

Final Report

STATE STUDY #183: ENHANCING MOBILITY TO IMPROVE THE QUALITY OF LIFE IN THE MISSISSIPPI CAPITAL REGION



MDOT

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**ENHANCING MOBILITY TO IMPROVE THE
QUALITY OF LIFE IN THE MISSISSIPPI CAPITAL
REGION**

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Introduction

Good access within a community and to other parts of the metropolitan area by drivers and by those, using public transportation is an important issue to community residents. Transportation helps shape an area's economic health and quality of life. Not only does the transportation system provide for the mobility of people and goods, it also influences patterns of growth and economic activity by providing access to land. Transportation planning plays a fundamental role in the state, region or community's vision for its future. It includes a comprehensive consideration of possible strategies; an evaluation process that encompasses diverse viewpoints; the collaborative participation of relevant transportation-related agencies and organizations; and open, timely, and meaningful public involvement. The performance of the system affects public policy concerns like air quality, environmental resource consumption, social equity, land use, urban growth, economic development, safety, and security. Transportation planning recognizes the critical links between transportation and other societal goals. The planning process is more than merely listing highway and transit capital projects. It requires developing strategies for operating, managing, maintaining, and financing the area's transportation system in such a way as to advance the area's long-term goals.

Transportation Demand Management (TDM) is any action or set of actions designed to influence the intensity, timing, and distribution of transportation demand, in order to enhance mobility. As part of the congestion management process available to transportation planners, TDM actions are among the strategies that can enhance mobility.

A Metropolitan Planning Organization (MPO) is a transportation policy-making body made up of representatives from local government and transportation agencies with

authority and responsibility in metropolitan planning areas. Federal legislation passed in the early 1970s required the formation of an MPO for any urbanized area (UA) with a population greater than 50,000. MPOs were created in order to ensure that existing and future expenditures for transportation projects and programs were based on a continuing, cooperative, and comprehensive (3-C) planning process.

Intelligent Transportation Systems (ITS) are technological tools that can help to facilitate better transportation system. System Management and Operations (M&O) strategies and tools focus on optimizing the performance of the transportation system. It is essential to mention that M&O does not include traditional maintenance activities, such as lawn cutting, pothole repair, or resurfacing. The urban portions of this system along with the highways and public transportation services developed by state, county, and local governments, as well as public transportation services offered by other organizations, have provided urban Americans with unprecedented levels of mobility. However, in many communities increasing levels of traffic congestion have turned once easy trips into nightmares. In addition, the lack of accurate and timely public transportation information and services has discouraged drivers from considering options other than driving alone. People are turning to transportation officials for solutions.

Traffic congestion means there are more people trying to use a given transportation facility during a specific period than the facility can handle with what are considered to be acceptable levels of delay or inconvenience. In a broader sense, a congested facility is just one element of transportation system's ability to provide mobility and accessibility.

Study Scope

The research study consisted of the followings:

Identification and Review of Other Regional Mobility Initiatives

This included regional mobility initiatives in the Greater Washington, DC, metropolitan area, the Jacksonville, Florida, metropolitan area, and the Mobile, Alabama, metropolitan area. Additionally, transportation plans for the Mississippi capital region will be identified and reviewed. Economic development projects planned or underway in the Mississippi capital region will be identified, reviewed and monitored.

Regional Mobility Summit for the Mississippi Capital Region

The research team will develop the preliminary agenda for the Mississippi Capital Region Mobility Summit. Elected officials and transportation professionals from throughout the region will be contacted for their thoughts and ideas for the summit. A preliminary list of summit participants and invitees will be developed. A venue for the summit will be identified. Also, Governor Barbour's office has been contacted about his participation in the summit.

Convene the Mississippi Capital Region Mobility Summit

The summit meeting would convene during the second quarter of the fiscal year 2007. Following the summit meeting, a working group of summit participants was to identify specific options that could be developed and pursued to enhance mobility in the Mississippi Capital region. These options would be presented throughout the region for review and reaction. Those options receiving the most favorable reactions would be further developed so that strategies could be designed to implement some of the mobility enhancing options.

The Research Team Participants

The study has been conducted in collaboration with MDOT, the Federal Highway Administration (FHWA) and the Jackson State University (JSU). Since the study began, a Technical Committee, made up of representatives from each of these agencies, has been guiding it. During the course of this study, technical memoranda were developed to document study activities and to present interim findings and recommendations for review and discussion with members of the Technical Committee.

