Bossier Plan Chapter 7

Transportation

Planning in advance for thoroughfare development is important to meet future travel demands as the City and Parish continue to develop and to ensure safe and orderly movement of people and goods throughout the region. Effective thoroughfare planning contributes to economic development and is instrumental in reducing traffic congestion and environmental protection, both of which contribute to the quality of life of residents in the Bossier planning area. Although the automobile is the primary mode of transportation, with increased emphasis placed on the natural environment and the varying needs of residents, thoroughfare planning must look not only at the existing roadway network but at alternative modes of transportation, including pedestrian and bicycle circulation and public transportation to improve efficiency.

Transportation is of significant value and importance to Bossier as it is to the State of Louisiana and the nation. A transportation system offers the ability to depart from an origin and arrive at a destination in an efficient and timely manner. It allows the movement of goods, materials and services in a manner that permits the local and regional economy to function successfully. The transportation system is made up of a network of corridors that connect neighborhoods, business districts, and open spaces. These corridors define the shape and pattern of the community as well as the impression it leaves on tourists and residents.

The transportation element of the Bossier Comprehensive Land Use and Development Master Plan establishes a system to accommodate local and regional travel demand through 2020. It is closely coordinated with each of the various elements of the Master Plan to create a strong and successful areawide transportation network. As a reflection of today's system of travel, the transportation element will focus largely upon the street and thoroughfare system. However, it will also place renewed emphasis upon the ability to travel throughout the area without an automobile, via walking, bicycling and use of public transportation. Likewise, the transportation element will discuss the importance of regional, national and international interconnectivity through rail, truck, air and water travel.

The purpose of the Transportation element is to address area wide mobility needs on all levels, from sidewalks and trails, to local streets and neighborhood access, to arterial roadways, highways, railroads, airports and waterways. The principal aim of transportation planning is to ensure safe and efficient movement of people and goods. This plan element includes a new Thoroughfare Plan, which is the long-term general plan for developing an overall system of thoroughfares for the Bossier planning area. The plan will be a guide for securing needed rights-of-way and upgrading and extending the network of streets, roads and highways within the MPC planning area in an orderly and timely fashion as the area continues to grow and the public's mobility and access needs increase.

The transportation element consists of five general sections as follows:

- **Key transportation related issues** confronting the City and Parish as articulated by residents and other stakeholders during a community meeting series.
- **Goals, objectives and action statements** to guide implementation of the transportation element.
- Elements of the existing network and other important components of an **effective, multimodal transportation system**.

- Details of the **Master Thoroughfare Plan**.
- Discussion of **funding sources** available for implementation of the Transportation element.

Transportation Issues

In conjunction with the Master Plan Advisory Committee (MPAC) as well as the input received from dozens of citizens who participated in a community meeting series, there were a number of key transportation issues identified, including the following:

Enhancement of Areawide Mobility

Transportation mobility is the economic lifeblood of an urban area. Bossier benefits from its central location among major southwestern cities, including New Orleans; Dallas, Texas; Houston, Texas; Jackson, Mississippi; Little Rock, Arkansas; and, Memphis, Tennessee. Together, Bossier City and Shreveport form a major transportation hub serviced by Interstates 20, 220, and 49, and U.S. Highways 71, 79, and 80. The future construction of I-69 (known as the NAFTA Trade Corridor) to be routed within the Parish to the east of Bossier City will also enhance interstate mobility and commerce. Bossier's placement within the regional and national picture is of significant importance to the City and Parish. As improvements occur throughout the MPC Planning Area, the transportation system must be adjusted to add or widen streets, provide turn lanes, improve intersections, and manage new trip generators.

Railroad Grade Crossings

The significant presence of rail in Bossier is of great economic benefit while also a liability to traffic movement and safety. Numerous issues were raised by residents through focus group interviews and public meetings regarding the need to address railroad grade crossings, particularly as they relate to both traffic safety and efficiency. Grade crossings in Bossier have historically caused traffic delays at busy roadway intersections and they often serve as a physical barrier that divides neighborhoods. They can also result in dangerous and potentially fatal traffic conflicts. Comments from Bossier residents included the need for railroad scheduling, overpasses or grade separation, and possible rail realignment.

Walkability

Among the various issues regarding transportation, the most often cited concern was the need to address pedestrian infrastructure in Bossier. The vast majority of trips that occur throughout the planning area are by single occupant vehicles due to the sprawling development patterns and because the transportation system is not well equipped to handle walking as an alternative to driving. Many neighborhoods have incorporated sidewalks, however, they lack continuity and connection within and between neighborhoods and other districts. A true "system" of transportation improvements offer a variety of modes, including driving, bicycling, walking and high occupancy vehicles such as carpooling and public transportation.

Public Transportation

In tandem with walkability is the need to have an effective and comprehensive public transportation system that can allow users to reach a destination without a vehicle. While this method will not replace the automobile as the standard and preferred means of travel, the availability of public transportation and pedestrian friendly neighborhoods can play a significant role in achieving efficiency in the transportation system. SporTran, provides routes through Bossier, however, the service area is limited and coverage is not designed to compete with automobiles as an alternative means of transportation. Residents have suggested incorporation of light rail for commuters and expanding bus transportation through a diversified fleet of small and medium size buses.

Multimodal Transportation

The transportation of people, goods, materials, and services is best achieved through a variety of transportation alternatives. In Bossier, the transportation system not only includes streets, but also rail service, waterborne traffic through the Port of Shreveport-Bossier, and air travel through the Shreveport Regional Airport. Each of these nodes generate traffic that can impact the capacity of the existing network of streets and rail lines.

Access Management

The transportation system is designed to provide access to adjacent land uses and intersecting streets. However, the number of access points can directly affect the efficiency

and safety of the street system. Too many points of ingress and egress along a corridor can significantly impede traffic flow and result in more vehicular and pedestrian conflicts. On the other hand, too few access points can result in reduced marketability of area property. An efficient system is properly regulated with regard to the number and placement of curb cuts, traffic signals and signage. Bossier residents raised concerns about access lanes for businesses along major corridors, signal synchronization, misuse of center turn lanes, and neighborhood access problems associated with railroads and other events.

Transportation Plans and Related Studies and Ordinances

- *Subdivision Regulations* – The Subdivision Regulations, which were adopted in 1975, govern the layout, design and standard of development of the street network within the MPC planning area. The regulations address the functional classification of streets, the width of street rights-of-way and pavement, standards of alignment and design, and property access. The subdivision regulations are being updated and unified with the zoning and other development-related ordinances as part of the plan development process.

- *Railroad Grade Crossing Study* – Commissioned by the City of Bossier City in 2001, the primary purpose of this study was to evaluate the railroad impacts on vehicular traffic operations and identify improvement needs at a series of highly congested railroad crossings. The study evaluated the existing vehicular and railroad traffic conditions, identified delays and hazards, and recommended improvements such as grade separations, roadway widening, installation of warning devices and other traffic control/site improvements. Its conclusions and recommended improvements are further discussed later in this chapter.

- *Shreveport-Bossier Area Metropolitan Area Transportation Plan, 1990-2010* – Developed by the Shreve Area Council of Governments, now known as the Northwest Louisiana Council of Governments, the Transportation Plan provides a framework for planning and development of the region's transportation system through 2010. Change in the Bossier-Shreveport area, including the projected growth, made this plan imperative to provide continuing attention to ongoing development of the transportation system. The plan identified committed roadway improvements and short and long-range improvement needs throughout the metropolitan area. Major roadway projects such as the extension of I-49 and the proposed I-69 corridor have prompted the Council of Governments to update its Metropolitan Transportation Plan, which is in the final stages of development as this plan was prepared.

- *Corridor 18 Feasibility Study* – In the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Congress designated certain highway corridors of national significance to be included in the National Highway System. In this legislation, Corridor 18 was defined as extending from Indianapolis, IN to Memphis, TN. Subsequent legislation extended the corridor to Houston, Texas via Shreveport-Bossier City, Louisiana. This study produced data concerning cost, economic efficiency, impacts on economic development, financial viability and other issues for the corridor. The study concluded that the project was indeed feasible and it would enhance freight transportation and trade, improve economic

Source: Wilbur Smith Associates

Corridor 18, foreshadowing I-69, extends from Michigan south to Texas substantially improving over the road transportation and trade, ultimately connecting Canada and Mexico.

efficiencies, as well as enhance access to intermodal facilities and military installations.

- *Corridor 18 Special Issues Study* – On the heels of two previous studies including the Corridor 18 Feasibility Study, the Special Issues Study addressed issues that will impact the future location and environmental considerations of the proposed corridor. Additionally, the study addressed significant location issues such as major river crossings, state line crossings (Louisiana/Texas) and connections to the urban areas such as Shreveport-Bossier City. The study identified the preferred location along the eastern edge of Barksdale Air Force Base, which is now under consideration for the alignment of I-69.
- *Bossier Parish Focus Forum Report* – As part of the Louisiana Community Futures Forum, a statewide needs assessment sponsored by the Louisiana Cooperative Extension Service, this report presents the results of a forum held in the Parish. The outcome of the forum pertaining to infrastructure was discussion to facilitate population growth within Bossier Parish. Identified action steps included the need to create north/south expressways throughout the Parish and relocation of existing rail service.
- *Traffic Study for the Downtown Bossier Redevelopment Plan* – Completed in 1995, this study was part of a larger redevelopment plan conducted for Bossier City. The Traffic Study analyzed the traffic system in areas of North Bossier regarding existing conditions and traffic patterns, parking, transit and other elements. The report included roadway, parking, transit, signage and pedestrian access recommendations.
- *Bossier City Arena Traffic Impact Study* – In anticipation of the CenturyTel Center, which has since been completed, this report analyzed the existing transportation conditions, developed traffic generation forecasts, evaluated traffic impacts and established recommendations for improvements. The study concluded that a combination of roadway and traffic control improvements would most efficiently accommodate future Arena traffic and improve traffic operation in the area.

Transportation Goals, Objectives and Action Statements

The following goals, objectives and actions form the bridge between the identified transportation issues and the recommended implementation actions. Based upon feedback through a variety of public meetings, focus group interviews and advisory committee meetings, the following statements are intended to provide guidance for the long-term development of the regional transportation system. In summary, the transportation goals include:

- Improve mobility through key thoroughfare improvements, new construction and enhancing the existing street infrastructure.
- Mitigate railroad grade crossing conflicts to reduce interference with other modes of transportation.
- Promote pedestrian and bicycle pathways as a viable alternative to automobile traffic, particularly one that is tied to a public transportation system.
- Enhance the public transportation system to allow the combination of walking and public transportation to be considered a viable alternative to automobile use in the MPC Planning Area.
- Enhance the coordinated use of street, rail, water and air transportation as a single system designed for the efficient movement of people, goods and materials.
- Manage access to land uses from the transportation system in order to reduce or minimize the risk of accidents and increase travel efficiency.

Enhancement of Areawide Mobility

The new Master Thoroughfare Plan Map identifies the forecasted build-out of the MPC Planning Area transportation system. Incremental development of the street network will occur concurrent with private development through dedication and construction of adjacent streets and through various local, parish or state initiated projects.

Goal 7.1: Improve mobility by key thoroughfare improvements, new construction and enhancing the existing street infrastructure.

Improved areawide mobility requires coordination with future land uses (i.e. the Future Land Use Map) and cooperation between various jurisdictions.

Objective A: Coordinate with the Louisiana Department of Transportation and Development (LA DOTD), Shreveport/Bossier City MPO, Northwest Louisiana Council of Governments, Bossier City, and Bossier Parish to anticipate and implement pending transportation system improvements.

Objective B: Revise ordinances as needed to improve the character and efficiency of the local street network, including both new and existing streets.

Objective C: Adopt a roadway classification system that permits for added flexibility in street design yet improves overall network functionality.

Objective D: Provide sufficient interconnection between neighborhoods and other areas to ensure appropriate emergency response times and to encourage enhanced interaction between areas.

Action 7.1.1: Coordinate with LA DOTD for improvement of Barksdale Boulevard to a five-lane configuration.

Action 7.1.2: Coordinate with the City of Shreveport to provide for thoroughfare system development and additional bridges across the Red River. For example, link McDade Street in Bossier City to Stoner Avenue in Shreveport and widen the Jimmie Davis Bridge.

Action 7.1.3: Expand Arthur Teague Parkway north through to Traffic Street and south to ultimately connect with Curtis Sligo Road.

Action 7.1.4: Enhance and extend Winnfield Road to connect with Airline Drive.

Action 7.1.5: Improve and extend Caplis-Sligo Road to connect Curtis-Sligo Road to Hill Road (LA 527).

Action 7.1.6: Enhance Wafer Road and extend south of U.S. 79/80 to tie into I-20.

Action 7.1.7: Enhance access to and circulation in the vicinity of the CenturyTel Center by extending Teague Parkway to link with new collector routes including the extension of Sunflower Boulevard, Golden Meadow Drive, and Hope Street, ultimately connecting to Curtis-Sligo Road.

Action 7.1.8: For additional connectivity and mobility, extend Sunflower Boulevard as a minor arterial south and east to Barksdale Boulevard.

Action 7.1.9: Enhance Industrial Drive as it connects with Bodcau Station Road and an interchange at I-20.

Action 7.1.10: Extend Shed Road to Bellevue Road in the Red Chute area.

Action 7.1.11: Improve Adner Road to minor arterial street standards and establish a new north/south minor arterial street between Winnfield Road and U.S. 79/80 linked to the eastern terminus of Adner Road.

Action 7.1.12: Extend Greenacres Drive easterly as a collector to Swan Lake Road.

Action 7.1.13: Extend Wemple Drive westerly to Benton Road and easterly to Swan Lake Road.

Action 7.1.14: Begin to acquire additional right-of-way, where available, to improve collector and arterial classified roadways.

Action 7.1.15: Coordinate land development decisions with the Master Thoroughfare Plan to ensure that the integrity of the street system is maintained and that access and circulation are acceptable both on and off site.

Action 7.1.16: Identify opportunities for acquiring undeveloped lots or other parcels to extend

collector roadways within developing areas to provide for adequate connections between developments.

Action 7.1.17: Limit the construction of dead-end streets or cul-de-sacs that prevent interconnection of the street system.

Action 7.1.18: Establish a formalized partnership with LA DOTD, Bossier City, Bossier Parish and the NLCOG to regularly discuss and coordinate area wide transportation improvements within the MPC Planning Area. Key issues include rights-of-way preservation, thoroughfare improvements, trails and bikeways and public transportation.

Action 7.1.19: Extend Viking Road north under IH 220 to tie into Airline Drive.

Railroad Grade Crossings

Numerous rail lines that pass through Bossier City and Bossier Parish are an economic amenity because of the significant goods and materials that pass through the area, including several destinations in the region. However, the location of the rail lines also creates transportation issues because of traffic congestion when the rail lines are in use. While care must be exercised to preserve the functional utility of rail corridors, traffic conflicts between railroads and motor vehicles, pedestrians, and bicycles are a significant concern.

This is largely due to the number of at-grade crossings with few alternative routes. Constructing grade separated overpasses major railroad-roadway intersections and traffic safety improvements at existing crossings are potential solutions. Several key conflicts between railroad and vehicular traffic have been identified in conjunction with the recent analysis, "Railroad Grade Crossing Study" performed by WSA for Bossier City.

Goal 7.2: Mitigate railroad grade crossing conflicts to reduce interference with other modes of transportation.

Objective A: Initiate major improvements to significant automobile/rail conflict intersections.

Objective B: Coordinate with LA DOTD and the U.S. DOT to improve safety conditions of rail lines and specifically highway/rail grade crossings throughout the MPC Planning Area.

Congestion at the main entrance to Barksdale Air Force Base is magnified when movement is interrupted by trains. Implementation of recommendations in the "Railroad Grade Crossing Study" should help to alleviate the problem.

Objective C: Analyze the possibility of railroad relocation in a manner that can benefit area residents,, the railroad companies and economic development opportunities.

Action 7.2.1: Implement the grade separation project on Benton Road at the KCS rail line.

Action 7.2.2: Consider implementation of grade separations on Airline Drive (S of IH-20) at the KCS rail line as well as on East Texas at the UP rail line to eliminate vehicle/train conflicts.

