Northwest Louisiana
Mobility 2040

Long Range Transportation Plan

April 2016

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NLCOG
Northwest Louisiana Council of Governments

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Northwest Louisiana Council of Governments

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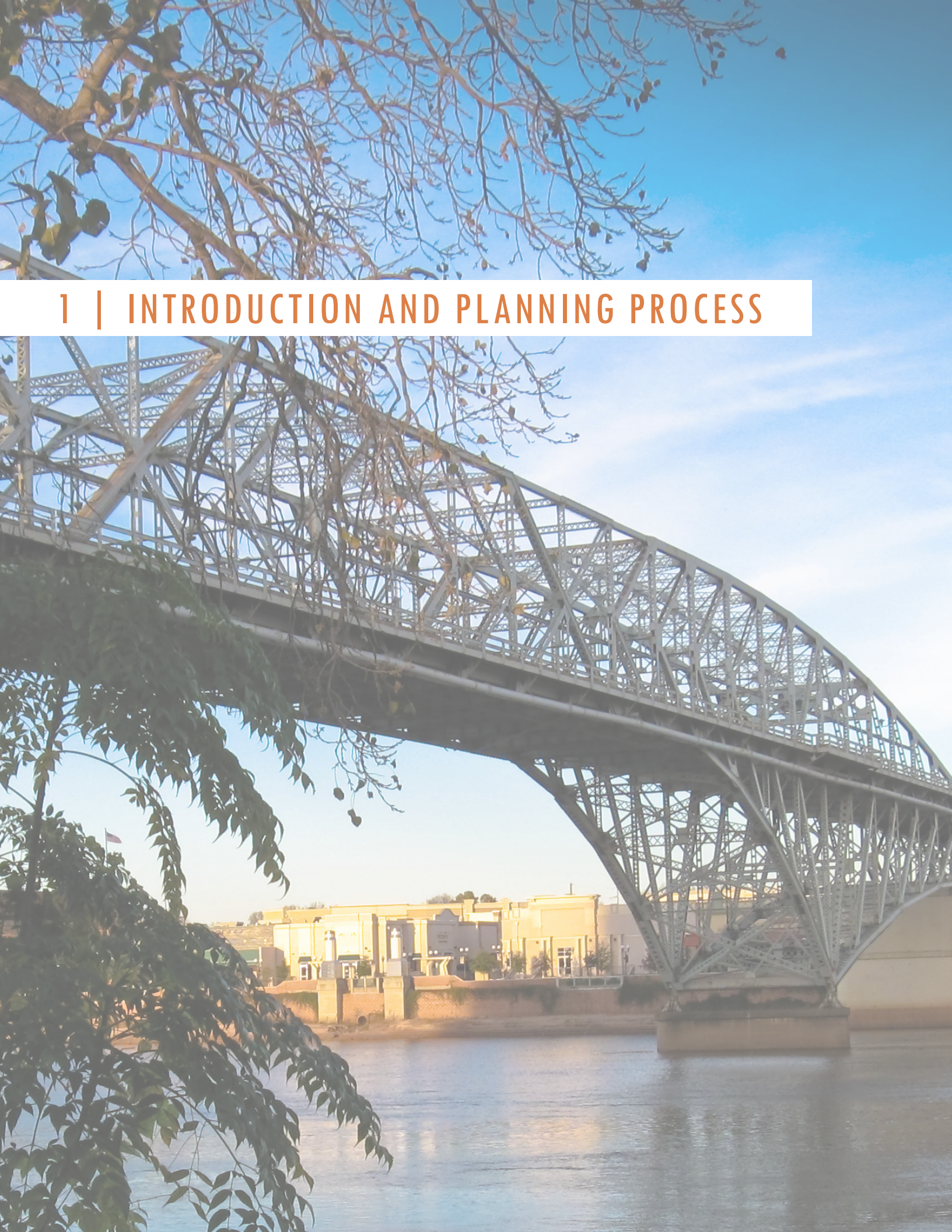


Introduction

Long range transportation planning is a cooperative process conducted by the Metropolitan Planning Organization (MPO), in coordination with the Louisiana Department of Transportation and Development (LADOTD), transit operators, numerous stakeholders from throughout the region, and the public to create a vision for the future of the community. The process, which is prescribed by federal regulations, is designed to assist the MPO in prioritizing short- and long-term investments in the regional transportation system over the next 25 years through a proactive public participation process that involves all users of the transportation system.

The Northwest Louisiana Council of Governments (NLCOG), the MPO for Bossier and Caddo Parishes, initiated an update to the Long Range Transportation Plan (LRTP) in June 2014. The 2040 LRTP was developed over a 21-month period, during which time several rounds of public and stakeholder meetings were conducted, technical data was analyzed, existing plans and studies were compiled and reviewed, and potential projects were evaluated according to community goals and performance based criteria. The resulting product is a comprehensive blueprint for the future of the transportation system that takes into account the needs of all modes and users.

The planning area for the 2040 LRTP encompasses the entirety of Bossier and Caddo Parishes, occupying the northwestern-most corner of Louisiana. Figure 1-1 shows the boundary of the LRTP study area, as well as the location of population centers, major transportation facilities, and major environmental features within the MPO.

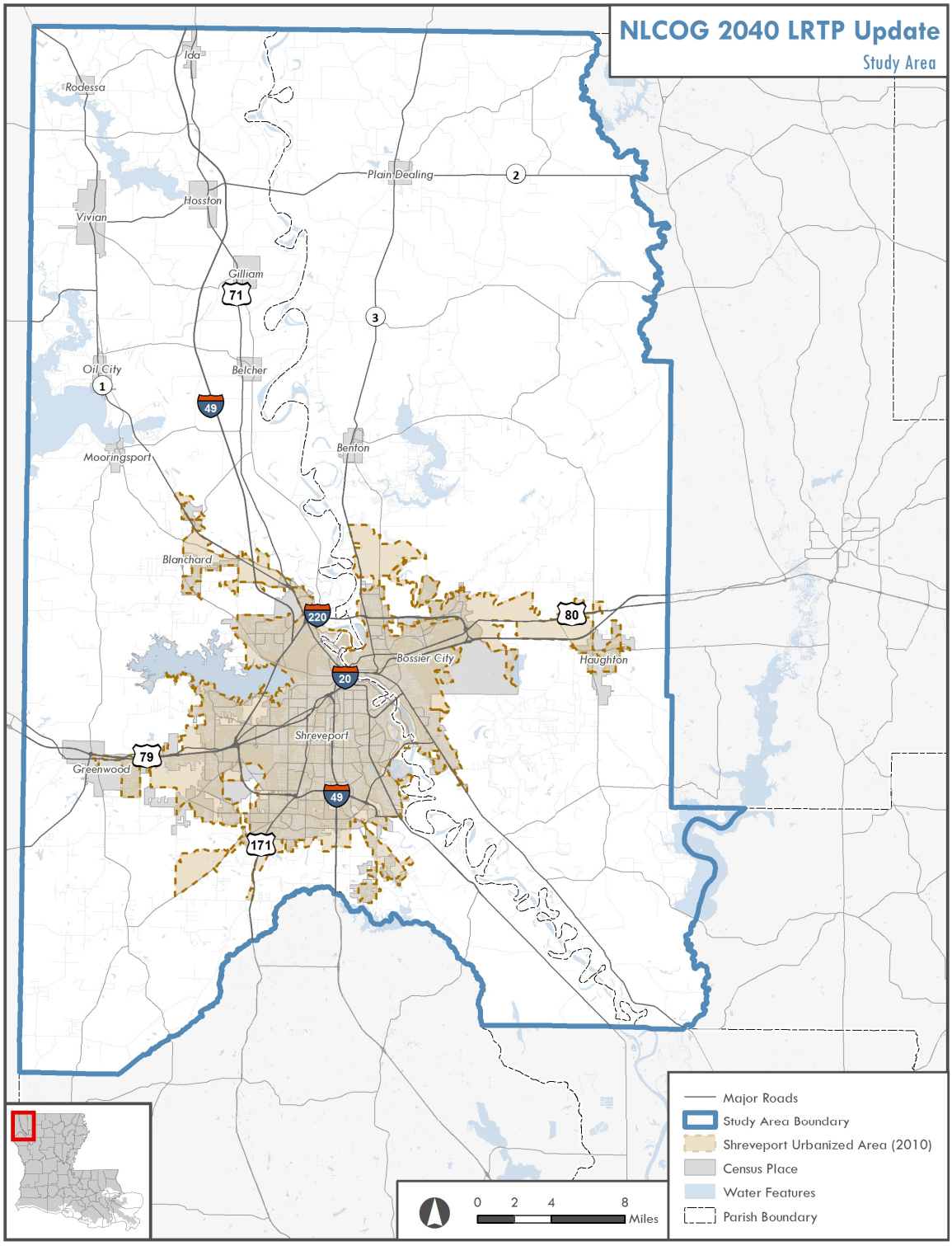
Metropolitan Planning Organization

With the passage of the Federal Highway Act of 1962, all major cities within the United States were required to adopt an LRTP to guide the long term development of the transportation system. The Act established specific rules and regulations for carrying out the long range transportation planning process, and required the formation of MPOs for any urbanized area (UZA) with a population greater than 50,000. Under federal regulations, MPOs are responsible for carrying out a continuing, cooperative, and comprehensive (3-C) planning process, in cooperation with the state and local governments, to develop the LRTP and determine how best to invest federal transportation funding in the region.

The Northwest Louisiana Council of Governments (NLCOG)

Following the 1970 decennial Census, the Census Bureau determined that the area in and around the cities of Shreveport and Bossier City exceeded a population of 50,000, and as such, required the designation of an MPO to oversee regional transportation planning for the area. NLCOG became the designated MPO for the Shreveport-Bossier City Urbanized Area (UZA), as well as the towns of Benton, Blanchard, Greenwood, Haughton, Oil City, Plain Dealing, and Vivian, and the unincorporated areas of Bossier and Caddo Parishes. According to federal regulations, the planning area for which MPOs are responsible must include the urbanized area, as well as the area expected to be urbanized within the next 25 years. NLCOG consists of a Policy Committee, a Technical Coordinating Committee (TCC), and MPO staff. The role of the MPO staff is to complete administrative tasks and other activities in support of the transportation planning process, including the development of the LRTP.

Figure 1-1: Study Area



Transportation Policy Committee

Elected and appointed officials comprise the Policy Committee, which is responsible for approving and adopting all the transportation planning activities and programs of the MPO. Membership of the Policy Committee is governed by agreement between the affected local governments and the governor of Louisiana, and is reviewed periodically to ensure adequate representation of all parties. Membership consists of 8 voting members and 3 non-voting members, with representatives from the following member agencies as detailed below.

Voting Members

- Bossier Parish Police Jury – Parish Administrator
- Caddo Parish Commission – Parish Administrator
- Bossier City – Mayor
- Shreveport – Mayor
- Bossier Metropolitan Planning Commission – Director
- Shreveport Metropolitan Planning Commission – Director
- Caddo-Bossier Parishes Port Commission – Director
- SporTran
- LADOTD District Representative – District 04 Administrator

Non-voting Members

- Federal Highway Administration
- Federal Transit Administration

Technical Coordinating Committee (TCC)

The TCC serves in an advisory role to the Policy Committee and is responsible for professional and technical review of work programs, policy recommendations, and transportation planning activities. Membership consists of local and state technical and professional personnel knowledgeable in the transportation field. Membership is capped at 29 members, including the following:

- City of Shreveport – City Engineer
- City of Shreveport – Traffic Engineer
- City of Shreveport – Environmental Services Director
- City of Bossier City – City Engineer
- City of Bossier City – Traffic Engineer
- Caddo Parish – Director of Public Works
- Caddo Parish – Assistant Director of Public Works
- Bossier Parish – Parish Engineer
- Bossier Parish – Project Manager
- SporTran – General Manager
- Port of Caddo-Bossier – Director of Engineering and Planning
- Shreveport/Caddo Metropolitan Planning Commission – Senior Planner
- Bossier City/Parish Metropolitan Planning Commission – Senior Planner
- LADOTD District 04:
  - Traffic Engineer
  - Maintenance Engineer
  - Public Information Officer
- LADOTD Headquarters:
  - Transit Section
  - Urban Program Project Manager
  - Planning/Program Planning Manager
  - Planning/Program Project Engineer
- FHWA – Louisiana District 04 Area Engineer
- FTA – Community Planner
- Shreveport Regional Airport – Assistant Director of Operations
- Barksdale Air Force Base – Base Community Planner
- NLCOG – Transportation Planning Manager
- NLCOG – Public Involvement Coordinator/Title VI Officer
- NLCOG – Executive Director (only in case of tie vote)

Purpose of the Long Range Transportation Plan

As the MPO for Bossier and Caddo Parishes, NLCOG is responsible for determining which transportation projects to implement in the region using federal transportation funding. The need for transportation improvements across the nation continues to outpace the funding available to address our nation's growing transportation needs. Therefore, the process for developing the LRTP is intended to ensure that federal funding is allocated to transportation projects that best address the needs and goals defined by the community. Given the long timeline for implementing transportation improvements, the LRTP must have a planning-horizon of at least 20 years. Federal regulations also require the LRTP to be "fiscally constrained," meaning the anticipated cost of transportation improvements cannot exceed the expected revenue over the planning horizon. In short, the LRTP is a prioritized list of transportation improvements programmed for implementation over the next 25 years according to how much funding is expected to be available.

Legislative Authority for the LRTP

Following passage of the Federal Highway Act of 1962, Congress has passed a series of surface transportation bills that have continued to require MPOs to develop a metropolitan transportation plan in order to be eligible for federal funding. The most recent surface transportation legislation was the Moving Ahead for Progress in the 21st Century Act (MAP-21). The LRTP was developed in compliance with this legislation.

Moving Ahead for Progress in the 21st Century (MAP-21)

In 2012, MAP-21 became the fourth intermodal surface transportation bill passed by Congress since 1991, the previous three being: the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the Transportation Equity Act for the 21st Century (TEA-21), and the Intermodal Surface Transportation Efficiency Act (ISTEA). MAP-21 maintains the eight federal planning factors established under TEA-21 and expanded under SAFETEA-LU, with the core considerations of economic development, safety, security, mobility and accessibility, environmental protection, intermodal connectivity, systems management and operations, and system preservation. MAP-21 also continues the requirement for a continuing, cooperative, and comprehensive (3-C) long range transportation planning process for making transportation decisions in metropolitan areas.

MAP-21 provides funding for highways, highway safety, transit, bicycle and pedestrian facilities, and multi-modal infrastructure. The original 3-year funding authorization has been extended through a series of continuing resolutions and was the de-facto federal transportation legislation at the time of adoption of the LRTP. As with previous legislation, MAP-21 requires MPOs to develop a LRTP. However, MAP-21 introduced some major programmatic and policy changes to long

range transportation planning, establishing seven national performance goals focused on safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, reduced project delivery delays, and environmental sustainability. MAP-21 also requires state DOTs and MPOs to adopt a performance-based planning process.

The national performance goals are as follows:

- To achieve a significant reduction in traffic fatalities and serious injuries on all public roads;
- To maintain the highway infrastructure asset system in a state of good repair;
- To achieve a significant reduction in congestion on the National Highway System;
- To improve the efficiency of the surface transportation system;
- To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development;
- To enhance the performance of the transportation system while protecting and enhancing the natural environment; and
- To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

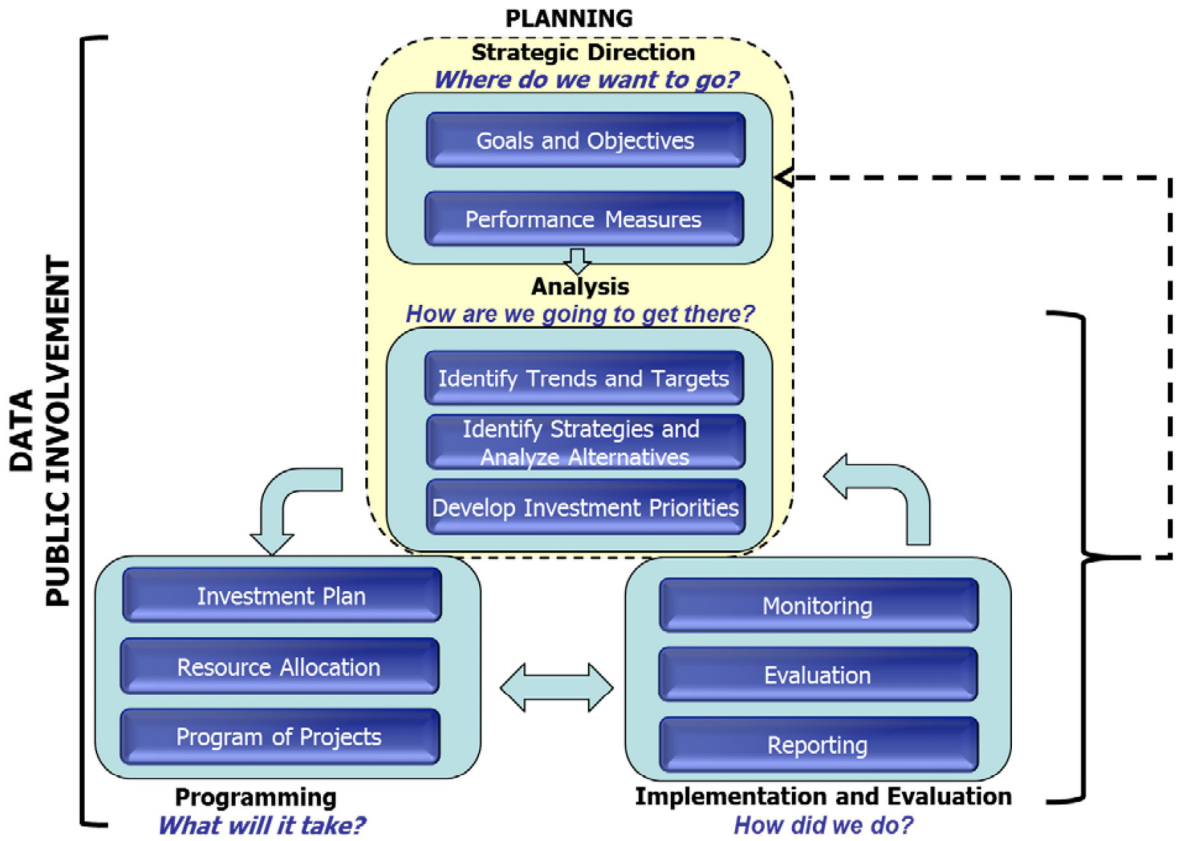
Performance-Based Planning and Programming

MAP-21 requires MPOs to develop long-range transportation plans through a "performance-driven, outcome-based approach to planning," which has long been regarded as a best practice in the field of transportation planning. A performance-based approach uses data on the performance of the transportation system to identify, evaluate, and prioritize strategies to achieve desired outcomes and track progress over time. The primary rationale behind this approach to long range transportation planning is that funding decisions should be closely tied to achieving specific outcomes. Figure 1-2 provides a visual explanation of the process.

To understand performance-based planning under MAP-21, it is important to first grasp the difference between performance goals, measures, and targets. The seven national performance goals described above are broad statements that describe a desired end state. Performance measures are metrics used to assess progress toward meeting these goals. For instance, take the national performance goal of achieving a significant reduction in traffic fatalities and serious injuries; an example of a performance measure for this goal is the number of fatalities and serious injuries per 100 million vehicle miles traveled. Performance measures represent a quantitative approach to determining whether progress is being made towards achieving goals. Performance targets, on the other hand, are the specific level of performance that is desired to be achieved within a certain timeframe. Using the previous example, a performance target would be X fatalities per 100 million vehicle miles traveled over a 1-year period.

MAP-21 requires the United States Department of Transportation (USDOT), in consultation with state DOTs, MPOs, and other stakeholders, to establish performance measures for pavement

Figure 1-2: Performance Based Planning Process



Source: Federal Highway Administration (FHWA)

condition, highway performance, bridge condition, safety, traffic congestion, on-road mobile source emissions, and freight movement. State DOTs and MPOs are then required to adopt performance targets within a specified time frame. While not effective at the time of the development of the 2040 LRTP, future transportation decisions, including the prioritization of transportation improvements in the LRTP, will need to be based on their likely impact on achieving NLCOG's adopted performance targets. Future transportation funding allocations will be based on the success of state DOTs and MPOs in achieving their adopted performance targets.

The LRTP Planning Process

The planning process for creating the LRTP is prescribed by state and federal regulations, but the vision that drives the process is locally developed. Development of the 2040 LRTP was kicked off by an extensive public visioning process that included workshops with the public and consultation with regional stakeholders. Existing plans, studies, and data in the region were reviewed to better understand planning efforts to date and ensure the 2040 LRTP supports other activities in the region that are impacted by the transportation system.

Development of the LRTP also included a significant technical analysis component, including an inventory of the existing transportation system, the development of

population and growth projections for the region, and an analysis of roadway and non-roadway performance, including how growth will impact the future performance of the transportation system if no improvements are made over the planning horizon. Using information gathered from the public, key stakeholders, and the results of the technical analyses, strategies for meeting the needs of the region were identified and evaluated, including alternative growth scenarios. Potential transportation improvements were scored and ranked according to community goals and their anticipated impact on regional mobility. Finally, the cost of each project was estimated, and likely revenues were forecasted for the planning horizon. The list of prioritized transportation improvements was further refined according to how much funding is expected to be available. The end result is a prioritized list of current (2015-2020), short-term (2021-2030), and long-term (2031-2040) projects programmed for federal funding over the next 25 years.

Visioning Process

The purpose of the LRTP is to identify the mobility needs of the community over the next 25 years, establish priorities for funding those improvements, and chart a course for meeting the community's identified transportation needs. Establishing a community vision for the future of the transportation system and related goals to assist in the prioritization of transportation improvements is key to ensuring the plan reflects community values. Input from members of the public and other regional stakeholders was solicited early and continuously throughout the development of the plan.

The process for updating the 2040 LRTP was initiated by a series of workshops with the public and consultation with regional stakeholders with a specific interest in the transportation system, such as freight operators and emergency responders. The purpose of these meetings was to gather data and input on community needs and values to establish a framework for LRTP development. Using the feedback received, NLCOG drafted a vision statement and reconfirmed the goals and objectives from the previous LRTP. A list of evaluation criteria, ranked according to input from the public, was also developed to assist in prioritizing transportation improvements for inclusion in the LRTP, and the needs of the public, as well as specific stakeholder groups, was documented for further analysis.

Source: Shreveport-Bossier City CVB (via Flickr)

Gathering Existing Data and Professional Expertise

Early in the process and throughout plan development, roundtable discussions and interviews were conducted with key stakeholders with a specific interest in the transportation system, such as freight operators, emergency responders, bicycle and pedestrian advocates, and members of the business community. These meetings were designed to gather information on related plans, reports, studies, and data in the region, and better understand each stakeholder's needs related to the transportation system. The meetings included discussions on existing plans, reports, data, and professional knowledge of ongoing projects, development patterns, and community concerns to create an initial framework, including an overview of challenges and opportunities in the study area, to guide the development of the LRTP.

Important planning guidelines mandated by MAP-21 include due consideration of other related planning activities within the metropolitan area and the support of local economic vitality as one factor by which all transportation projects must be evaluated. Therefore, the study team coordinated with representatives and agencies responsible for land use, economic development, and other related planning processes as a key element in the visioning phase of the LRTP development. MAP-21 also requires that MPOs consult with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of a long range transportation plan. Many of these agencies are represented on the MPO's TCC and were also involved in the initial stakeholder consultations.

Conducting Public Visioning Workshops

In addition to the stakeholder consultations, the MPO hosted a series of visioning workshops to gather information from the public on perceived needs, community values, and desired community growth and development patterns. An outreach and advertising campaign was conducted to invite a large and diverse group of stakeholders to participate in the visioning workshops. At the workshops, public participation specialists worked with the community to articulate their needs and priorities as they relate to the transportation system, and help them visualize alternative land use scenarios and future multi-modal transportation system options. Throughout the workshops, the public was given opportunities to inform the MPO of the transportation needs and challenges that should be addressed in the area and to provide input regarding the importance of criteria used to evaluate future transportation projects.

Identification of Regional Transportation Needs

In order to develop strategies for improving the transportation system and accommodating future growth, it is imperative to assess the current state of the transportation system, as well as community growth trends. For the update to the 2040 LRTP, the needs assessment included an inventory of the existing transportation system, a demographic analysis to determine existing transportation demand based on current population levels, projections of future population and employment and the associated future travel demand, and an evaluation of the performance of both roadway and non-roadway transportation systems.

Transportation System Inventory

In order to determine existing and future travel demand on the transportation system, all existing transportation modes in Bossier and Caddo Parish were inventoried, including the National Highway System (NHS), urban and rural roadways by functional class, bridges, rail facilities, airports, intermodal terminals, fixed route transit system, demand response public transit systems, bicycle facilities, pedestrian facilities, passenger rail, and intercity bus.

Regional Growth Trends

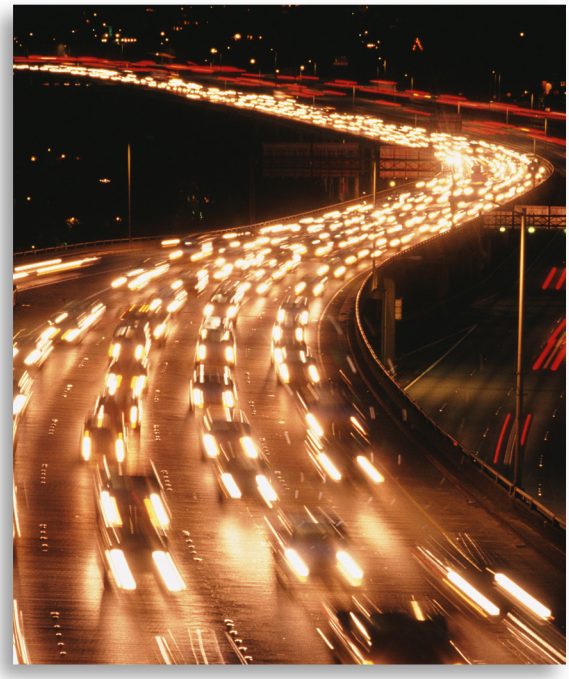
The density and distribution of residences, jobs, schools, shopping, and recreational opportunities within the region, to name a few, have significant implications for the way the transportation system is used by the traveling public. In order to evaluate existing needs and establish a baseline to which future needs can be compared, the study team gathered existing data on population, employment, and land use. 2010 was selected as the base year, as it is the most recent year during which the decennial Census was conducted – the only complete enumeration of the population. Information on employment was acquired from InfoUSA, a proprietary dataset, and supplemented with the

institutional knowledge from regional stakeholders.

Projections of future population and employment were developed using the Delphi method. The Delphi method is a consensus-building process that asks a group of experts to reply to several rounds of questionnaires until the range of responses is reduced and a consensus among the experts is established. The Delphi Process for the development of the 2040 LRTP involved over fifty regional stakeholders who developed estimates and projections of total population and employment for each parish for the years 2020, 2030, and 2040, and subsequently allocated those totals to subareas within the region.

Roadway Needs Assessment

The resulting population and employment projections were applied to the existing roadway network in the travel demand model to analyze the performance of the transportation system if no improvements are made over the planning horizon. This is often referred to as the "no-build" scenario. The travel demand model provides data on select performance measures, including average delay, volume-to-capacity ratios, and vehicle miles/hours traveled, which can then be compared to the resulting outputs when various transportation improvements are coded into the network to determine their impact on regional mobility.



Non-Roadway Needs Assessment

A transit deficiencies analysis was conducted to evaluate the system coverage in terms of the percent of the regional population that is within walking distance of a transit route. Transit access to key destination was also assessed and target transit rider subareas were identified using data on the location of minority, non-driving, elderly, and disabled populations, as well as households reporting no access to a personal vehicle. The transit deficiencies analysis also includes information on the perceived service quality and availability of transit based on responses to an online survey and an assessment of coordination between human service providers and the providers of transportation.

Bicycle and pedestrian facilities were assessed using evaluation criteria adopted from the Bicycle Environmental Quality Index (BEQI) and the Pedestrian Environmental Quality Index (PEQI) – a planning tool developed by the San Francisco Department of Public Health, in which scores are assigned to locations on the street network based on environmental variables that either enhance or detract from favorable bicycle or pedestrian conditions. The BEQI and PEQI use a combination of qualitative and quantitative indicators related to street and intersection design, safety, and adjacent land uses to assign an overall BEQI and PEQI score to chosen locations. The locations are then categorized by their relative suitability for bicycling or walking as either Excellent, Above Average, Average, Below Average, or Poor. Additionally, survey data from an online questionnaire regarding bicycle and pedestrian facilities in the region was used to supplement the analysis.

Safety and Security of the Transportation System

Safety is the protection from injury or loss by circumstance, accident, or negligence. Security, on the other hand, is the protection from injury or loss caused by deliberate action. Increasing the safety of the transportation system, therefore, would focus on reducing the number and the severity of traffic accidents, while increasing security would focus on reducing crime at transit stops and the resiliency of the transportation system in the case of an extreme weather event or terrorist attack. Needs related to the safety and security of the transportation system in Bossier and Caddo Parishes were evaluated both quantitatively and qualitatively, through an analysis of crash data, discussions with the public and key stakeholders, and a review of the planning documents developed by local, regional, and state agencies responsible for safety and security.

Freight and Intermodal Terminals

Federal planning regulations require consideration of how transportation impacts the economy, including how easily freight can move through the region, as well as within the region. The analysis of freight in Bossier and Caddo Parishes involved inventorying all major freight generators and activity centers in the region, conducting targeted outreach to freight stakeholders, identifying regional roadways with high levels of truck volumes and congestion, and analyzing regional crash data to determine crash hot spots for freight.

Transportation Systems Management and Operations

Building new roads and adding capacity to existing roadways not only comes with a high price tag, but it also often takes years for a project to go through the planning, design, and construction phases of project development. Given the limited availability of funding for transportation projects and rising congestion levels, state, regional, and local agencies are increasingly relying on transportation system management and operation (TSM&O) strategies to increase the capacity and improve the performance of existing roadways. These strategies do not require the construction of new roadways or additional lanes of capacity, and therefore, are often referred to as "no-build" strategies. Needs related to the management and operation of the transportation system in Bossier and Caddo Parishes were evaluated qualitatively through a review of local, regional, and state plans, and targeted outreach to agencies involved in TSM&O activities.

Identification of Regional Transportation Strategies

The next step in the long range transportation planning process is to identify and prioritize strategies to address the needs identified in the previous phase of plan development in accordance with the vision and goals of the community. The identification of regional transportation strategies includes both “build” and “no-build” strategies, and addresses the needs of all modes, including motorized vehicles, freight trucks, public transit, bicycles, and pedestrians.

Building new facilities will not address all the identified transportation needs. Not only is building new roadways expensive and funding is limited, but some needs are best addressed by strategies that reduce demand and improve the operational efficiency of the existing

transportation system. Therefore, the LRTP planning process included consideration of the preservation of the existing system through preventative and rehabilitative maintenance, the inclusion of access management strategies, and the incorporation of Travel Demand Management (TDM) and TSM&O strategies.

Once the no-build strategies were considered, potential projects to expand or build new facilities were examined. A list of candidate projects for further evaluation was developed through the combined consideration of the results of the technical analyses, other regional plans and studies, consultation with local traffic engineers, planners, and other stakeholders, and a request for transportation projects sent to all jurisdictions in the planning area. Using a set of evaluation criteria ranked by the public during the visioning workshops, as well as the results of the travel demand model, proposed projects were scored and ranked by members of the TCC according to their impact on achieving regional goals and the public's vision for the future of the transportation system.

Alternative Land Use Strategies

In addition to examining the operational efficiency of the region's roadways in terms of vehicle movement, the process of identifying regional transportation strategies included a scenario-based alternatives analysis that looked at how different growth patterns impact the performance of the transportation system and the need for transportation improvements. The purpose of the scenario-based alternatives analysis is to provide policy makers, stakeholders, and the public with an understanding of the negative operational and fiscal impacts that occur when land use and transportation decision making are not well coordinated. The thoughtful integration of land use and transportation planning can help conserve limited financial resources and reduce the need for transportation infrastructure investment.

Systems-Level Analysis of Proposed Projects

The systems-level analysis examines how the program of candidate projects impact community issues that are of system- and region-wide concern, including environmental, cultural, and historical resources. It includes an environmental mitigation analysis, as required under federal planning regulations, to identify any potentially negative impacts on the environment and/or historical and cultural resources. It is a high-level, conceptual analysis conducted with the intent to avoid any obvious environmental constraints that would prevent projects from being implemented.[1] The analysis also assessed potential impacts associated with the program of proposed projects that might have a disparate impact or unintended consequences for low-income and minority populations (environmental justice).

Source: Shreveport-Bossier City CVB (via Flickr)

[1] Once projects reach the implementation stage, a more detailed environmental evaluation will be done as a part of the pre-construction process.

Financial Analysis and Fiscal Constraint

Fiscal constraint is a significant priority in determining the final list of improvements that will be included in the LRTP. Not only does MAP-21 mandate that the LRTP be fiscally constrained and only include projects that can reasonably be expected to have adequate funding, but certain projects also require that local communities provide matching local funds in order to receive federal funds. The process for establishing both estimated costs and expected revenues is critical to the development of an implementable LRTP.

