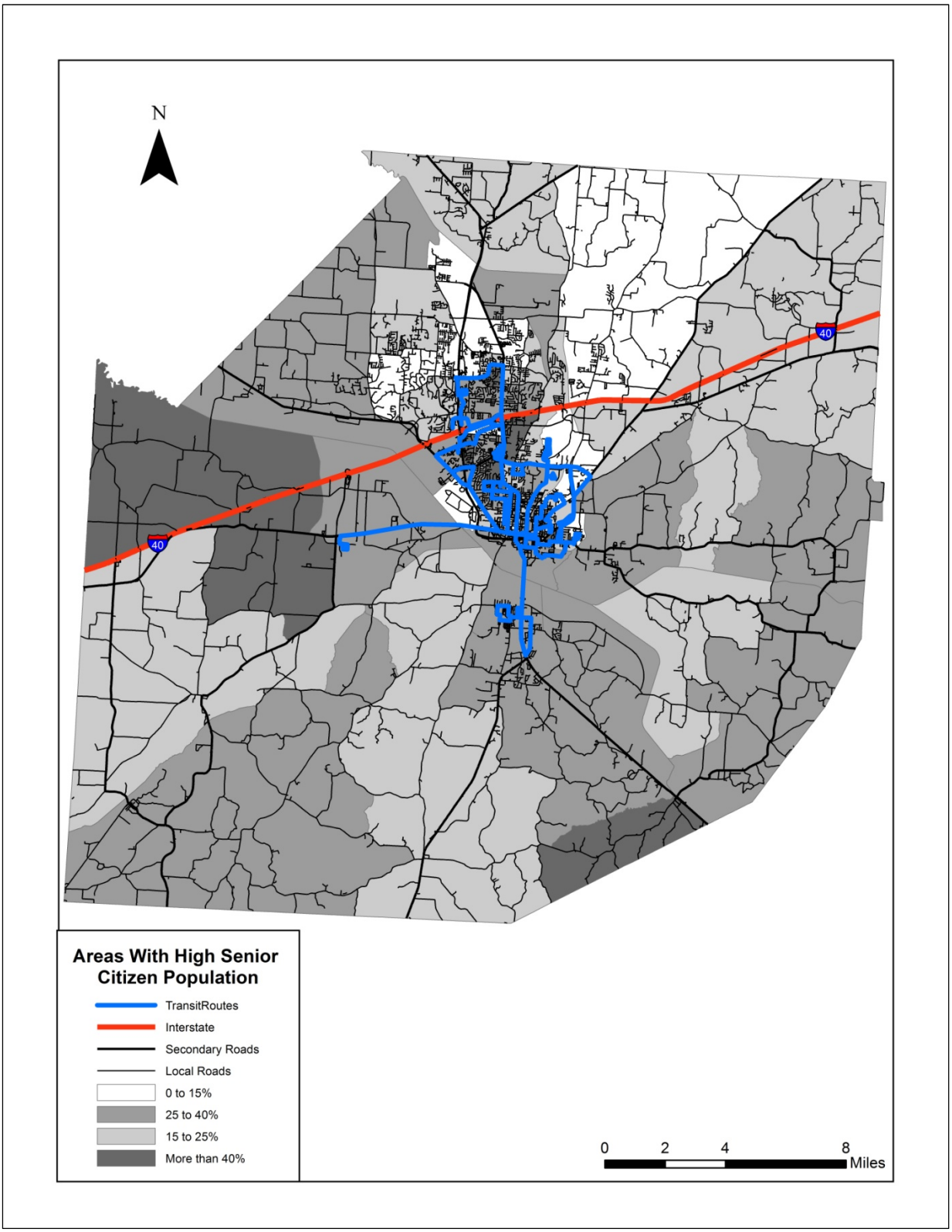


Figure 6-6: **Areas with High Minority Population (City inset)**

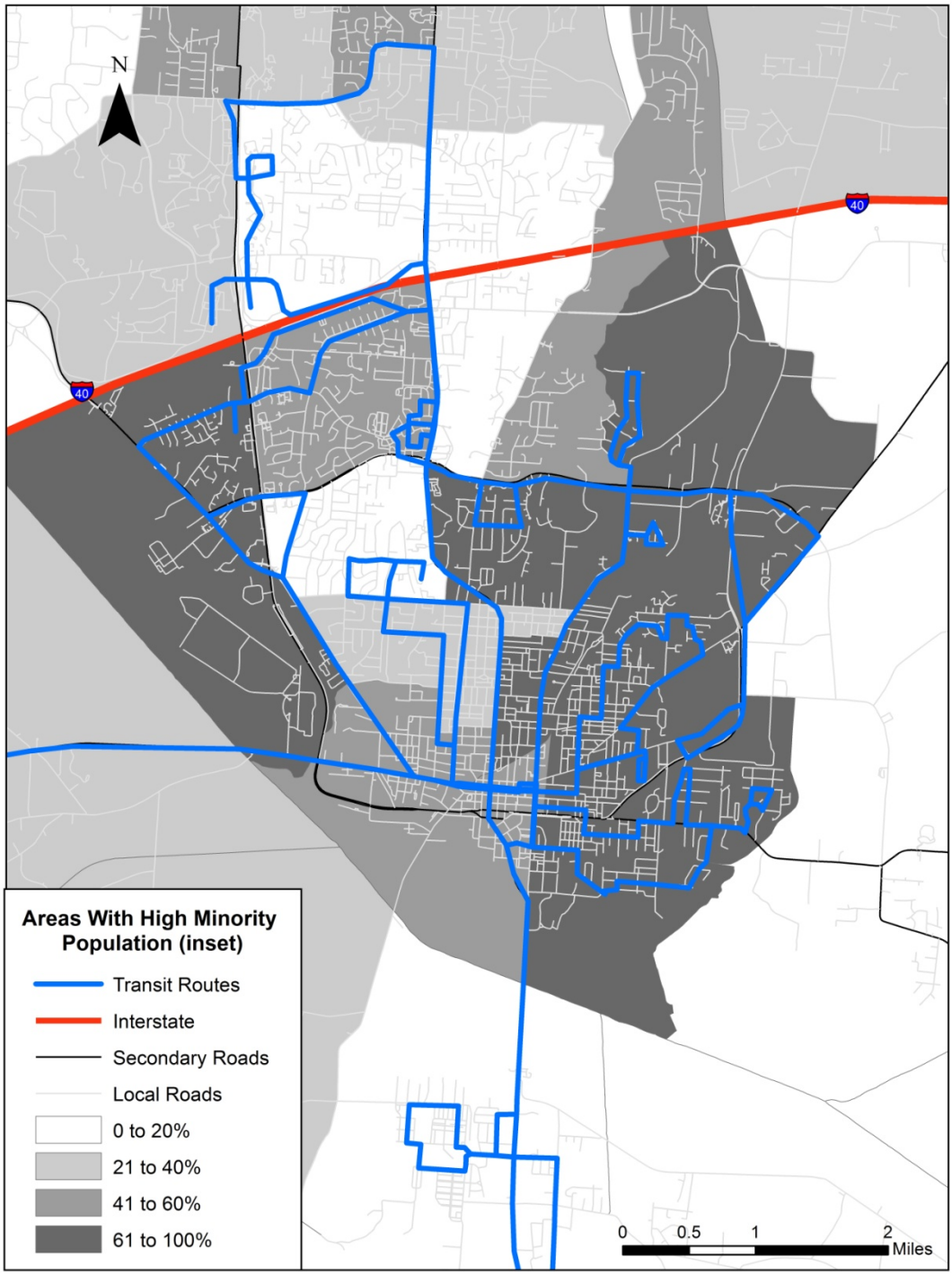


Figure 6-7: **Areas with High Minority Population (Countywide map)**

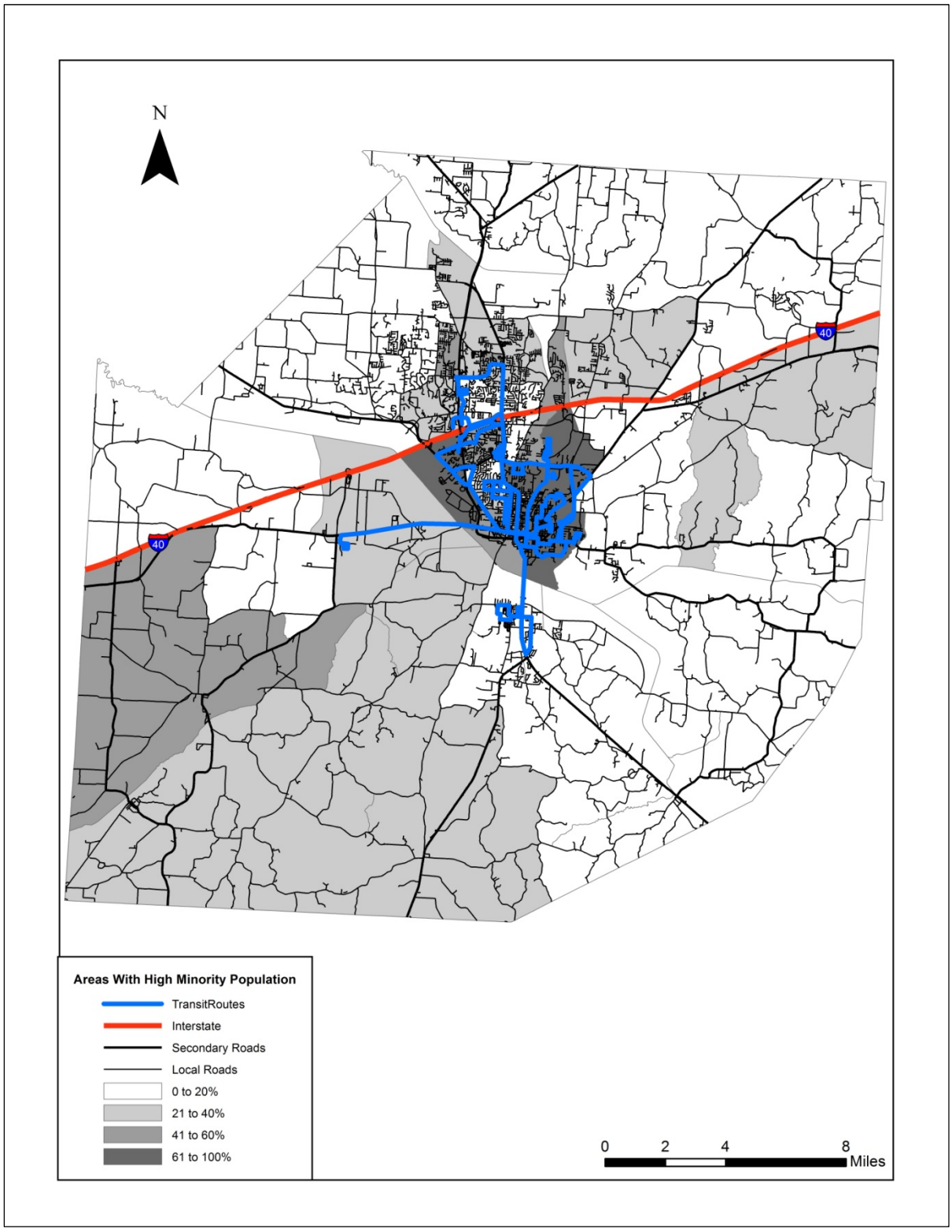
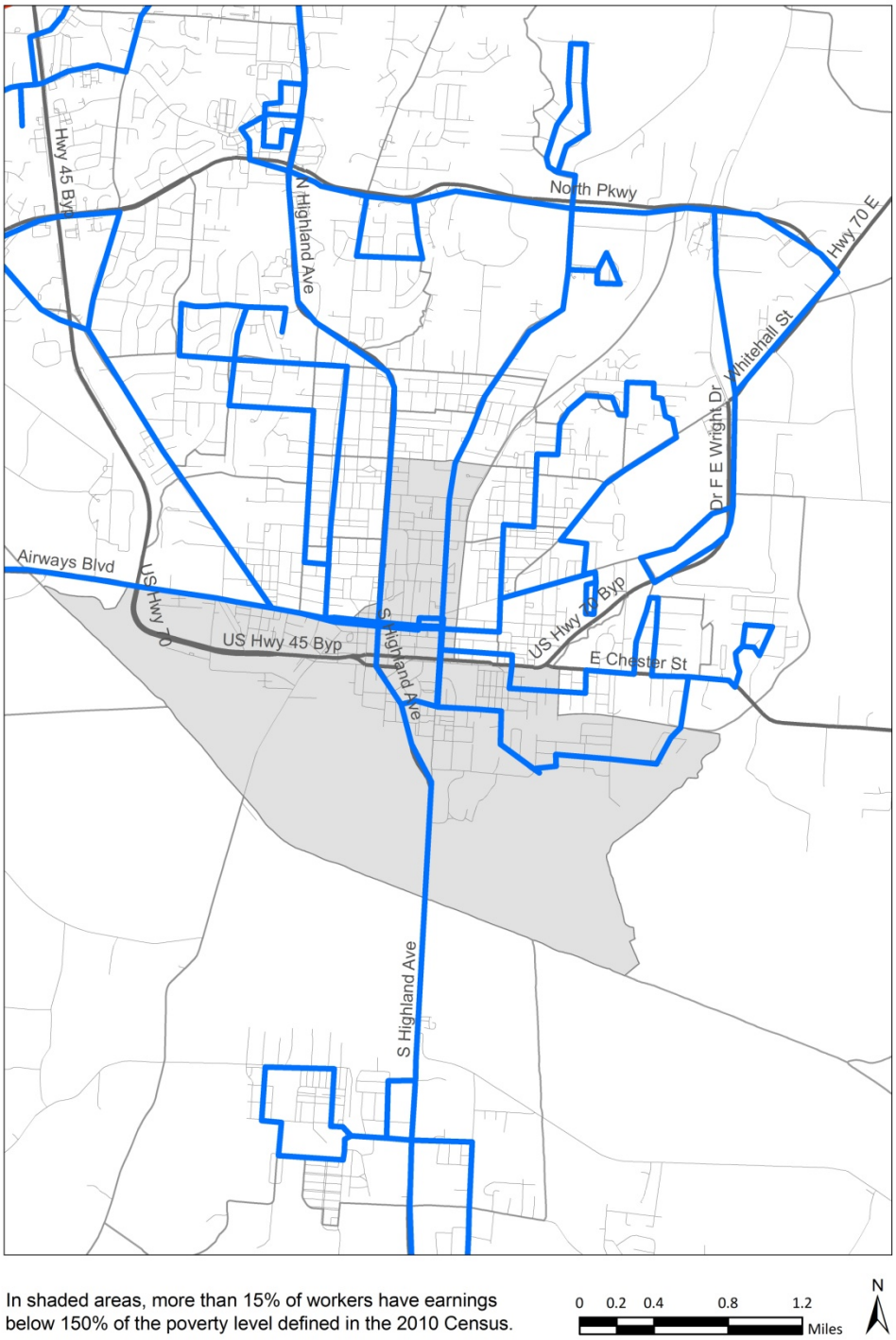


Figure 6-8: **Areas with Low-Income Populations**



RECOMMENDATIONS

After review and analysis of data from the Jackson Transit Authority and Federal Transit Administration, discussions with JTA staff and the Jackson Area MPO, and a field review of transit routes, the following recommendations are offered for public transit.

Operations/Network Improvements

- Review the city's bus routes on a regular basis to ensure that service efficiency is being maintained as the Jackson area grows and changes. Based on official JTA maps, it does not appear that the bus routes have changed in more than ten years, which suggests that it is time for such a review. More detail on this issue is provided below as part of the recommendations related to transit planning.
- Consider establishing a "mini-hub" at Old Hickory Mall, which is a major destination for riders and an area where many of JTA's regular routes intersect. As the city continues to grow outward, it will become increasingly important to facilitate convenient cross-town access with multiple locations where riders can transfer.
- Consider the addition of a North Side route, particularly the areas located between the US-45 Bypass corridor and US-45/North Highland Avenue corridor on the north side of I-40. Local land use plans indicate that higher density residential and commercial development is being directed to these areas as the city adds new households and jobs. Many of the employees who work at the shopping centers and restaurants along Vann Drive already use JTA bus service. Expanding the geographic coverage of the North Side route, and providing more frequent service as funds permit, may also help reduce the number of vehicle trips being made on North Highland Avenue. As described in Chapter 4, traffic modeling indicates that a high percentage of those using this section of North Highland have origins and destinations not far from the road itself. These travelers might be attracted by a premium transit service.
- Extend bus service along the Ridgecrest Road corridor between North Highland Avenue and Dr. F.E. Wright Drive to provide access to new commercial and residential growth at the Campbell Street and Christmasville Road interchanges with I-40.
- Consider the long-term development of a southern transit route along the Southern Extension of the US-45 Bypass.

Capital Improvements

- Establish a "mini-hub," or small transfer center, at Old Hickory Mall. It may be beneficial for the city to work in partnership with JTA on this project. At times JTA has had informal arrangements with property owners in the mall area to allow short-term bus parking for transfer purposes, but a more permanent solution is needed. It may be possible for the city to seek opportunities to set aside a small transfer area as mall area properties expand and redevelop. No elaborate design is necessary for the initial project; a simple bus shelter with adequate space for two buses to pull through the area could greatly improve safety and convenience for riders.
- Improve safety and access to bus services by extending Jackson's sidewalk network and upgrading curb ramps to meet ADA standards. All bus riders are pedestrians at some point during their trip. The sidewalk projects recommended in this Plan were selected and prioritized based in part on their role in providing access to the city's transit routes. Chapter 7, Bicycle and Pedestrian Network, discusses the linkages between transit routes and sidewalks and bikeways.

- Continue to replace buses, vans and other transit system vehicles on a regular cycle. JTA was recently able to utilize funds through the American Recovery and Reinvestment Act (ARRA) to replace some of its aging fleet. It is important to continue this practice regardless of funding source. When vehicles are operated beyond their useful life, the transit system's overall maintenance and operating costs increase unnecessarily. Table 6-1 provides a detailed list of recommended capital improvements, including the periods when transit vehicles will need to be replaced.
- Increase system efficiency and rider convenience by continuing to implement the transit projects proposed in the regional Intelligent Transportation Systems (ITS) architecture. JTA has recently implemented one of its first ITS projects, which installed automated vehicle locators (AVL) throughout its demand-responsive vehicle fleet. AVL enables more efficient vehicle dispatch and can be combined with electronic signs, smartphone applications, etc. to provide real-time information to transit riders about when the next bus will arrive.
- Construct bus shelters at appropriate locations. Identification of these sites should start by evaluating which stops have the greatest number of daily boardings.

Table 6-1: Recommended Transit Capital Improvements

Year	Description
2015	Replace 5 buses for fixed-route service, add 2 buses for new/expanded routes Replace 7 vans for paratransit service Replace 4 support vehicles Upgrades to downtown transfer center
2020	Replace 7 buses for fixed-route service Replace 4 vans for paratransit service Replace 2 support vehicles Construct mini-hub at Old Hickory Mall
2025	Replace 8 buses for fixed-route service Replace 4 vans for paratransit service Replace 3 support vehicles Upgrades to JTA administrative/maintenance facility
2030	Replace 6 buses for fixed-route service Replace 5 vans for paratransit service Replace 4 support vehicles Upgrades to downtown and Old Hickory Mall transfer centers
2035	Replace 4 buses for fixed-route service Replace 4 vans for paratransit service Replace 2 support vehicles
2040	Replace 6 buses for fixed-route service Replace 4 vans for paratransit service Replace 2 support vehicles Upgrades to JTA administrative/maintenance facility

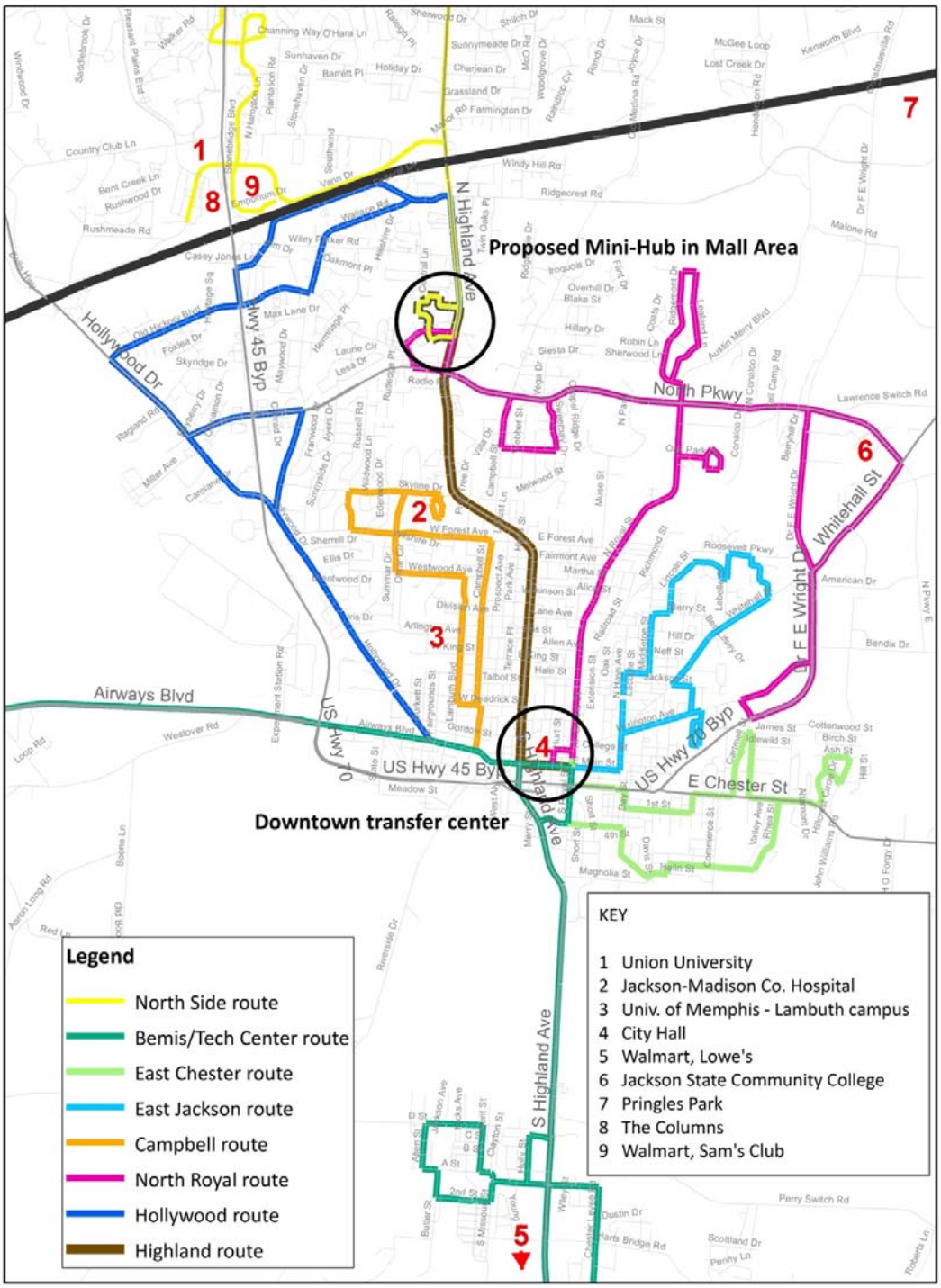
Transit Planning

- Initiate an update to the Transit Development Plan within the next two years. The basis of this document is an operational analysis of the system and recommendations to enhance efficiency. It will include collection and analysis of detailed rider travel patterns: origins and destinations, average trip lengths, most frequent transfer locations, etc. Many of the issues identified may be known to staff, but it is important to document them so that the information is available to decision-makers to help support future budget requests, similar to the methods used for highway planning. The Transit Development Plan guides numerous decisions about the number and size of transit vehicles needed, where to improve transit stops, and potential route changes or additions.

- Update the Coordinated Human Services Transportation Plan regularly to identify any gaps in service, whether geographic, hours of service, or type of rider served. JTA, Southwest HRA and other key service providers in the Jackson area should particularly discuss service provided for senior citizens and disabled persons, since JTA's ridership data for The Lift indicates a continuing decline in the number of senior and disabled riders. It is important to verify that these citizens are receiving reasonably priced transit service through some means.

- Review site plans and large subdivision plats to ensure appropriate design for incorporating transit stops in major new developments. City planning and engineering staff should coordinate with JTA operations/planning staff to determine the desired standards.

Figure 6-9: **Concept for New Transit "Mini-hub"**



PASSENGER RAIL

High Priority Project (HPP) funding has been set aside to evaluate the potential for the passenger rail route connecting Nashville and Atlanta, Georgia, via Chattanooga as well as from Memphis to Little Rock, Arkansas. Due to its location, the City of Jackson might ultimately be connected via a passenger rail line from Nashville to Memphis. When compared to other corridors in the state, the terrain and current level of development along this corridor provides a good opportunity to acquire right-of-way for a new rail alignment and would be straight enough to accommodate the needs of high-speed rail. This potential corridor would likely be more beneficial to intrastate travelers, but has not been recognized as a vital link among the routes that are being discussed nationally. Unless the State of Tennessee is able to secure substantial high-speed rail funding at the federal level, it is unlikely that the projected ridership would be high enough to warrant pursuing a passenger rail project between Memphis and Nashville during the period covered by this Plan.

Chapter 7

Bicycle and Pedestrian

INTRODUCTION

In an effort to improve conditions and provide more opportunities for bicycling and walking, in February 2005 the Jackson Area Metropolitan Planning Organization (Jackson Area MPO) completed a Bicycle and Pedestrian Plan (2005 Plan). The recommendations for sidewalks, bicycle facilities and multi-purpose trails within the Jackson Area MPO contained in this 2005 Plan were incorporated into the Jackson/Madison County 2035 Long Range Transportation Plan (2035 LRTP).

The purpose of the 2005 Plan was to provide a framework for a viable, convenient, efficient and safe bicycle and pedestrian system. The 2005 Plan identified street segments with sidewalks throughout the Jackson MPO Area and included guiding principles for the development of pedestrian, bicycle and multi-purpose trail facilities.

The Proposed Pedestrian Network outlined in the 2005 Plan was based on areas where significant pedestrian trip origin and destination points were located within a half mile radius of one another. The 2005 Plan separated proposed pedestrian facilities improvements into three categories:

- Sidewalk additions in conjunction with programmed roadway improvements,
- Sidewalk additions in conjunction with anticipated roadway improvements, and
- Other sidewalk improvements (three groups of sidewalk retrofit and new construction projects).

The Proposed Bicycle Network outlined in the 2005 Plan was developed by identifying locations of possible bicycle trip destinations that have a significant number of potential origins within a reasonable travel distance by bicycle (three miles based on the average bicycle trip length). Bicycle routes were selected to provide access within no more than a half mile to trip generators while avoiding roadways which could not feasibly provide an adequate level of safety and comfort for bicyclists. Similar to the pedestrian network, the 2005 Plan separated bicycle facilities improvements into three categories:

- Bike route development in conjunction with programmed roadway improvements,
- Bike route development in conjunction with anticipated roadway improvements, and
- Bicycle facility retrofits (three groups, based on factors such as development densities, the trip generating potential of connected destinations, connections to other routes and the presence of significant origin points).

The 2005 Plan also included recommendations for the location of eleven multi-purpose trail routes.

As noted in the following “Existing Conditions” section, three major new sidewalk construction projects have been completed since the 2005 Plan, and four new bicycle segments have been constructed in the study area since 2005, adding approximately 3.6 miles of new bicycle routes. The remainder of the projects identified in the 2005 Plan have not been funded.

STATE OF TENNESSEE BICYCLE ROUTE PLAN

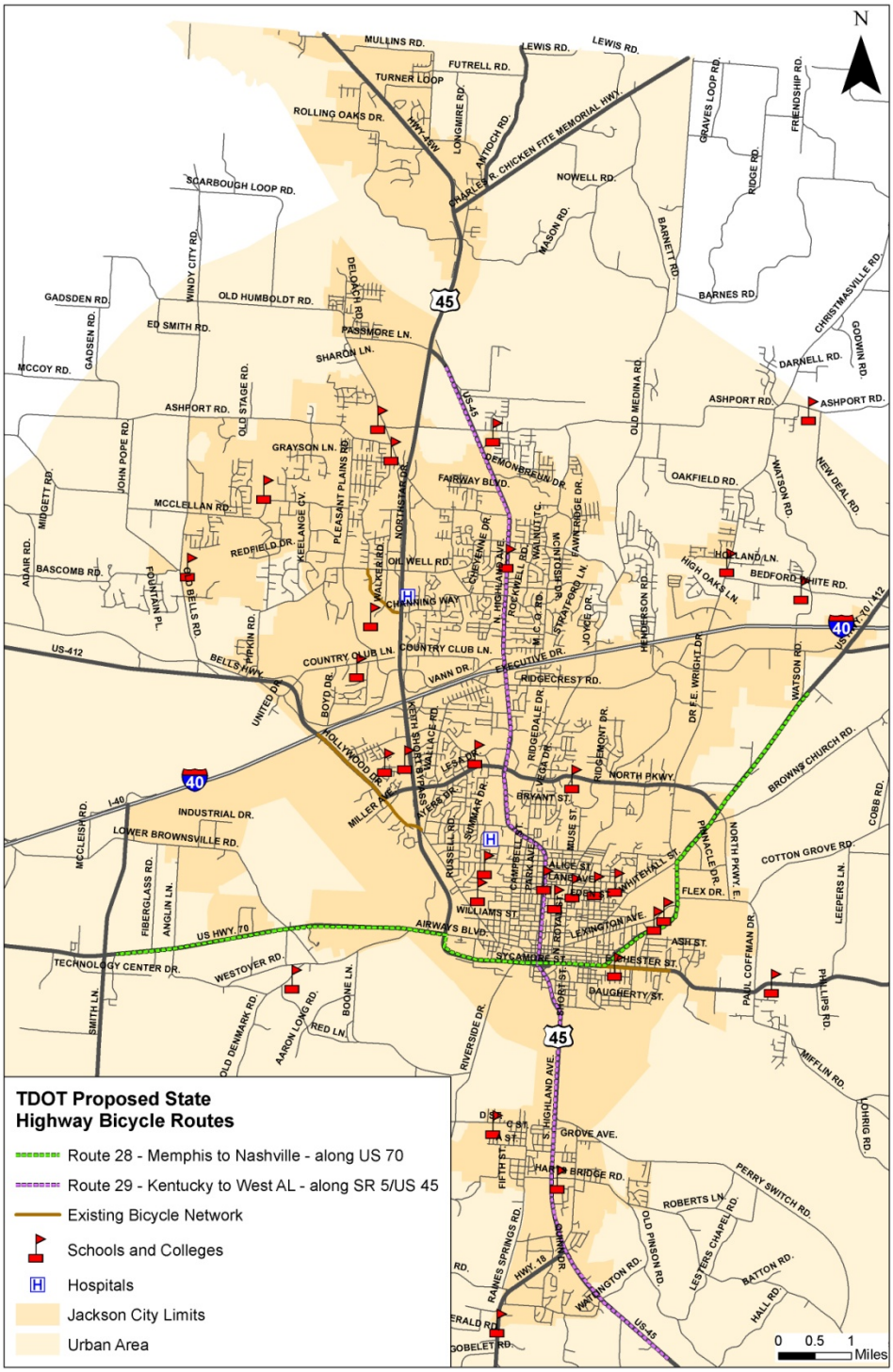
In 2005, the Tennessee Department of Transportation (TDOT) adopted the Long-Range Transportation Plan – PlanGo, which included a Bicycle and Pedestrian Plan element. The document served as an information and policy plan to guide the development and maintenance of a statewide bicycle network on the nearly 14,150 miles of state highways under the jurisdiction of the State over the next 25 years. The purpose of the Bicycle and Pedestrian Plan element was to provide directives through new policies, procedures, and programs that would emphasize the consideration of bicycle and pedestrian accommodations and encourage greater opportunities for walking and biking within Tennessee.

In October 2011, TDOT provided an update to the Plan that focused on the bicycling element by evaluating the State's existing and proposed 2005 bicycle route system and providing a clear vision for accomplishing increased bicycling trips throughout Tennessee. TDOT recognized that changes in infrastructure and data collection necessitated an update to the existing bicycle route network, and thus the findings of a new bicycle suitability methodology was used to establish the proposed State Highway Bicycle Route System. The updated network utilizes Tennessee's State Highways, except through major urban areas, and is intended to provide a statewide bicycle route system to which local, regional, and other bicycle facilities for transportation and recreational purposes can connect.

As shown in Figure 7-1, two routes in the proposed State Highway Bicycle System run through the City of Jackson and Madison County. Providing bicycle facilities along these two state corridors should be given high priority because they would offer regional connectivity, as well as connectivity among various jurisdictions and communities across the greater Jackson region. The routes are:

- "Route 28 - Memphis to Nashville," an east-west route that would run along US 70/SR 1/Whitehall Street/Airways Boulevard
- "Route 29 - Kentucky to West Alabama," a north-south route that would run along SR 5/US 45/North Highland Avenue in Madison County

Figure 7-1: TDOT Proposed State Highway Bicycle Routes



According to TDOT's adopted policies, the state will routinely integrate bicycling and walking facilities into the transportation system as a means to improve mobility, access and safety of non-motorized traffic. TDOT will coordinate through established transportation planning processes with local government agencies and regional planning agencies to assure that bicycle and pedestrian accommodations are addressed on a multimodal planning level through the Long Range Plan and the project development process. TDOT is committed to the development of a transportation system that improves conditions for bicycling through the following actions:

1. Provisions for bicycles shall be integrated into new construction and reconstruction of roadway projects through design features appropriate for the context and function of the transportation facility.
2. The design and construction of new facilities shall anticipate likely future demand for bicycling facilities and not preclude the provision of future improvements.

In accordance with this policy, several TDOT roadway projects completed in the Jackson area since 2005 have incorporated new pedestrian and bicycle facilities, as described below.

Local governments within the Jackson Area MPO follow the TDOT policy in the implementation of all of their federally funded roadway projects. In addition, the region's local governments design all federally funded transportation improvements in accordance with Americans with Disabilities Act of 1990 (ADA) standards.

EXISTING CONDITIONS

The Bicycle and Pedestrian Component of the Jackson Area MPO 2040 Long Range Transportation Plan (2040 LRTP) is intended as an update to the 2005 Plan and an opportunity to identify enhancements to bicycle and pedestrian travel within the Jackson Area MPO region. The intent of the plan is not to secure funding for every project, but, instead, to identify the opportunities that are available. By updating and incorporating the Bicycle and Pedestrian Component into the overall 2040 LRTP, the necessary projects will be eligible for funding and implementation through the Jackson MPO Transportation Improvement Program.

The Bicycle and Pedestrian Component must be consistent with the 2040 LRTP's goals, objectives and strategies. The Bicycle/Pedestrian strategies of the 2040 LRTP are reiterated below:

- Include sidewalks and bikeways wherever possible in all new road construction
- Identify new locations for bikeways and greenways
- Provide alternative connections between land uses via bikeways and greenways

The bicycle and pedestrian recommendations outlined are tailored to meet these strategies. Implementation of these recommendations will provide for a comprehensive bicycle and pedestrian transportation system that focuses on accessibility, safety, and mobility.

According to the US Census estimates provided by the 2006-2010 American Community Survey (5-Year Estimates), among the 42,888 workers in Madison County that are 16 years of age or older, 600 residents walk or ride their bicycles as a primary means of transportation to work. Approximately 14 percent of one-person households have no vehicle available, which suggests a significant need for alternatives to driving. Approximately 23 percent of three-person households had one or no vehicle available, and 23 percent of four-person households had one or no vehicle available. This may limit the mobility of persons in those households,

even if not all members of the household are old enough to drive. In communities where there are safe facilities, children may walk or ride bikes to school and other activities, giving them greater independence.

Existing Sidewalk Network

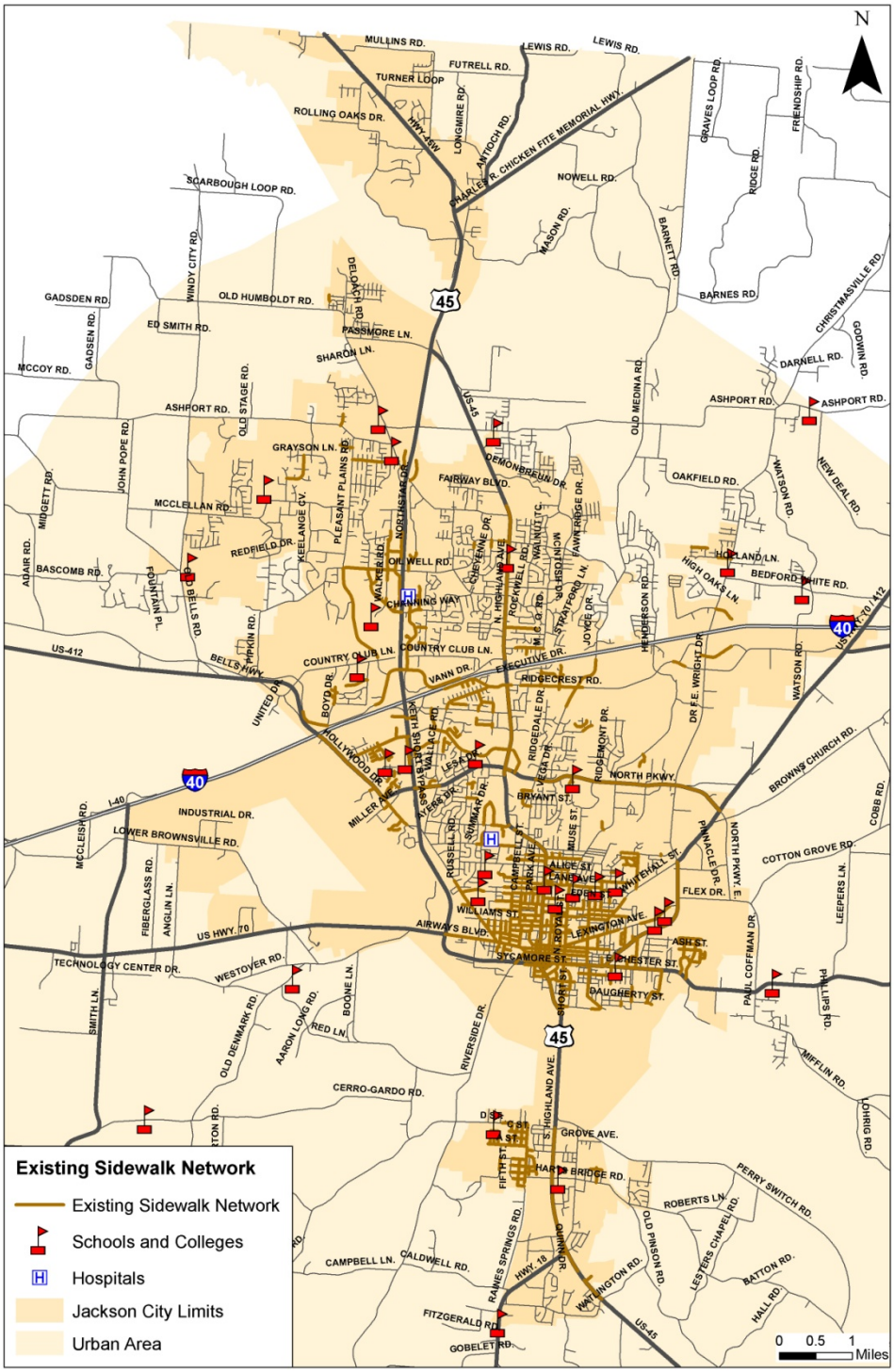
Taking into account whether sidewalks are available on one or both sides of the street, there are approximately 169 linear miles of sidewalk within the Jackson Urbanized Area (See Figure 7-2). The most walkable areas in Jackson remain in the downtown area, but newly constructed segments along Hollywood Drive and near Union University add pedestrian access to these portions of the urbanized area. In many areas, sidewalks can be described as intermittently present, due to locations where private developers have constructed new sidewalks as part of a new development, thus leaving critical gaps in the sidewalk system. Major new sidewalk construction projects completed since 2005 include:

- **Hollywood Drive, from I-40 to the US 45 Bypass (2 miles).** The *2005 Plan* listed this project as a "Sidewalk development project in conjunction with programmed roadway improvements." The completion of this project included the widening of Hollywood Drive to five-lanes and the addition of sidewalks on either side of the street.

- **North Highland Avenue (SR 5), from McCowat Street to Westwood Avenue (0.76 miles).** The *2005 Plan* listed this project as a "Sidewalk development project in conjunction with programmed roadway improvements." The completion of this project involved the reconstruction of North Highland Avenue, including the addition of sidewalks.

- **East Chester Street (SR 198) Phase 1 Streetscape Improvements, from the US 70 Bypass to Holland Street (0.73 miles) and East Chester Street (SR 198) Phase 2 Streetscape Improvements, from Holland Street to Altamont Drive (0.10 miles).** The *2005 Plan* listed these projects as "Sidewalk development project in conjunction with anticipated roadway improvements." The completion of these projects included reconstruction of East Chester Street to two lanes with a center turn lane and the addition of a multi-use path on the north side of the roadway and sidewalk on the south side.

Figure 7-2: Existing Sidewalk Network



Existing Bicycle Network

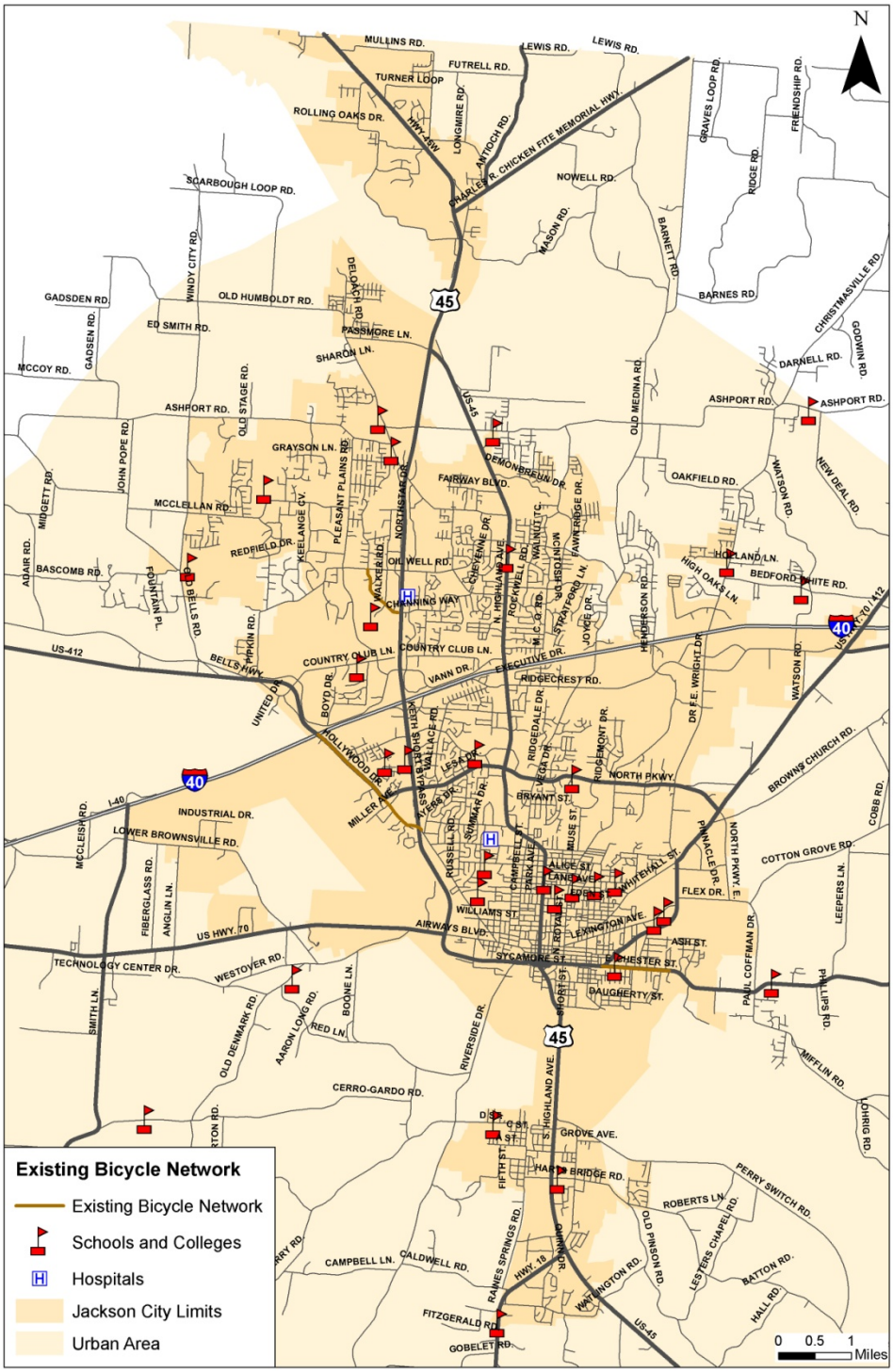
Four new bicycle segments have been constructed in the study area since 2005, adding approximately 3.6 miles of new bicycle routes. A map of the Existing Bicycle Network in 2012 is illustrated in Figure 7-3. Bicycle route segments completed since 2005, include:

- **Hollywood Drive, from I-40 to the US 45 Bypass (2 miles).** The *2005 Plan* listed this project as a "Bicycle route development project in conjunction with programmed roadway improvements." The completion of this project included the widening of Hollywood Drive to five-lanes and the addition of four-foot bike lanes on either side of the street.

- **East Chester Street (SR-198) Phase 1 Streetscape improvements, from the US Highway 70 Bypass to Holland Street (0.73 miles) and East Chester Street (SR-198) Phase 2 Streetscape improvements, from Holland Street to Altamont Drive (0.10 miles).** The *2005 Plan* listed these projects as "Bicycle route development project in conjunction with anticipated roadway improvements." The completion of these projects included reconstruction of East Chester Street to two lanes with a center turn lane and the addition of a multi-use path on the north side of the roadway and sidewalk on the south side.

- **Union University Drive, from Oil Well Road to US 45 Bypass (0.79 miles).** The project was not shown in the *2005 Plan*. Bike lanes were added to both directions of the new street in conjunction with a private development.

Figure 7-3: Existing Bicycle Network



Existing Multi-Purpose Trail Network
None of the multi-purpose trails proposed in the *2005 Bicycle and Pedestrian Plan* have been constructed.

EVALUATION CRITERIA

All proposed sidewalk, bicycle and multi-purpose trail projects were evaluated using nine criteria to prioritize them for the 2040 Plan. In addition, this approach is intended to help inform potential funding allocation for pedestrian and bicycle system improvements and to identify the features of a network most important to the Jackson Area MPO.

The nine evaluation criteria used to rank the sidewalk, bicycle and multi-purpose trail projects included:

1. Average Daily Traffic (ADT) volume on roadway
2. Accessibility to commercial, retail and office uses
3. Accessibility to parks, recreation and public facilities
4. Access to public and private schools
5. Access to Jackson Transit Authority (JTA) transit routes
6. Closing critical gaps in the existing bicycle and pedestrian network
7. Population density (according to the 2010 Census)
8. Right-of-way needed for construction – yes/no
9. Estimated project construction cost

The criteria were weighted, giving the Tier One group criteria a higher score than the Tier Two and Three group criteria. The breakdown of Tier criteria is listed below:

Tier One Criteria (weighted x3):	Tier Two Criteria (weighted x2):	Tier Three Criteria (weighted x1):
• Access to public and private schools • Closing critical gaps in the existing bicycle and pedestrian network	• Accessibility to commercial, retail and office uses • Access to Jackson Transit Authority (JTA) transit routes • Population density (according to the 2010 Census)	• Average Daily Traffic volume on roadway • Accessibility to parks, recreation and public facilities • Right-of-way needed for construction – yes/no • Estimated project construction cost

A Project Evaluation Worksheet was used to score and weight each criterion, and thus determine which projects met the highest number of criteria listed. The overall scores were compared together to prioritize projects. Projects fulfilling the greatest number of evaluation criteria received higher scores, correspondingly leading to higher rankings within the overall list of network plan recommendations. These rankings were used to group the proposed projects within each category (sidewalk, bike and multi-purpose trails) into a list of Priority 1, Priority 2 and Priority 3 projects.

These rankings were used to group the proposed projects into phased recommendations for Priority 1, Priority 2, and Priority 3 implementation as follows:

- Priority 1 projects with the highest potential for near-term project implementation within 1-5 years.
- Priority 2 projects are projects that can supplement the core network within 6-10 years.
- Priority 3 projects are included as long-term projects to be implemented over the next 10-20 years.

It is important to note that the project priorities should be revisited periodically as conditions change. This may include an increase (or decrease) in available funds, new roadway projects that could incorporate proposed bike/ped projects, and new development and redevelopment opportunities. Ideally, the MPO should pursue grant funding or apportion available capital funding to the highest priority projects. However, if grant requirements or construction in conjunction with another roadway project make it possible to construct another project on the list, then the MPO should pursue funding sources for the project regardless of priority.

PROGRAMMED AND PLANNED PROJECTS

The following four sections discuss the priority of the recommended sidewalk construction projects, sidewalk retrofit projects, bicycle route and improvement projects, and multi-purpose trail projects. Suggested improvements include low-cost measures that yield immediate results, such as sidewalk accessibility retrofit projects, gap-infill of sidewalks to provide missing links in the existing sidewalk system, non-infrastructure projects such as bicycle signage and pavement markings to encourage bicycling, and the re-striping of streets to accommodate bike lanes. Higher-cost measures that are suggested include sidewalk construction on new streets, and the construction of wide curb lanes or four-foot paved shoulders on roads to establish and extend a formalized bikeway system. Other suggested improvements, such as multi-use trails, represent longer-term strategies for transforming the Jackson Urban Area into a truly bicycle and pedestrian friendly community.