Action 7.2.3: In coordination with LA DOTD, analyze and make necessary recommendations for highway/rail grade crossing safety initiatives at key crossings, including at Airline Drive (South of Northside) at KCS, Hamilton/Shed Road at UP, Barksdale Boulevard at KCS, and Benton Road (North of Shed Road) at KCS to improve warning/protection of vehicular traffic.

Action 7.2.4: Coordinate with the railroad companies (Union Pacific and Kansas City Southern) for future thoroughfare improvements that intersect railroad right-of-way.

Action 7.2.5: Coordinate and communicate with the railroad companies (Union Pacific and Kansas City Southern) as well as LA DOTD and the U.S. DOT to identify safety and traffic congestion solutions,

including limiting rail service during peak traffic hours and establishment of a speed limit through urbanized areas.

Action 7.2.6: Consider coordination with the LA DOTD and U.S. DOT to identify the feasibility of rail line consolidation and/or rail line realignments away from the urbanized area to be situated closer to customers and potential warehousing/distribution activities associated with the development of the Port of Shreveport/Bossier and the proposed IH 69 corridor in the southeastern portion of the MPC Planning Area.

Walkability

The key components to creating a walkable environment include ensuring that pedestrians paths are available, and convenient; the distance between destinations is relatively short; the duration of the walk is entertaining and comfortable; and that other forms of transportation are available for traveling longer distances.

Sidewalks, street separation and shade from large trees provide an inviting environment that is conducive to walking.

Pedestrian routes are generally linked to sidewalk and trail systems. Those neighborhoods that include such systems rarely ensure that they are connected to surrounding systems. Connections to other types of uses, such as commercial sites or higher density housing are almost nonexistent with the exception of historic areas such as North Bossier.

Goal 7.3: Promote pedestrian and bicycle pathways as a viable alternative to automobile traffic, particularly when tied to a public transportation system.

Objective A: Pursue development of a communitywide bicycle and trail network that links neighborhoods with other destinations, including, schools, parks, the riverfront, entertainment areas and commercial opportunities.

Objective B: Improve subdivision design to promote an efficient and enjoyable pedestrian experience.

Objective C: Maintain and expand the existing system of sidewalks in the MPC Planning Area.

Action 7.3.1: Conduct a comprehensive and detailed inventory of sidewalks and other pedestrian facilities throughout the community and prioritize needed improvements by use and proximity to public facilities.

Action 7.3.2: Pursue additional grant opportunities through LA DOTD's Transportation Enhancement Program similar to pending projects such as the McDade Street Corridor Enhancement Project and the Civil War Red River Campaign Trail project.

Action 7.3.3: Establish an ongoing pedestrian and bicycle system planning program to acquire easements and rights-of-way, through fee simple purchase or dedication, in conjunction with or preferably in advance of development.

Action 7.3.4: Acquire conservation easements within the floodplain and along Willow Bayou, Flat River, Fifi Bayou, and the Red River as greenbelt corridors.

Action 7.3.5: Identify secondary arterials, collectors and local residential streets that are suitable for designation as a bicycle route.

Action 7.3.6: Seek Federal and State financial assistance grants for pedestrian and bicycle transportation projects, such as transportation enhancement funds under the Transportation Equity Act for the 21st Century (TEA-21).

Action 7.3.7: Allocate capital improvement funds on an annual basis to construct pedestrian walkways, sidewalks, crosswalks, handicap accessible ramps

and curb cuts in areas with significant pedestrian traffic, such as North Bossier, along major transportation arteries such as Airline Drive, Benton Road and Barksdale Boulevard, around elementary and middle schools, public parks, and public buildings.

Action 7.3.8: Consider funding sources such as improvement districts, Community Development Block Grants, transportation enhancement funds, and public-private partnerships for sidewalk improvements along existing roadways in established neighborhoods.

Action 7.3.9: Maintain block lengths of less than 500 feet or require incorporation of mid-block pedestrian pathways.

Action 7.3.10: Utilize pedestrian paths to create interconnection between parks, schools, neighborhoods and other sites of interest.

Action 7.3.11: Provide street furniture and vegetation to complement the pedestrian experience.

Public Transportation

SporTran is the most obvious of three public transportation programs operating in the MPC Planning Area. Bossier City has historically shown a hesitancy to expand SporTran's service and the carrier is unable to expand outside of incorporated boundaries. Other programs are designed only for support on an irregular basis. Yet walkability is strongly linked to public transportation. Without the ability to travel extensive distances without an automobile, it is likely that even the most pedestrian friendly neighborhood will not realize a rise in destination oriented pedestrian trips without public transportation.

Goal 7.4: Enhance the public transportation system to allow the combination of walking and public transportation to be considered a viable alternative to automobile use in the MPC Planning Area.

Objective A: Ensure that all neighborhoods and employment centers in the MPC Planning Area are within a ten–minute walking distance of a bus stop.

Objective B: Provide a single, coordinated public transportation system that offers service throughout the residential and employment centers of the MPC Planning Area.

SporTran is the primary public transportation provider in Bossier City, while other agencies such as the Council on Aging, provide transit services for residents with special needs.

Action 7.4.1: Conduct a transit study to evaluate the most efficient and cost-effective service options for expansion.

Action 7.4.2: Coordinate with Bossier City to gain approval necessary to expand public transportation service in and around Bossier.

Action 7.4.3: Seek funding assistance from the Federal Transit Administration (FTA), Louisiana Department of Transportation & Development (LA DOTD) or through a local referendum to subsidize fare box revenues.

Action 7.4.4: Expand SporTran shuttles used for the Independence Bowl for other area special events held at the CenturyTel Center.

Action 7.4.5: Develop a park-and-ride program to provide ridesharing opportunities to and from communities in the Planning Area and other regional employment destinations.

Action 7.4.6: Create bus stops and stations to reflect a public transportation system that serves as a viable alternative transportation source to automobile traffic.

Action 7.4.7: Coordinate with local leaders to amend all ordinances and legislation that restrict development of a single public transportation service provider for the entire MPC Planning Area.

Multimodal Transportation

Maximization of the transportation system includes utilizing the Port of Shreveport-Bossier, Shreveport Regional Airport, and Shreveport Downtown Airport as significant components to the transportation system. Air travel allows for people and goods to be made available quickly, regardless of distance. The Port provides an economical means of moving goods and materials through Louisiana and the country.

Goal 7.5: Enhance the coordinated use of street, rail, water and air transportation as a single system designed for the efficient transportation of people, goods and materials.

Objective A: Ensure that adequate rail and street service is available to the Port of Shreveport-Bossier and the Shreveport Regional Airport.

Objective B: Build upon the competitive advantages offered by the presence of the Port and airports by enhancing all aspects of the multimodal system.

Source: Intermodal Association of North America

Multimodal transportation networks are taking hold in the Bossier region through the continued expansion of the port, airport and fruition of the I-69 project.

Action 7.5.1: Seek out development of the I-69 corridor in a location that allows for improved service to the Port and Shreveport Regional Airport.

Action 7.5.2: Endorse continued internal improvements to the Port and airport systems.

Action 7.5.3: Coordinate among all components of the multimodal system to determine growth needs of all components, including air, water and rail.

Action 7.5.4: Study and improve movement of goods between Bossier Industrial Park and the Port and airport facilities.

Access Management

The efficiency of the local transportation system depends upon the ability to move people and goods without interruption. Access management ensures that traffic flow is not impeded while vehicles enter or exit adjacent land uses.

Goal 7.6: Manage access to land uses from the transportation system in order to reduce or minimize the risk of accidents and increase travel efficiency.

Increased access management will result in enhanced efficiencies, fewer auto accidents, and improved mobility with fewer curb cuts, more median breaks and synchronized traffic signals.

Objective A: Institute access management techniques through incorporation into local ordinances and alleviation of potential conflict points.

Action 7.6.1: Implement standards to manage access, including the number of driveways, their location,

spacing; street intersections and connections; medians and median breaks; marginal access roads; traffic signal location and timing; turn lanes and acceleration/deceleration lanes; and, pedestrian and bicycle facilities.

Action 7.6.2: Adopt/reinforce a driveway ordinance to include guidelines regarding the design, construction, location, width, spacing, radius, offset and coordination of driveways on principal and minor arterials and collectors roadways.

Action 7.6.3: Acquire additional right-of-way as needed to address areas of congestion caused by the lack of access management and develop turn lanes and acceleration/deceleration lanes as appropriate.

Existing Transportation System

As noted in the Area Profile, the Bossier MPC Planning Area is located in northwestern Louisiana along the eastern bank of the Red River. With Shreveport opposite Bossier City along the river, and proximity to Arkansas and Texas, it is the heart of the Ark-La-Tex region.

Two major interstate highways, I-20 and I-49, intersect this region. With the development of the Port of Shreveport-Bossier and its proximity to the Interstate Highway System and the Shreveport Regional Airport, the region is well suited for a variety of economic development activities. Bossier City is well connected to other urban centers. Along I-20, Dallas, Texas is approximately 200 miles west and Monroe, Louisiana is approximately 100 miles east. Little Rock, Arkansas is approximately 210 miles north and Lafayette, Louisiana is 227 miles south along the I-49 corridor. Bossier City and the surrounding MPC Planning Area is a focal point of activity in Bossier Parish. Other communities in the Parish are primarily along three radiating corridors. North of Benton along LA 3 are Hughes, Plain Dealing and Bolinger. East of Bossier City along I-20 is Haughton and south along U.S. 71 are Elm Grove and McDade. All but Elm Grove are outside the MPC Planning Area.

The Red River is also an important component of the region's transportation system allowing barge access to and from the Mississippi River, which is the nation's largest river system. Situated along the Red River, the Port of Shreveport-Bossier City links customers throughout the Ark-La-Tex region to domestic and international markets via the Mississippi River and the Gulf Intracoastal Waterway.

The existing roadway system, traffic conditions and travel patterns on the highway and street network were evaluated using information obtained from the Northwest Louisiana Council of Governments and the City of Bossier City. This evaluation was needed to assist in determining long-range needs for thoroughfare system development. Other transportation modes, facilities, and services were also identified for this element.

Existing Roadway Network

A network of State, Parish and local highways, roads, and streets comprise the surface transportation system in the Bossier planning area. Connections to other major state highways and the National Highway System (NHS) contribute to the growth of the overall regional economy. The purpose of the NHS is to provide an interconnected system of principal arterial routes that serve major population centers, international border crossings, ports, airports, public transportation facilities, other intermodal transportation facilities and other major travel destinations; meet national defense requirements; and serve interstate and interregional travel. The roadway network in the Bossier planning area includes the following facilities:

Interstate Highways

Proximity to Interstate Highways is essential for the movement of people and goods throughout the region. The area's transportation network is complemented by the presence of the following interstate corridors:

Interstate Highway 20 - This east-west controlled access highway links Bossier City to Shreveport and Dallas/Ft. Worth (and ultimately I-10 east of El Paso, Texas) to the west and Monroe, Louisiana to the east (and ultimately I-95 east of Columbia, South Carolina).

Interstate Highway 220 - This limited access corridor serves as a northern bypass of the Shreveport-Bossier City urbanized area. The presence of Barksdale A.F.B. is a limiting factor to extending this facility south of I-20 to form a complete loop around the urbanized area. I-220 exits I-20 near the Shreveport Regional Airport and connects back to I-20 near the eastern extents of Bossier City's corporate limits. The southern segment is discontinued in

Shreveport, but will ultimately tie into the I-69 alignment upon completion.

Interstate Highway 49 - Louisiana's newest interstate corridor connects Shreveport to Lafayette via Alexandria/Pineville. The I-49 corridor is part of ISTEA/NHS High Priority Corridor 1, which extends between Shreveport, Louisiana, and Kansas City, Missouri. Interstate 49 will follow U.S. 71 from its current northern terminus in Shreveport north into Arkansas. A number of corridor-specific improvements have been identified for consideration in the *State Highways of Significance Plan*, which includes extension of I-49 north from I-20 to the Arkansas line.

U.S. Highways

The U.S. Highway system was a predecessor to the Interstate Highway System. A number of U.S. Highway corridors traverse the Ark-La-Tex region, four of which are within the planning area, including:

U.S. 79 – U.S. 79 runs southwest/northeast occupying the same alignment as U.S. 80 within the planning area. U.S. 79 originates in Round Rock, Texas and terminates in Russellville, Kentucky.

U.S. 80 – U.S. 80 runs east/west parallel to I-20. Through much of the planning area the route is shared with U.S. 79. Significant growth in the northeastern portion of the planning area continues to increase traffic volumes adding to an already congested condition.

U.S. 71 – U.S. 71 runs north/south and parallels the east side of the Red River. To the south, it connects Alexandria, Louisiana parallel to I-49 and ends at U.S. 190 near the Atchafalaya River. To the north, the corridor ties much of the Great Plains terminating in International Falls, Minnesota.

U.S. 171 - Known as Louisiana's "Western Corridor", U.S. 171 runs south to connect to Lake Charles, Louisiana. Many portions of the corridor have been improved to four lanes, but significant stretches remain two lanes. The remaining improvements are tied to LA DOTD's Transportation Infrastructure for Economic Development (TIMED) program, which is a 15-year (1990 – 2004) construction program funded by a four cent fuel tax.

State Highways

Several thoroughfares in the MPC Planning Area are maintained by the Louisiana Department of Transportation & Development (LA DOTD), including:

LA 3 – Also known as Benton Road, LA 3 runs north from its point of origin at Old Minden Road near Barksdale Boulevard (U.S. 71) connecting to Arkansas S.H. 29. This highway segment is one of the area's busiest roadways since L.A. 3 connects rapidly growing suburban areas between Bossier City and Benton. The Arkansas portion connects to Interstate 30 in Hope, AR.

LA 3105 – LA 3105, also known as Airline Drive, originates at Barksdale Boulevard and continues north parallel to L.A. 3 (Benton Road). Similar to Benton Road/L.A. 3, this roadway is heavily utilized as a commuter corridor between the developing portions of the Parish and the Bossier urban area.

LA 782-1 – This short route is an extension of Patricia Drive and connects LA 3105 (Airline Drive) to LA 185 (Northgate Road).

LA 782-2 – LA 782-2, also known as Industrial Drive, is a spur of LA 72 (Old Minden Road) that connects to U.S. 79/80 (E. Texas Street). Parallel to I-20 and the KCS Railroad, the corridor is dotted with warehousing, distribution and light industrial uses.

LA 72 - Also known as Old Minden Road, this east-west corridor ties into I-20 and Industrial Drive and originates on the west at Traffic Street.

LA 185 - LA 185, or N. Gate Drive, originates at Old Minden Road near Airline, runs southeast and provides secondary access to Barksdale A.F.B.

LA 3032 - LA 3032, or W. Gate Drive is a short corridor that connects Barksdale A.F.B. to Shreveport where it becomes Shreveport Barksdale Highway before terminating at LA 1 (Youree Drive).

LA 511- In the southern portion of Bossier City, LA 511 or Jimmy Davis Highway originates at U.S. 71 (Barksdale Blvd.) traversing the Red River to connect to Shreveport. In Shreveport, LA 511 is known as W. 70th Street as it proceeds westerly providing connections to Bert Kouns Industrial Loop (LA 526), I-49, Shreveport Regional Airport, Airport Industrial Park, West Shreveport Industrial Park and Greenwood. It is the southernmost of five bridges tying to Caddo Parish.

LA 612 - LA 612 originates at U.S. 71 in southern Bossier City. Also known as Curtis Sligo Road, this roadway connects

the communities of Curtis and Sligo, which are realizing rural development and congestion.