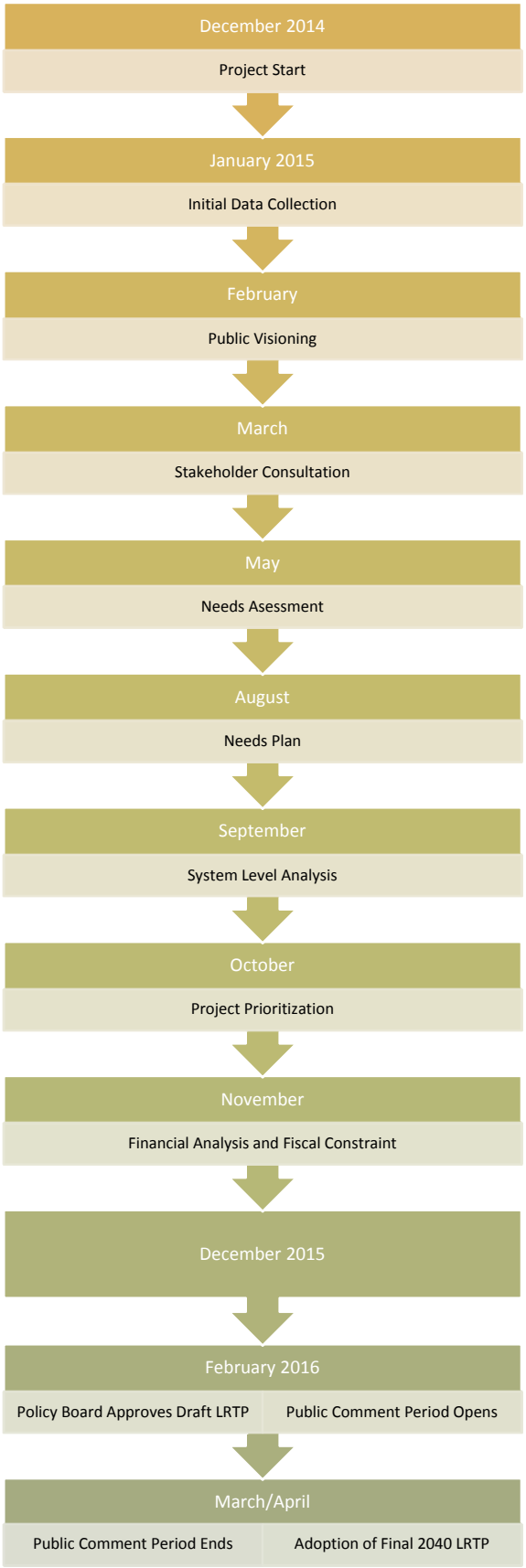
Before fiscal analyses can be conducted, several factors, or "givens," to be used in the financial calculations have to be determined. For example, the inflation factor for the calculation of future year costs must be determined, as well as the average cost of right-of-way acquisition in the state. For consistency purposes, these factors are often determined by the state and used in all LRTPs. However, the state may also choose to provide different factors for each region in Louisiana. LADOTD provided information that helped develop the factors that were included in the financial analysis of this plan.

Using these established factors, a cost was calculated for each project. Cost is defined as the total project cost, which includes planning elements (e.g. environmental studies and functional studies), engineering costs (e.g. preliminary engineering and design), preconstruction activities (e.g. line and grade studies, right-of-way acquisition and corridor preservation), construction activities, and contingencies. These costs also include an inflation factor so that costs can be determined based on year-of-expenditure dollars. A revenue projection was also developed that identified the anticipated revenue stream for local, state, and federal funds. The inflation factor was also applied to the revenues to account for the year funding is expected.

A fiscal constraint analysis was performed that compared the anticipated year-of-expenditure costs to the anticipated year-of-receipt revenues to determine if sufficient and timely financial resources were likely to exist to fund the proposed program of projects. Based on the cost and revenue projections, the package of fiscally constrained projects anticipated to best accomplish community-defined goals and objectives, was selected by the study team and then submitted to the Policy Committee for approval.

Adoption Process

The results of the public involvement process and the technical analyses, as well as recommended strategies and a fiscally-constrained list of prioritized transportation improvements were included in the draft 2040 LRTP for review by the public and adoption by the MPO Policy Committee. On February 29, 2016, the draft plan was presented to the public and their feedback was solicited throughout the 30-day public review period. Input was considered by the Policy Committee, and as needed, appropriate modifications to the plan were made as noted in the Technical Supplement. The final LRTP was presented to the Policy Committee for adoption on April 15, 2016. The approved LRTP has an effective date of April 15, 2016 and was shared with LADOTD, the Federal Highway Administration, and the Federal Transit Administration.



2 | EXISTING PLANS & STUDIES

The regional visioning process is the first step in the LRTP development process. It is a collaborative effort between the MPO, its planning partners in the region, and the public to develop a strategic direction for the LRTP, and to guide the community in achieving its vision for the future of the transportation system. The regional visioning process for the development of the 2040 LRTP involved 1) examining other planning efforts in the region; 2) identifying regional issues and needs; and 3) establishing goals and objectives. Each of these activities was conducted in coordination with the public and key stakeholders, and is intended to deepen the MPO's understanding of various users' experiences with the transportation system. This chapter discusses the first step in the regional visioning process, while Chapter 3 discusses the public participation and stakeholder engagement components.

Existing Plans and Studies

In order to create a baseline from which to start the planning process, the study team gathered existing data, plans, and reports about land use patterns, economic development goals, environmental issues, the transportation system, and safety and security.

Land Use Planning

Land use influences demand for transportation, and the transportation system, in turn, influences how and whether land is developed; therefore, it is important to consider land use plans when planning for the future transportation needs of the community. Transportation infrastructure is not only necessary for growth in new areas, but also for the continuation of growth in established areas. When the transportation system is inadequate, growth can be negatively impacted. Land use plans in the area were reviewed to develop an accurate understanding of the plans guiding future land development in the region.

Three major land use planning efforts were reviewed in the development of this MTP:

- Bossier City Comprehensive Plan;
- Shreveport-Caddo 2030 Master Plan; and
- Barksdale Joint Land Use Study.

Bossier City Comprehensive Plan

The Bossier City Comprehensive Plan, developed in 2004 and updated in 2013, is based on an all-inclusive planning process with community involvement as its cornerstone. The plan lays out a comprehensive vision for the future of the city that includes future land uses, parks and open space, transportation, utilities and infrastructure, housing, and urban design. Recommendations in the comprehensive plan are designed to help the city succeed in striving to be a "dynamic and attractive community that aggressively seeks to improve area quality of life through wise use of resources; appreciates town and rural character and values; provides an abundance of parks, facilities, services, and infrastructure; promotes healthy neighborhoods and districts; and establishes the area as a desirable home for present and future generations of residents and businesses."[1]

The land use component of the comprehensive plan includes an analysis of existing and future land use issues for Bossier City, and an update to the existing land use map to account for current development and future growth. In addition to the recommended land uses, the plan also includes recommendations for linking land use types with appropriate transportation infrastructure. The residents of Bossier City envision a future transportation network that is "a strong multimodal network that is attractive to business, residents, and visitors while also

[1] Bossier City Comprehensive Plan, Ch. 3, Pg. 7.

providing adequate and safe access to neighborhoods and other area amenities."[2] I-20, 220, Benton Road, Arthur Teague Parkway, Airline Drive, and the future I-69 are identified as important transportation amenities, as well as the Port of Caddo-Bossier, Barksdale Air Force Base, and Shreveport Regional Airport. However, the comprehensive plan also identifies several challenges related to land use and transportation in Bossier City, including:

- High number of at-grade railroad crossings;
- Limited pedestrian facilities, including sidewalks;
- Visually unappealing signage;
- Appearance of overhead utilities;
- Limited public transit;
- Only two north/south thoroughfares and no relief route for east/west thoroughfares;
- Lack of ingress/egress for neighborhoods;
- Traffic near Jimmy Davis bridge;
- Lack of river crossings in South Bossier; and
- Traffic congestion along portions of Airline Drive.

The development of the 2040 LRTP considered the future land use patterns recommended in the comprehensive plan for Bossier City, particularly in the development of future land use and demographic inputs to the travel demand model which is discussed in further detail in Chapter 4 – Identification of Regional Transportation Needs. The overall goals for the transportation system and the identified challenges were combined with feedback obtained from the public in the development of the 2040 LRTP to identify appropriate transportation improvements that will address existing needs and assist the city in achieving its vision of a multimodal network supportive of businesses, residents, and visitors.

Shreveport-Caddo 2030 Master Plan

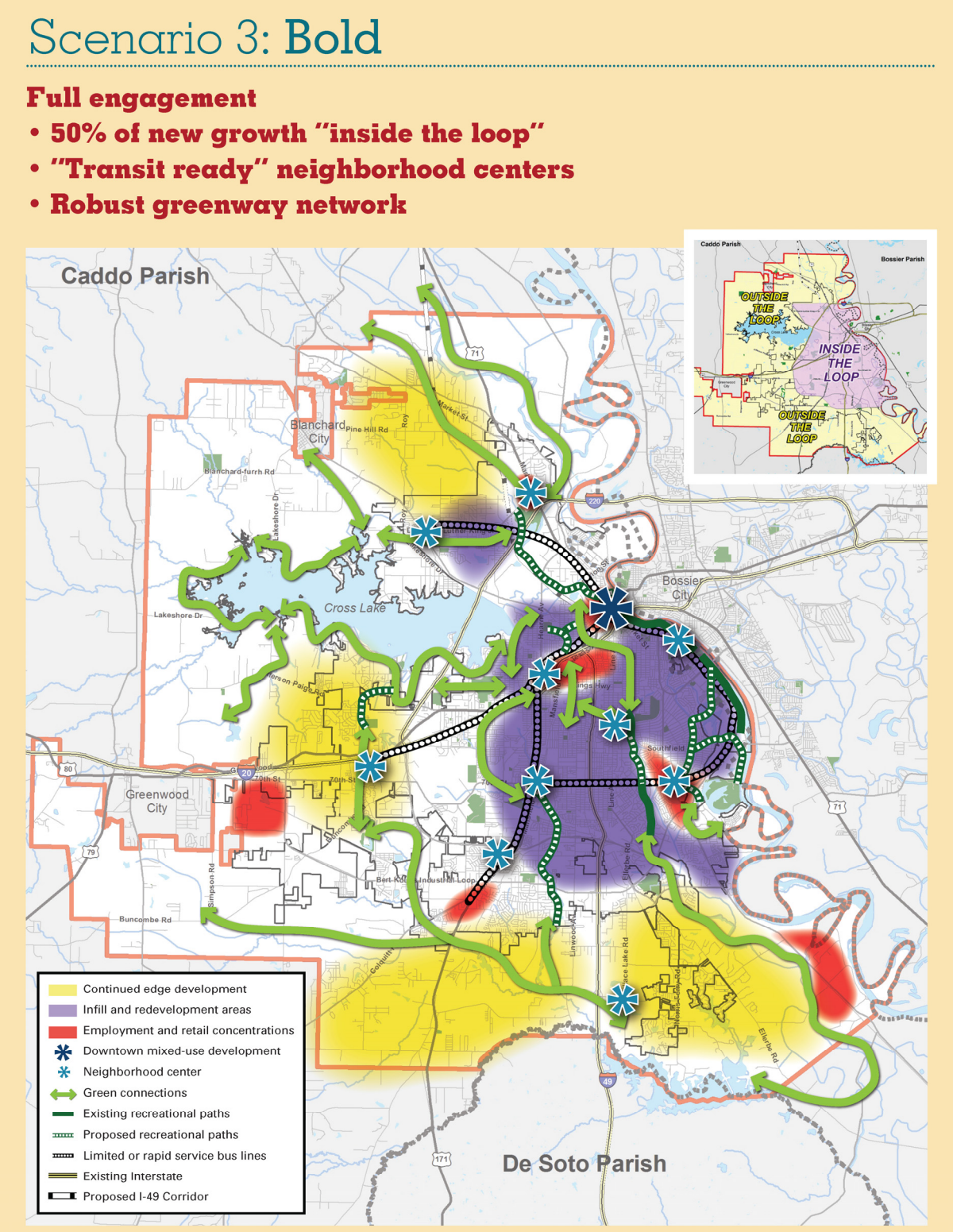
Greater Shreveport's vision for the 21st century foresees greater Shreveport as "the dynamic, creative, and flourishing powerhouse of the ArkLaTex region [that] combines the economic opportunity, diversity, and cultural excitement of a growing city with the friendliness of a small town." [3] Adopted in 2010, the Shreveport-Caddo 2030 Master Plan encourages future growth in the core areas of the city in an effort to stem sprawl. The plan includes three growth scenarios – cautious, focused, and bold – each of which prescribes specific policies for achieving a more compact, mixed-use development pattern.

All scenarios promote infill development and include a trail access and green corridor component. Under the cautious scenario, most new development continues to occur outside of the loop. The focused scenario has a greater emphasis on growth within the loop and identifies additional compact centers outside of the loop. Finally, the bold scenario places half of new growth inside the loop and proposes the development of neighborhood centers dense enough to support transit. Each scenario is also accompanied by proposed transportation improvements, ranging from improved maintenance and repair, to complete streets, to addition of bus rapid transit (BRT) in focus areas. Through the plan's public engagement process, the bold scenario was selected as the preferred scenario. Figure 2-1 shows the physical definition of the bold scenario.

[2] Ch. 3 p. 8

[3] Great Expectations: Shreveport-Caddo 2030 Master Plan, Executive Summary

Figure 2-1: Shreveport-Caddo 2030 Master Plan Preferred Scenario



Source: Shreveport-Caddo 2030 Master Plan

Transportation and mobility challenges identified included implementing a complete streets policy, identifying a funding source for SporTran, improving alternative modes given existing sprawl, maintenance of the growing transportation network, and fulfilling federal requirements for ozone non-attainment areas. In light of these challenges, the 2030 Master Plan sets out five transportation goals:

- Roads and streets that are maintained to a high standard for long-term use, and that encourage sustainable development patterns;
- Improved design and function of arterial roads and neighborhood streets;
- A safe and attractive pedestrian and bicycling network integrated with vehicle transportation;
- A convenient, fast, and efficient public transit system; and
- Improved intercity transportation.

Barksdale Air Force Base Joint Land Use Study

The Barksdale Air Force Base Joint Land Use Study (JLUS) was created in 2009 to evaluate the impacts of growth within and around the Barksdale Air Force base to "encourage cooperative land use planning between military installations and the surrounding communities, and to seek ways to reduce the operational impacts of military installations on adjacent land."[4] The plan points to water/wastewater and transportation improvements necessary to support compatible developments in and around the base. The report anticipates that future land use will be significantly impacted by the construction of I-69, a proposed interstate from Michigan to Texas. The project will likely promote growth east and south of the base, enhance freight access to the base, and increase the need for joint planning efforts to ensure that new development is compatible with noise and other externalities produced by the base. In general, the land use study recommends manufacturing, transportation and distribution, and limited types of residential development in surrounding areas.

Source: Wikimedia Commons

Economic Development

The economic vitality of a region depends on the transportation system's ability to move people and goods in a way that is safe, secure, and efficient. When a transportation system works effectively, it has a direct positive impact on economic growth by connecting the community to larger markets and more effectively moving goods to the market. The ability of a system to provide these connections depends not only on construction, maintenance, and repair, but also on the transportation systems management and operations (TSM&O) strategies employed to optimize the system.

Major Employers[5]

Bossier City, Shreveport, and the surrounding areas have a versatile economy comprised of service, retail, industrial, and defense activities. The transportation needs of each of these sectors differ, and a complete system is needed to support economic development in each. The Barksdale Air Force Base employs over ten

[4] Barksdale Air Force Base Joint Land Use Study, January 2009.

[5] http://www.chooseshreveport.com/work/employers

thousand people in the region and is home to the 2nd Bomb Wing of the United States Air Force. Health care and biotechnology are also strong industries in the region, with Willis-Knighton and Dr. Reddy's Laboratories providing health care services and pharmaceutical research, respectively. Additionally, the manufacture of steel tubes by Benteler Steel/Tube, of glass containers by Verallia North America, of wood products by Roy O. Martin Lumber Company, and of paper products by International Paper comprise a strong manufacturing sector in the region. Louisiana Economic Development also boasts telecommunications, digital media, and film & animation as additional sectors of the diversified economy of the region. High tech industries will continue to be a source of economic growth as the Cyber Innovation Center, located near Barksdale, expands and attracts more firms to the region.

Economic Development Entities and Plans

Many entities support economic development in the MPO planning area. Louisiana Economic Development maintains a regional website promoting what it's like to live, work and play in the area called "Choose Shreveport-Bossier." The North Louisiana Economic Partnership is comprised of 14 parishes to strengthen the regional economy. The Greater Bossier Economic Development Foundation advertises available sites, incentives to do business in Bossier Parish, available transportation amenities, and a skilled labor force. The transportation amenities advertised include:

- Shreveport Regional Airport;
- Shreveport Downtown Airport;
- Three interstate highways;
- Motor freight service for two-day and overnight deliveries;
- Public transportation, SporTran;
- Railroad access; and
- Port of Caddo-Bossier.

Shreveport-Caddo 2030 Master Plan

The Shreveport-Caddo 2030 Master Plan identified several challenges in economic development in the region, including improving outcomes for K-12 and continuing education, removing barriers for low income residents such as lack of child care, maintaining and improving higher education, retaining highly skilled young adults, and reducing disparities in economic opportunity between white and African-American residents. As in the transportation and mobility section of the plan, five goals were identified to enhance economic development in Shreveport:

- Expand and diversify the economy through export industries;
- Develop a highly-skilled workforce through expanded education and support;
- Create a stronger entrepreneurial environment;
- Make Shreveport a community of choice for highly-skilled entrepreneurs and professionals; and
- Improve the business environment by lowering costs, increasing available facilities, and enhancing the regulatory environment.

Transportation plays a critical role in reaching these goals by providing access to freight and ports for export industries, to education for individuals, and to a connected place that encourages entrepreneurial exchange of ideas.

Shreveport Common Cultural District Vision Plan

The 2011 vision plan for the Shreveport Common outlines a vision and process for revitalizing a blighted neighborhood into a vibrant cultural district. Figure 2-2 shows an overview image of the recommendations. Parking is one key transportation component of the plan, with recommendations to move lots away from the center of the district, and promote pedestrian and public transportation access to and within the district. The plan also advocates for signage and traffic-calming

measures to alert drivers of the pedestrian-friendly area, as its proximity to I-20 can result in more aggressive driving. Sidewalks, crosswalks, and bikeways are all recommended within the district. Each of these transportation recommendations would improve the safety and character of the district, making it a destination for residents and visitors alike.

Figure 2-2: Shreveport Common

Source: Shreveport Common Cultural District Vision Plan

Shreveport Community Planning Assistant Team Report

In 2014, Shreveport's downtown area was the focus of an American Planning Association (APA) Community Planning Assistant Team (CPAT). The goal of the CPAT program is to assemble a multidisciplinary team of planning professionals from across the country, local stakeholders, and community leaders to develop a pro bono framework or vision plan for a particular community concern. A central theme of the economic development recommendations included in their report is that transportation systems can have an invigorating effect on downtowns. Reducing motorized travel speeds and improving pedestrian and bicycle infrastructure can increase the visibility of local businesses. When more modes are able to access and traverse a downtown, more jobs, goods, and services can be concentrated in a vibrant place.

Environment

Transportation projects often have substantial impacts on the natural environment. In order to understand how the transportation planning process should accommodate environmental resources, it was important to review plans that addressed the community's needs and values related to the environment to ensure that the LRTP was compatible with that vision.

Caddo Parish/City of Shreveport Parks and Recreation Master Plan (2006-2020)

SJB Group, LLC, conducted a study in 2006 to gather information from the Caddo Parish community to address future development needs of their parks and recreation facilities. The study outlined current funding, inventoried existing facilities and schools, met with staff, and assessed the level of service of facilities. The planning process involved outreach sessions with public officials and citizens and deployed an online survey to develop a list of options to consider for facility and program development in the future.

The plan resulted in a Capital Improvement Plan for Parks and Recreation and a list of strategies to implement the plan. The plan recommends development of several existing parks, new park facilities, and trail systems. Coordination with the parks service during transportation project development will ensure accommodations are made for facilities adjacent to projects.

Source: Shreveport-Bossier City CVB (via Flickr)

Transportation System

Transportation plans and policies for a variety of modes were examined to develop a picture of the overall transportation system. In addition to roadways, this analysis includes bicycle and pedestrian facilities, transit service, and TSM&O strategies.

Bicycle and Pedestrian

Non-motorized travel is an important part of the overall transportation system, particularly in urban areas seeking to reduce the negative effects of dependence on personal automobiles such as congestion, pollution, and land consumption for parking and roadways. The MPO planning area currently has state and local plans for bicycle and pedestrian infrastructure, including:

- Louisiana Statewide Bicycle and Pedestrian Master Plan;
- Complete Streets Work Group Report;
- "Linking the Hub," Shreveport Common Bicycle and Pedestrian Plan; and
- Shreveport-Caddo Bicycle and Pedestrian Plan.

Louisiana Statewide Bicycle and Pedestrian Master Plan

The 2009 Louisiana Statewide Bicycle and Pedestrian Master Plan envisions a system that enables people to walk and bike safely to access schools, jobs, social services, shopping, and transit. The primary purpose of this plan is to guide planning efforts in the state by providing information on current statistics, funding sources, and planning practices. The plan also includes five primary tenets for the state's non-motorized system: social equity, personal safety, economic development, public health, and environmental stewardship.

The statewide plan recognizes the role of MPOs in achieving goals put forth by state and federal programs, as they prioritize funding. The plan encourages tying bicycle and

pedestrian projects to other goals, such as air quality, congestion relief, and safety measures. Minimum requirements for MPOs when planning bicycle and pedestrian activities are also listed in the plan:

- Consider all modes of transportation;
- Provide for the development and implementation of an intermodal system;
- Include representatives of users of pedestrian walkways and bicycle transportation facilities in the list of interested parties; and
- Give due consideration to bicyclists and pedestrians in the comprehensive transportation plans developed by each MPO and state.

The Louisiana Statewide plan also includes policies for any LADOTD project with state or federal funding, with conditions for exceptions. These principles can also inform regional and local planning, and include:

- Plan and design roadways that accommodate walking and bicycling at all appropriate design phases;
- Consider impacts to bicycle and pedestrian safety in all roadway improvements;
- Plan, fund, and design sidewalks on all new construction or reconstruction projects that serve potential destinations; and
- Provide bikeways and bicycle accommodations on all projects where feasible, typically not separated from the roadway.

Complete Streets Work Group Report

The Complete Streets Work Group Report was prepared in 2010 for the LADOTD to define complete streets, discuss their benefits, and to provide no cost and low cost options for improving streets. The practices described in the report support mobility and accessibility for all road users, including motorists, bicyclists, pedestrians, and transit users. The report provides statistics for the many benefits of complete streets policies, including:

- Improved safety;
- Increased mobility for children, aging citizens, and disabled citizens;
- More active living;
- Reduced emissions;
- Boosted economic development; and
- Lower household transportation costs.

The work group recommended specific low cost actions to improve existing streets, such as bicycle-friendly grates (or grate orientation), retiming traffic signals to increase pedestrian crossing time, providing pedestrian signals with countdowns, and restriping existing rights-of-way to convert traffic lanes to bicycle or transit-only lanes. This resource can serve as a tool for communities seeking to learn about or advocate for complete streets policies in their communities.

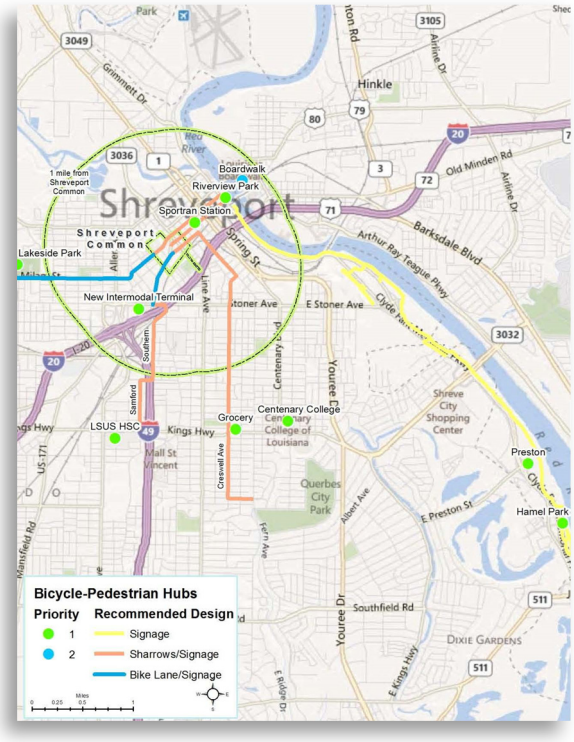
The report culminated in a recommended complete streets policy statement, which was signed by the LADOTD Secretary in 2010. The policy states that impacts on pedestrians and cyclists must be considered on all projects, and projects should not create barriers to non-motorized travel. LADOTD will plan, fund, and design pedestrian facilities for new and reconstructed roadways near existing or future transit service. Bicycle lanes, or in some cases a wide shoulder, will be provided in urban and suburban areas where appropriate. The full policy statement can be found on LADOTD's website.

Shreveport-Caddo Bicycle and Pedestrian Master Plan

The Shreveport-Caddo Bicycle and Pedestrian Master Plan is currently being developed, and its aim is to improve bicycle and pedestrian infrastructure throughout Caddo Parish. The goals of the plan are to improve quality of life, health, and resource consumption in the parish through transportation options that are safe, equitable, and connected.

"Linking the Hub"

Linking the Hub is a sub-area plan created for the Shreveport Common Management Team in 2012 to connect the community to the Shreveport Common district. The plan includes an inventory of bicycle facilities that may be used to enhance the network. A map of the area around the Shreveport Commons demonstrates the type of improvements recommended for various corridors leading to the district, as well as specifications for selected segments. The tools described in this plan may be a useful reference for communities within the MPO planning area seeking to develop sub-area plans.



Source: Linking the Hub

Public Transportation Plans

Public transportation in the MPO planning area is provided by the Shreveport Area Transit System (SporTran), as well as additional demand response services offered by a variety of organizations for rural, elderly, and disabled populations in Bossier and Caddo Parishes. Presently, SporTran and NLCOG have transit-related plans that are relevant to the development of the 2040 LRTP. The following section describes existing plans in the region related to public transportation and any ongoing planning efforts that have implications for the long range transportation planning process.

SporTran

At the time the 2040 LRTP was drafted, SporTran had begun the process of developing a transit development plan to improve the efficiency of the current bus network. The goal of the development plan is to find ways to expand service availability (both in temporal and spatial coverage) without significantly increasing costs.

SporTran is also in the process of implementing real-time bus tracking technology that will provide riders with information regarding the actual arrival and departure times of buses, and is actively pursuing the following other activities to improve the public transit system:

- New fare payment technology (e.g. smartcards, mobile ticketing);
- Wi-Fi on buses;
- Feasible routes for express bus technology; and
- Limited transit signal prioritization.

Recently, SporTran created a dedicated safety department to administer safety and security policies across the agency. The new department has implemented a variety of strategies to improve safety and security on SporTran buses and at stops, including:

- Beginning a "bus operator academy" to re-train drivers on safety procedures;
- Installing cameras on all buses and paratransit vehicles;
- Ensuring maintenance is up-to-date on all equipment; and
- Improving coordination with the Transportation Security Administration (TSA).

Coordinated Human Services – Transportation Plan (CHSTP)

With the passage of SAFETEA-LU in 2005, service providers that receive federal transit funding through Section 5310 (for individuals with disabilities and the elderly), Job Access and Reverse Commute (JARC), or New Freedom (no longer separate funding categories under MAP-21) grants must derive their projects or programs from a "locally developed, coordinated human services transportation plan developed through a process that includes representatives of public, private, and non-profit transportation and human services providers and participation by members of the public." [6] The coordinated human services transportation plan (CHSTP) identifies the needs of area residents with disabilities, older adults, and people with low incomes, and prioritizes strategies for meeting those needs.

The CHSTP for Bossier and Caddo Parishes was completed by NLCOG in 2007, and covers a ten-county region which also includes Bienville, Claiborne, De Soto, Lincoln, Natchitoches, Red River, Sabine and Webster Parishes. Due to the demands on regional service providers presented by Hurricanes Katrina and Rita, the process resulted in an abbreviated plan, as resources were limited to complete a more extensive CHSTP. However, the plan presents broad, parish-level data on concentrations of populations to be served by human services/transportation providers, identifies the goals of the plan, outlines criteria for evaluating future coordination options, recommends specific coordination options, and presents an action plan for creating effective human services transportation coordination processes.

The plan also identifies several challenges to regional coordination amongst service providers, including 1) a lack of incentives for agencies to meet unmet transportation needs given their limited budgets; 2) the perception that it will be difficult to obtain large enough ridership numbers to realize additional benefits in rural areas; and 3) the inability to control when and where stakeholder transportation assets are used.

Transportation Systems Management and Operations

Transportation System Management and Operations (TSM&O) strategies seek to improve the performance of existing roadways through increased efficiency and throughput of vehicles on roadways. TSM&O strategies not only rely on traffic engineering solutions (such as signal synchronization and access management) to optimize the existing system, but also rely on resource utilization, infrastructure, personnel, and data management strategies to extend the useful life of the existing transportation system and improve its reliability. There are several plans in the MPO planning area that include TSM&O strategies, including the Shreveport Regional Intelligent Transportation Systems (ITS) Architecture and the Congestion Management Process (CMP) developed and maintained by NLCOG.

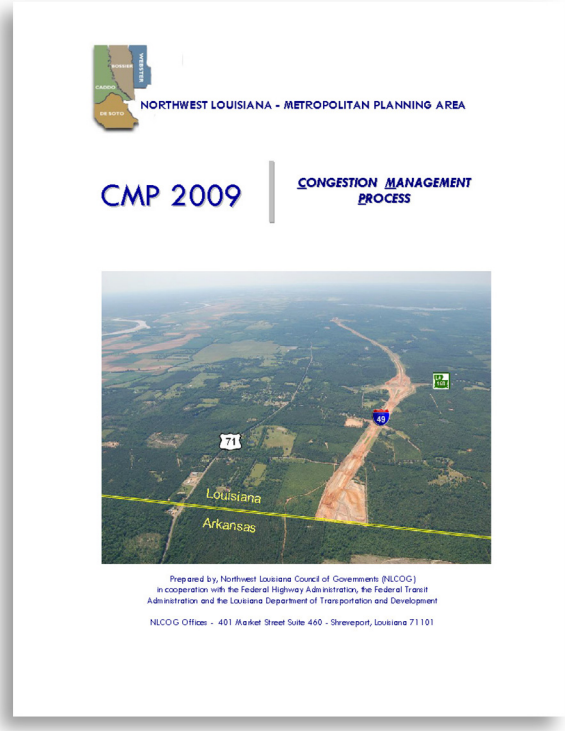
[6] Federal Transit Administration, http://www.fta.dot.gov/13093_8196.html

Shreveport Regional ITS Architecture

The Federal Highway Administration (FHWA) requires that any region planning to use federal funds to implement Intelligent Transportation System (ITS) projects develop a Regional ITS Architecture that conforms to USDOT standards. The ITS Architecture uses a standard vocabulary and set of concepts to describe regional ITS deployment in an effort to ensure "institutional agreement and technical integration for…ITS projects or groups of projects." The Shreveport Regional ITS Architecture was completed in 2012 and contains the following elements in compliance with 23 CFR 940 Part 11:

- Description of the region;
- Identification of the participating agencies and other stakeholders;
- Roles and responsibilities of the participating agencies and other stakeholders;
- Agreements needed for operation;
- System functional requirements;
- Interface requirements and information exchanges with planned and existing systems;
- Identification of applicable ITS standards; and
- Sequence of projects necessary for implementation traceable to a portion of the regional architecture.

The Architecture documents existing and planned ITS technology in the Shreveport-Bossier City region. Some notable ITS elements that have been implemented in the region to-date include: real time transit vehicle location; network surveillance (cameras, traffic detectors); traffic information dissemination (dynamic message signs, highway advisory radio); and a traffic incident management system that uses regional coordination to detect and respond to both planned and unplanned traffic incidents. The Shreveport-Bossier City area also has a traffic management center (TMC) that is staffed from 6:45am to 6:30pm to monitor traffic conditions on area highways and operate elements of the ITS network. When the regional TMC is unmanned, the State TMC in Baton Rouge monitors traffic conditions and ITS architecture in the Shreveport-Bossier City area.



Congestion Management Process (CMP) – 2009

As the MPO for a Transportation Management Area (TMA), or an urbanized area with population greater than 200,000 as determined by the Census, NLCOG is required to maintain a congestion management process (CMP) that informs transportation planning and decision-making. The CMP provides transportation planning partners with an empirically-derived methodology and rational framework for identifying congestion in a region, corridor, activity center, or project area, and developing appropriate strategies to address congestion. While the CMP can recommend projects that increase roadway capacity for Single Occupancy Vehicles (SOVs), it can also suggest TSM&O strategies for congestion reduction.

Some of the TSM&O strategies to emerge from the most recent CMP for the MPO planning area include:

- Working with large employers to create programs for staggered or flexible work hours;
- Working with employers to incentivize carpool/vanpool and commute mode shift;
- Encouraging non-motorized trips;
- Improving the pedestrian and bike network to further encourage non-motorized trips;
- Extending hours of service for SporTran on nights and weekends;
- Considering traffic operation improvements such as intersection widening or reconfiguration, signal coordination, and ITS;
- Collecting incident management information from local and state authorities on crash hotspots and problem intersections;
- Collecting incident management information on incident detection and clearing and response times;
- Creating an alternative route plan for emergency situations, hazard mitigation, and other incidents;
- Using access management strategies to analyze median, signal, and driveway spacing that limit access on major arterials;
- Using frontage road and inter-parcel connections to create access from major roadways; and
- Creating a signal coordination system.

Safety

MAP-21 continues the Highway Safety Improvement Program as a core federal aid program which mandates that every state is required to develop a Strategic Highway Safety Plan (SHSP) that outlines targeted safety performance measures and is regularly evaluated and updated. The SHSP identifies a state's key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries. The SHSP provides a framework for reducing fatalities and serious injuries on public roadways by establishing statewide goals, objectives, and emphasis areas (EAs) that incorporate a data-driven, 4E approach to highway safety: engineering, education, enforcement, and emergency services (EMS).