Sidewalk Construction Projects

A total of 88 new sidewalk construction projects are recommended. The new sidewalk construction projects build upon the Priority projects in the *2005 Plan*, and include new recommendations for locations of sidewalks. The recommended new sidewalk pedestrian network includes a set of system improvements to provide pedestrian access to key destinations (i.e schools and parks), to fill major sidewalk gaps in the existing sidewalk system, to create a broader network of sidewalk connectivity and to provide sidewalks on new streets. A map showing the existing sidewalk network with the proposed new sidewalk construction projects is provided in Figure 7-4. Figures 7-4A, 7-4B and 7-4C show enlarged maps of the recommended Sidewalk Construction Projects in the Northern, Downtown and Southern Areas of the planning region. Full development of this network would result in a total of over 357,585 linear feet – or more than 67 centerline miles – of new sidewalks.

Table 7-1 lists the recommended locations and estimated costs for the Sidewalk Construction Priority 1 projects. Thirty Priority 1 projects are proposed, which total approximately $11,409,600 in 2012 dollars, for a total of approximately 95,080 linear feet or nearly 18 centerline miles of new sidewalk. Year of expenditure (YOE) construction costs are reflected five years out for 2017, using a three percent inflation rate per year.

Table 7-1: Sidewalk Construction Priority 1 Projects

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
Segments of W. University Pkwy.	Elmfield Cove	N. Highland Avenue	1,023	$120	**$122,760**	**$142,312**
Royal Street	Lane Avenue	North Parkway	8,212	$120	**$985,440**	**$1,142,395**
North Parkway	Wallace Road	N. Highland Avenue	5,280	$120	**$633,600**	**$734,516**
Old Hickory Blvd.	US 45 Bypass	Approx. 900' west of Wallace Road	1,743	$120	**$209,160**	**$242,474**
Cartmell Street	Chester	Hwy 70	2,640	$120	**$316,800**	**$367,258**

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
Lincoln Street	Roosevelt Pkwy	Berry Street	2,423	$120	**$290,760**	**$337,071**
Vann Drive	Approx 3500' West of Highland	N. Highland Avenue	3,546	$120	**$425,520**	**$493,294**
Channing Way	US 45 Bypass	Ferguson Drive	617	$120	**$74,040**	**$85,833**
Harts Bridge Road	S. Missouri Street	Roxy Cove	5,280	$120	**$633,600**	**$734,516**
North Highland Avenue	Lambuth Blvd.	Approx. 600' south of North Pkwy	4,203	$120	**$504,360**	**$584,691**
SR 18	Triangle at US 45	City Limits	7,068	$120	**$848,160**	**$983,250**
Arlington Avenue	Segment btwn Hollywood Dr. and	Lambuth Blvd	1,175	$120	**$141,000**	**$163,458**
45 Bypass Frontage Road (West Side)	Casey Jones Lane	Old Hickory Blvd	1,444	$120	**$173,280**	**$200,879**
North Parkway	Hollywood Drive	US 45 Bypass	2,280	$120	**$273,600**	**$317,177**
Rosenblum Drive	Old Hickory Blvd	North Parkway	862	$120	**$103,440**	**$119,915**
Old Hickory Blvd.	Hollywood Drive	Breezewood Cove	946	$120	**$113,520**	**$131,601**
Hollywood Dr.	Russell Road	Southwide Drive	5,224	$120	**$626,880**	**$726,726**
Dr. F.E. Wright Dr.	Whitehall Street	North Parkway	5,500	$120	**$660,000**	**$765,121**
US 70	Whitehall Street	North Parkway	4,668	$120	**$560,160**	**$649,379**
Commerce Street	E. Chester Street	Washington Douglas Circle	1,517	$120	**$182,040**	**$211,034**
Lane Avenue	Stonewall Street	Whitehall Street	1,357	$120	**$162,840**	**$188,776**
Chester Levee Rd	S. Highland Avenue	Herron Grove Road	6,834	$120	**$820,080**	**$950,697**
Campbell Street	Wisdom Street	Highland Avenue	2,847	$120	**$341,640**	**$396,054**
Westwood Blvd.	Russell Rd	N. Highland Avenue	6,259	$120	**$751,080**	**$870,708**

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
E. Main Street	S. Hayes Avenue	Hwy 70	1,794	$120	**$215,280**	**$249,569**
Lambuth Blvd.	Westwood Avenue	N. Highland Avenue	2,345	$120	**$281,400**	**$326,220**
University Pkwy	North Highland Ave	Cooper Anderson Road	4,114	$120	**$493,680**	**$572,310**
Bemis Lane	Clayton Street	S. Highland Avenue	1,407	$120	**$168,840**	**$195,732**
Summar Drive	Segment btwn Skyline Drive	W. Forest Avenue	627	$120	**$75,240**	**$87,224**

Table 7-2 lists the recommended locations and estimated costs for the Sidewalk Construction Priority 2 projects. Twenty-nine Priority 2 projects are proposed, which total approximately $12,892,440 in 2012 dollars, for a total of approximately 107,437 linear feet or nearly 20 centerline miles of new sidewalk. Year of expenditure (YOE) construction costs are reflected ten years out for 2022, using a three percent inflation rate per year.

Table 7-2: Sidewalk Construction Priority 2 Projects

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2022 dollars)
Lexington Ave	Boone St	Cartmell Street	1,768	$120	**$212,160**	**$285,125**
E. Chester Street	Rhea St	Hillcrest Circle Drive	1,873	$120	**$224,760**	**$302,059**
Forest Avenue	Hollywood Drive	Edenwood Drive	3,225	$120	**$387,000**	**$520,096**
Whitehall Street	Lexington Ave.	Dupree Street	1,584	$120	**$190,080**	**$255,452**
Whitehall Street	Approx. 400' south of Lane Ave.	Dr. F.E. Wright Drive	4,800	$120	**$576,000**	**$774,096**
Cheyenne Drive	Moize Cut-Off	University Pkwy	2,256	$120	**$270,720**	**$363,825**
Farmington Road	US 45	Existing sidewalk	715	$120	**$85,800**	**$115,308**
North Pkwy.	Old Hickory Blvd E.	Campbell Street	1,499	$120	**$179,880**	**$241,744**

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2022 dollars)
Campbell	N. Highland Ave.	North Parkway	4,303	$120	**$516,360**	**$693,945**
Carriage House Drive	Approx. 630' west of 45 Bypass	Existing sidewalk	2,935	$120	**$352,200**	**$473,327**
Lambuth Blvd.	Westwood Ave	Arlington Avenue	2,045	$120	**$245,400**	**$329,797**
Ridgecrest Road	Approx. 250' east of N. Highland Ave.	Lamar Circle	495	$120	**$59,400**	**$79,829**
Old Humboldt Road	Moize Cut-Off	St. Augustine School north of Ashport Road	9,142	$120	**$1,097,040**	**$1,474,330**
Christmasville Road	Kenworth Blvd.	Middle School Road	3,673	$120	**$440,760**	**$592,345**
Forest Avenue	Lambuth Blvd.	N. Royal Street	5,195	$120	**$623,400**	**$837,797**
D Street	N. Kentucky Street	N. Missouri Street	1,090	$120	**$130,800**	**$175,784**
Country Club Lane	Stonebridge Blvd.	Vann Drive	5,815	$120	**$697,800**	**$937,785**
E. Chester St / Beech Bluff Road	Hillcrest Circle Drive	Rose Hill Middle School	6,875	$120	**$825,000**	**$1,108,731**
Roosevelt Pkwy.	Labelle Street	Dr. F.E. Wright Drive	3,070	$120	**$368,400**	**$495,099**
Daugherty St./Burton Street	James Buchanan Drive	Regency Drive	4,467	$120	**$536,040**	**$720,393**
Wallace Road	Hollywood Drive	Wiley Parker Road	9,273	$120	**$1,112,760**	**$1,495,456**
Vann Drive	Approx. 4800' east of Country Club Lane	Approx. 3555' west of US 45 Bypass	3,581	$120	**$429,720**	**$577,508**
Magnolia Street	Short Street	Approx. 1150' west of James Buchanan Drive	1,653	$120	**$198,360**	**$266,579**
Oil Well Road	45 Bypass Frontage Rd.	Old Humboldt Road	4,216	$120	**$505,920**	**$679,914**

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2022 dollars)
University Pkwy	Old Humboldt Road	Elmfield Drive	2,615	$120	**$313,800**	**$421,721**
North Highland Avenue	Volunteer Blvd	Ashport Road	5,871	$120	**$704,520**	**$946,816**
Wiley Parker Road	Carriage House Drive	N. Highland Avenue	6,693	$120	**$803,160**	**$1,079,380**
Murray Guard Dr./N. Star Drive	Security Drive	Old Humboldt	4,988	$120	**$598,560**	**$804,415**
Herron Grove Road	S. Highland Avenue	Chester Levee Road	1,722	$120	**$206,640**	**$277,707**

Table 7-3 lists the recommended locations and estimated costs for the Sidewalk Construction Priority 3 projects. Twenty-nine Priority 3 projects are proposed, which total approximately $18,077,520, for a total of approximately 150,646 linear feet or nearly 28 centerline miles of new sidewalk. Year of expenditure (YOE) construction costs are reflected twenty years out for 2032, using a three percent inflation rate per year.

Table 7-3: Sidewalk Construction Priority 3 Projects

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Costs (in 2032 dollars)
US 45	Approx. 1880' north of Watlington Road	Approx. 1500' south of SR 18	783	$120	**$93,960**	**$169,702**
Russell Road	North Pkwy.	Old Hickory Blvd	1,777	$120	**$213,240**	**$385,135**
Ashport Road	Approx. 1450' west of Zachary Lane	Old Humboldt Road	5,381	$120	**$645,720**	**$1,166,242**
Martin Luther King Drive	Carson Street	Donovan Street	1,687	$120	**$202,440**	**$365,629**
Ashport Road	North Highland Ave	Cooper Anderson Rd	6,707	$120	**$804,840**	**$1,453,631**
Old Humboldt Road	North Highland Ave	University Pkwy	4,515	$120	**$541,800**	**$978,551**
Moize Cut-Off	Old Humboldt Road	US 45	4,015	$120	**$481,800**	**$870,184**

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Costs (in 2032 dollars)
Country Club Lane	Vann Drive	Pleasant Plains Exd.	6,120	$120	**$734,400**	**$1,326,408**
Ridgecrest Road	Approx. 590' east of Christmasville Road	Bancorp South Pkwy	5,000	$120	**$600,000**	**$1,083,667**
Campbell Street	North Pkwy.	Approx. 1600' south of Ridgecrest Road	5,645	$120	**$677,400**	**$1,223,460**
Dr. F.E. Wright Drive / Christmasville Rd.	Ridgecrest Road	Kenworth Blvd	4,495	$120	**$539,400**	**$974,216**
Vann Drive	Country Club Lane	Existing sidewalk	2,284	$120	**$274,080**	**$495,019**
Bancorp South Pkwy	Existing sidewalk dead end	Ridgecrest Road	1,240	$120	**$148,800**	**$268,749**
Pleasant Plains Road	Oil Well Road	Ashport Road	9,465	$120	**$1,135,800**	**$2,051,381**
Hopper Barker Road	North Highland Ave.	Broad Meadow Drive	4,170	$120	**$500,400**	**$903,778**
Ridgecrest Road	Approx. 465' east of Campbell Street	Approx. 570' west of Christmasville Cove	6,980	$120	**$837,600**	**$1,512,799**
Windy City /McClellan Road	Old Bells Road	Pleasant Plains Road	16,820	$120	**$2,018,400**	**$3,645,455**
Rushmeade Road	Rushwood Road	Country Club Lane	1,966	$120	**$235,920**	**$426,098**
Pleasant Plains Exd.	Country Club Lane	Vann Drive	1,403	$120	**$168,360**	**$304,077**
Russell Road	Hollywood Drive	W. Forest Avenue	2,884	$120	**$346,080**	**$625,059**
Russell Road	W. Forest Avenue	North Parkway	5,185	$120	**$622,200**	**$1,123,762**
Old Humboldt Road	University Pkwy	Moize Cut-Off	4,330	$120	**$519,600**	**$938,455**
N. Royal Street	North Pkwy	Ridgecrest Road	11,070	$120	**$1,328,400**	**$2,399,238**
Cooper Anderson Rd	University Pkwy	Ashport Road	9,591	$120	**$1,150,920**	**$2,078,690**
Ashport Road	Old Humboldt Rd.	US 45	6,386	$120	**$766,320**	**$1,384,059**

Road	From	To	Linear Feet	Unit Cost Per Linear Foot	Projected Construction Cost (in 2012 dollars)	YOE Construction Costs (in 2032 dollars)
Broad Meadow Dr.	E. University Pkwy	Hopper Barker Road	2,645	$120	**$317,400**	**$573,260**
Summersby Drive	Northwyke Drive	McClellan Road	1,667	$120	**$200,040**	**$361,294**
Ashport Road	Windy City Road	Proposed Multi-Purpose Trail H	9,501	$120	**$1,140,120**	**$2,059,184**
Windy City Road	McClellan Road	Ashport Road	6,934	$120	**$832,080**	**$1,502,829**

Figure 7-4: Proposed Sidewalk Construction Projects

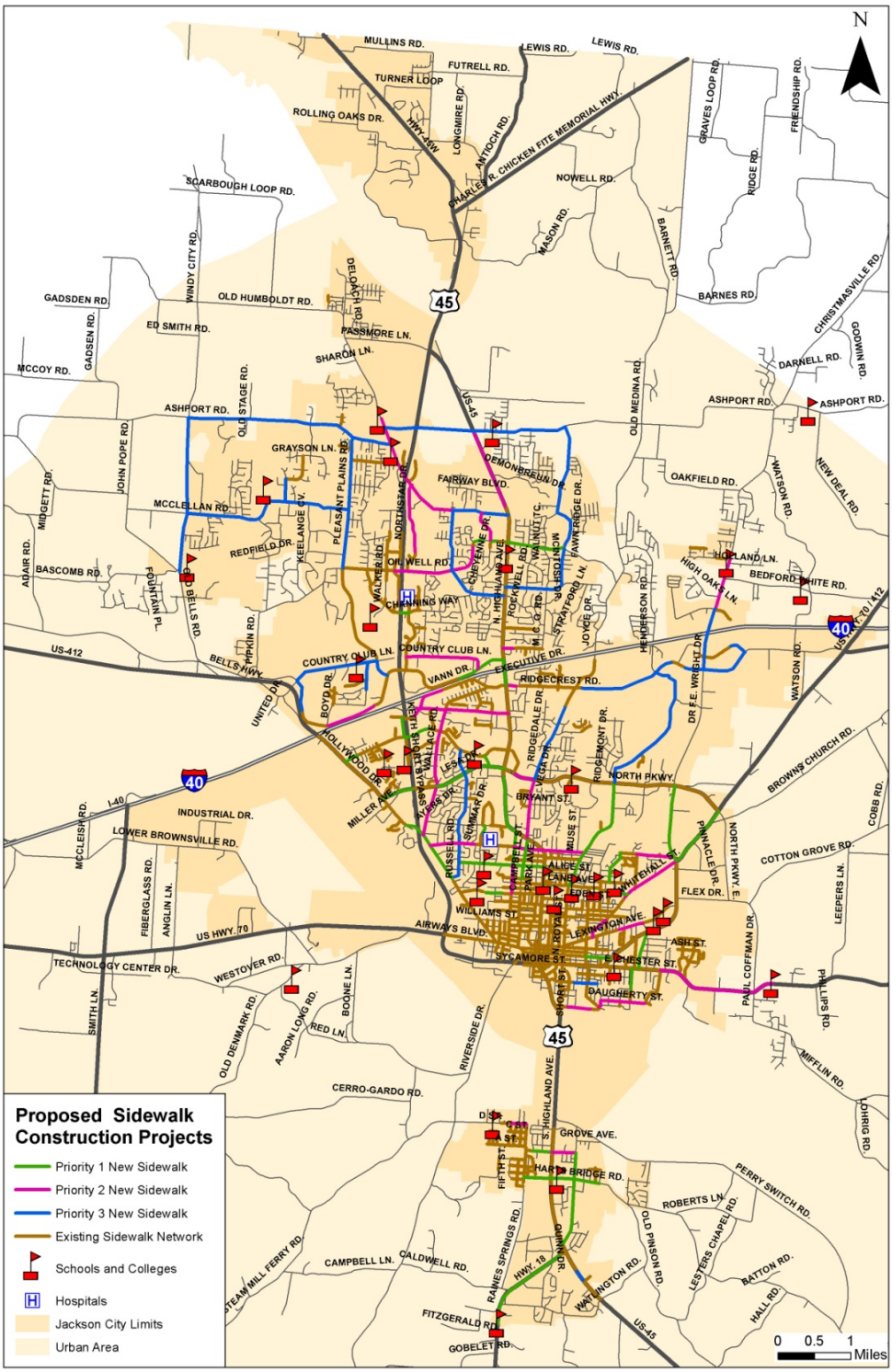


Figure 7-4A: Proposed Sidewalk Construction Projects (Northern Area Map)

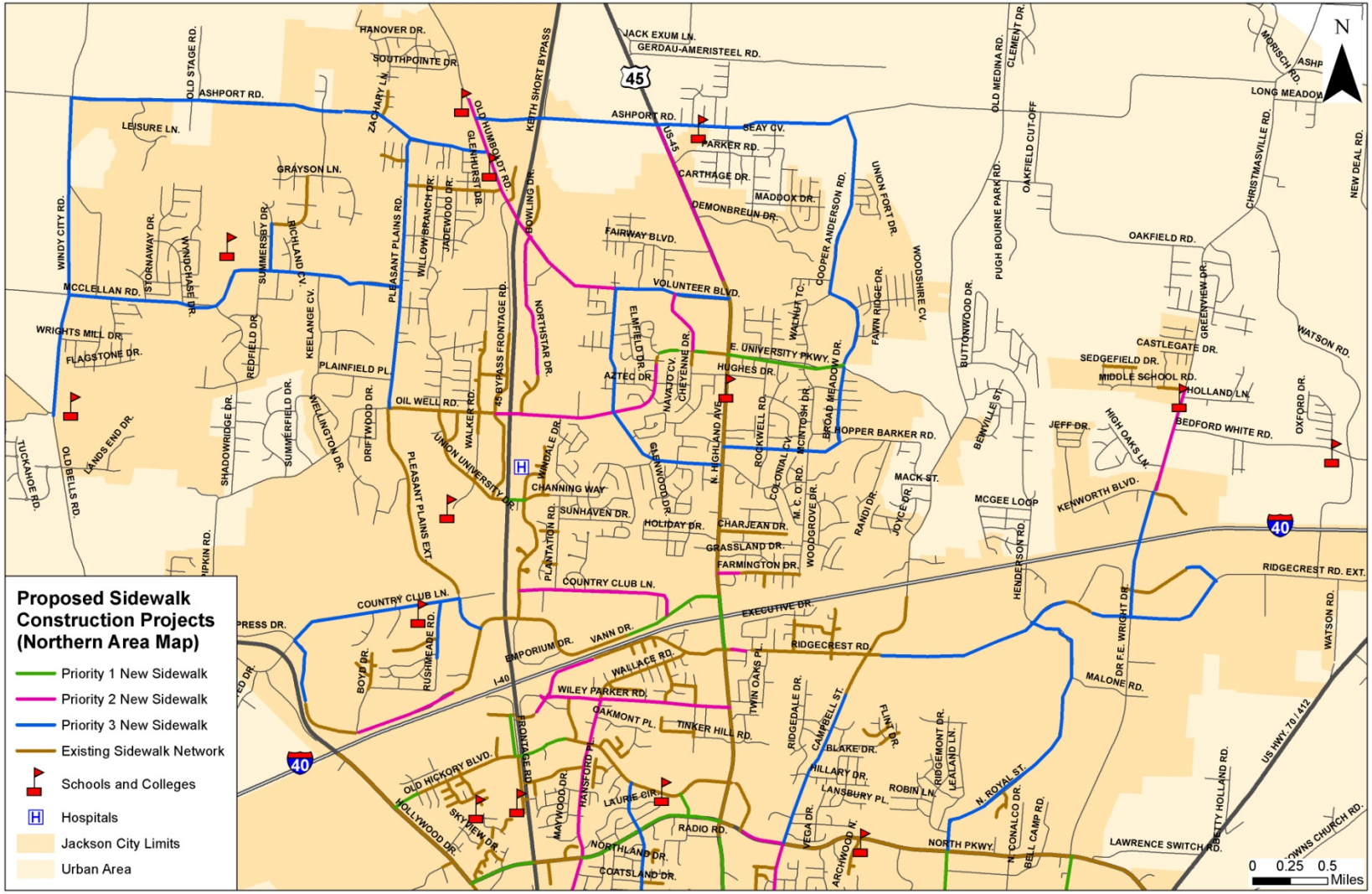


Figure 7-4B: Proposed Sidewalk Construction Projects (Downtown Area Map)

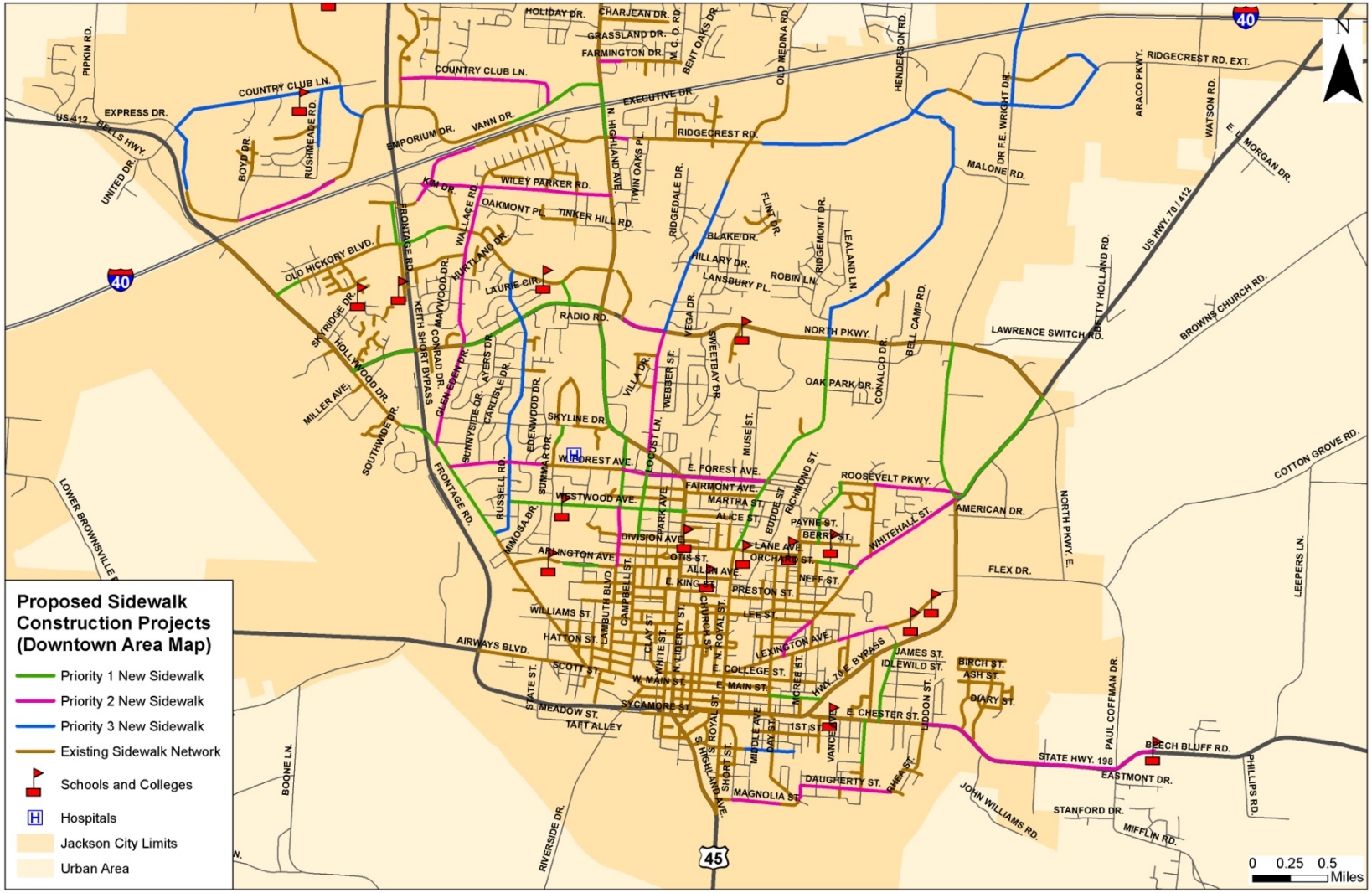
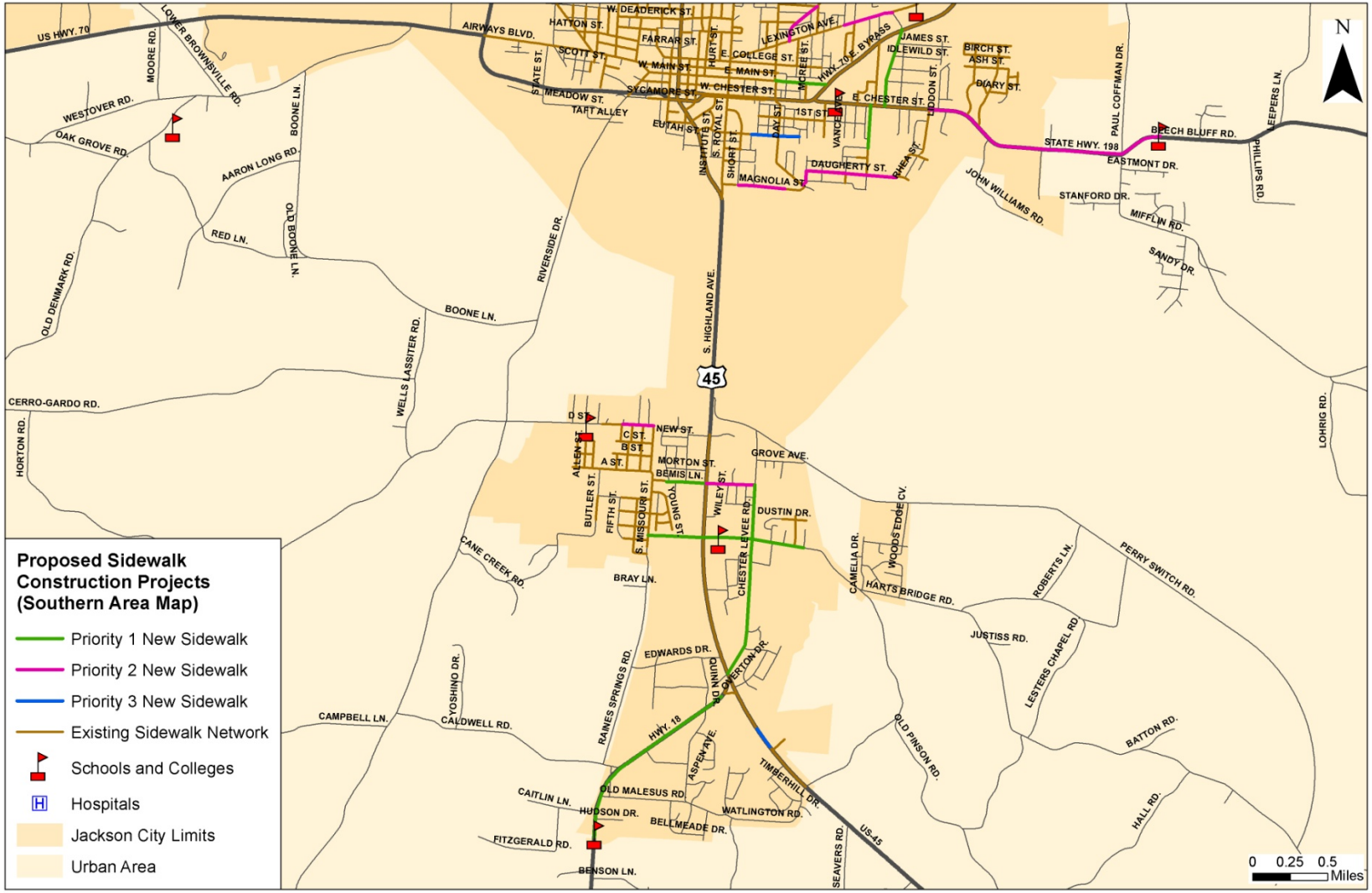


Figure 7-4C: Proposed Sidewalk Construction Projects (Southern Area Map)



Sidewalk Retrofit Projects

As stated in the *2005 Plan*, there is a need to retrofit sidewalks on a number of existing streets to provide an interconnected network of sidewalks and to rectify deficiencies related to accessibility of existing sidewalks. Improving pedestrian crossings and deficient ramps at intersections is needed to create high visibility crosswalks and to provide ADA-compliant curb ramps. A map showing the existing sidewalk network and locations of the recommended Sidewalk Retrofit Projects is provided in Figure 7-5. Figures 7-5A, 7-5B and 7-5C show enlarged maps of the recommended Sidewalk Retrofit Projects in the Northern, Downtown and Southern Areas of the planning region. The projects identified in the 2005 Plan are shown here in dashed lines that overlay the existing sidewalk segments. No additional locations have been recommended.

Table 7-4 lists the recommended location, the number of deficient ramps and the updated estimated costs for the Sidewalk Retrofit Priority 1 projects. Thirteen Priority 1 projects are proposed, which total approximately $684,000 in 2012 dollars, to address deficiencies for a total of 114 deficient ramps. Year of expenditure (YOE) construction costs are reflected five years out for 2017, using a three percent inflation rate per year.

Table 7-4: Priority 1 Sidewalk Retrofit Projects

Road	From	To	# of Deficient Ramps	Unit Cost Per Ramp	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
North Highland Avenue	Vann Drive	Highland Memorial Gardens	16	$6,000	**$96,000**	**$111,290**
Royal Street	Lexington Street	Bennett Street	10	$6,000	**$60,000**	**$69,556**
North Parkway	N. Royal Street	Campbell Street	4	$6,000	**$24,000**	**$27,823**
E .Chester Street	Cartmell Street	US 70	14	$6,000	**$84,000**	**$97,379**
South Highland	State Hwy 18	Will McKnight Dr.	33	$6,000	**$198,000**	**$229,536**
Vann Drive	Wal-Mart Entrance	Approx. 3500' west of Highland Avenue	6	$6,000	**$36,000**	**$41,734**
US 70	Whitehall Street	Cartmell Street	2	$6,000	**$12,000**	**$13,911**
Chester Street	Hays Street	Royal Street	2	$6,000	**$12,000**	**$13,911**
Lexington Street	Royal Street	Hays Street	2	$6,000	**$12,000**	**$13,911**
North Highland	Campbell Street	Lambuth Blvd	3	$6,000	**$18,000**	**$20,867**
Airways Blvd.	West Main Street	US 45 Bypass	8	$6,000	**$48,000**	**$55,645**
Royal Street	Magnolia Street	Chester Street	7	$6,000	**$42,000**	**$48,690**
Old Hickory Blvd.	Oak Hill Shopping	Wallace Road	7	$6,000	**$42,000**	**$48,690**

Table 7-5 lists the recommended location, the number of deficient ramps and the updated estimated costs for the Sidewalk Retrofit Priority 2 projects. Fourteen Priority 2 projects are proposed, which total approximately $588,000 in 2012 dollars, for a total of 98 deficient ramps. Year of expenditure (YOE) construction costs are reflected ten years out for 2022, using a three percent inflation rate per year.

Table 7-5: Priority 2 Sidewalk Retrofit Projects

Road	From	To	# of Deficient Ramps	Unit Cost Per Ramp	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2022 dollars)
Carriage House Drive	#300	Devonshire Square	1	$6,000	**$6,000**	**$8,063**
Carriage House Drive	Devonshire Square	Wallace Road	2	$6,000	**$12,000**	**$16,127**
Old Hickory Blvd.	US 45 Bypass	Breezewood Cove	17	$6,000	**$102,000**	**$137,079**
South Highland	S. Royal Street	E. Main Street	20	$6,000	**$120,000**	**$161,270**
Carriage House Drive	Wallace	North Highland	3	$6,000	**$18,000**	**$24,190**
E. Chester Street	Holland Avenue	Webb Drive	1	$6,000	**$6,000**	**$8,063**
E. Chester Street	Wisteria Street	Rhea Street	2	$6,000	**$12,000**	**$16,127**
Chester Street	S. Church Street	S. Royal Street	2	$6,000	**$12,000**	**$16,127**
North Parkway	N. Royal Street	Whitehall Street	17	$6,000	**$102,000**	**$137,079**
North Highland Avenue	Radio Road	Carriage House Drive	22	$6,000	**$132,000**	**$177,397**
University Pkwy.	Post Office Drive	Post Office Drive	1	$6,000	**$6,000**	**$8,063**
North Pkwy.	Wallace Road	US 45 Bypass	4	$6,000	**$24,000**	**$32,254**
Lexington Avenue	Cartmell Street	US 70	2	$6,000	**$12,000**	**$16,127**
US Hwy 70	Cartmell Street	Hays Avenue	4	$6,000	**$24,000**	**$32,254**

Table 7-6 lists the recommended location, the number of deficient ramps and the updated estimated costs for the Sidewalk Retrofit Priority 3 projects. Twelve Priority 3 projects are proposed, which total approximately $258,000 in 2012 dollars, for a total of 43 deficient ramps. Year of expenditure (YOE) construction costs are reflected twenty years out for 2032, using a three percent inflation rate per year.

Table 7-6: Priority 3 Sidewalk Retrofit Projects

Road	From	To	# of Deficient Ramps	Unit Cost Per Ramp	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2032 dollars)
Main Street	R.R. Near Royal St.	R.R. At Riverside Drive	4	$6,000	**$24,000**	**$43,347**
Whitehall Street	Neff Street	Dupree Street	6	$6,000	**$36,000**	**$65,020**
Old Hickory Blvd.	North Parkway	N. Highland Avenue	10	$6,000	**$60,000**	**$108,367**
Lexington Ave.	N. Hays Avenue	Whitehall	2	$6,000	**$12,000**	**$21,673**

Road	From	To	# of Deficient Ramps	Unit Cost Per Ramp	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2032 dollars)
Campbell Street	Princeton Street	Arlington	2	$6,000	**$12,000**	**$21,673**
Campbell Street	W. Deaderick Street	W. King Street	5	$6,000	**$30,000**	**$54,183**
Campbell Street	W. King Street	Princeton Street	3	$6,000	**$18,000**	**$32,510**
Lexington Ave	Whitehall Street	Boone Street	4	$6,000	**$24,000**	**$43,347**
Ridgecrest Rd.	Lamar Circle	Campbell Street	4	$6,000	**$24,000**	**$43,347**
Lexington St.	Boone Street	Rosewood	1	$6,000	**$6,000**	**$10,837**
Carriage House	#382	Yarbro Antique Mall	1	$6,000	**$6,000**	**$10,837**
Campbell Street	Division Ave	Wisdom Street	1	$6,000	**$6,000**	**$10,837**

Figure 7-5: Proposed Sidewalk Retrofit Projects

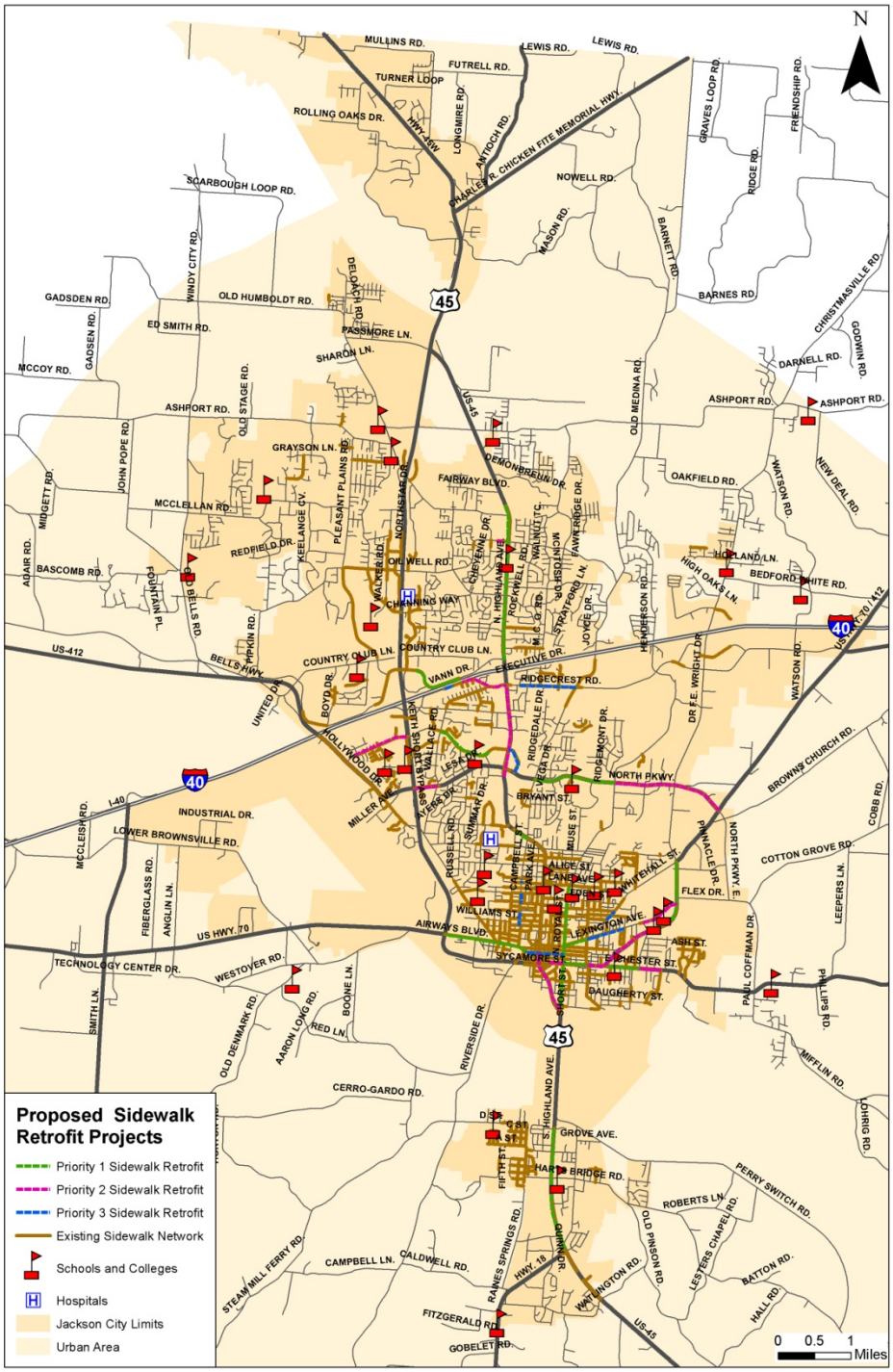


Figure 7-5A: Proposed Sidewalk Retrofit Projects (Northern Area Map)

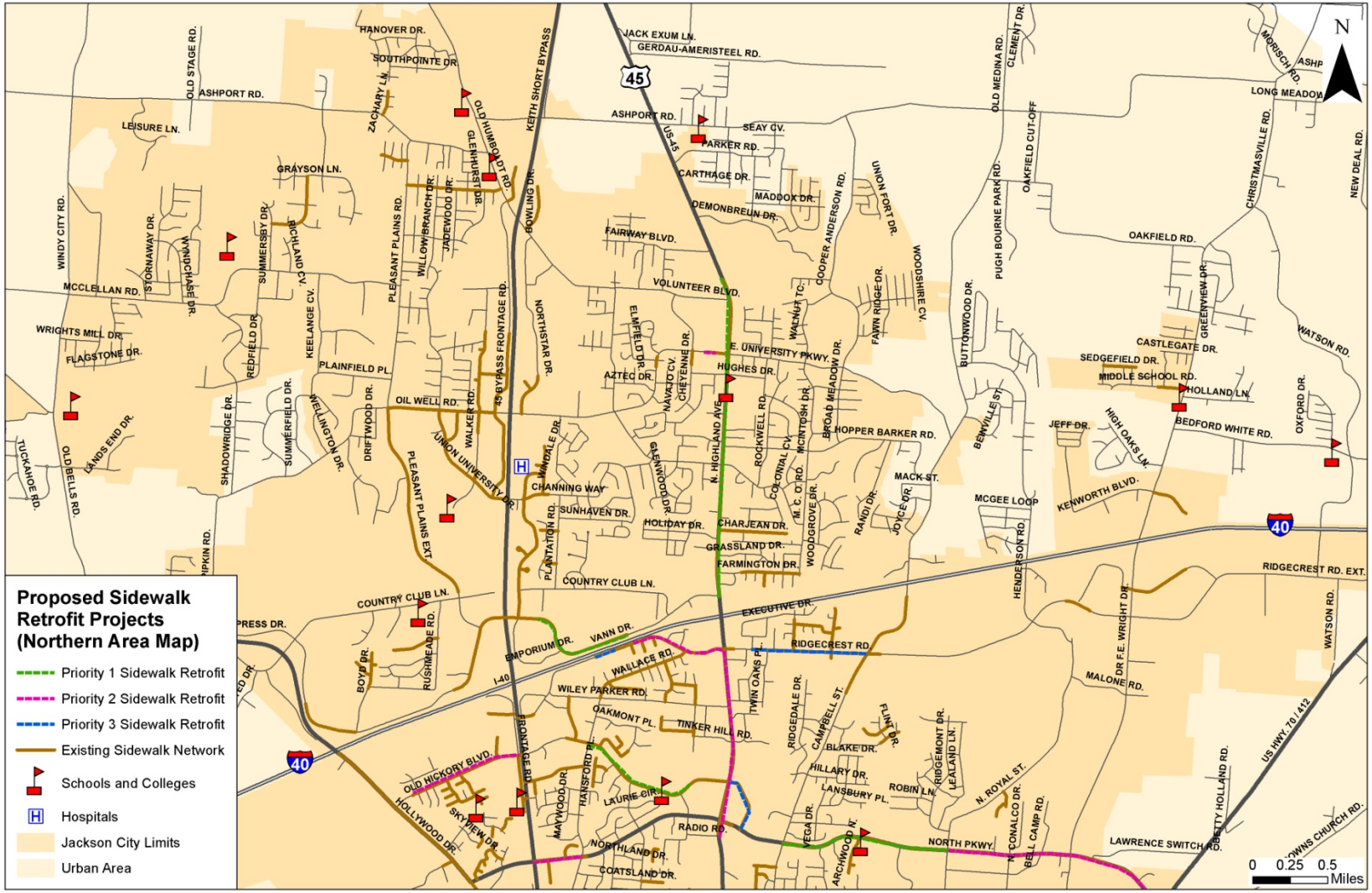


Figure 7-5B: Proposed Sidewalk Retrofit Projects (Downtown Area Map)

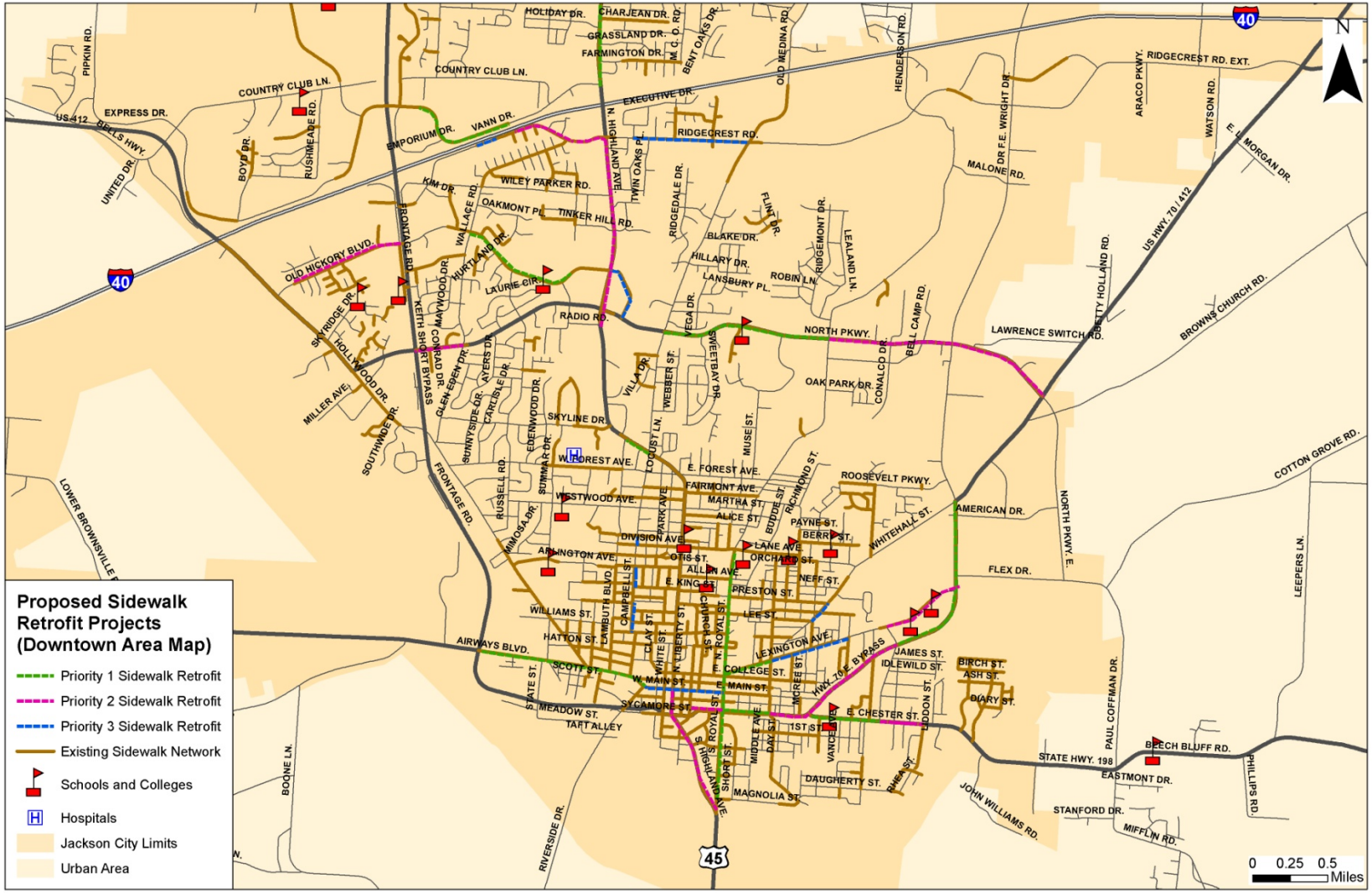
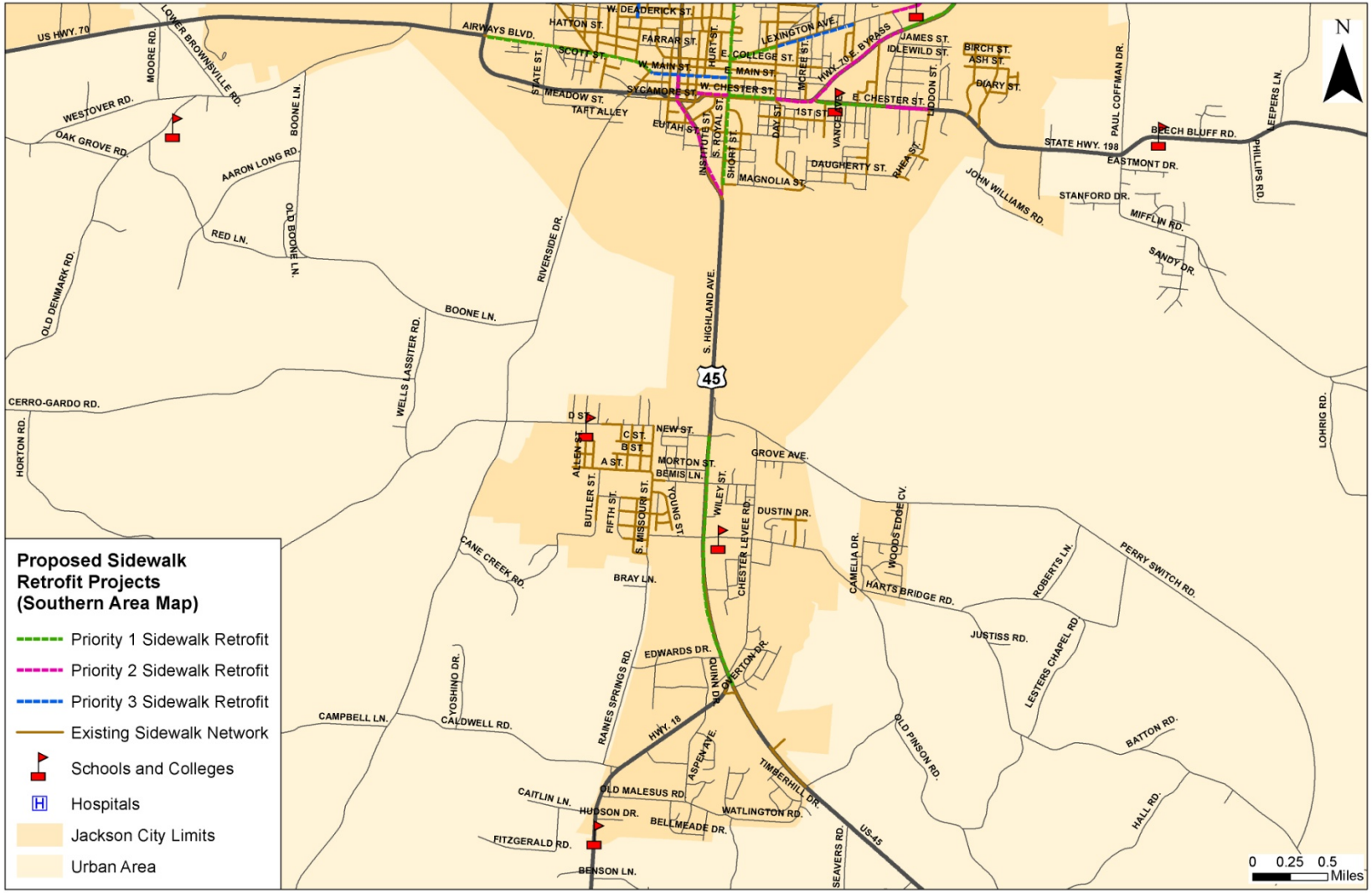


Figure 7-5C: Proposed Sidewalk Retrofit Projects (Southern Area Map)



Bicycle Route Projects

The effort to plan for and establish a formalized bikeway system builds upon the Priority projects in the *2005 Plan* and includes new recommendations for locations of bicycle route improvements to enhance connectivity to key destinations and to the proposed multi-purpose trails. The proposed bicycle treatment improvements include a range of lower cost options such as bike signage/wayfinding, "Share the Road" pavement markings, restriping of streets by lane removal or lane reduction to provide four foot bike lanes or the restriping of streets by lane removal or lane reduction to provide six foot paved shoulders. More expensive measures, representing longer-term strategies, include the addition of two foot wide curb lanes on urban roads and the addition of four foot paved shoulders on rural sections of roads where the current width of the outside shoulders is too narrow for restriping. The *2005 Plan* describes the treatments in more detail.