Table 7.1
Bossier Area Traffic Volumes

Street	Intersection	ADT
Airline	Crosscheek Road	11,517
	Greenacres Blvd	19,908
	Old Minden Road	42,107
	Pierre Bossier Mall	36,530
	Shed Road	44,370
Arthur Ray Teague Parkway	McDade Street	13,980
Barksdale Blvd.	Airline Drive	47,062
	Bellaire	26,350
	Central Park Drive	17,495
	Hamilton Road	20,847
	Jimmie Davis Hwy.	30,997
	Shady Grove Drive	33,080
	Westgate Drive	56,137
Benton Road	Beckett Street	32,515
	Burns Drive	31,371
	Greenacres Blvd	25,458
	Riverwood Drive	34,321
	Shed Road	36,397
E. Texas Street	Airline Drive	53,826
	Benton Road	50,603
	Hamilton Road	27,409
	Industrial Drive	29,387
	Pierre Bossier Mall	25,093
	Swan Lake Road	25,847
	Traffic Street	29,832
I-20	Airline Drive	49,350
	Hamilton Road	21,945
	Industrial Drive (E/B)	18,307
I-220	Airline Drive	39,549
	Benton Road	38,927
	E. Texas Street (E/B)	20,816
Isle of Capri Blvd.	Arthur Teague Parkway	17,362
Jimmie Davis Hwy.	CenturyTel Center Drive	29,535
	Sunflower Blvd.	19,197
LA 154	U.S. 71	2,070
LA 612/Curtis Sligo Road	U.S. 71	6,264
Old Minden Road	Benton Road	12,784
	Benton Road Spur	45,520
	Preston Blvd.	18,842
	Waller Avenue	14,191
Patricia Drive	Northgate Road	18,231

LA 527 - Originating at U.S. 71 in the community of Taylortown, LA 527 terminates at Lake Bastineau State Park in Webster Parish to the east.

LA 154 - This two-lane corridor also originates at U.S. 71 in Elm Grove in the southernmost portion of the planning area. LA 154 meanders easterly through Bienville Parish and northerly to Claiborne Parish, terminating in Athens at LA 9.

Traffic Volumes

Traffic volumes identify existing travel patterns and assist in determining the ability of the transportation system to serve the area's travel demands. The most recent available average daily traffic volume counts for major area roadways were obtained from the District 4 Office of the Louisiana Department of Transportation and Development (LA DOTD). The office records average daily travel (ADT) volume counts for stations throughout the planning area and maintains data from 1973 (in most cases) forward.

The traffic volume data displayed in **Table 7.1 – Bossier Area Traffic Volumes**, clearly show the rise in traffic on roadways approaching Bossier City and the drop-off as roads leave the urban area. The highest average daily traffic volume in Bossier City in 2001 was the 56,137 average daily traffic (ADT) on Barksdale Boulevard at Westgate Drive. There are significant volumes on both Benton Road and Airline Drive ranging from 19,908 vehicles at Airline and Greenacres to 44,370 vehicles at Airline and Shed Road. Data collected for various dates at stations located in the unincorporated areas of Bossier Parish consistently exhibit an increase in traffic volume. The most marked increases were noted in the northern and eastern portions of the Bossier City area where much of the recent development has occurred.

Transportation Modes

Opportunities abound for the enhancement of multimodal transportation options in the Bossier area, representing improvements to economic development, recreation, the environment, and local quality of life. The term multimodal refers to the range of transportation modes that form an urban transportation system, including single occupant vehicles, multiple occupant vehicles such

as car/van pools and public transit, walking, bicycling, rail, air and water. The following subsections inventory each mode of transportation in the Bossier planning area, including regional facilities that serve the travel demand needs of Bossier's residents even though they may be located in Shreveport.

Walking and Biking

A dynamic, multimodal transportation system encompasses a variety of transportation options, including those that are the most basic: walking and bicycling. In Bossier, similar to most other urban areas, the role of walking and biking has diminished significantly over the years as dependence on the automobile has increased. In recent years though, there has been a renewed interest in making communities more livable, which means making neighborhoods, commercial districts and centers, and public spaces more pedestrian friendly and walkable.

Over the last several decades, dependence upon the automobile as the preferred mode of transportation has become a national trend. This trend is apparent in the Bossier planning area as witnessed by the increasing importance on transportation infrastructure improvements and specifically in the outward development pattern that is occurring. Reliance on the automobile has resulted in more choice in how and where to live, work and play.

However, dependence upon the automobile has not come without cost – a cost that is being realized in the form of increased taxes, reduced levels of public services such as police and fire protection, less affordable housing, degradation of green space and environmentally sensitive areas, pollution of air and water, and many other well documented costs. The automobile has changed development patterns causing land uses to be segregated, setbacks to be increased, and nearby neighborhoods to become rural subdivisions outside of corporate limits. All of these occurrences have contributed to reduced accessibility and less walkable communities.

Not unlike most urbanized areas, the Bossier region's transportation system is highly automobile oriented, and much of this element addresses improved mobility focused on the street system. However, the importance of other modes of transportation, including walking, bicycling and public transportation is not overlooked. Each travel mode plays a vital role in the overall transportation system and is addressed accordingly.

Pedestrian System Planning

Pedestrian walkways, sidewalks and crosswalks are part of the City's existing transportation system that serve the needs for pedestrian movement in residential neighborhoods, commercial business areas, and around schools, parks and other community facilities. Safe and well-maintained pedestrian facilities are particularly needed in the older established areas and in areas that did not have sidewalks installed before they were required by the Bossier City-Parish MPC Subdivision Regulations.

The nature and extent of the sidewalk inventory has not been formally evaluated. However, consideration should be given to conducting such an assessment to ensure proper and timely maintenance of sidewalk facilities, implement compliance with the American's with Disabilities Act (ADA) and establish sidewalks in neighborhoods that warrant them. Locally drafted and administered ordinances should also restrict obstacles on sidewalks such as parked vehicles and trailers, which are a hindrance to pedestrian mobility.

Eliminating barriers to pedestrian mobility is one of the most important features in planning and developing an effective pedestrian network. Freeways, major arterials, railroads, and rivers and bayous all impose significant barriers to access and mobility. Barriers may be reduced or eliminated through shifts in subdivision design, fully integrating concepts of neighborhood schools, parks, retail/service and other public facilities.

The Influence of Neighborhood Design on Pedestrian Mobility

Most modern subdivision street patterns are highly auto oriented while traditional street grid patterns accommodate cars but offer better solutions for pedestrians. Examples of each are available within the Bossier Planning Area that can provide insight for maximizing the potential of a bicycle and pedestrian transportation system.

In "Old Bossier", situated north of downtown and immediately east of the proposed Cane's Landing is a neighborhood that has a grid pattern of local streets. Supporting the concept of "community", Bossier

Elementary School serves as a central focus for the neighborhood. The street grid is dense and regular allowing pedestrians several choices of routes to the school. This and many other good examples may be found in Bossier, which offer lessons toward creating walkable neighborhoods.

Compared to traditional neighborhood designs, newer residential developments exhibit less desirable street patterns for walking and bicycling. While curvilinear street patterns provide interest and appeal to the homeowner, pedestrians have fewer choices of direct routes to destinations within or outside of their subdivision. Rather the pedestrian is left with the alternative of following streets that, at times, meander away from their destination.

Similar to automobile traffic, pedestrians rely on a series of connecting paths to make their trips. These paths may include sidewalks, off-street trails and walkways, linear parks and connections, crosswalks or any other form of linkage. Most importantly, the system of paths must be well connected and continuous. Climate, too, has an influence on the pedestrian system. In the Ark-La-Tex region, the climate is generally hot and humid in the spring and summer months and mild but often wet in the winter months. With limited exceptions, neither are conducive to walking for significant distances. Thus, the nature of the walk becomes a factor. In terms of transportation and thoroughfare design, the design of the unoccupied public right-of-way becomes quintessential.

Recommendations for street design considerations in a pedestrian-friendly community include:

- Cul-de-sac streets should be carefully managed to ensure they are not over utilized. Pedestrian linkages in the form of access easements and walkways connecting parts of the neighborhood together and providing access to schools and parks should be encouraged or required.
- Sidewalks and/or trails should be required in all new development, concurrent with street construction, and installed in areas where they are not currently available. Sidewalks should be provided on both sides of all arterials and collector roadways and on one or both sides of local residential streets. Trade-offs may be permitted in large lot developments to allow off-street trails in lieu of sidewalks thereby meeting the needs of walkers and bicyclers.
- As the pedestrian system matures, a hierarchy of paths (similar to street classification) should be developed. For instance, a series of feeder pedestrian paths may include only minimal amenities while collector (secondary) and "arterial" (primary) paths are fully developed.
- Mid-block connections in the form of access easements and walkways should be required to provide linkages between blocks and particularly to common facilities such as parks and open areas.
- Streets, sidewalks and other pedestrian connections and public gathering areas should be encouraged to create sheltered areas from heat and inclement weather.
- Landscaping should be encouraged along pedestrian paths both for aesthetic and environmental reasons. Trees provide shade and a sense of enclosure around pedestrian paths. Other vegetation, such as flowers and shrubs are also encouraged to further compliment the streetscape. When possible native plant material should be integrated, which is more tolerant of local conditions.

Planning for Bicycle Transportation

As the Bossier planning area continues to grow, designated bicycle routes, on-street bikeways, and off-street bike/hike/jog trails should be developed to link major attractions and destinations throughout the City and Parish, including neighborhoods and apartments, parks, schools, churches, libraries, museums, major employers, medical clinics, social service agencies, and shopping areas. In this way bicycle routes can provide an alternative mode of transportation while also serving the recreational needs of area residents. The Arthur Ray Teague Greenway offers an excellent example of a trail facility that provides connection from South Bossier toward downtown.

The State of Louisiana recognizes a bicycle as a vehicle, with all rights and responsibilities for roadway use that are provided to motor vehicles. As such, cyclists can legally ride on any street in the planning area, although controlled-access highways are off limits to both bicycles and pedestrians. Highway funds in Louisiana may be used for the construction and development of bicycle paths

where paths may be established wherever a highway, road, or street is being constructed, reconstructed or relocated. Additionally, bayou corridors, parks and recreation areas, and various rights-of-way and easements that traverse the planning area represent opportunities for future development of bicycle and pedestrian facilities. These opportunities can be incorporated as transportation enhancement projects such as multi-use trails, historic sites, and scenic beautification areas. The conceptual plan for trail and bikeway system development provided in *Chapter 6, Parks, Natural Resources and Open Space*, of this plan should serve as a long-range plan for the development and implementation of an interconnected network of bike and pedestrian trails.

Public Transportation

As a component of a multimodal transportation system, the ability of public transportation to function effectively is directly related to the degree to which the community is transit-supportive. Beyond political and popular support, a transit-supportive community is characterized by a well-developed system connecting nodes of activity, such as major employers, shopping areas, medical clinics, social service agencies and public institutions.

Evaluated as a stand alone system, highly effective public transit systems are generally intended to supplement other modes of transportation. Balance among the various modes must be achieved based upon ridership demands and suitability. From a demand perspective, bus transportation is ideal for many demographic groups, among them are the elderly, the young, and persons on a limited or "fixed" income. Though there are exceptions, by and large, systems are typically designed to facilitate these primary groups.

The elderly and young represent a captured market, most with few alternatives to travel beyond walking or rides with friends and family. The increasing ratio of elderly persons in Bossier is not likely to peak for another twenty years since the largest population is within their middle thirties and early forties, as displayed in Chapter 2 – Area Profile. Elderly persons, many of who are no longer able to drive, typically live in clusters such as retirement homes and communities. Young people, including teenagers, college students and young professionals, also represent strong ridership opportunities. Many young people are eager to gain employment and go to school, but do not have the resources with which to purchase a vehicle. Thus, public transit is a plausible solution. College students, many away from college without vehicles, tend to cluster in dormitory housing or apartments. Although most of the post-secondary education opportunities are located in Shreveport, many students could rely on dependable, efficient transit from areas within Bossier.

The Federal Transit Administration (FTA) notes the following trends as they relate to the impacts on the transportation system, particularly transit:

- As the population increases, the aggregate increase in the number of trips and miles can be expected to affect environmental quality and the demand for transportation infrastructure.
- Accessible transportation alternatives are necessary for maintaining older Americans' opportunities for independent living and their access to necessary goods and services. The growth in the older American population will also increase demand for elderly friendly fixed route vehicles, ADA paratransit and other transit services.
- Despite progress, transportation remains a major obstacle to employment and participation in the community for persons with disabilities.
- Because low density population areas provide little low or moderate income housing, unemployed and low-income people are concentrated in inner cities, without transit links to suburbs where new jobs are being created.
- A change in commuting patterns will place new and different demands on the transportation network.
- The planning and designing of surface transportation systems must take into account non-traditional work schedules and provide intermodal linkages for people who work at varying locations and those who must combine work trips with other stops, such as child or elder care facilities.
- Telecommuting can provide significant reduction in highway congestion, fewer accidents, reduced emission of pollutants and savings in energy and petroleum consumption.
- Transportation patterns are determined largely by

employment and location. Low income service workers and unemployed individuals, many of whom are minorities, tend to travel shorter distances and depend more on public transit.

- Improved efficiency, reduced pollution, and increased use of alternative fuels are vital to meeting environmental goals.

Public Transportation in the Bossier Planning Area

There are three organizations that provide public transportation in the MPC area. Local transit service is available through SporTran but serves only Bossier City and Shreveport. Bossier Parish Public Transit provides rural public transportation services and the Bossier Council on Aging provides transportation services exclusively for the elderly. Each fills a niche in the overall transportation system for the MPC Planning Area as described below.

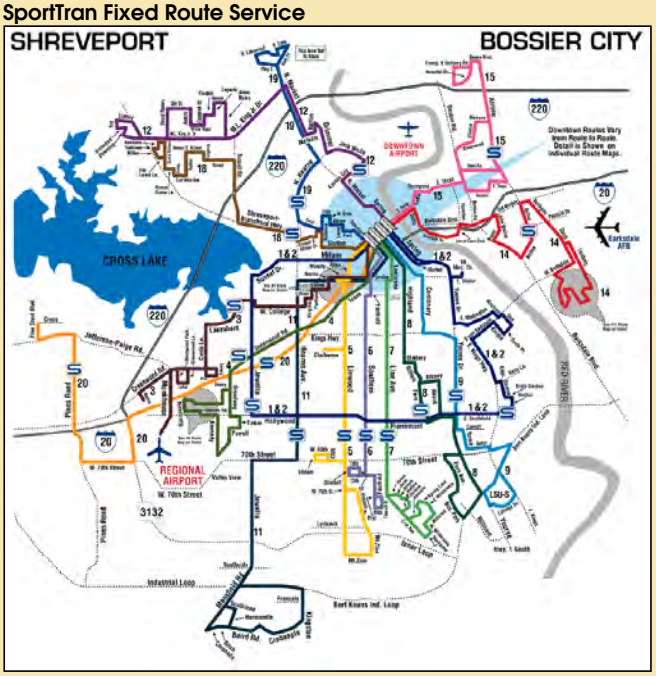
Shreveport Area Transportation System (SPORTRAN) – SporTran is the public transit system for Shreveport and Bossier City. It is operated by Shreveport Transit Management, Inc. under contract by the City of Shreveport. A fleet of 45 buses is used to facilitate sixteen scheduled fixed routes, all of which are ADA accessible. Persons unable to access the fixed route system because of disabilities are eligible to use a demand-response paratransit service called the Lift Line. When qualified, a client must schedule service 24 hours in advance.

Schedules vary for both fixed route and paratransit services. Fixed route service is available from 4:55 a.m. to 8:00 p.m. on weekdays, from 5:30 a.m. to 7:15 p.m. Saturdays and from 7:55 a.m. to 5:00 p.m. Sundays. The paratransit vans are available from 6:30 a.m. to 7:00 p.m. weekdays, from 7:00 a.m. to 6:00 p.m. on Saturday and from 8:00 a.m. – 4:00 p.m. on Sunday. Discounted fares are available to students, disabled and the elderly.

Displayed in **Figure 7.1 – SporTran Fixed Route Service**, are the 16 current routes within Bossier City and Shreveport, which reach the vast majority of the area's shopping, educational and medical facilities. The route system of SporTran offers the ability for riders to get to most major destinations throughout the metropolitan area by transferring between routes through the Downtown Terminal.

Displayed in **Figures 7.2 and 7.3** are the two fixed routes within Bossier City, including Route 14 – Barksdale and Route 15 – North Bossier. These two routes provide good coverage of the area within Bossier City with stops at major destinations such as the Bossier Municipal Complex, Pierre Bossier Mall, Heart O'Bossier Shopping Center, Bossier Parish Community College, Barksdale A.F.B., the State Employment Office, and the Bossier Parish Health Unit.