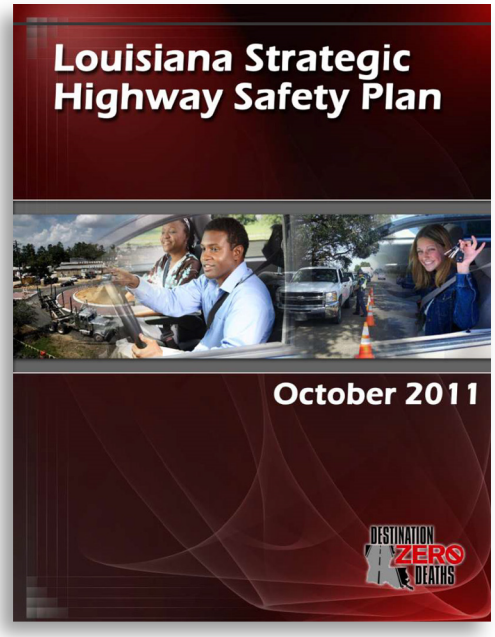
Strategic Highway Safety Plan (SHSP)

The Louisiana SHSP was first developed in 2006 and was most recently updated in 2011. The vision of the Louisiana SHSP is "to reach destination zero deaths on Louisiana roadways." In 2009, LADOTD adopted the AASHTO goal to halve fatalities by 2030, using the baseline average of 2006-2008 data. Based on analysis of 2006-2008 crash data, the statewide EA teams focus on strategies to reduce fatalities related to impaired driving, occupant protection, infrastructure and operations, and young drivers. Each EA was developed based on statewide crash data and includes an action plan identifying strategies, action steps, leaders, and metrics to follow the status and implementation of each step.

Most relevant to the development of the 2040 LRTP are the state's recommended strategies for reducing fatalities related to infrastructure and operations. Examples of infrastructure and operations strategies which were considered in the development of the 2040 LRTP are listed on the following page.

SHSP Infrastructure Strategies

- Conducting a systemic deployment of low-cost countermeasures on state highways including enhanced signing and pavement markings, centerline, edge line and shoulder rumble strips/stripes, curve delineation, high-friction surface treatments, guardrail upgrades, vegetation removal, and utility pole treatments;
- Incorporating cost-effective countermeasures (i.e., centerline, edge line, and shoulder rumble strips/stripes, signing, curve delineation, guardrail, etc.) at crash locations for programmed projects;
- Implementing traditional roadway departure countermeasures such as cable median barriers at appropriate locations;
- Implementing pavement friction improvements at identified locations;
- Making signal, signing, and pavement marking improvements on state and local signalized and stop control intersections;
- Installing detection control systems, pedestrian enhancements, and lighting at appropriate signalized intersections;
- Implementing pavement friction improvements at higher speed intersections with wet pavement crashes; and
- Conducting a corridor 3E (engineering, enforcement, and education) improvement program on 11 state route corridors that have experienced seven or more fatal intersection crashes over the past five years along with a significant number of severe injury intersection crashes.



Regional Plan

The State is lowering fatalities and serious injuries in part by using a regional approach to develop and continually implement the federally required SHSP. Nine regions are charged with forming 4E safety coalitions, reviewing the regional and local crash data, and developing continually evolving, data driven action plans linked to the SHSP. Linking regional efforts to the statewide plan strengthens its efforts and provides access to state and national experts.

While not required, Federal legislation indicates that SHSP development include participation of local agencies. Regional safety coalitions complement the SHSP by addressing safety issues specific to a multi-parish region of the state. Crash data and safety issues differ from one area to the next and these groups focus on why crashes happen and what can be done to reduce fatalities. LADOTD offers resources and guidance to help regions develop and implement their regional plans. Once a region's EA plans are approved through LADOTD, the coalition may pursue funding through the SHSP to implement countermeasures and increase safety on public roadways.

Security

MAP-21 requires that the transportation planning process address the security of the transportation system. Security is defined as "freedom from intentional harm." This typically refers to harm inflicted by people, such as terrorist acts and other criminal activities, as well as harm stemming from natural disasters, such as hurricanes, earthquakes, and other weather events. Security planning is carried out by agencies at multiple levels of government and involves all four phases of emergency management: Preparedness, Response, Recovery, and Mitigation.

In support of state, regional, and local security goals and objectives, the primary role of the MPO is to facilitate coordination between agencies responsible for transportation security. This may include law enforcement, emergency response, transit agencies, and homeland security departments as well as others.

Source: U.S. Army Corps of Engineers (via Flickr)

State of Louisiana Emergency Operations Plan

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) coordinates state disaster declarations authorized by the Governor and has the responsibility of creating and updating emergency plans. The State of Louisiana Emergency Operations Plan applies to a wide range of emergencies, including natural, technological, terrorist, and attack-related emergencies. The basic plan describes the elements that guide emergency management efforts, including:

- Services provided by governmental agencies;
- Methods for carrying out emergency operations;
- Public information systems; and
- Continuity planning and uninterrupted government operations.

This information is supported by subject-specific Emergency Support Function (ESF) Annexes, including a section on transportation. The annex calls for the designation of an Emergency Transportation Coordinator (ETC) designated by the LADOTD. The LADOTD has primary responsibility for emergency transportation, with the ETC coordinating and organizing the following services:

- Develop plans and procedures to mobilize transportation for at risk populations in the event of an evacuation;
- Maintain information about transportation resources, with emphasis on, in, or near risk areas;
- Process requests for transportation and allocate resources to highest priority missions;
- Acquire additional resources as the emergency continues; and
- Release transportation assets at the conclusion of the emergency.

GOHSEP has developed a second document targeted at individuals, families, and businesses called the Emergency Preparedness Guide. The guide includes evacuation maps, contraflow access points, sheltering points, and emergency contact information for each parish. Four northbound evacuation routes converge in the Shreveport-Bossier City area, making the region a critical hub for disasters and emergencies occurring farther south in the state.

Caddo-Bossier Emergency Operations Plan

The Caddo-Bossier Office of Homeland Security and Emergency Preparedness (OHSEP) develops plans to protect life and property, coordinates resources during and following a disaster, and assists other entities with their emergency operations. The office updates the area emergency operations plan (EOP) continuously, as prescribed by state and federal law.

The Caddo-Bossier EOP describes the program for preparation against, operation during, and relief and recovery following disasters. The EOP implies a mutual aid agreement between Bossier City, Shreveport, Bossier Parish, and Caddo Parish, and it provides methods to ensure coordination between local, state, and federal responses. The Caddo-Bossier OHSEP Council is comprised of seven members and acts as the local decision making authority for emergency management.

Bossier City Hazard Mitigation Plan

Bossier City developed the Local Hazard Mitigation Plan (LHMP) to reduce long-term risk of hazards to people and property. The city is in the process of updating the 2011 document, which includes a risk assessment, a vulnerability assessment, and mitigation strategies. From the risk analysis, four goals for the plan were identified:

- Identify and pursue measures that will reduce future damages from natural hazards;
- Enhance public awareness of the effects of natural hazards and disaster preparedness;
- Facilitate sound development in the city to reduce potential impacts of hazards; and
- Maintain FEMA eligibility for grant funding.

The plan describes 27 mitigation actions, predominantly related to flood mitigation and general mitigation actions applicable to all hazards.

Summary

Existing plans and studies in the region were reviewed to ensure the strategies and improvements recommended in the 2040 LRTP work in conjunction with, rather than against, other planning efforts in Bossier and Caddo Parishes. Understanding how various activities in the region are impacted by the LRTP will assist the MPO and its planning partners in identifying opportunities to coordinate resources and strategies across various implementing agencies. Transportation decision-making not only impacts the transportation system and travel behavior, it also has implications for other facets of city planning and economic development, and vice versa. Therefore, plans and forecasts for land use, economic development, environmental resources, and safety and security were also included in the plan review.

3 | REGIONAL VISIONING PROCESS

A significant component in the long range transportation planning process is the gathering of public and stakeholder input regarding community needs and goals. Federal regulations require the participation of state Departments of Transportation (DOTs) and public transit operators in the long range planning process, and outline a list of federally-defined "interested parties," which must be provided a reasonable opportunity to comment on the transportation plan. The information provided by the public and stakeholders helps decision makers better understand the issues facing all users of the transportation system, and coordinate regional resources and strategies to achieve the community's vision.

Public and stakeholder involvement in the development of the 2040 LRTP was encouraged early in the process and throughout plan development using a public outreach plan created specifically for the 2040 LRTP, as well as NLCOG's adopted Public Involvement Plan (PIP). The PIP, which was adopted on April 9, 2009, outlines the purpose of the public involvement plan – to "foster two-way communication and trust between NLCOG and residents" and ensure that "public participation is an integral and effective part of its activities and decisions" – as well as specific goals, objectives, and requirements for carrying out the public involvement process.

Related specifically to the development of the LRTP, the PIP requires the MPO to 1) provide reasonable access to technical and policy information used in the development of the LRTP; 2) give adequate public notice of public involvement activities; 3) solicit the needs of those traditionally underserved by existing transportation systems; and 4) provide a public comment period of not less than 30 calendar days prior to adoption of the LRTP. All policies and procedures outlined in the PIP were closely adhered to in the development of the 2040 LRTP.

Screenshot of NLCOG Listens Website

The public outreach plan, created specifically to guide the public involvement process for the development of the 2040 LRTP, went above and beyond the PIP, and outlined a strategic approach to ensuring broad community participation in the long range transportation planning process. The public outreach plan, which is available on the NLCOG website, is divided according to 1) outreach strategies – or the methods for increasing the public's knowledge of involvement opportunities; 2) participation strategies – or the methods for gathering input from the public and stakeholders; and 3) evaluation strategies – or the methods for evaluating the effectiveness of the public participation process.

The gathering of public and stakeholder input informed several key phases of plan development, including 1) the development of a community vision; 2) the identification of needs in the region; 3) a review of the technical analyses performed as part of plan development; and 4) a review of the draft plan. At each of these stages of plan development, the public was invited to provide feedback through a variety of meeting formats and activities tailored specifically to the information

needed from the public and how the information would be used in the development of the plan. Additionally, NLCOG maintained a website, NLCOG Listens, which provided a forum for ongoing participation in the plan development process. The following section describes in detail the public outreach and participation efforts undertaken by the MPO, in accordance with its adopted PIP and the public outreach plan, to fulfill federal requirements and generate broad community support for the 2040 LRTP.

Visioning Workshops

To kick off the development of the 2040 LRTP and cultivate a vision to guide the long range transportation planning process, a series of five public visioning workshops were conducted between September 23, 2014 and October 2, 2014. The primary objective of the visioning workshops was to initiate a dialogue with the public regarding 1) their thoughts on the current state of the transportation system in the region; 2) how their needs related to transportation may change over time; 3) what growth patterns are likely in the future and how they might impact the transportation system; and 4) what factors the MPO should regard as the most important in evaluating transportation improvements for inclusion in the 2040 LRTP.

The five workshops were held at locations across the region to maximize participation and ensure all citizens in the study area were provided a convenient opportunity to attend a workshop. Meetings were held in both urban and rural locations in Bossier and Caddo Parishes. Consideration was given to locations that could be reached by public transportation, as well as those that were ADA compliant. Furthermore, meetings were offered both in the evening and during the lunch hour. NLCOG also hosted materials from the visioning workshops on NLCOG Listens, a website maintained by the MPO to disseminate information and solicit feedback from the public on several ongoing projects, including the development of the 2040 LRTP. To the extent practicable, individuals were able to participate in the same activities online that were conducted at the visioning workshops. Meeting dates and locations are shown in Table 3-1.

Table 3-1: Visioning Workshop Locations

Location	Address	Date
Bossier Civic Center	620 Benton Road, Bossier City, LA	September 23, 2014
Shreve Memorial Library	424 Texas Street, Shreveport, LA	September 24, 2014
Broadmoor Baptist Church	4110 Youree Drive, Shreveport, LA	September 25, 2014
Bossier Parish Library, Benton Branch	115 Courthouse Drive, Benton, LA	September 30, 2014
Vivian Events Center	625 Park Drive, Vivian, LA	October 2, 2014

Feedback provided by the public during the visioning workshops indicated that residents in the region see a need for more transportation options, including safe bicycle and pedestrian facilities and expanded public transit services. Participants emphasized the role of these modes in addressing the needs of older adults and people with disabilities, who are not presently served well by the existing transportation system. Several roadways in need of completion or improvement were identified by participants, as well as issues related to congestion, safety, and pavement quality. In terms of future growth, participants identified Bossier City, particularly north Bossier City, and the cities of Benton and Haughton as likely high growth areas. However, the challenges of sprawling development patterns and their impact on traffic, as well as the future vitality of downtown Shreveport, were a concern for many participants.

Bicycle and Pedestrian Facilities

Participants cited the need for better bicycle and pedestrian connections between Shreveport and Bossier City and discussed the potential for the presence of bicycle and pedestrian infrastructure to drive redevelopment in north Shreveport. The Highland neighborhood was identified by participants as a priority neighborhood for bicycle and pedestrian facilities. In addition to on-system bicycle and pedestrian improvements, participants also voiced approval for expanded trail and greenway options, citing North Bossier Park as a good example. The Red River Greenway was described by participants as being too narrow to serve both recreational users and those that use the greenway to travel between destinations. Participants noted that greater bicycle connections to and from the greenway would make it a more viable option for commuters. King's Highway and Youree Drive were identified as particularly dangerous roadways for both cyclists and pedestrians, especially where there is high pedestrian traffic near LSU-Shreveport.

Public Transportation

In general, participants felt that public transportation services, in terms of service hours and system coverage, should be expanded, particularly in Bossier City (a park-and-ride facility was specifically mentioned as being needed in Bossier City), Benton, in the southeast portion of the region between I-49 and Louisiana State Highway 1, and in the more rural regions of both Parishes. Connecting residents to major shopping centers, food establishments, employment centers, and casinos (particularly during off-peak hours) was cited as needing consideration in the development of transit routes, schedules, and stop locations. Participants identified the U.S. Highway 171/ Mansfield Road corridor, south of Louisiana State Highway 3132/Inner Loop Expressway, as a good candidate for increased public transportation services.

Roadways and Congestion

During group discussions, participants identified several roadways in need of completion, including Interstate 49 (I-49), Swan Lake Road, Highway 3132, and the future sections of Interstate 69 (I-69) designated to travel through both Bossier and Caddo Parish. Participants believe that completing these roadways will relieve traffic congestion on other roadways. Other roadways identified as needing upgrades include: Kings Highway, Line Avenue, Youree Drive, and Barksdale Boulevard. Participants also expressed the desire for

improved roadway pavement conditions, feeder roads from highways to promote local businesses to passersby, and additional bridges between Shreveport and Bossier City.

Swan Lake Road in Bossier Parish and Youree Drive, south of East 70th Street where there is considerable commercial development, were both identified as congested corridors during the group discussions. In Bossier City, participants were concerned about the congestion potential caused by new housing developments under construction near churches, along with the current and anticipated traffic near popular shopping destinations on Airline Drive. Participants also recognized the growth occurring in the Town of Haughton, and the resulting congestion where vehicles must cross railroad tracks and the two-lane Clarke Bayou Bridge to access schools. Generally, issues related to traffic congestion at railroad crossings, particularly in Bossier City which does not have elevated roadways like those in Shreveport, was cited as a concern, especially with freight movement by rail projected to increase over time.

Growth Patterns and Economic Development

Participants identified several major employers in the region which may spur future population growth and economic development, including Barksdale Air Force Base, Benteler Steel, and the Cyber Innovation Center. Downtown revitalization was mentioned as a priority in Shreveport, for example, with the Shreveport Commons project, and participants noted the likely attractiveness of the Highland neighborhood if downtown revitalization efforts are successful. However, participants anticipate most future growth in Shreveport to occur in the southern and southeastern portions of the city. Participants in Bossier City do not anticipate future growth in the downtown region due to poor roadway conditions and substandard schools.

A complete listing of the comments received during the public visioning workshops and online, as well as the corresponding images of the annotated maps used to facilitate group discussions, is included in the Technical Supplement.

Evaluation Criteria

Due to funding shortfalls and constrained budgets, the number of needed transportation improvements is likely to exceed available funding. Therefore, it is important for the MPO to have a clear understanding of community priorities on which to base the evaluation of projects for inclusion in the 2040 LRTP. Projects will be evaluated by NLCOG based on the results of the technical analyses performed as part of the update to the 2040 LRTP, other regional plans and studies, and feedback from the MPO's planning partners. A component of that feedback includes the scoring and ranking of projects according to evaluation criteria.

MAP-21 requires the long range planning process to address eight federally-mandated planning factors. These planning factors, which are described in detail in Chapter 1, were used as a basis for developing evaluation criteria. The criteria were further expanded to address additional regional goals and objectives. Figure 3-1 lists the evaluation criteria and their definitions.

Figure 3-1: Evaluation Criteria and Definitions

During the public visioning workshops, participants at the meetings and online were asked to provide their feedback on which of the criteria should be the most important in determining projects to be included in the 2040 LRTP. The results of the exercise were considered in conjunction with the outcomes of the technical analyses and feedback from the MPO's planning partners in developing the prioritized list of projects for inclusion in the 2040 LRTP. Table 3-2 shows the final ranking of the evaluation criteria according to feedback from the public, which emphasizes the importance of increasing multi-modal options, and improving safety and quality of life in the region.

Table 3-2: Final Evaluation Criteria Ranking

Final Rank	Evaluation Criteria
1	Increase multi-modal options
2	Improve safety
3	Improve quality of life
4	Connect modes of travel
5	Improve access
6	Support economic goals
7	Increase connections
8	Reduce congestion
9	Promote efficiency
10	Conserve energy
11	Protect the environment
12	Support land use goals
13	Preserve rights-of-way
14	Improve security

Open Houses

A second round of public meetings was held in June 2015 to give the public an opportunity to review the results of the first round of public meetings and demonstrate how that information was used to inform the subsequent technical analyses. The meetings, which followed an open house format, were held between June 16th and June 18th, 2015 at three different locations throughout the region, as shown in Table 3-3. An open house format does not include any facilitated activities. Instead, participants were invited to view a series of meeting exhibits, ask questions, and provide feedback at their convenience. The meeting exhibits were also hosted on the NLCOG Listens website, and online participants were able to provide comments.

Table 3-3: Second Round Open House Locations

Location	Address	Date
Bossier Civic Center – Bossier City	620 Benton Road, Bossier City, LA	June 16, 2015
First United Methodist Church Shreveport	500 Common Street, Shreveport, LA	June 17, 2015
Broadmoor Baptist Church	4110 Youree Drive, Shreveport, LA	June 18, 2015

The main objective of the second round of public meetings was to provide the public with balanced and objective information to assist them in understanding the planning process to date and provide additional guidance. Information presented to the public for their review and feedback included 1) goals and objectives; 2) population and employment projections; 3) the analysis of bicycle and pedestrian conditions, public transportation services, and crash hotspots in the region; 4) an explanation of the alternative growth scenarios that will be examined later in the LRTP development process; 5) the ranked evaluation criteria from the visioning workshops and online participation; and 6) an explanation of how the final plan will be evaluated in terms of its impacts on the environment and quality of life.

The Technical Supplement includes a complete summary of the comments received during the open houses.

Draft Plan Review

Prior to final adoption of the 2040 LRTP, citizens of the region were given another opportunity to review and provide feedback on the draft 2040 LRTP. The 30-day public review and comment period began following TPC adoption of the draft plan, in accordance with the MPO's adopted PIP. Members of the public were invited to ask questions and make comments regarding the draft plan. The comments were reviewed by NLCOG to determine whether a significant number of oral or written comments were received, which would require the MPO to summarize, analyze, and report on the disposition of comments as part of the final plan.

The final list of comments received during the review period are documented in the Technical Supplement.

Stakeholder Consultation

In addition to gathering input from the general public through visioning workshops, open houses, and the NLCOG Listens website, local stakeholder groups were consulted early in the process to aid in the development of the 2040 LRTP. Individuals representing 26 stakeholder groups throughout the region were interviewed between September and October 2014, as well as throughout the LRTP development process. The complete list of participants is shown in Table 3-4.

Table 3-4: Stakeholder Outreach Participants

Stakeholder Groups	Agency and Business Name
Community Group	Volunteers of America of North Louisiana Caddo Community Action Agency Catholic Charities of Northwest Louisiana Family Helping Families Hope for Homeless United Way Barksdale Forward
Governmental Agency	Bossier City Metropolitan Planning Commission Shreveport Metropolitan Planning Commission Bossier Parish Police Jury
Traffic Management	Bossier City – Engineer City of Shreveport – Engineer Beast Engineering, LLC
Historic Preservation	Shreveport Historic Preservation Commission Highland Restoration Association
Public Transportation	SporTran New Horizons
Bicycle	Local Bicyclist
Economic Development	Shreveport Chamber of Commerce Bossier City Community Development City of Shreveport Community Development Downtown Development Corporation
Emergency Response & Transportation Safety	Caddo Parish Sheriff's Office Caddo Parish Communications City of Shreveport Police Department
Environmental Protection	Sierra Club

Roadways

A major topic for many of the stakeholders was the Interstate 49 (I-49) and the Inner-City Connector project in Shreveport. Some felt that expanding the highway would benefit commerce and enhance the connection to Texarkana. Others were concerned about the lack of a final alignment, which may result in delays in the redevelopment of the Allendale and Ledbetter Heights neighborhoods. Opponents of the connector project cited the potential for the highway to separate neighborhoods from downtown Shreveport and to bisect the St. Paul's Bottom neighborhood. Additional roadway concerns included poor pavement quality and the need for an expansion of the Jimmie Davis Bridge.

Several congested roadways were identified during the consultation interviews, including:

- Benton Road;
- Airline Drive;
- North Market Street;
- Youree Drive;
- Line Drive;
- Bert Kouns Industrial Loop;
- Jimmie Davis Bridge; and
- King's Highway.

Common causes for congestion were identified as: traffic near schools and shopping centers, inefficient traffic signal cycles, and a lack of capacity to accommodate the amount of vehicles that travel on the Jimmy Davis Bridge. At-grade railroad crossings were also called out as a contributor to congestion, particularly where trains cross major roadways causing traffic to back up, particularly during peak travel times.

Safety and Security

Multiple safety concerns were discussed during the consultation meetings. Stakeholders discussed their concerns related to deteriorating roadway surfaces resulting from the heavy vehicles traveling on local roadways. Poor pavement conditions were mentioned as being hazardous to pedestrians, especially older adults and individuals with disabilities. Debris on the roadway was also identified as posing safety risks. Stakeholders stated that speeding drivers and drivers who ignore traffic signals and signage are prevalent in the region, including downtown Shreveport.

Security concerns were also discussed, namely the lack of connections between Shreveport and Bossier City, where travel is restricted to a small number of bridges and the use of Interstate 20 (I-20) and Interstate 220 (I-220). Stakeholders felt the lack of connections has the potential to cause evacuation issues in the event of an emergency. Participants also mentioned security concerns related to Barksdale Air Force Base. It was noted that the base's primary exit route crosses a rail line, which restricts movement to and from the base and can result in congestion when trains are passing. Additionally, stakeholders discussed concerns related to the fact that many gated communities in the region only have one entrance/exit point, which can result in chokepoints. Additional issues stakeholders were concerned with regarding safety and security included:

- Insufficient lighting on roads;
- Poor signal timing for vehicles and pedestrians;
- Confusing one-way streets; and
- Dangerous intersections, such as Spring Street and Lake Street.

Mobility and Accessibility

Travel between rural and urban areas was the most common concern related to mobility and accessibility. For younger children, older adults, individuals with disabilities, and disabled veterans travel within and from rural parts of the region to the cities of Bossier City and Shreveport can be very difficult. Stakeholders pointed out that there are few options for these groups besides personal vehicles. Many rely on

family or friends to get around. Other groups identified as facing barriers to mobility include workers, tourists, and those needing medical-related transportation that either cannot drive or do not have access to a personal vehicle. Stakeholders also discussed the difficulty of reaching destinations outside the MPO study area, and the need for expanded services at the Shreveport Regional Airport, as well as a desire for Amtrak rail services to Dallas and east of the region.

Public Transportation

Regional public transportation services were generally discussed favorably. Stakeholders expressed excitement for SporTran's pending move to a new intermodal transfer center, which will also be utilized by Greyhound. Stakeholders acknowledged the importance of having public transportation in the region, but also identified areas within Bossier and Caddo Parishes that are currently not served by SporTran.

Although SporTran has extended service hours and expanded its service area, stakeholders indicated that additional service is needed to accommodate workers on late shifts and those who need to reach employment centers not currently located near a transit route. There was a perceived disconnect among stakeholders between transit and jobs. The port was cited as an example of a growing economic base that is currently inaccessible via public transportation.

Some stakeholders mentioned their clients felt unsafe crossing roadways to catch the bus. Other identified public transportation deficiencies included:

- Neighborhoods (Cedar Grove, Greenwood, and Spring Lake) in Shreveport that have few stops within walking distance or stops with shelters;
- Lack of rural access (some would like to see twice-a-week service for individuals outside of Shreveport and Bossier City);
- ADA-accessible transit for individuals with physical disabilities; and
- Lack of taxi services within the region.

Stakeholders also indicated a desire to see additional public transportation options in the region such as streetcars or passenger rail service.

Bicycle and Pedestrian

Stakeholders expressed optimism over recent bicycle and pedestrian improvements, including increased opportunities for cycling between downtown Shreveport and Shreveport Commons, rails-to-trails conversions, and more accessible sidewalks for individuals with disabilities. Despite the recent developments, stakeholders are still concerned about infrastructure deficiencies, safety, and a lack of advocacy for bicycle and pedestrian interests and concerns.

Stakeholders noted the need for more dedicated bike lanes, increased connections, and better sidewalk coverage. Currently, there are a small number of bike lanes and trail connections throughout the region, especially to Barksdale Air Force Base, and between Shreveport and Bossier City. In addition, stakeholders would like to see more pedestrian connections to downtown Shreveport and to shopping destinations in Bossier City.

Stakeholders discussed a variety of concerns regarding the quality of existing pedestrian

and bicycle infrastructure. Sidewalks were described as overgrown and non-continuous in some neighborhoods, which impair mobility for individuals in wheelchairs and create hazards for pedestrians. Stakeholders noted that poor sidewalk conditions in the region has resulted in many individuals being forced to walk or use wheelchairs on roadways, thereby increasing the potential for accidents involving vehicles. Safety concerns were also expressed for the region's cyclists, who ride on roadways without the protection of dedicated bicycle lanes (aside from bicycle "sharrows" painted on select roadways), especially on North Market Street, Youree Drive, and King's Highway. Poor pavement conditions were also identified as the cause of many bicycle accidents.

Stakeholders generally felt that elected officials have not addressed their concerns related to the quality and lack of non-motorized transportation infrastructure, and voiced a desire to see bicycle and pedestrian facilities more frequently considered as part of roadway projects, rather than separately or reactively.

Passenger Air and Rail

Several stakeholders expressed concerns with passenger air travel, including: high fares, the lack of direct flights, few transportation options to and from the Shreveport Regional Airport, and the lack of a precision landing system at the Shreveport downtown airport, which would allow for an increased number of flights. Additional interregional travel concerns expressed by stakeholders included: the desire for Amtrak service, the extension of State Highway 3132 to the port, construction of I-69, and the addition of a low-cost air carrier to the airport.

Freight and Intermodal Transfer

Stakeholders regarded the port and the airport as vital to the regional economy, and anticipate the port to become even more important as new businesses locate in the vicinity. Benteler Steel, which is located at the port, and Libby Glass were both identified as expanding industries that will likely increase the amount of freight traffic in the region. Barge traffic is also expected to grow, and increasing the channel depth from 9 to 12 feet could provide enhanced economies of scale for barge shipments.

Stakeholders also anticipate freight movements to increase on roadways and railroads in the region. The junction of two Class A railroads located in the area makes the region a significant corridor for freight travel. In addition to freight movement by rail, truck traffic on I-20 is expected to increase. Some stakeholders felt that I-49 and the Inner City Connector projects would provide additional freight travel options once completed.

Economic Development

Stakeholders identified several growth areas in the region where new industries are developing and/or housing is being constructed. These areas include both north and south Shreveport and north Bossier City. There were concerns about the lack of parking in downtown Shreveport and Bossier City, and stakeholders expressed concern that inadequate parking could be a major hindrance to growth in these areas. Stakeholders indicated that there is demand for housing downtown and developers wish to build in the area, however parking limitations have negatively impacted the development process. Stakeholders feared that rather than absorbing the cost of constructing needed parking garages, developers are more likely to develop in other areas or not build at all.

Historic Preservation

Stakeholders noted that there are six historic districts and two cemeteries in Bossier and Caddo Parishes that are listed on the National Register of Historic Places. Concerns related to historic preservation included the fact that many of these sites and neighborhoods have a large number of vacant buildings and are not accessible by public transportation or by pedestrians. Stakeholders felt that improving the accessibility of these areas by pedestrians and public transit may encourage the restoration or redevelopment of these areas and increase regional tourism.

Environmental Protection

Stakeholders expressed concern that transportation infrastructure is not being constructed with the appropriate environmental considerations. Air and water quality were among the top concerns discussed during the consultation meetings. According to stakeholders, air quality in the region is nearing the Environmental Protection Agency's (EPAs) defined pollutant levels despite the fact that there is limited presence of heavy industry in the region. Vehicles were identified as the main cause for the elevated air pollution levels. There was a desire among stakeholders for better municipal coordination to mitigate negative impacts on air quality.

Source: Shreveport-Bossier City CVB (via Flickr)

Regional water quality was also a concern. According to stakeholders, most of the regional drinking water is not supplied by underground aquifers, but instead comes from surface water sources. Roadway runoff affects surface water more than underground water sources. Stakeholders also indicated that the current regional water plant is at capacity, and a new plant is needed to provide clean water to residents as development continues to increase in the southern portions of Bossier and Caddo Parishes.

Establishing a Regional Vision

In the 2009 update to the 2030 LRTP, "Mapping the Way – 2030," it was determined that area residents valued the region's clear roads, ease of mobility, safety, abundant interstate and intermodal connections, and regional character and quality of life in old and new neighborhoods. Additionally, residents indicated that improvements made to the transportation system should enhance the local economy, especially manufacturing, the Port, and the regional gaming industry.

Feedback gathered during the public visioning workshops and stakeholder consultations conducted for the 2040 LRTP confirm that the previously established goals and objectives remain consistent with the current regional vision.

Adopted Goals

The following goals and objectives for the 2040 LRTP were approved by the NLCOG Technical Coordinating Committee (TCC) and the Transportation Policy Committee (TPC) to guide the long range transportation planning process. Each goal supports the overall goal of enhancing livability in the Northwest Louisiana region.

The final adopted goals are:

Minimize Congestion

- Identify and prioritize improvements to address current and forecasted areas of congestion;
- Identify needed transit routes and services;
- Identify and prioritize projects to address needs for signal optimization and intersection improvements; and
- Develop a policy to coordinate maintenance work that requires lane closures to minimize compound congestion.

Relate Transportation to Economic Growth

- Identify and prioritize projects to address intermodal access needs (Port, rail intermodal ramps, key industrial truck routes);
- Identify and prioritize projects to implement needed access improvements to casinos;
- Establish high priority for I-49 and I-69 funding; and
- Coordinate local government's requests for LADOTD and FHWA transportation funds.

Optimize Use of Existing Transportation Infrastructure

- Dedicate adequate resources for maintenance and rehabilitation of existing roads and bridges;
- Identify the need for land-use policies that steer new development to areas that presently have adequate or underutilized infrastructure;
- Support and facilitate ITS technology deployment as detailed in the Shreveport/Bossier City Regional ITS Strategic Deployment Plan;
- Continue implementation and maintenance of Northwest Louisiana's incident management system through the facilitation of the Traffic Incident Management System Committee;
- Continue implementation and maintenance of the Congestion Management Process for the Shreveport/Bossier City urban area; and
- Develop a model access control policy for new commercial development that minimizes points of conflict and promotes efficient traffic flow.

Improve Transportation Safety

- Identify and prioritize projects to address rail crossing needs; and
- Identify and prioritize improvements to address roadway intersections and spot locations that experience abnormal numbers of safety incidents.

Enhance Quality of Life

- Recommend policies to require in-depth public involvement to assure acceptable integration of transportation within existing development;
- Recommend funding for a study to determine the need for and acceptability of smart-growth and in-fill land use policies (study should focus on the relationships between transportation improvements and the redevelopment of older / blighted areas, and measures to retain and enhance neighborhood integrity);
- Identify, prioritize, and request funding for projects that qualify for Transportation Alternatives Program Funds;
- Develop corridor preservation plan for major Shreveport-Bossier City area projects; and
- Utilize transportation modeling ability to evaluate air quality impacts and plan conformity.

Performance Measures

MAP-21 introduced new requirements for carrying out a performance-and outcome-based transportation planning process in support of the seven national performance goals. A performance-based planning process requires the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) to establish performance measures, which will be used by state DOTs and MPOs to inform funding decisions based on achieving performance targets.

At the time of the development of the 2040 LRTP, FHWA and FTA were still in the process of establishing performance measures. Once determined, state DOTs, MPOs, and the providers of public transportation will be required to coordinate on the selection of performance targets. State DOTs are required to adopt their performance targets within one year of the DOT final rule on performance measures, and MPOs are required to set performance targets no later than 180 days after the date on which the state DOT or provider of public transportation establishes theirs. Moreover, the MPO is required to integrate the goals, objectives, performance measures, and targets of the State and public transportation providers directly or by reference into the metropolitan transportation planning process.

The project selection process for the 2040 LRTP utilizes performance measures to ensure the plan prioritizes projects that will achieve regional goals and objectives. The TCC scored each project according to its likely impact on each of the evaluation criteria. Each evaluation criteria was assigned a weight according to feedback obtained from the public in the first round of public meetings (see Table 3-2 on pg. 3-6). Additionally, performance measures from the travel demand model (discussed in greater detail in the following chapter) were used to assess each project's impact on congestion in the region.