The majority of the treatments listed for the proposed bicycle improvement projects were previously identified in the *2005 Plan.* The necessary treatments listed to retrofit existing streets as bicycle routes were generalized recommendations based on observation and planning judgment (see page 40 of *2005 Plan*). In this 2040 Plan update, the project team identified 18 additional bicycle improvement projects. GoogleEarth and TDOT's data from TDOT's Tennessee Roadway Information Management System (TRIMS) were used to determine the recommended bicycle treatment for these additional projects (i.e. for determining if the existing width of a roadway is wide enough to restripe for bike lanes, or if wide curb lanes, four-foot paved shoulders or signage/pavement marking is needed due to narrowness of the road). Before designation of any route as a bicycle route, a specific engineering study should be conducted to determine whether additional measures are needed. In cases where providing sufficient width for bicycle traffic would involve reduction of the number of vehicle traffic lanes, a study should be done to ensure adequate capacity will be maintained.

Figure 7-6 depicts proposed priorities for bicycle projects. Figures 7-6A, 7-6B and 7-6C show enlarged maps of the recommended Bicycle Improvement Projects in the Northern, Downtown and Southern Areas of the planning region. A total of 79 bicycle improvement projects are recommended. Full development of this network would result in a total of approximately 103 centerline miles of bicycle facilities.

Table 7-7 lists the recommended locations and estimated costs for the Priority 1 Bicycle Improvement projects. Thirty Priority 1 projects are proposed, which total approximately $1,771,460 in 2012 dollars, for a total of approximately 39 centerline miles of bicycle routes. Year of expenditure (YOE) construction costs are reflected five years out for 2017, using a three percent inflation rate per year.

Table 7-7: Priority 1 Bicycle Improvement Projects

Road	From	To	Priority 1 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
Hollywood Drive	Arlington Avenue	US 45 Bypass	Restriping to provide 4' bike lanes	1.02	$25,000	**$25,500**	**$29,561**
Lexington Street	US 70	Royal Street	Restriping to provide 4' bike lanes	1.64	$25,000	**$41,000**	**$47,530**

Road	From	To	Priority 1 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
Old Hickory Blvd.	Hollywood Drive	North Parkway	Restriping to provide 4' bike lanes	3.15	$25,000	**$78,750**	**$91,293**
University Pkwy.	Old Humboldt Road	N. Highland Avenue	Restriping to provide 4' bike lanes	1.04	$25,000	**$26,000**	**$30,141**
Main St./ South Hamilton St.	Riverside Drive	Chester St.	Restriping to provide 4' bike lanes	1.17	$25,000	**$29,250**	**$33,909**
S. Highland (US 45)	Watlington Rd.	Harts Bridge Road	Signage and Pavement Markings	1.86	$11,000	**$20,460**	**$23,719**
Hollywood Blvd.	Hatton Street	Arlington Avenue	Restriping to provide 4' bike lanes	0.67	$25,000	**$16,750**	**$19,418**
North Highland Avenue	University Parkway	Ashport Road	Restriping to provide 6' paved shoulders	1.63	$40,000	**$65,200**	**$75,585**
N. Highland Avenue	University Parkway	Ridgecrest Road	Restriping to provide 6' paved shoulders	1.96	$40,000	**$78,400**	**$90,887**
North Parkway	Campbell Street	Dr. F.E. Wright Drive	Restriping to provide 4' bike lanes	1.92	$25,000	**$48,000**	**$55,645**
Lane Avenue	Royal Street	Whitehall Street	Signage and Pavement Markings	0.84	$11,000	**$9,240**	**$10,712**
Old Humboldt Road	Oil Well Road	Ashport Road	Signage and Pavement Markings	2.38	$11,000	**$26,180**	**$30,350**
Summar Drive	Skyline Drive	Westwood Ave.	Restriping to provide 4' bike lanes	0.52	$25,000	**$13,000**	**$15,071**
Royal Street	Lexington Avenue	Lane Avenue	Restriping to provide 4' bike lanes	0.84	$25,000	**$21,000**	**$24,345**
Royal Street	Lane Avenue	E. Forrest Avenue	Restriping to provide 4' bike lanes	0.51	$25,000	**$12,750**	**$14,781**

Road	From	To	Priority 1 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
Campbell St. / Johnson St. / Farrar St. / Union Ave. / New Market St.	Main Street	North Parkway	Restriping to provide 4' bike lanes	2.54	$25,000	**$63,500**	**$73,614**
University Pkwy.	North Highland Avenue	Cooper Anderson Road	Restriping to provide 4' bike lanes	0.80	$25,000	**$20,000**	**$23,185**
Linda Vista Dr.	Forest Ave.	Westwood Ave.	Restriping to provide 4' bike lanes	0.25	$25,000	**$6,250**	**$7,245**
Westwood Avenue	Campbell Street	Russell Road	Signage and Pavement Markings	0.88	$11,000	**$9,680**	**$11,222**
Cartmell Street	Chester Street	Lexington Avenue	Signage and Pavement Markings	0.67	$11,000	**$7,370**	**$8,544**
Harts Bridge Rd. / Chester Levee Rd.	Missouri Street	US 45	4' Paved Shoulders	1.63	$300,000	**$489,000**	**$566,885**
Whitehall St	Lexington Street	Dr. F.E. Wright Drive	4' Paved Shoulders	1.58	$300,000	**$474,000**	**$549,496**
Stonebridge Blvd.	Vann Drive	Channing Way	Signage and Pavement Markings	0.67	$11,000	**$7,370**	**$14,410**
SR 18	S. Highland Avenue (US 45)	City Limits	Restriping to provide 4' bike lanes	1.51	$25,000	**$37,750**	**$8,544**
Oil Well Road	Pleasant Plains Road	Old Humboldt	Restriping to provide 4' bike lanes	1.51	$25,000	**$37,750**	**$43,763**
Wallace Road/ Carriage House Road	Old Hickory Blvd.	N. Highland Avenue	Restriping to provide 4' bike lanes	1.25	$25,000	**$31,250**	**$36,227**
Royal Street	Magnolia Street	Lexington Avenue	Restriping to provide 4' bike lanes	0.86	$25,000	**$21,500**	**$24,924**

Road	From	To	Priority 1 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2017 dollars)
Royal Street	E. Forrest Avenue	North Parkway	Restriping to provide 4' bike lanes	1.10	$25,000	**$27,500**	**$31,880**

Table 7-8 lists the recommended locations and estimated costs for the Priority 2 Bicycle Improvement projects. Twenty-seven Priority 2 projects are proposed, which total approximately $1,154,910 in 2012 dollars, for a total of approximately 32 centerline miles of bicycle routes. Year of expenditure (YOE) construction costs are reflected ten years out for 2022, using a three percent inflation rate per year.

Table 7-8: Priority 2 Bicycle Improvement Projects

Road	From	To	Priority 2 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2022 dollars)
Dr. F.E. Wright Drive	North Parkway	Whitehall Street	Restriping to provide 6' paved shoulders	1.05	$40,000	**$42,000**	**$56,444**
Northstar Drive	Old Humboldt Road	Oil Well Road	Restriping to provide 4' bike lanes	1.24	$25,000	**$31,000**	**$41,661**
West King Street	Campbell Street	Maple Street	Signage and Pavement Markings	0.59	$11,000	**$6,490**	**$8,722**
East Forest Avenue	Campbell St	Royal Street	Restriping to provide 4' bike lanes	0.82	$25,000	**$20,500**	**$27,550**
US 412	I-40	Country Club	Signage and Pavement Markings	0.90	$11,000	**$9,900**	**$13,305**
Vann Dr. / Country Club Lane	N. Highland Avenue	Stonebridge Blvd	Signage and Pavement Markings	1.50	$11,000	**$16,500**	**$22,175**
Ashport Road	US 45 Bypass	Cooper Anderson Road	Signage and Pavement Markings	1.30	$11,000	**$14,300**	**$19,218**
Medical Center Dr.	Skyline Drive	Forest Ave.	Restriping to provide 4' bike lanes	0.25	$25,000	**$6,250**	**$8,399**

Road	From	To	Priority 2 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2022 dollars)
Lambuth Blvd.	Morgan St.	Forest Ave.	Restriping to provide 4' bike lanes	1.15	$25,000	**$28,750**	**$38,638**
Skyline Drive	Highland Ave.	Summar Dr.	Restriping to provide 4' bike lanes	0.33	$25,000	**$8,250**	**$11,087**
S. Liberty Street	E. Main Street	Proposed Downtown to Bemis Greenway	Restriping to provide 4' bike lanes	0.54	$25,000	**$13,500**	**$18,143**
Old Medina Rd. / Campbell St	Ridgecrest Road	University Parkway	Signage and Pavement Markings	1.58	$11,000	**$17,380**	**$23,357**
Christmasville Road	Bancorp South Pkwy.	Oakfield Road	Restriping to provide 4' bike lanes	2.35	$25,000	**$58,750**	**$78,955**
Ridgecrest Road	N. Highland Avenue	Campbell Street	Restriping to provide 4' bike lanes	0.96	$25,000	**$24,000**	**$32,254**
Dr. F.E. Wright Drive	North Parkway	Bancorp South Pkwy.	Restriping to provide 4' bike lanes	1.84	$25,000	**$46,000**	**$61,820**
D Street	Jefferson	Missouri	4' Paved Shoulders	0.54	$300,000	**$162,000**	**$217,714**
Missouri Street	Harts Bridge Road	D Street	Signage and Pavement Markings	0.73	$11,000	**$8,030**	**$10,792**
Country Club Lane / Express Drive	Pleasant Plains Extended	Pipkin Road	Signage and Pavement Markings	1.70	$11,000	**$18,700**	**$25,131**
Russell Road	Hollywood Avenue	Old Hickory Blvd.	Restriping to provide 4' bike lanes	1.87	$25,000	**$46,750**	**$62,828**
Ashport Road	Old Humboldt Road	N. Highland Avenue	4' Paved Shoulders	1.23	$300,000	**$369,000**	**$495,905**
Old Humboldt Road	North Higland Avenue	Oil Well Road	Signage and Pavement Markings	0.88	$11,000	**$9,680**	**$13,009**

Road	From	To	Priority 2 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2022 dollars)
Windy City Road	Ashport Road	Old Bells Road	Signage and Pavement Markings	2.11	$11,000	**$23,210**	**$31,192**
Old Bells Rd / Bells Highway	Bascomb Road	Express Drive	Signage and Pavement Markings	2.13	$11,000	**$23,430**	**$31,488**
Cooper Anderson Road	Old Medina	University Parkway	Restriping to provide 4' bike lanes	0.93	$25,000	**$23,250**	**$31,246**
Campbell Street	North Parkway	Ridgecrest Road	Signage and Pavement Markings	1.39	$11,000	**$15,290**	**$20,548**
Dr. Martin Luther King Jr. Drive	Royal Street	Proposed Anderson Creek Greenway	Wide Curb Lanes	0.45	$211,000	**$94,950**	**$127,605**
Old Malesus Road	SR 18	US 45	Signage and Pavement Markings	1.55	$11,000	**$17,050**	**$22,914**

Table 7-9 lists the recommended locations and estimated costs for the Priority 3 Bicycle Improvement projects. Twenty-two Priority 3 projects are proposed, which total approximately $2,882,730 in 2012 dollars, for a total of approximately 32 centerline miles of bicycle routes. Year of expenditure (YOE) construction costs are reflected twenty years out for 2032, using a three percent inflation rate per year.

Table 7-9: Priority 3 Bicycle Improvement Projects

Road	From	To	Priority 3 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2032 dollars)
McClellan Road	Pleasant Plains Road	Shadowridge Drive	Wide Curb Lanes	1.40	$211,000	**$295,400**	**$533,525**
Magnolia Street	Royal Street	Proposed Anderson Creek Greenway	Wide Curb Lanes	0.41	$211,000	**$86,510**	**$156,247**

Road	From	To	Priority 3 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2032 dollars)
Hopper Barker Road	Highland Avenue	Old Medina Road	Wide Curb Lanes	1.66	$211,000	**$350,260**	**$632,609**
Wiley Parker Road	Wallace Road	Proposed Multi-Purpose Trail D	Signage and Pavement Markings	0.44	$11,000	**$4,840**	**$8,742**
Ridgecrest Road	Campbell Street	Watson Road	Restriping to provide 4' bike lanes	3.27	$25,000	**$81,750**	**$147,650**
Cooper Anderson Road	University Parkway	Ashport Road	Signage and Pavement Markings	1.84	$11,000	**$20,240**	**$36,556**
Pleasant Plains Road	Oil Well Road	Ashport Road	Signage and Pavement Markings	1.77	$11,000	**$19,470**	**$35,165**
Oakfield Road	Old Medina Road	Christmas ville Road	Signage and Pavement Markings	1.76	$11,000	**$19,360**	**$34,966**
Ashport Road	Windy City Road	Old Humboldt Road	Signage and Pavement Markings	2.90	$11,000	**$31,900**	**$57,615**
Morgan St.	Lambuth Blvd.	Union Ave.	Restriping to provide 4' bike lanes	0.26	$25,000	**$6,500**	**$11,740**
Bedford White Rd	Watson Road	Christmas ville Road	4' Paved Shoulders	1.19	$300,000	**$357,000**	**$644,782**
Henderson Road	Ridgecrest Road	Old Medina Road	Signage and Pavement Markings	2.11	$11,000	**$23,210**	**$41,920**
McIntosh Drive	Hopper Barker Road	University Parkway	Signage and Pavement Markings	0.61	$11,000	**$6,710**	**$12,119**
Chester Street	Altamont Drive	Paul Coffman Drive	Signage and Pavement Markings	1.23	$11,000	**$13,530**	**$24,437**
Ashport Road	Cooper Anderson Road	Old Medina Road	Signage and Pavement Markings	1.09	$11,000	**$11,990**	**$21,655**

Road	From	To	Priority 3 Proposed Bicycle Treatment	Linear Miles	Unit Cost Per Linear Mile	Projected Construction Cost (in 2012 dollars)	YOE Construction Cost (in 2032 dollars)
Watson Road	Ridgecrest Road	Bedford White Road	4' Paved Shoulders	0.97	$300,000	**$291,000**	**$525,578**
Pipkin Road	Pleasant Plains Road	US Hwy 412	Signage and Pavement Markings	2.28	$11,000	**$25,080**	**$45,297**
Shadow Ridge Drive	McClellan Road	Pipkin Road	Signage and Pavement Markings	1.40	$11,000	**$15,400**	**$27,814**
Old Medina Road	University Pkwy.	Ashport Road	Signage and Pavement Markings	1.78	$11,000	**$19,580**	**$35,364**
Pleasant Plains Road	Oil Well Road	Country Club Lane	4' Paved Shoulders	1.43	$300,000	**$429,000**	**$774,822**
McClellan Road	Shadow Ridge Road	Windy City Road	4' Paved Shoulders	1.00	$300,000	**$300,000**	**$541,833**
Raines Spring Road	State Hwy 18	Harts Bridge Road	4' Paved Shoulders	1.58	$300,000	**$474,000**	**$856,097**

Figure 7-6: Proposed Bicycle Improvement Projects

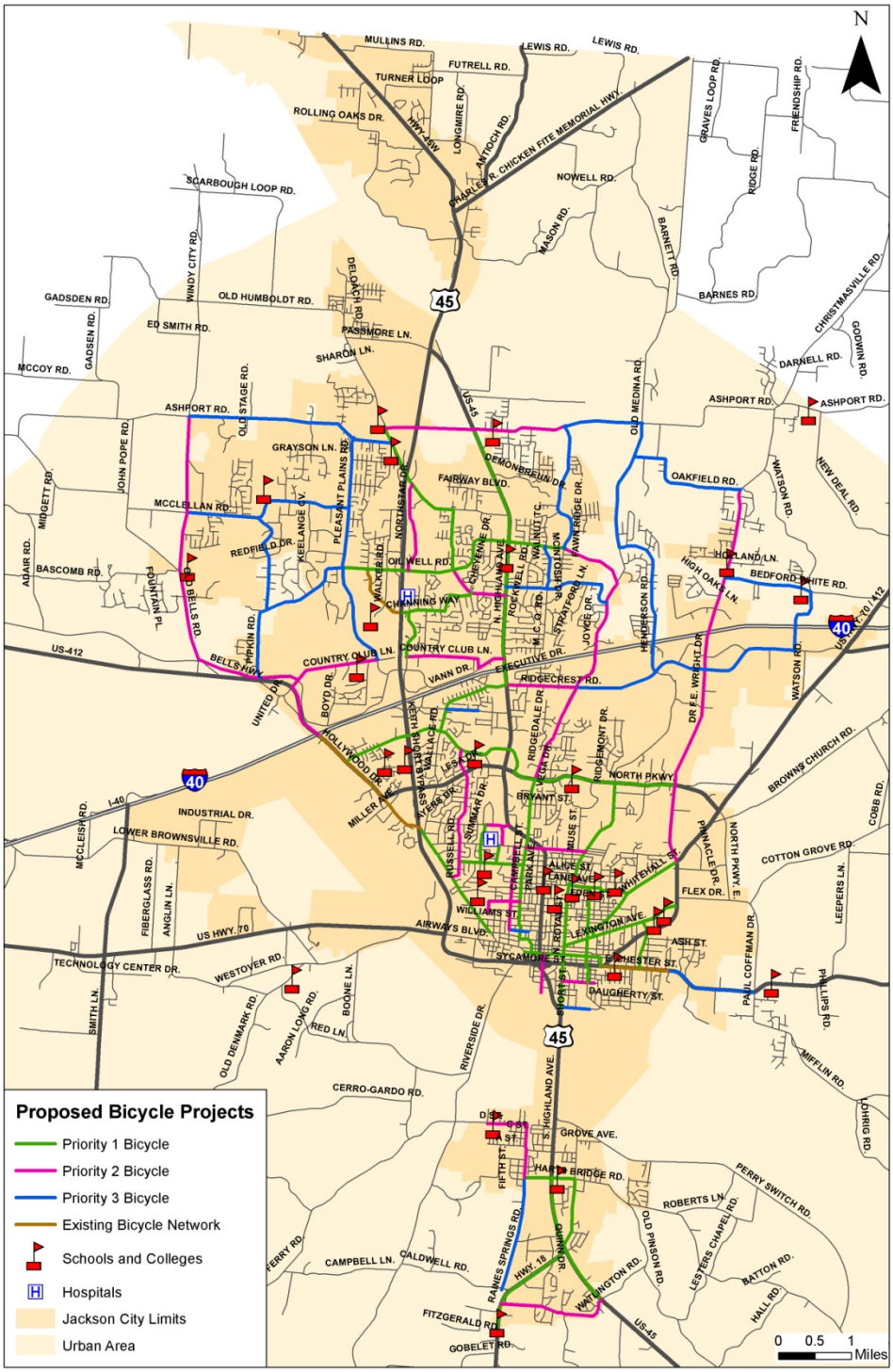


Figure 7-6A: Proposed Bicycle Improvement Projects (Northern Area Map)

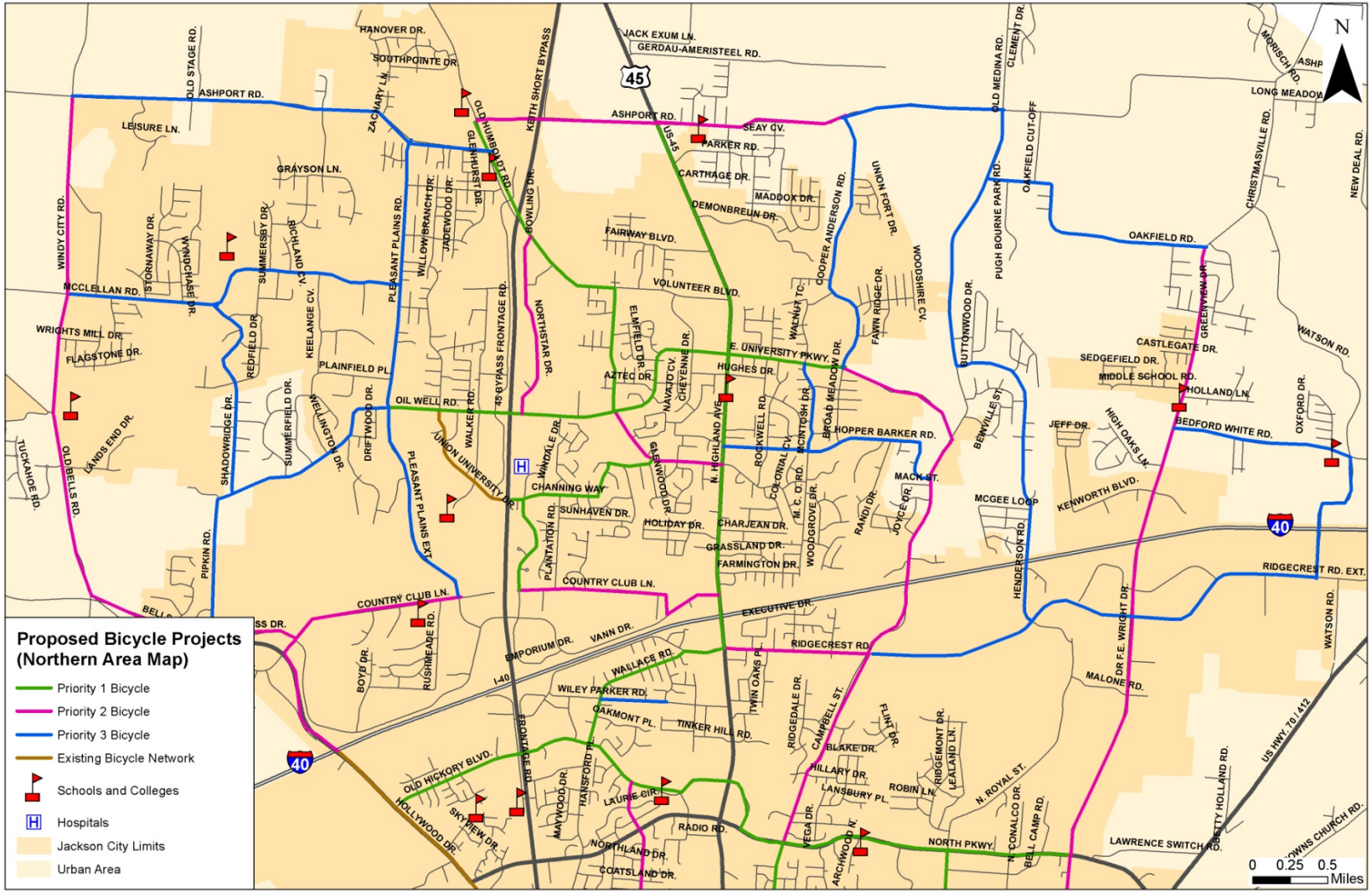


Figure 7-6B: Proposed Bicycle Improvement Projects (Downtown Area Map)

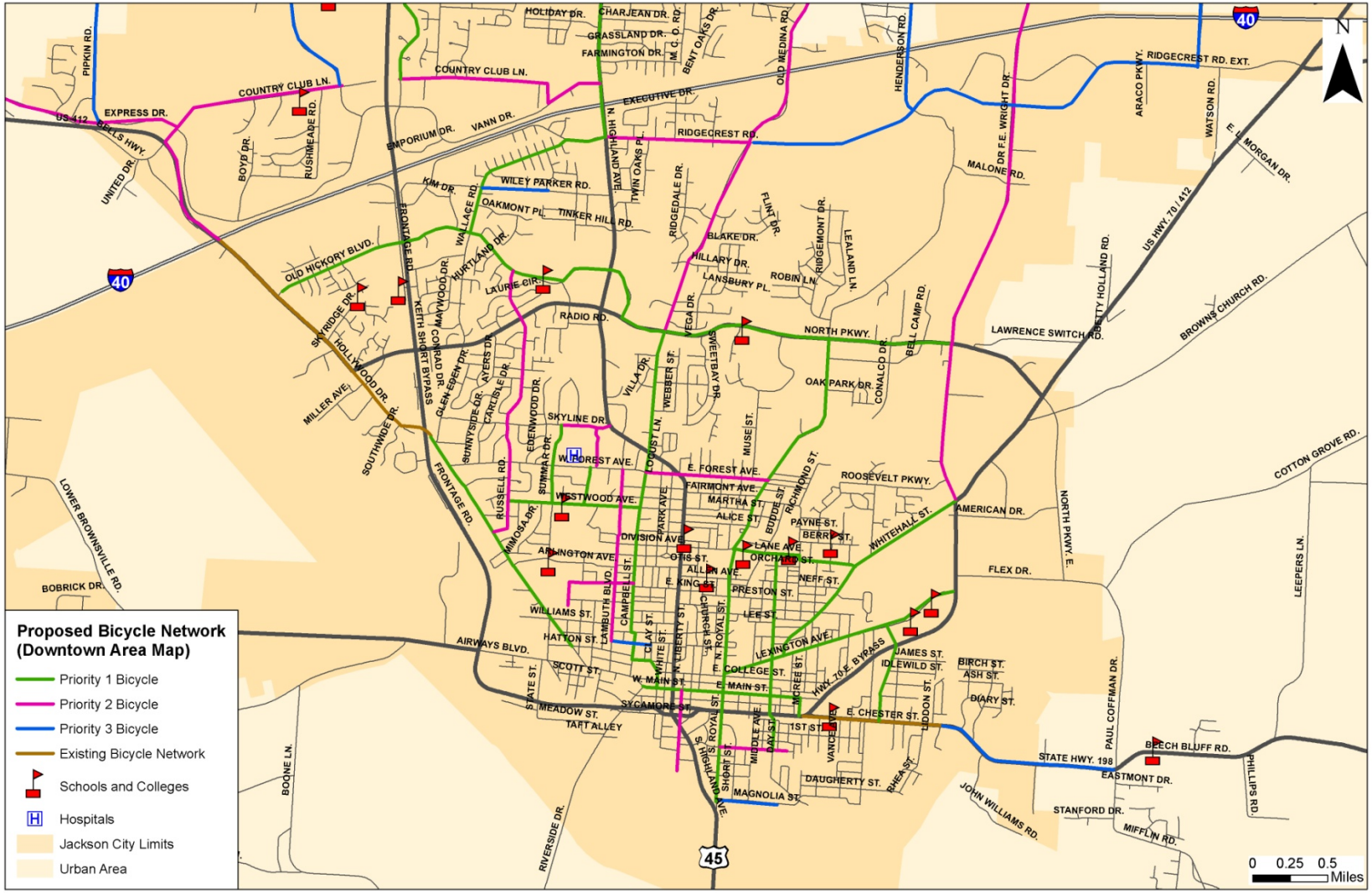
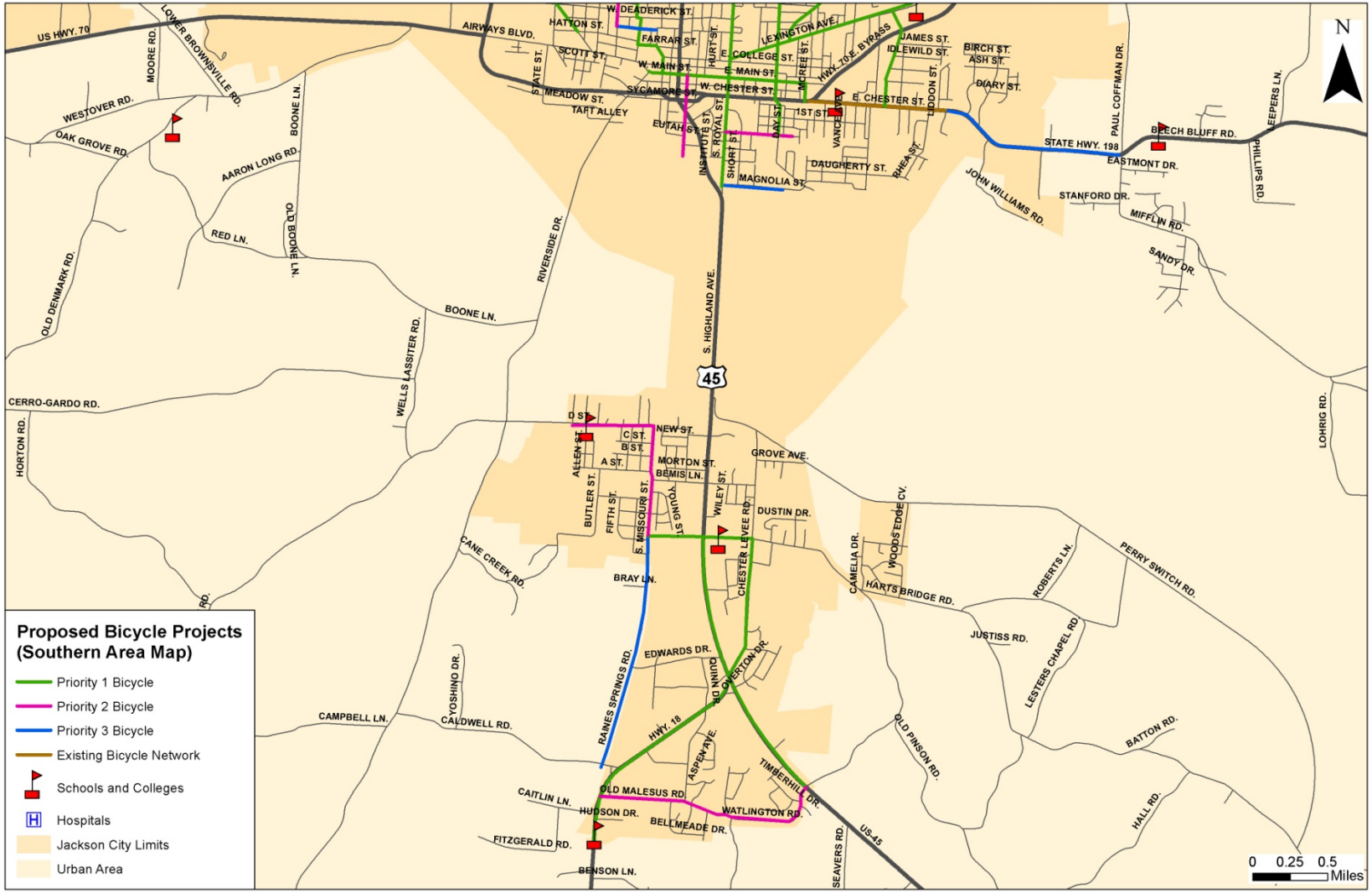


Figure 7-6C: Proposed Bicycle Improvement Projects (Southern Area Map)



Multi-Purpose Trail Projects

Multi-purpose trails are off-road facilities intended to provide transportation and recreational benefits to pedestrians and cyclists. Table 10 lists the locations and estimated costs of the proposed multi-purpose trail projects. This list builds upon the proposed trails from the *2005 Plan* and includes the recommendations of new trail projects, as shown in the *Northwest Area Land Use Plan* adopted by the City of Jackson in January 2012 and the potential to locate trails along the TVA utility easement in the northern portion of the Jackson City limits. The Proposed Multi-Purpose Trails are illustrated in Figure 7-7. A total of nine multi-purpose trail projects are recommended. Full development of this network would result in a total of approximately 13 linear miles of trails.

As noted in the *2005 Plan*, the decision to proceed with any multi-purpose trail project should include a substantial effort to gauge public support and address any concerns people may have. This is particularly due to the high construction cost and right-of-way acquisition cost of trails, as well as security concerns, maintenance requirements, and acceptance by adjoining property owners.

Table 7-10 lists the recommended locations and estimated construction and wayfinding costs for the Priority 1 Multi-Purpose Trail projects. Three Priority 1 projects are proposed, which total approximately $2,651,500 in 2012 dollards, for a total of approximately four linear miles of trails. Year of expenditure (YOE) construction costs are reflected five years out for 2017, using a three percent inflation rate per year. The Anderson Creek Greenway Trail scored the highest in the evaluation ranking system. The City of Jackson already owns the right-of-way for this trail, which would run approximately 1.3 miles in downtown Jackson from Magnolia Street northeast to James Street, paralleling US 70 on the north side of East Chester Street.

Table 7-10: Priority 1 Multi-Purpose Trail Projects

Priority 1 Multi-Purpose Trails	Linear Miles	Unit Construction Cost Per Linear Mile	Unit Wayfinding Cost Per Linear Mile	Projected Construction Cost and Wayfinding (in 2012 dollars)	YOE Construction Cost and Wayfinding (in 2017 dollars)
Trail A - Anderson Creek Greenway	1.34	$660,000	$3,000	**$886,073**	**$1,027,201**
Trail B - TVA line from Northstar Drive east to Cooper Anderson Road	2.00	$660,000	$3,000	**$1,323,580**	**$1,534,392**
Trail C - Bayberry Drive north to Old Hickory Blvd	0.67	$660,000	$3,000	**$441,838**	**$512,211**

Table 7-11 lists the recommended locations and estimated construction and wayfinding costs for the Priority 2 Multi-Purpose Trail projects. Three Priority 2 projects are proposed, which total approximately 3,275,080 in 2012 dollars, for a total of approximately five linear miles of trails. Year of expenditure (YOE) construction costs are reflected ten years out for 2022, using a three percent inflation rate per year.

Table 7-11: Priority 2 Multi-Purpose Trail Projects

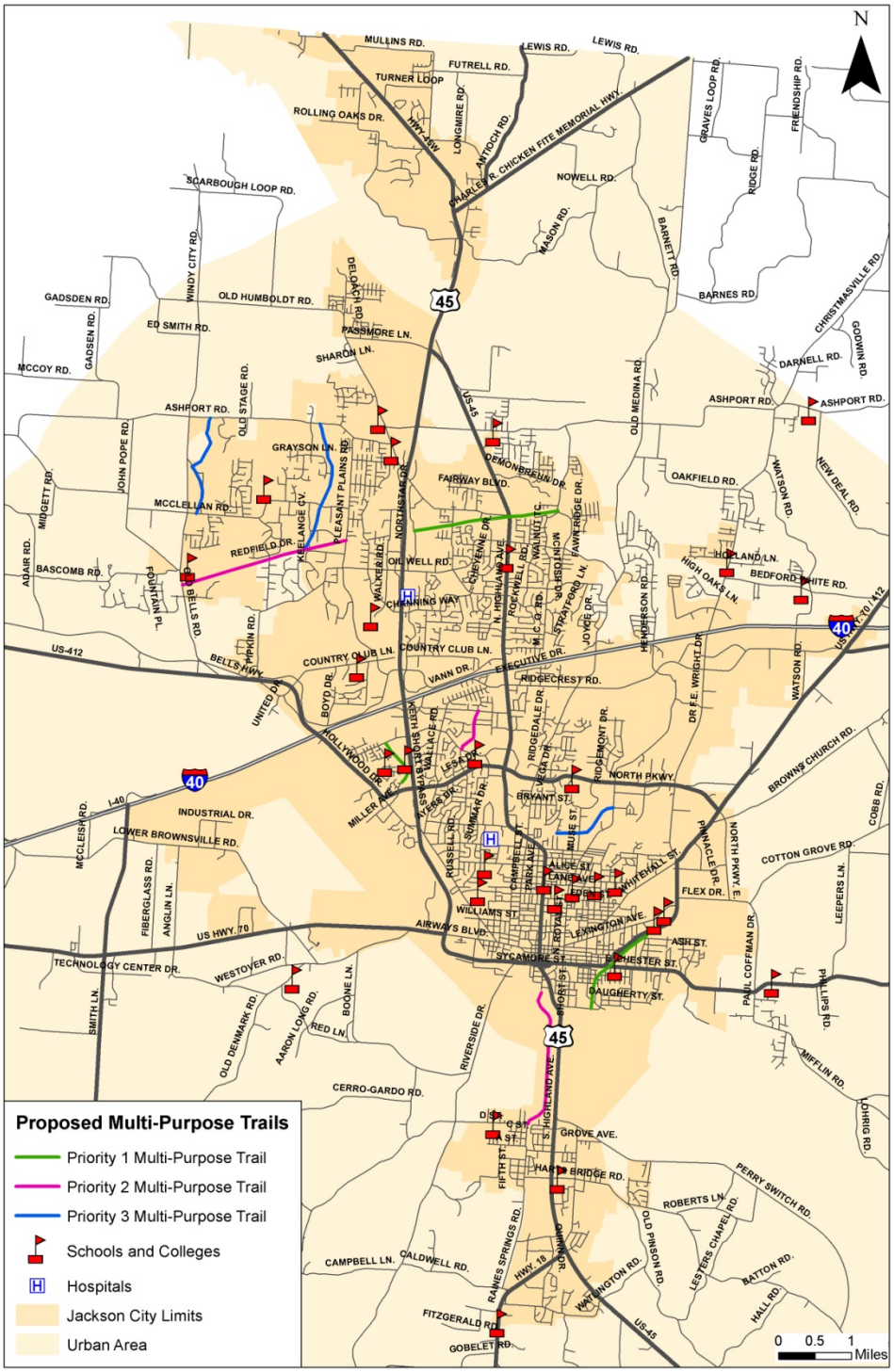
Priority 2 Multi-Purpose Trails	Linear Miles	Unit Construction Cost Per Linear Mile	Unit Wayfinding Cost Per Linear Mile	Projected Construction Cost and Wayfinding (in 2012 dollars)	YOE Construction Cost and Wayfinding (in 2022 dollars)
Trail D - Russell Rd north to Wiley Parker Road	0.62	$660,000	$3,000	**$411,026**	**$552,384**
Trail E - Downtown south to Bemis	1.99	$660,000	$3,000	**$1,319,264**	**$1,772,980**
Trail F - Windy City Road east to Pleasant Plains Road	2.33	$660,000	$3,000	**$1,544,790**	**$2,076,069**

Table 7-12 lists the recommended locations and estimated construction and wayfinding costs for the Priority 3 Multi-Purpose Trail projects. Three Priority 3 projects are proposed, which total approximately $2,798,200 in 2012 dollars, for a total of approximately four linear miles of trails. Year of expenditure (YOE) construction costs are reflected twenty years out for 2032, using a three percent inflation rate per year.

Table 7-12: Priority 3 Multi-Purpose Trail Projects

Priority 3 Multi-Purpose Trails	Linear Miles	Unit Construction Cost Per Linear Mile	Unit Wayfinding Cost Per Linear Mile	Projected Construction Cost and Wayfinding (in 2012 dollars)	YOE Construction Cost and Wayfinding (in 2032 dollars)
Trail G - Currie Ave east to Royal Street	0.94	$660,000	$3,000	**$619,905**	**$1,119,617**
Trail H - TVA line at Keelange Cove north to Ashport Road	1.81	$660,000	$3,000	**$1,199,818**	**$2,167,004**
Trail I - McClellan Road north to Ashport Road	1.48	$660,000	$3,000	**$978,495**	**$1,767,271**

Figure 7-7: Proposed Multi-Purpose Trails



Chapter 8

Freight and Air Transportation

INTRODUCTION

The Jackson Area MPO's 2035 Plan contained a freight transportation component which forecasted the daily truck flows for the year 2035 from the Jackson/Madison County travel demand model. The report also considered major truck traffic generators within the City of Jackson and Madison County in the year 2005 and the location of major industrial parks. Rail and air freight conditions were also analyzed, although neither is currently a major component of freight movement in the area. Results from 22 survey responses and an interview with FedEx were used to develop a Truck Count model. The results of this analysis were integrated into the 2035 Plan recommendations.

As discussed in this section, the 2040 Plan updated this analysis through distribution of a new survey to area businesses identified as major freight generators. Additional information from the following sources was analyzed to gain knowledge specific to freight movement in the Jackson area:

- Annual Average Daily Traffic (AADT) data from the Tennessee Department of Transportation (TDOT)
- Locations of major freight generators in the Jackson area
- Interviews with major business associations in the region

Analysis of the results indicates that the Jackson area continues to be a location that is very attractive to businesses of all sizes and provides a number of strategic advantages related to freight movement, including two full service freight centers run by FedEx and UPS, and a central location along one of the nation's major interstate corridors that is a day's drive from 76% of the major markets in the United States.

EXISTING CONDITIONS

The City of Jackson is located along the I-40 corridor, between Memphis and Nashville, the two largest markets in Tennessee, and within one day's drive from 76% of the major markets in the United States. Locating in Jackson gives companies a strategic advantage in terms of freight movement:

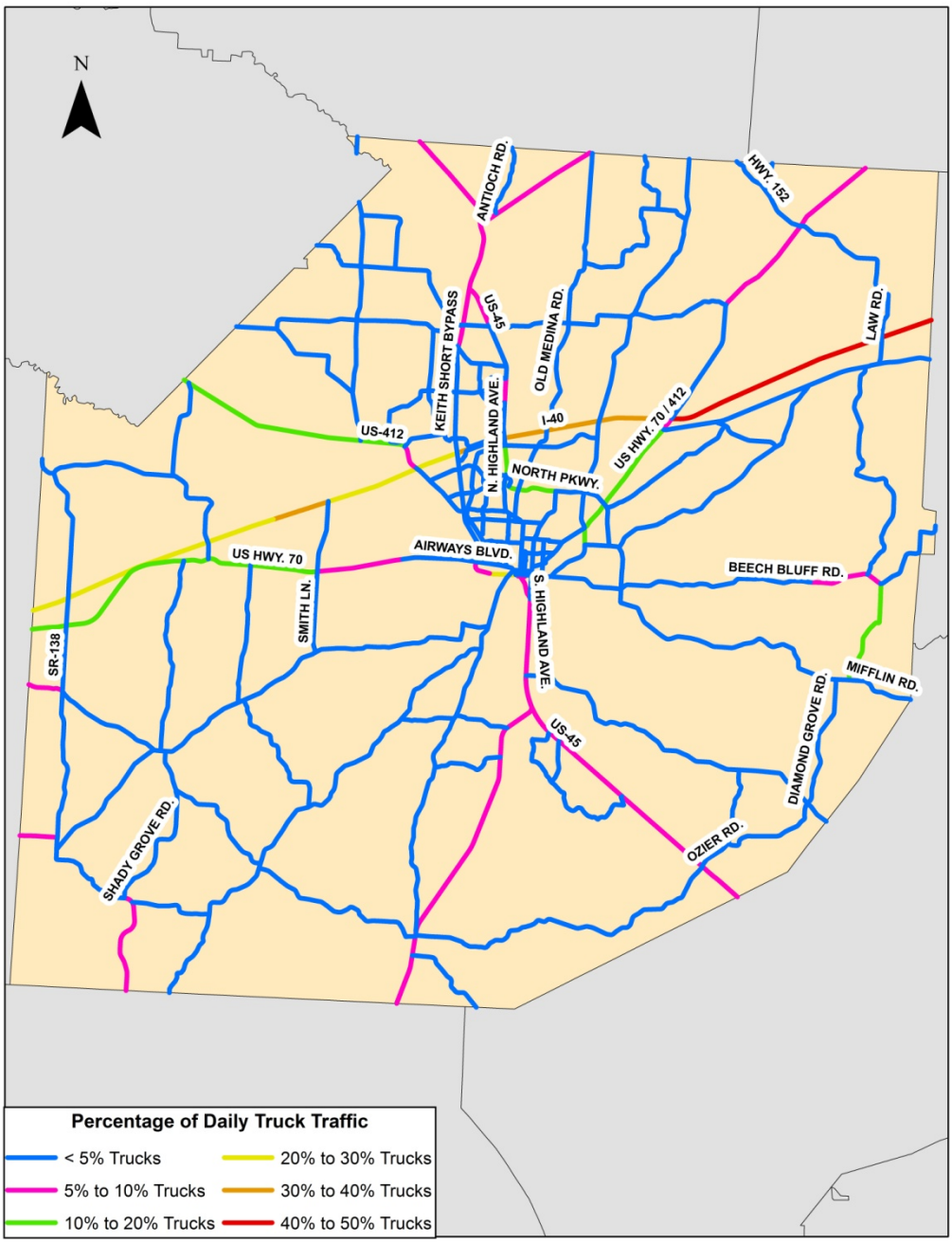
- Jackson currently serves as the home to large players in the industries of consumer goods, clothing, food products, automobiles, paper products, steel and a variety of other manufacturing industries, thus making it easy for new companies to operate in the area.
- Business owners and associations report that local governments prioritize the needs of local businesses, including those related to transportation and the movement of goods.
- The Jackson area is also home to several universities, colleges and vocational centers, providing local businesses with an educated and capable work force.

Despite being one of the busiest east-west Interstate corridors in the United States, I-40 provides local businesses with convenient routes to the interstate highway network as well as access to water, rail and air

transport facilities. These logistical strengths along with the City of Jackson's business-friendly policies and access to cheap, reliable utilities make the area an ideal location for manufacturing and shipping businesses.

Freight traffic in the Jackson area is directed primarily along I-40, but also along US-412, US-70, US-45, and SR-18. Figure 8-1 is a map demonstrating the percentage of daily traffic attributable to trucks.

Figure 8-1: Percentage of Daily Truck Traffic



Existing Rail Network

Over the last 30 years, the use of rail for freight transport has steadily decreased as a result of heavy investment in the interstate highway system and the relative cost and flexibility of using trucks as opposed to rail. As a result of consolidation and divestment, one short line rail road currently serves the Jackson area.

The short line West Tennessee Railroad connects Jackson to four Class 1 railroads:

- CSX Railroad at Humboldt, TN
- Canadian National at Fulton, KY
- Norfolk-Southern Railroad at Corinth, MS
- Kansas City Southern Railroad at Corinth, MS

Existing Access to Waterways and Airports

The majority of waterway and airport transportation originating from or terminating in the Jackson area runs through Memphis and Nashville. As an alternative to Memphis, SR-412 connects Jackson to a small Mississippi River port north of Memphis. Additionally, the McKellar-Sipes regional airport provides a local alternative to Memphis and Nashville international airports.

RECOMMENDATIONS

The following sections discuss the recommended improvement projects. Suggested improvements include high priority ideas that will yield immediate impacts to efficient freight movement. Since the majority of freight movement in the Jackson area is conducted via ground transport, all of these recommendations are for highway improvements. Measures that will decrease the Jackson area's reliance on trucks and/or reduce its dependence on transport facilities in Memphis may not have as pronounced an effect on local businesses, but should be considered in the long-term plan for freight transport.

Method of Evaluation

In addition to the AADT data and percentage of traffic attributable to trucks described in the above section, a survey was sent to businesses in the Jackson area that were identified as potential freight generators. Of the surveys distributed, 22 were completed and returned by the business owners. The responses were analyzed to determine freight activity in the Jackson area, major freight transit issues, and potential solutions. Respondents to the survey account for approximately 108 million tons of freight shipped and 97 million tons of freight received.

Additionally, interviews were sought with the Jackson Area Chamber of Commerce, the Jackson Energy Authority, the Southwest Tennessee Development District, and the West Tennessee Industrial Association. Interviews were conducted with three of the four organizations to determine the strengths and weaknesses of local freight infrastructure and hear ideas to improve the ability of businesses within the Jackson area to move freight more efficiently. The opinions and concerns of the interviewees were generally consistent. Each organization mentioned the same strengths and weaknesses of doing business in the Jackson area and identified the same areas of concern with truck freight movement. Ideas for future improvements to other modes of freight transport were more diverse.

Highway Recommendations

According to interviewees, the Jackson area is an ideal location for business activity that relies on freight movement. It is approximately equidistant from Tennessee's two largest markets, Memphis and Nashville. This allows Jackson to serve as a shipping hub to the state of Tennessee and also play a role in Memphis' claim to being the distribution hub of the United States.

The existing conditions in the Jackson area are friendly to businesses, especially those involved in manufacturing with large demand for freight activity. Locating in Jackson currently gives companies a strategic advantage by providing low utility rates, proximity to large manufacturing companies and their resources, favorable public policies, and a wide array of freight shipping options. The highway infrastructure is among the best in Tennessee and reflects local government agencies' willingness to prioritize the needs of businesses. I-40 is one of the busiest East-West corridors in the nation and connects Jackson with most of the major consumer markets in the eastern United States.

The most common method of shipment among survey respondents was by truck, which accounts for just over 80% of their freight activity. Intercontinental shipping accounts for just over 2% of freight activity, while less than truckload (LTL), small package and barge comprise less than 1% of activity. The remaining 17% of freight activity uses other methods of transport (discussed in subsequent sections).

Despite the strong preference for ground transport and the favorable properties of the Jackson area with regard to this method of transport, there remain impediments to freight shipping activities.

- Traffic problems along I-40 generally occur at exits 79 (US-412/SR-20 to I-155), 80 (US-45 bypass/SR-186) and 82 (US-45/SR-5).
- Overturned trucks caused by cloverleaf interchanges are a cause of major issues on I-40, not just for shippers, but for commuter and school traffic.
- US-45 is one of a very limited number of ways in and out of Jackson, causing significant congestion. Freight traffic (large trucks) mixes with commercial traffic downtown (churches, retail, commercial), adding unnecessary delays to their schedules. The current US-45 Bypass terminates in the middle of downtown and the development along the bypass has been enormous. There is a need for a true bypass that reconnects with US-45 south of Jackson.
- Rush hour highway congestion was the issue that local businesses felt affects freight activity in the Jackson area most adversely. Other times of day were not reported to pose the same level of travel difficulty.
- Survey respondents also felt that delays due to highway maintenance, areas that are congested at all times of the day, a lack of turn lanes, and frequent accidents created impediments to freight movement.