Figure 7.1
SportTran Fixed Route Service



Source: SportTran, The Public Transit System for Shreveport and Bossier City, LA

Bossier Parish Public Transit - The Bossier Office of Community Service operates a comprehensive transportation service system for all of Bossier Parish through funds received from the Louisiana Department of Transportation and Development. Services are provided to citizens in the rural portions of the Parish by the agency's Section 18 Rural Transportation Program. Clients within Bossier Parish may utilize the agency's Transportation Program with 48 hours notice for pick-up. Drivers pick participants up at their curb and transport them to appropriate services as their needs dictate. Staff of the Transportation Program have provided 17,470 units of service to its clients during this fiscal year.

The system is one of 31 rural public transit providers in Louisiana. Transportation services are provided through two lift-equipped vans and are available from 8:00 a.m. to

Figure 7.2
SportTran Route 14 – Barksdale

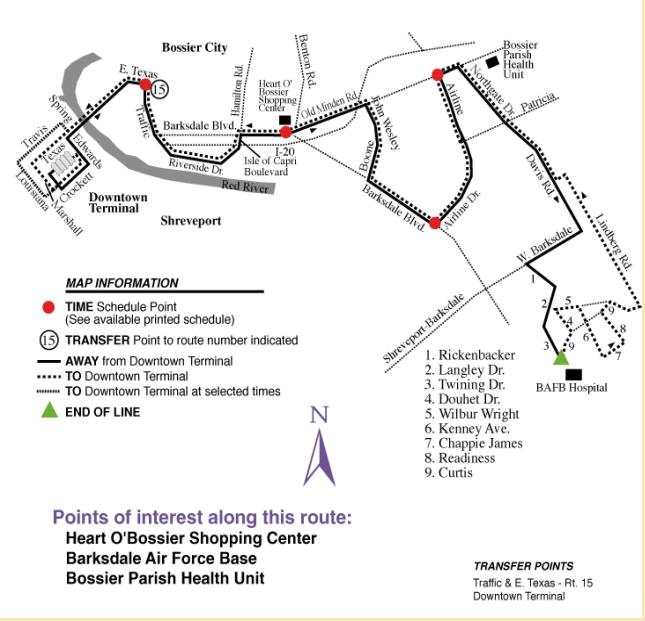
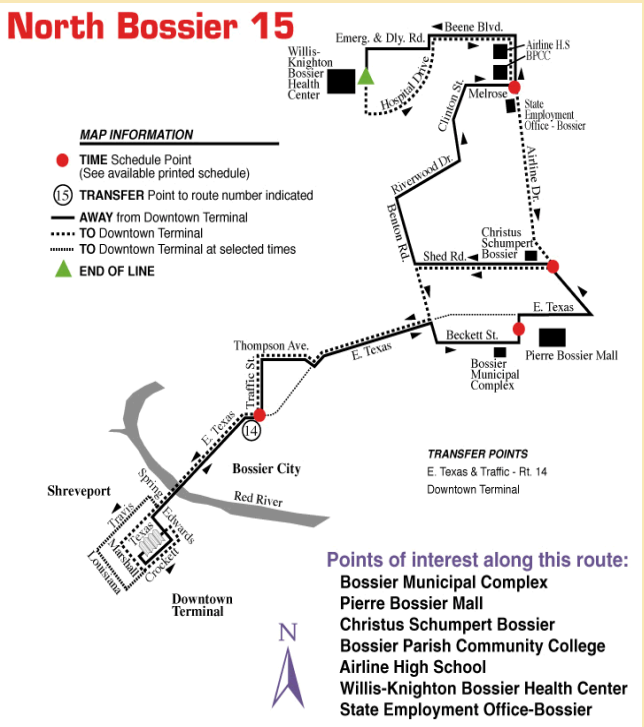


Figure 7.3
SporTran Route 15 – North Bossier



Source: SportTran, The Public Transit System for Shreveport and Bossier City, LA

4:30 p.m. on Monday through Friday. The service is available to all Parish residents to provide accessible public transportation for all income levels, ages and populations. Fares are nominal. In 1997, the latest year for which data are available, ridership exceeded 4,200 persons. The total operating cost for the system was approximately $121,000. Fares generated only offset costs and funding is primarily derived from the Louisiana Public Transit Section under the Non-urbanized Area Formula Program, or Section 5311. These funds may be used to finance up to 80 percent of capital costs and up to 50 percent of operational deficits.

Bossier Council on Aging (BCOA) - This agency offers demand-response public transportation services for the elderly throughout Bossier Parish. Transportation services are available from 7:30 a.m. to 4:00 p.m. on Monday through Friday. The Council operates two vans, one of which is equipped with a handicap accessible lift. Fares are accepted by donation.

Other transit service providers in the Bossier MPC Planning Area include intra- and interstate bus service and local for hire vehicles. Greyhound Bus Lines offers longer-distance bus service between Bossier City and other destinations. Action Taxi also provides private taxi service in the area.

The Louisiana Department of Transportation and Development (LA DOTD) manages and allocates federal transit funds through its Public Transportation section, whose mission is to enhance the access of people in non-urbanized areas to health care, shopping, education, employment, public services and recreation.

Railroads and Motor Freight

The railroad has played an important role in the history and development of Bossier and, as the city progresses, that role continues. Today, trains frequently pass through Bossier City and Bossier Parish carrying goods and services to destinations within the area such as the Port of Shreveport-Bossier and beyond. However, unlike decades past, rail lines must now transect major roadways that provide access to various destinations throughout Bossier. The result impedes traffic movement and causes delay, which is necessary to allow the railroad service to adequately function. For many, as expressed by citizens through the public involvement process, the stops are too

frequent and the noise generated by passing trains is highly undesirable.

Despite some of the negative impacts of rail service, it is essential to the success of a truly multimodal transportation system. Rail provides a land-based alternative to truck traffic that can prove to be cheaper. As a result, it remains a useful and cost effective method of transportation for many entities, particularly industrial activity, agriculture and retailers of large items such as cars or lumber.

Passenger rail service is not directly available in Bossier City, but an unmanned terminal is provided. AMTRAK provides a bus connector service to the nearest terminal, in Shreveport.

Union Pacific Railroad (UP) and Kansas City Southern Railroad (KCS) operate rail service in Bossier City and Bossier Parish. Union Pacific operates a rail line that enters Bossier City from Caddo Parish south of Interstate 20 and follows Benton Road north through the Parish. KCS operates lines that travel generally east and west. Two rail lines enter Bossier City jointly north of Interstate 20 and split beyond Traffic Street. One section continues east, crosses Interstate 20, and runs adjacent to Barksdale Air Force Base while another travels southeast along Barksdale Boulevard. A third major rail line operated by KCS splits from the UP rail line north of Texas Street before veering northeast in a straight path past the Bossier Industrial Park before turning east toward Princeton.

The KCS rail lines connect in northwest Shreveport at a major intermodal facility containing 44 tracks, which is a key feature of the network that is referred to as the *NAFTA Railway*. Similar to the proposed I-69 corridor, it connects Mexico, 12 states and Canada. The KCS intermodal facility in Shreveport is also a transfer point for the Union Pacific Railroad. The UP intermodal facility is located in New Orleans.

Street Grade Crossings

Street grade crossings are an important issue in the MPC Planning Area because of the number of intersections between area streets and railroads. Grade crossings can interfere with the safe and efficient circulation of railroads, motor vehicles, bicycles and pedestrians. At-grade intersections between railroad lines and area roadways also impede emergency vehicle access. Currently all rail crossings in Bossier City are at grade except along the Interstate 20 corridor.

In 2001, a study was conducted to evaluate railroad impacts on vehicular traffic in Bossier City. The resulting report, *Railroad Grade Crossing Study*, analyzed the selected railroad crossings and ranked their need for improvement by severity of congestion and safety issues. While the scope of the study was limited to designated grade crossings within Bossier City, the results of the study, as indicated by **Figure 7.4, Rail Crossing Solutions**, represent the significant conflict that exists throughout the MPC Planning Area between vehicle traffic and rail service.

A summary of the existing conditions noted the following:

- Typical train speeds at the crossings range from 15 to 35 mph.
- The crossings at Airline Drive (South of Interstate 20), Benton Road, and Old Minden Road experience approximately 26 trains per day, while the remaining crossings have 10 trains or less per day.
- The average train lengths along the KCS rail line are approximately 6,000 feet, and about 7,000 feet on the UP line.
- The average daily traffic (ADT) totals at the ten crossings range from 8,200 vehicles per day (vpd) at the Hamilton/Shed Road crossing to 37,000 vpd at the Airline Drive (S of IH-20) crossing.
- Results from the study show that the various grade crossings throughout Bossier City and Bossier Parish can create significant delays, particularly during peak periods of the day. More, the layout of rail lines and the street system ensures that alternative routes are not available to circumvent rail traffic. Recommended improvements include construction of grade separations and widening of roads to reduce the length and duration of congested traffic. Important additional considerations in coordinating railroads with thoroughfare development include:
- Grade crossing safety and traffic control devices including gate arms, flashing lights, signage and pavement markings should be installed and maintained at railroad-roadway crossings;

- Train speed limits should be observed and enforced for train operations through urbanized portions of the Planning Area;
- Warning whistles of the trains may be restricted by the municipality within specified limits and during specified times, which the City may choose to impose;
- State regulations should be observed concerning maximum street grade crossing times.

The Potential for Relocation

Comments gathered through focus group interviews and elsewhere allude to possibilities to relocate rail service within Bossier City and Bossier Parish to another, more "appropriate" location. Specifically, comments indicate a desire to relocate a portion of the railroad system to align with proposed Interstate 69 as it bypasses Bossier City.

Benefits to relocation of the rail line include the alleviation of grade crossings and increased safety. However, additional benefits can include use of the abandoned rail line for a light rail transit system, use of the right of way for a trail system connects several areas of Bossier City and Bossier Parish, decreased noise, increased property value for areas sensitive to the impacts of rail, potential economic opportunity for areas adjacent to the proposed location of the rail line, and overall increased automobile traffic efficiency. Numerous neighborhoods in Bossier are adjacent to a rail line and would likely see relocation as a benefit.

On the other hand, the relocation of rail also poses potential detriments to Bossier. Relocation of a rail system may eliminate some problems, but it may also only transfer other problems to locations surrounding the relocated rail system. For example, noise and aesthetic value of a rail system does not change with relocation. While an area may see industrial or commercial benefit from proximity to rail, it also will likely see suppressed demand for residential development or commercial activity sensitive to the presence of rail. Existing businesses that utilize rail may no longer have access to the system and be forced to either compensate for the added cost of business or simply close.

Most prohibitive of all factors related to relocation is cost. Movement of a rail line is very expensive. While many communities have considered the benefits of relocation, very few have actually moved into implementation.

One community that has successfully relocated a rail line and serves as the national "case study" is Lafayette, Indiana. Like Bossier and Shreveport, Lafayette is located along a river and is directly adjacent to the City of West Lafayette. Over 30 years ago, the City of Lafayette embarked upon a massive railroad relocation project that would ultimately cost $182.5 million. The project, which was funded as an FHWA Demonstration Project, relocated the rail line that ran through downtown to an area along the river and outside of the major areas of traffic. Over a series of five phases, the project improved safety and traffic efficiency by eliminating 41 at-grade crossings. Further, the construction process that begun in 1986, was used as a means of performing additional physical, aesthetic and functional improvements.

Completed in 2001, the project is heralded as a major success that has improved traffic flow and area quality of life. Area neighborhoods within proximity to downtown now enjoy the quiet of other neighborhoods. The railroad company indicates satisfaction with the new alignment. At the same time, Lafayette has already begun to notice problems. The new alignment along the river allows for development of an extended park site at the water's edge, but little possibility for full riverfront development.

Reno, Nevada is preparing to begin construction on a project to eliminate grade crossing issues by simply dropping the rail line below grade. The Alameda Corridor in Long Beach and Los Angeles, California, is underway and will combine rail lines and provide improved service to both the Port of Los Angeles and the Port of Long Beach. Both projects are expected to surpass the costs of the project in Lafayette, Indiana.

Port Facilities

The Port of Shreveport-Bossier plays a significant role in Bossier's future economy, growth and transportation network. As part of a significant port network, the success of the port is also significant to the State of Louisiana. Louisiana's strategic location at the mouth of the Mississippi River and the Gulf of Mexico make the port and maritime industry one of the state's most important economic generators.

For Louisiana, the Port of Shreveport-Bossier, as part of the larger port system, serves as a gateway to the state and

the entire mid-section of the United States as evidenced in **Figure 7. 5 - Location of the Port of Shreveport-Bossier in Relationship to Other U.S. Cities**. While it serves as a means for cargo to come into and out of the country, it also acts as a major economic catalyst for the state economy. The Port of Shreveport-Bossier is a natural magnet for attracting warehousing and manufacturing firms that use the Red River to import raw materials or export finished products. It also services the vessels that call on the stop to deposit or pick up goods and materials.

In 1994, the Louisiana ports and the maritime industry produced $7.6 billion of primary spending and $14.3 billion of secondary spending for a total of $21.9 billion - 21 percent of total dollar value of the state's goods and services. The ports and related activities produced $3.8 billion of income for Louisiana residents, representing 4.7 percent of the entire personal income in the state. In total, the economic activities of port-related firms throughout Louisiana supported 178,582 permanent jobs - approximately one out of every 10 jobs statewide. In addition, the economic activities of those port-related firms created $209.0 million in state tax revenue and $101.1 million in local tax revenue.

The 2,000 acre Port of Shreveport-Bossier is a relatively new resource that takes advantage of a historic and reliable form of transportation, the Red River. Both Shreveport and Bossier were founded upon river navigation. However, by the turn of the century, transportation by rail had replaced shipment of goods and services by water.

History of the Port dates to legislation originating in 1962 that created the Caddo-Bossier Parishes Port Commission. By 1976, Congress funded the Red River Waterway Project that initiated construction of the lock and dam system necessary to successfully support barge traffic. The initial infrastructure for the Port was constructed in 1992 and the first leases were signed in 1994.

Today, the Port of Shreveport-Bossier is a growing and robust component to the local economy. In 2001, approximately 460,000 tons of goods and materials were transported through the Port. In 2002, tonnage is expected to exceed 500,000 and will be comprised of goods including liquid petroleum products, dry bulk fertilizers and other dry bulk products. After only 37-months of operation, the Port reached a historic milestone - processing one million tons of cargo. Despite changes in the economy, the Port continues to meet or beat tonnage and employment expectations.

The U.S. Department of Transportation Maritime Administration notes that barge transport is energy efficient, can handle large cargo capacities, is extremely safe, reduces roadway congestion, produces little pollution, and provides little impact upon the surrounding area.

Goods and materials access the Port by barges utilizing the Mississippi River/Gulf of Mexico and the Gulf Intracoastal Waterway (GIWW). Products and materials delivered through the Port are either utilized by businesses on location or shipped to other destinations. Of items shipped out of the Port, approximately 95 percent are shipped by truck via LA 1. The remaining 5 percent are shipped to various resources by rail. Union Pacific owns the main rail line that ties to the Port, although the Port also operates an intraplant short line service that includes on-dock rail, an internal rail switch yard and two rail cars.

The Port is accessed by a shallow draft navigation channel nine feet deep and 200 feet wide that is regulated by five lock and dam structures. All are maintained by the U.S. Army Corps of Engineers. The locks allow six barge tows - two wide, three deep.

General cargo terminal facilities at the Port include a 600' general cargo wharf complimented by 30- and 50-ton overhead bridge cranes, 30,000 square foot dockside warehouse and bulk and liquid bulk storage facilities. Industries located at the Port include a sulfuric

Figure 7.5
Location of the Port of Shreveport-Bossier in Relationship to Other U.S. Cities

The Port of Shreveport-Bossier offers access to a number of destinations by water, rail, road and air.

Source: Port of Shreveport-Bossier

acid manufacturer, a fertilizer warehouse, a liquid product blender and bottler, two liquid bulk tank farms, and a yacht manufacturer.

Continuing to develop facilities to accommodate growth has been a priority. To provide quality service to its customers, the Port is embarking on development of an ambitious, environmentally sensitive, $500 million power plant that will utilize local discharge water instead of groundwater. Florida Power and Light Energy will operate the plant.

The Port of Shreveport-Bossier continues to grow and is well positioned to leverage further maturation of multimodal transportation systems in the region.