Summary

A robust public involvement and stakeholder engagement process was carried out by the MPO to identify issues and understand the needs of the public, as well as those of agencies and organizations with a specific interest in the transportation system. Public participation has long been a federal requirement for the long range transportation planning process. The public participation process carried out by the MPO in support of the LRTP not only complies with federal regulations, it also ensures the plan goes above and beyond the results of the technical analyses and incorporates information on how the public experiences and perceives the transportation system, which may not always align with the technical data. Developing a plan in close cooperation with the public and key stakeholders also helps to ensure broad community support for plan adoption and implementation.

Goals and objectives provide guidance to the MPO and policy makers in selecting projects for inclusion in the LRTP and help to link other transportation planning processes and documents produced by the MPO, like the Transportation Improvement Program (TIP), the Unified Planning Work Program (UPWP), and the Congestion Management Plan (CMP), with the long term vision of the community. As state DOTs and MPOs across the nation prepare to transition to a performance-based planning and programming process as required under MAP-21, it will be increasingly important to develop outcome-based goals and objectives that are closely tied to the adopted performance measures. A key principle of a performance-based planning and programming process is that each step in the planning process needs to be clearly connected to the next, starting with the initial goal setting phase.

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4 | TRANSPORTATION NEEDS ASSESSMENT

The needs of the regional transportation system change over time in response to evolving travel behaviors of the community, the demographic profile of the region's population, growth patterns, the availability of transportation facilities, and economic development. Analyzing the need for new roadways and additional capacity on existing roadways represents one component of the regional transportation needs assessment. Other considerations such as the quality and availability of transit services and non-motorized infrastructure, the safety of all modes and for all users, the resiliency of the transportation system in the case of a natural disaster or security threat, and the efficiency of the existing transportation system are also important considerations when assessing the transportation needs of the community over the long term.

Roadway Needs Assessment

Planning for a future transportation system that addresses the needs of the community over the next 25 years requires an understanding of how regional growth patterns and land use will impact use of the transportation system over time. Factors like where people live and work, their income levels, and household sizes, among other factors, all influence the frequency with which people use the transportation system (i.e. the number of trips a person makes a day), as well as the patterns of travel across the transportation system (i.e. the locations of origins and destinations and the routes people choose to get from Point A to Point B). Travel demand modeling is a powerful tool used to quantify existing and future demand on the transportation system, conduct scenario-based planning through analysis of the impacts of alternative growth scenarios, and evaluate the impact of various improvements on the performance of the transportation system. The following section describes the process for preparing the NLCOG travel demand model for use in the development of the LRTP.

NLCOG Travel Demand Model

Travel demand forecasting quantifies the existing and future interaction between supply and demand on the transportation system. The supply of transportation is represented by the characteristics of the roadway network, while the demand for transportation is created by the separation and intensity of urban activities. Land use forecasts provide estimates of where people will live and where businesses will locate in the future. These forecasts include the intensity of activity anticipated, such as the number of households or employees, and socioeconomic characteristics, such as income level and household size, which are prepared for small geographic areas called traffic analysis zones (TAZs). The service characteristics of the roadway and land use forecasts are direct inputs to the travel demand model.

A travel demand model (TDM) was developed for the NLCOG region as part of this LRTP update process. The study area for the model includes Caddo, Bossier, and DeSoto parishes (although DeSoto Parish is not currently included in the MPO Study Area, it was included in the TDM to help analyze certain large-scale, high profile projects). It estimates travel demand for a base year of 2010 and forecast years 2020, 2030, and 2040, producing metrics including delay and volume-to-capacity (V/C) ratios that help quantify system deficiencies. Delay is measured as the total daily system delay in vehicle hours and helps put region-wide congestion into perspective. On the other hand, V/C ratios provide a measurement for location-specific congestion on regional roadways by comparing the number of vehicles traveling on a roadway to the roadway's capacity.

The NLCOG TDM was designed to operate in TransCAD version 6.0 build 9225, providing access to the most up to date TransCAD functions, giving the model flexibility and longevity. It is based upon a conventional four-step trip-based modeling approach, which includes the following four major components:

Travel Demand Model Steps

- **Trip Generation** - The process of estimating trip productions and attractions at each TAZ.
- **Trip Distribution** - The process of linking trip productions to trip attractions for each TAZ pair.
- **Modal Choice** - The process of estimating the number of trips using a particular mode for each TAZ pair. The NLCOG TDM considers six mode choices: drive alone, share ride 2, share ride 3+, urban bus with two access modes (drive and walk), premium bus with two access modes (drive and walk), and urban rail with 2 access modes (drive and walk).
- **Trip Assignment** - The process of assigning auto and truck trips onto specific highway facilities in the region.

At each step in the development process, care was taken to ensure that the model maintained a high level of predictive value. All changes and adjustments to model parameters were performed in a comprehensive and systemic manner and were applied uniformly and consistently across the entire model. The resulting model provides a realistic and reliable predictor of scale and pattern of future travel in and around the area and serves as a useful and informative tool for performing travel forecasts and systems planning level analysis of proposed transportation projects.

More technical information about the model development process can be found in the Technical Supplement.

Socioeconomic Data Development

Travel demand is greatly influenced by the pattern of development in the study area. Changes in land use and/or intensity will create new travel demand or modify existing patterns. There is a strong relationship between trip-making, land use, and demographic data. For the NLCOG travel demand model, demographic data for both the base year and the forecast years were compiled from several sources (described in the following section), as well as institutional knowledge from regional stakeholders.

Data Sources

Decennial Census

The decennial census is conducted once every ten years and represents the only complete enumeration of the population. Data is available at a variety of geographic levels. The smallest geographic level for which data is available is the census block. In urbanized areas, a census block may cover only a few city blocks, while in rural areas where there are significantly fewer households, a census block may cover many square miles. Census block-level data provides demographic information at a level of detail appropriate for use in the travel demand model, including number of households, average household size, and total population.

American Community Survey

The ACS samples a portion of the population once each year. Due to the small sample size, data is reported in the form of 1-year, 3-year, and 5-year estimates. Also because of the smaller sample size, the ACS is able to gather more detailed demographic information that aids in the proper function of the travel demand model. This information includes household income, work commute mode choice, and occupation. The 2006-2010 5-year estimates were selected for comparison to TAZ-level data due to their reliability and appropriateness for analyzing very small populations.

Louisiana State Data Center

Each U.S. state has a State Data Center (SDC), which serves as the official representative of the U.S. Census Bureau. The Louisiana SDC is housed at Louisiana State University, and currently has Census 2005-based population projections through the year 2030 for each parish in Louisiana. The Louisiana SDC produces three estimates of future population based on varying confidence limits and projection techniques.

Woods and Poole Economics, Inc.

Woods and Poole Economics, Inc. is a firm specializing in long-term parish economic and demographic projections. The database is updated annually and contains information and projections on more than 900 demographic variables. Each variable is projected for each year through the year 2050.

Bureau of Labor Statistics

The Bureau of Labor Statistics (BLS) is the principal fact-finding agency for the Federal Government for labor economics and statistics. It is an independent agency that collects, processes, analyzes, and distributes statistical data. It serves as a resource for the Department of Labor and publishes information about the nation's economy, including information related to employment.

Delphi Process

In addition to gathering data from published sources, the study team conducted a Delphi Process to utilize the knowledge of community leaders with regional expertise in a variety of areas to develop a demographic forecast for the study area. The Delphi method was originally developed in the 1950s to forecast the impact of technology on warfare. However, in the context of this project, it was used to develop regional population and employment forecasts for Bossier and Caddo Parishes. The method is a consensus-building process that relies on the wisdom and expertise of community leaders to identify patterns in the growth and development of the community. The method has three distinguishing features: input is confidential, the process is iterative, and group responses are statistically interpretable.

The process involves an initial kickoff meeting followed by several rounds of online activities. The final products of the process are population and employment control totals for the region and population and employment totals for 20 subareas within the region. Control totals are the parish-level estimates of population and employment, which "control" the allocation of demographic data to the smaller geographic areas, in that the aggregates of population and employment from the smaller geographic areas cannot exceed the parish-level control totals.

Base Year Demographics

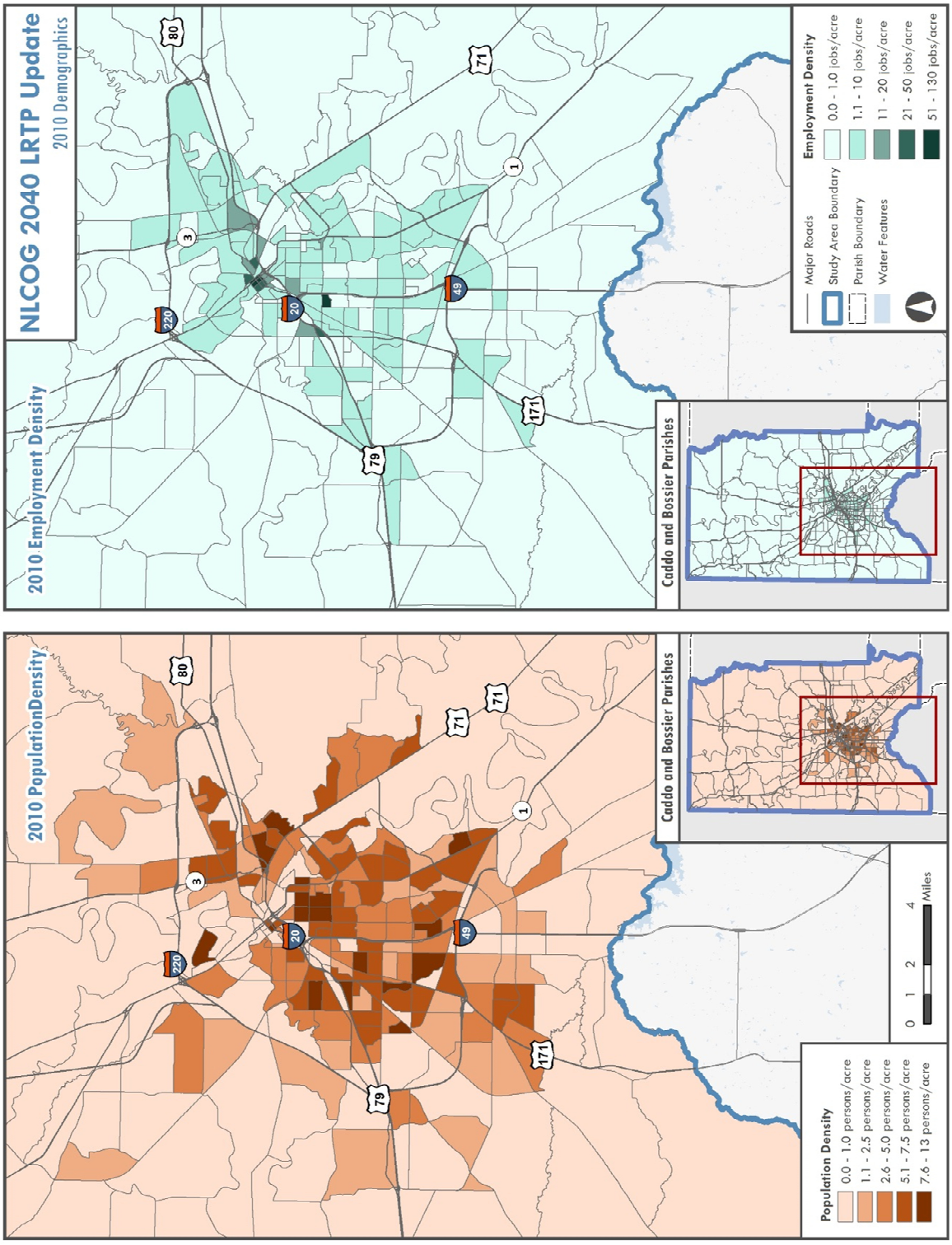
The existing demographic inputs for the base year total population and number of households for Bossier and Caddo Parishes were compared to parish totals from the 2010 census. TAZ-level population and household totals were compared to census block-level data, the geographic boundaries of which generally align with the travel demand model TAZ structure. Employment data was purchased from InfoUSA and reviewed for accuracy and consistency with existing demographic inputs for employment. Additionally, Barksdale Air Force Base was consulted regarding population living on the base in 2010.

Table 4-1 shows the Parish population and employment control totals for the region for the 2010 base year, while Figure 4-1 shows regional population and employment densities at the TAZ-level based on the base year population totals used by the travel demand model.

Table 4-1: Study Area Base Year Population and Employment Control Totals

Parish	2010 Population	2010 Employment
Bossier	116,979	54,482
Caddo	254,969	123,923
Total	**371,948**	**178,405**

Figure 4-1: Study Area Base Year Population and Employment



Many hospitals, airports, military bases, and other activity centers have unique characteristics that are not adequately captured in a travel demand model and therefore must be treated as special generators. Current special generators contained in the travel demand model were reviewed to confirm all special generators are correctly identified and adequately interpreted.

Source: Nicolas Henderson (via Flickr)

Forecast Year Demographics

Available demographic forecast data were obtained from the Louisiana State Data Center and Woods and Poole Economics, Inc. An additional set of population projections was produced using the Census 10-year linear growth rate from 2000 to 2010. Additional sets of employment projections were calculated using Census LODES and Bureau of Labor Statistics data.

Delphi panel participants used these growth scenarios as a base from which to build consensus on the long-term regional population and employment outlook. At the kickoff meeting, this involved an exercise where panelists were asked to either pick one of the provided scenarios or draw one in that they believed reflects the population and employment outlook for Caddo and Bossier Parishes. In general, Delphi participants believed that the census forecast best represented likely population and employment growth in Caddo Parish, while the Woods and Poole forecast was the best fit – if not overly conservative – for population and employment growth in Bossier Parish. Other kickoff meeting activities included a discussion of local factors affecting growth, identification of opportunities and constraints for growth, and an exercise that provided an initial allocation of regional population and employment control totals to subareas. These results were compiled and then refined through iterative web exercises where participants were asked to assess the likelihood of the forecast demographics and make adjustments as necessary until the process resulted in a reasonable degree of agreement. The complete results of the Delphi process can be found in the Technical Supplement.

Final Control Totals

Based on the results from the consensus-building Delphi process, final population and employment control totals were developed for Bossier and Caddo parishes. Table 4-2 shows the final base year and forecast year control totals for Bossier and Caddo parishes, which were utilized in the regional travel demand model.

Table 4-2: Final Parish Control Total Demographics

Year	Population		Employment	
	Bossier	Caddo	Bossier	Caddo
2010	117,714	254,177	54,482	123,923
2020	139,854	256,798	66,566	127,366
2030	161,648	258,796	80,160	130,457
2040	183,078	260,421	95,805	133,427

TAZ-Level Suballocation

While the Delphi process resulted in demographic allocation to the subarea-level, it was necessary to further allocate population and employment to individual TAZs to ensure proper functionality of the travel demand model. As the boundaries of these 20 sub-areas were created based on the TAZ geography, allocating from the sub-area level to the TAZ level was a mechanically straightforward process.

The amount of population and employment growth allocated to the individual TAZs was determined by a number of objective and subjective criteria, including a determination of total developable land, the feedback gathered from the Delphi panel on areas of high and low growth potential, and attractiveness based on a review of land use plans, employment trends, and planned educational facilities, among other available information. This analysis led to the formation of a development Growth Rating for each TAZ, which determined what proportion of the sub-area growth each TAZ received. A complete description of the sub-allocation process can be found in the Technical Supplement.

Figure 4-2 shows the results of the TAZ sub-allocation process, displaying the density of population and employment by TAZ in 2040.

Roadway Deficiencies Analysis

The roadway deficiencies analysis provides policy makers and the public with a better understanding of how the roadway network will be impacted by changes in the region over time if no improvements are made to the transportation system. The travel demand model utilizes the existing plus committed (E+C) roadway network and applies the forecast year demographics to identify areas on the roadway network where congestion may worsen or where roadways may become congested in the future. Outputs from the model on select performance measures are then used to evaluate the impacts of other growth scenarios and transportation improvements on the performance of the system and assist in prioritizing policies and projects for implementation.

System Deficiencies

The analysis performed for the 2040 LRTP utilized Volume-to-Capacity (V/C) ratios computed by the TDM as one method of identifying current and future system deficiencies. The V/C ratio compares roadway demand (volume of vehicles) to roadway supply (roadway carrying capacity), and is typically expressed as a decimal. For example, a V/C ratio of 0.5 indicates that a roadway segment is operating at about half of its capacity at its most used moment, while a ratio of 1.0 or higher implies that volume is at or exceeding capacity and that the roadway segment is likely to be congested.

The V/C ratio analysis results, illustrated in Figures 4-3 and 4-4, indicate congestion along key regional roadways may increase over time if no improvements are made to the system. The analysis displays relative congestion (red more congested than orange, etc.). Roadways colored orange indicate areas where traffic levels are approaching designed capacity and may highlight opportunities for operational improvements rather than capacity expansion, which are discussed in more detail in Chapter 5.

Perhaps the most glaring current system deficiency is the I-20 crossing over the Red River. During both the AM and PM peak periods this bridge experiences congestion, which is anticipated to increase over time. Other congestion points in the current system include N Market St at US 71, and Barksdale Blvd and E 70th St at the southeastern edge of the urbanized area. Looking ahead to 2040, additional areas of congestion are anticipated primarily in Bossier City in the AM peak period, I-20 leaving Bossier City in the PM peak period, and US 71 at the southeastern edge of the urbanized area, among others.

Figure 4-2: Study Area Horizon Year Population and Employment

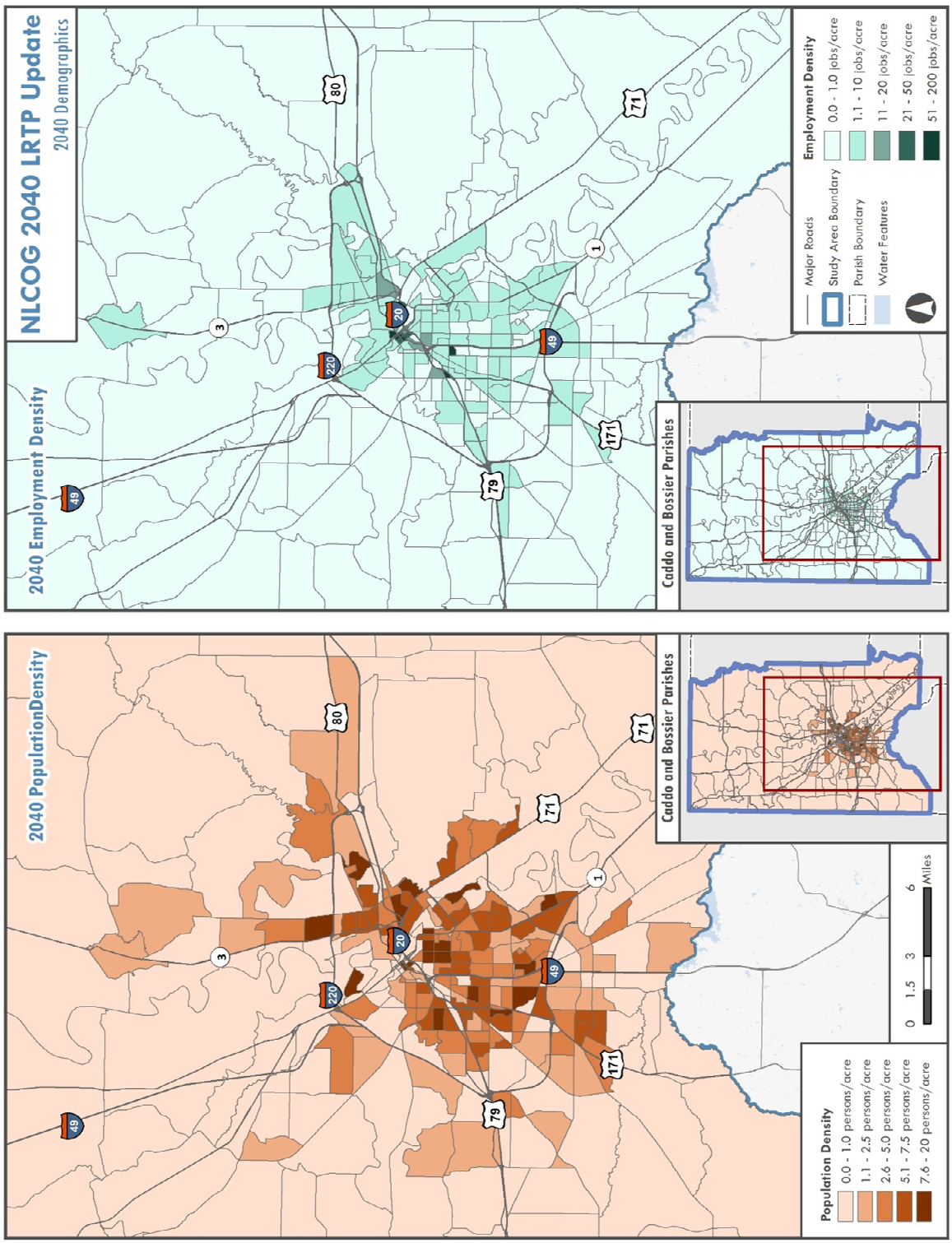


Figure 4-3: Deficiencies Analysis – Change in V/C Ratio 2010-2040 (AM Peak Period)

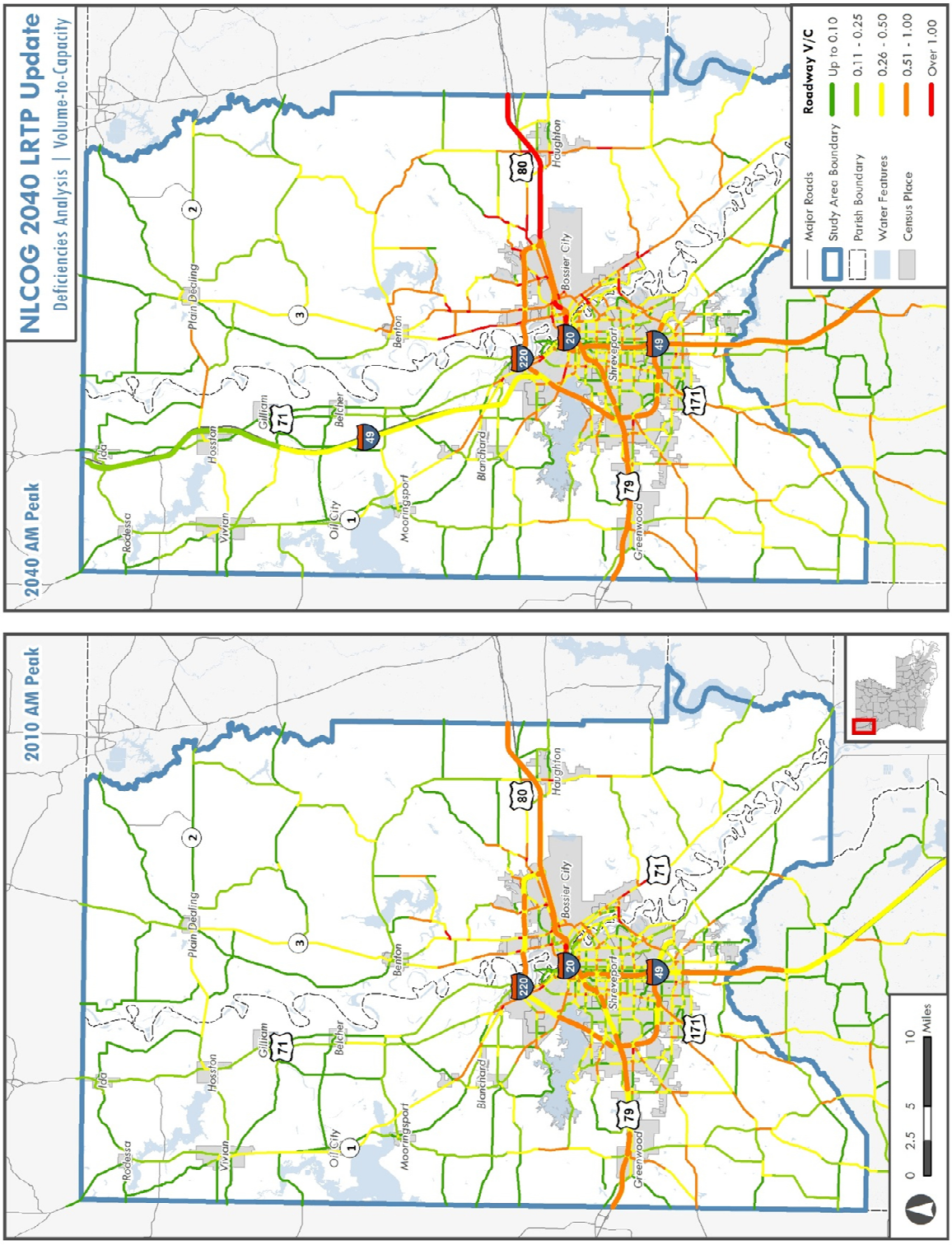
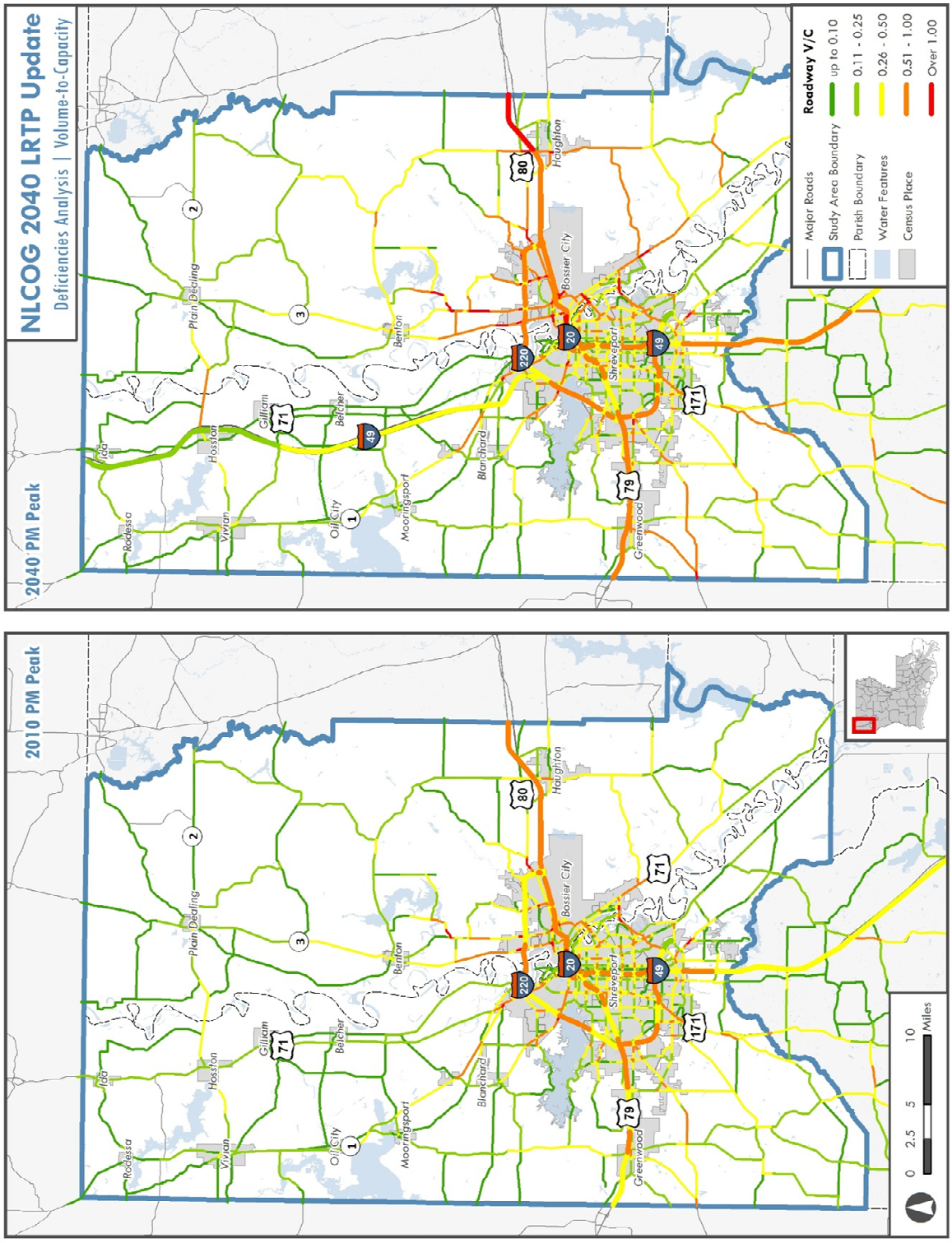
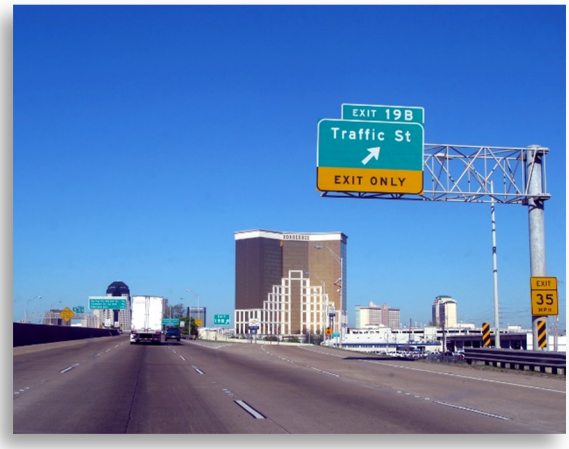


Figure 4-4: Deficiencies Analysis – Change in V/C Ratio 2010-2040 (PM Peak Period)



Another way to identify system deficiencies is by looking at current and forecasted vehicle delay. This performance measure was reported by the TDM, and the results indicate that total system delay will increase by 130 percent on the highway system and by 154 percent on regional arterials by 2040. More detailed results from the deficiencies analysis can be found in the Technical Supplement.



Source: So Max O (via Flickr)

Non-Roadway Needs Assessment

While the travel demand model provides a quantitative means to identify deficiencies and needs within the roadway portion of the transportation network, it is less effective at describing deficiencies for the other elements of the transportation network. This section discusses the analysis methods used to identify deficiencies and needs for the fixed-route transit system, non-fixed route transit users, and the bicycle and pedestrian network.

Fixed-Route Transit Analysis

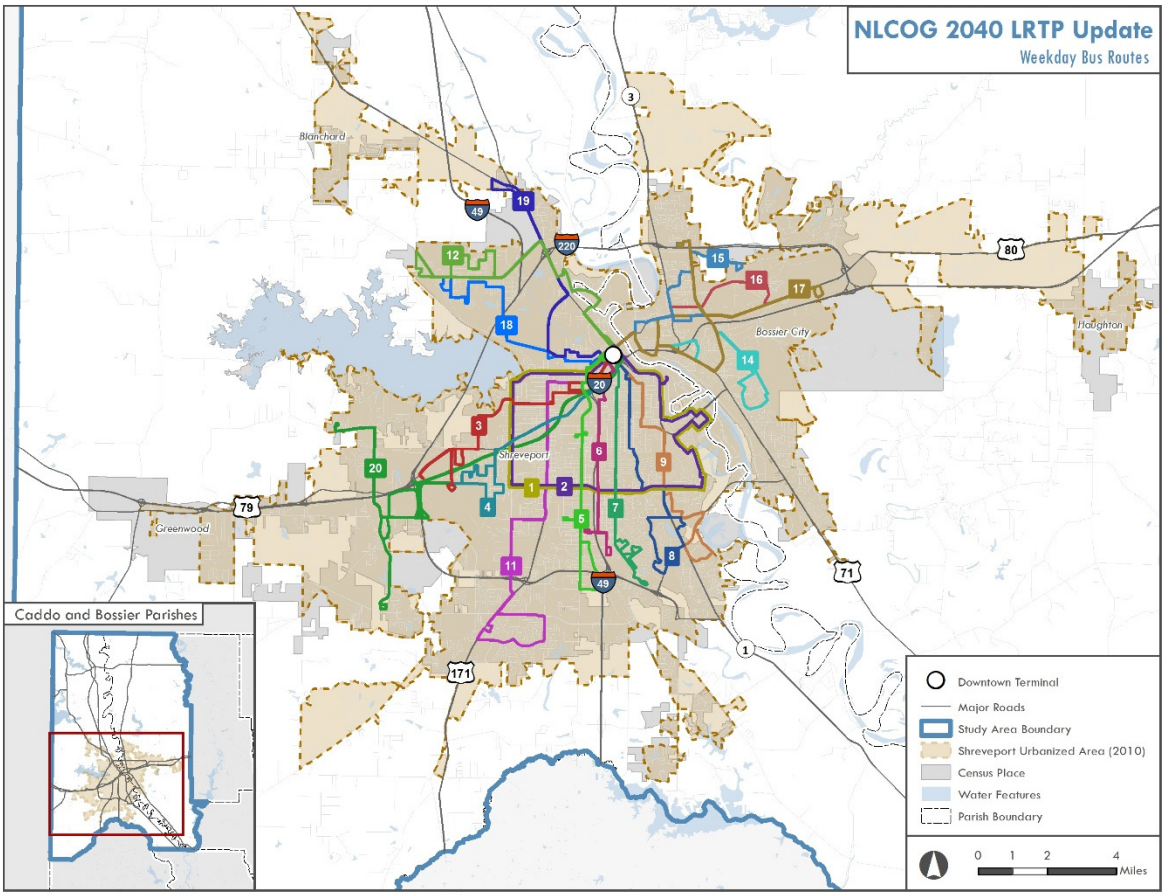
Fixed-route public transportation in the NLCOG region is provided by the Shreveport Area Transit System, known officially as SporTran. SporTran has been operational in Shreveport for the past 125 years, first as a private transit company and later as a public entity after being purchased by the City of Shreveport in 1972. SporTran today operates 18 fixed route bus lines, six night routes, and the LiftLine paratransit service in the cities of Shreveport and Bossier City. The following fixed-route public transportation analysis was done concurrently with NLCOG's Public Transportation Study, which was not complete at the time the LRTP was adopted. More details about public transportation in the NLCOG area can be found in that study, which is accessible through the NLCOG Listens website.