Objectives

The objectives of this research project are to:

- 1) Identify and review of other regional mobility initiatives,
- 2) Establish Regional Mobility Summit for the Mississippi Capital Region to discuss ways and recommended a new initiative to enhance mobility in the capitol areas. Additionally, develop strategies for implementations, and
- 3) Improve mobility and safety potential.

To the extent possible, these goals have been used as a guide in the development of improvement concepts or strategies, in the selection of key recommendations for more detailed analysis and in identifying components of the research plan.

Background

Good access within a community and to other parts of the metropolitan area by drivers and by those, using public transportation is an important issue to community residents. Not only is good access important to those looking for places to live, but it can become an important community public safety (e.g., police, fire and emergency medical) issue.

To some people, congested roads are a symptom of deteriorating quality of life in a community. In many cases, and in particular in suburban communities, residents moved to their community to escape urban problems like traffic jams. Now, facing this congestion has once again become part of their daily routine. Another aspect of this quality-of-life characteristic is the role transportation plays as a key element of getting and keeping a job.

Increasing levels of congestion are common in urban areas throughout the United States. Recent transportation plans for a sample of urban areas and states indicate some of the characteristics associated with future mobility challenges:

Florida: Daily vehicle miles traveled has continued to grow, from 300 million miles (1483 million kms) in 1990 to 334 million miles (538 million kms) in 1994, an increase of about 11 percent (Florida DOT 1995).

Dallas-Ft.Worth: The growth in vehicle miles of travel and vehicle miles of travel per person in the region represents a significant challenge in addressing mobility needs of the region. By the year 2010, daily vehicle miles traveled is projected to exceed 124 million (200 million kms) representing a 33 percent increase in travel (North Central Texas Council of Governments 1995).

Milwaukee: In 1991, the number of vehicle miles of travel on an average weekday totaled nearly 33 million (53 million kms). Under a no-build alternative, the growth in vehicle miles traveled would be approximately 35 percent to 44.5 million vehicle miles (72 million kms) of travel in the year 2010 (Southeast Wisconsin Regional Planning Commission 1995).

Boston: Vehicle miles traveled in 2020 are forecast to increase by approximately 25 percent...Vehicle hours of travel are forecast to grow by 35 percent in the base case,

evidence of growing system wide congestion (Central Transportation Planning AND TOMORROW staff 1993).

Albany: Congestion-related delay will increase significantly for the region as a whole by 2015. This congestion will be experienced disproportionately suburban areas will experience a growing percentage of the region's congestion (Capital District Transportation Commission 1995).

Atlanta: Despite substantial improvements to the highway system, over 53 percent of the vehicle miles traveled in 2010 will be on facilities that are subject to levels of service F (Atlanta Regional Commission 1990).

Texas: Increased congestion on Texas' highways will worsen significantly over the lifetime of the Plan-twice as many miles of major urban facilities will be congested in 2012 than were in 1992, causing delays on more than half of urban Interstate, freeway, and expressway miles (Texas DOT 1994).

Most often, this congestion occurred at specific locations and were, in many ways, just one element of the total trip for people and goods in a metropolitan region. Since passage of the Intermodal Surface Transportation Efficiency Act in 1991, many transportation officials have broadened their perspective on the types of strategies that can be considered in dealing with congestion and mobility. Multimodal transportation system performance more than ever now includes an integrated multimodal perspective for overall mobility and accessibility.

A research study for 2030 prepared by John McClain in 2012 was conducted to measure the relationships between transportation system use and economic growth in the Washington Metropolitan Area. The Washington region is projected to undergo significant potential economic growth over the next 30 years. Of the Gross Regional

Product (GRP) growth, almost $\frac{3}{4}$ will be in locations where autos provide the accessibility. For total GRP change in the region, \$977 billion will be enabled by auto, \$298 billion by transit, \$67 billion bike/walk, and \$77 billion for work – at – home. For all economic activity in the region, the share of GRP enabled by auto travel goes from 74.3% in 2007 to 73.1% in 2040, and economic activity supported by transit changes only very slightly from 22.3% to 22.2%. Some Regional Activity Centers have significant changes in economic activity supported by transit – most notably along the Silver Line in the Tysons Corner - Dulles corridor. Econometric forecasts assume that adequate infrastructure investments are made to support economic growth, and so the GRP forecasts in this report are “potential economic growth.” The region’s economic future will continue to rely on significant investments in transportation infrastructure – investments that will need to provide key transit support for some economic centers and major support and investments for auto access and connections for almost all economic centers. Additionally the research team found that the share of economic growth supported by different modes of transportation will change very little over the next 30 years. Applying the transportation model outputs for travel by mode and the calculations of GRP shows that economic growth will be supported in approximately the same shares in 2040 as today. The research team concluded that economic growth in activity centers in the region would be strongly enabled by all modes of future transportation investment: highway, transit, and bike/walk. The forecasts indicate that all modes have a role in enabling economic growth. Additionally, the importance of bike/walk use in economic activity centers is shown in the calculations: there is a greater increase in bike/walk trips for the forecast period than in transit trips across the region as a whole. This implies that land use policies to increase densities and mix of uses will improve growth in economic