Source: Port of Shreveport-Bossier

Incentives for port development are extensive, including location within a Foreign Trade Zone, Enterprise Zone and a U.S. Customs Port of Entry, as well as access to port bond financing programs and industrial property tax exemption.

Aviation

Air service is available in quantity throughout Bossier and neighboring Shreveport. Two civilian airports are located in Shreveport and serve the Ark-La-Tex region that includes the MPC Planning Area. Barksdale AFB provides military air service for the base. Despite the fact that both civilian airports are located in Shreveport, each contributes to the Bossier's transportation system by facilitating the movement of people and goods.

Like the Port of Shreveport-Bossier, the local airports have the ability to provide a significant economic impact and benefit to the region. However, while the goods and materials that flow through the Port are generally related to manufacturing, the materials and goods that flow through the airport can range from industrial goods to commercial supplies and, of course, people.

Shreveport Regional Airport

The Shreveport Regional Airport is the primary commercial airport for the Shreveport-Bossier area. It was opened in 1952 to fulfill the region's demand for passenger airline service. The older Downtown Airport lacked room for expansion and was too close to Barksdale AFB.

Since its inception, the Shreveport Regional Airport has continued to grow and prosper. A new terminal was constructed in 1971 and a $30 million expansion/renovation project was completed in the Fall of 1999. Boeing employs more than 150 people at a military aircraft maintenance facility in the adjacent industrial park.

Several air cargo companies utilize Shreveport Regional Airport for delivery and reception of goods and materials. Both runways at the airport are designed to handle the weight of the largest cargo carriers. Among others, United Parcel Service, Federal Express and Airborne Express operate from the Shreveport Regional Airport.

The facility, with its strong passenger demand and tenant activity is also well positioned as a multimodal facility. The airport is designated as a small hub airport served by seven airlines and a variety of connections, including:

- American Connection (formerly TWA) to St Louis. Missouri
- American Eagle Airlines to Dallas/Ft. Worth (DFW), Texas
- Atlantic Southeast Airlines (ASA) to DFW
- Continental Express Airlines to Houston, Texas
- Delta Air Lines to Atlanta, Ga.; Dallas Ft. Worth; Monroe, La.; and Jackson, Miss.
- Northwest Airlink to Memphis, Tennessee
- US Airways Express to New Orleans, Louisiana

Carriers provide over 70 flights in and out of Shreveport Regional Airport every day with the ability to directly provide service to approximately 250 destinations.

Shreveport Downtown Airport

Since 1931 and a Delta Air Lines commercial flight to Monroe, Louisiana and Jackson, Mississippi, the Shreveport Downtown Airport has provided air service to the Shreveport-Bossier area. Located along a meandering point of the Red River on Airport Drive north of the downtown area, the Shreveport Downtown Airport continued commercial air carrier service for the region until 1952 when the Shreveport Regional Airport was opened.

> *"The (Downtown) airport initially consisted of an open field with an airsock located roughly in the middle. This allowed aircraft to depart in virtually any direction depending upon the direction of the wind."*
>
> *Shreveport Downtown Airport History*
> *City of Shreveport Website*

Today, the Shreveport Downtown Airport operates as a general aviation facility. To ensure the continued success of the airport, the Shreveport Airport Authority has made numerous improvements, including recent improvements to the runway and tower. Two training facilities anchor the complex, the Southern University Airframe and Power Plant Mechanics School as well as the Louisiana Tech pilot training school.

Trip Generators

All land uses generate trips. Residents of the MPC Planning Area travel daily to work, home and a myriad of other places along the way. The number of trips that each use generates depends upon a number of factors such as the type of use, size and location. The role of the transportation system is to adequately accommodate the number of trips generated by the various uses.

Specific uses in the MPC Planning Area create very large numbers of trips. Barksdale AFB, for example, is a major employer for both the Bossier area and the greater region. While a number of persons travel to and from the air base throughout the day, the majority of traffic generated by the base occurs at those times that people are traveling at the beginning and ending of the work day. CenturyTel Center, on the other hand, is also an employer. However, the majority of traffic generated by the arena occurs during major events.

These and other major trip generators can have a significant impact on the transportation system, particularly regarding traffic volumes and flow patterns. Thus, the various major trip generators were identified and considered in development of the Transportation Element and companion Thoroughfare Plan. Specific trip generators considered include:

- Barksdale Air Force Base (outlets from West Gate Drive to Barksdale Boulevard, as well as North Gate Road to Old Minden Road)
- Pierre Bossier Mall (outlets along Airline Drive and Texas Street)
- Bossier City Municipal Complex (outlets from Beckett Street to Benton Road or Texas Street)
- Heart of Bossier Shopping Center (outlets along Benton Road and Barksdale Boulevard)
- Gaming District (outlets near the riverfront, Traffic Street, Old Minden Road, and Barksdale Boulevard)
- Airline High School (outlets along Airline Drive)
- Medical area (various outlets near Interstate 220 and Airline Drive)
- CenturyTel Center (outlets along Woodmont Boulevard onto Jimmy Davis Highway)
- Downtown Shreveport (immediate access points at Interstate 20 and Texas Street, with secondary access via West Gate Drive)
- Shreve City Shopping Center (outlets along West Gate Drive/Shreveport Barksdale Highway)

Roadway Cross Sections

Roadway classifications reflect the functions that roadways serve as part of the street network. The cross section of a roadway is related to traffic volume, design capacity, and Level of Service. The Bossier City-Parish Metropolitan Planning Commission currently classifies the local street system as Expressways (or Parkways), Major Arterial Streets, Collectors, Residential Collector Streets, Residential Minor Streets, and Marginal Access Streets. Cross section requirements for each class of road are provided in the Subdivision Regulations for the Bossier City-Parish Metropolitan Planning Commission. A summary of requirements is provided in **Table 7.2 - Existing Roadway Cross Sections**. Each cross section identifies minimum dimensional criteria for right-of-way and pavement width.

No specific width is provided for sidewalks, however, it is noted that sidewalks are required in Bossier Parish.

Table 7.2
Existing Roadway Cross Sections

Classification	Right-Of-Way*		Pavement Width*
	Minimum	Preferred	
Expressway (or Parkway)	200	300	**
Major Arterial Street	80	100	48
Collector	70	--	44
Residential Collector Street	60	--	36
Residential Principal Street	60	--	25
Industrial/Commercial Street Without Curb and Gutt	60	--	--
Residential Minor Street (City only)	50	--	26
Residential Minor Street (MPC outside City only)	38	--	18
Marginal Access Street	40	--	20
Alley	20	--	20
Crosswalkway	10	--	4

** All distances in feet*
*** Pavement width determined by LA DOTD*

Source: Subdivision Regulations, Bossier City-Parish Metropolitan Planning Commission

The single set of standards for the entire MPC Planning Area has been a focus of discussion throughout the comprehensive planning process. Standards indicated by the Subdivision Regulations are designed to accommodate a modern, suburban-style development pattern. This can potentially be problematic in a jurisdiction in which the character of the community may be urban in some places, suburban in others, and along the outer areas. Several insist that standards in the urban areas should reflect the urban area, with similar consideration in suburban and urban areas. For example, sidewalks are not indicative of rural development, but are certainly appropriate to the urban village envisioned in *Chapter 5, Land Use* or suburban subdivision design. In the case of the rural subdivision, an inner trail system that builds upon the natural environment may be more appropriate.

The Master Thoroughfare Plan

Thoroughfare system planning represents the process that is proposed for the Bossier Comprehensive Land Use and Development Plan to assure development of the most efficient and appropriate street system to meet existing and future travel needs of the MPC Planning Area. The purpose is to ensure orderly and progressive development of the streets to serve mobility and access needs of the public. Thoroughfare planning is intrinsically interrelated with other components of the plan including land use, housing, the environment, and public utilities.

Constraints to Thoroughfare Development

As discussed at length in *Chapter 5, Land Use*, the MPC Planning Area has several natural and created barriers to standard development practices. Some of these constraints hinder development, such as floodplains and wetlands. Others, such as the massive area of Barksdale Air Force Base, add complexity to traditional transportation development. Constraints include:

- **Railroads.** The existing railroads and train traffic are a major constraint for movement of automobile traffic. At-grade intersections of the railroad lines with area roadways are a cause of traffic delays and traffic safety concerns. Relocating existing railroad lines to an alignment outside the densely developed area is a potential solution, yet an extremely costly proposition. Other alternatives include constructing grade separated roadways over major railroad-roadway intersections, and traffic safety improvements at existing crossings.

- **Barksdale Air Force Base.** The air base impacts the transportation system in a number of ways, but it poses constraints primarily as a result of its bulk, location and flight path. The AICUZ that protects residents from negative impacts of intense sound and potential risk to safety also keeps dense development from occurring in a significant portion of the MPC Planning Area. The transportation system has historically adjusted to this constraint and will continue to do so in order to support continued coexistence with the air base. The size and location of Barksdale Air Force Base make interconnections along north and south routes difficult. Interstate 220, for example, could form a complete loop around Bossier and Shreveport but is blocked by the air base.

- **Red River, floodplains and wetlands.** Several constraints to thoroughfare system development involve water in various forms, be it the Red River, its tributaries or the expansive floodplains and wetland areas. The Red River creates a natural boundary for

development activity in the MPC Planning Area while tributaries, floodplains and wetlands represent sensitive areas where development must be low density, low intensity and designed in concert with the natural environment.

- Existing development. Perhaps the most significant influences on thoroughfare improvement are existing residential neighborhoods and other developed areas that present constraints when a thoroughfare might impact the area. While existing development does not entirely prohibit the development of a desirable transportation system, its existence, like that of other constraints, may affect the feasibility, location, and construction cost of transportation improvements.

Master Thoroughfare Plan Map

The existing and proposed thoroughfare system of principal and minor arterials and collector streets is displayed in **Figure 7.6 - Master Thoroughfare Plan Map**. The Master Thoroughfare Plan Map shows approximate alignments for planned thoroughfares that will be considered in platting of subdivisions, right-of-way dedication, and construction of major roadways within the MPC Planning Area.

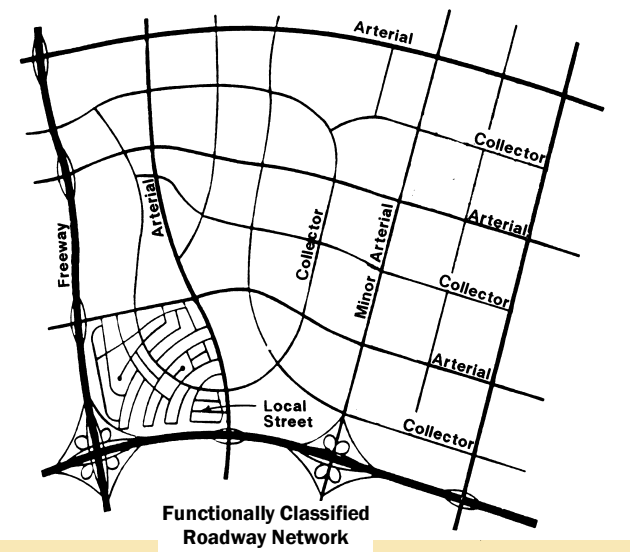
Some elements of the thoroughfare system will require new or wider right-of-way and may ultimately be developed as two-lane or multi-lane roadways with various cross sections. Other streets identified as collectors on the Plan will not necessarily ever be widened due to physical constraints and right-of-way limitations. Instead, the collector designation signifies their traffic-handling role in the overall street system and the importance of maintaining such streets in superior condition to maximize their traffic capacity since they most likely cannot be improved to an optimal width and cross section. The Plan does not show future local streets because these streets function principally to provide access and their future alignments may vary depending upon development plans. Local street alignment should be determined by the MPC, in conjunction with Bossier City, Bossier Parish and landowners, as part of the subdivision development process. Likewise, secondary collectors (referred to as Residential Collector Streets in the existing Subdivision Regulations) are required with new development but are not shown in all places on the Thoroughfare Plan since their alignments will depend on the surrounding street system and the particular development concept. Secondary collectors should be situated on a case-by-case basis to connect major collectors (and sometimes arterials) with other major collectors and local streets.

The Master Thoroughfare Plan will affect the growth and development of the MPC Planning Area since it guides the preservation of right-of-way needed for future thoroughfare improvements. As a result, the Plan has significant influence on the pattern of movement and the desirability of areas as locations for development and land use. While other elements of the Plan look at foreseeable changes and needs over a 20-year period, thoroughfare planning requires an even longer-range perspective extending into the very long-term future. Future changes in transportation technology, cost structure, service demand and long-term shifts in urban growth and development patterns require a far-sighted and visionary approach to thoroughfare planning decisions.

Functional Classification of Roadways

The roads and streets of the MPC Planning Area are grouped into functional classes according to the type of service they are intended to provide in terms of traffic

Figure 7.7
Example of Functional Classifications



Various classifications of roads in a network are based upon intended function. However, the function and classification of a road may change over time as development patterns in the MPC Planning Area change.

Source: adaptation by Wilbur Smith Associates

movement and access. Characteristics of each functional class of roadway differ as needed to meet the corridor's intended purpose.

The functional classification of area roadways, an example of which is shown in **Figure 7.7, Example of Functional Classifications**, includes Principal Arterials, Minor Arterials and Collectors. Minor Arterials are a new addition to current standards. On a neighborhood scale, streets are further classified as Residential Local Streets.

These classifications vary from the current classification system, which is more extensive at a neighborhood scale. In addition to standard street classifications, the Subdivision Regulations have classifications, including separate right-of-way and pavement width requirements, for Residential Collector Streets, Residential Principal Streets, Residential Minor Streets, Industrial or Commercial Streets without curb and gutter, Marginal Access Streets, and Crosswalkways. The Master Thoroughfare Plan does not differentiate between local streets by assigning class. Instead, the Plan proposes that local street width and other characteristics be changed according to need, including such characteristics as the desire for on-street parking, presence of bike lanes, choice of trails or sidewalks, anticipated traffic volume, and location within an urban, suburban or rural setting.

Classifications for alleys and marginal access streets are a function of service and property access and, therefore, are not included in the recommended classification system of the Master Thoroughfare Plan. This is not to indicate that the Master Thoroughfare Plan ignores the possibility of alleys in a development. In fact, the Plan recognizes the valuable contribution of alleys to the urban fabric and establishment of community character and proposes that they be used as appropriate.

In addition to changes to the types of classifications, the Plan also proposes alternatives to the current right-of-way and pavement width requirements for collector and local roads (and possibly existing neighborhoods through striping or actual reconstruction). These alternative modifications to the right-of-way and pavement widths should be offered to developers in return for added or preserved green space within a development. Currently, the standards for Collector streets require a 44 foot cross section within a 70 foot right-of-way. As an alternative, a developer willing to set aside space for additional green space or enhanced pedestrian pathways, may request that pavement width be reduced to 36 foot and right-of-way reduced to 60 foot, which will offer the following benefits:

- Reduced development costs by decreasing the amount of pavement and right-of-way for collector streets;
- Increased green space adding an additional 8 feet total and 4 feet on each side of the roadway, or an increase in preserved open space;
- Increased pedestrian safety by increasing the separation between the edge of the pavement and the sidewalk;
- Improved ability to locate the street within the right-of-way as a means to preserve trees and other natural features; and,
- Reduced travel speed resulting from the perceived safety of driving on a narrower street.

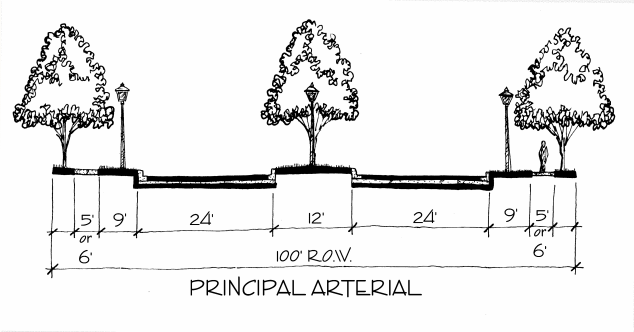
A 36 foot wide street cross section provides three, 12 foot travel lanes, which is sufficient to serve the traffic carrying capacity of a collector roadway, particularly in instances where walking is encouraged.