Existing Conditions

The first component of the analysis is understanding how the existing system functions within the region. Understanding existing conditions aids in the identification of service gaps and builds a framework for recommending improvements to address deficiencies and accommodate future growth. SporTran operates 18 fixed bus routes during the week (M-F), as shown in Figure 4-5.

Service begins as early as 5:00 AM on some routes, with regular weekday service ending by 7:00 PM. Headways – the time elapsing between each bus – are typically 30-45 minutes, with some routes operating more frequently during rush hour. Slight variations or spurs on some routes allow more frequent service along those routes' main sections. All routes begin and end at the downtown terminal in downtown Shreveport.

Figure 4-5: Regular Weekday Bus Routes



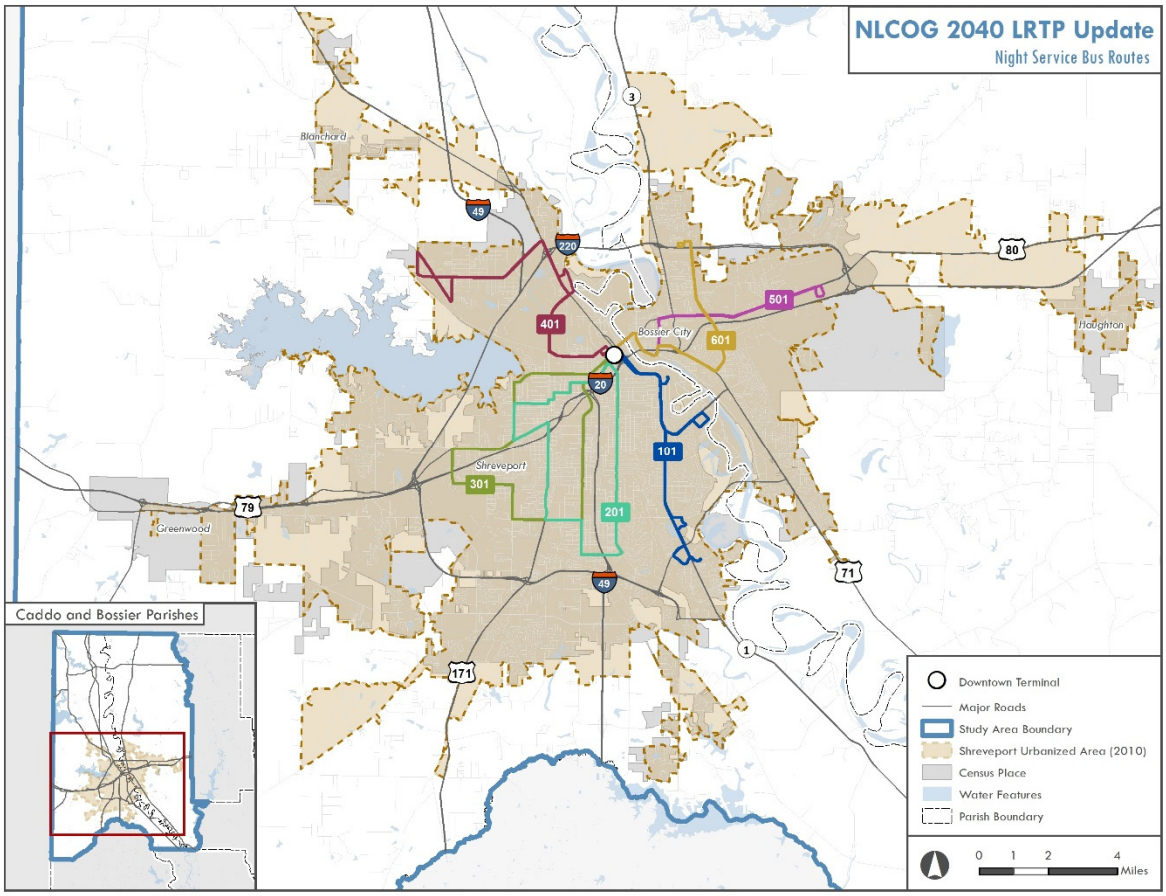
In addition to the 18 regular weekday fixed routes, SporTran operates service on most routes on Saturday and (less extensively) on Sunday. Saturday service also begins as early as 5:00 AM on some routes and ends at 7:00 PM. Headways are typically 45 minutes or longer. Sunday service begins at 8:00 AM and ends by 6:00 PM with headways that range from one to three hours.

SporTran also operates six fixed routes after 7:00 PM from Monday to Saturday. Night service routes differ substantially from the regular routes and follow a different numbering system (N-101, N-201, N-301, N-401, N-501, N-601). Service begins at the downtown terminal at 7:00 PM, with the last bus returning to the terminal by 1:30 AM. Headways are typically one hour. Figure 4-6 shows the extent of night service in the Shreveport Urbanized Area (UZA).

When regular weekday, Saturday, Sunday, and night services are all taken into account, SporTran provides public transportation service as early as 5:00 AM and as late as 1:30 AM, and provides some level of regular fixed- route transit service seven days a week.

SporTran also operates LiftLine, which is a paratransit service that provides door-to-door public transportation for individuals with disabilities who are unable to ride regular fixed-route service. SporTran defines three categories of people who are eligible for LiftLine service:

Figure 4-6: Night Service Bus Routes



- Persons who are unable to board, ride, or de-board a bus, even if they can get to the bus stop and the bus is accessible – including those with mental or visual impairments who cannot navigate the system.
- Persons with disabilities who cannot use buses without wheelchair lifts or other accommodations. These persons are eligible for paratransit service if accessible buses are not available on the fixed route on which they would like to travel.
- Persons with disabilities who cannot travel to or from a bus stop. A person is eligible if travel is impossible because of architectural or environmental barriers that, when combined with the disability, prevent that individual from reaching the bus stop.

LiftLine service is available to and from any point within Shreveport or Bossier City and during the same time periods that SporTran operates its fixed-route service. Individuals obtain a LiftLine eligibility card by submitting an application packet along with a signed statement from their physician. Personal Care Attendants (PCAs) may accompany LiftLine users at no additional charge.

Table 4-3 shows the fare structure of SporTran service. Although individual transfers cost $0.25, SporTran offers daily and monthly passes that allow unlimited use of the system for the respective time period. Note that any discount fares require the use of a SporTran ID (or Medicare card and proof of ID in the case of senior, disabled, or Medicare cardholder discount fares).

Table 4-3: SporTran Fare Structure

Fare Type	Price
Adult Basic	$1.25
Senior Citizen (Age 65+)	$0.60
Person with a Disability	$0.60
Medicare Cardholder	$0.60
Child (under 37" Tall)	FREE
Child (37" tall thru age 11)	$0.60
Students (thru 12th Grade)	$0.60
Transfer Charge	$0.25
Event Shuttle (Round Trip)	$2.50
City of Shreveport Employees	FREE
LiftLine Paratransit Trip (One way)	$2.50
Passes	
Day Pass	$3.00
Adult FlashPass (Monthly)	$40.00
Discount FlashPass (Monthly)	$20.00

System Coverage

A GIS-based approach was used to identify which parts of the region are currently served by SporTran for all types of service – regular weekday, Saturday, Sunday, and night service. The analysis was accomplished by generating a quarter-mile buffer around each transit route and then using Census data to determine the total population and employment captured by the buffer area. A quarter-mile distance is generally accepted as the length that most individuals (95%) are willing to walk to reach local, fixed-route bus stops. While buffers are typically generated around transit stops themselves to analyze service areas, because stops along most of SporTran's routes are spaced closely together, generating a buffer around the route line itself is justifiable to determine the coverage area of the system.

Population and employment figures were calculated using U.S. Census blocks, which are the smallest geographic unit for which Census data is available. The calculation was done by determining the percentage of each block that intersected the quarter-mile buffer zone and then allocating the same percentage of that block's 2010 population and 2011 LEHD employment totals. For example, if 100 percent of a block fell within the transit buffer zone, it was assumed that 100 percent of the population and employment is located inside the buffer. However, if only 50 percent of the block fell within the buffer zone, it was assumed that only 50 percent of the population and employment of that Census block have access to transit service.

Figure 4-7 shows the quarter-mile buffer – or "system coverage" – area for all routes operated by SporTran (excluding paratransit). For regular weekday service, approximately 41 percent of the population of Bossier and Caddo Parishes, or approximately 150,000 individuals, currently have access to transit. That figure drops to 36 percent, 30 percent, and 21 percent of the study area population for Saturday, Sunday, and night service respectively. For regular weekday service, it is estimated that approximately 70 percent of regional employment, or approximately 100,000 jobs, are accessible to public transportation, dropping to 64 percent, 57 percent, and 45 percent for Saturday, Sunday, and night service respectively.

Table 4-4 provides a more detailed overview of the total regional population and employment that falls within the SporTran coverage area. The system coverage analysis reveals a strong disparity between Bossier and Caddo Parishes. SporTran service is much more prevalent in Caddo Parish, where it reaches nearly twice the percentage of population than it does in Bossier Parish. The disparity is less pronounced for employment, but service in Bossier Parish still only reaches about half of the jobs in the parish compared to more than three-fourths of the jobs in Caddo Parish.

Figure 4-7: SporTran Quarter-Mile Coverage Area

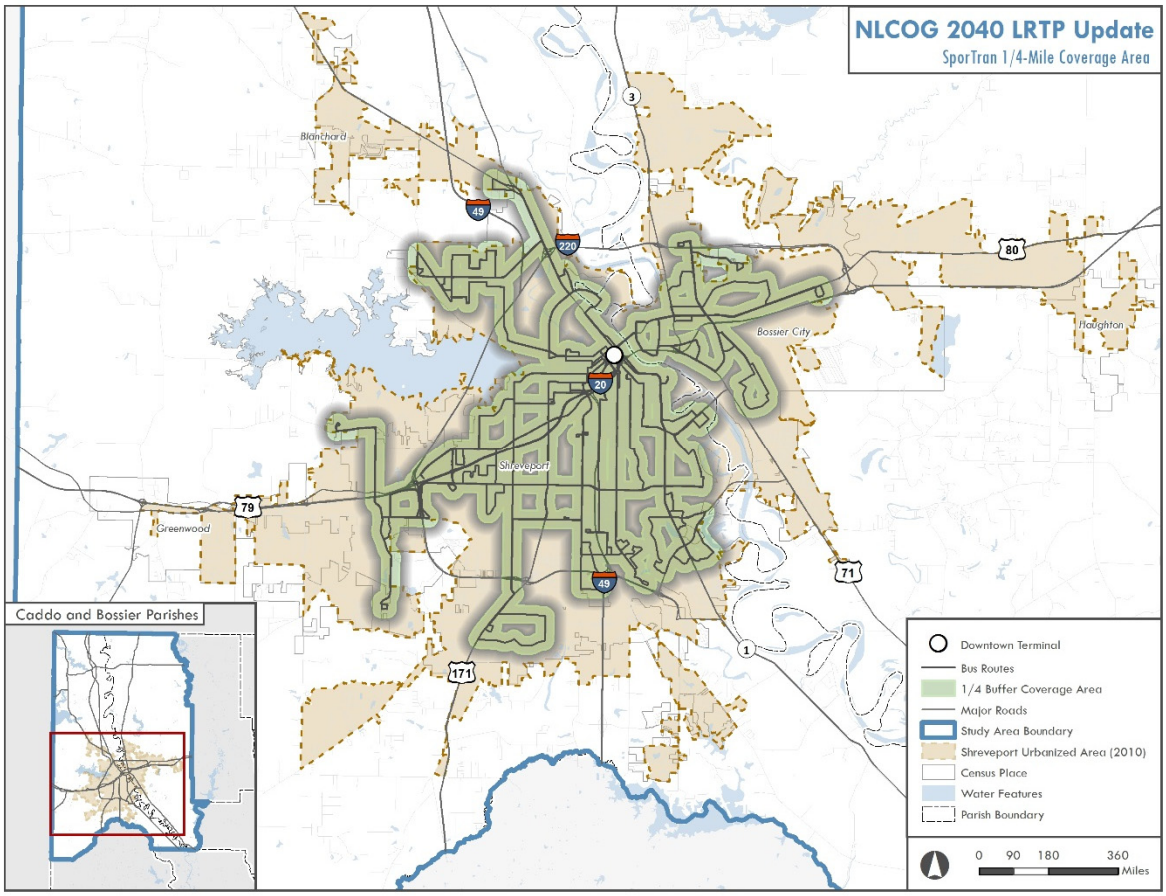


Table 4-4: Population and Employment within Coverage Area (By Type of Service)

Service Type	Population	Percent Covered	Employment	Percent Covered
Weekday	151,916	41%	106,526	70%
Saturday	134,387	36%	97,445	64%
Sunday	112,926	30%	86,719	57%
Night	76,624	21%	67,510	45%
All Routes	**153,082**	**41%**	**106,708**	**70%**
Parish Level				
Caddo Parish	125,310	49%	84,263	78%
Bossier Parish	27,772	24%	22,445	52%
Total	**153,082**	**41%**	**106,708**	**70%**

It should be noted that this analysis presents only the amount of potential riders based on population and employment totals and does not represent an estimate of likely transit riders. Many other factors contribute to individual mode choice, and only a small percentage of the individuals within the coverage area are likely to choose transit to complete any or all of their trips. Additionally, the analysis does not account for actual development patterns of each Census block, and instead assumes an equal distribution of population and employment within each block. In reality, population and jobs are likely to be concentrated in certain areas of the block, with other land uses and open space occupying the remainder.

Source: Robert and Talbot Trudeau (via Flickr)

Target Transit Rider Subareas

In Bossier and Caddo Parishes, as in most areas, transit-dependent populations (those with limited transportation options) constitute the highest portion of ridership on public transportation. Therefore, an analysis of origins and destinations of individuals with limited transportation choices was performed to define areas with higher concentrations of "target transit riders." The analysis uses data from the American Community Survey (ACS), which is an ongoing Census Bureau survey that collects socio-economic data beyond what is reported in the Decennial Census. The smallest geographic area for which most ACS data is available is the block group, which is a combination of several Census blocks. ACS five-year estimates from 2009 to 2013 were used to determine areas with higher than average concentrations of the following characteristics, which are generally associated with transit-dependent populations:

- Vehicle availability;
- Poverty status;
- Disability; and
- Age.

It is generally assumed that individuals without regular access to a private automobile, those living below the poverty line, individuals with a disability, and those who are not old enough to drive or for whom it is unsafe to drive, are more likely to rely on public transportation for their mobility needs. Target transit rider subareas were identified by calculating the percentage of the total population or number of households within each Census block group that possessed each indicator of transit dependency. The top 10 percent of block groups by totals for each indicator were generally considered to be target transit rider subareas.

Figure 4-8 displays the results of the target transit rider subarea analysis. Block groups were assigned a weighted score that measured the relative "need" for transit within each subarea. The weighted score was computed based on the number of subarea types for which the block group was among the top 10 percent, the rank of each subarea category applicable to that block group, and the percentage of population or households within each block group for each subarea category. If the block group was not part of the top 10 percent for that category, the percentage of population or households did not factor into the weighted score. The numbers on the map refer to Table 4-5, which shows summary statistics for the top three block groups for each subarea category.

Figure 4-8: Target Transit Rider Subareas

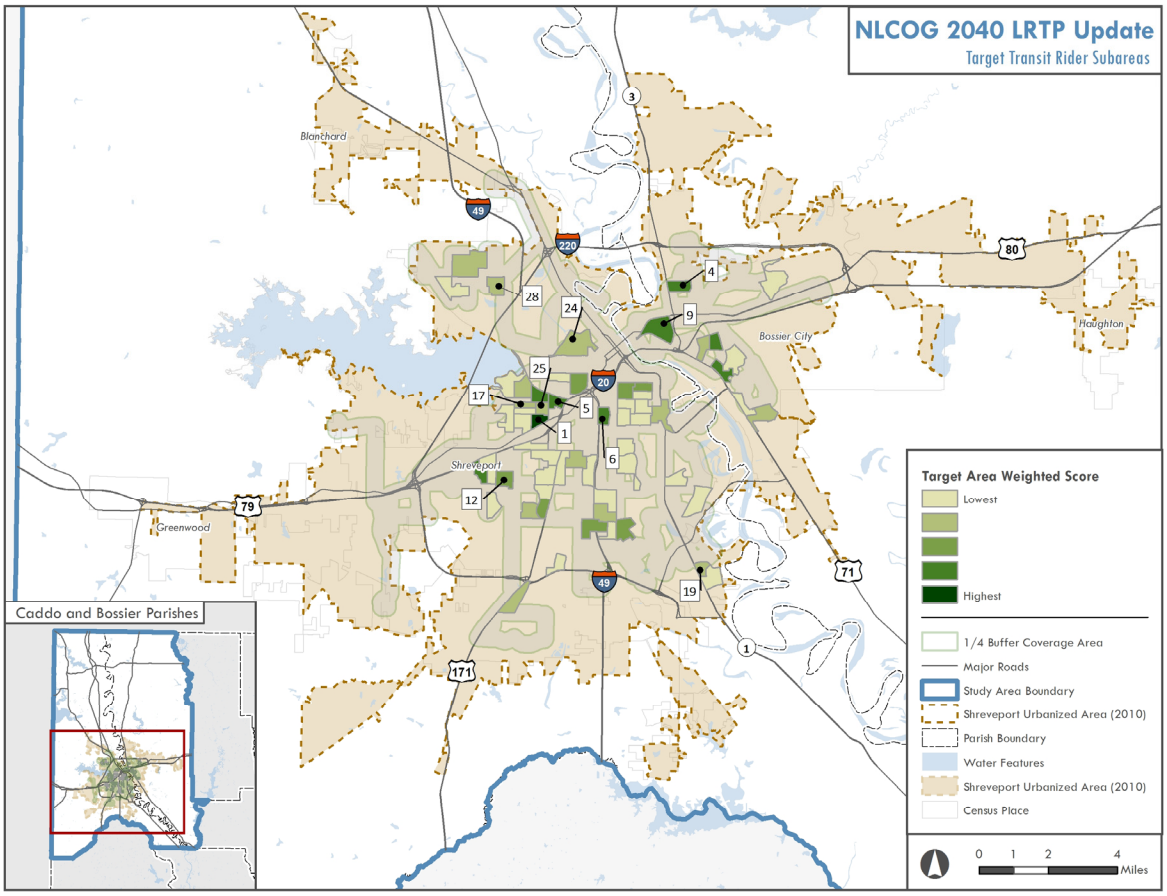


Table 4-5: Top Three Transit Target Areas by Subarea Category

Overall Rank (Map ID)	Percent House-holds with No Vehicle	Percent House-holds Below Poverty Line	Percent House-holds w/at least 1 Disability	Percent Non-driving Age	Rank (No Vehicle HHs)	Rank (Poverty HHs)	Rank (Dis-ability)	Rank (Non-driving Age)	Weighted Score
1	42%	84%	65%	n/a	5	2	1	0	3.807
4	18%	52%	n/a	56%	24	11	0	3	1.011
5	23%	41%	52%	35%	20	19	3	25	0.980
6	48%	71%	n/a	n/a	4	3	0	0	0.969
9	49%	56%	n/a	n/a	3	6	0	0	0.769
12	n/a	42%	n/a	56%	0	18	0	2	0.430
17	n/a	85%	n/a	n/a	0	1	0	0	0.212
19	n/a	n/a	n/a	73%	0	0	0	1	0.182
24	53%	n/a	n/a	n/a	1	0	0	0	0.132
25	n/a	n/a	57%	n/a	0	0	2	0	0.131
28	51%	n/a	n/a	n/a	2	0	0	0	0.117

The information that follows summarizes the spatial distribution of each target area category. Individual maps were created to show the top 10 percent block groups for each subarea type, which can be referenced in the Technical Supplement.

Vehicle Availability

Block groups with high concentrations of no-vehicle households are generally concentrated in central portions of Shreveport and Bossier City. All but one block group located off LA-1 in the southeast corner of the Shreveport UZA currently fall at least partially within the quarter-mile transit service buffer. However, there are several block groups with significant portions located outside the quarter-mile transit service buffer.

Income Level

Block groups with the highest percentage of households under the poverty line are all located within the Shreveport UZA and fall almost entirely within the current quarter-mile transit service buffer area.

Mobility Needs

Households reporting at least one person with a disability are concentrated within the central portions of the Shreveport UZA and fall almost entirely within the current quarter-mile transit service buffer area.

Non-Driving Population

The non-driving population analysis included individuals under the age of 15 and over the age of 60. These individuals are considered transit dependent as they likely fall outside the age range at which it is legal to drive or for which driving may be unsafe. Block groups with the highest percentage of non-driving age population are located within the Shreveport UZA and mostly fall within the current quarter-mile transit service buffer area. One block group in the far southeast portion of Shreveport lies completely outside of the current quarter-mile transit service buffer area.

Access to Key Destinations

The transit service analysis also considered the accessibility of key destinations within the region by public transportation. The analysis includes 385 major destinations in Bossier and Caddo Parishes, including civic institutions, major employers, recreational facilities, higher education centers, and hospitals. As shown in Figure 4-9, most of the major destinations are located within the Shreveport UZA.

Source: Wikimedia Commons

The analysis of key destinations evaluated the portion of destinations that are accessible by transit by computing the total number of destinations that lie within the quarter-mile service area buffer for each transit service type: regular weekday, night, Saturday, and Sunday. For regular weekday service, approximately 63 percent of the key destinations are within a quarter mile of a transit route. This percentage decreases to 57 percent for Saturday service, 50 percent for Sunday service, and 40 percent for night routes. Overall, 244 key destinations – or 63 percent – are accessible from a transit route. The destination types that tend to have lower accessibility levels are K-12 schools (both public and private) and religious institutions. At least two-thirds of all other key destination types are within the quarter-mile transit coverage area. Table 4-6 shows the percentage of each type of key destination that is located within the transit coverage area.

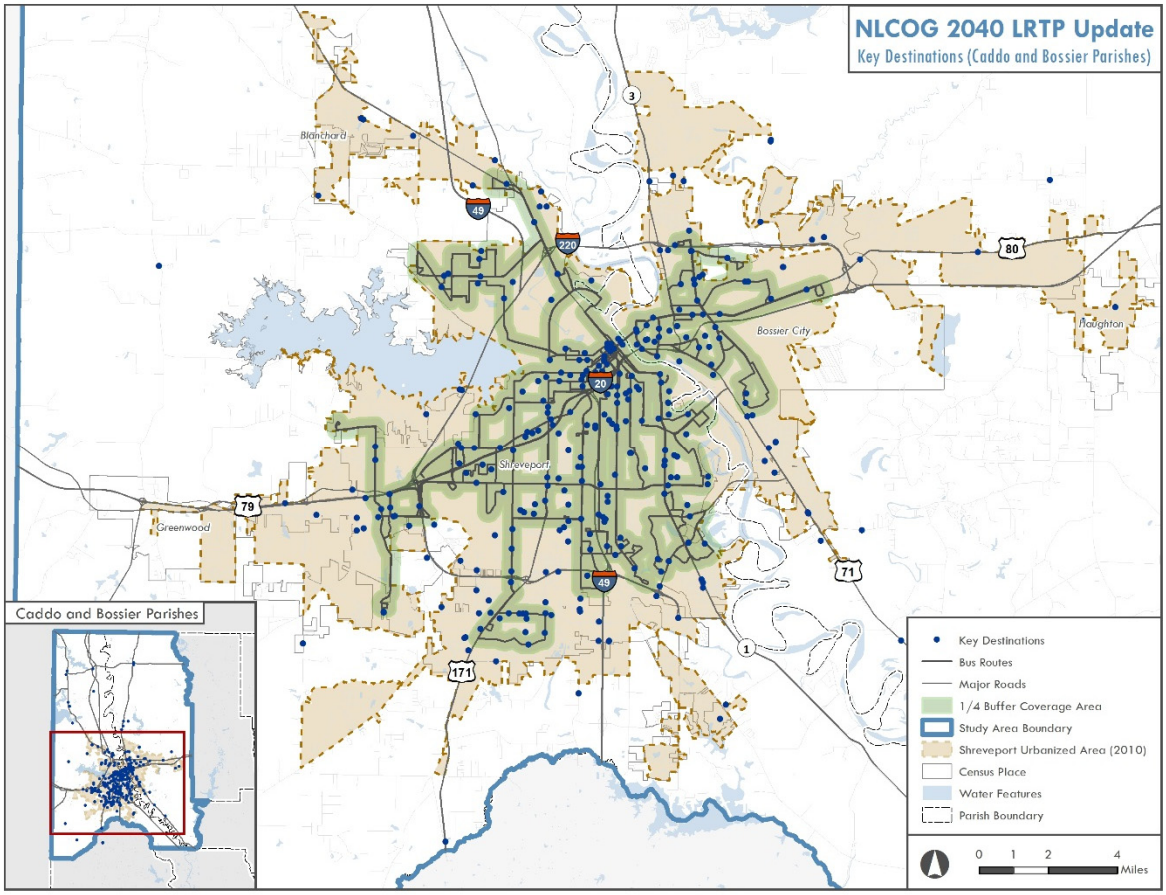
Table 4-6: Key Destinations inside the Transit Coverage Area

Key Destination	Percent
Civic Institutions	90%
Major Employers	83%
Community/Recreation Facilities	80%
Higher Education	77%
Hospitals	70%
Religious Institutions	65%
Private Schools	64%
TOTAL	63%

Key destinations that lie outside of the transit coverage area include (but are not limited to):

- Bossier Parish Police Jury;
- CenturyLink Center;
- Cargill Park;
- Bossier Parish School Board;
- Caddo Parish School Board;
- Caddo Parish Sherriff's Office;
- Promise Hospital of Louisiana – Shreveport;
- Harrah's Horseshoe Casino & Hotel/Harrah's Louisiana Downs;
- State of Louisiana Department of Civil Service (Bossier Parish);
- Wiley College;
- Louisiana Baptist University; and
- Louisiana Tech Shreveport.

Figure 4-9: Key Destinations in Caddo and Bossier Parishes



Findings

In recent years, SporTran has made significant progress towards upgrading its buses, facilities, and technology to improve service. The agency has installed bike racks on buses and enabled buses with GPS-tracking technology, which allows users to get real-time arrival information for SporTran buses on their website and on mobile devices. The agency is currently in the process of relocating the central bus hub from the Downtown Terminal to a brand new Intermodal Terminal on Murphy Street just southwest of downtown Shreveport. Once complete in 2016, the Intermodal Terminal will provide SporTran with the ability to reprogram some of its routes to avoid congested downtown streets.

Overall, a little less than half of the population of Bossier and Caddo Parishes lies within a quarter mile of a fixed transit route and is considered a potential rider for SporTran's current route configuration. However, only about one-third of the population of both parishes lies within the service coverage area on Saturdays and Sundays, and less than one-quarter is located within a quarter mile of service after 7PM. Regular, fixed-route transit service is confined to the Shreveport UZA, and the availability of transit services is much higher in Shreveport than Bossier City. Regular, fixed-route service is not available to rural areas of the parishes. While paratransit service compensates for some of the service gaps within Shreveport and Bossier City, elderly and disabled residents living outside of the two major cities must rely on Human Service Providers (such as The ARC Caddo-Bossier) for demand-responsive paratransit service.

Transit dependent populations are similarly concentrated in the Shreveport UZA and are therefore fairly well served by existing fixed-route transit service operated by SporTran. However, due to the varied nature of transit service (operating more frequently during peak hours on the weekdays), there are some areas of concentrated transit-dependent populations that are only served by lower quality transit service. A few areas that exhibit higher concentrations of transit dependent populations are not served by any fixed route service at all - particularly in the Southgate Estates area of far southeast Shreveport.

A much greater percentage of employment within Caddo/Bossier lies within a quarter mile of fixed-route transit. 70 percent of the jobs in both parishes are accessible by regular weekday service, and even night service reaches close to half of the jobs in the study area. Nearly half of the jobs in the study area are reachable by transit at any time during SporTran's operating hours (including weekdays, weekends, and evenings after 7PM). Transit service in the study area also reaches a reasonably high percentage of major destinations – 63 percent of all destinations, and 70 percent or more of area hospitals, higher education facilities, community centers, major employers, and civic institutions. However, there are significant destinations that are located outside of the current fixed-route transit coverage area that would be well-served by transit.

The results of the NLCOG Listens survey indicate that the overwhelming majority of survey respondents – regardless of whether they used transit or not – felt that service frequency and reliability, as well as the poor quality of bus stop amenities, were major barriers to more

widespread transit usage. These are issues that will be examined and addressed to the extent practicable in SporTran's update to its Transit Development Plan, which is currently underway and is scheduled to be completed in 2016.

Non-Fixed Route Transit Analysis

Outside of the city limits of Shreveport and Bossier City, the rural areas of Bossier and Caddo Parishes do not have access to regular, fixed-route public transportation. Instead, residents in this part of the study area rely on a variety of demand-responsive transit services, many of which are provided by organizations and agencies engaged in transportation only as a secondary function. These include: Councils on Aging (COAs), which partner with nonprofit organizations, government, and business to help people aged 60+ meet the challenges of aging; Associations of Retarded Citizens (ARCs), which actively support the full inclusion and participation of people with intellectual and development disabilities in the community; the Veterans Administration, and others. The following section takes a more qualitative approach to assessing existing deficiencies in the non-fixed route transit system to identify areas where services can be improved, particularly through improved coordination between transit providers and human services providers.

Coordinated Human Services – User Survey Results

Between February 2013 and April 2014, NLCOG administered a survey to users of the various human services/transportation providers in the region to better understand service needs. The survey included responses from the entire 10-parish region for which NLCOG is responsible as the Council of Governments, but because the survey included zip code information, it was possible to extract only the responses where the user either lived, worked, or had a doctor located within Bossier or Caddo Parish. The survey revealed some of the following information about the users of these demand-responsive transit services:

- 34 percent of survey respondents use transportation service providers to get to work in Bossier or Caddo Parishes;
- 67 percent of respondents use transit to get to doctor or medical appointments;
- The largest percentages of respondents were female (56 percent), low-income (making less than $10,000/year – 42.5 percent), and elderly (over age 65 – 35 percent);
- Most respondents reported having no children in the household, but of households reporting any children, one-child households were most common; and
- Only 38 percent of respondents reported receiving some form of disability payments; only 28 percent reported receiving social security benefits.

The survey also presented a series of questions about the quality of service as perceived by users by asking users to agree or disagree with several service-oriented statements, as well as ranking possible areas of improvement. Overall, respondents felt that service quality was adequate, although there was some concern that the service limited the options for where users could work. While most respondents agreed that service met their current needs, they also agreed that they would use public transportation more if every one of the service quality improvements suggested were implemented – particularly if reliability were improved.

Coordinated Human Services - Provider Survey Results

NLCOG also distributed a survey to the service providers in Northwest Louisiana about some of the challenges these organizations face in providing transportation to rural and transit-dependent populations within the area. Respondents indicated that a lack of adequate funding, as well as reconciling the priorities and agendas of various service providers, were the biggest obstacles to mobility in the area.

Furthermore, respondents see customer needs being adequately met, but that they could be met more cost effectively, and that one possible role providers could play in improving regional transportation services could be to offer data on the transportation needs of individuals with disabilities.

Table 4-7 shows the CHS providers in Caddo and Bossier parishes by service type.