Traffic data provided by Tennessee Department of Transportation (TDOT) in its 2010 Average Daily Traffic (ADT) data indicates that the major traffic corridors in Jackson (those with ADT exceeding 20,000 trips) include the I-40 corridor from the eastern city limits to the western city limits, US-45 Bypass between the northern city limits and the southern city limits, and Highland Avenue (US-45) between University Parkway and Forest Avenue. Traffic along the I-40 corridor ranges between 20% and 50% trucks, and traffic along the US-45 bypass and the US-45 south of Jackson is between 5% and 10% trucks. Interviewees reiterated the importance of these corridors, suggesting additional lanes on I-40 to relieve congestion, interchange improvements to the I-40 interchange at

both the US-45 Bypass and US-45 (Highland Avenue), and an extension to the US-45 Bypass to route freight traffic around downtown Jackson.

I-40 is one of the most heavily trafficked East-West corridors in the United States, extending over 2,500 miles from Barstow, California to Wilmington, North Carolina and passing through eight different states. Given its importance to freight transport, both survey respondents and interviewees mentioned the need for additional lanes, thus relieving congestion and reducing the probability of crashes.

Another common suggestion was to modify the existing cloverleaf intersections at exits 79 and 80 to allow for smoother ingress and egress. The goal of these interchange improvements would be to get freight vehicles to and from major shippers, shipping providers, industrial parks, and business parks quickly and efficiently. This could be accomplished by expanding the interchanges, segregating freight and passenger vehicles, or providing restricted access bypasses for freight vehicles. These improvements would relieve congestion and also reduce the likelihood of overturned trucks and large traffic accidents, providing time savings to both freight and commuter traffic.

Although the US-45 Bypass is not as heavily trafficked by freight vehicles as I-40, it represents a critical part of the freight infrastructure in the Jackson area. A greater percentage of freight trips along US-45 and the US-45 Bypass is originating or terminating in the Jackson area than freight trips along I-40. Both survey respondents and interviewees expressed frustration with the US-45 Bypass, saying that it was not an authentic bypass since it routes freight vehicles through downtown Jackson, mixing freight traffic with commercial traffic and creating unavoidable delays. Commercial development along the US-45 Bypass has been intensive, increasing the amount of turns onto and off of the highway. Also, trucks must pass through several signalized intersections before being able to reach highway speeds south of Jackson. As a result, survey respondents and interviewees reported a strong need for a true bypass that circumvents the downtown area and reconnects to US-45 south of Jackson.

MAP-21, the recently enacted federal transportation law, has established a new national freight policy that will result in the designation of a National Freight Network. By July 2013, the U.S Department of Transportation (USDOT) will select up to 27,000 miles of interstates and certain critical rural freight corridors that are considered most important to the safe and efficient movement of freight. The Jackson region should work cooperatively with TDOT to ensure the national designation of I-40, US-45, the US-45 Bypass, US-412 and US-70. Under the new law, interstate highway projects on the National Freight Network will be eligible for 95% federal funding, and projects to improve freight movement on non-interstate routes will be eligible for 90% federal funding, if the projects are identified in the State Freight Plan and if the USDOT certifies that they improve the efficiency of freight movement. This potential eligibility for additional funds is especially valuable, given the high cost of the proposed US-45 Bypass Extension.

Rail Recommendations

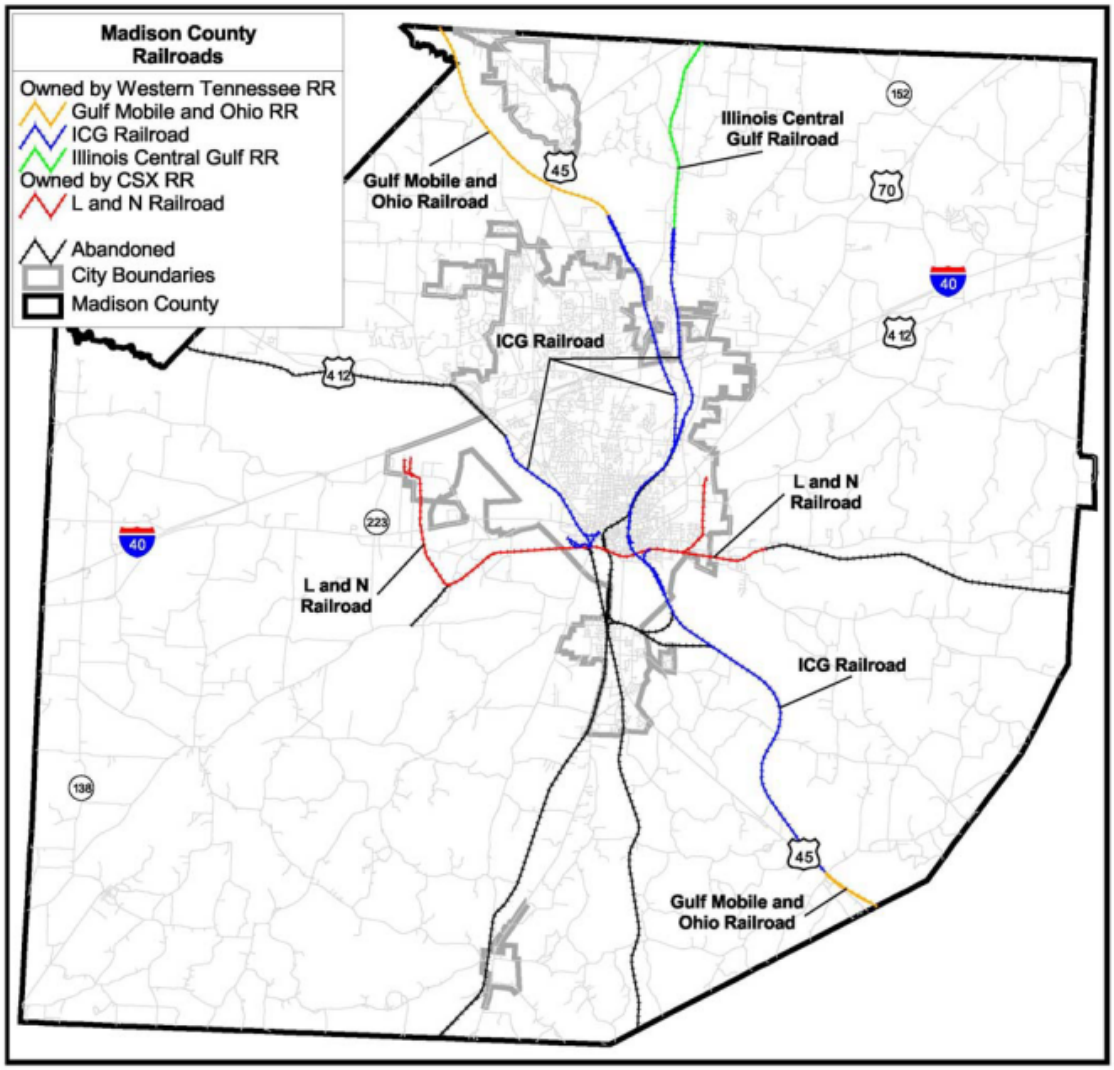
Though once an important hub, the use of rail to transport freight has decreased substantially over the last 30 years, leaving the Jackson rail port with one short line rail company actively serving the area: the Western Tennessee Railroad (WTNN). Figure 8-2 identifies railroads in Madison County. The surge in development of the Interstate highway system and economic advantages of using trucking for distribution rather than rail led to divestment from rail in Jackson, consolidation of rail authority and the abandonment of several lines.

WTNN provides service to transfer points for four Class 1 railroads:

- CSX Railroad (Humboldt, TN)
- Canadian National Railroad (Fulton, KY)
- Norfolk-Southern Railroad (Corinth, MS)
- Kansas City Southern Railroad (Corinth, MS)

None of the survey respondents expected to change their preference for ground transport of freight in the next 25 years. However, rising fuel costs may make rail a more attractive option economically than it is today and spur resurgence in usage. Investment in rail improvements, particularly multi-modal logistics facilities that would provide easy transition from rail to other methods of transport would help the Jackson area stay competitive. Providing both trucking and rail capabilities may attract businesses who wish to reduce the risk associated with locating in the Jackson area by cutting out one variable, namely the downside risk of increasing fuel costs.

Figure 8-2: Madison County Railroads



Waterway Recommendations

Waterway and airport freight movement are important to Jackson area businesses in that Jackson's proximity to two international airports and the second largest deepwater port on the Mississippi River gives businesses and shippers a multitude of good transport options. Nonetheless, the ability exists to make these options faster and cheaper for freight users.

As an alternative to the port of Memphis, SR-412 connects Jackson to the Port of Cates Landing to the north. Use of this port is attractive to local businesses in that it is less crowded and less expensive. However, transporting goods from the Jackson area to the Port of Cates Landing needs to be more efficient for it to become a competitive option. The Jackson MPO will continue to monitor the traffic to/from the port to determine if any improvements are necessary to accommodate future growth in truck traffic.

AIR TRANSPORTATION

Originally established by the U.S. Government as a military aviation training center, McKellar-Sipes Regional Airport was given to the City of Jackson and Madison County after World War II for civilian use. The Jackson-Madison County Airport Authority owns and operates the airport (MKL) which provides commercial air service, general aviation and other aviation services to the City of Jackson, Madison County and surrounding communities in western Tennessee. As per the Federal Aviation Administration records, the airport had 134 passenger boardings (enplanements) in 2008, 1,502 enplanements in 2009, and 2,545 in 2010.

Existing Conditions

The airport is located on an 800-acre site five miles west of downtown Jackson on the east side of SR-223 (Smith Lane) and south of US-70 (Airways Boulevard). Interstate access to the airport is via the I-40 interchange at SR-22. The airport is part of the Tennessee Statewide Airport System Plan of six commercial service airports, including the Memphis International Airport (about 80 miles to the west of Jackson) and Nashville International Airport (about 125 miles east of Jackson). McKellar-Sipes provides air freight handling capabilities to local businesses and it meets the same safety and security requirements as much larger airports. Over 50,000 tons of freight cargo is transported through this regional airport, and that amount is expected to double by 2030. However, this represents a small fraction of the freight moved through the Memphis and Nashville international airports.

The airport has an instrument landing system for its two runways of about 6,000 feet (Runway 02/20) and 3,540 feet (Runway 11/29). Originally constructed in 1958, the passenger terminal building of about 8,364 square feet was last renovated in 1993. The airport is mostly used for general aviation, but is also served by one commercial airline. SeaPort Airlines began services to both Memphis and Nashville on January 22, 2012.

The airport has the land needed to improve the logistical facilities and foster more growth. There is potential for McKellar-Sipes to increase its air connectivity and become a more attractive option for businesses with air shipment needs. Moreover, the airport almost lost its federal subsidy in recent budget talks. As such, there is an urgent need to increase both passenger and cargo traffic to ensure that it continues to provide service to the region.

Programmed and Planned Projects

The Regional Airport Master Plan (April 2005) included short-term (2005-2009), intermediate-term (2010-2014) and long-term (2015-2025) projects for federal Airport Improvement Program (AIP) funds. As outlined in their master plan, the proposed projects were intended to maintain the current facilities and equipment and expand the current services and capabilities of the airport for the next 20 years.

McKellar-Sipes Airport received two grants from the Tennessee Department of Transportation in May 2012 as shown in the table below.

Table 8-1: Airport Grants Received in 2012

Project Description	State Funding	Local Funding
Upgrade Perimeter Fencing	$67,500	$7,500
Airport Drainage Study	$16,200	$1,800

Chapter 9

Intelligent Transportation Systems

INTRODUCTION

As population and vehicle miles traveled continue to increase in the Jackson region, congestion and associated travel delays are also expected to increase. Intelligent Transportation Systems (ITS) are one of the most effective congestion management strategies used to improve the safety and mobility of the transportation system. The National ITS Architecture, a web-based resource developed by the United States Department of Transportation (USDOT), defines ITS as a broad range of wireless and wire-line communications-based information and electronics technologies that may be used singly or integrated together to enhance productivity. The National ITS Architecture and its components can be viewed at the following web address: http://www.iteris.com/itsarch/index.htm. The National ITS Architecture should be reviewed on a routine basis to identify the latest technology advancements that may be applicable to the Jackson region.

The purpose of this section is to provide recommendations for ITS projects that build upon recommendations made in the 2035 Plan. These recommendations are based on three deployment timeframes: short-term (5-year planning horizon), mid-term (10-year planning horizon) and long-term (20-year planning horizon). As with any major infrastructure project, successful ITS deployment should be implemented in an incremental fashion. ITS projects by their very nature are meant to be integrated and the identification of project dependencies was essential in determining the sequence of recommended projects. For example, a traffic operations center (TOC) must first be established before closed circuit television (CCTV) cameras can be used for incident detection and traffic monitoring. The overarching principles of a phased implementation approach are to leverage existing and planned infrastructure to the maximum extent, accommodate increasing levels of system integration, ensure equity in benefits and costs, and promote a coordinated approach to meeting the ITS needs of the Jackson Area MPO.

JACKSON ITS HISTORY

The *Regional ITS Architecture (2007)* and *Regional ITS Deployment Plan (2007)* developed for the City of Jackson and the Jackson Area MPO included significant input from local, state and federal officials and should continue to serve as the basis for ITS project development and deployment in the Jackson region. A broad range of projects were identified in the *Regional ITS Deployment Plan*, including travel and traffic management enhancements, emergency management upgrades, maintenance and construction management, public transportation management upgrades, as well as, the establishment of a data archive management process.

The Jackson region currently has several ITS components deployed in the field. Examples include closed loop signal systems, vehicular video detection, centralized dispatch for public safety vehicles, speed monitoring and red-light running equipment used for enforcement, a transit dispatch and scheduling system, as well as, CCTV surveillance at the Transit Center. It is assumed that the functionality of these existing ITS components may be expanded, upgraded and integrated with any future deployments in the region.

It should be acknowledged that since the architecture and deployment plans were developed in 2007, technology advancements, particularly the prevalence of smart phones and other devices which allow travelers

access to real-time travel conditions, have evolved the long-term vision for the dissemination of traveler information. It should also be expected that further advancements in the USDOT Connected Vehicle Initiative, in which vehicles will communicate via dedicated short range communications (DSRC) with roadside devices as well as other vehicles, may also impact the scale and type of ITS infrastructure improvements that are needed in the future.

The list of project recommendations contained in this section was developed in conjunction with the City of Jackson and MPO staff and builds upon the projects and strategies recommended as part of the architecture and deployment plan. As the Jackson Region pursues funding opportunities for proposed projects, it will be necessary to show that a project fits within the ITS Architecture developed for the Region.

ITS BENEFITS

The deployment of many ITS applications have proven to provide measurable benefits in terms of congestion reduction, increases in transit ridership, safety, and economic productivity. The USDOT's ITS Joint Program Office developed a report entitled *Intelligent Transportation Systems Benefits, Costs, Deployment, and Lessons Learned*, which summarized information about deployed ITS systems. The overall goal of report was to support informed decision making with regard to the deployment of ITS. It should be expected that benefits, similar to the ones listed in Table 9-1, will be accrued with the implementation of ITS technologies in the Jackson region.

Table 9-1: ITS Benefits

ITS Service Area	Benefits
Traffic Management	- Increase transportation system efficiency and capacity through improved signal coordination/timing and incident detection - Reduce queue lengths and vehicle hours of delay - Reduce energy consumption and environmental costs through reduced emissions and fuel consumption
Emergency Management	- Decrease emergency response times and incident clearance times - Decrease delay experienced by emergency vehicles
Maintenance and Construction Management	- Reduce infrastructure operating costs through preventive maintenance
Public Transportation Management	- Increase efficiency of the transportation system through improved service to transit users - Reduce customer delay through electronic payment - Maximize customer safety through use of video surveillance
Archived Data Management	- Enhanced planning capabilities based on historical data

ITS SERVICE AREAS

The National ITS Architecture categorizes ITS technologies by service areas, each of which encompass a group of closely related strategies that may be implemented singly or in combination with the goal of achieving certain benefits related to a particular facet of the transportation system. Each of the ITS service areas relevant to the Jackson region are listed below, as described in the National ITS Architecture.

- **Traffic Management**
  The traffic management service area applies to the management of traffic on arterial roadways. ITS strategies typically used within this service area are traffic detectors, traffic signals, traffic surveillance devices, dynamic message signs and highway advisory radio. Additionally, various methods may be used to communicate the information from field devices back to a central operating center or to travelers.

- **Emergency Management**
  ITS applications in emergency management include hazardous materials management, the deployment of emergency medical services, and large and small-scale emergency response and evacuation operations.

- **Maintenance and Construction Management**
  ITS applications in maintenance and construction management focus on integrated management of maintenance fleets, specialized service vehicles, hazardous road conditions remediation, and work zone mobility and safety. These applications monitor, analyze, and disseminate roadway and infrastructure data for operational, maintenance, and managerial uses. ITS can help secure the safety of workers and travelers in a work zone while facilitating traffic flow through and around the construction area. This is often achieved through the temporary deployment of other ITS services, such as elements of traffic management and incident management programs.

- **Public Transportation**
  Public Transportation ITS services include surveillance and communications, such as automated vehicle location (AVL) systems, computer-aided dispatch (CAD) systems, and remote vehicle and facility surveillance cameras, which enable transit agencies to improve the operational efficiency, safety, and security of the nation's public transportation systems.

- **Archived Data Management**
  ITS archived data management supports the archiving and retrieval of data generated by other ITS applications and enables ITS applications that use archived information. Decision support systems, predictive information, and performance monitoring are some ITS applications enabled by ITS information management. In addition, ITS information management systems can assist in transportation planning, research, and safety management activities.

ITS PERFORMANCE MEASURES

There are a range of issues associated with transportation system operations that may be addressed in the short term solely through the use of management and operations (M&O) strategies without adding additional infrastructure. One example of this would be improved signal timing plans to address issues with recurring congestion. MAP-21, the recently enacted federal transportation legislation, requires that states and MPOs use an objectives-driven, performance-based approach to planning and programming transportation projects. This approach is intended to promote efficient system management by using established system performance measures rather than focusing on implementation of projects as a measure of success.

The following list contains sample performance measures related to arterial management that are included in the *National ITS Architecture*. Similarly, performance measures could also be created for each of the ITS service areas, including emergency management, maintenance and construction management, and public transportation.

Sample Performance Measures for Arterial Traffic Management

- Number of traffic signals evaluated for re-timing
- Number of years between reviews of crash data on all arterials for possible signal timing impacts
- Number of intersections running in a coordinated or closed loop signal system

It is recommended that performance measures be developed for all ITS deployments in the Jackson region potentially during the next update of the Regional ITS architecture. Through the development and tracking of performance measures, the Jackson region will have the ability to assess the usefulness of the ITS system as a whole, quantify the cost-benefit ratio of the investments, as well as, communicate the measures to the public. Performance measures may also be used to guide future investments to areas and applications in which the most benefits are being achieved and away from efforts that are not providing the anticipated level of benefits.

SHORT-TERM ITS RECOMMENDATIONS

The projects identified for short-term implementation are those that will provide a visible and positive impact to the safety and efficiency of the transportation system and are feasible from a funding standpoint. It is important to recognize that ITS projects usually necessitate some level of continuous or near continuous operational commitment along with higher levels of maintenance and maintenance responsiveness. Additionally, many ITS projects and systems involve multiple agencies, which will require increased levels of communication, coordination and formal agreements for planning, implementation and operations.

The short-term project recommendations are categorized by the following ITS service areas:

- Traffic Management
- Emergency Management
- Maintenance and Construction Management
- Public Transportation

The primary goal of the short-term project recommendations is to improve the efficiency and safety of the arterial street network through the establishment of a traffic operations center (TOC) and a centrally managed signal system that is interconnected with fiber optic cable. The TOC and fiber optic communications network

will provide the ability for improved signal coordination and reduced energy consumption and emissions along the regions signalized corridors. Furthermore, it will provide the basis for future expansions of ITS devices, which may include CCTV cameras for faster incident identification and response.

Table 9-2 contains a listing of projects recommended for short-term implementation, along with the agencies responsible for the implementation, operations and maintenance of the project, as well as implementation considerations related to the deployment.

Table 9-2: Short-Term ITS Projects

High-Level Project Description	Responsible Agency	Implementation Considerations
Develop performance measures for all short-term ITS deployments	City of Jackson	- Performance measures should be easily measurable and not put an undue data collection burden on City staff
Traffic Management		
Utilize fiber interconnect to create closed loop signal systems with on-street masters	City of Jackson	- Priority given to existing groupings of signals with coordinated timing plans - Use Jackson Energy Authority (JEA) dark fiber - Fiber sharing agreement needed - Signal controller upgrades will be required for fiber communications
Establish a Traffic Operations Center (TOC) for the City of Jackson	City of Jackson	- Use existing office space at City Hall - Agency agreements will be needed for information sharing
Utilize fiber interconnect to provide communications from signal controllers back to the TOC, creating a centrally managed signal system	City of Jackson	- Use Jackson Energy Authority dark fiber - Fiber sharing agreement needed - Procure central control software for signals - Additional fiber runs or wireless links may be necessary to bridge gaps in JEA coverage between signals
Upgrade and expand the City of Jackson signal system	City of Jackson	- Install fiber-ready controllers for all new signal installations and upgrades
Implement vehicle detection technologies on roadways in the City of Jackson	City of Jackson	- Agency agreements will be needed for information sharing
Establish a communications link between the City of Jackson TOC and TDOT Region 4	City of Jackson TDOT Region 4	- Agency agreements will be needed for information sharing

High-Level Project Description	Responsible Agency	Implementation Considerations
Implement closed circuit television (CCTV) cameras along I-40 in Madison County	TDOT	- TDOT would manage deployment, operations and maintenance - Agency agreements will be needed for information sharing
Emergency Management		
Implement technology for video sharing between City of Jackson Police Department helicopters to the Police Department for incident monitoring	City of Jackson Police Department	- The exclusive 4.9 GHz public safety band makes wireless a safe and secure communications medium - Images transmitted may contain sensitive information and proper security controls need to be in place
Expand the implementation of GPS emergency vehicle preemption at traffic signals	City of Jackson	- Ensure operability with emergency vehicles from surrounding jurisdictions - Increase in delay to non-emergency vehicles
Maintenance and Construction Management		
Implement a GPS based tracking system to log locations needing maintenance	City of Jackson	- Requires integration with Jackson area GIS data - Ensure operations personnel are available for monitoring and managing the data
Upgrade TDOT portable DMS to add remote communications capabilities	TDOT	- Will need central processing software located at the TOC or in a field hub with wireless communications links
Public Transportation		
Retrofit Jackson Transit Authority buses with automated stop annunciation technology	Jackson Transit Authority	- Implement GPS devices on buses and wireless communications back to transit control center
Implement video surveillance on Jackson Transit Authority vehicles to improve patron and driver safety	Jackson Transit Authority	- Communications medium needed for video image transmission
Implement video surveillance on Southwest Human Resource Agency vehicles to improve patron and driver safety	Jackson Transit Authority	- Communications medium needed for video image transmission

MID-TERM ITS RECOMMENDATIONS

The projects identified for mid-term implementation build upon the functionality deployed with the short-term projects. It should be noted that projects referring to system expansion of ITS elements or that rely on a connection to the traffic operations center are dependent on the projects identified for short-term implementation being implemented first.

The mid-term project recommendations are categorized by the following ITS service areas:

- Traffic Management
- Emergency Management
- Maintenance and Construction Management
- Public Transportation

The primary goal of the mid-term project recommendations is to expand upon the functionalities implemented with the short-term projects. The implementation of field devices such as CCTV cameras, additional vehicle detection equipment, and dynamic message signs will greatly expand the traffic operations, incident management, and information dissemination capabilities of the TOC. The deployment of similar technologies along I-40 in the Jackson region would allow for enhanced incident and emergency management and information sharing capabilities between the City and TDOT. Additionally, the implementation of advanced technologies for public transit operations and will enhance the efficiency and safety of the multi-modal travel experience in the Jackson region.

Table 9-3 contains a listing of projects recommended for mid-term implementation, along with the agencies responsible for the implementation, operations and maintenance of the project, as well as implementation considerations related to the deployment.

Table 9-3: Mid-Term ITS Projects

High-Level Project Description	Responsible Agency	Implementation Considerations
Continue to monitor performance of existing ITS deployments and develop measures for all mid-term ITS deployments with new functionality	City of Jackson	- Performance measures should be easily measurable and not put an undue data collection burden on City staff
Traffic Management		
Implement CCTV cameras along congested corridors and at intersections with high crash rates	City of Jackson	- Use Jackson Energy Authority dark fiber - Fiber sharing agreement needed - Additional fiber runs or wireless links may be necessary to bridge gaps in JEA coverage between device locations
Implement additional vehicle detection equipment for monitoring speeds and volumes	City of Jackson	- Use Jackson Energy Authority dark fiber - Fiber sharing agreement needed - Additional fiber runs or wireless links may be necessary to bridge gaps in JEA coverage between device locations
Expand the capabilities of the TOC to include the ability to monitor CCTV cameras and vehicle detection equipment	City of Jackson	- Use Jackson Energy Authority dark fiber - Fiber sharing agreement needed - Consider use of commercial-of-the-

High-Level Project Description	Responsible Agency	Implementation Considerations
		shelf monitoring software
Implement dynamic message signs (DMS) for traffic information dissemination	City of Jackson	- Use Jackson Energy Authority dark fiber - Fiber sharing agreement needed - Agency agreements needed for information sharing - Aesthetics of sign structures on arterial roadways
Develop data and video sharing agreements with local media to improve information dissemination	City of Jackson Local Media Outlets	- Agency agreements will be needed for information sharing
Implement highway advisory radio (HAR) transmitters and signs for information dissemination along I-40 in Madison County	TDOT	- TDOT would manage deployment, operations and maintenance - Agency agreements will be needed for information sharing
Implement vehicle detection technologies along I-40 in Madison County to monitor speeds and volumes	TDOT	- TDOT would manage deployment, operations and maintenance - Agency agreements will be needed for information sharing
Implement DMS along I-40 in Madison County	TDOT	- TDOT would manage deployment, operations and maintenance - Agency agreements will be needed for information sharing
Consolidate all City of Jackson automated vehicle location (AVL) into a single tracking system	City of Jackson Jackson Transit Authority	- Consider web-based off-the-shelf system - Integrate with in-vehicle stop annunciation - Ensure adequate operations staff for data monitoring
Emergency Management		
Establish a connection to share TDOT and City of Jackson CCTV camera images with the Madison County E911 Center	TDOT City of Jackson Jackson/Madison County EMA	- Agency agreements will be needed for information sharing
Maintenance and Construction Management		
Implement roadway weather sensors and flood detection sensors at key locations	City of Jackson	- Consider deployment of signals and/or gates in combination with sensors
Public Transportation		
Install technology to provide real-time vehicle location information at transit transfer stations and permanent covered stops	Jackson Transit Authority	- Implement GPS devices on buses and wireless communications back to transit control center
Implement electronic fare collection	Jackson Transit Authority	- Consider system consistent with

High-Level Project Description	Responsible Agency	Implementation Considerations
technology on Jackson Transit Authority vehicles		adjacent jurisdictions
Implement video surveillance at transit transfer stations and permanent covered stops to improve patron and driver safety	Jackson Transit Authority	- Agency agreements will be needed for information sharing

LONG-TERM ITS RECOMMENDATIONS

The projects identified for long-term implementation are more strategic in nature and may need to be updated based on the progress achieved with the short- and mid-term projects as well as adjusted for advances in technology. The goal of the long-term recommendations is to expand upon and upgrade the technologies and services implemented with the short- and mid-term project and to continue to ensure that people and goods are moved safely and efficiently in the Jackson region. It is reasonable to expect that information will be provided to travelers in real-time across a wide range of platforms that will allow travelers to make informed decisions regarding routes, travel times, and travel modes.

The long-term project recommendations are categorized by the following ITS service areas:

- Traffic Management
- Emergency Management
- Archived Data Management

Table 9-4 contains a listing of projects recommended for long-term implementation, along with the agencies responsible for the implementation, operations and maintenance of the project, as well as implementation considerations related to the deployment.

Table 9-4: Long-Term ITS Projects

High-Level Project Description	Responsible Agency	Implementation Considerations
Continue to monitor performance of existing ITS deployments and develop measures for all long-term ITS deployments with new functionality	City of Jackson	- Performance measures should be easily measurable and not put an undue data collection burden on City staff
Traffic Management		
Continue to upgrade and expand the City of Jackson traffic signal system	City of Jackson	- Ensure detector placement is compatible with potential for future adaptive signal control
Continue to expand deployment of CCTV cameras and DMS	City of Jackson	- Use Jackson Energy Authority dark fiber - Fiber sharing agreement needed - Additional fiber runs or wireless links may be necessary to bridge gaps in JEA coverage between device locations

Emergency Management		
Expand the Region 4 HELP service area to include the Jackson Region	TDOT	- TDOT would manage deployment, operations and maintenance
Implement AVL technology on HELP vehicles	TDOT	- TDOT would manage deployment, operations and maintenance
Archived Data Management		
Establish a data warehouse to archive data from cities and transit agencies in the MPO service area for use in regional planning	Jackson Area MPO	- Ensure operations personnel are available for monitoring and managing the data - System security - Data ownership

HIGHLAND AVENUE CORRIDOR

Due to the constrained nature of the Highland Avenue corridor widening and/or capacity improvements are not an option. Purchasing right-of-way (ROW) to widen North Highland Avenue south of I-40 is not viable for a number of reasons: (1) the expense of purchasing land from multiple commercial developments; (2) the inability to acquire ROW from historic properties; (3) buildings abut the existing ROW in the downtown area; and (4) the inability to acquire ROW in the wetlands area located south of downtown. As a result, the implementation of arterial traffic management systems (ATMS) will become increasingly important in future years in order to maintain the safety of the surface transportation system and the mobility of its users on a regional scale. It will be of particular importance along the segment of North Highland Avenue south of I-40 due to the anticipated increase in traffic volumes and limited ability to widen the roadway.

ATMS strategies applicable to this section of the North Highland Avenue for the 2040 Plan, include, but should not be limited to the following:

- Coordinated signal timing plans;
- Adaptive signal control;
- Incident management;
- Advanced traveler information systems; and
- Integration with transit and emergency vehicle operations.

Each of these ATMS strategies is described in more detail below.

Coordinated Signal Timing Plans

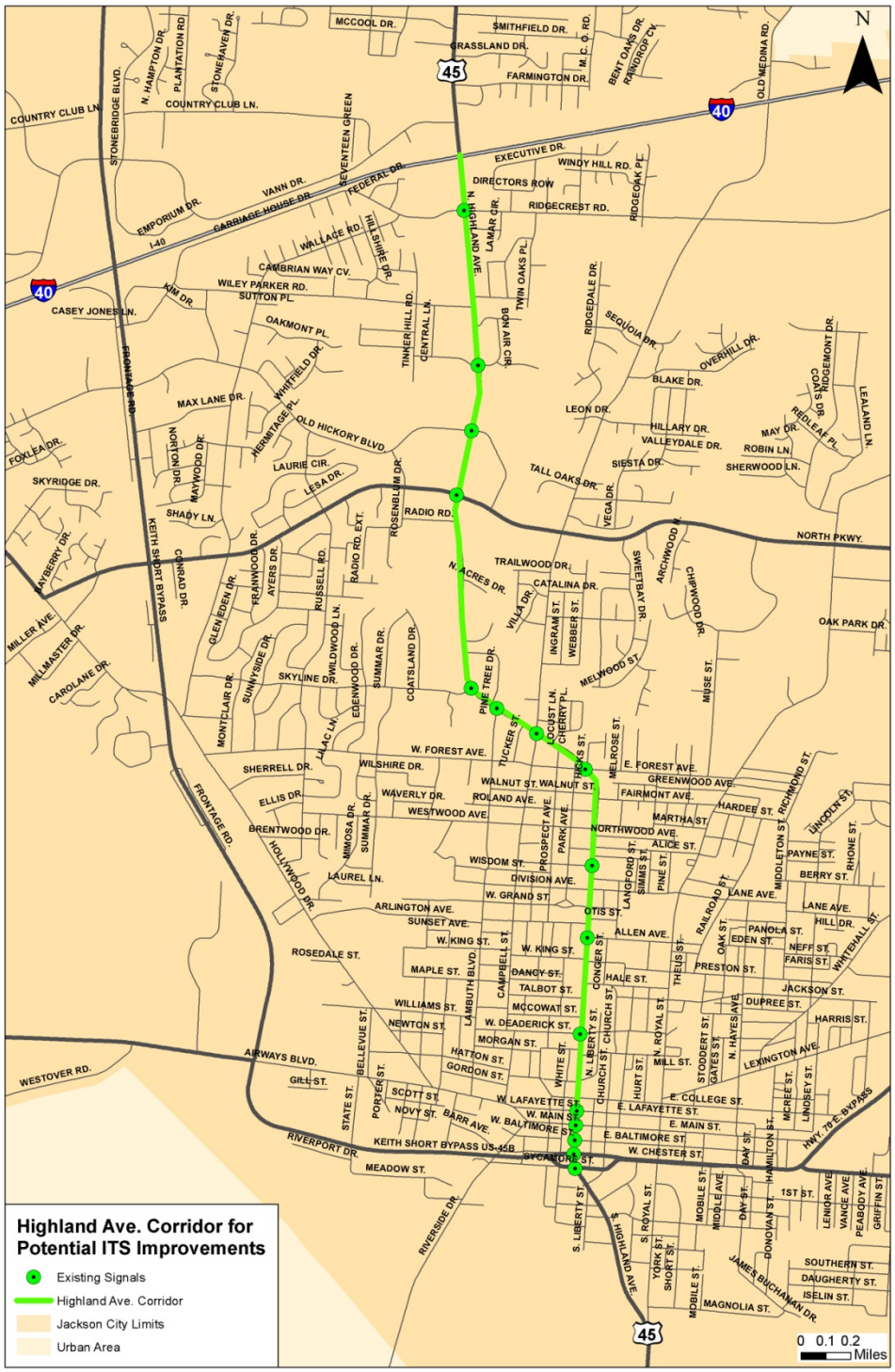
A coordinated signal system at the most elementary level consists of time-based coordination between signal controllers. Each signal controller contains an accurate clock and all intersections are coordinated according to their internal clocks, which keeps the timing plans in sync with each other and the signals coordinated. However, signals using time-based coordination do not necessarily have to be interconnected together with a form of communications media (e.g., wireless, fiber optic cable or twisted pair copper). They rely solely on the accuracy of their internal clocks to stay synchronized with adjacent signals. At a minimum, the 16 signals along this segment of North Highland Avenue (from I-40 to the US-45 Bypass), shown in Figure 1, should run coordinated signal timing plans. In general, it can be expected that signal coordination/implementation will cost approximately $7,000 per intersection.

But, it is more desirable to have the signals interconnected with communications infrastructure (twisted pair copper or fiber optic cable), which will allow the signals to communicate with each other and a master controller

and/or central software system. This allows the internal clocks of each signal controller to be checked against the others and updated if they get out of sync with each other.

Well-maintained traffic signal coordination has been proven to improve travel time and progression along a corridor. For example, in 2006 Metro Nashville/Davidson County undertook a signal re-timing effort along seven key travel corridors, including 223 signalized intersections. Results from the re-timing effort included a 20 percent reduction in delay for the seven corridors, with two corridors experiencing a 37 percent delay reduction. Benefits in reduced fuel consumption and improvements in air quality were also achieved. The total project achieved a one year benefit-to-cost ratio of 21:1 with a projected three year benefit-to-cost ratio of 62:1.

Figure 9-1: Highland Avenue Corridor



Adaptive Signal Control

Adaptive signal control (ASC) refers to traffic signal operations in which the signal timing plans are optimized in real-time based on current traffic conditions, demand and system capacity. ASC is particularly useful along corridors that experience daily variations in traffic volumes that are unpredictable and not consistent with typical peak periods. In other words, if the North Highland Avenue corridor is used by traffic diverting from I-40 due to an incident or freeway closure; under ASC the corridor will be able to better service the dramatic increase in traffic volumes on a one-time basis by updating timing plans on the fly. It is costly and time consuming to manually update signal timing plans on a routine basis (recommended every 3 to 5 years), and with the implementation of ASC, the timing plans would not need to manually updated.

The benefits that have been attributed to the deployment of ASC, include, but are not limited to the following:

- Improvements in travel time by more than ten percent, and in areas with particularly outdated signal timing, improvements can be 50 percent or more.
- Reduction in rear-end crashes due to fewer stops.
- Ability to collect data that can be used to monitor the performance of the corridor.
- Improved customer service and reduction in citizen complaints.

Some municipalities see the implementation cost of ASC to be cost prohibitive, however, it can become more manageable if the appropriate detector infrastructure is installed when signals are upgraded, even if the implementation of ASC is still several years in the future. Costs typically range between $5,000 to $45,000 per intersection for ASC deployment depending on the infrastructure needs.

Incident Management

Incident management typically uses incident detection devices, such as closed circuit television (CCTV) cameras at key intersections or high incident locations to monitor traffic operations and detect and verify incidents from a traffic management center as soon as they occur. Incident management has been proven to reduce emergency response times, incident durations, and secondary crashes. Information obtained through incident management can then be disseminated to travelers using the advanced traveler information systems described in the next section.

According to the U.S. Department of Transportation (USDOT) Joint Program Office, the deployment of traffic incident management strategies results in measurable benefits across the nation, including the following:

- Reduces fuel consumption annual by approximately 1.2 percent, which equates to a savings of 2,600-7,700 gallons per incident.
- Reduces incident durations by up to 65 percent and reduces secondary crashes by 30-50 percent.

Furthermore, the USDOT has conducted studies that indicate that the likelihood of a secondary crash increases by 2.8 percent for each minute the primary accident continues to be a hazard.

It is recommended that the City of Jackson consider the implementation of CCTV cameras at key intersections along the Highland Avenue corridor as a first step in the deployment of an incident management system. The locations selected for the camera installations should take into account viewing distances, horizontal and vertical curvature of the roadway, and the need for camera views down select cross streets. Priority should be

given to the intersections listed below, which were identified as having a crash rate of over one crash per million entering vehicles. The intersections are listed in order of descending crash rate. It should be noted that existing signalized intersections with fiber optic communications should be selected over unsignalized intersections since the signal control cabinet may be used to house the camera control equipment, and power service and communications infrastructure will already be at the intersection. Furthermore, a camera may not need to be located at every intersection listed below, because closely spaced intersections may be monitored using a single camera.

1. North Highland Avenue/Ridgecrest Road/Carriage House Drive
2. South Highland Avenue/Sycamore Street
3. North Highland Avenue and North Parkway
4. North Highland Avenue/E. Chester Street
5. North Highland Avenue/Old Hickory Boulevard
6. North Highland Avenue/Arlington Avenue (unsignalized)
7. North Highland Avenue/Lane Avenue (unsignalized)
8. North Highland Avenue/Main Street
9. North Highland Avenue/Wiley Parker Road (unsignalized)
10. North Highland Avenue/Hale Street (unsignalized)
11. North Highland Avenue/Westwood Avenue (unsignalized)
12. North Highland Avenue/Forest Avenue
13. North Highland Avenue/Skyline Drive

Advanced Traveler Information Systems

Advanced Traveler Information Systems (ATIS) for arterials includes similar technologies and strategies for collecting and disseminating traveler information as those used for freeway systems. In the past decade, jurisdictions and state departments of transportation have increasingly begun to disseminate information on travel conditions, weather, construction and incidents via dynamic message signs, highway advisory radio, a national three-digit traveler information telephone number (511), websites, social media such as Facebook and Twitter, and email and text alert. It is anticipated that with the continued increase and prevalence in smartphone use, that the dissemination of information to travelers via mobile devices will be more widespread in the future. It should also be expected that further advancements in the USDOT Connected Vehicle Initiative, in which vehicles will communicate via dedicated short range communications (DSRC) with roadside devices as well as other vehicles, may also impact the scale and type of ITS infrastructure improvements that are needed in the future.

Based on a six year long survey of the 78 largest metropolitan areas in the United States conducted, the most popular media for distributing traveler information is the internet, and email is the second most popular. As documented by the USDOT Research and Innovative Technology Administration (RITA) in 2008, benefits of traveler information systems have been identified to include the following:

- Drivers who use route specific travel time information as opposed to area-wide traffic advisories can improve on-time performance by 5 to 13 percent;
- Travel information services are in very high demand during severe weather events, emergencies, or other special events;
- Customer satisfaction with regional 511 telephone system deployments ranges from 68 to 92 percent; and

- Enhanced network traffic distribution improves effective capacity and reduces fuel consumption and emissions.

It is recommended that the City of Jackson consider the following ATIS applications for the North Highland Avenue corridor:

- Dynamic message signs (sized for use on the major arterial).
- Disseminate traveler information via City website, text alert, email, Facebook page, and Twitter account.
- Continued monitoring of the impacts of distracted driving legislation on viable information dissemination methods.

Integration with Transit and Emergency Vehicle Operations

Integration of Arterial Traffic Management Systems (ATMS) with transit and emergency vehicle operations is typically implemented in the form of transit signal priority (TSP) and emergency vehicle preemption (EVP). Furthermore, integration may be improved through coordination between the transit and emergency vehicle management and the Jackson Traffic Management Center (at the point in time that it is established). Coordination between transit and emergency management personnel and traffic management personnel is intended to improve on-time performance of transit vehicles, to reduce emergency vehicle response and transit times and to be performed in such a way that the overall performance of the traffic network is not degraded.

Table 9-5 contains a summary of the ATMS strategies applicable to the segment of North Highland Avenue (between I-40 and US-45 Bypass).

Table 9-5: Summary of Potential ITS Improvements

ITS Strategy	Order of Magnitude Implementation Cost	Anticipated Benefits
Coordinated signal timing plans	$5-10K per intersection *(only includes coordination effort – communications infrastructure not included)*	- Reduction in vehicular delay - Reduction in fuel consumption - Reduction in vehicular emissions - Reduction in vehicular stops - Reduction in rear-end collisions
Adaptive signal control	$5-45K per intersection *(only includes infrastructure needed at intersection – communications not included)*	- Reduction in vehicular delay - Reduction in fuel consumption - Reduction in vehicular emissions - Reduction in vehicular stops - Reduction in rear-end collisions - Ability to collect data that can be used to monitor the performance of the corridor - Improved customer service and reduction in citizen complaints
Incident management	$15-25K per intersection *(only includes camera, housing, controller and mounting – communications infrastructure not included)*	- Ability to remotely monitor the surface street network and quickly identify incidents - Reduction in fuel consumption - Reduction in incident duration - Reduction in secondary crashes
Advanced traveler information systems	$60-90K per DMS location *(only includes DMS sign and structure – communications infrastructure not included)* Upgrades to city website and provision of email/text alerts varies widely based on implementation parameters	- Improved on-time performance of drivers - Improved customer service during severe weather events, emergencies, or other special events - Improved traffic network distribution, reducing fuel consumption and emissions
Integration with transit and emergency vehicle operations	EVP - $5-10K per intersection TSP - $10-40K per intersection *(only includes infrastructure needed at intersection – communications and central control software not included)*	- Improved on-time performance of transit vehicles - Reduction in emergency vehicle response time

Chapter 10

Capital Improvement Program

INTRODUCTION

This chapter consolidates the project and program recommendations made in previous chapters to present a financially feasible plan that meets the needs of the Jackson area's regional transportation system over the next 30 years. Available funding sources are identified and described here, along with the range of transportation investments that are eligible for various types of funding. Forecasts have been made for the level of funding anticipated to be available from each source through the year 2040.

The projected revenue is then compared to the recommended projects and programs to determine whether there will be sufficient funds to cover the cost of the recommended Plan.

SOURCES OF TRANSPORTATION FUNDING

Most of the funds spent on public roads and transit come from federal, state and local sources. Table 10-1 provides a summary of the major federal funding programs that are available to implement projects and programs in Metropolitan Planning Organizations (MPOs), including the Jackson Area MPO. Nearly all require non-federal matching funds, usually either state or local dollars. The required matching ratio is shown for each of the federal programs. It should be noted that MAP-21, the legislation that authorizes and regulates federal spending on transportation, was enacted as this Plan was being developed. The information on funding programs and eligibility has been updated with the latest information available about the final bill signed by the President; however, the updated version of the United States Code is not yet available, so details in the tables below (such as matching ratios) may require minor adjustments at a future date.

Table 10-1: Federal Transportation Funding Programs

Federal Programs	Description	Funding Ratio
National Highway Performance Program	Combines former funding programs for Interstate Maintenance (IM), National Highway System (NHS) and the portion of the Bridge Replacement & Rehabilitation (BRR) used for bridges on the federal-aid system. Provides funding for construction, reconstruction, resurfacing, restoration, rehabilitation, preservation, or operational improvement of segments of the National Highway System. This includes Interstate highways and bridges on the NHS. Projects must support progress toward national goals for the condition and performance of the system.	80% Federal 20% Non-Federal 90 to 95% Federal match available for certain freight projects
Surface Transportation Program (STP or S-STP)	Provides funding for roads functionally classified as rural major collector and above. Funds may be utilized on projects in Rural Areas, Urbanized Areas, Small Urban Areas, Enhancement, Safety and Rail-Highway Crossings. Also funds bridge replacement & rehabilitation on non-federal aid routes (activities previously under the BRR local program).	80% Federal 20% Non-Federal

Federal Programs	Description	Funding Ratio
Transportation Alternatives (set aside of STP)	Combines former funding programs for Enhancements, Safe Routes to Schools, Scenic Byways, and Recreational Trails. Eligible activities include bicycle and pedestrian facilities, sidewalks near elementary and middle schools, main street and boulevard projects, and environmental mitigation to address impacts of the transportation system.	80% Federal 20% Non-Federal
Urban - Surface Transportation Program (U-STP)	Provides funding to areas of 50,000 to 200,000 in population for improvements on routes functionally classified urban collectors or higher. These funds are allocated to the State of Tennessee, which then distributes them to Metropolitan Planning Organizations.	80% Federal 20% Non-Federal
Highway Safety Improvement Program (HSIP)	Provides funds to make improvements to high hazard locations on eligible roadways, including highway-rail grade crossings. Projects are selected based on crash rate and crash frequency.	90% Federal 10% Non-Federal
Federal Transit Administration (FTA-5307)	Section 5307 is a formula grant program for urbanized areas providing capital, operating, and planning assistance for mass transportation. This program now includes funds previously available through the Job Access/Reverse Commute program (FTA-5316), which provides new or expanded transportation service to fill gaps that exist for welfare recipients and other low-income individuals to and from jobs and other employment-related services. Reverse Commute projects facilitate the provision of new or expanded public mass transportation services for the general public from urban, suburban, and rural areas to suburban work sites.	Capital 80% Federal 20% Non-Federal Operating 50% Federal 50% Non-Federal
Federal Transit Administration (FTA-5309)	Provides funding for the establishment of new rail or busway projects (new starts), the improvement and maintenance of existing rail and other fixed guideway systems that are more than seven years old, and the upgrading of bus systems.	80% Federal 20% Non-Federal
Federal Transit Administration (FTA-5310)	Section 5310 is a formula grant program for the special needs of elderly individuals with disabilities. Funds (which are subject to annual appropriations) are appropriated annually based on an administrative formula that considers the number of elderly individuals with disabilities in each State. Funds available through the former New Freedoms program (FTA-5317), which encourages services and facility improvements that go beyond those required by the Americans with Disabilities Act, are now combined with this program.	80% Federal 20% Non-Federal

State Transportation Funding Sources

The State of Tennessee also has dedicated funding sources for transportation projects, primarily made up of revenue from the state gasoline tax. Additionally Tennessee collects a motor fuel tax on diesel sales and a gasoline inspection tax.

The current state gas tax is 20 cents per gallon, and the motor fuel tax is 17 cents per gallon; neither of these rates has changed in more than twenty years. All revenue generated from these two sources is restricted to

spending on roadways and/or mass transit. The gasoline inspection tax rate is 1.7 cents per gallon, with 98% of the revenue used for transportation funding; the remaining 2 percent goes to the state's general fund.

The state gasoline tax generates about $670 million annually. This revenue is divided among the Tennessee Department of Transportation (60%), local governments (37%) and the state's general fund (3%). The majority of the state's share of the gasoline tax is spent to match the federal funding obtained through the programs listed in Table 10-1. The rest is used to fund highway maintenance activities across the state, as well as the Tennessee Department of Transportation's administrative functions.

Revenue from the motor fuel tax is shared among the Tennessee Department of Transportation (66.8%), county governments (21.3%), municipal governments (10.7%), and the state's general fund (1.2%). In recent years, most of the state's share of the motor fuel tax has been spent for grants to local public transit systems and shortline railroads across the state.

Local Transportation Funding Sources

As noted, both the City of Jackson and Madison County receive an annual share of the fuel taxes collected by the state. Other significant sources of local funds for transportation include property tax revenue, the local share of state sales tax (currently 2.75%).

The City of Jackson's general fund receives about 40% of its revenue from local property taxes and tax equivalents; 19% from local sales taxes; about 12% from state-shared taxes (including the state gasoline tax); 2% from other state grants; and the remainder from various sources including business taxes, fines, and revenue from local recreation/sports venues.

Madison County utilizes local property taxes and other local revenues to cover about 40% of its annual transportation expenditures. The remaining 60% of the county's transportation revenue comes from its share of the state gasoline and motor fuel taxes, the state bridge program, state-aid program for road maintenance, and a small amount from the gasoline inspection fee. The towns of Three-Way and Medon are included in the county highway department's expenditures.

TRANSPORTATION REVENUE FORECASTS

Although this Long Range Transportation Plan covers a 30-year period, the Jackson region will update the Plan at least every 5 years to address any significant changes in the goals, conditions and assumptions on which the Plan was developed.

Due to recent economic changes, the financial assumptions underlying the 2040 regional transportation plan are more conservative than those used in the 2035 Plan. Since 2008, the global recession has resulted in significantly reduced spending levels within both the public and private sectors. Most state and local governments experienced sharp drops in revenue as businesses and households struggled to survive the economic downturn. At the federal level, funding levels have essentially been frozen for the programs used by most states and cities for major highway projects. The American Reinvestment and Recovery Act (ARRA) made special one-time funds available for "shovel-ready" highway projects and major capital purchases such as bus replacements, which benefited the Jackson region. However, a number of the roadway projects included in Jackson's Transportation Improvement Program have been on hold due to limited availability of local funds or uncertainty as to whether the region would actually receive its anticipated federal transportation funds.