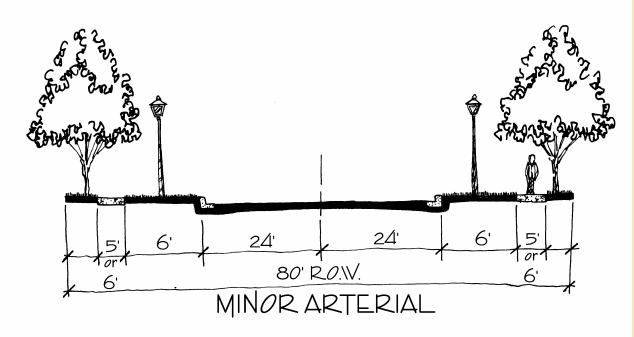
Another option possible for developers in rural communities is consideration of collector roads without sidewalks or curb and gutter. This permits the development to maintain the look and feel of a rural area, but similarly may not provide the drainage system offered with roads that utilize a curb and gutter system.

In this style of development, significant green space and an interior trail system would be necessary to compensate for the loss of sidewalks. Pavement width would remain at the alternative 36 foot requirement, however, right-of-way must account for the increased space required for open or covered ditches.

Alternatives are likewise proposed for the local street system. A standard 50 foot right-of-way includes 26 foot of pavement width to account for informal parking along the street. However, as need and volume change, right-of-way may be reduced to as little as 38 foot and pavement width to 18 foot. The result, particularly along local streets that are designed to only serve immediate residents, are narrow streets that provide the charm and

Figure 7.8
Principal and Minor Arterial Cross Sections





Source: Wilbur Smith Associates

safety of older, historic neighborhoods. Once again, however, the developer must be prepared to provide an incentive to the MPC in return for reduced right-of-way and pavement width, such as added green space or affordable housing.

Like the collector system, local streets may be adapted to a rural setting to include an open or closed ditch system and trails as opposed to curbs, gutters and sidewalks. As with collectors, the advantage continues to be preservation of rural character while the disadvantages include a reduced standard for rural development and potentially less effective stormwater management.

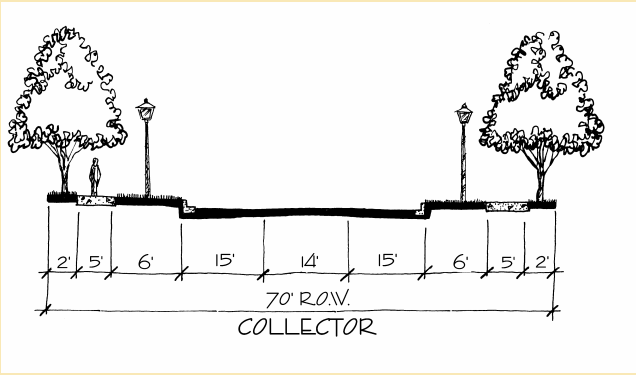
The right-of-way and pavement width for primary arterials is recommended to remain the same. A recommended new minor arterial classification provides a connection between an interstate or other arterial roadway and the local collector system.

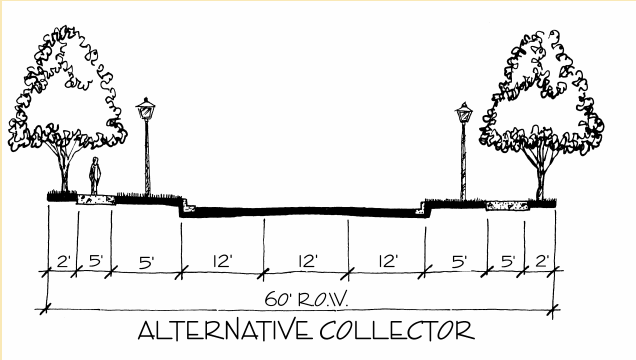
Principal Arterial. A divided thoroughfare with a recommended 100 foot of total street right-of-way with a pavement section of 48 feet and a 12 foot raised median. Sidewalks are located on both sides of the street and are located nine feet from the back of the curb. The 12 foot esplanade is sufficient in width to provide for decorative street lighting, landscaping, "green-space" and public open space. In addition, a median provides for access control and improved traffic safety. Examples of principal arterials are proposed to include Airline Drive, Benton Road, Barksdale Boulevard, Curtis Sligo Road and the extension of Winnfield Road across the northern section of the MPC Planning Area.

Minor Arterial. An undivided thoroughfare is recommended to include 80 foot of total street right-of-way with a 48 foot pavement section. Sidewalks are located on both sides of the street and are located six feet from the back of the curb. The 22 foot right-of-way, excluding the width of pavement, provides space for decorative street lighting, landscaping, "green-space" and public open space. Examples are proposed to include an expanded Arthur Teague Parkway, Traffic Street/Shed Road to the intersection with Swan Lake Drive, and a new road south of IH-20 and north of Barksdale AFB.

Collector. The collector roadway classification is recommended to remain with a total street right-of-way of

Figure 7.9
Collector Cross Sections

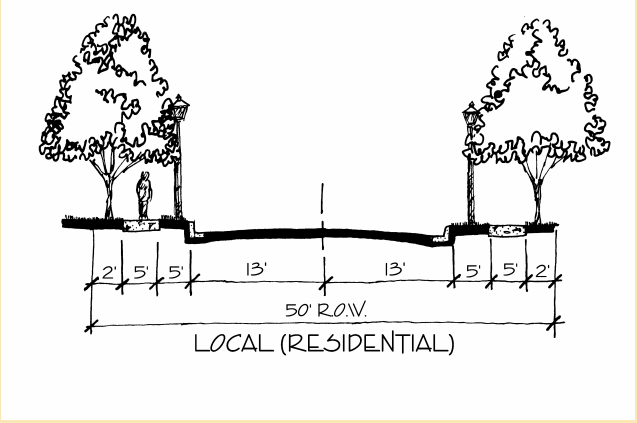


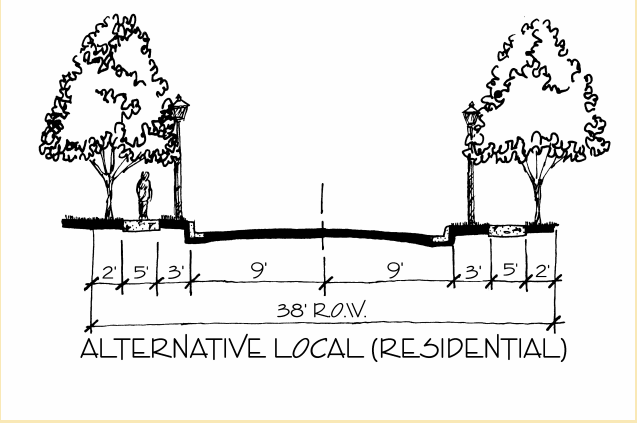


Source: Wilbur Smith Associates

70 foot and continue to require 44 feet of pavement width, with an option to reduce pavement width to 36 foot and right-of-way to 60 foot. In instances where the reduced pavement width option is utilized, sidewalks are located on both sides of the street and five feet from the back of curb. The 36 feet of pavement width is adequate to collect and distribute traffic to the arterial roadway network, particularly when walking is encouraged. The 24 feet of right-of-way, excluding the width of pavement, provides ample space for neighborhood-scale street lighting, street trees, "green-space" and public open space. A rural character option would permit a developer to also remove curbs, gutter and sidewalks in return for significantly increased green space and an interior network of trails. The street width may remain 36 foot, however, right-of-way will depend upon the use of open or closed ditches. Examples of collector roadways include Old Brownlee-Linton Road, North Gate Road, Woodmont Boulevard, Douglas Drive, and Dogwood Trail.

Figure 7.10
Local Street Cross Sections





Source: Wilbur Smith Associates

Local Residential. A local residential street is proposed to replace the categories of Residential Collector Street, Residential Principal Street and Residential Minor Street with a single category that has the flexibility to adapt as street requirements change. Original right-of-way ranging between 60 and 50 foot is recommended to become a standard 50 foot right-of-way with a pavement width of 26 foot. While the standard is proposed to be one foot greater than that currently in place for Residential Principal and Minor Streets, it is also proposed to accommodate on-street parking. Five foot sidewalks are required along both sides of the street along Local Residential Streets. The 24 foot right-of-way, excluding the width of pavement, is sufficient yet constrained for neighborhood-scale street lighting, sidewalks, landscaping, and "green-space".

As an option and in return for added green space or another predetermined need of the MPC Planning Area, such as affordable housing, the developer may request reduction of both right-of-way and street width. Depending upon circumstances, right-of-way may be reduced to only 38 foot while pavement width may shrink to 18 foot. This reduced width is designed for a road carrying immediately local traffic and is sufficient to accommodate fire apparatus, but offers the added benefit of neighborhood traffic calming. This approach is one of the defining principals of new urbanism, which is designed to create a pedestrian-scaled neighborhood with reduced street widths and building setbacks. A narrower street width also allows an increase in the distance from the sidewalk to the street and provides adequate space for neighborhood-scale lighting and green-space. As previously mentioned, a rural character version of Local Residential Streets is also available.

Criteria for Roadway Classification

Criteria used in determining the functional classifications of roadways are shown in **Table 7.3 - Functional Classifications**. Classification is based on each roadway's functional role in the overall network, and the existing and future travel patterns and areas served.

Arterial roadways form an interconnecting network for communitywide movement of traffic through connections to expressways, parkways and interstates. Although they usually represent only five to ten percent of the total

Table 7.3
Functional Classifications

Criterion	Expressway/ High-Speed Thoroughfare	Principal Arterial	Minor Arterial	Collector	Local Residential Street
Functional Role	Entirely through traffic movement with no direct access to property.	Mobility is primary, access is secondary. Connects Freeways and other Arterials.	Connects Freeways, Principal Arterials and lower-classification roadways. Access is secondary.	Collects traffic destined for the Arterial network. Connects Arterials to Local Streets. Also land access.	Access is primary. Little through movement.
Roadway Continuity	Inter-city, regional and interstate.	Connects Freeways to lower-classification roadways. Connect major activity centers.	Connect Freeways and Principal Arterials to lower-classification roadways.	Continuous between Arterials. May extend across Arterials.	Discontinuous. Connect to Collectors.
Roadway Length	Usually more than 5 miles long	Usually more than 5 miles long	Usually more than 3 miles long	Varies from about 1/2 mile to 2 miles	Generally less than 1 mile long
Traffic Volumes	40,000 Vehicles per Day or more	20,000 to 60,000 VPD	5,000 to 30,000 VPD	1,000 to 15,000 VPD	100 to 5,000 VPD
Desirable Spacing	5 miles or more	2 miles or more	Generally 1/2 mile to 2 miles	Generally 1/4 to 1/2 mile	Varies with block length (at least 125 feet between)
Posted Speed	55 to 70 MPH	40 to 55 MPH	30 to 45 MPH	30 to 35 MPH or less	20 to 30 MPH
Access	Controlled access. Grade-separated interchanges and frontage/service roads.	Intersect with Freeways, Arterials, Collectors and Local Streets. Restricted driveway access.	Intersect with Freeways, Arterials, Collectors and Local Streets. Limited driveway access.	Intersect with Arterials and Local Streets. Driveways permitted.	Intersect with Collectors and Arterials. Driveways permitted.
On-Street Parking	Prohibited	Restricted	Restricted	Normally permitted	Permitted
Community Relationship	Define neighborhood boundaries.	Define neighborhood boundaries.	Define and traverse neighborhood boundaries.	Internal and traverse neighborhood boundaries.	Internal.
Through Truck Routes	Yes	Yes	Permitted	No	No
Bikeways	No	No	Limited	Yes	Yes
Sidewalks	No	Yes	Yes	Yes	Yes

*** Pavement width determined by LA DOTD*

Source: Wilbur Smith Associates

roadway network, arterials typically accommodate about 30 to 40 percent of an area's travel volume. Since traffic movement, not land access, is the primary function of arterials, access management is essential to avoid traffic congestion and delays caused by turning movements for vehicles entering and exiting driveways. Likewise, intersections of arterials with other public streets and private access drives should be designed to limit speed differentials between turning vehicles and other traffic to no more than 10-15 miles per hour. Signalized intersection spacing should be long enough to allow a variety of signal cycle lengths and timing plans that can be adjusted to meet changes in traffic volumes and maintain traffic progression (preferably one-third to one-half mile spacing).

The cross section of arterials may vary from multi-lane roadways with three, four or five lanes down to two-lane roadways in developing fringe and rural areas such as the area south of Bossier City where traffic volumes either have not increased to the point that more travel lanes are needed or are not warranted due to limited density. Functional classification is not dependent on the existing number of lanes since the functional role served by a roadway typically remains constant over time while the roadway's cross section is improved to accommodate increasing traffic volumes. Thus, lower-volume roadways that are continuous over long distances may also function as arterials, particularly in fringe and rural areas.

Subdivision street layout plans and commercial and industrial districts should include Collectors as well as Local Residential Streets in order to provide efficient traffic ingress/egress and circulation. Since collectors generally carry higher traffic volumes than local residential streets, they may require a wider roadway cross-section or added lanes at intersections with arterials to provide adequate capacity for both through traffic and turning movements. However, since speeds are slower and more turn

movements are expected, a higher speed differential and much closer intersection/access spacing can be used than on arterials. Collectors typically make up about five to ten percent of the total street system.

Local residential streets allow direct property access within residential and commercial areas. Through traffic and excessive speeds should be discouraged by using appropriate geometric designs, traffic control devices, curvilinear alignments, and discontinuous streets. Local Streets typically comprise about 65 to 80 percent of the total street system in urban areas. In Bossier City, Local Streets comprise 62 percent of the total roadway mileage. Private roads make up .01 percent of the total roadway system. Local Streets in Bossier Parish compose 84 percent of the roadway system.

Thoroughfare Development Requirements and Standards

This section outlines typical criteria for certain characteristics of street and land development, which should be part of a MPC's thoroughfare development standards and subdivision regulations.

- **Location and Alignment of Thoroughfares.** The general location and alignment of thoroughfares must be in conformance with the Thoroughfare Plan. Subdivision plats should provide for dedication of needed right-of-way for thoroughfares within or bordering the subdivision. Any major changes in thoroughfare alignment that are inconsistent with the Plan require the approval of the Metropolitan Planning Commission, Bossier City and Bossier Parish through a public hearing process. A major change would include any proposal that involves the addition or deletion of established thoroughfare designations, or changes in the planned general alignment of thoroughfares that would affect parcels of land beyond the specific tract in question.
- **Location and Alignment of Collectors.** Generally, to adequately serve their role to collect traffic from local residential streets and distribute it to the arterial street system, collectors should be placed between arterial streets, with a spacing of approximately one-half mile. Figure 7.7 illustrates a functional roadway network.
- **Right-of-Way and Pavement Width.** The pavement width and right-of-way width for thoroughfares and other public streets should conform to minimum standards unless the MPC grants a waiver using formalized criteria. Properties proposed for subdivision that include or are bordered by an existing thoroughfare with insufficient right-of-way width should be required to dedicate land to compensate for any right-of-way deficiency of that thoroughfare. When a new thoroughfare extension is proposed to connect with an existing thoroughfare that has narrower right-of-way, a transitional area should be provided.
- **Continuation and Projection of Streets.** Existing streets in adjacent areas should be continued and, when an adjacent area is undeveloped, the street layout should provide for future projection and continuation of streets into the undeveloped area. In particular, the arrangement of streets in a new subdivision must make provision for continuation of right-of-way for the principal existing streets in adjoining areas - or where new streets will be necessary for future public requirements on adjacent properties that have not yet been subdivided. Where adjacent land is undeveloped, stub streets should include a temporary turnaround to accommodate fire apparatus.
- **Location of Street Intersections.** New intersections of subdivision streets with existing thoroughfares within or bordering the subdivision should be planned to align with existing intersections, where feasible, to avoid creation of off-set or "jogged" intersections and to provide for continuity of existing streets, especially Collectors and higher classes of thoroughfares.
- **Angle of Intersection.** The angle of intersection for street intersections should be as nearly at a right angle as possible. Corner cutbacks or radii should be required at the acute corner of the right-of-way line, to provide adequate sight distance at intersections.
- **Offset Intersections.** Offset or "jogged" street intersections should have a minimum separation of 125 feet between the centerlines of the intersecting streets.
- **Cul-de-sacs.** Through streets and tee-intersections are preferable to cul-de-sacs. Care should be taken so as not to over utilize cul-de-sacs, which limits thru access, restricts pedestrian circulation, increases

response times and confuse motorists. However, when cul-de-sacs are used, they should have a maximum length of no more than 600 feet measured from the connecting street centerline to centerline of radius point, with a paved turnaround pad of at least 80 feet and a right-of-way diameter at least 100 feet in residential areas, and at least 180 feet diameter on a street with a 200 foot right-of-way diameter in commercial and industrial areas. A cul-de-sac with an island should have a diameter of no less than 150 feet.