activity centers, and that further implementation of such land use policies will benefit and encourage economic growth.

Summit Meeting

During the first year of the study period, members of the research team met with summit participants and elected officials to solicit their input on traffic and congestion needs in the region. These interviews consisted of a briefing on the purpose, approach, and expected schedule for the Jackson Mobility Study, followed by an opportunity for the elected officials to answer questions and provide input. Following is a list of questions that were used during the meetings to collect inputs:

1. What major development is being seriously considered in your area? (Shopping centers? housing? factories/industry? etc.) Where and when will these occur?
2. What do you see as your best economic growth potential? Where will it be?
3. What is your greatest transportation needs now and in the future in the Jackson metro area?
4. How does your transportation need relate to your economic plans?
5. What do you think MDOT should plan to do in the Jackson urban area to accommodate future traffic growth? Do you have suggested locations and priorities?
6. Do you think public transit could relieve congestion in your area?
7. Do you have any additional comments?

Population and Employment Diversity

The population and employment trends in the Jackson study area suggest that:

1. The population and employment growth in the area is expected to occupy land outside of the urban core of the Jackson metro area, which may not be accessible to existing freeway and arterial systems.
2. The population and employment growth in the area is expected to be in areas not currently densely developed, emphasizing the need for arterial and collector improvements, as well as access to freeways from these areas.
3. Development density is expected to increase along existing freeways and arterials, pointing to the need for adequate supporting road systems.

The transportation and mobility requirements of Jackson's metro area will change as the region grows. An important element of regional growth is the diversity of the population with respect to race, income and household size. Trends suggest that the Jackson area is increasingly diverse, requiring the transportation system to serve an increasingly broad range of system users as shown in Figures 1 and 2. In the last three decades, the six county region of the Jackson mobility study area has increased in population by 45 percent. As the region looks forward to the year 2030, growing concentrations of population and employment are expected to place growing demands on the transportation network.