The nation's economy is now in a recovery period. It is also clear that transportation will continue to be a major expenditure nationally, as well as in Tennessee and its major cities. An adequate transportation system is vital to the economy, both in terms of enabling workers to reach their place of employment and in terms of moving

goods and supplies from their place of production to the point of purchase/use. It is therefore reasonable to project that as economic conditions continue to improve, transportation funding provided at the federal, state and local levels will increase at a rate that either keeps pace with inflation or trails it closely.

Forecasting Methodology

For an extended timeframe such as the 2040 Plan, revenue estimates are often developed by examining historic averages spent in the region, then projecting a trend based on those amounts. This is a reasonable starting-point for revenue projections and was used for several of the funding programs on which the 2040 Plan relies. However, this method is not necessarily appropriate for the federal funding programs that are used for the most sizable roadway capacity projects, including the National Highway Performance Program (NHPP) and state Surface Transportation Funds (S-STP). Traffic growth in the Jackson area has reached a tipping-point and there are now major capacity needs on highways that served well for many years. A number of key highway projects under development for Jackson are currently in the engineering phase, including widening several miles of Interstate 40. The average funding levels in Jackson's recent Transportation Improvement Programs do not reflect the much larger expenditures that will occur as these projects are constructed.

As noted in Chapter 4, Roadway System, certain major highways in the Jackson area play an essential role in serving a much broader area of West Tennessee. I-40 is a critical corridor for which the Tennessee Department of Transportation (TDOT) has developed a detailed list of future capacity and safety projects that have statewide benefits. Jackson also serves as a regional freight hub through which trucks must pass in order to serve numerous smaller communities throughout West Tennessee that have no direct access to Interstate 40. Traffic problems on the sections of U.S. Highway 45, U.S. Highway 412 and State Highway 18 that pass through Jackson have an economic impact not only to the 98,000 residents of Madison County, but to the citizens and businesses in at least six other counties in the rural southwest and northwest parts of the state.

Because of Jackson's role as the hub of rural West Tennessee – and the new federal emphasis on targeting improvements to critical freight routes – it is reasonable to assume that state expenditures to address these critical routes will be proportionate to the greater regional benefits. To estimate future allocations of certain federal funding programs, it is therefore more appropriate to use data that represent highway usage in the Jackson area, such as daily vehicle-miles traveled. Some of the largest highway projects proposed in this Plan, particularly the proposed Southern Bypass Extension which is critical to address congestion on U.S. Highway 45, will require spending levels that exceed the recent historic average for the Jackson area. This plan anticipates that the necessary additional funds will be made available when needed, as is the case for major improvement projects on Interstate 40. The MPO has consulted with TDOT on those assumptions and will continue to revisit them each time the Plan is updated.

Table 10-2 shows the projected highway capital funding available to implement this Plan, listed by funding category. These figures are based on projected annual growth for federal, state and local funds that increases at a gradual rate over the planning horizon: a 2% increase for the first horizon of 2013 to 2017; a 2.5% increase through the year 2025; and a 3% increase for the remaining period of the Plan. The revenue forecasts also reflect the State Data Center's projections that the Jackson region's population will grow more than 10% between now and 2040, which will lead to a corresponding increase in the base amount allocated to it through federal formulas for transportation funding. Projections for the MPO's allocation of urban Surface Transportation Program (U-STP) funds have been adjusted accordingly to reflect increases after the 2020 and 2030 decennial census.

The annual base funds assumed for NHPP and S-STP were derived from data on highway usage, as explained above. Daily vehicle-miles traveled (DVMT) for Madison County were compared to statewide figures for DVMT as reported in the state's 2010 Highway Performance Monitoring System data. The ratio of Madison County

DVMT to statewide DVMT was then applied to the annual allocation of NHPP and S-STP received by the state of Tennessee for federal fiscal year 2012. The resulting figures were used as the region's base funds.

Estimates for the remaining funding categories are trend projections based on historic average expenditures over the past three to six years. The exception is the High Priority Funds (HPP) program; since it is no longer part of the federal authorization legislation, no additional HPP revenue is assumed over the life of the Plan.

Table 10-2: Projected Capital Funding Available for Highways

Revenue Source	Annual Base Funds*	Projected Funds**			
	Total	2013-2017	2018-2025	2026-2040	Total (2013-2040)
National Highway Performance Program (NHPP)	$7,364,181	$38,323,494	$71,378,497	$186,054,798	**$295,756,789**
State Surface Transportation Program (S-STP)	$4,567,536	23,769,640	$44,271,568	$115,398,028	**$183,439,236**
State (100% State Funds)	$216,500	1,126,675	$2,098,461	$5,469,836	**$8,694,972**
Urban Surface Transportation Program (U-STP)	$1,138,896	8,204,654	$11,283,168	$30,995,138	**$50,482,960**
High Priority Funds (HPP)	$1,562,500	$360,000	$0	$0	**$360,000**
Transportation Alternatives (TA)	$228,237	$1,187,752	$2,212,219	$5,766,358	**$9,166,330**
City of Jackson (100% Local)	$3,377,250	24,329,845	$32,734,533	$85,325,655	**$142,390,032**
Madison County (100% Local)	$1,275,000	$6,635,151	$12,358,140	$32,212,661	**$51,205,953**
Private	$1,481,481	$7,709,689	$14,359,495	$37,429,381	**$59,498,565**
Total	**$21,211,581**	**$111,646,900**	**$190,696,081**	**$498,651,855**	**$800,994,836**

* All totals include federal and non-federal share. Annual Base for NHPP and S-STP is based on ratio of daily vehicle-miles (DVMT) traveled in Madison County to statewide DVMT. Other programs based on historic averages. See text in this section for additional details.

** 2013-2017 projection for U-STP includes $3.4 million balance from prior years.

In addition to roadway capacity projects, meeting future transportation needs includes adequate operations and maintenance of the region's roadway system.

Over the past six years, the City of Jackson spent an average of $2.8 million annually for basic roadway operations and maintenance activities from its general fund. The typical breakdown of these activities has averaged:

- $1,200,000 for street resurfacing;
- $260,000 for street restoration;
- $26,000 for bridge repair;
- $68,000 for sidewalk improvements; and
- $1,300,000 for street and alley improvements.

During the same period, the Madison County Highway Department spent an average of $3.1 million annually for roadway maintenance and operations, relying on state-shared fuel tax revenue for the majority of its funding.

By far the largest share of roadway maintenance and operations spending in the region is by the Tennessee Department of Transportation (TDOT), which spent an average of $10.6 million annually during the past 5 years. This included activities performed by its own staff at the Region 4 facility in Jackson as well as a number of maintenance contracts. Expenditures included pavement preservation, traffic signal maintenance and traffic management, signs and pavement markings, mowing and other ROW maintenance, and equipment/facility maintenance.

Based on these average expenditures as shown in Table 10-3 below, there are adequate resources available to operate and maintain the roadway system during the period covered by this Plan.

Table 10-3: Projected Funding Available for Highway Operations & Maintenance

Revenue Source	Annual Average*	Projected Funds **			
		2013-2017	2018-2025	2026-2040	Total (2013-2040)
TDOT (Various state sources)	$10,575,068	$55,033,078	$100,212,425	$246,510,854	**$391,819,066**
City of Jackson (local)	$2,520,254	$13,115,503	$23,882,661	$56,380,297	**$93,378,461**
Madison County (local)	$3,125,000	$16,262,626	$29,613,411	$72,845,529	**$115,785,032**
Total	**$16,220,322**	**$84,411,207**	**$153,708,497**	**$362,862,856**	**$600,982,559**

* Annual Averages are based on historic trends over the last five to six years.

** Reflects annual growth rate of 2% through 2017, 2.5% through 2025, and 3% for the remainder of the planning horizon.

PROJECTED HIGHWAY PROJECT COSTS

Planning-level cost estimates for each of the recommended highway projects were developed in 2012 dollars using the Tennessee Department of Transportation's current cost-per-mile spreadsheet. Projects previously listed in the 2035 Plan were adjusted from 2007 to 2012 costs by applying a three percent annual inflation rate, selected after reviewing trends from the Construction Cost Index reported in *Engineering News-Record*.

The same three percent annual inflation rate was used to adjust each project to the appropriate year of expenditure (YOE) according to the horizon in which the project is listed for completion.

Tables 10-4 through 10-6 summarize the estimated highway project costs for the recommended 2040 Plan. The table reflects the agency and funding source considered most likely to be applicable to each project. Certain projects are eligible for more than one funding source, and it may be necessary to combine multiple funding sources in order to complete large highway projects within the given timeframe.

Table 10-7 lists various transportation enhancements, operational improvements, and bridge replacement and rehabilitation anticipated to occur during the period covered by this Plan.

Two significant roadway projects that may occur during the 20-year planning period are listed separately in Table 10-8 because they are anticipated to be built through private development activity, which the MPO does not have authority to initiate. This list of projects is considered "illustrative" because they are not part of the MPO's official long-term revenue projections, but they do illustrate area development goals that have frequently been part of discussions about the city's future growth.

Table 10-4: Roadway Projects for Completion in 2013-2017

2040 Plan Number	Previous Project Number	TIP Number	Route	Termini	Sponsor	Miles	Description	Cost in Millions (YOE)	Funding Sources
1	T-3		US-45 Bypass/ SR-186	US 45E ramps to/from south US 45 Bypass	TDOT	0.8	Interchange modification - widen US 45E ramps to 2 lanes to/from south US 45 Bypass	$3.8	NHPP, S-STP
2	T-5		US-45 Bypass/ SR-186	Old Hickory Blvd. to Hollywood Drive ramps to/from north	TDOT	1.1	Widen to 6 lanes	$18.2	NHPP, S-STP
3	N/A	U-STP-43	Dr. F.E. Wright Dr.	US-70 (Whitehall St.) to UGN Pkwy.	City of Jackson	2.2	Widen to 4-lane divided and 5-lane section with bike lanes on both sides	$10.1	U-STP, Local
4	J-2	C-2-25	Skyline Drive	Phase 3 - from Medical Center Dr. to Summar Dr.	City of Jackson	0.2	Widen from 3 to 5 lanes with sidewalks on both sides	$4.7	Local
5	C-1	C-1-24	Campbell St.	Phase 1 - from Ridgecrest Rd. to SR-20 (North Pkwy.)	City of Jackson	1.3	Widen from 2 to 5 lanes with sidewalks and bike lanes on both sides	$8.7	Local
6	J-6		Campbell St.	Phase 2 - from SR-20 (North Pkwy.) to US-45 (Highland Ave.)	City of Jackson	0.8	Widen from 2 to 4 lanes	$6.1	Local
7	STP-1		SR-18 (Bolivar Road)	North of Medon-Malesus Road to US-45 (SR-5/Highland Ave)	TDOT	6.3	Widen from 2 to 5 lanes, including realignment at proposed Southern Extension of SR-186 and US-45 Bypass	$34.7	S-STP
8	N/A		SR-5 (N. Highland Ave.)	Intersection of SR-5 (N. Highland Ave.) and Deaderick St.	City of Jackson	0.2	Modify intersection to a roundabout design	$1.0	U-STP, Local

Table 10-5: Roadway Projects for Completion in 2018-2025

2040 Plan Number	Previous Project Number	TIP Number	Route	Termini	Sponsor	Miles	Description	Cost in Millions (YOE)	Funding Sources
9	T-9		Southern Extension of US-45 Bypass – (SR-186) - Phase I	US 45 north of Edwards Dr to Airways Blvd (US 70/SR 1).	TDOT, City of Jackson, Madison Co.	5.3	New 4/5-lane roadway, including interchange with SR-18 realignment	$155.3	NHPP, S-STP, U-STP, Local
10	J-14		Dr. F.E. Wright Dr. / Christmasville Rd.	From I-40 eastbound ramp to Bedford White Rd.	City of Jackson	0.9	Widen from 2 to 5 lanes	$15.7	U-STP, Local
11	C-2	C-3-26	Royal St.	Phase 2 - from Lexington Ave. to Lane Ave.	City of Jackson	0.85	Widen from 2 to 3 lanes with sidewalks and bike lanes on both sides	$9.5	Local
13	M-11		Christmasville Rd.	Bedford White Rd. to Ashport Rd.	Madison Co., City of Jackson	3.3	Widen to 12-foot travel lanes with 8-foot shoulders (safety improvements)	$3.7	U-STP, Local

Table 10-6: Roadway Projects for Completion in 2026-2040

2040 Plan Number	Previous Project Number	TIP Number	Route	Termini	Sponsor	Miles	Description	Cost in Millions (YOE)	Funding Sources
14	M-12		E. University Pkwy.	US-45 (Highland Ave.) to Cooper Anderson Rd.	Madison, City of Jackson	0.8	Safety improvements, including addition of shoulders	$2.2	U-STP, Local
15	T-10		Southern Extension of US-45 Bypass (SR-186) - Phase II	US-45 north of Edwards Dr to the east side of US-45, opposite Seavers Rd	TDOT, City of Jackson, Madison Co.	2.23	New 4/5-lane roadway	$230.6	NHPP, S-STP, U-STP, Local
16	T-1b (pt)		I-40	East of SR-223 (Miller Rd./Smith Ln.) to US-412	TDOT	2.25	Widen from 4 to 6 lanes	$20.8	NHPP
17	T-1c		I-40	West of SR-138 (Providence Rd) to east of SR-223 (Smith Ln.)	TDOT	8.3	Widen from 4 to 6 lanes	$37.4	NHPP
18	T-1d		I-40	US-70 to east of SR-152 (Law Rd)	TDOT	6.8	Widen from 4 to 6 lanes	$37.4	IM, NHPP
19	J-4		Old Humboldt Rd.	Ashport Rd. (north junction) to US-45 Bypass	City of Jackson	0.7	Widen from 2 to 4 lanes	$12.6	U-STP, Local
20	J-5		Old Medina Rd.	Hopper Barker Rd. to existing 4-lane section north of I-40	City of Jackson	0.6	Widen from 2 to 4 lanes	$14.5	U-STP, Local
21	J-10		Hollywood Dr.	From existing 4-lane section north of Arlington Ave. to existing four-lane section at Forest Ave.	City of Jackson	0.8	Widen from 2 to 4 lanes	$13.8	U-STP, Local
22	J-11		Hopper Barker Rd.	US-45 (Highland Ave.) to Old Medina Rd.	City of Jackson	1.7	Reconstruction and minor widening within existing ROW	$11.7	U-STP, Local
24	M-3		University Pkwy.	Cooper Anderson Rd. to Henderson Rd.	Madison Co., City of Jackson	1.5	New 2-lane roadway	$10.8	U-STP, Local
25	M-1		Ashport Rd.	US-45 Bypass to Cooper Anderson Rd.	Madison Co., City of Jackson	2.1	Widen from 2 to 4 lanes	$36.1	U-STP, Local
26	M-8		Ashport Rd.	0.6-mile curve section located between Old Medina Rd. and Christmasville Rd.	Madison Co.	0.6	Relocate roadway to eliminate curve	$8.4	U-STP, Local
27	M-9		Ashport Rd.	West of US-70 to the US-70/Waynick Rd. intersection	Madison Co.	0.7	New 2-lane road, relocated	$5.4	U-STP, Local
28	M-10		Ashport Rd.	Windy City Rd. to Old Humboldt Rd.	Madison Co., City of Jackson	2.9	Widen from 2 to 4 lanes	$7.0	U-STP, Local

Table 10-7: Additional Projects Anticipated throughout the Planning Period

2040 Plan Number	Previous Project Number	TIP Number	Route	Termini	Sponsor	Miles	Description	Cost in Millions (YOE)	Funding Sources
-	N/A		Various TSM, ITS and safety improvements	-	MPO member agencies	-	Projects may include intersection improvements (e.g. additional turn lanes and/or signals, signage and lighting; other operational improvements such as signal timing, access management, and projects based on the MPO's Regional ITS Architecture.	$10.0	NHPP, S-STP. U-STP, TA, Local
-	N/A		Various bridges	-	TDOT, MPO member agencies	-	Bridge Replacement / Bridge Rehabilitation	$25.0	NHPP, S-STP, U-STP, Local
-	N/A		Various routes	-	TDOT, MPO member agencies	-	Enhancements to various routes and locations throughout the MPO planning area. Includes projects such as improvements to the bicycle/pedestrian network, trails, scenic byways, landscaping and beautification, mitigation of environmental impacts caused by transportation projects, and restoration of historic transportation facilities.	$9.0	TA, S-STP, U-STP, Local

Table 10-8: Illustrative Projects (Unfunded)

2040 Plan Number	Previous Project Number	Route	Termini	Miles	Description	Cost in Millions (YOE)
12	J-9	Vann Drive Extension	US-45 (Highland Ave.) to Campbell St.	1.3	New 5-lane roadway	$16.8
23	J-16	Casey Jones Extension	US-45 Bypass to US-412 (Hollywood Dr.)	1.1	New 4/5 lane roadway	$19.5

Table 10-9 summarizes total roadway project costs by horizon compared to available revenue.

Unspent funds from one horizon were carried forward to the next horizon with the appropriate annual growth factor applied to reflect that the value of the surplus funds increases over time.

Table 10-9: Projected Revenue vs. Total Cost of Roadway Projects by Horizon *

Funding Source	2013-2017		2018-2025		2026-2040	
	Revenue	Cost of Projects	Revenue	Cost of Projects	Revenue	Cost of Projects
National Highway Performance Program (NHPP)	$38.3	$22.0	$93.2	$93.2	$186.1	$186.1
State Surface Transportation Program (S-STP)	$34.7	$34.7	$44.3	$44.3	$115.4	$115.4
State (100% State Funds)	$1.2	$0	$3.7	$3.7	$5.5	$5.5
Urban Surface Transportation Program (U-STP)	$8.2	$8.2	$11.3	$11.3	$31.0	$31.0
City of Jackson (100% Local)	$24.3	$22.4	$36.6	$24.7	$106.4	$60.5
Madison County (100% Local)	$6.6	$0	$21.2	$7.1	$51.2	$51.2
Private	$0	$0	$16.8	$16.8	$19.5	$19.5
Total	**$113.3**	**$87.3**	**$227.1**	**$201.1**	**$515.1**	**$469.2**

** Revenues and costs are shown in millions of year-of-expenditure dollars.*

PROJECTED FUNDING FOR TRANSIT

Revenue projections for public transit were developed using the trend forecasting method discussed earlier in this chapter and are presented in Tables 10-10 and 10-11. Annual base funds for the Jackson Transit Authority and the annual growth rate of 5 percent were determined based on the past six years of budget information.

Table 10-10: Projected Capital Funding for Transit

Revenue Source	Annual Base Funds *	Projected Funds***			
		2013-2017	2018-2025	2026-2040	Total (2013-2040)
Capital Assistance - FTA 5307/5309 (federal) 80% **	$844,000	$4,663,633	$10,286,125	$34,342,022	**$42,172,640**
Capital Assistance - (State) 10%	$84,400	$466,363	$1,028,612	$3,434,202	**$4,217,264**
Capital Assistance - Jackson 10%	$84,400	$466,363	$1,028,612	$3,434,202	**$4,217,264**
Total	**$1,012,800**	**$5,596,359**	**$12,343,349**	**$41,210,426**	**$50,607,168**

* Annual average based on historic trends over the past six years.
** Capital assistance is difference of federal 5307 allocation minus operating needs.
***Projections based on 5% annual growth rate.

Table 10-11: Projected Funding for Transit Operations & Maintenance

Revenue Source	Annual Base Funds *	Projected Funds**			
		2013-2017	2018-2025	2026-2040	Total (2013-2040)
Operating Assistance – FTA 5307 (Federal) 50%	$1,729,300	$9,555,474	$21,075,587	$70,364,525	**$100,995,586**
Operating Assistance – (State) 25%	$432,325	$2,388,869	$5,268,897	$17,591,131	**$25,248,897**
Operating Assistance – (Local) 25%	$432,325	$2,388,869	$5,268,897	$17,591,131	**$25,248,897**
Farebox and Misc. Revenue	$625,092	$3,454,028	$7,618,216	$25,434,743	**$36,506,987**
Total	**$3,219,042**	**$17,787,239**	**$39,231,597**	**$130,981,531**	**$188,000,367**

* Annual average based on historic trends over the past six years.
** Projections based on 5% annual growth rate.

PROJECTED TRANSIT COSTS

Cost estimates for the transit capital projects identified in Chapter 6 were provided by the Jackson Transit Authority in 2012 dollars. In Table 10-12 below, the costs have been adjusted to year of expenditure for each of the three horizons within the 2040 Plan, using an annual inflation rate of 4 percent based on the past six years of budget information from JTA.

Table 10-12: Transit Capital Needs by Horizon

	2013-2017	2018-2025	2026-2040	Total * (2013-2040)
Bus replacement	$2,163,200	$7,895,591	$10,908,243	$20,967,034
Add buses to fleet	$432,640	$526,373	$1,558,320	$2,517,333
Van replacement	$757,120	$1,052,745	$2,532,271	$4,342,136
Support vehicle replacement	$129,792	$197,390	$467,496	$794,678
Upgrade transfer centers	$324,480	$0	$1,268,026	$1,592,506
Construct mini-hub at mall	$0	$789,559	$0	$789,559
Upgrade admin/maint. facility	$0	$657,966	$1,947,900	$2,605,866
Support equip/misc. capital	$162,240	$526,373	$1,460,925	$2,149,538
Total	**$3,969,472**	**$11,645,997**	**$20,143,181**	**$35,758,650**

* Future costs based on annual inflation rate of 4 percent.

The projected cost of future transit operations and maintenance, shown in Table 10-13, includes the new/expanded fixed-route service recommended in Chapter 6. Estimates for additional service were based on existing operating costs per vehicle-revenue mile, and assumed the same hours of service that are provided on other existing bus routes.

Table 10-13: Transit Operating and Maintenance Costs by Horizon

Current Annual Cost*	2013-2017	2018-2025	2026-2040	Total * (2013-2040)
$2,963,306	$17,655,244	$36,542,207	$118,558,603	$172,756,055

* Based on average of past six years from JTA budget information.

Based on the projected revenues compared with the estimated costs shown in the tables above, the Jackson region will be able to expand its level of transit service as the region's population grows.

Chapter 11

Title VI and Environmental Justice Assessment

INTRODUCTION

Federal laws require that MPOs ensure Federal funds are used fairly and without discrimination. Title VI of the Civil Rights Act of 1964 states that "No person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

Environmental Justice Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice (EJ) in Minority and Low-Income Populations*, clarified the need to involve minority and low-income populations in transportation decision-making processes and the need to assess the equity of transportation investments. The EO calls for identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Low income is a population whose median household income is at or below the Department of Health and Human Services poverty guidelines.

The intent of EO 12898, and the U.S. Department of Transportation's corresponding guidance, is to ensure that these communities of concern are included in the transportation decision-making process, and to ensure that they may benefit equally from the transportation system without shouldering a disproportionate share its burdens.

A disproportionately high and adverse effect is one that is:

1. Predominantly borne by the minority and/or low-income population; or
2. Suffered by the minority and/or low income population more severely or in greater magnitude than the adverse effect suffered by the non-protected population.

Disproportionately high and adverse effects are not determined solely by the size of the population, but rather the comparative effects on these populations in relation to either non-minority or higher income populations. In this EJ assessment, U.S. Census data was used to identify the demographics of the area in order to recognize potential "communities of concern". Communities of concern are areas where the percentage of low-income households or minority population is greater than that of the entire MPO area.

It is important to note that impacts from transportation projects can be either positive or negative. For example, positive impacts could be improved traffic conditions, decreased accidents, and new/improved sidewalks and bikeways. In order to construct some of these projects, a negative impact could be disruption to residents and businesses during the construction period and right-of-way that may need to be acquired. As the improvement projects in this Long Range Transportation Plan progress through the planning and design stages, these areas should be carefully addressed.

ANALYSIS

Concentrations of minority and low-income populations are defined by Census Block Groups with percentages greater than the average of the MPO area. The determination of what is disproportionately high and adverse human health or environmental effect is context dependent. All block groups include members of protected populations and the approach used in the development of the Plan to identify communities of concern is only based on Census data and the proportion of protected populations that they contain. All future project development processes should include additional efforts to utilize local knowledge of individual neighborhoods to identify potential EJ populations that might have been missed during this Census based analysis.

The MPO's role does not include awarding funds to local organizations, but rather to designate funds for transportation projects to be carried out by local governments and JTA. The analysis was performed to indicate which projects may affect areas with large proportions of low-income and minority citizens. It is recognized that impacts may be positive, negative, or both.

Minority Populations

According to the 2010 Census, 40.8 percent of the MPO area population is considered to be minority. Using this threshold, if the minority population of a block group was greater than this amount, the level of concern can be assumed to be higher than in block groups below the threshold. As shown in Table 11-1 and Figure 11-1, using this approach 33 of the MPO's 70 block groups exceeded this threshold and based on this assessment should be considered potential communities of concern.

Although the Hispanic population in the MPO area is not significantly high, representing slightly less than four percent in the Jackson Area, 3.36 percent in Madison County, 0.35 percent in the Three Way area and 3.05 percent in Medina area, monitoring the growth of the Hispanic population will be necessary based on national and state growth trends, which indicate a rising Hispanic population (the future population and employment trends for the MPO area project a population increase to 11.4%).

In the event the Hispanic population, as well as other ethnic groups, reaches five percent, the MPO will need to comply with Executive Order 13166; which requires "improved access to services for persons with Limited English Proficiency (LEP)," since this plan is for the next twenty years.

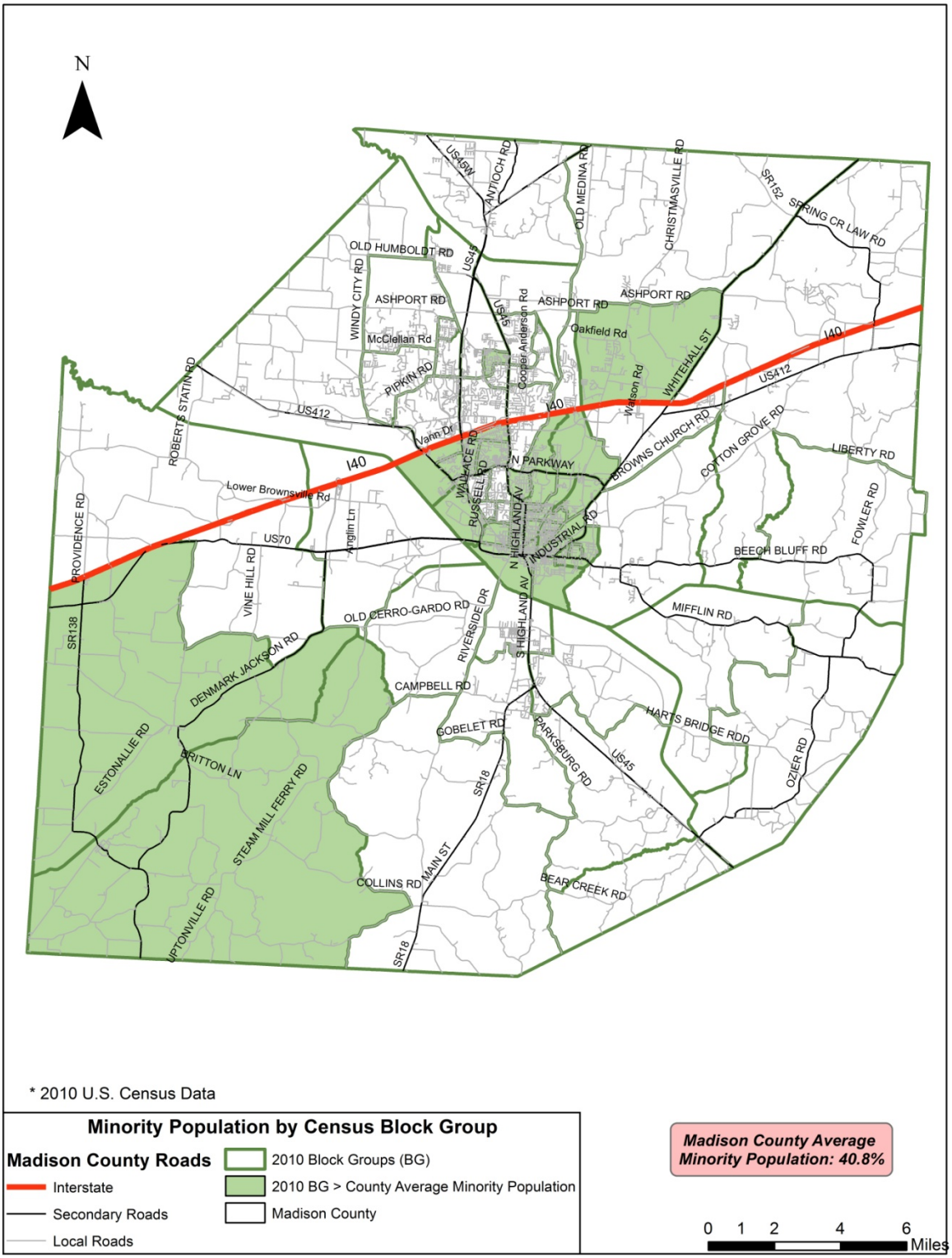
Table 11-1: Minority Population by Census Block Group

Census Tract	Block Group	Total	White		Minority	
Census Tract 1	Block Group 1	1,155	797	69%	358	31.0%
	Block Group 2	1,117	469	42%	648	**58.0%**
	Block Group 3	1,308	306	23%	1,002	**76.6%**
Census Tract 2	Block Group 1	1,938	432	22%	1,506	**77.7%**
	Block Group 2	692	154	22%	538	**77.7%**
	Block Group 3	849	375	44%	474	**55.8%**
	Block Group 4	1,412	386	27%	1,026	**72.7%**
	Block Group 5	1,584	910	57%	674	**42.6%**
Census Tract 3	Block Group 1	651	145	22%	506	**77.7%**
	Block Group 2	841	499	59%	342	40.7%
	Block Group 3	795	520	65%	275	34.6%
	Block Group 4	1,353	1,045	77%	308	22.8%
	Block Group 5	1,217	932	77%	285	23.4%
Census Tract 4	Block Group 1	396	15	4%	381	**96.2%**
	Block Group 2	1,573	240	15%	1,333	**84.7%**
	Block Group 3	1,662	514	31%	1,148	**69.1%**

Census Tract 5	Block Group 1	840	10	1%	830	**98.8%**
	Block Group 2	1,452	12	1%	1,440	**99.2%**
	Block Group 3	2,239	223	10%	2,016	**90.0%**
Census Tract 6	Block Group 1	1,312	649	49%	663	**50.5%**
	Block Group 2	808	115	14%	693	**85.8%**
Census Tract 7	Block Group 1	1,045	458	44%	587	**56.2%**
	Block Group 2	1,026	498	49%	528	**51.5%**
	Block Group 3	448	155	35%	293	**65.4%**
Census Tract 8	Block Group 1	679	91	13%	588	**86.6%**
	Block Group 2	1,062	331	31%	731	**68.8%**
Census Tract 9	Block Group 1	744	40	5%	704	**94.6%**
	Block Group 2	921	38	4%	883	**95.9%**
	Block Group 3	677	71	10%	606	**89.5%**
Census Tract 10	Block Group 1	136	5	4%	131	**96.3%**
	Block Group 2	656	24	4%	632	**96.3%**
	Block Group 3	916	142	16%	774	**84.5%**
	Block Group 4	635	50	8%	585	**92.1%**
Census Tract 11	Block Group 1	1,065	34	3%	1,031	**96.8%**
Census Tract 13	Block Group 1	1,737	1,549	89%	188	10.8%
	Block Group 2	2,198	1,944	88%	254	11.6%
	Block Group 3	2,204	1,682	76%	522	23.7%
Census Tract 14.01	Block Group 1	835	615	74%	220	26.3%
	Block Group 2	1,212	863	71%	349	28.8%
Census Tract 14.02	Block Group 1	811	619	76%	192	23.7%
	Block Group 2	1,392	1,037	74%	355	25.5%
Census Tract 15.01	Block Group 1	1,742	1,099	63%	643	36.9%
	Block Group 2	3,037	1,781	59%	1,256	41.4%
Census Tract 15.02	Block Group 1	1,889	1,597	85%	292	15.5%
	Block Group 2	1,924	1,746	91%	178	9.3%
	Block Group 3	1,206	1,020	85%	186	15.4%
	Block Group 4	871	824	95%	47	5.4%
Census Tract 16.03	Block Group 1	2,362	1,721	73%	641	27.1%
Census Tract 16.04	Block Group 1	2,898	2,271	78%	627	21.6%
Census Tract 16.05	Block Group 1	3,043	2,322	76%	721	23.7%
Census Tract 16.06	Block Group 1	1,054	683	65%	371	35.2%
	Block Group 2	1,808	1,030	57%	778	**43.0%**
	Block Group 3	3,273	2,252	69%	1,021	31.2%
	Block Group 4	1,894	1,162	61%	732	38.6%
	Block Group 5	1,452	987	68%	465	32.0%
Census Tract 16.07	Block Group 1	652	521	80%	131	20.1%
	Block Group 2	3,033	1,853	61%	1,180	38.9%
	Block Group 3	2,176	1,586	73%	590	27.1%
Census Tract 16.08	Block Group 1	2,305	2,026	88%	279	12.1%
Census Tract 16.09	Block Group 1	1,701	1,451	85%	250	14.7%
Census Tract 16.10	Block Group 1	2,509	2,235	89%	274	10.9%
	Block Group 2	2,766	2,323	84%	443	16.0%
Census Tract 17	Block Group 1	686	496	72%	190	27.7%
	Block Group 2	934	310	33%	624	**66.8%**
Census Tract 18	Block Group 1	1,871	1,301	70%	570	30.5%
	Block Group 2	1,370	769	56%	601	**43.9%**

Census Tract 19	**Block Group 1**	**1,091**	**1,023**	**94%**	**68**	**6.2%**
	Block Group 2	1,404	1,302	93%	102	7.3%
	Block Group 3	619	606	98%	13	2.1%
	Block Group 4	1,131	935	83%	196	17.3%
TOTAL		**98,294**	**58,226**	**59%**	**40,068**	**40.8%**

Figure 11-1: Minority Population by Census Block Group



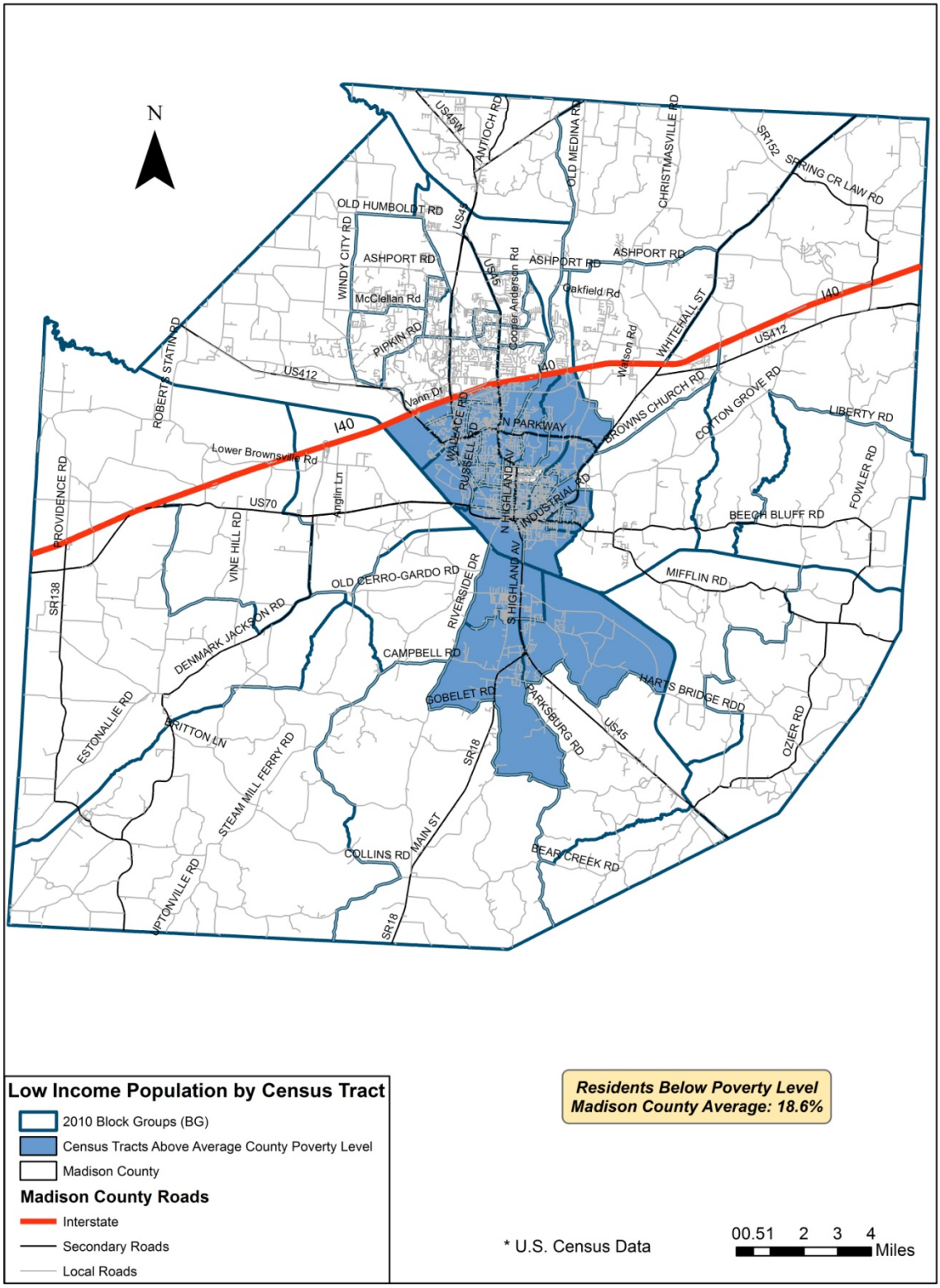
Low-Income Populations

According to the 2010 Census, 18.6 percent of the MPO area population is considered to be low-income. Using this threshold, if the low-income population of a Census tract was greater than this amount, the level of concern can be assumed to be higher than in Census tracts below the threshold. As shown in Table 11-2 and Figure 11-2, using this approach 11 of the MPO's 27 Census tracts exceeded this threshold and based on this assessment should be considered potential communities of concern.

Table 11-2: Low-Income Population by Census Tract

Census Tract	Percent (%) Below Poverty
Census Tract 1	**20.1**
Census Tract 2	**32.6**
Census Tract 3	**24.3**
Census Tract 4	**35**
Census Tract 5	**60.5**
Census Tract 6	10.7
Census Tract 7	**36.9**
Census Tract 8	**62.5**
Census Tract 9	**47.7**
Census Tract 10	**22.5**
Census Tract 11	**64.5**
Census Tract 13	**22.4**
Census Tract 14.01	16.5
Census Tract 14.02	14.5
Census Tract 15.01	5.8
Census Tract 15.02	13.7
Census Tract 16.03	7
Census Tract 16.04	1
Census Tract 16.05	12.1
Census Tract 16.06	8.2
Census Tract 16.07	7.2
Census Tract 16.08	2.9
Census Tract 16.09	8.7
Census Tract 16.10	1.5
Census Tract 17	15.4
Census Tract 18	12.5
Census Tract 19	7.4

Figure 11-2: Low-Income Population by Census Tract



ALLOCATION OF FUNDS TO COMMUNITIES OF CONCERN

An analysis was performed to determine what level of investment would occur in the identified communities of concern where a higher percentage of minority and low-income populations exist within the MPO areas.

Highway Projects

Approximately $760 million in highway projects are planned throughout the MPO area as part of this Plan. Of these projects, $520 million are totally or partially located in communities of concern. This represents approximately 70 percent of the total dollars invested in highway projects. The projects identified in this Plan that are located within minority and/or low-income areas are shown in Table 11-3. For each of the projects an assessment of the likely impacts to residential properties, businesses, and community facilities was undertaken to determine a "Level of Concern". Because the majority of these projects involve widening or roadway extensions into primarily undeveloped areas, overall the levels of concern for each of the projects is relatively low but will need to be studied in more detail as the specific designs for the projects are developed.

Table 11-3: Roadway Projects in Low-Income or Minority Areas

2040 Plan Number	2030 Plan Project Number	Route	Termini	Type of Project	Estimated Cost	Level of Concern
2	T-5	US 45 Bypass	Old Hickory Boulevard to Hollywood Drive ramps to/from the north	Widening	$18.2M	Low
4	J-2	Skyline Drive	Medical Center Drive to Summar Drive	Widening	$4.7M	Low
5	C-1	Campbell Street	Ridgecrest Road to SR 20/North Pkwy	Widening	$8.7M	Med
6	J-6	Campbell Street	SR 20/North Pkwy to US 45/Highland Avenue	Widening	$6.1M	Med
8	T-9	Southern Bypass – Phase 1	US 45 north of Edwards Drive to Airways Blvd	New Roadway	$155.3M	Low
9	J-14	Dr. F.E. Wright Drive/Christmasville Road	I-40 eastbound ramp to Bedford White Road	Widening	$15.7M	Low
13	T-10	Southern Bypass – Phase 2	US 45 n. of Edwards Drive to east side of US 45	New Roadway	$230.6M	Low
15	T-1c	I-40	West of SR 138/Providence Road to east of SR 223/Smith Lane	Widening	$37.4M	Low
19	J-10	Hollywood Drive	North of Arlington Avenue to Forest Avenue	Widening	$13.8M	Med
21	J-16	Casey Jones Extension	US 45 Bypass to US 412/Hollywood Drive	New Roadway	$19.5M	Low
24	M-8	Ashport Road	Old Medina Road to Christmasville Road	Relocate Roadway	$8.4M	Low
				Total Roadway Expenditures:	**$520M**	

Figure 11-3: LRTP Highway Projects in Minority Areas

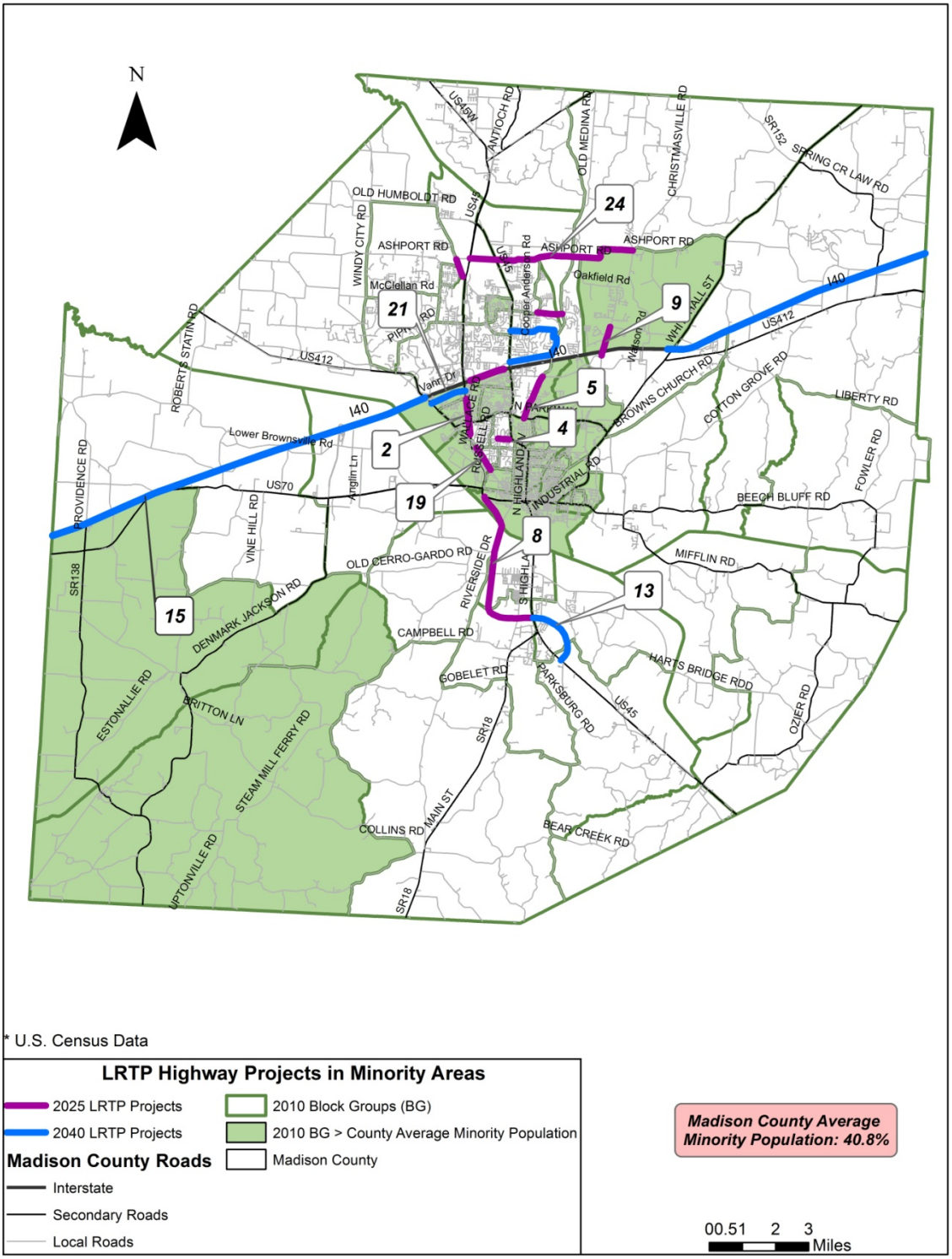
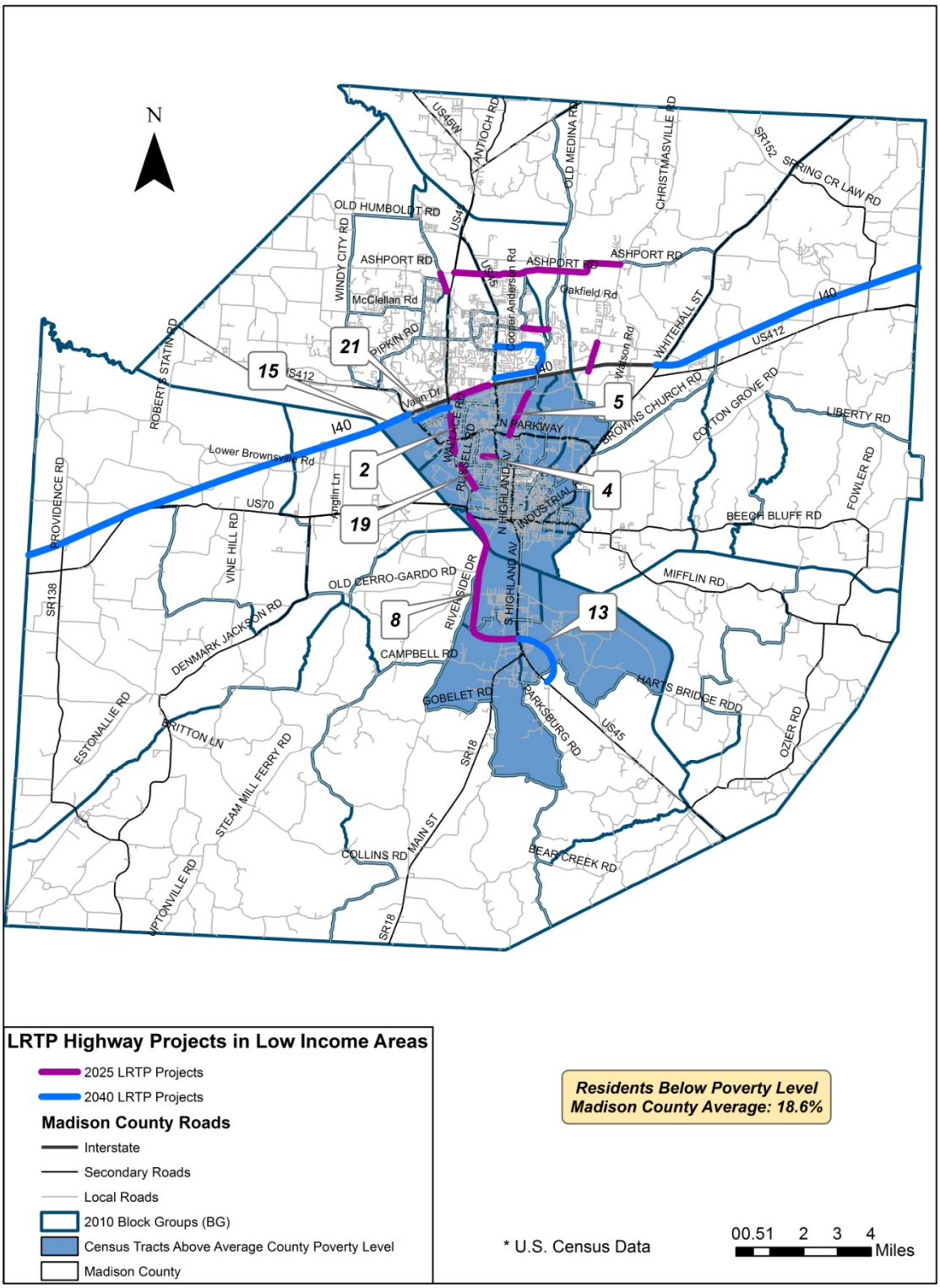


Figure 11-4: LRTP Highway Projects in Low Income Areas



Roadway Safety and ITS Projects

The roadway safety and ITS projects identified in the Plan are scattered throughout the MPO area and many of them may be developed in conjunction with proposed highway improvements. These improvements typically require little or no right-of-way acquisition and will have a significant positive impact on the residents and businesses as they address existing safety or traffic congestion problems.

Transit Projects

The transit projects identified in the Plan involve continuing operating assistance for transit services and continuing capital assistance for the replacement of buses, replacement and upgrade of miscellaneous capital equipment, and to upgrade existing facilities. No major capital investment involving land acquisition is proposed. As noted in Chapter 6, the areas with highest minority population are well-served by current transit routes and will benefit from the various service improvements and passenger amenities recommended in the Plan.

Bicycle and Pedestrian Projects

The bicycle and pedestrian projects identified in the Plan are scattered throughout the MPO area and many of them will be developed in conjunction with proposed highway improvements. The bicycle and pedestrian improvements that are independent projects will require little or no right-of-way acquisition and will involve no displacements of businesses or residents.