- **Residential Lots Fronting on Arterials.** Wherever feasible, subdivision layout should avoid the creation of residential lots fronting on arterials with direct driveway access to the arterial street. Lots should be accessed from Collector or, preferably, Local Residential streets within or bordering the subdivision or an auxiliary street designed to accommodate driveway traffic.
- **Residential Lots Fronting on Collectors.** Wherever feasible, subdivision layout should minimize the arrangement of lots to access Collectors, particularly within 180 feet of an intersection. To the extent possible, lots should be accessed from local residential streets.
- **Geometric Design Standards and Guidelines.** Other requirements and guidelines for the geometric design of thoroughfares and public streets should be provided in the MPC Subdivision Regulations and standard specifications. This includes special provisions for lot width and building setbacks on corner lots to preserve sight distances at adjacent intersections.
- **Private Streets.** The MPC should not approve a plat containing private streets, including gated communities and possibly manufacture housing communities unless adequate precautions are taken to ensure minimum standards of construction, necessary space for utilities and street widening, sufficient room for maneuvering emergency vehicles and appropriate pedestrian circulation and emergency access.
- **Sidewalks.** Within the boundaries of a subdivision, sidewalks should be installed on both sides of Arterial, Collector and Local Residential Streets, unless the development occurs in a rural area and will construct an internal trail system.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) are comprised of a combination of telecommunication, computer, monitoring and control devices designed to increase the overall efficiency and effectiveness of transportation networks. Implementation of ITS results in:

- increased mobility;
- reduction in transportation costs;
- more efficient use of roadway infrastructure;
- reduced operating and maintenance cost;
- Improved air quality;
- increased roadway safety; and,
- continuously updated traffic data for traffic signal timing and planning activities.

ITS is comprised of various field equipment components used to monitor traffic operations, detect incidents, and communicate conditions to the traveling public. This section identifies and describes the ITS field components that enhance traffic operations and relieve congested conditions within transportation planning areas. These individual components are typically linked together through a fiber optic communications network. The communications network allows traffic operations personnel to monitor and respond to real-time traffic conditions.

According to a technical summary of the "Louisiana ITS Business Plan" published by the Louisiana Transportation Research Center in March 2000, LA DOTD has taken significant steps to implement many of the following components of Intelligent Transportation Systems through the plan.

Fiber Optic Communications

Recently, LA DOTD has undertaken the planning and implementation of a statewide fiber optic and wireless communications backbone system to provide for data, video, and voice communications among traffic, incident, and emergency management systems, devices, controllers and centers. This cable network uses glass fibers to transmit light pulses for moving data, voice and visual images from specific locations along the freeway to a central control center. Fiber optics is a superior

communications medium, enabling great quantities of broadcast bandwidth in an economic manner. It has superior operating characteristics, which provides a high quality communication signal with low maintenance. ITS installations typically use fiber optic cable containing eight to sixteen fiber pairs. The fiber cable is placed in underground conduits that have access boxes located at specified locations. The conduit protects the fiber cable from incidental damage.

Vehicle Detection

Vehicle detection equipment is used to gather information about the operational condition of the roadway. This information includes vehicle speeds, traffic volumes, lane occupancy and incident warning. There are three forms of vehicle detection equipment: inductive loops, microwave detections, and Video Image Processing Systems (VIPS). *Inductive loops* is a low cost technology that uses wire coils imbedded into the pavement to detect the magnetic presence of a vehicle. The disadvantage of induction loop technology is the moderate to high cost associated with installation and repair for roadways that are operational. Traffic must be diverted and the cost to motorists can be significant. Consequently, the optimal time for installing induction loops is during roadway construction. *Microwave detectors* use microwave radio signals to detect vehicles. They can be installed with little disruption to existing traffic. However, they are not as accurate as the induction loop detectors. *Video Image Processing Systems (VIPs)* use cameras to detect vehicles. Like microwave detectors, they can be installed with little impact to existing traffic. VIPs are more expensive than microwave detectors but have the added value of observing existing traffic conditions.

Changeable Message Signs

Changeable Message Signs (CMS), or Variable Message Signs (VMS), are used to communicate directly with motorists to advise them of roadway conditions. The Louisiana ITS Plan calls for "the installation of site-specific safety warning systems and weather information systems and associated dynamic message signs (DMS) and variable speed limit signs at key high accident and fog-prone locations along Interstate corridors." At strategic points along the roadway, the signs provide motorists with timely information that may cause them to alter their travel route in order to avoid traffic congestion due to traffic accidents, construction or poor weather conditions.

Highway Advisory Radio

Highway Advisory Radio (HAR) uses a low powered radio transmitter to communicate directly with motorists via their car radios. HAR systems are typically used to inform motorists of roadway construction activity, travel and destination information, and current parking conditions at large airports. Such systems can be deployed using mobile trailer platforms or can be a permanent installation. Messages transmitted can be prescribed and transmitted at predetermined times. Alternatively, through a communications link, messages can be created and downloaded to address a specific, but temporary situation. The Louisiana ITS Plan advocates the "development of an Advanced Traveler Information System to provide real-time traffic, incident, and alternative route data via DMS, displays at rest stops and other sites, and a DOTD web site."

Lane Control Signals

Closing a freeway lane under certain operating conditions can be useful in improving traffic flow. Lane Control Signals (LCS) are another form of DMS used to give advance warning to motorists of a lane blockage. Well in advance of the blockage (caused by an incident or maintenance activity) motorists are encouraged to merge from one lane into another. LCS can also be used to mitigate recurrent congestion at entrance ramps with heavy traffic volumes and freeway merges.

Closed Circuit Television

The primary uses of Closed Circuit Television (CCTV) are incident verification and management and operation monitoring. Traffic operators use CCTV to confirm traffic operations before implementing traffic control strategies. Cameras can be mounted to existing sign structures or to free standing camera poles. Cameras should be deployed to provide optimal coverage of the roadway facility. Depending on land contours and number of interchanges, cameras should be located between 1-1.5 miles apart.

There are two video formats provided for CCTV camera - full motion video and compressed video. Full motion video operates at approximately 30 frames per second and is television broadcast quality. This type of video requires large communication bandwidth. Compressed

video operates at approximately eight frames per second. Picture quality is less than full motion video but is adequate for incident detection and verification. The advantage of compressed video is that pictures can be transmitted over high-speed telephone lines.

Ramp Metering

Ramp metering uses traffic signals to control the flow of traffic at freeway entrance ramps. The purpose of ramp metering is to control the flow of traffic onto the freeway so the combined freeway and ramp traffic does not exceed the capacity of the freeway. By regulating vehicle merging activity, ramp metering also results in smoother traffic operations thus helping to optimize the vehicle capacity of the freeway mainlanes. Ramp metering can be done using fixed times (vehicles entering the main lanes at a constant rate), or the rate can be more automated to adjust to real time up-stream traffic volumes.

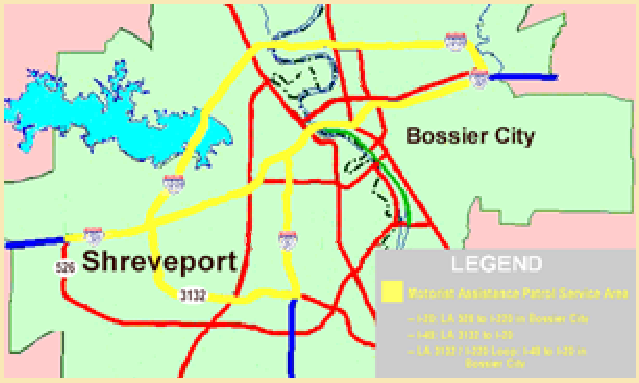
Cellular Phone Incident Reporting

Using the existing network of privately owned cellular telephones, private citizens can report traffic incidents to traffic operators. In addition to reporting traffic incidents, motorists can obtain help for themselves or other motorists. There are two types of cellular phone programs for reporting incidents. The first type involves recruiting motorists who frequently drive the area freeways to volunteer as "incident reporters". The advantage of this type of program is that volunteers are trained on how to accurately report an incident. The second type of incident reporting program targets all motorists with cellular phones to participate in reporting freeway incidents. The Louisiana State Police encourages motorists, through an extensive marketing campaign, to call *LSP (*577), which is a hot line number to report an incident using a cellular phone. The advantage of this type of program is the extensive coverage that can be obtained. The disadvantage is the reduced quality of the incident reporting.

Motorist Assistance Patrol (MAP) Program

In Louisiana and elsewhere, improved incident management capabilities are being realized through the continuation of the ongoing motorist assistance patrols, the development of incident response plans, and utilizing portable ITS applications in construction work zones. Freeways are designed as limited access facilities, so motorists who experience vehicle malfunctions may not be able to exit the facility easily. When an incident occurs it can have a severe impact on freeway operations. **Figure 7.11, Motorist Assistance Patrol Service Area** displays the corridors where the MAP service is available in the MPC Planning Area. This service is available seven days per week from 6 a.m. to 6 p.m. Sixty percent of freeway congestion is non-recurring, caused by accidents and disabled vehicles. Typically, a Motorist Assistance Patrol (MAP) program consists of personnel and equipment dedicated to providing assistance to motorists stranded on the freeway. The emphasis of MAP is on improving mobility by promptly restoring capacity to the roadway. MAP personnel patrol a freeway during the peak and off-peak hours of operation. Once a disabled vehicle or incident is identified, the MAP operator will work to resolve the situation as quickly as possible. Some of the free services offered include providing a gallon of fuel, changing flat tires, jumpstarting stalled cars, filling radiators with water, and providing a cellular phone for a local call if additional assistance is needed. The sooner the incident is resolved the less impact it will have on freeway operations. MAP operations are most effective in freeway corridors where traffic volumes are high compared to available lane capacity.

Figure 7.11
Motorist Assistance Patrol Service Area



Troop G of the Louisiana State Police responds to traffic issues along the network of state and Federal highways. In conjunction with their tasks, the Motorist Assistance Patrol responds to roadside needs on Interstates 20 and 220 in the Bossier MPC Planning Area.

Source: Louisiana Department of Transportation & Development (LA DOTD)

Traffic Signal Preemption

A traffic signal preemption system is an electrical device or devices that allow a traffic control signal to respond uniquely to the approach of a particular type of vehicle or the occurrence of an unusual condition at or near a highway intersection. Such systems are designed to increase safety, reduce emergency response times and enhance public transit operations.

A signal mounted preemption system requires the installation of a receiving device within the traffic control signal cabinet that responds to a remote triggering device attached to specific authorized vehicles. These systems may be used for the preemption of normal traffic control signal operation by the approach of emergency vehicles, or they may be used to modify the length of the green light time to allow for more efficient transit operation. Signal mounted systems generally allow vehicles traveling in the same direction as the emergency vehicle or bus to receive, or continue to receive, a green indication. In the case of emergency vehicle preemption, the green indication provides an opportunity for motorists to clear the road ahead of the advancing emergency vehicle. For signal mounted systems, if the remote signal from the source is interrupted or terminated for any reason, normal traffic control signal operation will continue. Signal mounted systems may respond to different vehicles or types of vehicles in recognition of different vehicle priorities.

Asset Management

An important and often overlooked component of ITS is documentation and record keeping of the different components and the design configuration of the system. ITS is comprised of electronic and communication equipment that is constantly in need of up-grade and maintenance. This requires system managers to have a detailed and up to date record of system components, their assembled and operation configuration, preventive maintenance schedule and the personnel providing maintenance. Systems that provide this type of asset management and control capability are based on geographical information systems (GIS) that permit the data to be presented graphically using space-oriented data bases. Space-oriented databases store data in tables that can be used to create maps of that information. For example, using asset management software allows personnel to request, via computer input, that all CCTV camera locations be displayed via a map on a computer monitor. Personnel can query the system to display any attribute the system may possess, such as the manufacturer of a specific component and that item's failure-rate history.

Asset management systems have the potential of saving millions of dollars in implementation and maintenance cost, increasing operational efficiency, and enhancing system evaluation.

Evaluation Methodology for ITS Strategies

The benefits of ITS technology come primarily from reductions in travel delay, accidents and fuel consumption. ITS technologies allow real-time monitoring and management of traffic operations for freeway and arterial facilities. These facilities can operate at a higher level of efficiency resulting in less congestion and better operating speeds for motorists. Secondary vehicle accidents are reduced by quickly responding to an accident condition and reducing the risk of related accidents and delay. Fuel consumption is reduced, lessening vehicle operating costs and improving air quality.

The Texas Transportation Institute (TTI) has developed non-recurring freeway congestion factors for freeways that operate at Level of Service (LOS) E and F during peak periods. These reduction factors measure the congestion reduction benefits of individual ITS field components and their combined synergistic benefits when implemented as a system. **Table 7.4, ITS Reduction Factors** presents potential percent reductions in congestion from an implemented ITS strategy.

The reduction factors can be applied to estimate the benefits from implementing a freeway ITS. For example, a freeway in the area will experience approximately "x-amount" of vehicle hours of delay per day. If 60 percent of this delay can be attributed to non-recurring congestion, then that accounts for approximately x-amount (0.6) of vehicle hours of delay per day. By applying the reduction factor values developed above, it is possible to estimate the reduction of congestion attributable to individual ITS components.

Because ITS installations are generally confined to Interstate Highways and other major corridors, local agencies must cooperate with the Metropolitan Planning

Organization in conjunction with LA DOTD to realize the benefits that are possible.

Table 7.4
ITS Reduction Standards

ITS Element	Reduction Factor
Loop Detectors	5%
CCTV Cameras	15%
Cellular Phone Hotline	10%
Ramp Meters	5%
Lane Control Signals (LCS)	5%
Changeable Message Signs (CMS)	15%
Highway Advisory Radio (HAR)	10%
Motorist Assistant Program (MAP)	40%
Root of Squares Summed (RSS)	48%

Source: Texas Transportation Institute, Dallas

Proposed ITS Deployment

A proposed ITS deployment plan has been prepared by Parsons Brinckerhoff Quade & Douglas, Inc. for the northwest Louisiana transportation planning area. This plan identifies by phase recommended deployment of ITS components. They include:

All Phases – Primary communication trunkline and secondary communications system. Estimated cost is $8,931,000 for construction, $893,100 for design, and $668,900 for annual operation.

Immediate – Installation of 29 CCTV cameras and traffic signal improvements at 75 intersections. Estimated cost is $10,617,000 for construction, $1,061,700 for design, and $261,100 for annual operation.

Near-Term – Installation of 135 CCTV cameras, traffic signal improvements at 114 intersections, 11 dynamic message signs, 357 radar vehicle detectors, and traffic management center software integration. Estimated cost is $39,331,500 for construction, $3,933,200 for design, and $2,620,000 for annual operation.

Long-Term – Installation of 67 CCTV cameras, traffic signal improvements at 206 intersections, two dynamic message signs, and 193 radar vehicle detectors. Estimated cost is $33, 892,300 for construction, $3,389,200 for design, and $968,100 for annual operation.

Considerations for ITS Implementation

Implementing an ITS program represents a significant and very visible commitment of personnel, time and funding. The level of effectiveness the system will have on increasing mobility, reducing congestion and improving the efficiency of the transportation network is directly connected to how well the system is implemented and subsequently maintained. The following are factors transportation agencies should consider before committing to implementation of ITS.

- A comprehensive communication requirements study should be conducted prior to the implementation of any phase of the system. A communication study looks at the overall data, voice and video bandwidth requirements for a total system. If communication/bandwidth needs are determined separately as each phase of the system is implemented, there is a greater likelihood the bandwidth for the system will either be under or over designed. This will result in lower performance, additional costs, or both.
- Developing software for integrating the system will be the greatest challenge to implementation. In all probability it will take longer, cost more, and provide the greatest level of frustration for the implementing agency than any other element associated with the system.