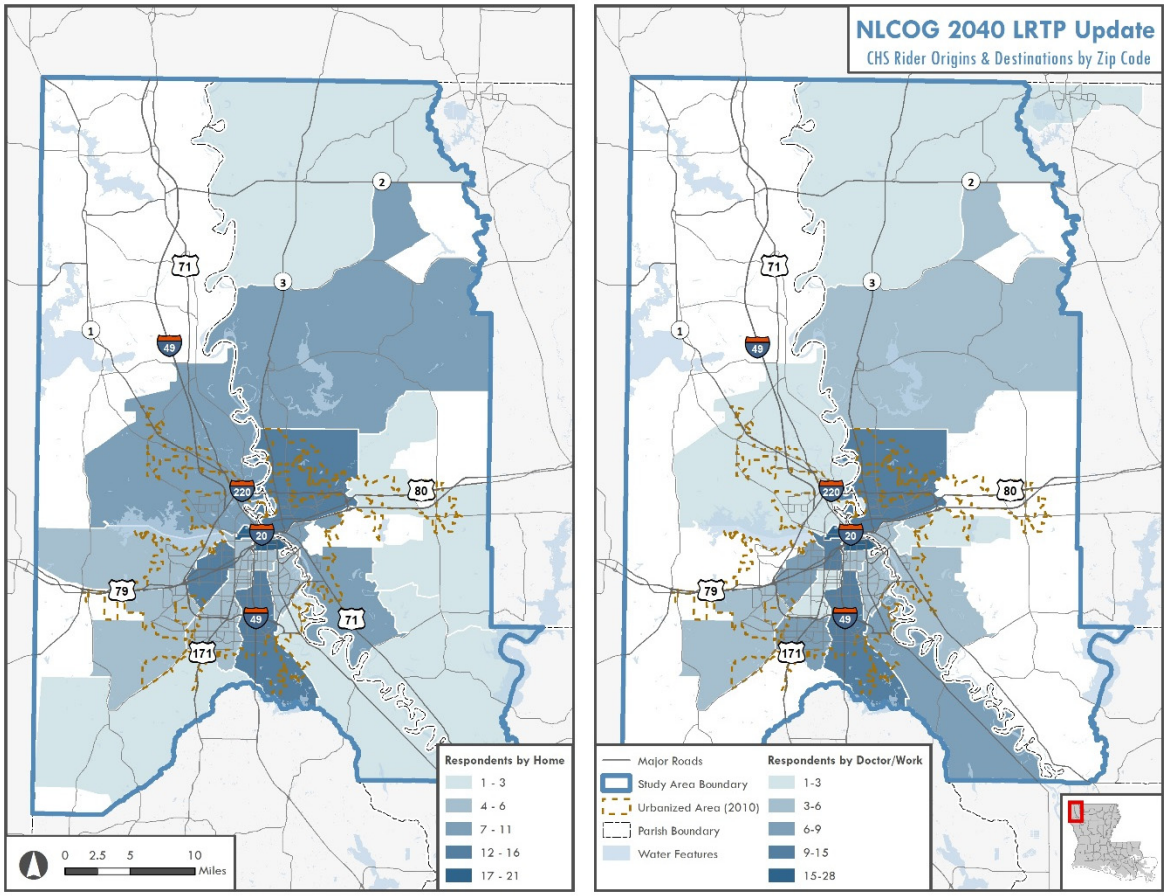
Table 4-7: CHS Providers in Caddo/Bossier

Human Service/Transportation Provider	Primarily Transportation?	Type of Service
Bossier Council on Aging	No	On-demand transportation for elderly, people with disabilities, and rural residents
Caddo Council on Aging	No	No transportation directly provided
ARC of Caddo-Bossier	No	On-demand transportation for people with disabilities and residents of ARC facilities
SporTran – LiftLine	Yes	On-demand transportation for elderly and people with disabilities – ONLY available within Shreveport and Bossier City
Socialization Services	No	On-demand transportation for elderly and people with disabilities
MJ Transport	Yes	Medical transportation only (Shreveport)
Medical Transportation	Yes	Medical and non-medical transportation (Shreveport)
Quality Transportation	Yes	Non-medical transportation (Caddo Parish)
AMPM	Yes	Medical transportation only (Caddo Parish)
Veterans Administration	No	Medical transportation for veterans to VA hospital (Caddo and Bossier parishes)
Goodwill Industries of NW Louisiana	No	Contracts with SporTran to provide discounted day and monthly transit passes for low-income job seekers

Rural and Human Service Transit Demand

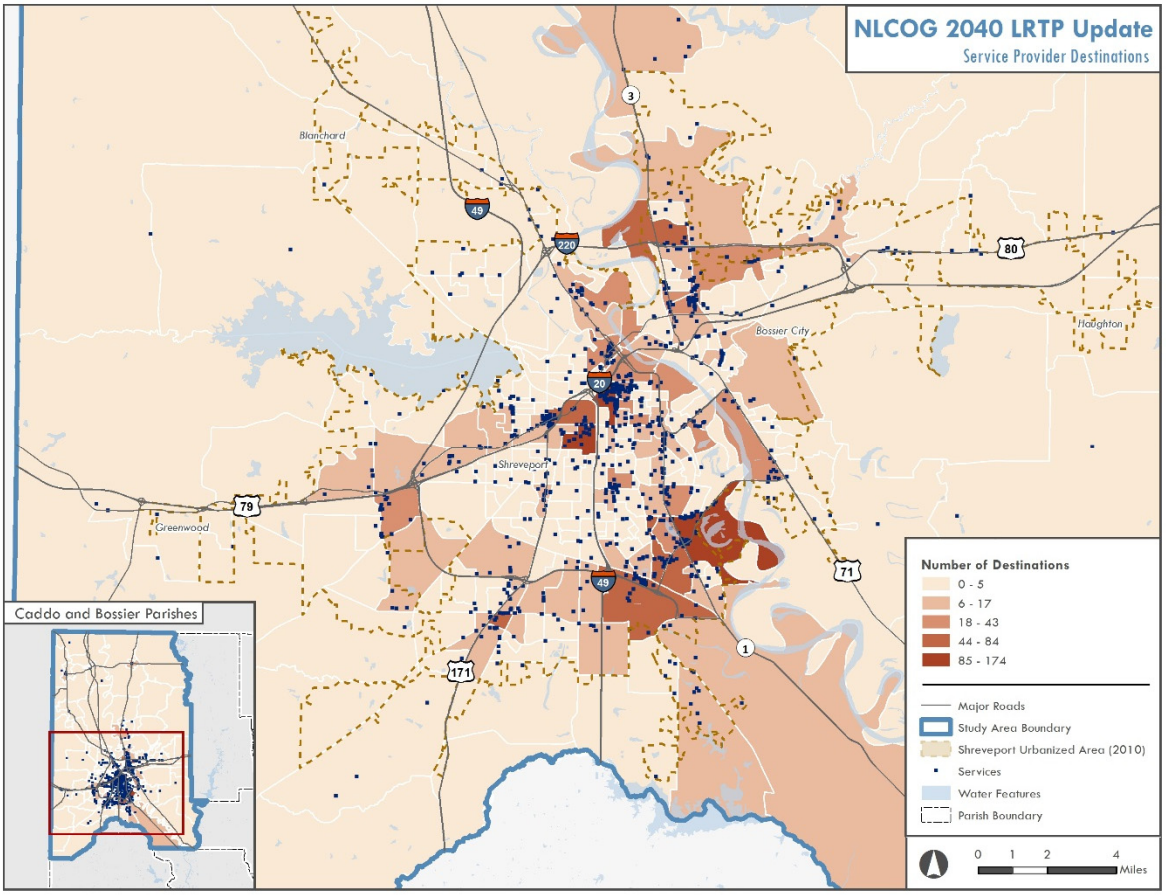
In addition to reviewing the Coordinated Human Services Transportation Plan (CHSTP) and the results from both the user and provider surveys, a geospatial analysis was used to identify areas of service demand in rural parts of Bossier and Caddo Parishes and areas where service providers are concentrated, to identify likely transportation origins and destinations for populations depending on these demand-responsive transit services. Figure 4-10 shows where respondents to the user survey live, work, or go to doctor appointments by zip code. The highest number of responses came from central Bossier and Caddo parishes, although a relatively high response rate originated from the north-central portion of each parish. Employment and doctor locations were overwhelmingly concentrated in urban portions of the parishes, indicating that while populations served by service providers are spread throughout the region, the most likely destinations for these populations are concentrated in Shreveport and Bossier City.

Figure 4-10: CHS Rider Origins and Destinations



A geospatial analysis of higher concentrations of potential service destinations for rural and transit dependent populations was completed to further identify service gaps. The list of destinations was created using InfoUSA employment data that indicated the locations of businesses by North American Industrial Classification System (NAICS) codes, pulling out businesses that fell into several broad categories including: 621XXXX – Ambulatory Care centers (such as doctors' offices, outpatient centers, kidney dialysis centers, etc.), 622XXXX – Hospitals, 623XXXX – Nursing and Other Care centers, and 624XXXX – Social Services. Figure 4-11 presents the results of this analysis. Service provider destinations are overwhelmingly concentrated in Central and Southeast Shreveport, with smaller concentrations located near the intersections of Benton Road and Interstate 220, Interstate 20 and the Inner Loop (3132), and Bert Kouns Industrial Loop and Mansfield Road.

Figure 4-11: Service Provider Destinations



Bicycle and Pedestrian Needs Assessment

A truly multimodal transportation system provides safe and efficient travel options for all modes of transportation, including active transportation options such as bicycling and walking. In order to ensure that these modes are a viable alternative for the region's residents it is important to first have a clear understanding of current bicycling and pedestrian conditions in the region and to identify areas with opportunities for improvement. To this end, an assessment of the region's current bicycling and pedestrian conditions was undertaken for this

plan two ways: by soliciting feedback from stakeholders in the active transportation community and the public through visioning workshops and an online survey; and by evaluating bicycling and pedestrian conditions at 150 randomly chosen locations throughout the region representing diverse area types (urban, suburban, rural, etc.) and a wide range of street types (major arterials, neighborhood streets, etc.).

Visioning Workshops

To kick off the development of the 2040 LRTP and cultivate a vision to guide the long range transportation planning process, a series of five public visioning workshops were conducted between September and October 2014. Participants of these workshops cited the need for better bicycle and pedestrian connections between Shreveport and Bossier City and discussed the potential for the presence of bicycle and pedestrian infrastructure to drive redevelopment in north Shreveport. In addition to on-system bicycle and pedestrian improvements, participants also voiced approval for expanded trail and greenway options, citing North Bossier Park as a good example. The Red River Greenway was described by participants as being too narrow to serve both recreational users and those that use the greenway to travel between destinations. Participants noted that greater bicycle connections to and from the greenway would make it more viable for commuting.

NLCOG Listens Bicycle/ Pedestrian Survey

To supplement the feedback gathered during the Visioning Workshops, the public, along with stakeholders in the active transportation community, were invited to participate in an online survey concerning bicycling and pedestrian conditions in the region. 152 respondents participated in the NLCOG Listens Bicycle and Pedestrian Survey, and some key findings are listed on this page. The full results of the survey can be found in the Technical Supplement.

- After motor vehicles, respondents rated bicycling as the second most important mode of transportation for their personal needs. Walking was ranked as the third most important, ahead of vanpool/carpool, "other," and bus.
- Participants were asked to rank the relative importance of a selection of transportation investments across all modes. Among the nine choices provided, the most important investment as ranked by the participants was, "expand the bicycle and trail network," followed by, "repair and maintain existing roads" and "expand the sidewalk network."
- 93% of respondents indicated that the condition and usability of the region's bicycle and pedestrian infrastructure was either "Poor" or "Below Average."
- Respondents were asked to provide the primary reasons preventing them from bicycling or walking for either transportation or leisure. The top response was "Safety concerns," followed by "availability and connectivity of bicycle/pedestrian facilities" and "weather." Other top responses included "time," "condition of the facility," and "distance."
- 51% of participants characterized motorist attitudes towards bicyclists and pedestrians as "generally negative" or "always negative," while only 22% characterized attitudes as either "generally positive" or "always positive." 20% of respondents characterized attitudes towards bicyclists and pedestrians as "neutral."
- 97% of respondents supported the inclusion of bicycle facilities and sidewalks in all roadway projects.

Bicycling Assessment

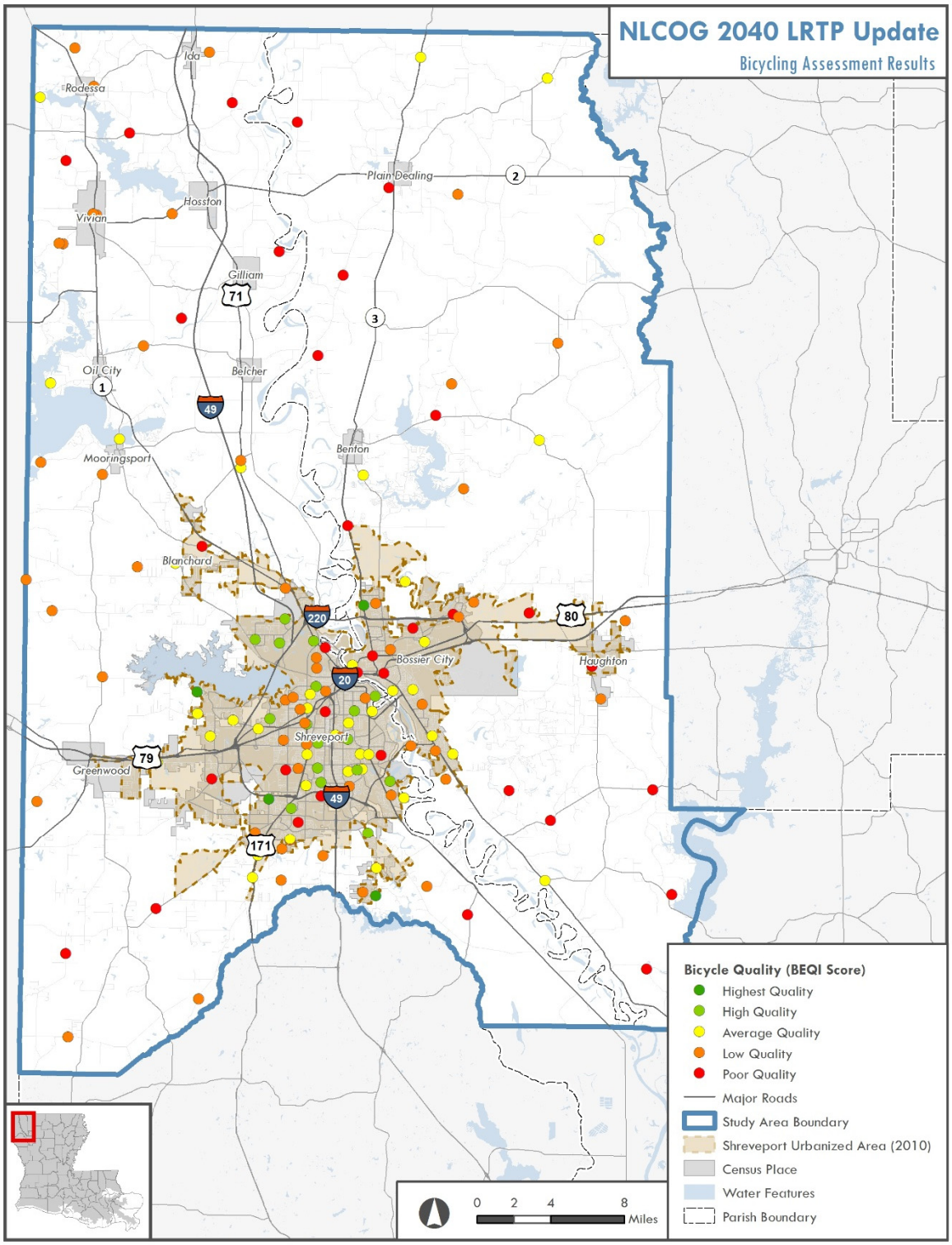
In addition to the public feedback gathered through the Visioning Workshops and NLCOG Listens Bicycling and Pedestrian Survey, a systematic evaluation of bicycling conditions in the region was undertaken to understand the physical condition of the bicycling environment in the region. The assessment utilized evaluation criteria adopted from the Bicycle Environmental Quality Index (BEQI) [1], a planning tool developed by the San Francisco Department of Public Health that allows planners to assign a bicycling suitability score to locations on the street network based on environmental variables that either enhance or detract from favorable bicycling conditions. The BEQI utilizes a combination of qualitative and quantitative indicators related to street and intersection design, safety, traffic, and adjacent land use to assign an overall BEQI score to the chosen locations. These locations are then categorized by the quality of bicycling conditions as either highest, high, average, low, or poor quality. The rating system was applied to 150 randomly chosen locations throughout the NLCOG region in order to acquire a high-level characterization of bicycling conditions in the region. Figure 4-12 shows the results of the bicycling assessment, including the geographic distribution of BEQI scores for the chosen locations.

Results from the bicycling assessment indicate that the regional transportation network offers average to below average bicycling conditions overall, with 90 of the 150 (60%) sampled locations returning a "Low Quality" or "Poor Quality" rating. A "Low Quality" rating, according to the BEQI methodology, signifies that there are "minimal bicycling conditions" present at a given location, while "Poor Quality" rating indicates that "bicycling conditions (are) absent." Conditions that detract from the bicycling environment that were frequently observed include a lack of bike lanes or other dedicated facilities and high posted speed limits, especially on rural roads. Conversely, conditions that were observed that promote the bicycling environment include a lack of significant elevation changes, smooth pavement, and abundant tree cover. Locations that received a "High Quality" or "Highest Quality" rating were generally located in the more urbanized locations of the region, especially in Shreveport and Bossier City.

While this assessment includes a relatively small sample size of roads in the region, the results suggest that there are a number of deficiencies in the regional transportation system that result in below average bicycling conditions. A lack of dedicated bicycling facilities, especially on roads with high speed limits, creates a real and perceived safety hazard and likely discourages many potential bicyclists from riding on the region's roads. This sentiment was confirmed through the feedback gathered from NLCOG Listens survey.

[1] More information on the BEQI methodology can be found at following link:
http://www.sfhealthequity.org/component/jdownloads/finish/19-beqi/91-bicycle-environmental-quality-index-report/0?Itemid=62

Figure 4-12: Bicycling Assessment Results



Pedestrian Assessment

Pedestrian conditions were assessed using evaluation criteria adopted from the Pedestrian Environmental Quality Index (PEQI)[2], which was also developed by the San Francisco Department of Public Health. Similar to the BEQI, the PEQI utilizes a combination of qualitative and quantitative indicators to assign an overall score representing the quality of the pedestrian environment for individual locations. Factors that are included in the rating system include the quality/completeness of sidewalks, presence or absence of traffic calming features or crosswalks, and presence of other pedestrian amenities such as public seating and lighting, among others.

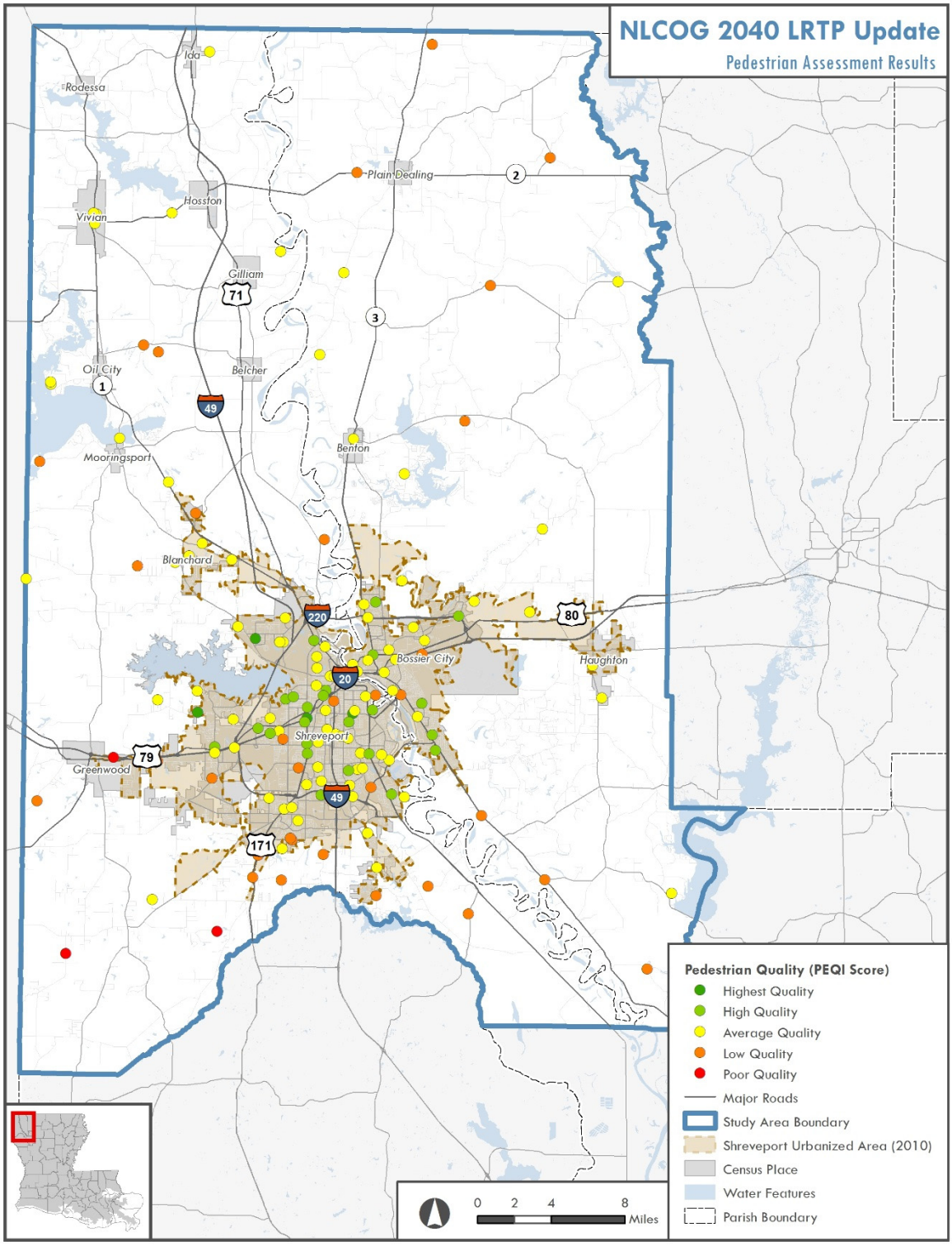
The PEQI rating system was applied to 150 randomly chosen locations throughout the NLCOG region in order to acquire a high-level characterization of pedestrian condition. Figure 4-13 shows the results of the pedestrian assessment, including the geographic distribution of PEQI scores for the chosen locations.

Results from the pedestrian assessment suggest that in general, the regional transportation system provides average conditions for pedestrians. In fact, 84 of the 150 (56%) observed locations returned a rating of "Average," defined by the PEQI methodology as, "pedestrian conditions present but room for improvement." Conditions that detract from the pedestrian environment that were frequently observed include missing, incomplete or damaged sidewalks and a lack of traffic calming features and crosswalks at intersections. Conditions that were observed that enhance the quality of the pedestrian environment include abundant tree coverage (i.e. shade), low levels of litter and graffiti, and adequate street lighting. Pedestrian conditions characterized as "High Quality" or "Highest Quality" tended to appear more frequently in the more urbanized areas of the region, which were more likely to include safety features such as crosswalks.

The results of this analysis suggest that there are a number of opportunities to improve pedestrian conditions on the transportation system. While missing or incomplete sidewalks pose a major challenge for the region's transportation system, results of the NLCOG Listens survey suggested the presence of latent demand for walking as a viable transportation alternative for many residents.

[2] More information on the PEQI methodology can be found at following link: http://www.sfhealthequity.org/component/jdownloads/finish/20-peqi/104-pedestrian-environmental-quality-index-peqi-an-assessment-of-the-physical-condition-of-streets-and-intersections/0?Itemid=62

Figure 4-13: Pedestrian Assessment Results



Safety Needs Assessment

Moving Ahead for Progress in the 21st Century (MAP-21) requires that long-range transportation plans support national performance goals in seven areas, including safety. "Safety" in transportation planning refers to the mitigation of traffic crashes, transit accidents, and other unintentional events resulting in fatalities, injuries, or loss of property on the transportation network. MAP-21 includes a national safety goal "to achieve a significant reduction in traffic fatalities and serious injuries on all public roads." This LTRP will promote safety in Bossier and Caddo Parishes by documenting current conditions and identifying the highest priority locations for safety improvements. In addition to using crash data collected by LADOTD, responses from the public and local stakeholders were gathered to capture a complete picture of safety in the MPO planning area for all users.

Crash Analysis

Crash records from LADOTD were analyzed to identify opportunities to improve safety throughout the system, at specific intersections, and on certain segments of the roadway. There were 84,174 crashes that occurred in Bossier and Caddo Parishes between 2008 and 2013; however, approximately 16 percent of the crashes had incomplete location data and were excluded from the analysis. Table 4-8 shows the final number of crashes used in the analysis to identify trends in crash conditions and locations.

Table 4-8: Crashes by Parish (2008-2013)

Parish	Crashes
Bossier	22,681
Caddo	48,140
Total	**70,821**

Source: LADOTD

Regional Trends

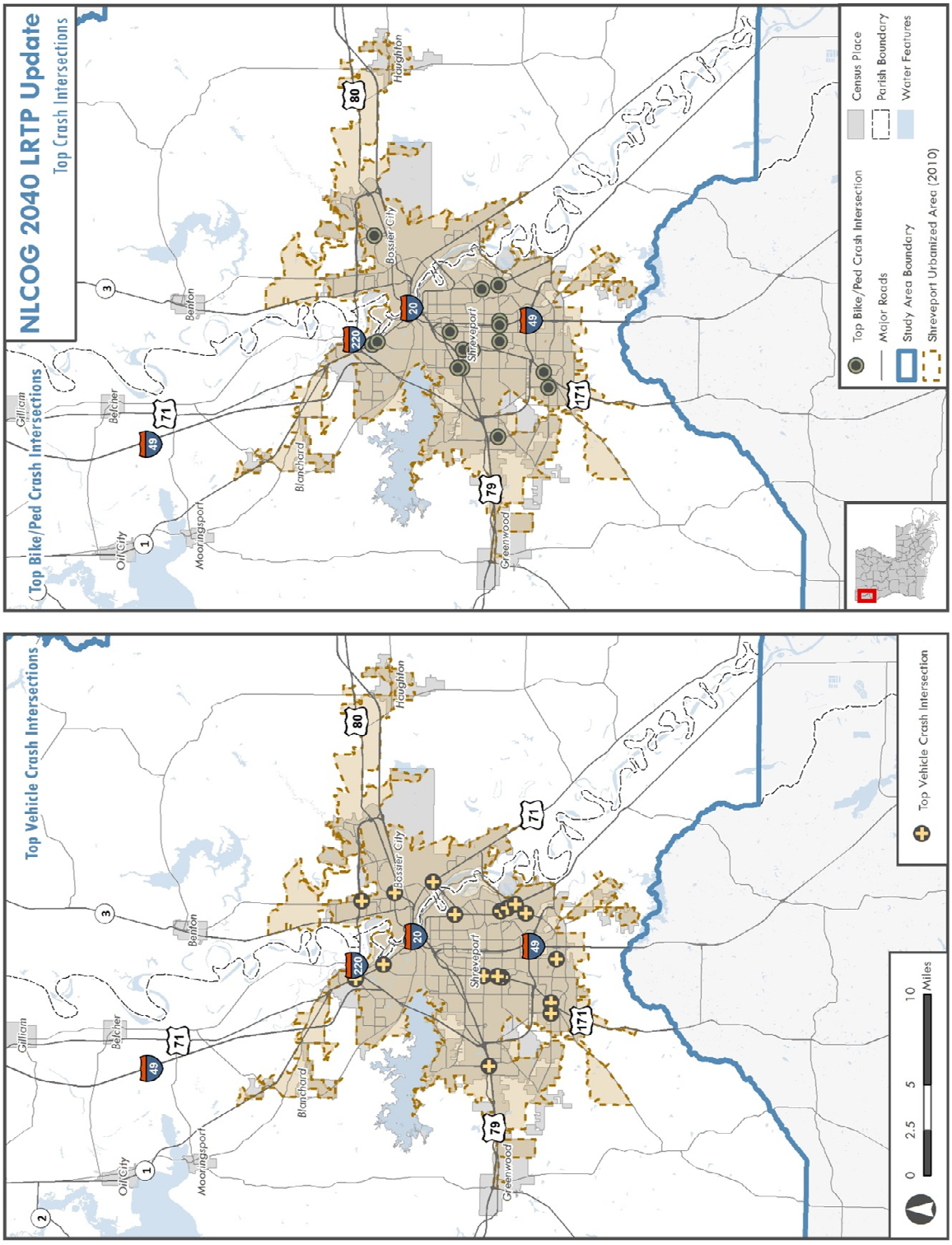
Over 70% of crashes resulted in no injury and less than 0.5% resulted in a fatality. Most crashes in Bossier and Caddo Parishes between 2008 and 2013 occurred during daylight hours, from 7 AM to 7 PM, with the highest percentages of crashes occurring between 3 PM and 5 PM. The increase during this period could be caused by inadequate congestion management, as the number of drivers on the road increases throughout the day through the afternoon commute. The majority of crashes occurred within 100 feet of an intersection, including vehicles turning without sufficient space, disobeying traffic signals, or not allowing sufficient stopping distance for red lights. Data suggest that drivers are not allowing sufficient stopping distance at intersections and on congested segments of the roadway, as rear end collisions were the most common crash type observed. Over one-third of all crashes were rear end collisions.

Crash Locations

The intersections and road segments with the highest number of crashes from 2008 to 2013 were identified in this analysis to guide safety improvement prioritization. The analysis explored crashes for both vehicular and non-motorized transportation. Figure 4-14 shows the highest frequency intersections for vehicle crashes in the MPO planning area as well as the highest frequency locations for crashes involving bicycles and/or pedestrians.

For a full summary of the results of the crash analysis, including detailed tables and maps of crash locations, refer to the Technical Supplement.

Figure 4-14: Top Crash Locations (2008-2013)



Security Needs Assessment

The following regional security needs were identified from stakeholder interviews and review of regional plans:

- Few bridges are available to cross the Red River;
- Cyber Innovation Center and Air Force Global Strike Command may become targets;
- Both exit gates for Barksdale residents are located adjacent to railroad crossings;
- Insufficient budget to implement desired Transportation System Management & Operations (TSM&O) improvements, including variable signage; and
- Four evacuation routes converge on MPO planning area.

Transportation Systems Management and Operations Needs Assessment

In addition to reviewing relevant planning documents that address Transportation System Maintenance and Operation (TSM&O), stakeholders with knowledge of TSM&O activities in the Shreveport-Bossier City area were interviewed to identify operational and maintenance needs in the region. The list of stakeholders interviewed can be found in Table 4-9.

Stakeholder Feedback

Local

In the past few years, the Shreveport Traffic Engineering department has upgraded 30 percent of the 1970s era traffic signals to modern ITS standards, prioritizing intersections with the highest travel demand. As part of the upgrade, limited signal pre-emption has been made available to emergency vehicles near major hospitals. A study conducted to analyze TSM&O needs identified $85 million in unfunded needs in Shreveport alone, mostly for further traffic signal modernizations and variable message signs. The Shreveport Traffic Engineering Department expressed a need to identify TSM&O approaches to address key congestion hotspots, particularly: LA-1, LA-526 (Bert Kouns Industrial Loop), and US Hwy 171 (Mansfield Road). Stakeholders identified financial constraints as one of the primary challenges to implementing TSM&O strategies in the region.

Table 4-9: TSM&O Stakeholders

Stakeholder	Title	Organization
Kirk Gallien	Deputy Assistant Secretary of Operations	Louisiana Department of Transportation and Development (LADOTD)
Ian Snellgrove	Manager	Bossier Parish Homeland Security & Emergency Preparedness
David North	District 4 Administrator	Louisiana Department of Transportation and Development (LADOTD)
Stephen Glascock	ITS Director	Louisiana Department of Transportation and Development (LADOTD)
Michael Erlund	City Traffic Engineer	Shreveport Department of Traffic Engineering
Alan Bright	Assistant General Manager	SporTran
Kevin Oliver	Safety and Security Manager	SporTran
Cheryl McEntyre	Assistant Director	Bossier Parish EMS

State

At the State level, LADOTD operates a regional Traffic Management Center (TMC) 10-11 hours a day to monitor traffic on major arteries in the Shreveport-Bossier City area. The primary LADOTD office in Baton Rouge monitors traffic in the Shreveport-Bossier City area when the local TMC is unstaffed. The TMC coordinates motorist assistant patrols and helps local emergency management personnel respond to incidents on the transportation network. Echoing the concerns of local stakeholders, state officials identified funding as a critical roadblock to implementing TSM&O strategies in Shreveport-Bossier City and throughout the state. As required, LADOTD works closely with FHWA to identify operations and maintenance funding sources for ITS infrastructure.

Transit

SporTran has made recent improvements to its transit service that contribute to TSM&O implementation in the Shreveport-Bossier City area. The agency has installed real-time GPS tracking to its buses to improve the accuracy of wait time estimates for transit users, as well as to help the agency gather data on its operations so it can optimize and streamline transit functions as needed. Further improvements to technology – including mobile ticketing, Wi-Fi on buses, and real-time travel data displays at key transit stops – will help the agency improve operations and expand ridership.

Source: Wikimedia Commons

Freight Needs Assessment

A healthy transportation system not only moves people using roads, public transit, and non-motorized transportation, but it also moves goods efficiently throughout the region. Intermodal transportation facilities are key to economic success and quality of life in the NLCOG study area. This section discusses the current state of intermodal freight transportation in the region.

The majority of freight movement into and within the Northwest Louisiana area is performed by heavy trucks, which is a trend that is consistent with the rest of the state of Louisiana and much of the country. As such, efficient freight movement by truck is essential to the region and the state. In addition to truck traffic, rail and air transportation play a role in regional freight mobility.

Regional Freight Activity Centers

Numerous freight generators and activity centers operate in the study area. Those inventoried as part of the LRTP update process are listed in Table 4-10 and shown in Figure 4-15. These facilities are primarily concentrated in Caddo Parish along Bert Kouns Industrial Loop between Buncombe Rd and I-20, near the Red River, and along I-20 in central Bossier City.

Freight Needs Identification

Congested Roadways

While congestion on the roadway network can be detrimental to all users, it is particularly harmful to freight traffic as increased travel times may lead to higher costs of goods or decreased likelihood that companies choose to locate facilities in the region. Therefore, roadway segments in the study area were analyzed in terms of freight congestion looking in particular at the relationship between volume-to-capacity (V/C) ratios and several other performance measures. For the purpose of this plan, a freight corridor is considered any roadway segment with a percentage of freight

activity that is greater than or equal to the average percentage of freight for the time period being analyzed. Figure 4-16 shows freight congestion throughout the region. More analysis of freight congestion trends can be found in the Technical Supplement.