SUMMARY

Although all segments of the population who live adjacent to roadway construction projects may endure some short-term construction related impacts related to visual changes, noise changes, and alternations in access, neither minority or low-income populations in the MPO area are likely to endure disproportionate impacts due to the projects proposed in the Plan.

Because populations shift and change, additional efforts to identify potential communities of concern should be undertaken as part of the future phases of each project. To ensure that all persons are involved in the implementation of this Plan, special efforts were undertaken by the Jackson Area MPO, its members' jurisdictions and TDOT during the project development process. These special outreach efforts to help mitigate any adverse impacts and/or burdens from transportation improvements for those areas identified as communities of concern are further outlined in Chapter 13 (Public Participation).

Many of the projects identified in the Plan will likely utilize Federal funding, in which case documentation in compliance with the National Environmental Policy Act (NEPA) will be required. During the NEPA process, a variety of issues will be evaluated, including an EJ analysis pursuant to EO 12898. In addition, the development of the NEPA document will require public participation and local coordination throughout with EJ issues can be identified and addressed.

Chapter 12

Environmental Mitigation

INTRODUCTION

This chapter includes a discussion of potential environmental impacts and avoidance and mitigation activities at the policy/strategy level based on environmental regulatory framework. This Environmental Mitigation section was developed to incorporate environmental considerations early in the planning process so that later project development processes are more streamlined, by including realistic assumptions of potential environmental impacts and costs.

SAFETEA-LU required greater environmental consideration in the development of metropolitan transportation plans, and the recently enacted MAP-21 legislation maintains that requirement. As part of the development of the Plan, the Jackson Area MPO has attempted to assess the impacts and/or create an initial understanding of environmental conditions, which can be used to assist in the project development process once a project has moved from the planning stage of this document to the programming stage (e.g. the TIP) for ultimate project implementation. This mitigation discussion assesses the identified environmentally sensitive areas and provides mitigation strategies that could be considered to reduce potential impacts related to transportation improvement projects.

ENVIRONMENTAL CONSULTATION PROCESS

The Jackson Area MPO undertook an environmental consultation process recommended by the Tennessee Department of Transportation and as identified in the MPO's Public Participation Plan which states that the MPO will "seek to actively engage local, state, and federal agencies in the transportation planning process through a consultation process for the development of the Plan and TIP. This consultation included, as appropriate, contacts with regional, local, and private agencies responsible for planned growth, economic development, environmental protection, airport operations, freight movements, land use management, natural resources, conservation, and historic preservation."

As part of the development of the Plan, the Jackson Area MPO implemented the following approach to ensure that environmental factors were included in the Plan:

- An appropriate level of review was undertaken to assess potential environmental, historic and cultural resource impacts in likely areas for mitigation activities in transportation planning;
- Potential impacts to wildlife and habitat were considered before transportation projects are planned, funded and designed;
- Consultation occurred with federal, state, tribal and local land use management, natural resources, wildlife, environmental protection, conservation and historic preservation agencies in developing the Plan; and,
- As part of the final Plan, the Jackson Area MPO will summarize the disposition of comments identified by the affected agencies.

ENVIRONMENTALLY SENSITIVE AREAS

Based on available information, a Geographic Information System (GIS) was used to map locations of known wetlands, flood zones, historic sites, and historic districts within the MPO planning boundary. By identifying sensitive areas in advance, this effort will help to improve avoidance measures and natural resource mitigation activities to provide greater benefits to the environment regionally. The Plan includes transportation related improvement projects that vary in scope from signalization, intersection improvements, minor and major reconstruction, to new corridors. The remainder of this chapter discusses and shows where improvement projects may impact environmentally sensitive areas. It is important to note, that while the physical footprint of a transportation improvement may not intersect with a known resource, it is possible that unrelated activities of that improvement may have an indirect effect on these sensitive areas. It is also important to note that until a project has gone through a full environmental study, the exact location of the transportation project is not known. The Plan identifies transportation improvement locations for general planning purposes only.

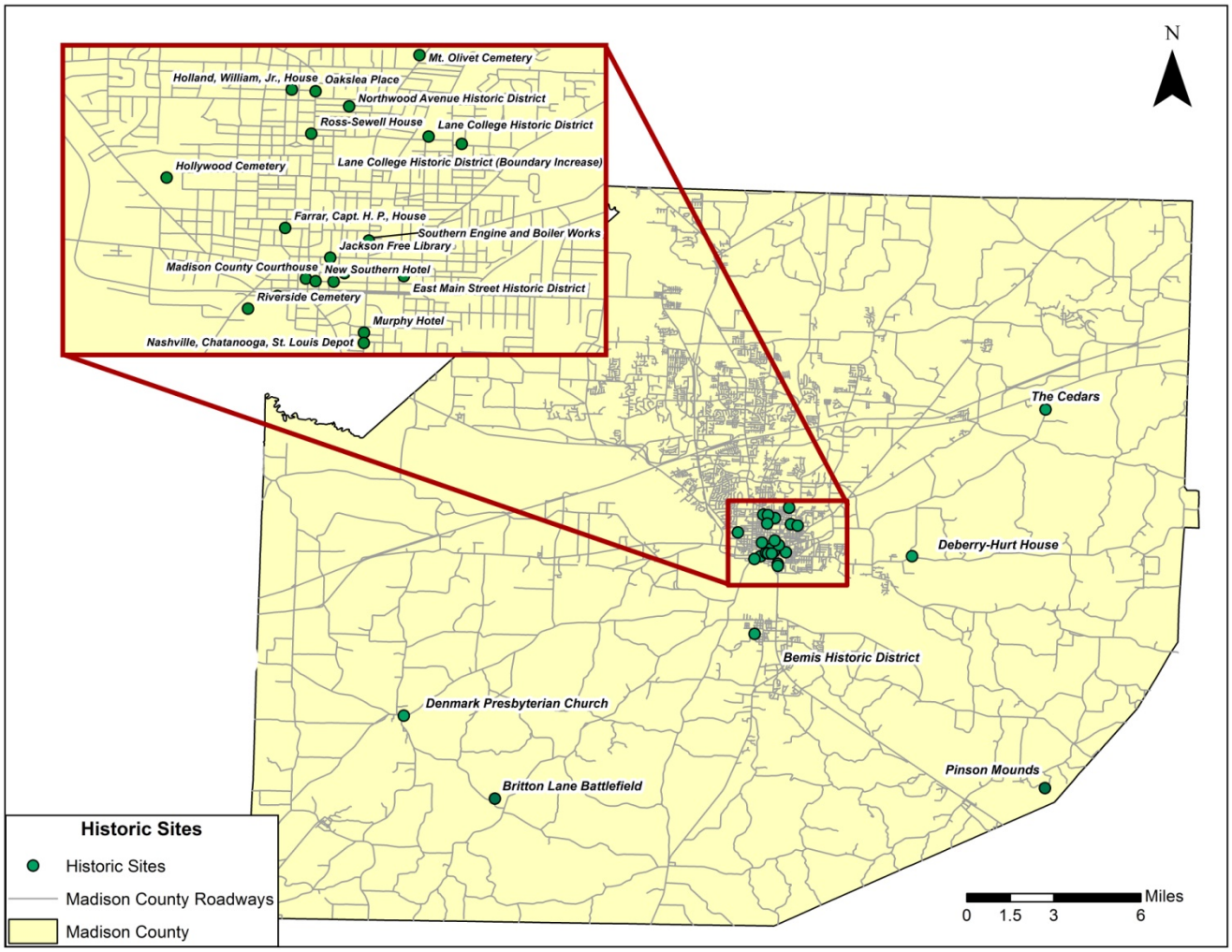
Historic Sites

Section 106 of the National Historic Preservation Act states that any federal agency which provides assistance or licenses any undertaking shall "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register" and shall afford the Advisory Council on Historic Preservation a "reasonable opportunity to comment with regard to such undertaking." The Advisory Council on Historic Preservation has issued regulations codified in 36 CFR, Part 800 which specify the procedures which federal agencies are to follow in carrying out their responsibilities under the provisions of this section. A significant portion of Section 106 review responsibilities in Tennessee are transferred to the Tennessee Historical Commission (THC) staff. Section 4(f) of the Department of Transportation Act of 1966 also applies to all historic sites (historic sites defined as those on or eligible for the National Register of Historic Places (NRHP)). A map of historic sites throughout Madison County is shown in Figure 12-1.

Section 106 also requires consultation with any Tribal Government "that attaches religious or cultural significance to historic properties that may be affected by an undertaking." While Tennessee does not have any Tribal Governments physically located with the State, historically consultation with several tribes that have ancestral homelands in Tennessee has occurred as part of the archaeological investigations that are undertaken as part of the early phases of project development. The following tribes have requested to be consulted on transportation projects in the Jackson MPO Area:

- Alabama-Quassarte Tribal Town
- The Chickasaw Nation
- Choctaw Nation of Oklahoma
- Eastern Shawnee Tribe of Oklahoma
- Kialegee Tribal Town
- Muscogee (Creek) Nation
- Shawnee Tribe
- United Keetoowah Band of Cherokee Indians

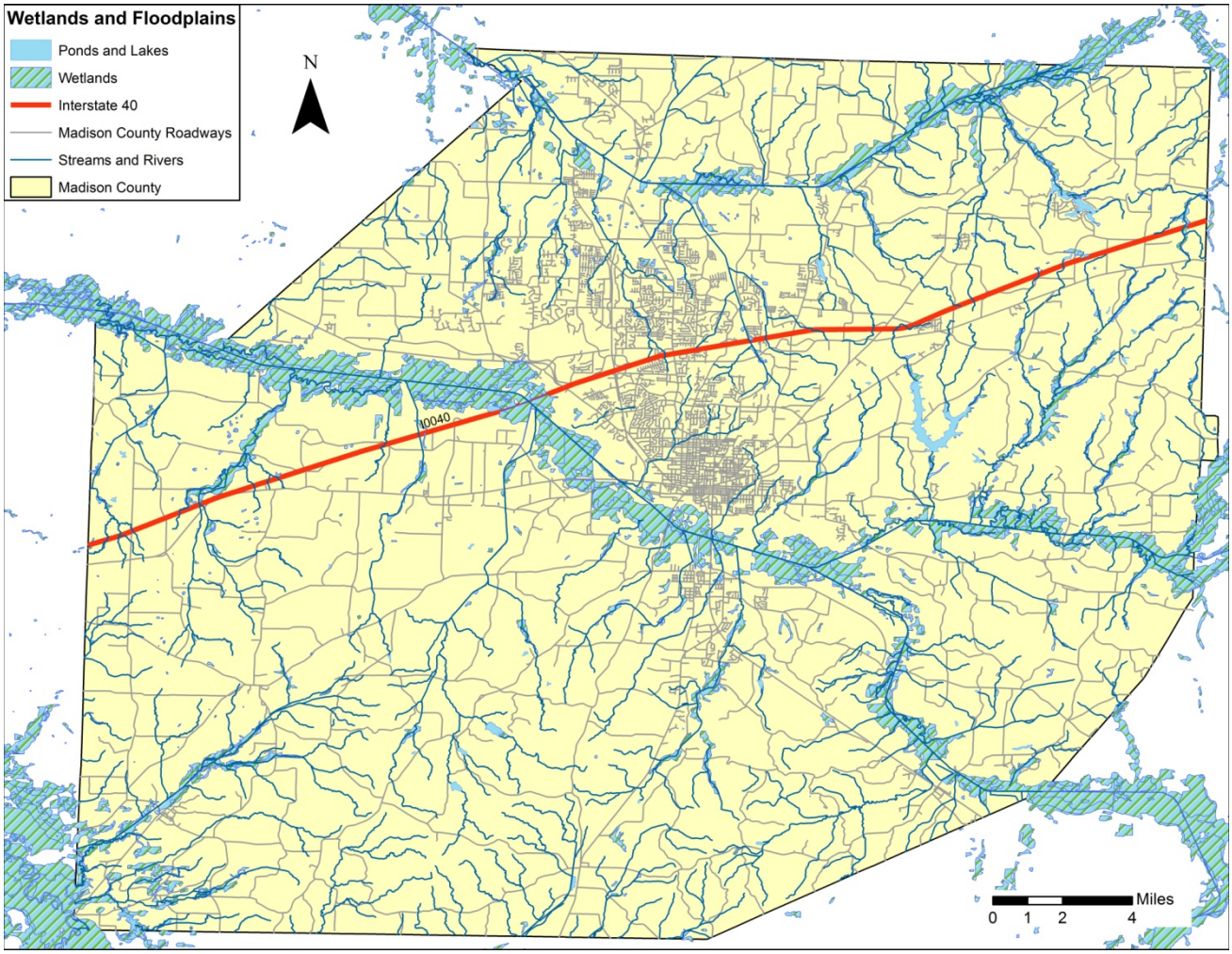
Figure 12-1: Historic Sites



Wetlands and Floodplains

As transportation projects are developed, it is important to be aware of their potential impacts to wetlands and floodplains. Wetlands can be described as lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on the surface. A floodplain is a low plain adjacent to a river that is formed mainly of river sediment and is subject to flooding. Based on the 2009 Federal Emergency Management Agency maps, Figure 12-2 shows the wetlands and floodplains throughout the Jackson Area MPO area.

Figure 12-2: Wetlands and Floodplains



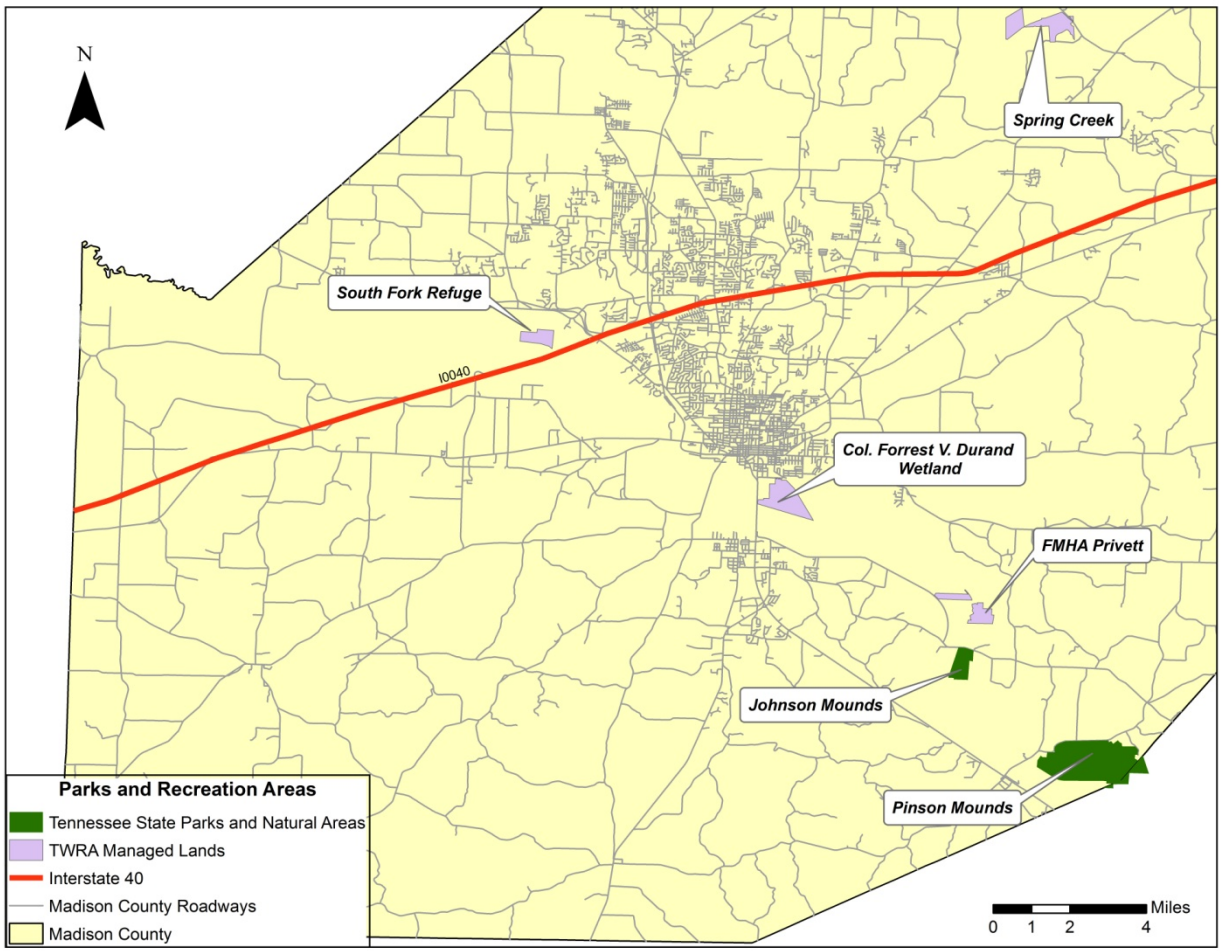
Endangered Species

The development of transportation projects may affect Federal- and/or State-listed threatened or endangered species, including fish, wildlife, and plants facing extinction due to impacts to their habitat. The Endangered Species Act of 1973 established a process and procedure for avoiding, minimizing, and/or mitigating impacts to threatened or endangered species. Impacts on wildlife habitats can often be correlated with impacts on wetlands and forested areas. Potential impact is typically the result of right-of-way acquisition and therefore must be investigated and addressed at a project-level basis. This process may require special studies and coordination with the Tennessee Department of Environment and Conservation (TDEC) and/or the U.S. Fish and Wildlife Service (USFWS).

Parks and Recreational Areas

Two federal regulations apply to projects that impact certain recreational resources: Section 6(f) of the Land and Water Conservation Fund Act of 1965 and Section 4(f) of the Department of Transportation Act of 1966, as amended. As mentioned previously, Section 4(f) applies to all historic sites (historic sites defined as those on or eligible for the National Register of Historic Places), but only to publicly owned public parks, recreation areas, and wildlife and waterfowl refuges. It also applies only if the project impact is considered a "use" under Section 4(f). As a result, development of prudent or feasible alternatives to avoid impacts or a determination of a de minimis impact to park or recreational areas is necessary during the transportation project development process. Figure 12-3 shows parks and recreation areas in Madison County.

Figure 12-3: Parks and Recreation Areas



Other Environmental Considerations

Other environmental considerations, including noise, air quality, hazardous materials, land use, water quality, as well as potential impacts to neighborhoods, businesses, and rural communities also need to be evaluated during the development of transportation projects.

ENVIRONMENTAL MITIGATION STRATEGIES

As previously discussed, SAFETEA-LU and its successor, MAP-21, directed states and MPOs to expand the consideration of environmental issues and impacts within the transportation planning process. Metropolitan and statewide transportation plans must include a discussion of types of potential environmental mitigation activities as part of their plans. The following strategies have been developed by the Jackson Area MPO to address and consider environmental impacts relative to the decisions of the MPO early in the planning process:

- Embrace the principles of Context Sensitive Solutions (CSS) as a means of developing transportation facilities that fit their physical setting and preserve scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility.
- Continue to utilize GIS information to identify environmental features (both physical and social) early in the planning process as a means of avoidance and/or to establish early corrective action plans prior to project construction.
- Partner with local, state, and federal resource agencies early in the planning process to identify potential issues relative to projects under consideration in the MPO's plans and programs to develop appropriate solutions prior to actually beginning the project development process.

Environmental impacts cannot always be avoided. Mitigation is the attempt to offset potential adverse effects of human activity on the environment. Potential mitigation activities should be consistent with legal and regulatory agencies pertaining to human and natural environments. Steps to take in the project development process include the following in relation to environment impacts:

- **Avoid Impacts**
  The first strategy in the environmental process is to avoid adverse impacts altogether.
- **Minimize Impacts**
  Minimizing a proposed activity / project size or its involvement may be an option.
- **Mitigate Impacts**
  Precautionary, special operational management features and / or abatement measures may be used to reduce construction impacts and repair or restore existing resources.
- **Compensate for Impacts**
  Compensation for environmental impacts by providing suitable replacement or substitute environmental resources of equivalent or greater value on or off-site could be utilized.

The Jackson Area MPO will continue to work with the agencies in the Plan process and as appropriate, as projects proceed in the project development process. The MPO recognizes that not every project will require the same level of mitigation; different projects may utilize more mitigation while others require very little. All impacts on environmentally sensitive areas will be analyzed on a project by project basis to examine what mitigation strategies are appropriate.

For major construction projects, such as new roadways, or for projects that may have a region-wide environmental impact, a context sensitive solution process should be considered in which considerable public participation and alternative design solutions are used to lessen the impact of the project.

CLIMATE CHANGE

Another area of environmental concern relates to the implications of the built environment on the climate. Considering the implications of the transportation system on climate change is a new emphasis area in 2010 for MPOs as they develop their regional transportation plans. This section provides an introduction to transportation planning policies related to Global Climate Change (GCC) and will lay the foundation for the Jackson Area MPO to build on in future plans.

There is general scientific consensus that the earth is experiencing a warming trend and that it is important to minimize human-induced increases in atmospheric greenhouse gases (GHGs) to help combat this trend. The combustion of fossil fuels is by far the biggest source of GHG emissions. In the United States, approximately 29 percent of GHG emissions are from transportation sources. According to a U.S. Department of Transportation report, entitled *Transportation's Role in Reducing U.S. Greenhouse Gas Emissions* (submitted to Congress in April 2010):

> *"In 2006, emissions from on-road vehicles accounted for 79 percent of transportation GHG emissions. Emissions from light-duty vehicles, which include passenger cars and light duty trucks (e.g., sport utility vehicles, pickup trucks, and minivans) accounted for 59 percent of emissions. Emissions from freight trucks accounted for 19 percent, and emissions from commercial aircraft (domestic and international) for 12 percent. Emissions from all other modes accounted for less than 10 percent of total emissions."*

The report also states that in recent decades, transportation GHG emissions have grown steadily. From 1990 to 2006, transportation GHG emissions increased 27 percent, which equated to almost one-half of the increase in total U.S. GHG emissions during the time period.

In addition to contributing to climate change, transportation infrastructure is also likely to be affected by the predicted increases in severe weather events and extreme temperatures. As a result, it is important to consider mitigation and adaptation strategies as part of the LRTP.

Climate Change Strategies

Because greenhouse gas emissions from transportation sources (fuel combustion and vehicle air conditioning systems) account for a large percentage of the total U.S. GHG emissions, the transportation sector will likely play a large role in the ongoing discussion of national GHG reduction goals. The strategies to reduce transportation GHG emissions include:

- **Introduction of low-carbon fuels**
  The objective of this group of strategies is to develop and introduce alternative fuels that have lower carbon content and therefore generate fewer transportation GHG emissions. These alternative fuels include ethanol, biodiesel, natural gas, liquefied petroleum gas, low-carbon synthetic fuels (such as biomass-to-liquids), hydrogen, and electricity.

- **Increasing vehicle fuel efficiency**
  The objective of this group of strategies is to reduce GHG emissions by using less fuel per mile traveled. Fuel efficiency improvements include advanced engine and transmission designs, lighter-weight materials, improved aerodynamics, and reduced rolling resistance.

- **Improving transportation system efficiency**
  These strategies seek to improve the operation of the transportation system through reduced vehicle travel time, improved traffic flow, decreased idling, and other efficiency of operations; improvements that can also result in lower energy use and GHG emissions. The strategies range from truck-idle reduction, to reducing congestion through Intelligent Transportation Systems (ITS) and other innovative forms of traffic management, to air traffic control systems that route aircraft more efficiently and reduce delays. Efficiency can also be improved by shifting travel to more efficient modes, where such shifts are practical in terms of price and convenience—such as passenger vehicle to bus, or truck to rail.

- **Reducing carbon-intensive travel activity**
  The objective of this group of strategies is to influence travelers' activity patterns to shift travel to more efficient modes, increase vehicle occupancy, eliminate the need for some trips, or take other actions that reduce energy use and GHG emissions associated with personal travel.

Climate Change Considerations

Based on current information and models, the five (5) climate change challenges that will likely affect the transportation infrastructure in the 21st century are:

- Increases in very hot days and heat waves;
- Increases in arctic temperatures;
- Rising sea levels;
- Increases in intense precipitation events; and
- Increases in hurricane intensity.

Although the Jackson Area MPO will not be directly affected by all of these challenges, increases in the intensity of precipitation events along with more intense and longer lasting heat extremes and heat waves will affect short- and long-term transportation system investment decisions.

The Jackson Area MPO recognizes that changes at the national, state, or local level regarding climate change and GHG will likely affect transportation planning during the next several years. While there are no explicit goals or performance measures regarding climate change included in the Plan, several of the stated goals and objectives of the plan have a direct correlation to climate change and GHG emissions reduction strategies. It is the goal of the Jackson Area MPO to link climate change and GHG emissions reduction strategies (both mitigation and adaptation) to each of the goals of the Plan. Table 14-1 outlines opportunities to link the goals of the Plan with strategies to address climate change and reduce GHG emissions.

Table 12-1: 2040 Plan Goals and Objectives and Related Climate Change Strategies

Goal I: Manage and Operate an Efficient Transportation System

- Encourage improvements to, or maintenance of, critical infrastructure components that are subject to climate change related hazards (e.g., flooding, intense precipitation, extreme temperatures, etc.).
- Encourage improved incident management, real-time information distribution, and traffic flow engineering.

Goal II: Promote and Encourage Economic Development

- Encourage transportation improvements that utilize and preserve existing transportation infrastructure.
- Encourage the coordination of land use and transportation planning to reduce the number and length of vehicle trips.

Goal III: Support Environmental Quality and Livability Principles

- Encourage roadway and infrastructure projects that promote harmony with locally adopted plans and policies that exist to protect environmental resources and improve the quality of life.
- Encourage transportation projects that avoid or mitigate environmentally sensitive areas.

Goal IV: Support Multi-modal and Mobility Needs

- Encourage the expansion of alternative transportation options (e.g., park-and-ride, carpooling, vanpooling, transit, etc.) to large employers and other institutions
- Encourage alternative transportation modes (e.g., sidewalks, bicycle routes, park and ride lots, bus pullouts, and other facilities/improvements) as part of future infrastructure projects when possible.

Goal V: Develop a Safe and Secure Transportation System

- Encourage safety enhancements that reduce the risk of crashes and promote smooth traffic flow (i.e., reduce congestion).

Chapter 13

Public Participation

INTRODUCTION

The Jackson Area MPO seeks to proactively involve the public in all phases of the transportation planning process for the MPO planning boundary. The MPO has an established Public Participation Plan to identify the procedures the MPO Staff will undertake to gather and utilize public input throughout the development and adoption of its plans and programs, such as the Unified Planning Work Program (UPWP), the Transportation Improvement Program (TIP), and the Long Range Transportation Plan (Plan). These procedures form the basis for informing the public of transportation decisions and the adoption of components of the transportation-planning program.

During the development of the Plan, outreach was undertaken in a variety of ways to ensure involvement and to gather input from other agencies, stakeholders, the freight community, and the community at-large. This input, which was focused on safety concerns, opportunities for improving particular roadway corridors, and suggestions for priority bicycle and pedestrian improvements were considered during the development of this Plan. This chapter outlines the public participation process utilized for the development of the 2040 Plan and summarizes the comments obtained as a result of the public input process.

PUBLIC PARTICIPATION PLAN

In accordance with federal transportation planning requirements, the Jackson Area MPO's Public Participation Plan states that all interested parties shall have reasonable opportunities to comment on the contents of the Plan.

Interested parties to be included by the MPO according to the federal requirements, include:

- General Public
- Affected public agencies
- Representatives of public transportation employees
- Freight shippers, providers of freight transportation services
- Private providers of transportation
- Representatives of users of public transportation
- Representatives of users of pedestrian walkways
- Representatives of users of bicycle transportation facilities
- Representatives of the disabled
- Other interested parties

Long Range Transportation Plan

The Public Participation Plan outlines the approach and steps that will be taken to ensure that public review and comment are afforded during the development of the Plan. In accordance with the plan, the Technical Staff guide the preparation of the Long Range Transportation Plan for the Jackson Area MPO. The Transportation Planning Coordinator and the Technical Staff review input from the public, the Executive Board, the Jackson

Transit Authority, the McKellar-Sipes Regional Airport, input from the State, and from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).

The Technical Staff review and endorse the Draft Plan for consideration by the Executive Board. After the Technical Staff endorses the Draft Plan for public review and comment, a notice to that effect is placed in the local newspaper of general circulation. The notice states that copies of the draft long range plan, as endorsed by the Technical Staff, are available in the City of Jackson Planning Department, the Jackson MPO website, the JTA website, and the Jackson Madison County Public Library and at community centers that serve low income or minority areas upon request. The notice specifies the date, time, and location of the forthcoming public hearing to explain the plan and obtain comments and public input. This notice is published a minimum of thirty (30) days prior to the meeting date prior to its final consideration and adoption by the Executive Board. Additionally, an electronic version of the draft is placed on the MPO website. After the public hearing, if any comments are received, the Transportation Planning Coordinator reports those comments to the Technical Staff and incorporates them into the plan draft. The Technical Staff reviews the comments and make a final endorsement of the plan to the Executive Board.

After the endorsement by the Technical Staff of the final Plan draft, a notice is placed in the local newspaper of general circulation stating that copies of the final draft, as endorsed by the Technical Staff, are available in the City of Jackson Planning Department for public review and comment. The notice specifies the date, time, and location of the forthcoming public hearing to adopt the plan. This notice is published a minimum of fourteen (14) days prior to the meeting date where the Plan will be considered by the Executive Board.

The public shall be afforded the opportunity for comment at the public hearings and all public meetings. The Executive Board may establish reasonable time limits for each presentation or comment, considering the time constraints of the meeting and the complexity of the issue. Any person desiring to attend the meeting and make a comment and who needs special consideration such as a sign-language interpreter, can contact the MPO beforehand at the number listed on the published notice to make provisions for special considerations.

In the event the Board determines there are significant unresolved comments on the Plan, it may defer the plan until a subsequent meeting. The MPO Staff will then prepare a written response to the comments to be incorporated into the document, or suggest amendments to the draft document as a means of summarizing, analyzing, and reporting on the disposition of the comments. Should these amendments be significant, an additional 30-day review period shall be afforded to the public.

Opportunities for public input are not limited to those contained in this section. Given the significance of the Plan, public comments will be taken at any time by letter, e-mail, fax, telephone, or comment from the MPO website.

Consultation with Interested Parties

Beyond public participation, the Public Participation Plan specifically encourages involving and engaging representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disables, and other interested parties in the development of the Plan.

Consultation with Local, State, and Federal Agencies

Finally, as outlined in the Public Participation Plan, the MPO will seek to actively engage local, state, and federal agencies in the transportation planning process through a consultation process for the development of the Plan. This consultation shall include, as appropriate, contacts with regional, local, and private agencies responsible for planned growth, economic development, environmental protection, airport operations, freight movements, land use management, natural resources, conservation, and historic preservation.

PUBLIC PARTICIPATION

Beyond the required public participation, during the development of the Plan, the Jackson Area MPO sought the input of interested parties in the development of the freight component of the Plan, as well as meetings to discuss safety concerns, and bicycle and pedestrian recommendations.

Freight Survey/Interviews

A survey was developed and sent to freight transportation stakeholders in the Jackson Area to provide input on ways to improve the movement of goods in the region. Of the surveys distributed, 20 were completed and returned by the business owners. The responses were analyzed to determine freight activity in the Jackson area, major freight transit issues, and potential solutions. Respondents to the survey account for approximately 108 million tons of freight shipped and 97 million tons of freight received.

In addition to the freight survey, interviews were sought with the Jackson Area Chamber of Commerce, the Jackson Energy Authority, the Southwest Tennessee Development District, and the West Tennessee Industrial Association to determine the strengths and weaknesses of local freight infrastructure and hear ideas to improve the ability of businesses within the Jackson area to move freight more efficiently. The opinions and concerns of the interviewees were generally consistent. Each organization mentioned the same strengths and weaknesses of doing business in the Jackson area and identified the same areas of concern with truck freight movement. Ideas for future improvements to other modes of freight transport were more diverse.

Safety Local Stakeholder Meeting

A meeting with local stakeholders was held at City Hall in Jackson on March 8, 2012. The meeting was an open discussion format where participants were invited to share their first-hand experience and knowledge regarding locations throughout the MPO area that could benefit from safety improvements (the improvement topics were not limited to only geometric improvements). The group was also discussed locations that might need further investigation. During the discussion county and city maps were utilized to note the locations identified. Later analysis used the information gathered from the meeting participants to select corridors or intersections that had multiple occurrences. Crash data was also provided by the City of Jackson Police Department at the meeting. Geometric and crash data, current traffic volumes, and projected growth in the MPO area were combined with the input from the local stakeholders to develop the safety improvement recommendations that are contained in this Plan.

Bicycle and Pedestrian Local Stakeholder Meeting

A meeting with local stakeholders was held at City Hall in Jackson on June 5, 2012. The meeting was an opportunity for those involved to share their thoughts and ideas on the bicycle and pedestrian recommendations that were being developed for inclusion in the Plan. During the meeting, the approach and criteria used to evaluate the proposed sidewalk, bicycle and multi-purpose trail projects were discussed along with the recommended project lists to ensure that the stakeholders had a clear understanding of the approach that was used to develop the recommended bicycle and pedestrian project lists contained in this Plan.

In addition to the specific outreach activities listed above, MPO staff also discussed transportation needs with the members of the Jackson Community Redevelopment Agency (CRA). CRA's board was appointed by the City Council following the major 2006 tornadoes to oversee redevelopment plans for downtown and east Jackson, which were hard hit and are predominantly minority and low-income neighborhoods. Staff also gave presentations to the Exchange Club, Rotary Club, Chamber of Commerce, and Leadership Jackson class. The public was also encouraged to help select transportation projects to be included in the 2035 Long Range Transportation Plan and the FY 2011-2014 Transportation Improvement Program on the Jackson Area MPO's website.

PUBLIC COMMENT PERIOD

In accordance with the MPO's adopted Public Participation Plan, approved by TDOT, FHWA and FTA, a 30 day public review period for the Plan was published in *The Jackson Sun* on October 26, 2012 and the West Tennessee Examiner (a local minority paper published weekly). In addition, a public comment notice was forwarded to the agencies and interested parties listed in Appendix D as required by the Public Participation Plan.

The draft and final Plan was also made available for review and comment in the City of Jackson Planning Department, on the Jackson Area MPO website, the Jackson Transit Authority website, and the Jackson Madison County Public Library. A copy of the Plan was made available and notices of the meetings were posted at community centers, including those serving minority or low income areas (See Figures 13-1 and 13-2). Flyers were also placed on buses to alert riders that a copy of the draft Plan is available at the JTA bus transfer center and the Plan was made available on CD by request and in paper format by request.

Figure 13-1: Community Centers (Minority Block Groups)

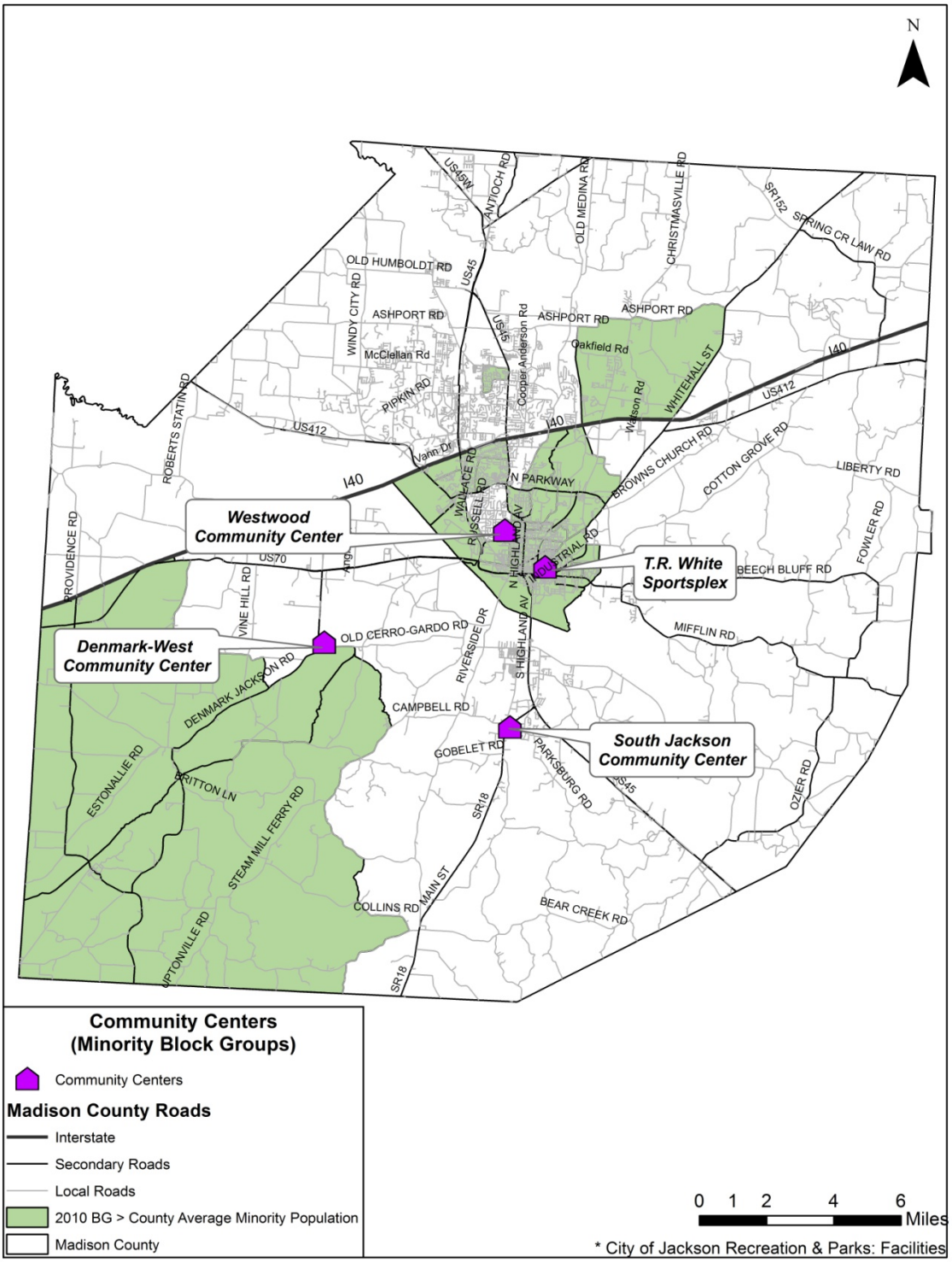
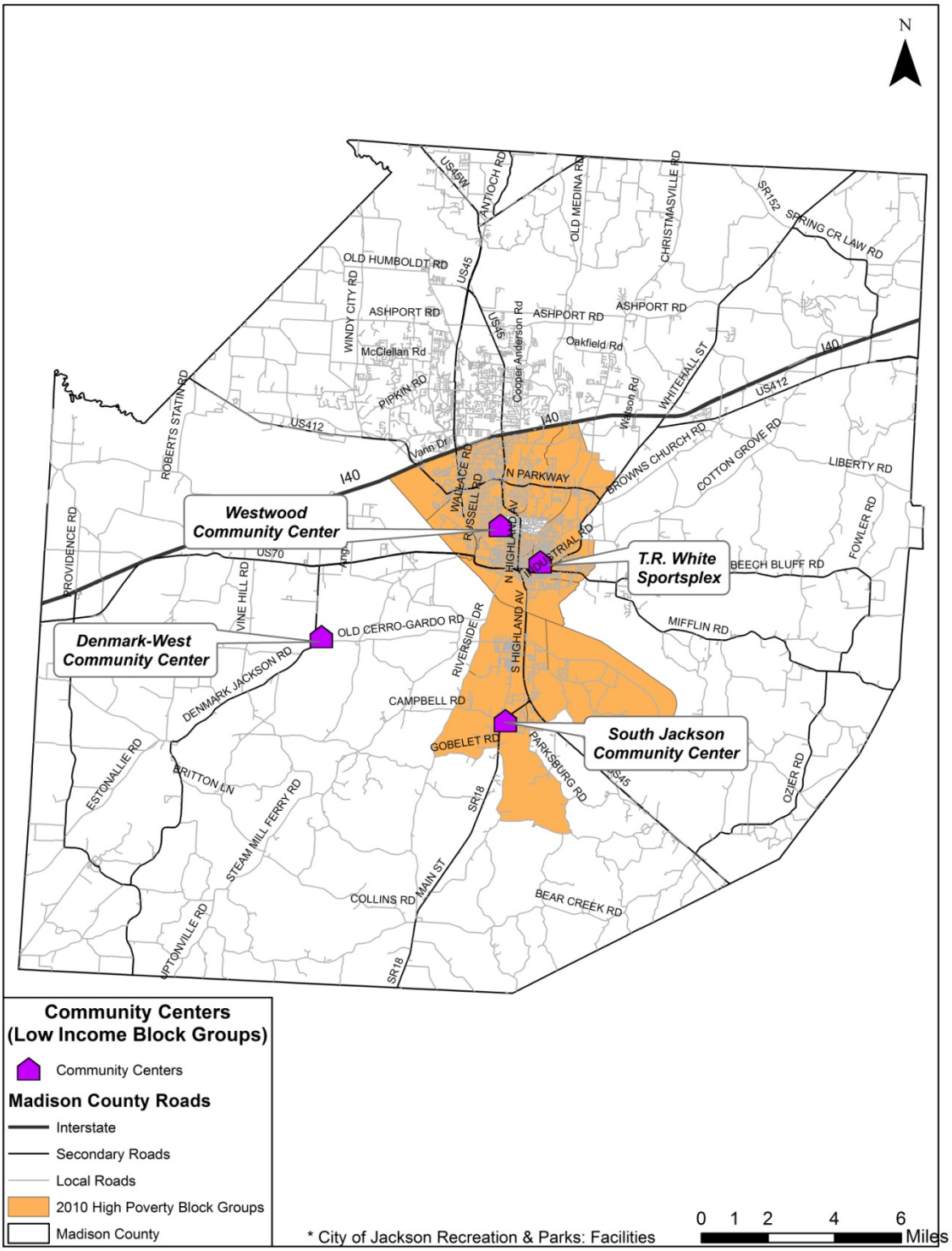


Figure 13-2: Community Centers (Low Income Block Groups)



PUBLIC COMMENTS

The following is a summary of the public comments received on the draft 2040 Long Range Transportation Plan (LRTP). A summary of the response and a reference to any resulting changes to the Final LRTP follow each of the comments.

Executive Technical Staff Comments

A meeting of the Jackson Area MPO Executive Technical Staff was held on October 25, 2012. A copy of the Plan and Executive Summary were made available to the members of the committee for review prior to the meeting. At the meeting, Keith Donaldson, MPO Coordinator, presented a brief overview of the draft LRTP and the schedule for the public review of the document. The following is a summary of the comments made by the Executive Technical Staff during the meeting:

Question #1

Project #26 along Ashport Road is shown to be widened from two to three lanes, but other sections of Ashport Road are shown to be widened to four lanes.

Response #1

In the final Plan, Project #26 will be shown to be widened from two to four lanes in order to be consistent with the other proposed improvements to Ashport Road. The anticipated cost of the roadway improvement will also be updated to reflect this change.

Question #2

Why are the projects not listed in numerical order (i.e. Project #28)?

Response #2

During the development of the draft Plan the timeframe for implementation of Project #28 was shifted earlier, resulting in the numerical sequence of the projects being out of order. In the final Plan, the project numbering will be revised to list all of the projects in numerical order.

Question #3

Can the Plan be amended, once it is adopted?

Response #3

Yes. The Plan can be amended.

Question #4

Many of the improvements to the Madison County road system are listed in the last tier of projects, but currently the County is getting requests for improvements to Ashport Road and Christmasville Road, including requests for shoulders and widening along Christmasville Road and improvements to the Christmasville Road/Ashport Road intersection. Would it be possible to tie together Project #27 with Project #9, or extend the termini or Project #9 further to the city limits instead of Bedford White Road?

Response #4

In the final Plan, Project #27 will be moved from the 2026-2040 timeframe to the same timeframe (2018-2025) as Project #9. The project numbers will be revised to list the projects in numerical order.

Question #5
The safety recommendations include a proposed project to close Grady Montgomery Drive – who requested this closure?

Response #5
This closure was requested by McKellar-Sipes Regional Airport due primarily to safety concerns with students not stopping at this intersection. As part of the discussion during the Executive Technical Staff meeting, it was mentioned that this closure would potentially add additional time to the existing transit route that serves this area. It was mentioned by JTA that this added time, plus the fact that the current route does not have a lot of ridership, may result in the route being discontinued.

Question #6
Projects 22, 23, and 24 – the basic question is, are you going to fix Cooper Anderson Road?

Response #6
Yes. Each of these projects is proposed to improve Cooper Anderson Road.

Question #7
Question regarding the third bullet under Operations/Network Improvements (Transit Recommendations) which states "Expand the North Side route, particularly the areas located between the US-45 Bypass corridor and US-45/North Highland Avenue corridor on the north side of I-40." This would have to be another route, not an expansion.

Response #7
The recommendation in the final Plan will be revised to read: "Consider the addition of a North Side route to serve the areas located between the US-45 Bypass corridor and US-45/North Highland Avenue corridor on the north side of I-40."

Question #8
Question regarding the fourth bullet under Capital Improvements (Transit Recommendations) which states "Increase system efficiency and rider convenience by implementing the transit projects proposed in the regional Intelligent Transportation Systems (ITS) architecture." The only recommendation that hasn't been implemented is placing cameras on buses.

Response #8
The recommendation in the final Plan will be revised to read: "Increase system efficiency and rider convenience by continuing to implement the transit projects proposed in the regional Intelligent Transportation Systems (ITS) architecture."

Question #9
Once the Southern Extension of the US-45 Bypass is constructed, it will be necessary to look at a stronger transit presence to the south.

Response #9
In the final Plan, a long-term recommendation to look at a southern transit route along the Southern Extension of the US-45 Bypass will be added.

Written Public Comments

One written public comment was received during the 30-day public review and comment period for the draft LRTP. A letter was submitted by Dana Holmes, LBSW, a service coordinator with St. Mary Manor.

Question

The primary concern outlined in the letter (attached) is that the current "Lift" program operated by the Jackson Transit Authority (JTA) does not adequately accommodate the elderly and disabled adults in the City of Jackson. The letter goes on to state that the residents of Jackson would benefit from additional low, or no cost, transportation options.

Answer

The LRTP outlines a list of long-range recommendations for transportation, including transit, in the City of Jackson and Madison County. JTA is the agency charged with providing all transit within the MPO boundary. Because the issues outlined in the letter concern existing problems being experienced by elderly and/or disabled residents, the letter and concerns were forwarded to JTA for their response. A letter of response from the Jackson Area MPO was sent to Ms. Holmes indicating that her comment had been received and forwarded to JTA for their review and response.

Public Meeting Comments

A public meeting to present an overview and gather input from the public on the draft LRTP was held on November 27th from 5:00 PM – 7:00 PM in the George A. Smith Meeting Room of the Jackson City Hall. At the meeting, Keith Donaldson, MPO Coordinator, presented a brief overview of the draft LRTP and solicited questions from the seven (7) citizens (sign-in sheet attached) in attendance. The following is a summary of the public comments made during the meeting:

Question

A question was asked about the Southern Extension of the US-45 Bypass, specifically the impacts to property at the terminus near Seavers Road.

Answer

Keith Donaldson, MPO Coordinator described the current status of the Southern Extension project and discussed that an Environmental Assessment is currently being done and that the project was only at a corridor level of analysis. Additional meetings will be held and more specific design plans will be developed as the project moves forward.

Question

A question was asked about projects planned for the western portion of Madison County.

Answer

Keith Donaldson, MPO Coordinator walked through the maps of the proposed projects listed in the Plan and described the purpose of each project.

After all of the questions, Keith Donaldson, MPO Coordinator, presented information about the other components of the draft Plan, including the safety, transit, bicycle and pedestrian, and ITS recommendations.

Several of the attendees responded positively to the proposed ITS recommendations to establish a traffic operations center and coordinate traffic signals, because the existing traffic signals were not currently timed

well. Mr. Donaldson concluded the presentation by outlining the next steps of the process to approve the Plan, including a meeting of the Executive Technical Committee and a meeting with the MPO Board in December.

Appendix A

Travel Demand Model Documentation

Technical Memorandum

Travel Demand Model Update

The purpose of this document is to describe the Year 2010 update and recalibration/validation of the Jackson Area Metropolitan Planning Organization (Jackson Area MPO) travel demand model. The document highlights changes that were made to the 2003 TransCAD model. It is important to note that this document does not deal with issues associated with executing the model, nor preparing any of the input data files. Additionally, for simplicity, the Jackson Area MPO travel demand model is referred to as "TDM" within this report.

INTRODUCTION/HISTORY OF THE JACKSON AREA MPO MODEL

The Jackson Area MPO is currently updating its Long Range Transportation Plan (LRTP). As part of this update, the MPO is required to update their regional travel demand forecasting model, or TDM. The current update is the second time the model has been updated since it was originally developed in 1999. The following briefly outlines the history and changes to the TDM that have been undertaken to date.

- 1999: This version of the model included a basic set of geography files (traffic analysis zones (TAZs)) and roadway network. The TAZs were relatively large in size, especially in the fringe areas of the model. The roadway network supported the TAZ structure and contained only higher functionally classified roadways.
- 2005: This version involved a major overhaul in which each aspect of the model was upgraded. For instance, the network was expanded to include all roadways classified as a collector or above. Also, the TAZs were updated with the most recent Census information and forecasted to a base year of 2003. In addition, the model script was updated to a more robust set of trip generation, trip distribution, and traffic assignment models.
- 2012: As part of the current effort, the 2003 base TransCAD Model was updated to a base year of 2010. Year 2010 was selected as the new base year to coincide with available new Census data and the most recent complete set of traffic counts for the Jackson Area MPO.

Because the model was so well calibrated in 2005, one of the goals for the current model update was to use as much of the existing model as possible. However, updating components of the model such as socioeconomic data in the traffic analysis zones (TAZs), roadway network, and external station characteristics were necessary. The four-step modeling process was virtually unchanged and the user interface was updated to run in the most recent version of TransCAD (Version 5.0). Errors contained in the original model were fixed as well through a step-by-step review of the model output.