An asset management system to manage the multimillion dollar ITS program is critical to the long term success of the system and should be a requirement of implementation. It is much more cost effective to implement an asset management program prior to constructing the ITS than to attempt to do so years later after the system has been built. If funding is currently not programmed for an asset management system, then the implementing agencies should seriously consider delaying the ITS program until such funding can be secured.

Access Management

Access management is the coordination between land access and traffic flow along streets in the MPC Planning Area, with a basic premise to preserve and enhance the performance and safety of the major street system. It manages congestion along existing corridors such as Airline Drive and protects the capacity of future streets such as Stockwell Place Road by controlling access from adjacent development. Properly utilized, it can slow or eliminate the need for street widening or right-of-way acquisition. When widening is necessary, the limited number of access points improves the speed of design and development.

Techniques to accomplish access management include limiting and separating vehicle (and pedestrian) conflict points, reducing locations that require vehicle deceleration, removing vehicle turning movements, creating intersection spacing that facilitates signal progression, and providing on-site ingress and egress capacity. In addition, regulation focuses on the spacing and design of driveways, street connections, medians and median openings, auxiliary lanes and transit facilities, on-street parking and parking facilities, on-site storage aisles, traffic signals, turn lanes, freeway interchanges, pedestrian and bicycle facilities, bus stops and loading zones.

Research indicates that a well-designed and effectively administered access management plan can result in the following tangible benefits:

- Accident and crash rates are reduced by 40 to 60 percent
- Roadway capacity and the useful life of transportation facilities is prolonged
- Travel time and congestion is decreased
- Better coordination between access and land uses is accomplished
- Air quality is improved
- Economic activity is enhanced
- Urban design and transportation objectives are reconciled
- The unique character and livability of the community is preserved through the coordination of land use and transportation.

On the other hand, failure to manage access negatively impacts the efficiency of transportation networks in the following ways:

- More driveways related to strip commercial development
- Local streets become bypasses for congested streets thereby creating the need to address cut-through traffic in residential neighborhoods
- More frequent driveway related accidents
- Vehicle conflicts from closely spaced driveways, which increase congestion thereby reducing capacity
- Longer travel times that shrink market areas for business
- More difficulty in providing safe access for new development thereby affecting economic growth
- Lower cost/benefit ratios of transportation improvements
- Greater need for wider streets to compensate for lost capacity
- More cluttered streets and frequent driveways, which create an undesirable environment for pedestrians and bicyclists.

The following access management strategies may be used to coordinate the access needs of adjacent land uses with the function of the transportation system:

- **Intergovernmental Coordination.** Certainly access management in the MPC Planning Area will require coordination between Bossier City and Bossier Parish. However, a more regional strategy involves members of the Northwest Louisiana Council of Governments, as well as LA DOTD and federal organizations involved in design and construction of roadways. Through coordinated efforts, access management can even further emphasize thoroughfare efficiency.
- **Separate Conflict Points.** Two common conflict points are driveways and adjacent intersections. Spacing driveways so they are not located within the area of influence of intersections or other driveways is a method to achieve access management objectives.

Stockwell Place Road is a good example of the impact that residential driveways from strip development along a suburban collector road can have on current and future capacity.

- **Restrict Turning Movements at Un-signalized Driveways and Intersections on Multi-Lane Roadways.** Full movement intersections can serve multiple developments through the use of joint driveways or cross-access easements. Turning movements can be restricted by designing accesses to limit movements or by the construction of raised medians that can be used to provide turn lanes.
- **Establish Design Standards.** Design standards addressing the spacing of access points, driveway dimensions and radii, sight distance, and the length of turn lanes and tapers are effective mechanisms for managing the balance between the movement of traffic and site access.
- **Locate and Design Traffic Signals to Enhance Traffic Movement.** Interconnecting and spacing traffic signals to enhance the progressive movement of traffic is another strategy for managing mobility needs. Keeping the number of signal phases to a minimum can improve the capacity of a corridor by increasing green bandwidth by 20 seconds.
- **Remove Turning Vehicles from Through Travel Lanes.** Left and right turn speed change lanes provide for the deceleration of vehicles turning into driveways or other major streets and for the acceleration of vehicles exiting driveways and entering major highways.
- **Encourage Shared Driveways, Unified Site Plans and Cross Access Easements.** Joint use of driveways reduces the proliferation of driveways and preserves the capacity of major transportation corridors. Such driveway arrangements also encourage sharing of parking and internal circulation among businesses that are in close proximity.

Funding Sources

Implementation of the Master Thoroughfare Plan or the goals, objectives and actions of the transportation element is not the responsibility of a single entity or agency. Instead, it will require coordination and the combined resources of local, state and federal transportation funding programs, as well as participation by the private sector. Following are alternative funding sources that are available or could be considered for financing future improvements to the transportation system in the MPC Planning Area.

Federal Funding

Many of the transportation improvements will be eligible to receive federal funds as part of the Transportation Efficiency Act of the 21st Century (TEA-21). This six-year program (through 2003) provides federal funding for surface transportation improvements, including roadways, public transportation, pedestrian facilities, and a number of other transportation improvements. TEA-21 emphasizes the development of a National Intermodal Transportation System that effectively connects highways with other modes of transportation. Additionally, TEA-21 gives states and local governments a significant amount of flexibility in determining the use of available federal funds. The federal share required for TEA-21 funding is generally 80 percent, with the remaining 20 percent provided by the state or local governments.

Title I - Surface Transportation - This title includes a number of programs and provisions oriented toward providing funding primarily for highway related projects. Some of the key programs within this title include the following:

- **National Highway System (NHS) -** This program provides funding for improvements to rural and urban roads that are part of the NHS, including Interstate Highways and designated connections to major intermodal terminals. In certain circumstances, NHS funds may also be used to fund transit improvements in NHS corridors.
- **Surface Transportation Program (STP), Federal Hazard Elimination Program -** This program addresses safety-related projects on and off the state highway system. Projects are evaluated using three years of accident data, and ranked by a Safety Improvement Index.
- **Surface Transportation Program (STP), Federal Railroad Signal Safety Program -** This program provides for installation of automatic railroad warning devices at most hazardous railroad crossings on and off of the state highway system. Projects are selected from a statewide inventory list, which is prioritized by

an index (number of trains per day, train speed, ADT, type of existing warning device, train-involved accidents within prior five (5) years, etc.).

- **Highway Bridge Replacement and Rehabilitation Program (HBRRP) -** This program provides funds to assist the States in their programs to replace and rehabilitate deficient on-state highway bridges.
- **Congestion Mitigation and Air Quality Improvement Program -** The primary purpose of the Congestion Mitigation and Air Quality Improvement Program (CMAQ) is to fund projects and programs in air quality and maintenance areas for ozone, carbon monoxide (CO), and small particulate matter (PM-10) which reduce transportation related emissions.
- **Transportation Enhancements (TE) -** Transportation enhancements are transportation-related activities that are designed to strengthen the cultural, aesthetic, and environmental aspects of the Nation's intermodal transportation system. The transportation enhancements program provides for the implementation of a variety of non-traditional projects, with examples ranging from the restoration of historic transportation facilities, to bike and pedestrian facilities, to landscaping and scenic beautification, and to the mitigation of water pollution from highway runoff.
- **Recreational Trail Program -** This program provides funds to develop and maintain recreational trails for motorized and non-motorized recreational trail users.
- **Bicycle Transportation and Pedestrian Walkways -** The Bicycle Transportation and Pedestrian Walkways provisions of Section 217 of Title 23, as amended by TEA-21, describe how Federal-aid funds may be used for bicycle and pedestrian projects. These projects are broadly eligible for all of the major funding programs where they compete with other transportation projects for available funding at the State and MPO levels.
- **Job Access and Reverse Commute Grants -** The Access to Jobs Program provides competitive grants to local governments and non-profit organizations to develop transportation services to connect welfare recipients and low-income persons to employment and support services.

State Funding

- **Transportation Enhancement Program (TEP) -** The Transportation Enhancement Program is a Federally funded program administered through LA DOTD. The goal is to work toward building a more balanced transportation system that includes pedestrians and bicyclists as well as the motoring public. However, projects are not limited to sidewalks and bike paths. They can include safety and educational activities for pedestrians and bicyclists, landscaping and other scenic beautification, historic preservation, acquisition of scenic easements and scenic or historic sites, preservation of abandoned railway corridors, scenic or historic highway programs including the provision of tourist and welcome center facilities, archaeological planning and research, control and removal of outdoor advertising, environmental mitigation and establishment of transportation museums.
- **Transportation Infrastructure Model for Economic Development (TIMED) –** The Transportation Infrastructure Model for Economic Development is based upon state legislation (Act 11 of the 1989 General Session) to allocate an additional four cent fuel tax to a fifteen year construction program for sixteen projects considering economic development opportunities versus needs. U.S. 171 is one of the corridors that is benefiting from this program.
- **Capital Outlay Program -** The Capital Outlay Program is a Bond Program that provides a source of funding for public improvement type projects not eligible for funding through any of the dedicated funding programs. The funds are provided through the sale of State General Obligation Bonds and can be used for acquiring lands, buildings, equipment or other properties, or for their preservation or development of permanent improvements. Items which qualify as capital outlay expenditures include acquisition of land; site development and improvement; construction of buildings and other structures; additions, major improvement, and alterations to an existing facility that will extend its life or increase its usefulness; installation, extension, or replacement of utility systems, fire protection, and other major

facilities; initial equipment and furnishings for new buildings; and major equipment and furnishings for existing buildings.

Projects compete through the legislative process, and successful ones are grouped into various funding priorities and included in the approved Capital Outlay Bill. Funding for a specific project does not become available until such time as the bonds for that project are sold, or the State Bond Commission approves an advance cash line-of-credit.

- **Port Construction and Development Priority Program –** The Port Construction and Development Priority Program was created by the Legislature in 1989. According the to LA DOTD, the purpose of this priority program is to allocate state funds to port projects that have the highest prospects of success as determined by objective standards such as technical and financial feasibility and overall impacts. The program specifically emphasizes the need to equitably distribute state funds and to avoid duplication of port infrastructure. A rigorous analysis of forecasted project benefits is undertaken in order to ensure that project impacts are positive and beneficial to the State.
- In order to be eligible for funding, a port authority must submit an application for consideration. These applications are reviewed, evaluated and prioritized. As allowed by statute, LA DOTD contracts with the LSU National Ports and Waterways Institute for assistance with the economic evaluation of these projects. The program requires a cost participation from the ports of 10% based on construction cost of the project.

Local Impact Fees

Annually, the City and Parish each should prepare a five-year capital program and a one-year capital budget. Included in the budget should be lists of projects, cost estimates and the source(s) of funding. Foregoing any federal, state, or private participation, the primary source of local funding, outside of general budget expenditures and the use of bonds is impact fees.

Consideration could be given to establishing an impact fees program to serve as an additional funding source for transportation improvements. A growing number of local jurisdictions and state governments throughout the United States are establishing impact fee programs as a method of private financing of needed transportation and other infrastructure improvements. Traffic impact fees are prevalent in the states of Florida and California, with State enabling legislation for local implementation enacted in Arizona, Colorado, Georgia, Illinois, Maryland, New Jersey, New Hampshire, North Carolina, Oregon, Pennsylvania, Texas, Utah and Washington. This trend is due to the increasing cost of maintaining existing infrastructure and the difficulty of local governments to provide needed improvements due to the lack of adequate funding on the federal, state and local levels.

A traffic impact fee is an exaction imposed by a local government on new development to generate revenue for funding transportation improvements needed to accommodate or alleviate traffic impacts caused by the development project. Impact fees, as distinguished from a general-purpose tax, are levied to allow the local government to build public infrastructure made necessary by a new development or renovation that results in new impacts. However, impact fees cannot be used to pay for correcting past deficiencies in existing facilities due to failure to keep pace with the impact of past development, nor can impact fees be used to support operation and maintenance of existing facilities. Impact fees have been used to provide capital funding for infrastructure improvements such as streets and other transportation improvements, water supply systems, wastewater collection and treatment systems, drainage, recreational facilities, police and fire protection facilities, and medical facilities. Developers can also be allowed to construct improvements and/or dedicate land for rights-of-way in lieu of paying impact fees.

Traffic impact fees provide a means of sharing the cost of transportation improvements that provide capacity for new development projects within a particular area. Generally, a district is delineated and transportation improvement needs within the district are identified based on projected future development. The number of trips that are generated by a particular development and an assessment of its traffic impacts are usually the basis for determining the share of total improvements costs that is assessed to the developer. Level-of-Service "C" or "D" is typically used as the standard for identifying needed

improvements. In residential areas, the traffic impact rate is often based on a cost per dwelling unit, and in commercial and industrial areas on cost per square foot or acre. Five-year capital improvements programs and major street plans are the most common background documents for calculating and implementing impact fee structures. Traffic impact fees are typically paid at the building permit stage.

Some advantages of an impact fee program are as follows:

- Improvement costs shared by all area development on a pro-rata basis based on their respective trip generation and traffic impacts;
- Provides an additional source of revenue to finance a portion of future transportation and other infrastructure improvements;
- Existing revenue sources can be devoted to maintaining existing service levels and funding improvements to correct existing deficiencies;
- The cost of infrastructure improvements is paid, all or in part, by those who directly benefit from those facilities; and,
- As a form of user charge, impact fees introduce the cost of necessary public infrastructure improvements into the private development decision-making process, thereby imposing a degree of market discipline on resource allocation decisions.

Thoroughfare Master Plan Implementation

Implementation of thoroughfare system improvements occurs in stages over time as development continues and, over many years, builds toward the ultimate thoroughfare system shown in the Thoroughfare Plan for the MPC Planning Area. The fact that a future thoroughfare is shown on the Plan does not represent a commitment to a specific time frame for construction, nor will that any of the jurisdictions involved in road construction build the roadway improvement. Individual thoroughfare improvements may be constructed by a variety of implementing agencies, including Bossier City, Bossier Parish and the Louisiana Department of Transportation and Development (LA DOTD), as well as private developers, intra-governmental agencies, and land owners for sections of roadways located within or adjacent to their property. Road construction can be implemented by individual entities, such as Bossier Parish, or in partnership with an entity such as Bossier Parish.

Each of these entities can utilize the Thoroughfare Plan in making decisions relating to planning, coordination and programming of future development and transportation improvements. Bossier City and Bossier Parish should utilize the Plan as a means of coordinating with NLCOG to place projects on the area Transportation Improvement Plan. Review of preliminary and final plats for proposed subdivisions in accordance with the MPC's subdivision regulations should include consideration of compliance with the Master Thoroughfare Plan in order to ensure consistency and availability of sufficient right-of-way for the general roadway alignments shown in the Plan.

It is of particular importance to provide for continuous roadways and through connections between developments to ensure community wide mobility. By identifying thoroughfare locations land owners and developers can consider the roadways in their subdivision planning, dedication of public right-of-way, and provision of setbacks for new buildings, utility lines, and other improvements located along the right-of-way for existing or planned thoroughfares.

Plan Amendment Process

It will be necessary for the Metropolitan Planning Commission to periodically consider and adopt amendments to the Master Thoroughfare Plan to reflect changing conditions and new needs for thoroughfare system improvements and development. A systematic procedure should be followed for making Plan amendments, including a set schedule for annually inviting and considering proposed changes.

The process for amending the Master Thoroughfare Plan should be established by ordinance. Typically, Plan amendment requests may originate from landowners, civic groups, neighborhood associations, developers, other governmental agencies, MPC staff, and other interested parties. The MPC and applicable members of City or Parish staff should analyze proposed revisions. The MPC should then formally consider the proposed changes and staff recommendations. The Commission should conduct a public hearing on proposed amendments,

including required public notice in advance of the hearing. Proposed amendments should be considered in a fair, reasonable, and open process. The burden for proving compelling reasons for the public benefit of any proposed changes should rest with the requesting parties. Decisions and determinations should represent the best interests of the public.

The revised Master Thoroughfare Plan, including any approved Plan amendments, should be adopted by the MPC and submitted to the Bossier City Council and Bossier Parish Police Jury for its consideration. The amended Plan becomes effective upon final adoption.