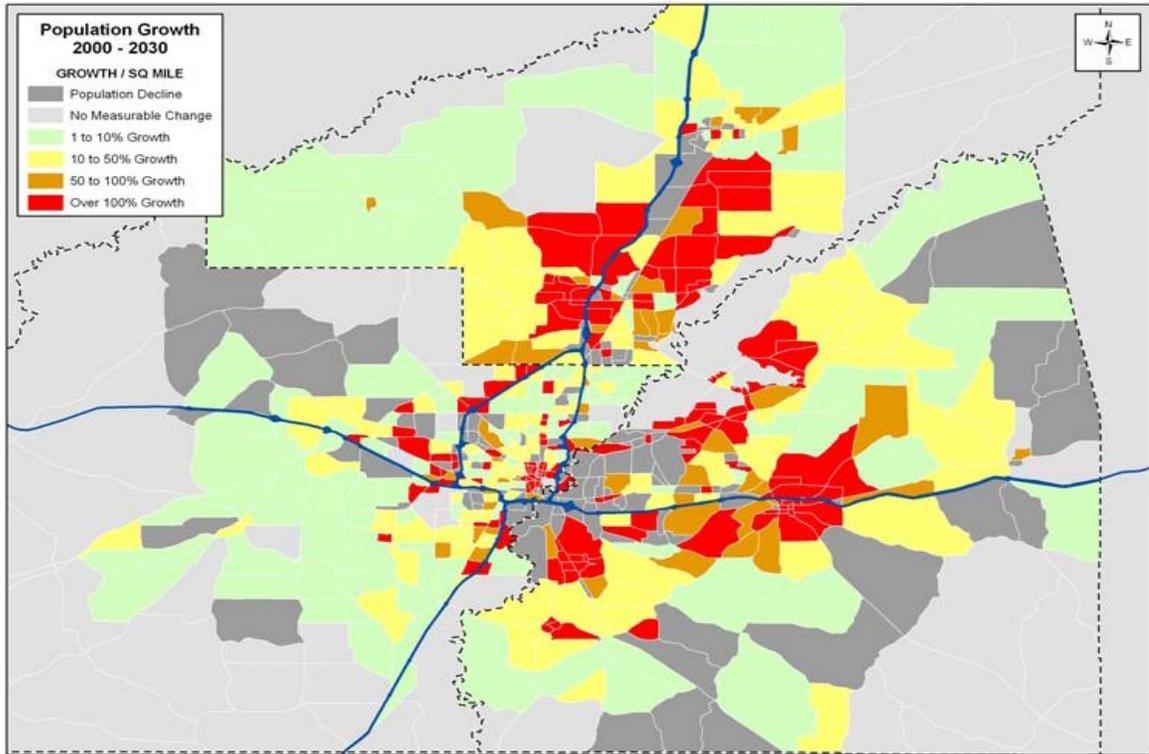


Figure 1 Expected Population Growth in the Jackson Area in the Next 20 Years

While the population center in Hinds County has remained nearly constant since 1980, growth in Madison and Rankin counties has accelerated in the last 20 years, accounting for much of the increase in regional population. Additionally, it highlights the areas where the Jackson MPO anticipates growth in population and housing density likely to result in increased demand for travel on the transportation system as shown in Figure 1 above.

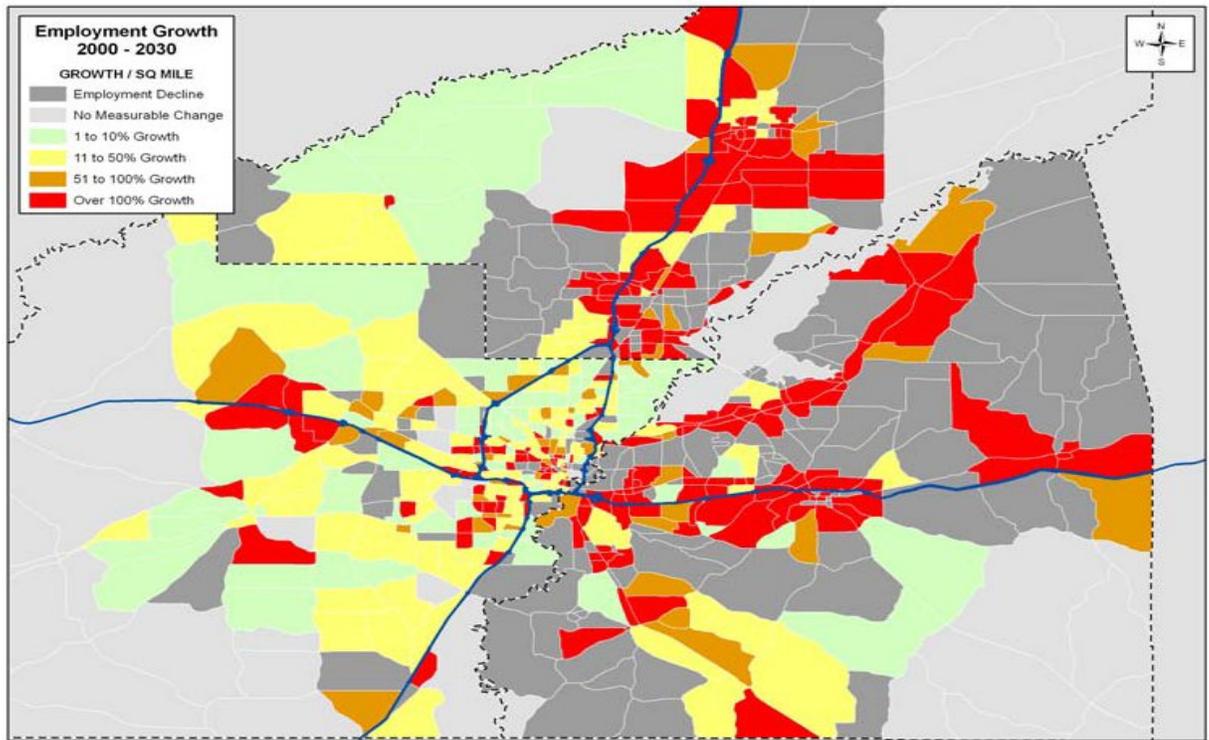


Figure 2 Expected Employment Growth in the Jackson Area in the Next 20 Years

While household income has shifted towards the upper-middle brackets in the Jackson region, household sizes have decreased in each of the six counties in the region. With fewer persons in each household, rising household incomes have the potential to support more activities for household members involving travel, whether associated with work to support higher income levels, or discretionary activities made possible by higher income levels. The Jackson metro area has become increasingly diverse in the last 15 years. The two largest racial groups in the Jackson area continue to be Caucasian and African American, accounting collectively for nearly 98 percent of the population. However, the Hispanic population has nearly tripled in size during this 15-year period, more than doubling its percentage of the overall demographic makeup of the region.