MODEL OVERVIEW

Consistent with the TDOT standards, the model was developed using the TransCAD travel demand forecasting software. The TDM can be executed by running a GISDK macro. The script developed to run this macro is provided in **Appendix A**. For simplicity, names of many of the input files are hard-coded in the script of the resource file, with the exception of the highway line geographic layer and the TAZ boundary file. Names of output files are also hard-coded. The user controls the name of the project folder, which becomes critical in the quality control and assurance.

The Jackson Area MPO TDM follows the traditional four-step planning process. However, the focus of the model is on the highway network; thus, transit is not included in the model and the mode choice step is excluded.

Appendix B contains a technical memorandum prepared by consultant team at the beginning of the model update to provide an overview of the proposed process/steps to update the model.

SOCIO-ECONOMIC DATA/TRAFFIC ANALYSIS ZONES

This section outlines the updates made to the TDM TAZ structure, including updates to the socio-economic data.

Original TAZ Structure

The Jackson Area MPO TDM model area includes all of Madison County. In the 2003 version of the model, the county was sub-divided into 391 TAZs. The TAZ boundaries followed the 2000 Census block boundary and the highway network.

TAZ Adjustments

The TAZ structure from 2005 was updated to match the latest census geography. The file provided by the Jackson Area MPO was used as a starting point but a few adjustments were made, as noted below:

- The 2010 Census Block definition includes 3505 Census Blocks.
- The Jackson Area MPO's geographic definition was followed as much as possible but a few blocks were reassigned to correct errors and be consistent with highway/2005 TAZ structure. The major difference is in regard to the TAZ number – the TAZ number of this 'new' system followed the 2005 TAZ IDs.
- Four (4) TAZs from 2005 are no longer in the 2010 version, due to Census Block redefinition, including Old Zones 50, 377, 385, and 386.
- The Census Blocks were aggregated based on "TAZ_2010" to get the 2010 TAZ definition.

After additional discussion with TDOT, additional zones in the model were combined due to low population and employment.

Table 1 provides a summary of the zones with low values (2010) for population and employment compared the 2005 model.

Table 1: Summary of 2005 vs 2010 Socioeconomic Data by Select TAZs						
TAZ	2005			2010		
	Population	Households	Employment	Population	Households	Employment
7	2	1	0	3	1	0
20	8	3	0	7	2	0
23	16	7	10	5	2	6
53	13	5	0	0	0	0
118	4	2	0	2	1	0
122	9	2	0	7	2	0
124	10	4	0	8	4	0
317	19	5	0	5	2	0
350	13	4	0	7	3	0
391	3	3	0	1	1	0

Each of these zones were combined with an adjacent zone as appropriate. The result of the zone splitting was a total of 377 TAZs, a decrease of fourteen TAZs from the 2003 model.

For reference, **Figure 1** shows the TAZ boundary in comparison to the Census block boundary.

Population and Households

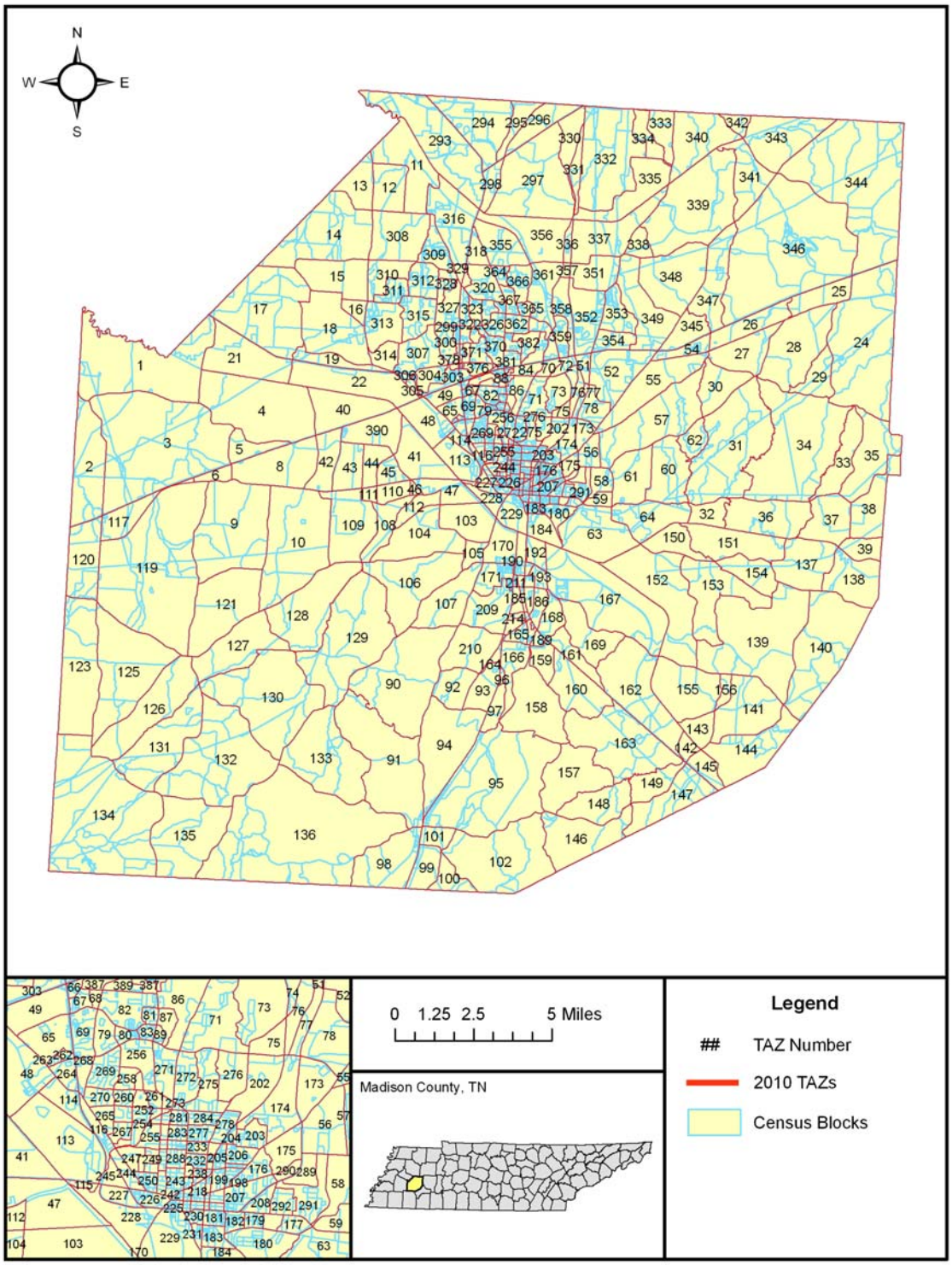
The socio-economic data is stored in the traffic analysis zone (TAZ) geographic file within TransCAD. As the base year of the model was 2010, the most recent Census data from Year 2010 was available and used in this model update. The population and household data used to populate the TAZs were updated with this Census data. There are multiple fields in the model related to population and household.

Table 2 provides a summary of 2010 population and household data.

Table 2: Summary of Population and Households (2010)	
Data	Value
Total Population	98,294
Total Households	38,073
Average Household Size	2.58

Population and household data for the base year 2010 model can be found in the TransCAD model files.

Figure 1: TAZ Boundary in comparison to the Census Block Boundary



Employment

Updating the employment information for the model update required a more complicated process than the population/household data. This is partly a result of the current model utilizing ten different employment categories, including:

- Agriculture
- Mining
- Construction
- Manufacturing
- Transportation
- Wholesale
- Retails
- Financial
- Services
- Government/Public Sector

In order to establish a base condition, control totals were established using Woods & Poole (W&P) control totals. W&P is an industry recognized source for providing current and future socioeconomic estimates at the county level. The 2005 model update also utilized W&P data; however, W&P changed employment category descriptions since 2005. The change in W&P data was a result of switching from Standard Industrial Classification (SIC) to the North American Industry Classification System (NAICS). As a result, assumptions had to be made as to which employment category was most appropriate. This included a comparison of data from Madison County, Putnam County (as a reference), and statewide. Patterns from 2005 to 2010 showed that:

- The Construction and Manufacturing sectors lost jobs statewide as well as in Madison and Putnam Counties;
- The Wholesale Trade sector lost jobs statewide, but slightly gained in Madison and Putnam Counties;
- The Retail Trade sector lost jobs statewide as well as in Madison County. However, Putnam County stayed flat;
- The Healthcare, Lodging, and Public Administration sectors gained jobs statewide as well as in Madison and Putnam Counties; and
- Other smaller industry sectors show no significant change to small gains in jobs.

A webconference between the Jackson Area MPO, was conducted on October 20, 2011 to discuss the process to update the employment data by the employment categories. This included walking through the W&P assumptions and agreeing upon control totals.

Using the 2005 model as a base, the zonal values were grown to match 2010 W&P control totals. Employment was then allocated to each TAZ, building up from the Census block. Employment totals were smoothed to match the W&P control totals and were classified between the multiple employment categories (with a total employment field as well). **Table 3** summarizes the employment data by sector.

Table 3: Summary of Employment by Sector (2010)	
Sector	**Employment**
Agriculture	1,030
Mining	196
Construction	2,883
Manufacturing	9,866
Transportation	1,523
Wholesale	2,671
Retail	7,429
Financial	4,052
Services	25,837
Public Administration	10,961
Total Employment	**66,448**

Employment data for the base year 2010 model can be found in the TransCAD model files.

Schools

The Jackson Area MPO TDM includes a consideration of trips produced and attracted to schools within Madison County. This includes K-12 as well as college/universities. As part of the model update, enrollment at public and private schools was obtained through communication with each of the schools.

HIGHWAY NETWORK

This section outlines the updates made to the Jackson Area MPO TDM roadway network.

Highway Line Geographic Layer

As with the TAZ layer, the roadway network is a geography file within TransCAD. The roadway network is compatible with other line layers such as centerline files in ESRI shapefile format.

The 2005 TransCAD network was updated as part of the model update to the new base year of 2010. Classification designations were assigned based on federal functional classification, maintained by TDOT. Geometric attributes that include the number of lanes in each direction, speed, etc. were also assigned to the highway links.

The following updates were conducted:

- Rearranged the table structure and moved the relevant fields (including model inputs and those being updated) to the front/top.
- 2010 Counts were added along with station numbers in the fields "AADT_2010" and "Station".
- Updated the following fields based on TRIMS data:
    - Posted_Speed
    - FHWA_FC
    - RS_Width
    - LN_Width

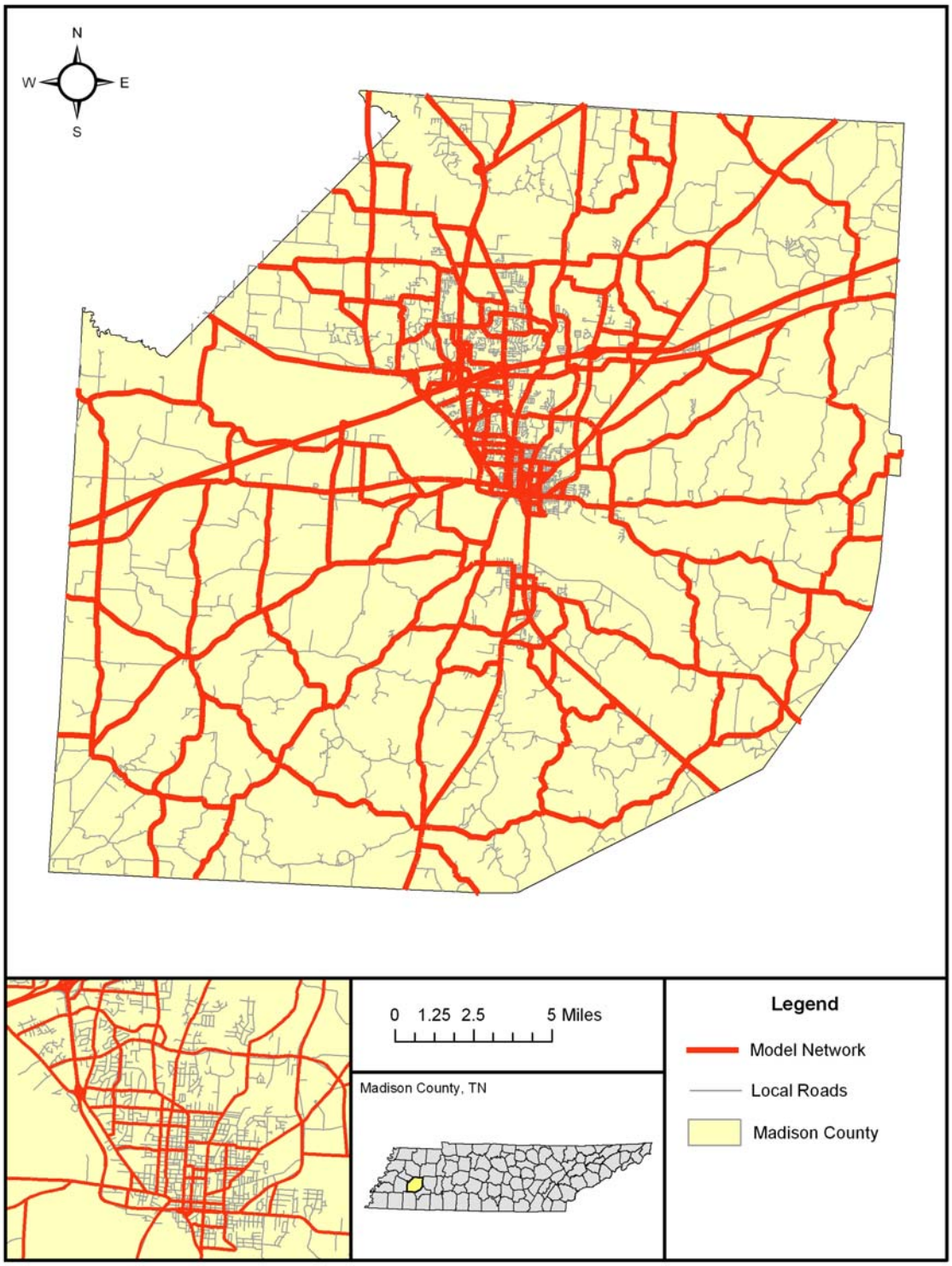
- According to TRIMS there were no changes in these fields:
    - Lanes
    - Divided
    - LN1DIR
    - Access
- Moved the centroids and centroid connectors so that they lie inside the modified TAZs.

Roadways within the model were categorized into the following six road classes:

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Local

Each is also divided into urban and rural. **Figure 2** overlays the final highway geographic file on top of the centerline file for Madison County.

Figure 2: Final Madison County Model Highway Lines



Free Flow Speed and Capacity

Free flow speed (or free running speeds) and capacity tables are important inputs in the development of a TDM and are especially important in the traffic assignment model. These tables provide a range of acceptable values for both speeds and capacity by road class. The link free-flow speed and capacity were assigned to each link through the GISDK script included in the model. The script considers a number of roadway attributes in the calculation of both speed and capacity including:

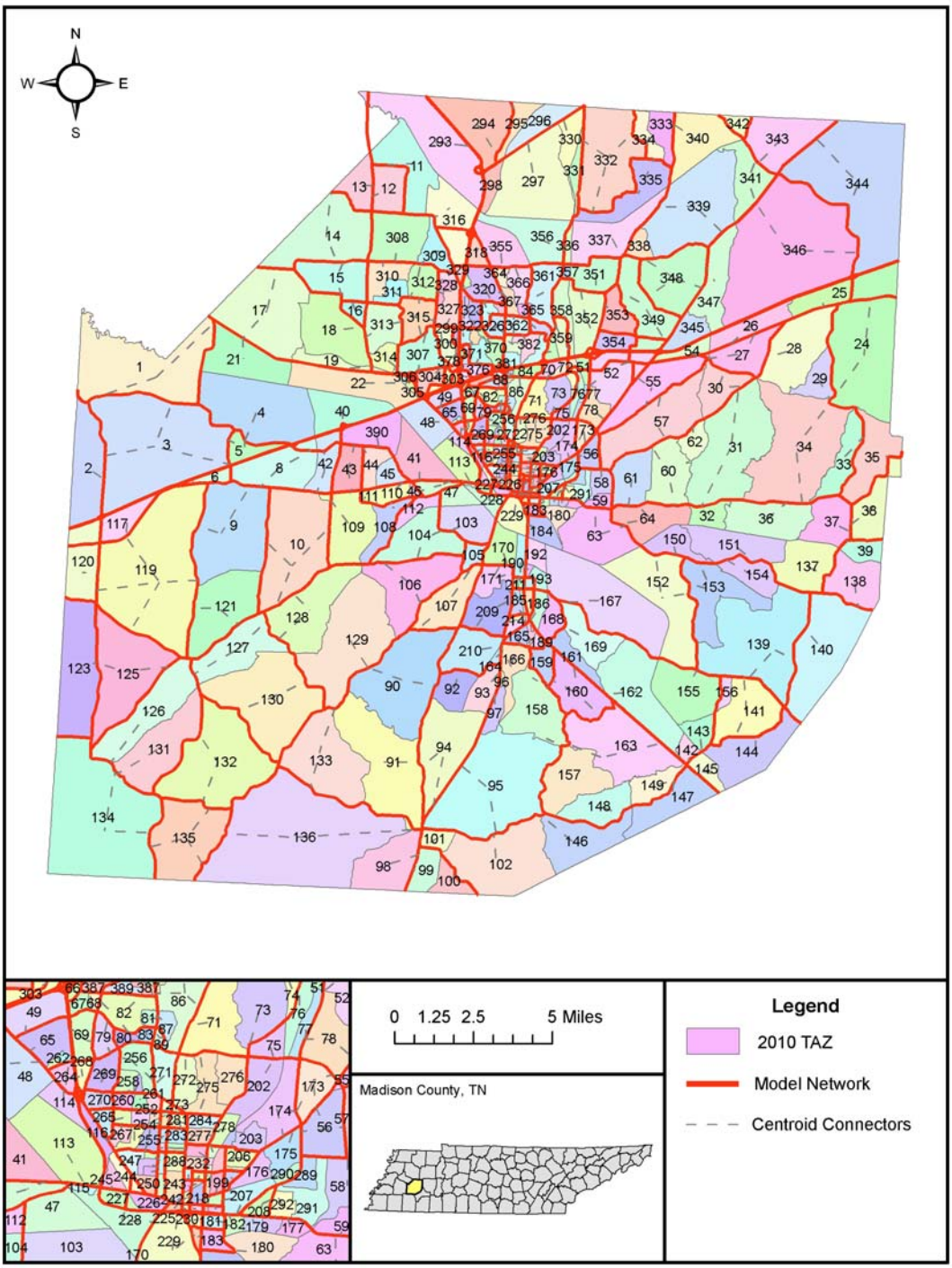
- Free Flow Speed
  - Posted Speed
  - Functional Classification
  - Rural / Urban
- Capacity
  - Functional Classification
  - Rural / Urban
  - Number of Lanes
  - Lane Width
  - Heavy Vehicle Percentages
  - Median Presence
  - Shoulder Width

Centroid Connectors

Centroid connectors are the linkage between the TAZs and roadway network and play an important role in the assignment of trips in a model. As part of the roadway network update, a review of the 2005 roadway network was conducted. One key item noted during this review was the high number of centroid connectors that resulted in zero volume during the traffic assignment step. This was an indication that fewer connectors were needed to run an assignment within TransCAD. Also, loadings from centroid connectors were reviewed against the latest aerial of the area and centroid loading pattern for peripheral large zones were modified to reasonably reflect the underlying land use growth and the latest network access pattern. The 2010 TDM network has 2,212 records, of which 602 are centroid connector links.

The final line layer, including centroid connectors, is shown in **Figure 3**, overlaid on a map of the TAZ boundaries.

Figure 3: Madison County Model Highway Lines



TRIP GENERATION

The trip generation model estimates the number of person trips to and from each TAZ in terms of trip ends. The estimation is based upon the land use properties and demographic characteristics of the TAZs. Trip ends are classified into productions and attractions. A trip production is defined as the home end of a home-based trip or the origin of a non-home-based trip. A trip attraction is defined as the non-home end of a home-based trip or the destination of a non-home-based trip. A home-based trip is made when a person travels from home to the non-home end of the trip or vice versa. For example, if a person travels from home to work and then from work to home on a certain day, that person would be considered to have two home-based work trip productions at his or her home and two home-based work trip attractions at his or her work location. A trip with neither of its ends made at home is called a non-home-based trip.

Like many metropolitan area transportation models this size, trips in the Jackson Area MPO TDM are stratified by seven (7) trip purposes:

1. Home-Based Work (HBW), by four different income classes: 1, 2, 3, and 4
2. Non-Home-Based Work (NHBW)
3. Home-Based Other (HBO)
4. Non-Home Based (NHB)
5. Home-Based School (HBSC)
6. Home-Based Shopping (HBSH)
7. Non-Home Based Other (NHBO)

The trip generation model estimates trip productions and attractions based upon the zonal information of households, population, and multiple employment sectors. The trip generation model is comprised of two components – a trip production model and a trip attraction model. These are described in the following sections.

Trip Production Model

The trip production model is a cross-classification model that considers different variables depending on the type of trip to be generated. This includes:

- Work
  - Vehicles/Household
  - Workers/Household
- Non-Work
  - Vehicles/Household
  - Household Size
- School
  - Vehicles/Household
  - Students/Household

The trip production model was not changed from the 2005 version of the model.

Trip Attraction Model

The trip attraction model computes the trip ends that are associated with the non-home end of a trip. The model considers each of the ten employment categories in that zone as part of the trip attraction rate. In addition to the employment types, the presence of households and schools in that zone has an impact on the number of trips attracted to that zone. The model considers the same trip purposes as the trip generation model.

As with the trip production rates, a review of the trip attraction model was conducted as part of the model update. The same trip attraction model was retained for the 2010 model update and did not include adjustment to the trip attraction rates.

External Trips

External stations are links within a model that represent key roadways on the edge of that modeled area. Typically, these roadways have a lower functional classification such as a freeway or arterial, but may contain key collectors.

External trips are considered those trips that enter or exit the system on an external station. In the Jackson Area MPO TDM, external trips consist of external-internal (E-I) trips and external-external (E-E) trips. E-E trips are pass-by or through trips of the model area (or Madison County). E-I trips have one end of the trips either originating from or ending in destinations inside Madison County.

A review of the E-E and E-I trips for the 2005 Jackson Area MPO TDM was conducted. External-external and external-internal productions were estimated using traffic counts at the external stations. The total trip productions at an external station include both the external-external and external-internal trip productions and are equal to the one-way traffic volume at the station.

Typically, the external-external portion of an origin-destination (OD) matrix is developed based upon some external cordon surveys, in which the relationship of external-internal and external-external trips at the external stations is determined. For the Jackson Area MPO TDM, the Tennessee Statewide Model was used and serves a seed trip table in the model stream.

E-E/E-I trips also considered trucks within the model as part of the 2005 model development. The truck trips were obtained from the Tennessee Statewide Model. As a result, a truck E-E trip matrix is included as part of the model files.

In addition to the information provided from the Tennessee Statewide Model, NCHRP 365 was consulted on guidance related to calculating E-E and E-I trips. Using the specific location shares and the traffic data, E-E productions and E-I attractions were calculated and are shown in **Table 4**.

Figure 4: External Stations Orientation

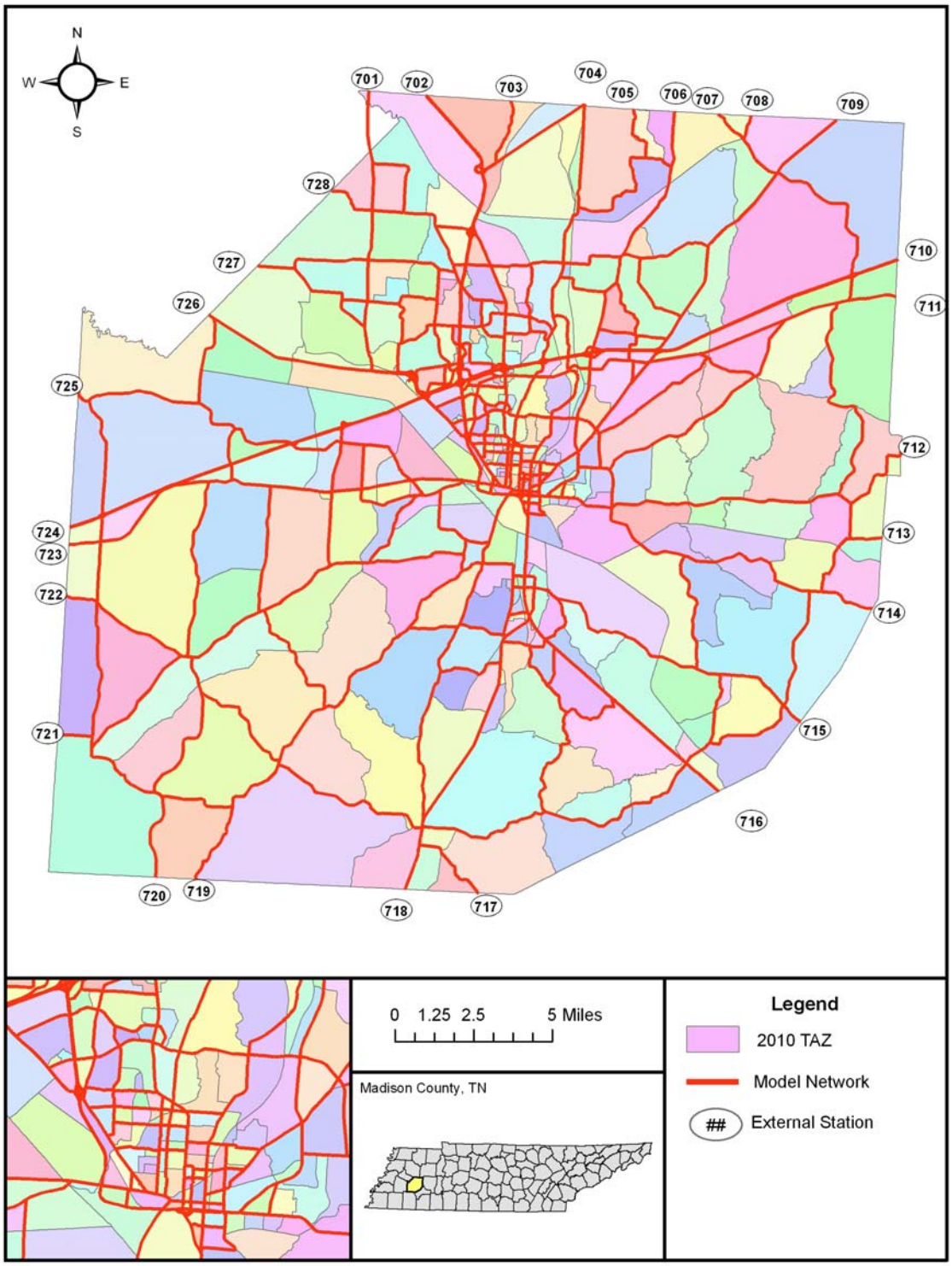


Table 4: Traffic Counts and Estimates of External Trips at External Stations

External Station	Description	Facility Type	Total Daily Traffic Volume*	External-External Productions#	External-Internal Productions^
701	Windy City Road	Non-freeway	1,310	0 (0%)	1,310 (100%)
702	US 45 W	Non-freeway	12,490	2,179 (17%)	10,311 (83%)
703	Antioch Road	Non-freeway	615	0 (0%)	615 (100%)
704	Jackson Hwy	Non-freeway	15,702	4,692 (30%)	11,010 (70%)
705	Friendship Rd	Non-freeway	200	0 (0%)	200 (100%)
706	Christmasville Rd	Non-freeway	1,274	0 (0%)	1,274 (100%)
707	SR 152	Non-freeway	1,733	0 (0%)	1,733 (100%)
708	Lavina Rd	Non-freeway	712	0 (0%)	712 (100%)
709	Whitehall St	Non-freeway	3,331	212 (6%)	3,119 (94%)
710	I-40	Freeway	34,652	31,409 (91%)	3,243 (9%)
711	US 412	Non-freeway	9,351	786 (8%)	8,565 (92%)
712	White Fern Rd	Non-freeway	680	0 (0%)	680 (100%)
713	Luray Rd	Non-freeway	512	0 (0%)	512 (100%)
714	Mifflin Rd	Non-freeway	1,230	0 (0%)	1,230 (100%)
715	Harts Bridge Road	Non-freeway	1,434	0 (0%)	1,434 (100%)
716	US 45	Non-freeway	16,908	4,023 (24%)	12,885 (76%)
717	Lowery Road	Non-freeway	496	0 (0%)	496 (100%)
718	SR 18	Non-freeway	6,001	671 (11%)	5,330 (89%)
719	Uptonville Road	Non-freeway	155	0 (0%)	155 (100%)
720	SR 138	Non-freeway	830	0 (0%)	830 (100%)
721	Batchlors Loop	Non-freeway	200	0 (0%)	200 (100%)
722	Demark-Leighton Rd	Non-freeway	202	0 (0%)	202 (100%)
723	US 70	Non-freeway	2,417	0 (0%)	2,417 (100%)
724	I-40	Freeway	38,869	32,090 (83%)	6,779 (17%)
725	Lower Brownsville Rd	Non-freeway	347	0 (0%)	347 (100%)
726	US 412	Non-freeway	14,085	4,690 (33%)	9,395 (67%)
727	Old Bells Rd	Non-freeway	1,109	0 (0%)	1,109 (100%)
728	Harris Grove Rd	Non-freeway	838	0 (0%)	838 (100%)

* 2010 ADT counts
# External-external productions are the same as external-external attractions
^ External-internal productions are the same as internal-external attractions
Note: Percentages represent the percent split between External-External and External-Internal for each zone.

Balancing Trip Productions and Attractions

Trip productions and attractions were balanced and input into the trip distribution model. This means that the total estimated 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. This was accomplished by scaling either the zonal productions or attractions to the regional control totals.

Table 5 shows the total trip productions and attractions before and after balancing.

Table 5: Regional Trip Productions and Attractions				
	Before Balancing		**After Balancing**	
Trip Purposes	**Productions**	**Attractions**	**Productions**	**Attractions**
Home-Based Work (Total) Trips	60,069.71	88,023.88	60,069.71	60,069.70
Home-Based Work (HBW1) Trips	15,739.01	14,684.12	15,739.90	15,739.90
Home-Based Work (HBW2) Trips	15,966.02	21,820.24	15,966.02	15,966.02
Home-Based Work (HBW3) Trips	9,939.37	20,371.55	9,939.37	9,939.37
Home-Based Work (HBW4) Trips	18,425.30	30,817.65	18,425.30	18,425.30
Home-Based Non-Work (HBNW) Trips	25,572.08	54,875.77	25,572.08	25,572.08
Home-Based Other (HBO)	14,3228.58	136,742.45	14,3228.58	143,228.58
Home-Based Shopping (HBSH)	35,686.40	17,224.70	35,686.40	35,686.40
Non-Home Based Other (NHBO)	79,333.89	54,203.15	79,333.89	79,333.89
Home-Based School (HBSC)	47,455.96	16,361.00	47,455.96	47,455.96

TRIP DISTRIBUTION

Trip distribution "distributes" or "links up" trip ends (or trip productions and trip attractions) to create trip tables. The Jackson Area MPO TDM trip distribution model uses the ***gravity model,*** the most common form of model used for trip distribution. The assumptions of the gravity model are that

1. The trip making between two TAZs is directly proportional to the number of trip productions in the production zone and the number of trip attractions in the attraction zone, and
2. The trip making between two TAZs is inversely proportional to the spatial separation, called impedance, of the zones.

The form of the gravity model is

$$T_{ij} = P_i A_j f_{ij} \Big/ \sum_{j=1}^{n} A_j f_{ij}$$

where T_{ij} = the number of trips from zone i to j
P_i = the number of trip productions of zone i
A_j = the number of trip attractions of zone j
f_{ij} = friction factor between zones i and j

The friction factor is an inverse function of travel impedance (or cost of travel such as travel time and distance). In the MPO TDM, travel time is the impedance. It means the friction factor decreases when the travel time from i to j increases.

Impedance Matrix

A travel time impedance matrix was built for each ij pair by tracing the shortest free-flow travel time path in the highway network from the centroid of zone i to the centroid of zone j. The accumulated time values were placed in a table called skim.

Since no path could be built when i equals j, intra-zonal travel time in the skim matrix was computed by taking half of the average of travel time from zone i to its three closest zones. For example, if the average of the travel time to the three closest zones is 1.5 minutes (average of 1.1, 1.5 and 2.0). The intra-zonal travel time of zone 3 is 0.75 (1.5*0.5).

Friction Factors

The friction factor is an inverse function of travel time and it is unique by trip purpose. The preliminary gamma function parameters as recommended by NCHRP 365 were used in the 2005 model calibration process.

For the 2010 model update, the trip distribution component of the 2005 Jackson Area MPO TDM was reviewed. The most significant change was an adjustment to the HBSC distribution model. In the original model, this step was skipped due to convergence errors with existing friction factors. Therefore, the friction factors were updated to a gamma function to remove this error.

TRIP BALANCING

The trip tables resulted from the trip distribution model are in production-attraction format. These trip tables were merged into one and balanced. An origin-destination (OD) trip table was computed as

$$OD = (PA + AP) * 0.5$$

where OD = origin-destination trip table
PA = production-attraction trip table of all trip purposes
AP = transpose of the PA trip table

Once the hourly trip table was converted, trips were converted from person trips to vehicle trips based on vehicle occupancy rates from NCHRP 365. Occupancy rates used by trip purpose are as follows:

- Home Based Work (HBW) - 1.11
- Home Based Non-Work (HBNW) - 1.67
- Non-Home Based (NHB) - 1.66

TRIP ASSIGNMENT

Trip assignment is the last step in the travel demand modeling chain. It simulates the routes to be traveled between each origin and destination pair in a given highway network. Route choice is determined based upon travel cost. In the Jackson Area MPO TDM model, time is cost. Link travel time is estimated by a set of volume-delay functions, which are in the form of the Bureau of Public Roads (BPR) curve and varies by facility type.

The model output stored in the network files provides results for multiple time periods:

- Daily
- AM Peak Period
- Midday Peak Period
- PM Peak Period

Volume-Delay Functions

Link travel time is determined by the volume-delay functions. These functions are sometimes called "speed-flow curves". As the volume of traffic on a roadway increases toward its capacity, the average speed declines to below the free flow speed. This indicates the degree of expected congestion, and affects the ultimate travel patterns assigned to roadways. The volume-delay functions are in the form the BPR curve. The general formula is:

$$T = T0 * (1+a*(v/c)^b)$$

where	T	is congested travel time
	T0	is travel time at free flow speed
	v	link assigned volume
	c	capacity
	a, b	BPR coefficients

The speed of a roadway is estimated based on the ratio of peak hour volume to capacity.

$$\text{Peak Hour Travel Speed} = (\text{Free Flow Speed}) / (1 + a\,(v/c)^b)$$

For this model, the BPR coefficient varied by factors including: facility type, functional classification, presence of a traffic signal, and number of lanes. Values of BPR coefficient "a" ranged from 0.05 to 0.88 while values for BPR coefficient "b" ranged from 2.1 to 10.0.

MODEL VALIDATION

The Jackson Area MPO TDM was validated to observed traffic volumes in Madison County. The traffic count data included the 2010 average daily traffic (ADT), provided by the Tennessee Department of Transportation (TDOT) as part of the State's annual traffic count program. For comparison purposes, the traffic counts were manually added to 241 highway links. The links where observed traffic counts are available are displayed in the highway network shown in **Figure 5**.

Three measures of statistics were used in the validation test.

1. The correlation of traffic counts to assigned volumes
2. The percent root mean square of the error (RMSE)
3. The percent difference of observed counts versus assigned volumes

The scattergram in **Figure 6** depicts the correlation between the observed counts and assigned volumes. A 45° line, which indicates perfect correlation, is also plotted in the diagram for comparison purposes. The correlation

coefficient, R^2, was approximately 0.95. The trend line indicates that the model tends to underestimate volumes on all functional classes when compared to actual ADT counts.

Table 6 provides a comparison of observed traffic counts (ADT) conducted by TDOT to assigned volumes from the Jackson Area MPO TDM by functional classification. As shown, the overall percent deviation is around -0.2. Related to the Interstate links, the model slightly underassigns. Similarly, other principal arterials slightly underassign within the model. With respect to Federal Highway Administration (FHWA) targets of percent deviation, the model falls within the specified target for each classification.

Table 7 is similar to Table 6 with the exception that the functional classification is expanded to include urban and rural links. As shown, each classification falls within the FHWA target. In addition, the overall %RMSE is less than 25%.

Table 8 provides a comparison of percent deviation in actual traffic count data (ADT) to assigned volumes by volume group. As shown, the model assignment is 0.2% less than the summation of traffic counts. All percent deviation targets set by FHWA are met.

Table 9 is similar to Table 8 except %RMSE is examined by volume group. As shown, the %RMSE is within range for all volume groups.

Figure 5: Highway Links with 2010 Observed Traffic Counts Available

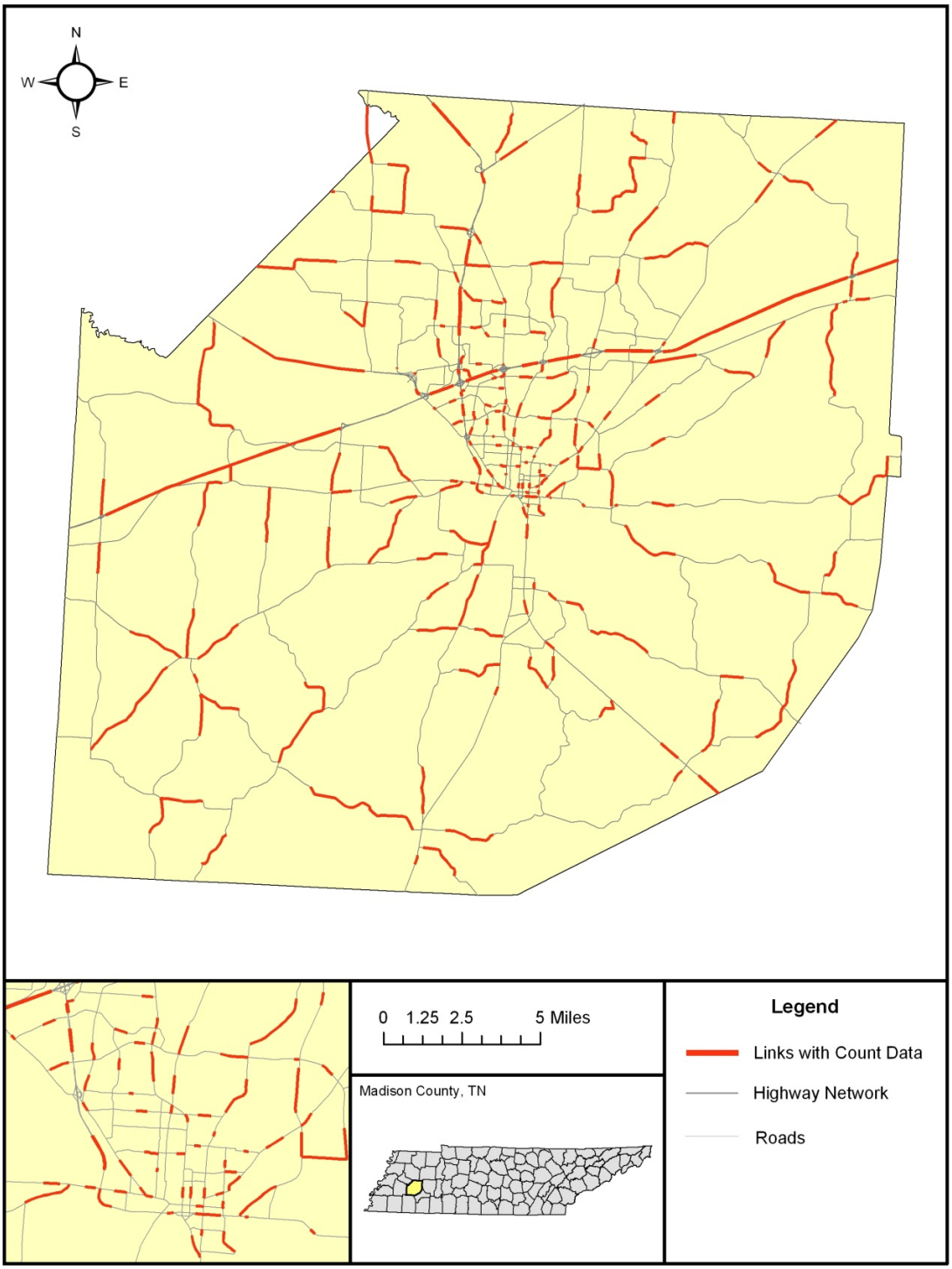


Figure 6: Assigned Traffic Volumes versus Observed Traffic Counts

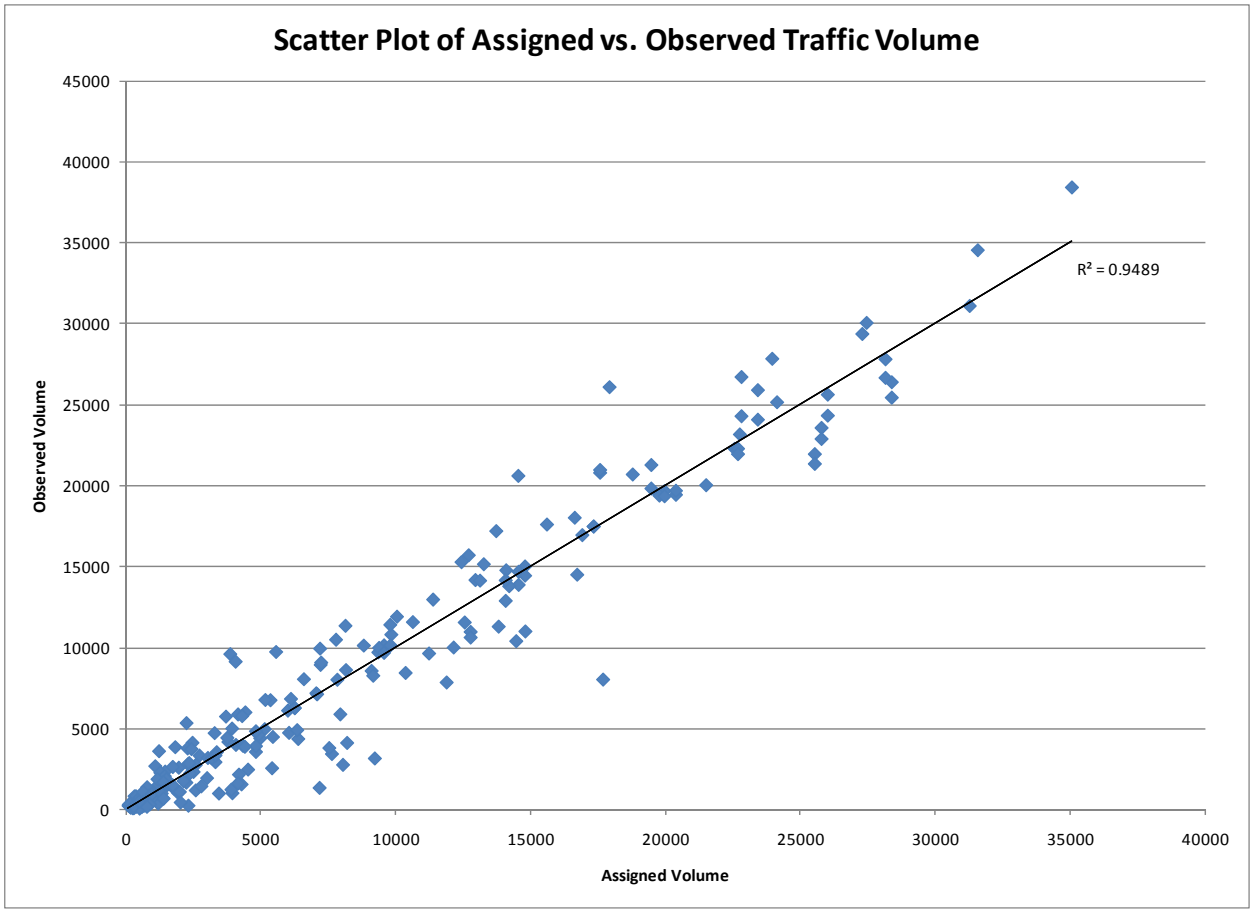


Table 6: Comparison of Observed to Assigned Volumes by Functional Classifications

Functional Class	# of Links	Count Sum	Model Sum	% Deviation Model	% Deviation FHWA Target*	Count Average	Model Average
Interstate	18	416,880	398,599	-4.4%	+/- 7%	23,160	22,144
Other Principal	38	638,700	627,269	-1.8%	+/- 10%	16,808	16,507
Minor Arterial	61	608,610	639,049	5.0%	+/- 15%	9,977	10,476
Collector	110	226,323	225,626	-0.3%	+/- 25%	2,057	2,051
Local	14	29,320	24,620	-16.0%	NA	2,094	1,759
Total	**241**	**1,919,833**	**1,915,163**	**-0.2%**	**NA**	**7,966**	**7,947**

Table 7: Comparison of Observed to Assigned Volumes by Urban and Rural Functional Classifications

Functional Class	# of Links	Count Sum	Model Sum	% Deviation Model	% Deviation FHWA Target*	% RMSE Model
Rural Interstate	8	154,880	151,825	-2.0%	+/- 7%	2.7%
Rural Other Prin. Art.	8	103,430	104,479	1.0%	+/- 10%	4.7%
Rural Minor Arterial	9	53,520	59,027	10.3%	+/- 15%	21.8%
Rural Major Collector	19	25,370	29,422	16.0%	+/- 25%	44.4%
Rural Minor Collector	54	43,450	46,657	7.4%	+/- 25%	54.6%
Rural Local	4	4,770	3,740	-21.6%	NA	33.5%
Urban Interstate	10	262,000	246,774	-5.8%	+/- 7%	6.9%
Urban Principal Art.	30	535,270	522,790	-2.3%	+/- 10%	15.1%
Urban Minor Arterial	52	555,090	580,022	4.5%	+/- 15%	27.7%
Urban Collector	37	157,503	149,547	-5.1%	+/- 25%	47.1%
Urban Local	10	24,550	20,880	-14.9%	NA	38.5%
Total	**241**	**1,919,833**	**1,915,163**	**-0.2%**	**NA**	**24.3%**

Table 8: Percent Difference for Daily Volumes for Individual Links

Volume Group	# of Links	Count Sum	Model Sum	% Deviation Model	% Deviation FHWA Target*
< 1000	49	23,413	22,597	-3.5%	+/- 200%
1,000 - 2,500	44	73,180	83,187	13.7%	+/- 100%
2,500 - 5,000	35	134,610	130,679	-2.9%	+/- 50%
5,000 - 10,000	40	299,730	285,984	-4.6%	+/- 25%
10,000 - 25,000	58	968,560	983,459	1.5%	+/- 20%
25,000 - 50,000	15	420,340	409,257	-2.6%	+/- 15%
> 50,000	0	-	-	-	+/- 10%
Total	**241**	**1,919,833**	**1,915,163**	**-0.2%**	

Table 9: Comparison of %RMSE by Volume Group

Volume Group	# of Links	Count Sum	Model Sum	% RMSE Model	% RMSE TDOT Target
< 5000	128	231,203	236,463	65.0%	115.8%
5,000 - 10,000	40	299,730	285,984	32.2%	43.1%
10,000 - 15,000	28	366,650	363,568	18.0%	28.3%
15,000 - 20,000	17	308,440	317,292	18.9%	25.4%
20,000 - 30,000	25	615,910	607,831	8.8%	30.3%
30,000 - 50,000	3	97,900	104,025	7.9%	19.2%
Total	**241**	**1,919,833**	**1,915,163**	**24.3%**	

Appendix B

Freight Survey

Jackson Area Freight Survey

PURPOSE

The Jackson Area Metropolitan Planning Organization (MPO) is preparing an update to the Long Range Transportation Plan (LRTP) for the City of Jackson and Madison County, Tennessee. An important element of the plan is the identification of ways to improve the movement of goods in the region. The following survey is being sent to freight transportation stakeholders in the Jackson Area. The responses to this questionnaire will be used to determine current and future freight infrastructure and service needs.

Your responses are important to us, and will be used to make sure that recommended improvements best suit the needs of local businesses and other users of the freight system.

Please enclose your responses in the envelope provided and mail (surveys can also be scanned and emailed) to the following address by Wednesday, January 25:

Keith Donaldson
Transportation Planning Coordinator, Jackson Area MPO
111 East Main Street, Suite 201
Jackson, TN 38301
Email: kdonaldson@cityofjackson.net

If you have any questions, please feel free to contact Keith Donaldson at (731) 425-8275 or at the e-mail address listed above.