Table 4-10: Regional Freight Activity Centers

1. AAA Cooper Transportation	2. ABF U-Pack Moving
3. Acme Truck Line – Bossier City	4. Acme Truck Line – Greenwood
5. ADS Logistics Co.	6. AFS Logistics
7. Averitt Express	8. Caddo-Bossier Port
9. Central Freight Lines, Inc.	10. Central-Herrin Storage & Transfer Co., Inc.
11. Con-Way Freight	12. FedEx Freight
13. Freight Xperts	14. Hardware Distribution Warehouse
15. Murphy Bonded Warehouse (four locations)	16. Old Dominion Freight Line
17. Plain Dealing Trucking Co.	18. R + L Carriers
19. Red River Intermodal	20. Saia LTL Freight
21. Shreveport Downtown Airport	22. Shreveport Regional Airport

Figure 4-15: Regional Freight Activity Centers

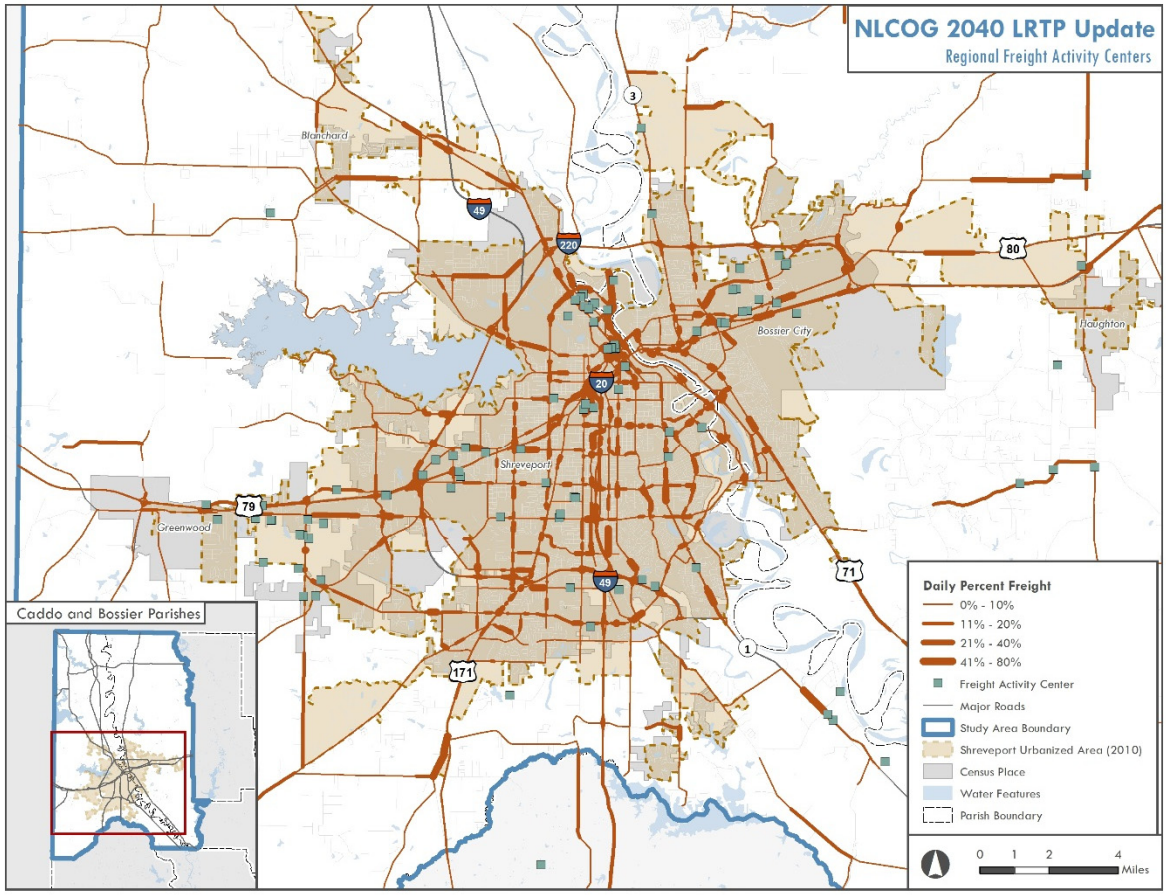
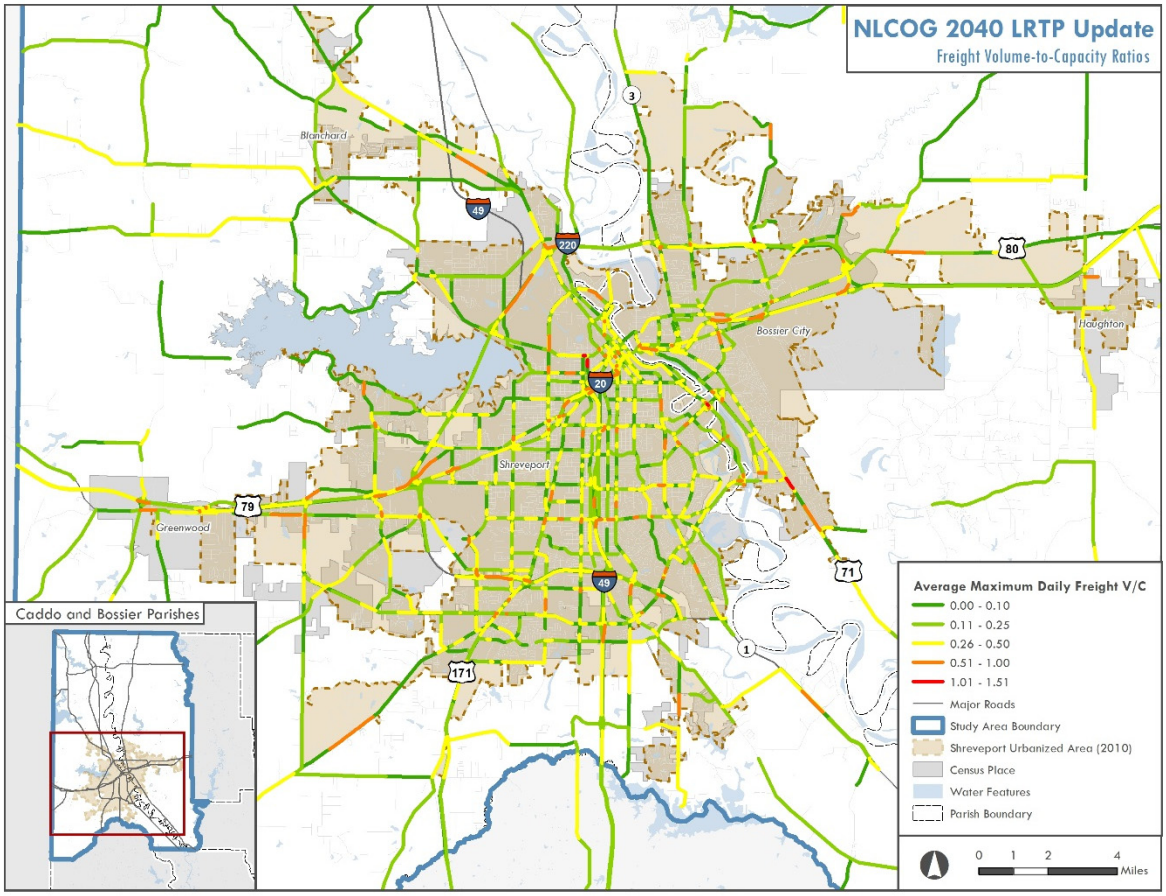


Figure 4-16: Freight V/C Ratio



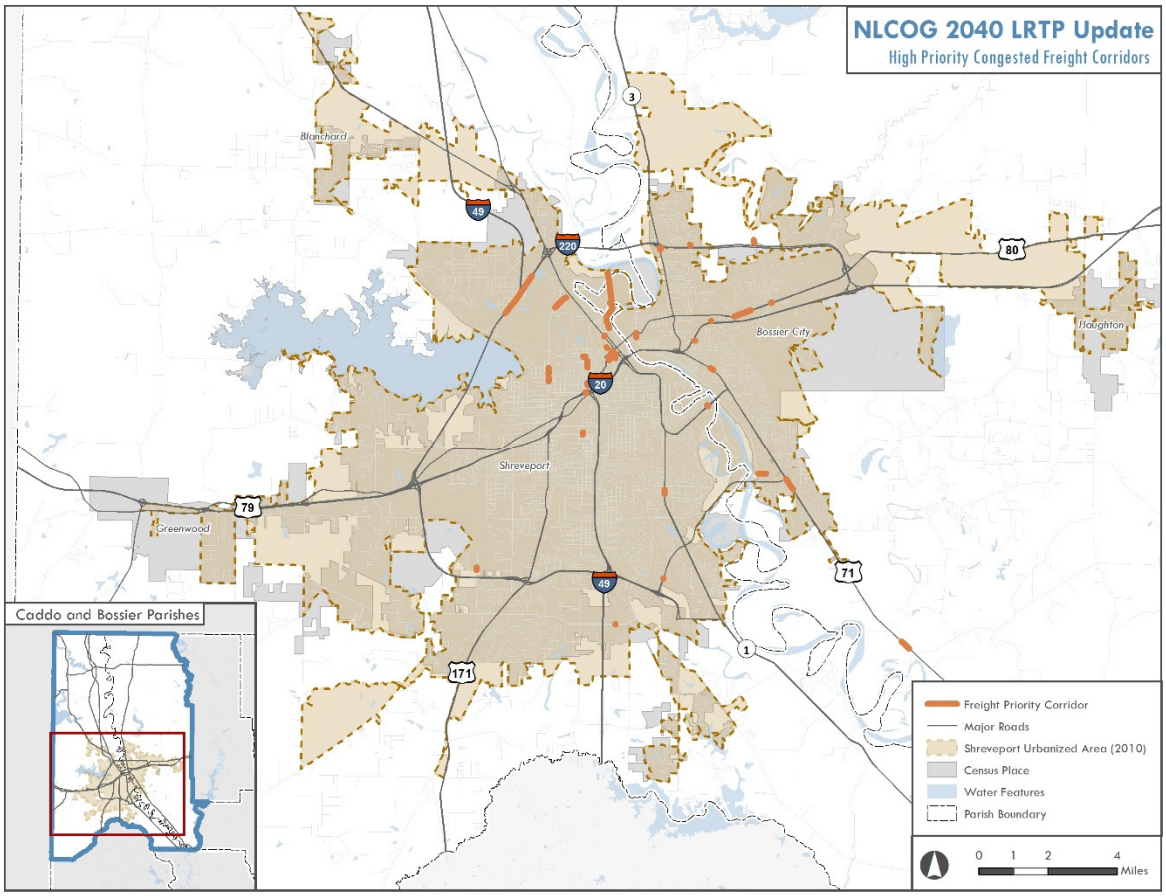
High-Priority Congested Freight Corridors

To aggregate the independent significance of each attribute, congested freight corridors were ranked according to their priority index for both the AM/PM and 24HR time period. The priority index was calculated by normalizing and then weighting the following attributes of each link: Percentage Freight, Maximum V/C Ratio, Average Delay (in minutes per vehicle), Freight Congestion Cost, Freight VHT, and Freight VMT. Table 4-11 and Figure 4-17 provide the top ten corridors for both the AM/PM and 24HR time period determined to be the highest priority freight corridors experiencing congestion. By considering both the degree of congestion as well as the intensity of freight usage, this analysis can help NLCOG's member agencies prioritize projects designed to specifically alleviate impediments to freight movement in the region.

Table 4-11: Freight Congestion Priority Index

Period	Rank	Roadway	*Priority Weight:* 12.5%	*40%*	*10%*	*12.5%*	*12.5%*	*12.5%*	Index
			% Freight	V/C Ratio	Avg. Delay	FCC	Freight VHT	Freight VMT	
AM/PM	1	LA 72 E/Old Minden Rd at I-20 Ramp	43%	0.61	2.1	$12,160	605.8	23,055	1.6
	2	US 71 /Barksdale Blvd (NB) at Garden	41%	0.55	1.6	$3,510	546.5	21,821	1.5
	3	LA 72/Traffic St at US 80/E Texas St	74%	0.34	0.8	$3,672	439.2	24,979	1.4
	4	Swan Lake Rd (NB) near I-220 Ramp	6%	1.82	0.5	$131	4.6	14	1.4
	5	Linwood Ave (SB) btw I-49 & I-20 Ramps	53%	0.61	0.9	$6,528	316	11,923	1.4
	6	Clyde Fant Memorial Pkwy (SB) at LA 3032	10%	1.69	0.3	$250	9.7	98	1.4
	7	LA 72/Traffic St btw Wilhelmina & Broadway	72%	0.28	0.5	$742	401.4	23,817	1.3
	8	Allen Ave btw Garden & Anna	4%	1.49	0.7	$56	7.8	208	1.3
	9	LA 3094/Hearne Ave (SB) btw Milam & Anna	15%	1.54	0.1	$29	0.9	5	1.3
	10	LA 173/Ford St (WB) btw Pierre and Hamilton	13%	1.37	0.3	$1,127	39.6	433	1.3
24HR	1	LA 72 E/Old Minden Rd at I-20 Ramp	40%	0.44	2.1	$14,034	991.7	45,865	1.6
	2	US 71 /Barksdale Blvd (NB) at Garden	42%	0.4	2	$4,039	938.7	46,229	1.5
	3	LA 72/Traffic St at US 80/E Texas St	73%	0.23	0.9	$4,003	754.1	46,403	1.4
	4	Swan Lake Rd (NB)	6%	1.51	0.5	$158	7.1	39	1.4
	5	LA 72/Traffic St btw Wilhelmina & Broadway	73%	0.2	0.7	$832	735.7	46,738	1.4
	6	Linwood Ave (SB) btw I-49 & I-20 Ramps	50%	0.41	1.0	$7,186	480.7	22,182	1.4
	7	Linwood Ave (NB) btw I-49 & I-20 Ramps	50%	0.39	1.0	$2,109	456.6	22,135	1.3
	8	Edward St btw Milam and Crockett	58%	0.19	0.5	$1,895	599.5	38,986	1.3
	9	Clyde Fant Memorial Pkwy (SB) at LA 3032	10%	1.15	0.2	$283	12.5	180	1.3
	10	LA 173/Ford St (WB) btw Pierre and Hamilton	12%	1.02	0.3	$1,342	56.9	931	1.3

Figure 4-17: High Priority Congested Freight Corridors



Crash Hot Spots

Highways and railroads account for nearly all fatalities and injuries involving freight transportation. Most of these fatalities involve individuals outside the freight transportation industry, such as trespassers at railroad facilities and occupants of other vehicles killed in crashes involving large trucks. According to FHWA, approximately 12% of all highway related fatalities in 2012 involved large trucks; however, freight-related fatalities have largely remained stable or declined despite an increase in freight activity in recent decades.

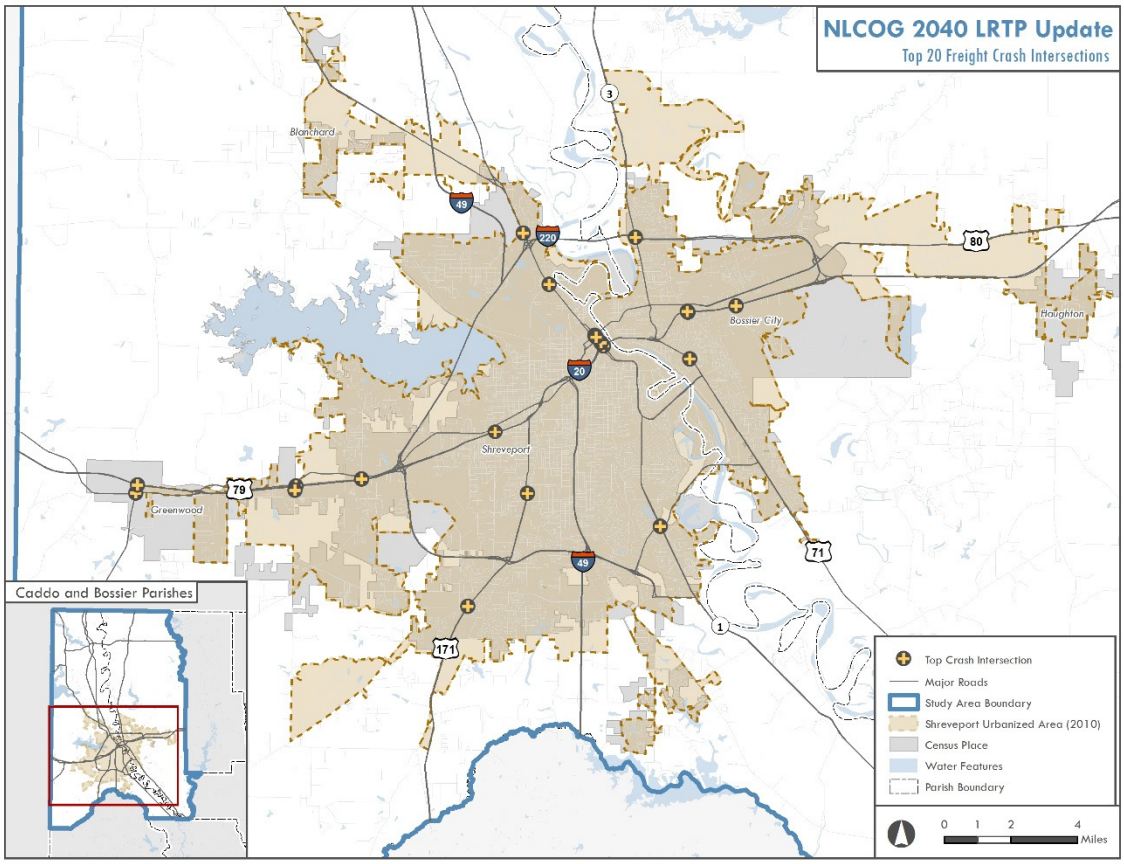
Because the overwhelming majority of freight transportation in the study area is conducted by truck, crash data was analyzed specifically for truck/commercial vehicle crashes to evaluate the location and nature of crashes involving these vehicles. Table 4-12 provides the total number of truck crashes by parish, while Figure 4-18 shows the top 20 truck crash locations in the entire study area.

Table 4-12: Total Truck/Commercial Vehicle Crashes by Parish (2008-2013)

Parish	Crashes
Bossier	747
Caddo	1,672
Total	**2,419**

Source: LADOTD

Figure 4-18: Top 20 Freight Crash Locations (Study Area)



The majority of crashes involving trucks occur along Interstate or U.S. Highways in the study area, although a significant number of Bossier Parish's top 20 crash sites are located along Airline Drive.

Source: Wikimedia Commons

Stakeholder Feedback

Freight stakeholders were identified as part of an outreach effort to gather input from a sample of regional freight, port, airport, and rail carriers regarding current and future needs of the multi-modal transportation system in Bossier and Caddo parishes, as well as to identify areas for coordination. The LRTP addresses both the maintenance of the existing system and the expansion of the system to meet future needs.

Stakeholders were sent a list of questions regarding freight movement and congestion concerns specific to freight as part of the outreach. Stakeholders agreed that infrastructure constraints affect the movement of their freight and explained that summer months tend to be worse. Stakeholders also identified the I-220 bypass as a problem location for freight congestion and cited poor East-West movement on I-20 as a concern.

Interregional Passenger Transportation

An increasingly globalized economy and interconnected world raises the demand for business and personal interaction, which is often characterized by the need or desire to travel outside of the immediate area. Such interregional travel can be accomplished by several different transportation modes, such as intercity bus or airplane. The following subsections provide an overview of interregional travel options available to NLCOG area residents.

Existing Conditions and Facilities

Bus Facilities

Greyhound serves this area through its station in downtown Shreveport. Numerous bus routes provide direct travel to various locations including Baton Rouge, New Orleans, Dallas, Houston, Texarkana, and many more.

Rail Facilities

Amtrak does not currently offer passenger rail service in the MPO study area. However, it does provide Thruway Connecting Service from both the Shreveport Greyhound station and the Shreveport Airport bus stop. Thruway provides connecting bus service directly to the Longview, TX and Jackson, MS Amtrak stations, and stops along the Texas Eagle and City of New Orleans trail routes, respectively.

Additionally, NLCOG commissioned a passenger rail feasibility study to assess the potential for introducing passenger rail service in the study area. This study was completed in July 2015 and focused mainly on the corridor between Shreveport and Vicksburg, MS, though it also considered the potential for connecting that corridor to both Dallas/Ft. Worth, TX and Meridian, MS. Study results indicate Shreveport to Vicksburg service could draw around 81,500 annual riders and generate $1.35 million in annual revenue from ticket sales. Integrating this service into a larger corridor could make it more attractive and increase its feasibility for implementation, but additional study is required. The final report is available on the NLCOG Listens website.

Air Facilities

The Shreveport Regional Airport provides direct passenger service to Las Vegas, Dallas/Fort Worth, Atlanta, Denver, Houston, and seasonally to Orlando/Sanford through the four airlines that use the airport as a small hub: Allegiant, American, Delta, and United Airlines. Additionally, one-stop service through one of the cities listed above connects passengers to almost 250 other domestic and international destinations.

Future Needs

During the visioning process, described in Chapter 3, stakeholders identified the difficulty of reaching destinations outside the MPO study area as an issue. They indicated the need for expanded services at the Shreveport Regional Airport including more direct flight destinations, lower fares, and more transportation options to and from the airport. Additionally, a precision landing system at the Shreveport downtown airport would allow for an increased number of flights to this airport, which has been primarily used as a general aviation and reliever airport to Shreveport Regional since that airport was constructed. Furthermore, stakeholders expressed the desire for Amtrak rail services to Dallas and east of the region – a need already under consideration through the North Louisiana Passenger Rail Study. Strategies to address these, and the other needs identified throughout this chapter, are discussed in Chapter 5.

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5 | TRANSPORTATION STRATEGIES

This chapter provides a description of the process used to develop a fiscally unconstrained plan for meeting the transportation needs of the community. Given the limited availability of funding to meet all of the needs identified in the Needs Identification chapter, both "build" and "no-build" strategies to address unmet needs are considered in the unconstrained plan. Applying fiscal constraints to the process and creating a financially constrained plan are described in Chapter 7.

No-Build Strategies for Addressing Unmet Needs

It is virtually impossible to build added capacity projects to address every need identified in the region. This is the case not only because of funding constraints, but also because some identified needs are best met through the adoption of "no-build" strategies. Therefore, the LRTP planning process included the consideration of no-build strategies – such as alternative growth scenario planning, travel demand management, and transportation system management and operations– in addition to facility construction projects.

Scenario Planning

The goal of scenario based planning is to provide policy makers, stakeholders, and interested parties – including the general public – with an understanding of the interaction between land use and transportation decisions. This practice helps to catalog the choices and tools available to the community to help realize an ultimate vision for the study area that incorporates a broad spectrum of regional goals. For the 2040 LRTP, scenario planning was accomplished through utilization of the travel demand model, which was used to test the outcomes of different potential land use and transportation improvement scenarios. The travel demand model produced a number of performance measures for each scenario that were compared to both the 2010 Base Year scenario and also to each other to forecast a conceptual picture of the possible conditions of the regional transportation network under different circumstances. These performance measures include vehicle miles traveled (VMT), vehicle hours traveled (VHT), average speed, total regional daily delay for the highway and arterial networks, and average regional congestion index (a measure of regional traffic density).

Regional measures of VMT, VHT, and delay quantify the total number of vehicle miles or hours traveled or the total vehicle delay (in vehicle-hours) in the region for an entire day (24 hours). The combination of the various measures provide insight into how the transportation system will perform under each scenario and allow decision-makers and stakeholders to compare alternative policy decisions related to the interaction of transportation and land use.

Alternative Growth Scenarios

Communities benefit when decisions about transportation and land use are made with the other in mind. Land use factors such as density, regional accessibility, and mix of land uses affect travel behavior, including how many trips people make, how far they travel, the mode they choose, and the way they get from Point A to Point B. Conversely, transportation infrastructure impacts land use demand, choices, and patterns. Compact development with a mix of land uses and a well-connected street network, including facilities for walking or biking, provides more transportation choices and may reduce the need for costly investments in larger scale transportation infrastructure. To better understand how land use policies that encourage certain land use patterns might improve the performance of the transportation system and reduce the need for investment, several growth scenarios were analyzed using the travel demand model, including a Current Growth Trends scenario, a Downtown High Growth scenario, and a Transit Oriented Development (TOD) scenario.

Current Growth Trends

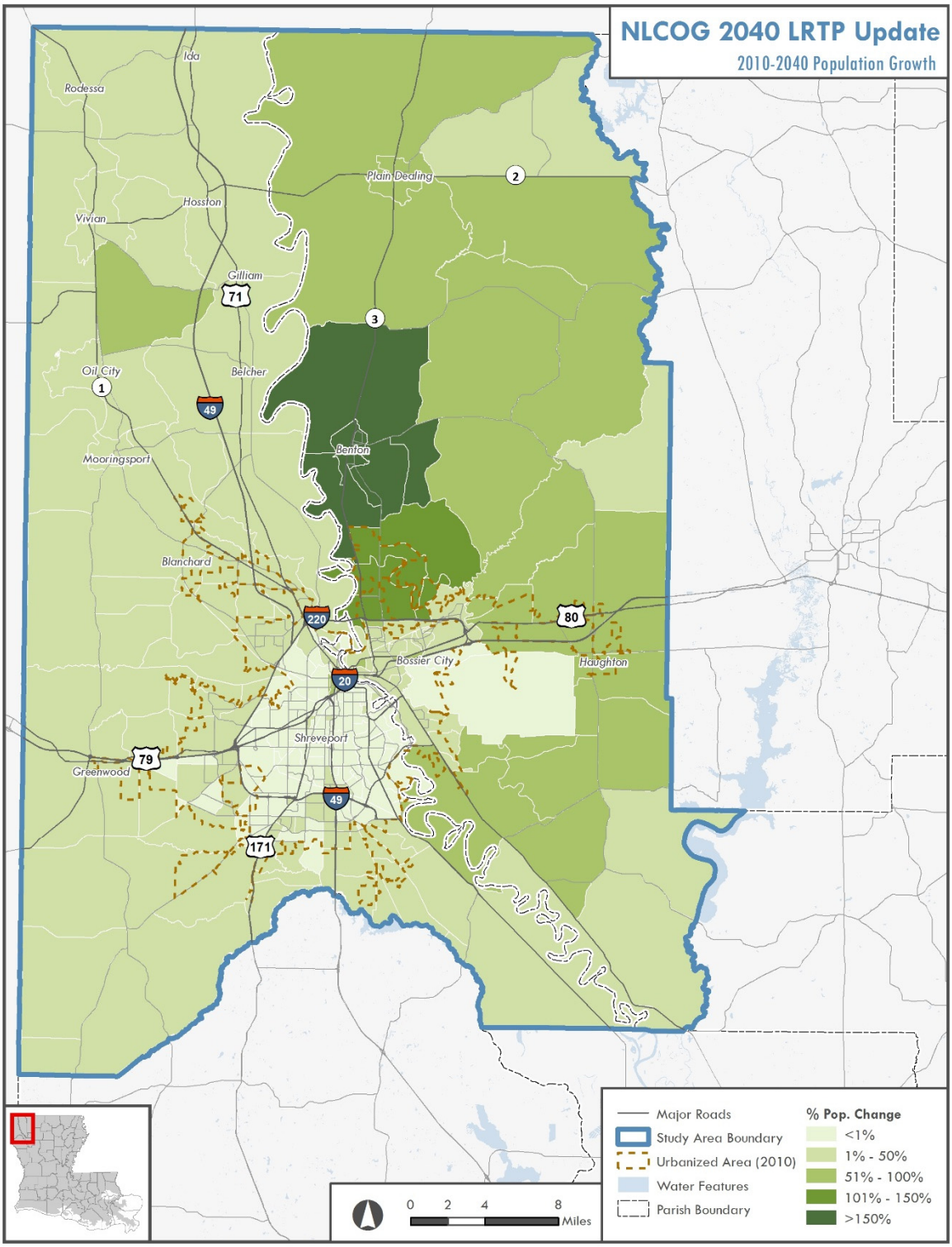
Land use development patterns in Bossier and Caddo Parishes are similar to those in many regions across the nation, with most recent growth occurring outside the city centers in more suburban communities. Land uses outside the central business districts of Shreveport and Bossier City tend to be separated, with residential development concentrated in certain areas and commercial development in others. Development densities also tend to be lower in suburban areas, making public transportation services less viable. As a result of these factors, individuals living or working in these areas tend to be more reliant on a personal vehicle for the majority of their trips. Trip distances also tend to be longer, making it difficult for individuals to walk or bike to complete their daily activities.

Sprawling development pattern typical of growth in Shreveport-Bossier City (Bottom Image: ScientistArtist via Blogspot)

If these development trends continue into the future, new development will continue to occur in previously undeveloped areas, and will likely require the construction of new transportation infrastructure.

Figure 5-1 shows the percent population growth likely to occur in Caddo and Bossier Parishes if current growth trends are maintained.

Figure 5-1: 2010-2040 Population Growth



Smart Growth Alternatives

Smart growth generally refers to the protection and preservation of valuable natural and cultural resources through encouragement of more compact development patterns that optimize use of existing transportation infrastructure. Smart growth development is characterized by higher population and employment densities and a mix of land uses, which increases the viability of public transportation, walking, and biking as transportation modes. Since smart growth principles encourage redevelopment and infill development of existing areas, investment in the transportation system is focused on the maintenance and operation of existing roadway infrastructure and providing safe opportunities to travel by bike or foot, rather than on building costly new roadways in previously undeveloped areas.

Source: BrettVA (via Flickr)

It is important to note that smart growth does not mean building dense high-rise structures or pitting transit or any other modes against highways. Instead, smart growth is about tailoring choices for individual settings. For example, in a suburban or rural community, smart growth may mean building smaller detached homes on smaller lots within walking distance of schools and other amenities. Smart growth encourages the development of a balanced intermodal transportation system that allows for the efficient and economical movement of people and goods. In some areas that may mean more transit, in other areas it may entail roadway improvements.

Source: Steven Maginnis (via Flickr)

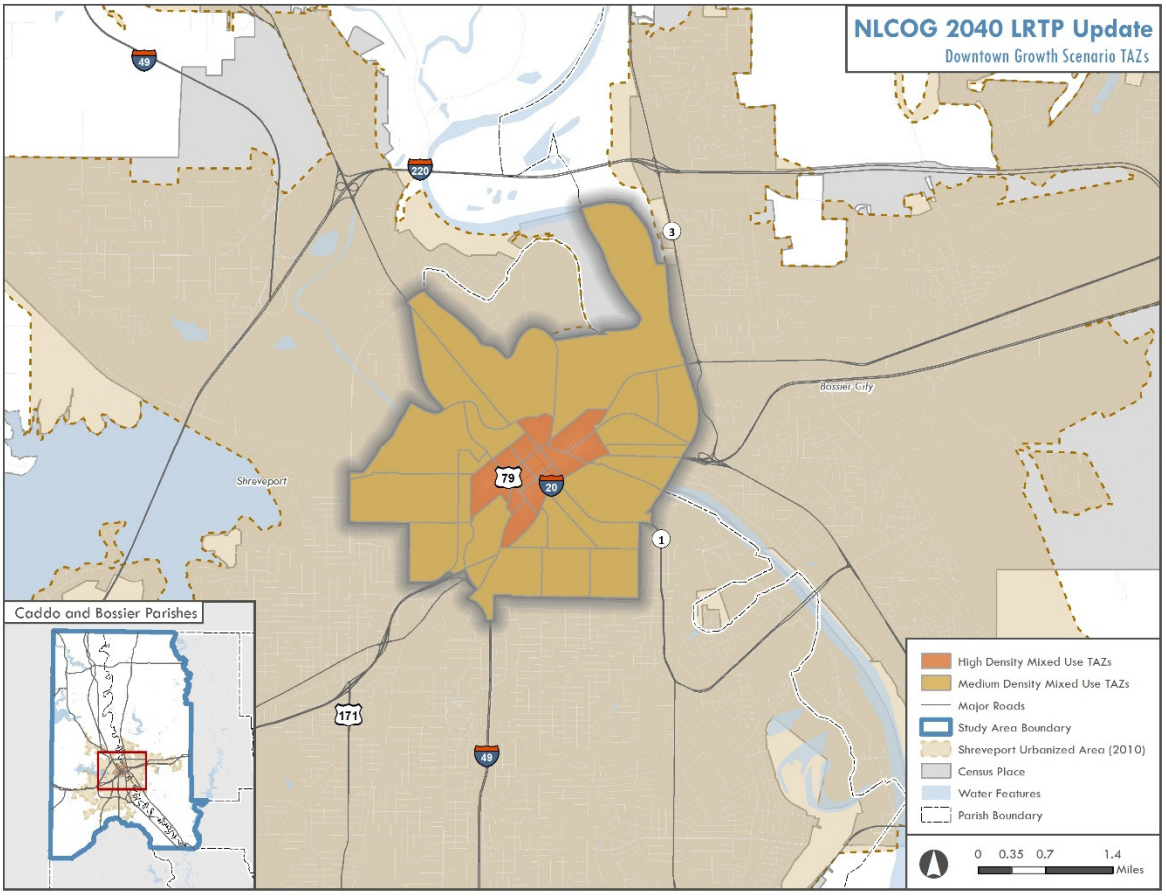
Both the Downtown High Growth and the TOD scenario are based on smart growth principles. The Downtown High Growth scenario assumes higher than anticipated growth in both population and employment in the central business district over the next 25 years, while the TOD scenario assumes higher than anticipated growth along select transit corridors throughout the region. The project team designed and analyzed these scenarios to support multiple goals of this LRTP including:

- Identifying the need for land use policies that steer new development to areas with adequate/underutilized infrastructure; and
- Studying the need for and acceptability of smart growth and infill land use policies.

Downtown High Growth Scenario

In many cities across the nation, the vibrancy that once characterized downtown areas is returning today. Young people and "empty-nesters" are increasingly choosing to live downtown to take advantage of the abundance and proximity of amenities and the ease of getting around without a car. To test the impacts of a downtown high growth scenario on the existing transportation system, the demographic inputs to the travel demand model for the year 2040 were adjusted to reflect higher population and employment densities in select TAZs in the downtown core, which includes parts of both Shreveport and Bossier City. The population and employment in these TAZs was increased to reflect density levels characteristic of "high density mixed use." The population and employment in the TAZs adjacent the central business district was increased to reflect density levels characteristic of "medium density mixed use" to simulate a tapering off of density going out from the core. To ensure the control totals for the NLCOG region remained the same, an across-the-board factor was applied to the remaining TAZs to reduce their population and employment to account for the increased growth in the downtown core. Figure 5-2 shows the TAZs that received increase population and employment densities to produce the Downtown High Growth Scenario.