Asian and Pacific Islander populations have more than doubled in the Jackson region as well. The growing racial diversity of the population emphasizes the importance of a holistic view of the transportation system, making mobility accessible to a dynamic and changing public.

While household income has shifted towards the upper-middle brackets in the Jackson metro area, household sizes have decreased in each of the Jackson metro surrounding areas. Overall, the trend in household income in the Jackson region suggests a pattern of increasing levels of activity, even as households get smaller, placing increasing demands on the regional transportation system to support members of smaller, but more affluent households.

In addition to the population and employment growth in the Jackson metro area, there have been changes in the age groups utilizing the transportation system in the region. These changes are important for the transportation system as they affect trip purposes and traffic patterns. For example, as individuals retire, the peak hour journey to work is replaced by other trip purposes to other destinations. This has the potential to change demands and needs on the transportation system. In a similar way, changes in the concentration of families with school-age children affect demand on routes to schools at specific times of the day.

Economic Growth

Demographic change Jackson metro and surrounding areas is strongly associated with the development of the region's economic base. In the last 15-year period, employment of residents in the region has outpaced the growth in population by 15 percent. As the region supports more employment in all industries, and draws workers

from the surrounding areas, the importance of commuting corridors and routes for peak hour commuting into and out of the region is a critical consideration for the transportation system.

The growth in regional employment together with trends in household income and age distribution, point to the economic importance of workforce commuting for the economy of the Jackson metro and surrounding area. Jackson’s highway network is faced with the challenge of consistently providing mobility for the Jackson area in the face of these changing demographic and economic factors. In 2005, congested conditions accounted for approximately 33 percent of vehicle miles of travel (VMT) and 38 percent of vehicle hours of travel in the six-county region. The impact of congestion was most concentrated on the Principal Arterials and Minor Arterials in the Jackson area, with 72 percent of vehicle hours of travel on Principal Arterials occurring in congested conditions and 43 percent of vehicle hours on Minor Arterials occurring in congested conditions as shown in Table 1.

Table 1 Summary of Jackson’s Roadway System Congestion in 2005

Functional Classification	Congested Conditions (Volume / Capacity) > 1							
	Centerline Miles		Lane Miles		VMT ⁽¹⁾		VHT ⁽²⁾	
Interstate or Freeway	20	6%	49	7%	739,658	11%	16,511	12%
Principal Arterial	156	49%	539	50%	3,105,865	68%	79,485	72%
Minor Arterial	86	15%	205	17%	923,711	38%	24,699	43%
Collector and Below	100	6%	203	6%	734,906	27%	19,397	28%
Total	362	13%	996	15%	5,504,140	33%	140,092	38%

Notes: (1) VMT – Daily Vehicle Miles of Travel.

(2) VHT – Daily Vehicle Hours of Travel.

Crash data for Jackson metro and surrounding areas for calendar years 2004 through 2007 were reviewed and summarized. Over this four-year period, almost 54,000 crashes were recorded, as shown in Table 2.

Table 2 Jackson Metro and Surrounding Areas Crash Summary in 2004-2007

County	Fatal Crashes	Injury Crashes	Property Damage Only	Total ⁽¹⁾	Percent
Hinds	173	5,990	22,845	29,008	53.9%
Madison	41	1,883	6,890	8,814	16.4%
Rankin	91	3,375	12,565	16,031	29.8%
Totals	305	11,248	42,300	53,853	100.0%
Percent	0.6%	20.9%	78.5%	100.0%	

Note: (1) From January 1, 2004, to December 31, 2007.

Source: Mississippi Department of Transportation.

Of these crashes, 0.6 percent involved fatalities, while another 20.9 percent resulted in non-fatal injuries. Additionally, the distribution of 305 crashes is shown throughout the Jackson metro and surrounding areas and in the central area of Jackson in Figure 3.