Background

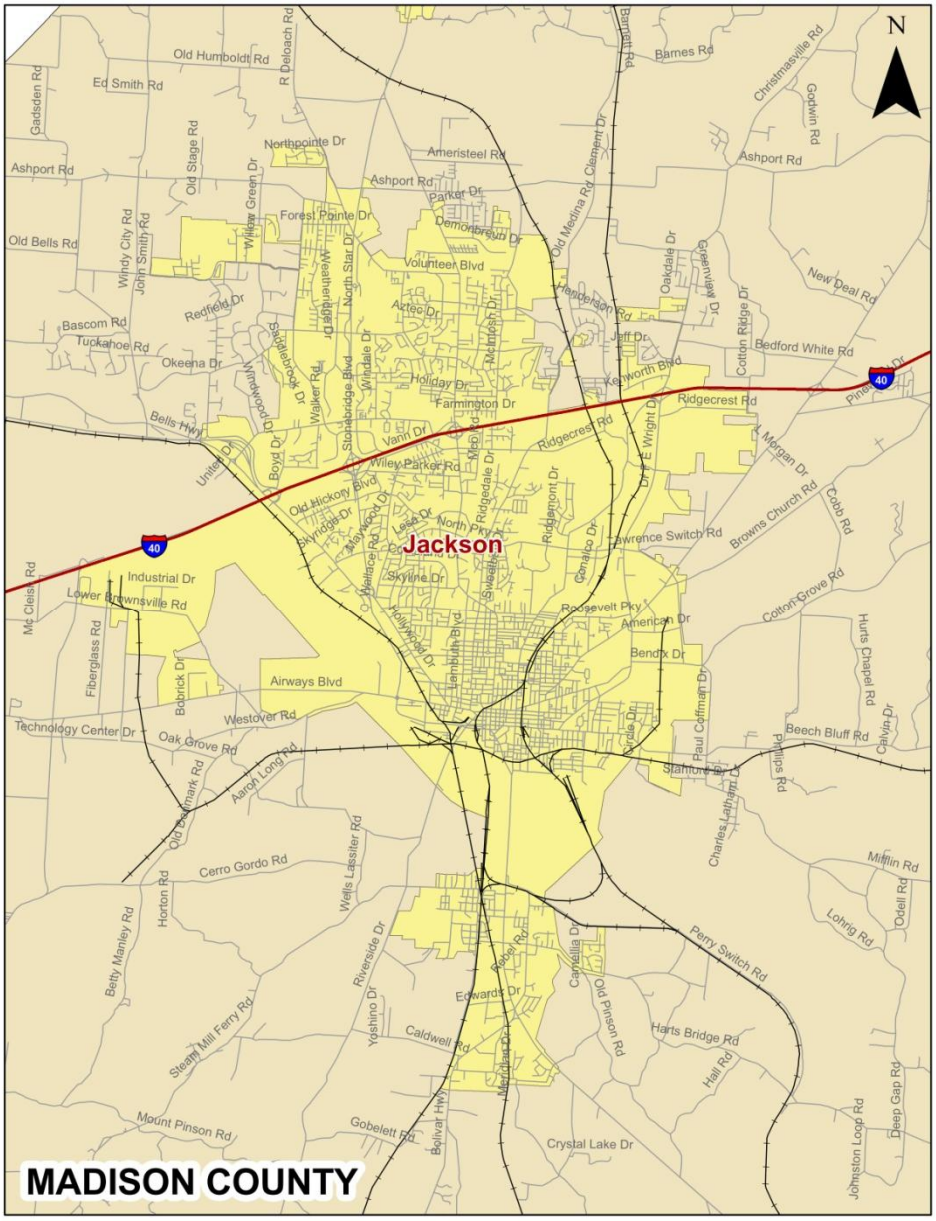
A. Please provide the following information about your company/business:

Company Name: _____ Name: _____
(of individual completing this survey)

Company Address: _____ Telephone: _____

_____

B. Please mark the location of your business on the map below.



B. Briefly describe your company/business (i.e. what type of products/materials are shipped to/from your business, what products do you distribute within the area).

_____

_____

_____

_____

_____

Transportation System

A. Based on the most recent year available, what was the approximate tonnage that your company either shipped or received:

Shipped: _____

Received: _____

Year of data _____

B. Please mark the modes of transportation your company uses for the movement of goods, either into, within or out of the area. If known, please also provide an estimate of the percent (by tonnage) of each mode used. Also, if you anticipate any shifts in the modes that will be used in the future (i.e. 2035) movement of goods, please provide that estimate.

Description	2010 Percent	2035 Percent
❒ Truck (e.g., tractor trailer)	____ %	____ %
❒ Barge (via Memphis)	____ %	____ %
❒ Air (via Memphis, Nashville)	____ %	____ %
❒ Rail	____ %	____ %
❒ Intermodal containers	____ %	____ %
❒ LTL	____ %	____ %
❒ Other truck/specialized vehicle	____ %	____ %
❒ Small package/parcel	____ %	____ %
❒ Other: _____	____ %	____ %

Highway Congestion and Other Issues

A. Please indicate whether any of these issues are a significant transportation problem for your business, on a scale of 1 to 5.

	Issue	Not a Problem				Major Problem
A	Locations that are always congested	1	2	3	4	5
B	Locations congested at certain times of day	1	2	3	4	5
C	Frequent Incidents/ Accidents	1	2	3	4	5
D	Maintenance (pavement, sign visibility, etc.)	1	2	3	4	5
E	Sharp turning radius at intersections	1	2	3	4	5
F	Turn lane needed	1	2	3	4	5
G	Inadequate horizontal / vertical clearance	1	2	3	4	5

B. Please mark locations on the enclosed large map where these issues exist, using the appropriate letter from the table above. For example, mark an “A” on any location(s) where daily congestion is a problem for your business, mark “E” at locations where there is a problem with turning radius at intersections, etc.

Please feel free to add comments below about specific locations you mark on the map. For example, if you mark a “B” to indicate that a location is congested at a particular time of day, please provide a short explanation, such as “School zone causes traffic to back up in mid-afternoon.”

Manufacturing/Distribution

A. Does your company have hub (or location) area preferences for certain supply chain operations over others? Why or why not? What are the important factors in selection of logistical hubs (such as population, demographics, business climate, tax incentives, etc.)?

_____

_____

_____

Plans/Trends

A. Are you considering new capital investments in the Jackson Area that may impact the transportation infrastructure?

_____

_____

_____

B. Will you likely consider the Jackson Area for more facilities? For more shipments in, within or out of the area?

_____

_____

_____

C. What infrastructure improvements would you suggest to make the Jackson Area more attractive for the movement and storage of goods?

_____

_____

_____

D. Do you anticipate any significant changes in your choice of transportation mode over the next 5 to 10 years? Why or why not?

_____

_____

_____

E. Any final thoughts we should consider regarding the quality of transport and its impacts on your business decisions for the Jackson Area?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Appendix C

Resource Agency Coordination

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Colonel Vernie L. Reichling Jr.
Commander
U.S. Army Corps of Engineers
Memphis District
167 North Main Street
Memphis, TN 38002

Dear Colonel Reichling:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Ms. Liz Agpaoa
Regional Forester
USDA Forest Service
1720 Peachtree Road NW
Atlanta, GA 30309-2449

Dear Ms. Agpaoa:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Rear Admiral Roy A. Nash
District Commander
Eighth Coast Guard District
Hale Boggs Federal Building
500 Poydras Street
New Orleans, LA 70130

Dear Rear Admiral Nash:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

U.S. Department of Homeland Security

United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314) 269-2382
Fax: (314) 269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mil/d8/westernriversbridges

16591.6/JACKSON RTP
October 4, 2012

Mr. Douglas J. Delaney, AICP
Parsons Brinckerholl
1900 Church Street
Suite 400
Nashville, TN 37203

Subj: JACKSON AREA METROPOLITAN PLANNING ORGANIZATION (MPO), REGIONAL TRANSPORTATION PLAN (RTP)

Dear Mr. Delaney:

Please refer to your letter dated September 5, 2012. We have determined that pursuant to the Coast Guard Authorization Act of 1982, the subject bridges listed under the Regional Transportation Plan (RTP) do not involve bridges over commercially navigable waterways of the United States. Therefore, Coast Guard bridge permits are not required for these projects.

We appreciate the opportunity to comment on the RTP projects.

Sincerely,

ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Mr. Robert Martineau
Commissioner
Tennessee Department of Environment and Conservation
L&C Annex, 1st Floor
401 Church Street
Nashville, TN 37243

Dear Mr. Martineau:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

ROBERT J. MARTINEAU, JR.
COMMISSIONER

BILL HASLAM
GOVERNOR

October 5, 2012

Via First Class Mail and Electronic Mail to delaneyd@pbworld.com

Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, TN 37203
Attention: Douglas J. Delaney, AICP

Mr. Delaney:

Please find enclosed the Tennessee Department of Environment and Conservation's (TDEC) comments on the Jackson Area Metropolitan Planning Organization's update to its Regional Transportation Plan. We appreciate the opportunity to comment on the update and plan; however, detailed comments regarding anticipated impacts to particular resources under TDEC's jurisdiction are difficult given the general scope and discussion included in the update and plan. Therefore, please consider the following general comments:

As transportation projects are developed, impacts to aquatic resources should be considered in detail, including streams, rivers, wetlands and floodplain areas. Page 12-3 of the pages included in your correspondence specifically refers to wetlands and floodplains.

Page 12-6, Environmental Mitigation Strategies indicates that "[m]etropolitan and statewide transportation plans must include a discussion of types of potential mitigation activities as part of their plans." The following text goes on to discuss certain strategies that may be applied in the development of a transportation project, including Context Sensitive Solutions, and steps that may be taken in the project development process regarding environmental impacts. While TDEC generally supports these strategies and processes in transportation project development, they do not represent a discussion of potential environmental mitigation activities.

For most transportation projects involving the Tennessee Department of Transportation, TDEC coordinates review and comment regarding resource impacts for those particular projects pursuant to the Tennessee Environmental Streamlining Agreement (TESA) in partnership and coordination with various other state and federal agencies. For those applicable projects in Jackson's update and plan, TDEC will continue provide detailed review and comment pursuant to TESA.

In order to provide some information regarding resources, we have reviewed the state's natural heritage database in regard to Madison County, and we find that the following rare species have been observed previously in Madison County or within two miles of its border:

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Invertebrate Animal	*Fallicambarus hortoni	Hatchie Burrowing Crayfish	G1	S1	--	E	Primary burrower; uses saturated or seasonally saturated soils associated with permanent bodies of water; Mississippi River tributaries, Coastal Plain.
Other (Ecological)	Heron rookery	Heron Rookery	GNR	SNR	--	Rare, Not State Listed	
Vascular Plant	*Acmella oppositifolia	Creeping Spot-flower	G5	S3	--	S	Swamps And Wetlands
Vascular Plant	*Carex lacustris	Lake-bank Sedge	G5	S1	--	T	Alluvial Woods
Vascular Plant	*Helianthus verticillatus	Whorled Sunflower	G1Q	S1	C	E	Edge Of Creeks And Fields
Vascular Plant	*Iris brevicaulis	Lamance Iris	G4	S1	--	E	Bottomlands
Vascular Plant	*Iris fulva	Copper Iris	G5	S2	--	T	Bottomlands
Vascular Plant	Panax quinquefolius	American Ginseng	G3G4	S3S4	--	S-CE	Rich Woods
Vascular Plant	Schisandra glabra	Red Starvine	G3	S2	--	T	Rich Mesic Woods, Bluffs
Vascular Plant	Utricularia inflata	Inflated Bladderwort	G5	S1	--	S	Ponds, Lake Margins
Vertebrate Animal	Ammocrypta beani	Naked Sand Darter	G5	S2	--	D	Shifting sand bottoms & sandy runs; Hatchie River & larger tribs.
Vertebrate Animal	Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S3	--	D	Caves, hollow trees, abandoned buildings; often associated with forested areas.
Vertebrate Animal	Cycleptus elongatus	Blue Sucker	G3G4	S2	--	T	Swift waters over firm substrates in big rivers.
Vertebrate Animal	Etheostoma pyrrhogaster	Firebelly Darter	G2G3	S2	--	D	Sand- and gravel-bottomed pools of headwaters, creeks, and small rivers; upper Coastal Plain; west Tennessee.

Type	Scientific Name	Common Name	Global Rank	St. Rank	Fed. Prot.	St. Prot.	Habitat
Vertebrate Animal	Noturus gladiator	Piebald Madtom	G3	S3	--	D	Large creeks & rivers in moderate-swift currents with clean sand or gravel substrates; Mississippi River tributaries.
Vertebrate Animal	*Sorex longirostris	Southeastern Shrew	G5	S4	--	D	Various habitats including wet meadows, damp woods, and uplands; statewide.
Vertebrate Animal	*Synaptomys cooperi	Southern Bog Lemming	G5	S4	--	D	Marshy meadows, wet balds, & rich upland forests.
Vertebrate Animal	Zapus hudsonius	Meadow Jumping Mouse	G5	S4	No Status	D	Open grassy fields; often abundant in thick vegetation near water bodies; statewide.

We provide this list as a point of reference for projects that may be conducted under the Jackson Area MPO 2040 Long Range Transportation Plan. Individual species that may be encountered will need further review as specific actions are planned and implemented. By no means will each of the above species receive consideration for every project, but note that other rare taxa may be added during the ensuing years. We note that the plan addresses both wetlands and endangered species as a consideration at the project level, and have highlighted (*) those taxa above that may merit examination in areas with hydric soils.

Of particular note is the state-endangered Hatchie burrowing crayfish (*Fallicambarus hortoni*), reported from a wetland feeding a tributary to the South Fork Forked Deer immediately south of Madison County. This species potentially is well distributed throughout the MPO, and likely will remain a conservation target for the foreseeable future. The U.S. Fish & Wildlife Service (USFWS) has been petitioned to list *F. hortoni* as an endangered species under the Endangered Species Act.

We ask that the MPO coordinate individual transportation projects with the Tennessee Wildlife Resources Agency (Rob Todd, rob.todd@tn.gov, 615-781-6577) to ensure that legal requirements for protection of state listed rare animals are addressed. Additionally, we ask that the MPO contact the USFWS Field Office, Cookeville, Tennessee (931-525-4970) for comments regarding federally listed species. For stabilization of disturbed areas, TDEC's Tennessee Natural Heritage Program advocates the use of native trees, shrubs, and warm season grasses, where practicable. Care should be taken to prevent re-vegetation of disturbed areas with plants listed by the Tennessee Exotic Pest Plant Council as harmful exotic plants: http://www.tneppc.org/.

In order to better assist with determining whether rare species are located on a given development site, TDEC's Tennessee Natural Heritage Program has implemented a publicly accessible website where rare species data lists by county, quadrangle, watershed, and MS4 boundaries can be obtained:http://environmentonline.state.tn.us:8080/pls/enf_reports/f?p=9014:3:3875605994273657.

These comments represent a general review of the update and plan, but do not represent a review and analysis of the specific projects noted in the tables included in Chapter 10. The issuance of this letter does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations.

Please contact me should you have any questions regarding these comments.

Sincerely,

Michelle B. Walker
Director, Office of Policy and Planning
Phone: (615) 532-9668

cc: Mary Parkman, TDEC, Office of General Counsel

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Mr. David Vela
Regional Director
National Park Service
100 Alabama Street, SW
1924 Building
Atlanta, GA 30303

Dear Mr. Vela:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Mr. Tom Kilgore
President and Chief Executive Officer
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902-1499

Dear Mr. Kilgore:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

October 1, 2012

Mr. Douglas J. Delaney, AICP
Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, Tennessee 37203

Dear Mr. Delaney:

This is in response to your September 5, 2012 letter requesting comments on the Jackson Area Metropolitan Planning Organization's (MPO) Regional Transportation Plan (RTP). We do not have any specific comments on the planning document.

Thank you for the opportunity to comment on the Jackson Area Metro Planning Organization's RTP.

Sincerely,

John W. Myers
Director, Environmental Policy and Regulatory Affairs

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Ms. Gwendolyn Keyes Fleming
Regional Administrator
United State Environmental Protection Agency
Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Dear Ms. Fleming:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Delaney, Douglas

From: Larry Long [Long.Larry@epamail.epa.gov]
Sent: Tuesday, October 02, 2012 12:49 PM
To: Delaney, Douglas
Subject: RE: Jackson Area MPO - DRAFT Regional Transportation Plan

Doug:
I am looking over your MPO and several of these projects I have or will be commenting on through the TESA process. I think that it would be best to keep comments going through the TESA process. I can send you a copy of my comments on these projects as we progress through the TESA review process if you like, but making a separate comment would be a duplication of efforts. Several of the projects listed would not require an EA or EIS for which we comments. Some of these projects might be as simple as a categorical exclusion (CATEX) for which TDOT will make the decision.

Larry Long
NEPA
Office of Policy and Management
EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303
404-562-9460
404-562-9598(FAX)
long.larry@epa.gov

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From: "Delaney, Douglas" <delaneyd@pbworld.com>
To: Larry Long/R4/USEPA/US@EPA
Cc: Keith Donaldson <KDonaldson@cityofjackson.net>, "Stevens, Jeanne E." <stevensje@pbworld.com>, "Kendall, Michelle" <Kendall@pbworld.com>
Date: 09/24/2012 12:13 PM
Subject: RE: Jackson Area MPO - DRAFT Regional Transportation Plan

---

Larry,

That date should be fine. I would appreciate if you could email Keith (kdonaldson@cityofjackson.net) and copy me with any questions or comments.

Thanks,
Doug.

From: Larry Long [mailto:Long.Larry@epamail.epa.gov]
Sent: Monday, September 24, 2012 9:18 AM
To: Delaney, Douglas
Subject: RE: Jackson Area MPO - DRAFT Regional Transportation Plan

It usually takes me about two weeks which would make the date Oct. 10th

Larry Long
NEPA
Office of Policy and Management
EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303
404-562-9460
404-562-9598(FAX)
long.larry@epa.gov

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From: "Delaney, Douglas" <delaneyd@pbworld.com>
To: Larry Long/R4/USEPA/US@EPA
Cc: Keith Donaldson <KDonaldson@cityofjackson.net>, "Kendall, Michelle" <Kendall@pbworld.com>, "Stevens, Jeanne E." <stevensje@pbworld.com>
Date: 09/19/2012 01:28 PM
Subject: RE: Jackson Area MPO - DRAFT Regional Transportation Plan

---

Larry,

A short time extension should not pose a problem. What date do you expect to have the review completed by?

Thanks,
Doug.

From: Larry Long [mailto:Long.Larry@epamail.epa.gov]
Sent: Wednesday, September 19, 2012 11:44 AM
To: Delaney, Douglas
Subject: Re: Jackson Area MPO - DRAFT Regional Transportation Plan

Thanks for the link. With my present work load it is unlikely that I will be able to review and comment by Oct 5th being that I just received the information. I did leave a phone message asking for a time extension.

Larry Long
NEPA
Office of Policy and Management
EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303
404-562-9460
404-562-9598(FAX)
long.larry@epa.gov

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If you have received this message in error, please notify the sender immediately by email and delete all copies of the message.

From: "Delaney, Douglas" <delaneyd@pbworld.com>
To: Larry Long/R4/USEPA/US@EPA
Cc: Keith Donaldson <KDonaldson@cityofjackson.net>, "Kendall, Michelle" <Kendall@pbworld.com>, "Stevens, Jeanne E." <stevensje@pbworld.com>
Date: 09/19/2012 12:14 PM
Subject: Jackson Area MPO - DRAFT Regional Transportation Plan

---

Mr. Long,

Keith Donaldson with the Jackson Area MPO asked that I forward the following link to download a copy of the DRAFT Regional Transportation Plan (RTP).

https://ftp.pbworld.com/GetFile.aspx?fn=1795575094.zip

We would appreciate your review and comments on the RTP before **October 5, 2012**.

Please let me know if you have questions, or need any additional information.

Thanks,
Doug.

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, TN 37203
615-340-9193 (office)
615-491-0694 (cell)
delaneyd@pbworld.com

www.pbworld.com

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Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Ms. Mary Jennings
Field Supervisor
Tennessee Field Office
U.S. Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

Dear Ms. Jennings:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

September 24, 2012

Mr. Douglas J. Delaney
Supervising Planner
Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, Tennessee 37203

Subject: FWS# 12-CPA-0798. Regional Transportation Plan for the City of Jackson, Madison County, Tennessee.

Dear Mr. Delaney:

Thank you for your correspondence dated September 5, 2012, requesting a review of the City of Jackson's 2040 Long Range Regional Transportation Plan. The purpose of the document is to identify transportation needs and plan improvements to address those needs. Parsons Brinkerhoff, on behalf of the Jackson Area Metropolitan Planning Organization (MPO), has requested that we provide our agency's concerns. Personnel of the U.S. Fish and Wildlife Service (Service) have reviewed the information submitted and offer the following comments.

The vast majority of the projects in this planning document would likely require some forested clearing. Our office currently considers all forested portions of the State to potentially provide suitable roosting habitats for federally endangered Indiana bats (*Myotis sodalis*). Prior to any tree clearing, we request that a qualified biologist determine whether the removal of trees for the project would result in an adverse effect to this species. A copy of the assessment and findings should be submitted to this office for review and concurrence. A finding of "may affect" could require initiation of formal consultation by the lead federal agency.

The document illustrates on Figure 12-2 that wetlands and floodplains are prevalent throughout the Jackson Area MPO area. The Corps of Engineers and Tennessee Department of Environment and Conservation should be contacted regarding the presence of regulatory wetlands and the requirements of wetlands protection statutes.

If you have any questions regarding our comments, please contact John Griffith of my staff at 931/528-6481 (ext. 228) or by email at *john_griffith@fws.gov*.

Sincerely,

Mary E. Jennings
Field Supervisor

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Mr. Harrell Carter, President
Jackson Madison County NAACP
118 North Church Street
Jackson, TN 38301

Dear Mr. Carter:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Mr. E. Patrick McIntyre, Jr.
Executive Director
Tennessee State Historic Preservation Office
291 Lebanon Road
Nashville, TN 37243-0442

Dear Mr. McIntyre:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

If you have questions or need any additional information, please do not hesitate to contact Mr. Donaldson at (731) 425-8275 or by email at kdonaldson@cityofjackson.net.

Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Mr. Ed Carter
Executive Director
Tennessee Wildlife Resources Agency
Ellington Agricultural Center
440 Hogan Road
Nashville, TN 37204

Dear Mr. Carter:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

We would appreciate your review and comment on the RTP before **October 5, 2012**.

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Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Parsons Brinckerhoff
1900 Church Street
Suite 400
Nashville, TN 37203
Main: 615-327-8514
Fax: 615-327-8529

September 5, 2012

Ms. Nell Huntspon
Executive Director
African American Chamber of Commerce
351 North Royal Street
Jackson, TN 38301

Dear Ms. Huntspon:

On behalf of the Jackson Area Metropolitan Planning Organization (MPO), I am contacting you to let you know that the MPO is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

In accordance with the consultation policy established by the Tennessee Department of Transportation regarding state and federal agency input on transportation improvements, I am requesting your agency's review and comment on the transportation plan. The attached documents provide additional information and an overview of the proposed transportation projects. If you would like to receive a copy of the entire RTP, please feel free to contact Mr. Keith Donaldson, MPO Transportation Planning Coordinator.

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Thank you for helping us to ensure the coordination of transportation planning with environmental sensitivity.

Sincerely,

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff

Appendix D

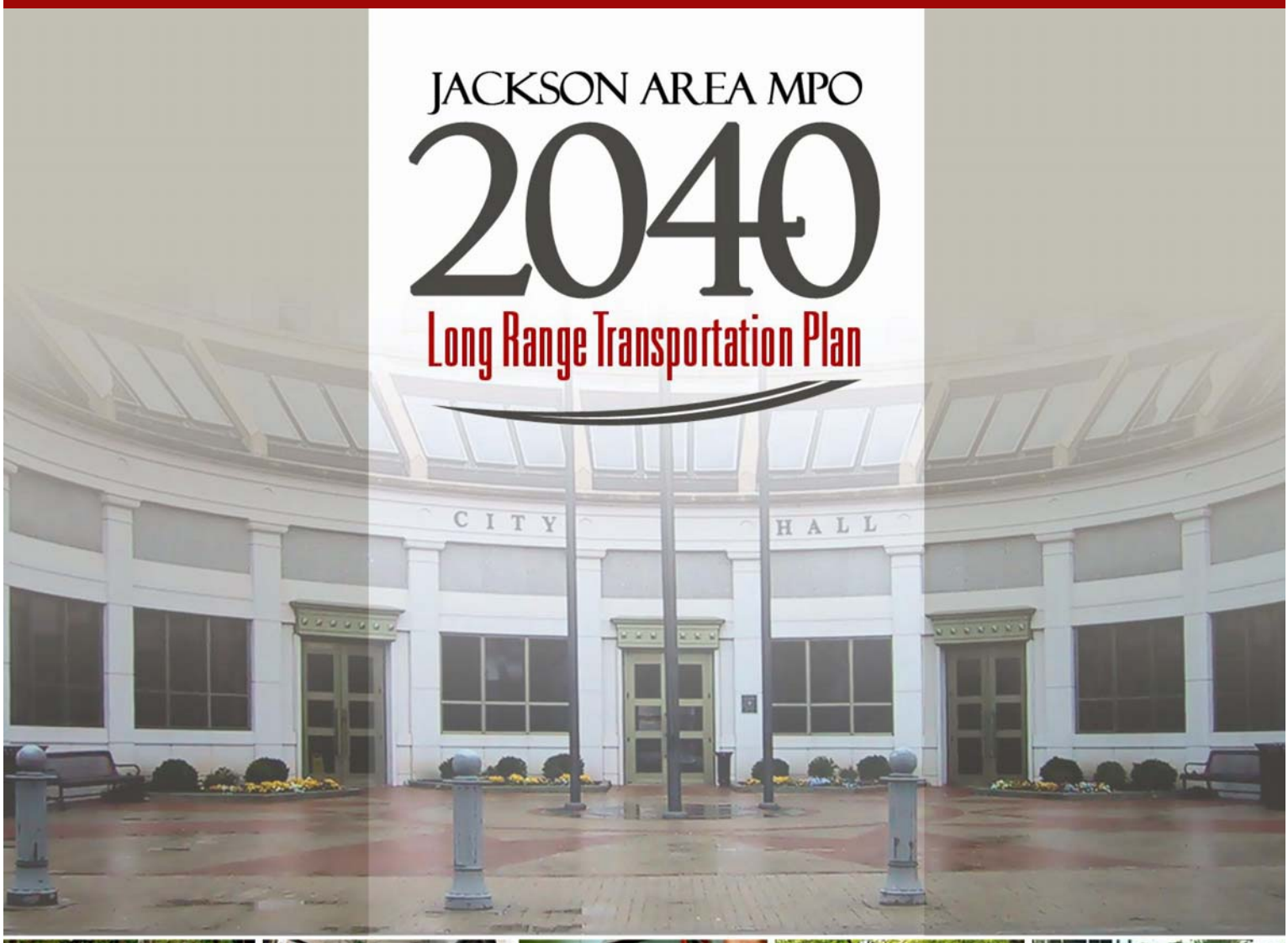
Public Comments

NOTICE OF 2040 LONG RANGE TRANSPORTATION PLAN PUBLIC HEARING

The Jackson Metropolitan Planning Organization will conduct a Public Hearing on the 27th day of November, 2012, in the George A. Smith Meeting Room, City Hall, 109 East Main Street, Suite 107, Jackson, Tennessee, to provide an overview and gather public input on the draft of the Jackson Area 2040 Long Range Transportation Plan.

This hearing will be held from 5:00 p.m. until 7:00 p.m. during which time there will be a short formal presentation and a brief question and answer period. Representatives of the MPO Staff will be present to provide information relative to the general location, design features, and any other matters of interest. The public is invited to ask questions and make comments during the hearing and will be given the opportunity to make their opinions known concerning the plan so that the plan would best serve the public interest.

Written statements and/or comments concerning the plan may be submitted to: Jackson Area Metropolitan Planning Organization, 111 East Main Street, Suite 201, Jackson, Tennessee 38301, e-mailed to kdonaldson@cityofjackson.net, or by telephone at (731) 425-8275.



The Plan is available for review at the following locations:

Planning Department
Jackson City Hall
111 East Main Street
Second Floor

Jackson Madison County Public Library
433 East Lafayette Street

The Plan is also available for review at the following websites:

Jackson Area MPO
www.cityofjackson.net/departments/planning/mpo.html

Jackson Transit Authority
www.ridejta.com

Public Meeting

Tuesday, November 27, 2012

5:00 PM - 7:00 PM

Jackson City Hall

George A. Smith Meeting Room
109 East Main Street, Suite 107

The purpose of the meeting is to provide an overview and gather public input on the

Jackson Area MPO
Long Range Transportation Plan

The Plan is available for review at the following community centers:

Bemis Community Center
12 North Missouri Street

Bennett Community Center
96 Oneal Street

Denmark-West Community Center
535 Denmark Jackson Road

Northside Community Center
2998 North Highland Avenue

South Jackson Community Center
412 Bolivar Highway

T.R. White Sportsplex
304 North Hays Avenue

Westwood Community Center
3 Westwood Gardens Drive

JACKSON AREA METROPOLITAN PLANNING ORGANIZATION

MAYOR JERRY GIST, MPO BOARD CHAIRMAN
STANLEY T. PILANT, MPO STAFF CHAIRMAN
KEITH C. DONALDSON, TRANSPORTATION PLANNING COORDINATOR

October 26, 2012

The Jackson Area Metropolitan Planning Organization (MPO) is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

Copies of the RTP are available for review at the following locations:

Planning Department Jackson City Hall 111 East Main Street Second Floor	**Denmark-West Community Center** 535 Denmark Jackson Road	**T.R. White Sportsplex** 304 North Hays Avenue	**Jackson Area MPO Website** www.cityofjackson.net/ departments/planning/mpo.html
Jackson Madison County Public Library 433 East Lafayette Street	**South Jackson Community Center** 412 Bolivar Highway	**Westwood Community Center** 3 Westwood Gardens Drive	**Jackson Transit Authority Website** www.ridejta.com

The MPO will conduct a Public Hearing from 5:00 PM – 7:00 PM on Tuesday, November 27, 2012, in the George A. Smith Meeting Room, City Hall, 109 East Main Street, Suite 107, Jackson, Tennessee. The purpose of the meeting will be to provide an overview and gather public input on the draft Plan. The public will be invited to ask questions and make comments during the hearing.

Written statements and/or comments concerning the Plan may be submitted to:

Jackson Area Metropolitan Planning Organization
111 East Main Street, Suite 201
Jackson, Tennessee 38301

Comments may also be e-mailed to kdonaldson@cityofjackson.net.

If you have questions or need additional information, please contact Keith Donaldson at (731) 425-8275.

Sincerely,

Keith C. Donaldson
Principal Planner
Transportation Planning Coordinator

MaxTrans
P. O. Box 7625
Jackson, TN 38302-

Area Agency on Aging and Disabilities
27 Conrad Drive
Jackson, TN 38305-

Harry Allen

Wayne Arnold
City of Jackson Fire Dept.
City Hall Mailbox

Steve Bell
Madison County Health Department
804 North Parkway
Jackson, TN 38305-

John Borner
AARP - Tenn

Linda Brumley
BellSouth Telephone Pioneer Volunteers
1513 East Main Street
Humboldt, TN 38343-

Sheila Cantrell
Madison County Highway Department
1529 Westover Road
Jackson, TN 38301-

Vaughn Cassidy
Tennessee Environmental Assistance Center
362 Carriage House Drive
Jackson, TN 38305-

Scott Chandler
Engineering
City Hall Mailbox
Jackson, TN 38301-

Ron Adams
Law Enforcement Center
South Royal Street
Jackson, TN 38301-

Barry Alexander
Neel-Schaffer, Inc.
101 North Highland
Jackson, TN 38305-

Brad Anderson
H&M Architects/Engineers, Inc.
50 Security Drive
Jackson, TN 38305-

Michael Austin
Mayor, City of Medon
P.O. Box 23
Medon, TN 38356-

Jackson Spokes Bike Club
148 Fairmont Avenue
Jackson, TN 38301-

Cindy Brewer
Jackson Madison County Airport Authority

Greyhound/Trailways Bus Line
407 East Main Street
Jackson, TN 38301-

Cherie L. Cash
Affirmative Action Officer Title VI Program TDOT
James K. Polk Building Suite 1800
Nashville, TN 37234-

African-American Chamber of Commerce
351 North Royal Street
Jackson, TN 38301-

Kiwanis Center for Child Development
32 Garland Drive
Jackson, TN 38305-

Marty Clements
Jackson Madison County Emergency Management Agency
234 Institute Street
Jackson, TN 38301-

Lewis Cobb
Attorney at Law
P. O. Box 2004
Jackson, TN 38302-

Danny Cole
Peach Tree Realty
58 Wilmington Cove
Jackson, TN 38305-

Lara Coleman
Jackson Energy Authority
P.O. Box 68
Jackson, TN 38302-0068

Ralph Comer
Tennessee Department of Transportation

Mission Convalescent Center
118 Glass Street
Jackson, TN 38301-

Tammy Cummings
Spragins Law
P. O. Box 2004
Jackson, TN 38301-

Tammy Cummings
Spragins Law
P. O. Box 2004
Jackson, TN 38301-

Madison Haywood Developmental Services
38 Garland Drive
Jackson, TN 38305-

Keith Donaldson
Planning Department
111 E. Main Street STE 201
Jackson, TN 38301-

Josh Dragon
URS Corporation
1000 Corporate Centre Drive One Corporate Center, Suite 250
Franklin, TN 37067-

Terry Drumwright
TLM & Associates
117 E. Lafayette Street
Jackson, TN 38301-

Lt. Jerry Elston
Madison County Sheriff Department
546 East College Street
Jackson, Tn 38301-

Federal Express
2125 Rushmeade Road
Jackson, TN 38305-

Estes Express Lines
P. O. Box 25612
Richmond, VA 23260-

West Tennessee Express, Inc.
58 TruckCenter Drive
Jackson, TN 38305-

Roadway Express, Inc.
P. O. Box 1160
Columbus, OH 43216-

Milan Express, Inc.
P. O. 699
Milan, TN 38358-

Averitt Express, Inc.
P. O. Box 182523
Columbus, OH 43218-

Deborah Fleming, Transportation Specialist
TDOT Suite 900 505 Deaderick Street
James K Polk State Office Building
Nashville, TN 37243-0341

West Tennessee School For The Deaf
100 Berryhill Drive
Jackson, TN 38305-

Old Dominion Freight Line, Inc.
500 Old Dominion Way
Thomasville, NC 27360-

ABF Freight Systems Inc.
P. O. Box 10048
Ft. Smith, AR 72917-

American Freightways, Inc.
P. O. Box 840
Harrison, AR 72602-

Paul George
Planning Department
111 E. Main Street STE 201
Jackson, TN 38301-

Mayor Jerry Gist
Jackson City Council
City Hall Mail Box

Johnny Gullett
Jackson Transit Authority
38 Eutah
Jackson, TN 38301-

Diane Gusky, Director
TDOT/Project Management Division
Suite 600 James K. Polk Building
Nashville, TN 37243-0341

Jack Hall
Madison County Building Commissioner
Room 100
Madison County Court House
Jackson, TN 38301-

Jack Hall
Madison County Building Commissioner
Room 100
Madison County Court House
Jackson, TN 38301-

Mayor Jimmy Harris
Mayor, Madison County
Madison County Courthouse
Jackson, TN 38301-

Bob Hayzlett
Program Development & Scheduling, TDOT
James K. Polk Building, Suite 600
Nashville, TN 37243-

Laurelwood Healthcare Center
200 Birch Street
Jackson, TN 38301-

Northbrook Healthcare Center
121 Physicians Drive
Jackson, TN 38305-

Andy Helms
RPO Coordinator Southwest Tennessee Development District
27 Conrad Drive, Suite 150
Jackson, TN 38305-

Winston Henning
Jackson Housing Authority
P. O. Box 3188
Jackson, TN 38301-

Mayor James R. Hill
Mayor, City of Three Way
136 Green Road
Humboldt, TN 38343-

Jimmy Hill, Mayor
City of Three Way
136 Green Road
Humboldt, TN 38343-

Elvis Hollis
Planning Department
111 E. Main Street STE 201
Jackson, TN 38301-

Jackson Center for Independent Living
231 North Parkway
Jackson, TN 38305-

Michele Jackson
Jackson Transit Authority
38 Eutah
Jackson, TN 38301-

Michele Jackson
Jackson Transit Authority
38 Eutah
Jackson, TN 38301-

Jodi Jacobs
City of Jackson Planning Dept
City Hall Mailbox

Jim Jacobs
City of Jackson Parks & Recreation Dept.
City Hall Mailbox

Jodi Jacobs
City of Jackson
Inter Office Mail Box
Jackson, TN 38301-

LaNonda Jernigan
City of Jackson Central Dispatch
City Hall Mail Box

Greg Johnson

Evelyn Keele
Friends of Harris Creek
604 Potts Chapel Road
Jackson, TN 38305-

Carolyn Kelly
55 Laurie Circle
Jackson, TN 38305-

Harry S. Kemp, CHMM
Tetra Tech EM Inc.
159 Ivybrook Cove
Jackson, TN 38305-7367

Gil Kendrick
Law Enforcement Center
South Royal Street
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Lori Kirby, Title VI Director
Tennessee Department of Transportation
505 Deaderick Street, Suite 1800
Nashville, TN 37243-0334

Jim Ladieu, Manager
Office of Public Transportation
1800 James K. Polk Building
Nashville, TN 37243-

Al Laffoon
City of Jackson Recorder
City Hall Mail Box

Nichole Lawrence

Ben Ledsinger
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Gary Leforgee
City of Jackson Street Dept
City Hall Box

Rachel Levy
WBBJ-TV
346 Muse Street
Jackson, TN 38301-

Allison Little
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26 Security Drive
Jackson, TN 38305-

Larry Majors
Tennessee Dept of Transportation Project Manager
300 Benchmark Place
Jackson, TN 38305-

St. Mary's Manor
1771 Highway 45 Bypass
Jackson, TN 38305-

Mary Ann Martin
595 Liberty Claybrook Road
Beech Bluff, TN 38313-

Shane McAlexander
McAlexander Engineering
2813 North Highland
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Randy McKinnon
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117 East Lafayette Street
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Angie Midgett, Transportation Manager
TDOT Planning Division
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Nashville, TN 37243-0334

Jim Moore

St. Michael Motor Express, Inc.
P. O. Box 12286
Jackson, TN 38308-

Gerry Neese
Neese-Dorris Investments
1642 Hollywood Drive
Jackson, TN 38305-

Regetta Nelson
Madison County Mayor's Office
Maidson County Court House
Jackson, TN 38301-

Buddy Norvel
Central Dispatch
City Hall Mailbox

Forest Cove Nursing Center
45 Forest Cove
Jackson, TN 38301-

Slyvia Odum, Title VI Program
Tennessee Department of Transportation, Civil Rights Office
505 Deaderick Street, Suite 1800
Nashville, TN 37243-

Morningside of Jackson
1200 North Parkway
Jackson, TN 38305-

Mark Only, Jr
592 Harts Bridge Road
Jackson, TN 38301-

Rick Pack, Transportation Manager
Local Program Development Office
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Nashville, TN 37243-0341

Connie Pafford
136 Chester Levee Road
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James Pearson
Fire Department Chief
City Hall Mail Box

Ron Pennel
City of Jackson Mayor's Office
City Hall Mail Box

Stan Pilant
City of Jackson Planning Dept
In House

Susan Ralph, Transportation Planner
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Will Reid
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6750 Poplar Avenue, Suite 625
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Jackson Meadow Retirement Residence
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Kimley-Horn and Associates, Inc.
5250 Virginia Way, Suite 150
Brentwood, TN 37027-

Ms. Kate E. Rhodes (Randy Oliver)
Rainey Kizer Reviere & Bell PLC
P. O. Box 1147
Jackson, TN 38302-

Darren Rigs
U S Postal Service
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Jackson, TN 38301-

Jerry Roache
Office of Public Transportation
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145 Paddock Place
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Joe A. Roland
County Commission
168 Adair Road
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Rebekah Ross
Vulcan Materials
219 North Parkway
Jackson, TN 38305-

Charles Rychen
Region IV Director, Tennessee Department of Transportation
300 Benchmark Place
Jackson, TN 38301-

Lester Sands
Jackson Madison County General Hospital
708 West Forest
Jackson, TN 38301-

Jackson Madison County Schools Transportation Department
89 Harts Bridge Road
Jackson, TN 38301-

Gordon Schultz
20 White Plains Drive
Jackson, TN 38305-

Jackson Oaks Senior Living Community
3131 North Highland
Jackson, TN 38305-

Paula Shaw
TDOT, Division of Multi0model Transportation Resources

Safe Shuttle
28 Central Avenue
Jackson, TN 38301-

Ms. Lorri Skelton
City Recorder, City of Medon
P. O. Box 23
Medon, TN 38356-

Patrick Smith
Smith Seckman Reid, Inc.
132B West University Parkway
Jackson, TN 38305-

Steve Smith
McKeller-Sipes Regional Airport Authority
308 Grady Montgomery Drive
Jackson, TN 38301-

Britta Stein
Federal Highway Administration
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Nashville, TN 37217-

The Jackson Sun
245 West Lafayette Street
Jackson, TN 38301-

Jerome Teel
Attorney at Law
87 Murray Guard Drive
Jackson, TN 38305-

Overnight Transportation Company
P. O. Box 1160
Columbus, OH 43216-

Diana Turner
Southwest Human Resource Agency
P. O. Box 264
Henderson, TN 38340-

USPS
200 Martin Luther King, Jr. Drive
Jackson, TN 38301-

William C. Wallace

Bart Walls
Madison County Highway Department
1529 Westover Road
Jackson, TN 38301-

Sammy West
Hart Freeland Robert, Inc.
113 North Liberty Street
Jackson, TN 38301-

Mandy White
Jackson Chamber of Commerce
P. O. Box 1904
Jackson, TN 38303-

Crystal Wiggins
Madison County Building Department
Room 100
Madison County Court House

Yellow Freight Systems, Inc.
990 Roe Avenue
Overland Park, KS 66211-

Nelson & Thornton Consultants
245 Sycamore Street
Jackson, TN 38301-

Sisson Transportation, Inc.
137 Law Road
Jackson, TN 38305-

UPS
46 College Park Cove
Jackson, TN 38305-

Teresa Vanover
City of ThreeWay
174 Three Way Lane
Humboldt, TN 38343-

Bart Walls
Madison County Highway Department
1529 Westover Road
Jackson, TN 38301-

Bart Walls
Madison County Highway Department
1529 Westover Road
Jackson, TN 38301-

Erwin White
Tennessee Dept of Transportation Project Manager
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Jackson, TN 38305-

Crystal Wiggins
Madison County Building Department
Room 100
Madison County Court House

Clay Williams
Clay Williams & Associates
2796B North Highland
Jackson, TN 38305-

Tom Winbush
City of Jackson Building
City Hall Mail Box

David Woolfork
Sheriff, Madison County
546 East College Street
Jackson, TN 38301-

Rena Duncan
Chickasaw Nation
P.O. Box 1548
Ada, OK 74821

Gregory Pyle
Choctaw Nation of Oklahoma
P.O. Drawer 1210
Durant, OK 74702

Charles Enyart
Eastern Shawnee Tribe of Oklahoma
P.O. Box 350
Seneca, MO 64865

Tim Thompson
Muscogee (Creek) Nation
P.O. Box 580
Okmulgee, OK 74447

Archie Mouse
United Keetoowah Band of Cherokee
P.O. Box 746
Tahlequah, OK 74465

Tarpie Yargee
Alabama-Quassarte Tribal Town
P.O. Box 187
Wetumka, OK 74883

Gary Bucktrot
Kialegee Tribal Town
P.O. Box 332
Wetumka, OK 74883

Ron Sparkman
Shawnee Tribe
P.O. Box 189
Miami, OK 74355

Delaney, Douglas

From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:26 AM
To: 'cbrewer@mckellarsipes.com'
Cc: 'Keith Donaldson'
Subject: Jackson Area MPO - Regional Transportation Plan Update
Attachments: Letter to Agencies and Interested Parties.pdf

You are receiving this email because you signed up to receive updates from the Jackson Area Metropolitan Planning Organization.

The Jackson Area Metropolitan Planning Organization (MPO) is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

The MPO will conduct a Public Hearing from 5:00 PM – 7:00 PM on Tuesday, November 27, 2012, in the George A. Smith Meeting Room, City Hall, 109 East Main Street, Suite 107, Jackson, Tennessee. The purpose of the meeting will be to provide an overview and gather public input on the draft Plan. The public will be invited to ask questions and make comments during the hearing.

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111 East Main Street, Suite 201
Jackson, Tennessee 38301

Comments may also be e-mailed to kdonaldson@cityofjackson.net.

If you have questions or need additional information, please contact Keith Donaldson at (731) 425-8275.

Sincerely,
Doug Delaney.

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, TN 37203
615-340-9193 (office)
615-491-0694 (cell)

delaneyd@pbworld.com

www.pbworld.com

Delaney, Douglas

From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:26 AM
To: 'bornerj@charter.net'
Cc: 'Keith Donaldson'
Subject: Jackson Area MPO - Regional Transportation Plan Update
Attachments: Letter to Agencies and Interested Parties.pdf

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Jackson, Tennessee 38301

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Sincerely,
Doug Delaney.

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, TN 37203
615-340-9193 (office)
615-491-0694 (cell)

delaneyd@pbworld.com

www.pbworld.com

Delaney, Douglas

From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:26 AM
To: 'harryallen2@yahoo.com'
Cc: 'Keith Donaldson'
Subject: Jackson Area MPO - Regional Transportation Plan Update
Attachments: Letter to Agencies and Interested Parties.pdf

You are receiving this email because you signed up to receive updates from the Jackson Area Metropolitan Planning Organization.

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111 East Main Street, Suite 201
Jackson, Tennessee 38301

Comments may also be e-mailed to kdonaldson@cityofjackson.net.

If you have questions or need additional information, please contact Keith Donaldson at (731) 425-8275.

Sincerely,
Doug Delaney.

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, TN 37203
615-340-9193 (office)
615-491-0694 (cell)

delaneyd@pbworld.com

www.pbworld.com

Delaney, Douglas

From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:26 AM
To: 'ralph.comer@tn.gov'
Cc: 'Keith Donaldson'
Subject: Jackson Area MPO - Regional Transportation Plan Update
Attachments: Letter to Agencies and Interested Parties.pdf

You are receiving this email because you signed up to receive updates from the Jackson Area Metropolitan Planning Organization.

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Written statements and/or comments concerning the Plan may be submitted to:

Jackson Area Metropolitan Planning Organization
111 East Main Street, Suite 201
Jackson, Tennessee 38301

Comments may also be e-mailed to kdonaldson@cityofjackson.net.

If you have questions or need additional information, please contact Keith Donaldson at (731) 425-8275.

Sincerely,
Doug Delaney.

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, TN 37203
615-340-9193 (office)
615-491-0694 (cell)

delaneyd@pbworld.com

www.pbworld.com

Delaney, Douglas

From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:25 AM
To: 'xcmtnbiker@earthlink.net'
Cc: 'Keith Donaldson'
Subject: Jackson Area MPO - Regional Transportation Plan Update
Attachments: Letter to Agencies and Interested Parties.pdf

You are receiving this email because you signed up to receive updates from the Jackson Area Metropolitan Planning Organization.

The Jackson Area Metropolitan Planning Organization (MPO) is in the process of updating its Regional Transportation Plan (RTP). The RTP is a long range planning document that addresses transportation needs and identifies planned improvements to address those needs.

The MPO will conduct a Public Hearing from 5:00 PM – 7:00 PM on Tuesday, November 27, 2012, in the George A. Smith Meeting Room, City Hall, 109 East Main Street, Suite 107, Jackson, Tennessee. The purpose of the meeting will be to provide an overview and gather public input on the draft Plan. The public will be invited to ask questions and make comments during the hearing.

Written statements and/or comments concerning the Plan may be submitted to:

Jackson Area Metropolitan Planning Organization
111 East Main Street, Suite 201
Jackson, Tennessee 38301

Comments may also be e-mailed to kdonaldson@cityofjackson.net.

If you have questions or need additional information, please contact Keith Donaldson at (731) 425-8275.

Sincerely,
Doug Delaney.

Douglas J. Delaney, AICP
Supervising Planner
Parsons Brinckerhoff
1900 Church Street, Suite 400
Nashville, TN 37203
615-340-9193 (office)
615-491-0694 (cell)

delaneyd@pbworld.com

www.pbworld.com

Delaney, Douglas

From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:25 AM
To: 'nichole.lawrence@tn.gov'
Cc: 'Keith Donaldson'
Subject: Jackson Area MPO - Regional Transportation Plan Update
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From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:25 AM
To: 'jim.moore@tn.gov'
Cc: 'Keith Donaldson'
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Delaney, Douglas

From: Delaney, Douglas
Sent: Friday, October 26, 2012 11:25 AM
To: 'wcwallace@pbsj.com'
Cc: 'Keith Donaldson'
Subject: Jackson Area MPO - Regional Transportation Plan Update
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Barbara Johnson	County Commissioner
Smokey Ryland	" "
Keith Donaldson	
Stan Pilant	
Scott Chandler	
Marty Clements	
Jeanne Stevens	
Doug Delaney	
Andrea Barbour	

ST. MARY MANOR

1771 Highway 45 Bypass
Jackson, Tennessee 38305
Phone: 731-668-5633 Fax: 731-668-9252
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11/21/12

Mr. Donaldson,

I will not be able to attend the public hearing, but would like to submit my comments concerning the plan and transportation in the city of Jackson. In reviewing the plan, Table 1-2: Six principles of Livability indicated that it was considered to provide more transportation choices. The current transportation in the city is limited to Jackson Transit Authority. While this works well for able bodied individuals, it does not work well for elderly and/or disabled adults. The "Lift" program is supposed to be designed for those individuals through JTA, but it really does not accommodate the elderly and disabled adults in the Community of Jackson. They often have to sit for extended periods of time while waiting on the bus to come and pick them up, both before and after scheduled appointments that are sometimes missed because of transportation problems. If the regular bus has to pick them up because they are on their route, sometimes they are required to ride on the bus throughout the city for extended periods of time until their route is completed or back on the side of town that the person lives on. Please keep in mind that these individuals often have been to a doctor appointment, are tired, and ready to return home as soon as possible. The extra waiting and riding time could be avoided if another transportation company was allowed to come into the city to transport elderly and disabled adults at a low cost or free.

Some insurance (such as Blue Care) requires individuals to go through JTA for medical transportation in the city. I have residents here that save, what little money they have, to take the taxi to their doctor appointments. The taxi is fast and reliable, unlike JTA. Also, the taxi can provide true door to door service, where the JTA LIFT bus cannot fit under some awnings and requires individuals to do quite a bit of walking to get on and off of the bus.

It would be of great benefit if the residents of Jackson had choices in low or no cost transportation. It is my understanding that there is something in place that prohibits anyone from transporting within the city of Jackson other than JTA. Please consider my comments when addressing changes within the transportation choices available to the city of Jackson.

Respectfully Submitted,

Dana Holmes, LBSW

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St. Mary Manor
Service Coordinator
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