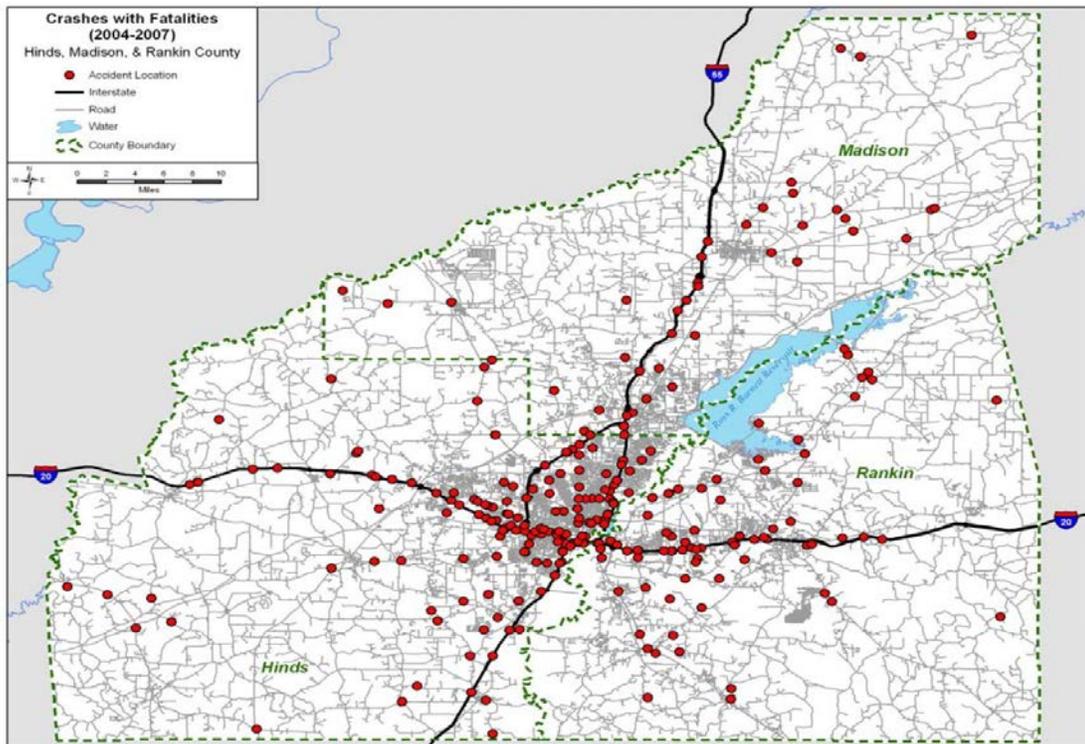


Figure 3 Fatal Crashes in Jackson Metro and Surrounding Areas

Transit System

Existing transit services and issues were discussed in the meetings to provide context to subsequent transit-related recommendations for the Metro Jackson area. Understanding the Metro Jackson area transportation infrastructure and services is key to understanding choices available to local residents. Planning and decision-making for all modes within the Jackson area transportation system allow for maximum travel choices for local residents. Making routine accommodations for other modes when developing or designing a transportation project allows for a safe, convenient, and efficient transportation system accessible for all users. Some of the multimodal accommodations examples includes but are not limited to the following:

1. Bike racks on public transit;

2. Sidewalks designed along roadways with mixed land uses;
3. Bicycle lanes on arterial roadways; and
4. Accessible curbs and roadways for persons with disabilities.

This continuous integration of multimodal transportation facilities will enhance the quality of life in Jackson, while providing an efficient and effective use of regional resources and leads to a variety of choices for local residents. JATRAN operates a fixed-route bus system that covers much of the City of Jackson and a demand response para-transit service. JATRAN currently operates 13 weekday routes which provide a radial type of transit service, with the central city as its hub. The existing JATRAN service area is within the city limits of Jackson. JATRAN could travel beyond the city limits if additional revenues were available. In general, the local transit services provide a basic level of public transit service for local residents. The existing services do not provide a realistic travel option for those residents who have access to and travel by single occupant vehicle.

Travel Conditions

Future travel conditions were projected in order to assess the potential benefits of alternative improvement strategies. In the meetings, the methodology used and the assumptions made. It also describes projected travel conditions in the absence of any new initiatives or strategies beyond implementation of previously committed improvement projects. Additionally, it will provide the basis for a comparison of alternatives improvement strategies.

Travel Modes

A travel demand model (TDM) was defined during the meetings as a set of procedures to estimate the number of vehicles or travelers that will use transportation facilities in the future. TDM are used by transportation planners to better understand the traffic patterns of a given area, and identify and address future congested roadways. A travel demand model utilizes geographic characteristics such as roadway network, social and economic characteristics such as population, households, employment to simulate travel characteristics of a region. One of the model that was discussed and used for this study is the Jackson Urban Model, developed and used by the MPO to model existing and future traffic conditions in the area under its jurisdiction, covers almost all of the three county region of Rankin, Hinds, and Madison counties. The Jackson area MPO, in conjunction with the Mississippi DOT, has committed roadway improvement projects to address the growing issue of roadway congestion in the Jackson area up to the year 2030. The expected roadway network in 2030 comprises today's transportation system (existing) and additional projects already committed to be delivered by the year 2030 (committed).

Road Network Improvement

The existing and proposed network will enable the transportation system in the six-county surrounding the Jackson region to carry significantly more vehicle miles of travel than today's system to accommodate the economic and demographic trends. The proposed projects described above will increase the number of available lane miles for vehicular traffic in Jackson and enhance the overall capacity of the system. However, even with completion of the committed projects by 2030, there are likely to be congested

conditions on most roadway types in the Jackson area. A large part of the congestion expected in 2030 under existing and proposed conditions is expected to occur on the interstates. While the proposed improvements are likely to reduce the percent of congested VMT on arterials and collectors, the percentage of interstate travel occurring under congested conditions, is expected to rise in 2030. For this reason, improvement scenarios are offered to support connections that may relieve congestion on Jackson's interstate system, through either constructing new interstate and freeway type facilities, by improving arterials in ways that relieve demand on interstates, or some combination of these approaches.

To better visualize projected travel demand, the numerous traffic analysis zones representing the Jackson region were combined into 15-20 sections and desire lines generated to illustrate the magnitude of travel demand between each section pair as shown in Figure 3.

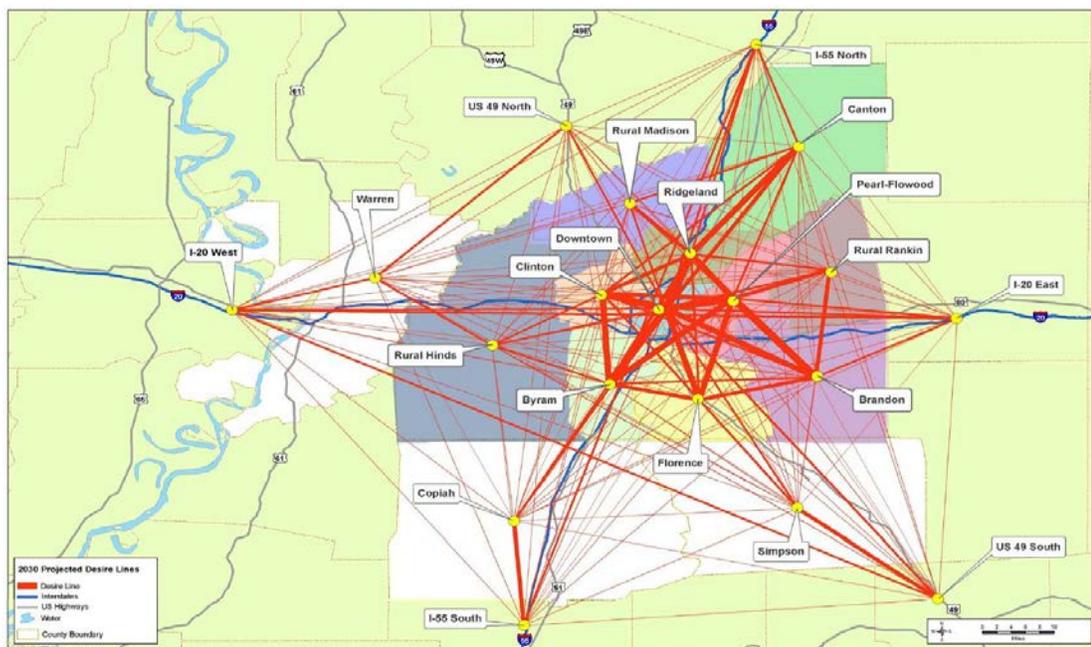


Figure 3 2030 Travel Demand

Strategies and Scenarios

Improvement scenarios offer an understanding of different possible approaches to achieving transportation system and performance conditions in next 15-20 years. In 2007, several scenarios were discussed over successive meetings in collaboration with MDOT and MPO staff, and other participants to represent approaches to improving mobility in greater Jackson metro area.

Following is the rationale for the scenarios:

1. Growing Jackson's arterials to manage congestion, adding capacity, improving circulation and accessibility to internal locations within the greater Jackson metro.
2. Focusing new investment on freeways, to improve circulation around the greater Jackson metro area, manage traffic through the area and provide high-speed connections across the region.
3. Investing in a new approach, to both freeway and non-freeway improvements, to serve both local and regional traffic within and around the greater Jackson metro area.

Each of the scenarios highlighted different approaches to improving mobility in the greater Jackson area through the strategic development of new or upgraded roadway facilities. No single scenario was offered as a preferred package of roadway improvements for Jackson. Instead, the scenarios were offered as a way to assess the relative merits of potential freeway and non-freeway improvements in the area, and to suggest the optimal mix of roadway improvements that would improve Jackson's mobility in terms of travel time, connectivity and efficiency. The comparison of the

several improvement scenarios provided the basis for a fourth improvement package for more detailed evaluation.

Regarding the first scenario, widening and upgrading facilities to arterial status with additional capacity is recommended. In addition, this option would involve better management of existing corridors through operational improvements, access management and other non-widening improvements to support the functionality of many of Jackson's roadways as part of an improved arterial system.

The second scenario entails concentrating new investment in Jackson's roadway system on freeway arcs surrounding the city. This scenario seeks to improve internal circulation by routing regional and state traffic around the city, allowing existing and committed arterial and collector systems using arcs connecting major modes to perform better in their local function. The arcs in this scenario would provide a freeway loop surrounding the outer perimeter of Jackson area. While the exact alignments of these proposed freeway arcs is not yet determined, the rationale of the scenario was to provide maximum mobility for traffic through Jackson, improve the statewide accessibility to Jackson and provide access to potential new development in the outer perimeter of the greater Jackson area.

The third scenario was intended to reflect a comprehensive and financially unconstrained approach to improving Jackson's roadways. The scenario included most projects and improvements, both freeway and non-freeway, offered in the other scenarios. The "Full Build" scenario was intended to demonstrate the combined merits of improvements in different functional systems, as well as areas in which freeway and non-freeway improvements may complement one another to improve overall mobility in Jackson.

The scenario with least Vehicle-Miles of Travel (VMT) in 2030 is Scenario 1, which focused on improving existing arterial roadways. Scenarios with major new freeways, namely Scenarios 2 and 3, are projected to result in greater totals of VMT due to the willingness of drivers to travel further (more miles) to avoid congestion and to save time. This option also will be clearly defined and can be used in the future programs such as performance measurement.

Another scenario is analysis of the results of the scenarios presented above, which indicated that some of the proposed major widening projects would be significantly more beneficial than others due to the high level of congestion projected if widening does not take place. Similarly, some proposed new freeway segments were more successful in attracting traffic and so relieving other routes than were other segments. Consequently, this scenario was constructed from the “best” of the projects evaluated in the first three scenarios.

It should be anticipated that future land use will change little over the short term. The limited access design of the proposed corridors will have the effect of restricting development of the adjacent land areas to that of areas adjacent to access points at interchanges with existing road networks. Thus, the existing road network becomes the controller for short-term impacts by providing access to the controlled access corridor. In addition, most of the corridors flow through rural lands predominated by large estate type single-family uses and agricultural uses. Long-term impacts will occur as growth in the surrounding areas results in improvements to the major and collector roads accessed through the limited access corridors.

Conclusion

With the increasing emphasis on safety and environmental issues, enhanced mobility will play an increasingly more significant role in urban and suburban transportation. To accomplish this role and meet future needs a “business as usual” approach will not be sufficient. The time for a fresh approach to enhance mobility is now. The recent growth in people around the greater Jackson metro area present an opportunity to meet transportation needs in innovative, customized ways. By openly discussing new strategies and options with communities throughout the Jackson area in the context of the changing environmental landscape progress can be made in building support for an increasing role for enhanced mobility even where such support did not exist a few years ago.

Transportation agencies must change their orientation toward building primarily for cars. Instituting a complete streets policy ensures that transportation agencies routinely design and operate the entire right of way to enable safe access for all users. This will make sure that their streets and roads work for drivers, transit users, pedestrians, and bicyclists, as well as for older people, children, and people with disabilities.

It is recommended that MDOT closely follow the development of complete street policies, and adopt such policies as appropriate, to support the study’s goals of enhanced mobility and access to all modes of transportation in the greater Jackson metro area.

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