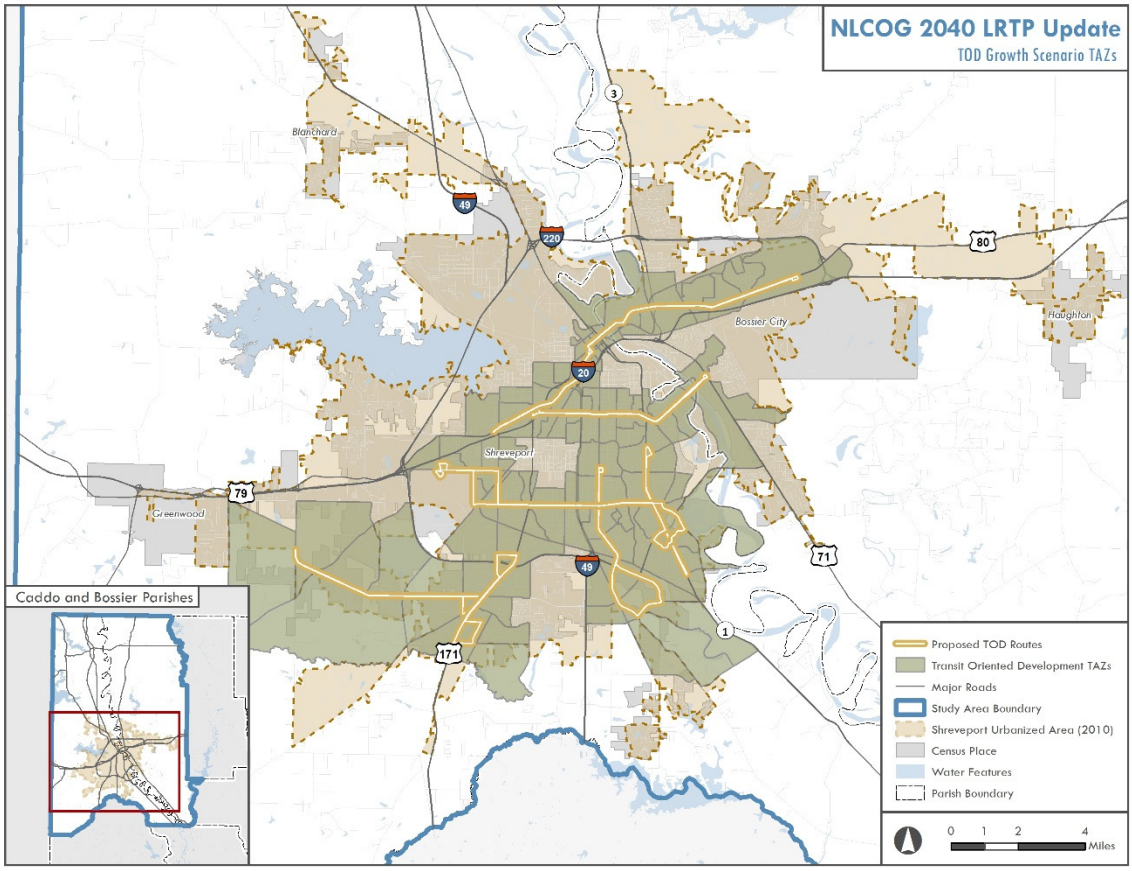
Figure 5-2: Downtown Growth Scenario TAZs



Transit Oriented Development Scenario

Transit-oriented development (TOD) is a type of community development pattern that includes a mixture of housing, office, retail, and/or other amenities integrated into a walkable neighborhood with access to public transportation. This strategy is aimed at providing increased density and a mix of land uses in order to encourage transit ridership, walkability within the site itself, and a reduction in auto dependency. The TOD land use scenario was created to test the effects of this strategy on the transportation system in the NLCOG region. A method similar to that used in the creation of the Downtown High Growth Scenario was employed to create the TOD land use scenario – however, densities were increased for TAZs within close proximity to a hypothetical future transit system rather than in the downtown core. Because this scenario involved TAZs outside the downtown core, a range of employment densities were applied to impacted TAZs to provide more reasonable growth increments to the TAZs with low base year densities – i.e. TAZs with the lowest 2010 employment densities received a lower goal density than those that had higher 2010 employment densities. Figure 5-3 shows the hypothetical future regional transit system and the TAZs selected for increased density[1].

Figure 5-3: TOD Growth Scenario TAZs



[1] *Note that two TAZs were removed from the selection, as they contain Barksdale Air Force Base and Shreveport Regional Airport, whose population and employment densities are unlikely to be significantly influenced by local or regional land use policies.*

Results

Though to varying degrees, under all scenarios, VMT, VHT, and delay measures are expected to increase by 2040, while the regional congestion index is expected to decrease. Additionally, at a regional scale, average speed will change very little under all scenarios. The following sections summarize additional key findings of this analysis; more detailed results can be found in the Technical Supplement.

Current Growth Trends Scenario

By 2040, if land use development patterns remain the same and no transportation improvements are implemented beyond what is already committed, VMT and VHT are expected to increase by 29% and 44%, respectively. Additionally, total regional highway daily delay would increase by 130%, while delay on the arterial network would increase by 154%. This scenario also predicts the least reduction in the regional congestion index at 2.5%. These results indicate that more people will be driving and/or that people will be driving farther, and that, on the whole, trips will take longer. This means more congestion as a result of people driving longer distances to reach destinations that are farther apart and/or to avoid congestion-induced bottlenecks on the transportation system.

Alternative Land Use Scenarios

As described previously, the alternative land use scenarios tested the potential impacts of changes in land use development patterns on the future transportation system. These scenarios did not incorporate any additional transportation improvements beyond those already committed. Both the Downtown High Growth and TOD land use scenarios could support increased efficiencies in the transit system as a result of growth being concentrated in areas where transit service is within walking distance.

The following sections discuss the projected performance of the alternative land use scenarios, while Tables 5-1 and 5-2 provide an overview of the scenario results.

Table 5-1: Percent Difference between 2010 and Future Land Use Scenarios

Scenario Group	VMT	VHT	Average Speed	Total Regional Hwy Daily Delay	Total Regional Arterial Daily Delay	Regional Congestion Index
2010 Base	-	-	-	-	-	-
Current Trends	29.0%	44.1%	-0.1%	130%	154%	-2.5%
Downtown High Growth	27.2%	44.4%	-0.3%	140%	165%	-3.1%
TOD	15.5%	24.6%	-0.3%	112%	64%	-6.9%

Table 5-2: Percent Difference between Current Trends and Alternative Future Land Use Scenarios

Scenario Group	VMT	VHT	Average Speed	Total Regional Hwy Daily Delay	Total Regional Arterial Daily Delay	Regional Congestion Index
Current Trends	-	-	-	-	-	-
Downtown High Growth	-1.37%	0.18%	-0.15%	4.61%	4.26%	-0.58%
TOD	-10.46%	-13.56%	-0.19%	-7.69%	-35.37%	-4.58%

Downtown High Growth Land Use Scenario

The Downtown High Growth land use scenario produced similar results as those predicted for the current trends scenario. Based on TDM forecasts, this scenario would result in the highest increases in the delay measures from 2010 to 2040 predicting an increase in total regional highway daily delay of 140% and an increase in total regional arterial daily delay by 165%. However, the TDM does not account for the potential for people to switch to a non-motorized mode (bicycling or walking) as a result of supportive infrastructure, amenities such as grocery stores, and land uses described in the discussion about smart growth. As such, these results illustrate the potential regional congestion that is possible if growth is concentrated in the central business districts but no infrastructure and amenity improvements are made to support the shift in population density and use of non-motorized travel modes.

Transit Oriented Development Land Use Scenario

Among the alternative land use scenarios, the TOD scenario resulted in the least amount of increase in VMT, VHT, and total regional daily delay as well as the highest reduction to the average regional congestion index between 2010 and 2040. Based on these results, under this scenario total regional daily delay would be almost 8% less for highways and about 35% less for arterials than under the current trends scenario in 2040, while VMT and VHT would be over 10% less and over 13% less, respectively, than under the current trends scenario in 2040.

Multiple factors might contribute to these results: the scenario concentrates growth, but not in one area; it might concentrate the growth in areas with adequate/underutilized roadway capacity; it supports an increase in transit system ridership by concentrating growth within walking distance of transit service; and may result in an increase in intrazonal trips, i.e. trips with an origin and destination within the same TAZ.

Travel Demand Management

Travel demand management (TDM) strategies seek to reduce congestion on existing roadways by reducing the overall number of cars using roads or by redistributing cars away from congested areas and peak periods of travel. Encouraging the use of alternative modes of transportation (such as transit, biking, or walking) and increasing the number of travelers in each vehicle are the primary ways in which TDM strategies reduce single-occupant vehicle demand on existing roadways. Put otherwise, travel demand can be managed by providing travelers with a wide range of choices for reaching their destination.

With fewer funds available to address congestion through new roadway capacity, TDM is a cost effective means to improve the transportation system. TDM strategies are designed to accomplish the following:

- **Improve mobility and accessibility** by expanding and enhancing the range and quality of available travel choices;
- **Reduce congestion and improve system reliability** by decreasing the number of vehicles using the roadway system and by redistributing demand away from peak periods and existing bottlenecks;
- **Increase safety** by addressing congestion, which is generally related to higher occurrences of traffic incidents; and
- **Improve air quality** by reducing the number of vehicle miles traveled, thereby saving energy, and by decreasing the number of short trips that are largely responsible for the proportion of emissions generated from cold starts.

Transit

As revealed through the transit needs assessment performed in Chapter 4, there are several destinations outside the current fixed-route transit network where expanded transit service could be explored as a transportation demand management solution. Louisiana Tech Shreveport and Wiley College, both of which are located in west/southwest Shreveport and both of which have an enrollment greater than 1,000 students, would be well served by transit. Harrah's Horseshoe Casino and Hotel in Bossier Parish employs nearly 2,000 workers and is located outside the transit coverage area. Promise Hospital of Louisiana – Shreveport and its 196 beds are located just outside the service coverage area. Finally, the State of Louisiana Department of Civil Service in Benton with 1,600 employees presents an opportunity to expand service to Benton (which is also the location of the administrative offices of the Bossier Parish School Board) and potentially serve commuters both leaving and coming into the town.

As a parallel effort to the LRTP, NLCOG and SporTran are developing a public transportation master plan that will completely restructure the regional fixed-route transit system, improve efficiency, and increase the frequency of buses on some of the most heavily traveled routes without significantly increasing cost. By increasing frequency along key routes, SporTran can improve the service reliability for individuals using transit to reach destinations, which could lead to higher ridership and overall enhancement of regional mobility without the need for additional roadway capacity. The results of that planning process can be found on the NLCOG Listens website.

Bicycle and Pedestrian

Conversations with local stakeholders and the public revealed a strong desire for improved and expanded pedestrian and bicycling opportunities in the region. Indeed, when given the opportunity to rank the importance of various transportation project evaluation criteria, the public ranked "increased multi-modal options" as their number one criterion. In the needs assessment phase of this plan, however, bicycling conditions in the NLCOG region were generally found to be of low quality, with a lack of bike lanes or other dedicated facilities and high posted speed limits, especially on rural roads. Similarly, pedestrian conditions were found to be of average quality, with missing, incomplete, or damaged sidewalks frequently observed, along with a lack of traffic calming features and crosswalks at intersections.

This section provides an overarching framework for creating a more robust pedestrian and bicycling network over time. This framework includes policy and programmatic recommendations, a strategy for prioritizing and selecting projects, and design guidance for implementing bicycle and pedestrian facilities that will contribute to a safer and more efficient regional active transportation network.

Policy and Program Strategies

This section outlines several policy and programmatic strategies for improving active transportation options in the NLCOG region. Recommended strategies are organized into six broad categories:

- Regional Safety Action Plan
- Regional Pedestrian Bicycle Master Plan
- Complete Streets Policies
- Education and Enforcement
- Engineering and Design
- Monitoring and Evaluation

Strategy 1: Adopt a Regional Safety Action Plan

After "increasing multi-modal options," "improving safety" was rated by the public as the most important criterion by which transportation projects should be evaluated. Similarly, results from the NLCOG Listens online survey show that the top reason for why people don't bike/walk more is, "Safety concerns." These results suggest that addressing traffic safety concerns should be a top priority when seeking to make active transportation options more attractive for potential users in the region.

One strategy that states and cities are using to address traffic safety and reduce fatalities and serious injuries is the adoption of holistic safety action plans. Louisiana's Strategic Highway Safety Plan (SHSP), for example, provides a "comprehensive, multidisciplinary approach to reducing the devastating effects of motor vehicle-related fatalities and injuries on Louisiana roadways."

Included in Louisiana's SHSP is the "Destination Zero Deaths" campaign, which promotes a vision of zero deaths on Louisiana roadways and a specific benchmark of halving traffic fatalities by 2030. This "Vision Zero" movement, as it is known, is being embraced by states and cities across the country. A core tenant of the movement is that all traffic deaths and injuries are preventable and therefore, none are acceptable. In addition, Vision Zero principles support the idea that because people will inevitably make mistakes on the road, the transportation system should be designed in ways that make serious injuries or fatalities less likely.

Adopting a Regional Safety Action Plan guided by Vision Zero principles may improve traffic safety, reduce or eliminate traffic fatalities and serious injuries, and make active transportation options a more viable option for users. While a plan of this type should focus on all road users, it should pay close attention to "vulnerable road users" such as pedestrians and bicyclists who are defenseless in crashes involving a motorized vehicle.

Strategy 2: Adopt a Regional Pedestrian and Bicycle Master Plan

The pedestrian and bicycle element of the NLCOG Long Range Transportation Plan Update provides an overview of existing conditions and offers a framework for incrementally improving active transportation options in the region over time. However, a Regional Pedestrian and Bicycle Master Plan would allow the region to develop an overall vision for its bicycling and pedestrian system, and provide a detailed blueprint, tailored to local conditions, for improving active transportation options in the region. The planning process could also serve as a catalyst for improving engagement and collaboration with the active transportation community.

Strategy 3: Adopt a Regional Complete Streets Policy

Complete Streets policies consider all transportation modes in the planning, design, construction, operation, and maintenance of the transportation system to ensure that streets are safe for people of all ages and abilities, regardless of the mode they choose to use. Adopting a regional Complete Streets policy could promote active transportation options in the region. As of early 2015, fifty-eight regional planning organizations have adopted comprehensive Complete Streets policies in the U.S. The National Complete Streets Coalition has identified ten elements that should be included in a comprehensive Complete Streets Policy. While a regional Complete Streets Policy for the NLCOG study area should be tailored to local goals and objectives, it should integrate these ten elements in order to ensure that it is effective.

Source: Rex Hammock (via Flickr)

Elements of a Complete Streets Policy

Includes a vision for how and why the community wants to complete its streets.

Specifies that 'all users' includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles.

Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.

Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.

Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.

Is adoptable by all agencies to cover all roads.

Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs.

Directs that Complete Streets solutions will complement the context of the community.

Establishes performance standards with measurable outcomes.

Includes specific next steps for implementation of the policy.

Source: National Complete Streets Coalition

Strategy 4: Promote Active Transportation Education and Enforcement

Public education and awareness campaigns are an effective strategy for promoting bicycling and walking as a safe, healthy, and fun means of getting around. Similarly, better enforcement of existing traffic laws – both for motorists and non-motorists – can lead to real and perceived safety improvements that make it easier for people to view bicycling and walking as safe transportation options. This section offers a number of strategies for improving people's perception of bicycling and walking in the region through education and enforcement programs and policies.

Education Strategies

- Offer bicycling skill and safety classes to interested groups, including schools.
- Actively promote or sponsor programs that encourage people to bike or walk to school and work, such as "Bike to School Day" or "Walk to Work Week."
- Implement promotional campaigns to encourage safe travel behavior. Examples include "Share the Road," "Street Smarts," or "Drive Kind, Ride Kind."
- As part of the Regional Pedestrian and Bicycle Master Plan (Strategy 2), develop a Regional Bicycle Map that shows bike routes, key destinations, and resources for bicyclists

Enforcement Strategies

Often times, law enforcement officers receive little or no training on pedestrian and bicycle laws and may be unaware of the safety concerns of these users. While the MPO does not have the authority to change or amend laws, it can serve an educational role in helping raise awareness of existing laws and how they affect vulnerable users such as pedestrians and bicyclists.

Strategy 5: Design and Engineering

This section presents a number of strategies that can be considered related to the design and engineering of pedestrian and bicycle facilities.

- Include design guidance and typical cross sections in the recommended Pedestrian and Bicycle Master Plan to ensure that all pedestrian and bicycle facilities comply with state and national design standards.
- Provide technical guidance to area planners and engineers on traffic control devices such as signs, markings, and traffic signals relevant to the pedestrian and bicycling environment.
- Provide policy guidance to local jurisdictions to ensure that adequate bicycle parking – both short and long-term – is available throughout the region. Policy guidance may also address strategies for promoting locker rooms and showers at the workplace in order to make bicycling a more attractive option for commuters.
- Provide policy guidance on technical training on strategies for improving areas surrounding public transportation stops, including adequate lighting, bicycle racks, accessible sidewalks, and other streetscape features that make public transportation a more attractive option for users.

Strategy 6: Monitoring and Evaluation

A comprehensive evaluation and monitoring program can measure pedestrian and bicycling activity over time in order to measure progress towards the region's active transportation goals and to better understand areas in need of improvement. Regularly collecting bicycle/ pedestrian count data and annual surveys on active transportation behaviors and attitudes in the region are examples of monitoring methods. An evaluation and monitoring program should also include an analysis of safety metrics, including the number crashes, injuries and fatalities involving pedestrians and bicyclists, as well as contributing factors in those crashes.

Strategies for Developing the Active Transportation Network

In addition to the policy and programmatic strategies discussed in the last section, improving pedestrian and bicycling conditions in the region also requires the identification and prioritization of active transportation investments to create a robust active transportation network. This section offers a number of guiding principles for selecting and prioritizing active transportation projects in the region and provides a high level, conceptual bicycling network comprised of major corridors connecting key destinations in the region. Projects recommended in the Caddo Parish Bicycle Plan, which is a parallel effort to this LRTP Update, were incorporated in the conceptual network outlined in this section. While this section offers a framework for incrementally improving active transportation options in the region over time, developing a comprehensive Pedestrian and Bicycle Master Plan could provide the region with a more detailed blueprint for prioritizing specific pedestrian and bicycling investments.

Guiding Principles

Develop an All Ages and Abilities Network

The first and most important guiding principle that should be followed is to prioritize projects that will contribute to the development of an "all ages and abilities" active transportation network that can be utilized safely and comfortably by both experienced and inexperienced users, regardless of age. Research has shown that the majority of the population is "interested but concerned" in bicycling more, but that traditional, low-cost treatments such as on-street bike lanes are not enough to entice them to bike. Therefore, creating an "all ages and abilities" network requires the implementation of a variety of facility types – from protected bike lanes to off-street trails (and bike lanes when appropriate) – to create a network that provides low-stress and direct connections to key destinations. In other words, the goal is to provide facilities that accommodate the full spectrum of active transportation users and potential users, from recreational cyclists to commuters to children walking to school. This approach has proven to be the most effective strategy for attracting the greatest number of active transportation users in cities around the world.

Connect Major Destinations

The second guiding principle that should be followed when prioritizing active transportation projects is to provide connections between major destinations. Behind "safety concerns," the top response from the NLCOG Listens online survey for why people don't walk or bike more was "availability and connectivity of bicycle/pedestrian facilities." Creating a well-connected network requires identifying areas where people would like to travel at the regional, city, and neighborhood level. Projects that enhance pedestrian and bicycling conditions near major employers, schools and universities, and residential areas, for example, should be given highest priority, as these have the potential to attract the greatest number of trips. Projects that enhance pedestrian and bicycling conditions near transit stops should also be prioritized to take advantage of the complementary nature of these modes.

Focus On Major Corridors

The third guiding principle that should be followed in creating the active transportation network is to focus investments along major corridors to create a continuous and direct network of facilities. Rather than using a piecemeal approach to creating the network, efficiencies can be gained by focusing investments along major corridors that link multiple destinations in the region. The navigability of these routes can be enhanced through wayfinding and signage, as well as streetscape enhancements such as lighting, bicycle parking, and street trees.

Address Barriers

The final guiding principle that should be considered when prioritizing active transportation investments is the degree to which a given project addresses barriers in the network. Barriers can take the form of dangerous intersections, controlled access highways, railroad track crossings, bodies of water, gaps in the sidewalk or bike network, or topography, among other physical features of the region. Stakeholders mentioned the limited number of bridges across the Red River as a major impediment to bicycling in the region; this is especially a concern for those who live and work on opposite sides of the river.

Conceptual Regional Bike Network

The map below represents a planning-level conceptual regional bicycle network that can be used as a starting point for prioritizing investments to create an all ages and abilities bicycling network. The network represents the guiding principles outlined above to form a conceptual bicycle network that provides active transportation options for all ages and abilities, connects key destinations along corridors, and addresses major barriers in the region. The network presented in Figures 5-4 and 5-5 also borrows from projects recommended in the Caddo Parish Bicycle Plan, which is a parallel effort to this plan.

Figure 5-4: Conceptual Regional Bicycle Network (Urban Area)

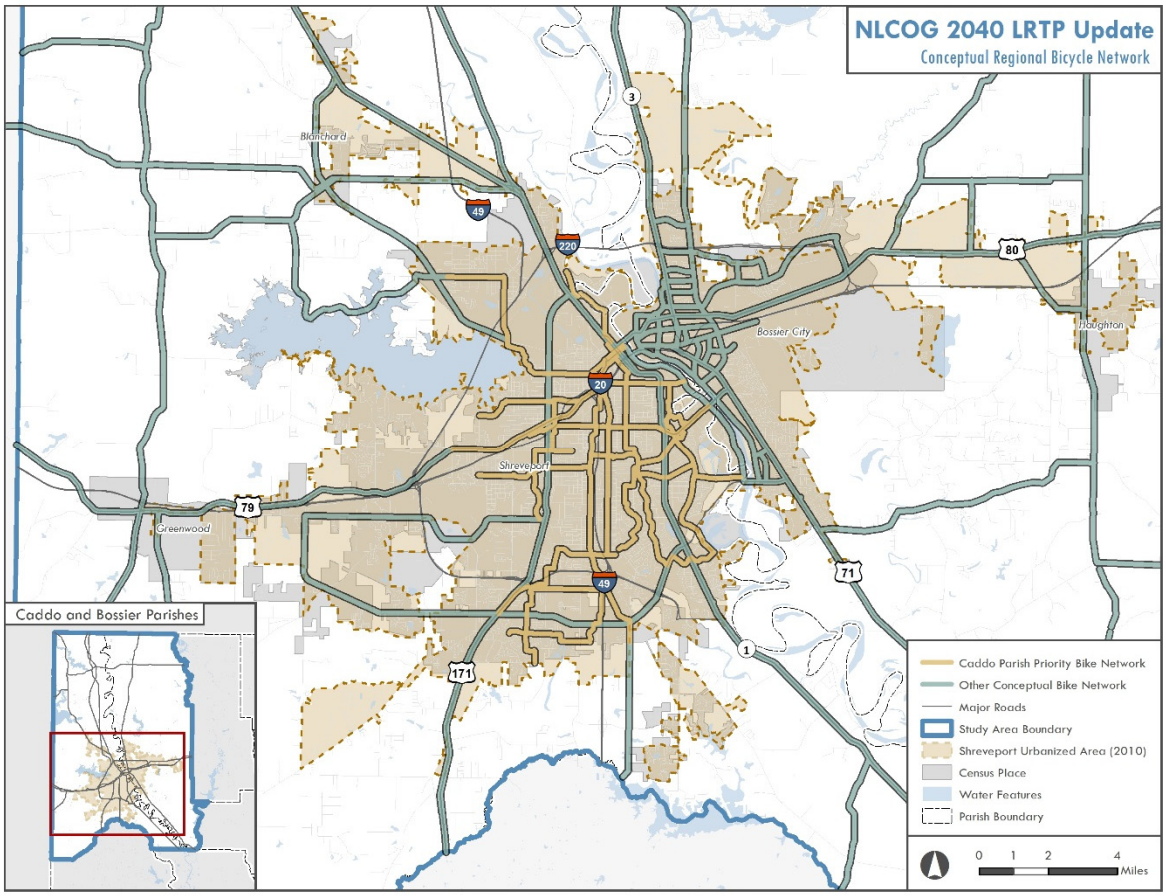
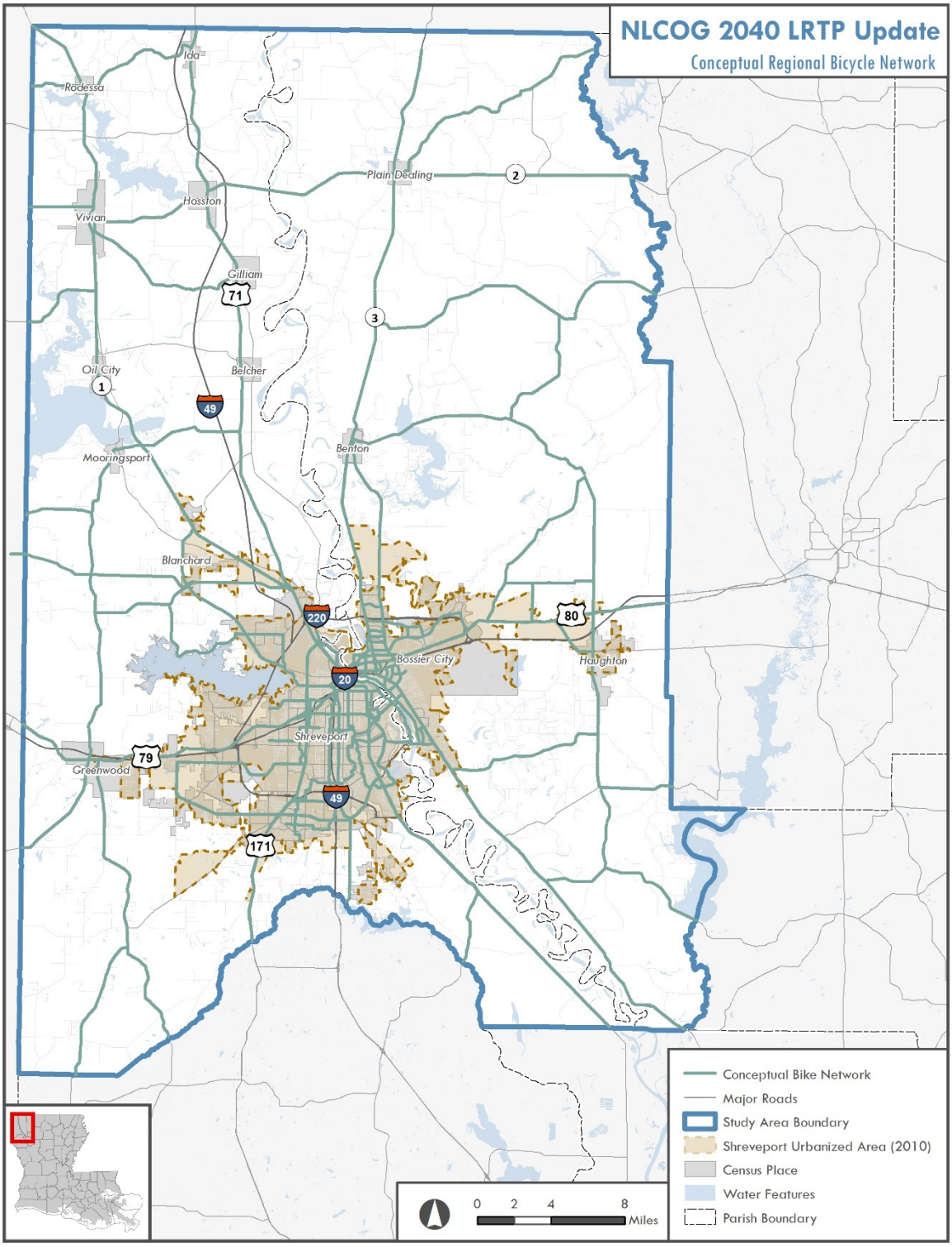


Figure 5-5: Conceptual Regional Bicycle Network



TDM Best Practices

Although no coordinated TDM strategies are currently implemented in the Shreveport-Bossier City area, there are best practices that have been successful in managing demand on transportation facilities in similar areas. As the regional transportation planning organization for the Shreveport-Bossier City area, NLCOG can work to educate its planning partners on available TDM strategies and associated benefits to encourage strong consideration of TDM strategies before investing in new construction projects.

Strategies to Increase Vehicle Occupancy

Carpool, vanpool, and school-pool programs encourage travelers with common destinations, particularly employment and school destinations, to share vehicles. These can be based on informal arrangements between individuals or formally arranged through ride-matching services. Available research indicates that improving awareness, trust, and willingness to ride with strangers, as well as flexibility in scheduling, may help to increase carpool use. Incentives are another effective tool for encouraging ride-sharing.

Source: Wikimedia Commons

Provide Ride-Sharing Resources for the Public on the MPO Website

Resources that may help to increase the use of carpooling, vanpooling, and school-pooling include "Frequently Asked Questions" (FAQs) that address the benefits of carpooling, tips for finding other carpoolers, advice on how to organize pick-ups and drop-offs, carpooling etiquette, and safety concerns, among others.

Additionally, the MPO may wish to provide resources that facilitate matching of individuals with other carpoolers by either hosting their own free ride-matching service on their website, using programs like AlterNet Rides, or publicizing ride-matching applications available to the public, such as the Carma carpooling smartphone app.

Work With SporTran and Member Jurisdictions to Implement Ride-Sharing Programs

The MPO can coordinate with SporTran and its member jurisdictions to educate its planning partners on the benefits of carpooling, vanpooling, and school-pooling and explore the feasibility of developing and implementing locally-operated ride-sharing programs.

Encourage Employers to Incentivize Ride-Sharing

The MPO can play a valuable role in working with area employers and schools to develop employer-based incentives to encourage ride-sharing, such as tax incentives and preferential parking. A variety of employer-based incentives for carpooling are discussed in greater detail later in this section.

Explore the Implementation of Transportation Management Associations (TMAs)

Transportation Management Associations (TMAs) are non-profit organizations voluntarily created by a group of businesses – often with local government support – to coordinate transportation services in a defined area (typically a commercial district, medical center, or industrial park). Because they tend to serve a small geographic area and constituency, these groups can be very responsive to members' needs. TMAs provide a variety of TDM services that encourage more efficient use of transportation and parking resources, particularly through commute trip reduction strategies and ridesharing.

Employer-based Tools and Incentives

The commute to and from work is a significant contributor to traffic congestion along area roadways, particularly during peak travel times. TDM strategies that focus on employer-based tools and incentives can be an effective way to reduce travel by single occupant vehicles by coordinating ride-sharing among employees, encouraging the use of alternative modes for work trips, shifting work trips from peak hours, and reducing work travel times and the number of overall trips. The Shreveport-Bossier City area has several large employment centers that generate significant travel on the area's roadways, and which make employer-based tools and incentives an attractive strategy for reducing demand on existing roadways in the Shreveport-Bossier City area.

Employer-based TDM strategies fall into four separate categories:

- Encouraging employees to travel by **alternative modes;**
- **Shifting trips** from peak periods of travel and reducing the total number of trips;
- **Providing route information** to divert commuters from congested routes; and
- Using **location-specific solutions** to shorten the work commute and reduce the need for midday trips.

As the regional transportation planning entity, NLCOG can actively work with area employers to reduce congestion by expanding the transportation options available to their employees. The MPO may wish to provide information on its website or develop a "speaker series" for educating area employers regarding options available and their benefits to employers, employees, and the community as a whole.

Alternative Modes

Employers can influence employees' mode choice through a variety of supporting services aimed at making the alternative travel options easier and/or cheaper to use.

Commuter Choice Tax Benefits

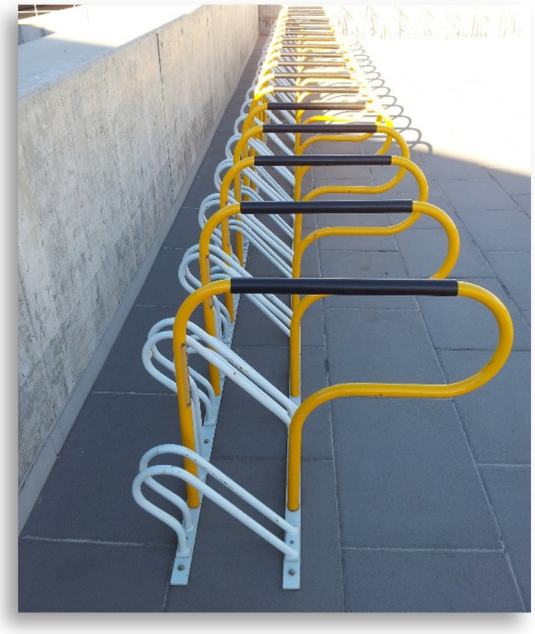
The Internal Revenue Code allows employers to offer the employees tax free commute benefits under the Commuter Choice tax benefits provisions, which provides a financial incentive for employees who switch from driving alone to transit or vanpool. Transit agencies often provide discounted fare passes to employers seeking to provide this benefit in the form of transit passes.

Rideshare Matching

Employers can help facilitate carpooling among their employees by 1) creating a "ride-match" bulletin board at the worksite or online where employees can post riders- or rides-wanted cards, 2) matching potential riders using their home zip codes, or 3) utilizing ride-matching software to facilitate carpooling of employees with nearby home addresses.

On-Site Transit Pass Sales

An employer can increase the convenience of using transit by selling transit passes on-site to its employees.



Source: Jeremy Huggins (via Flickr)

On-Site Facilities

Employers can provide on-site facilities, which refers to physical improvements to accommodate alternative modes of travel, including bicycle racks or storage facilities, showers and lockers, transit stop improvements adjacent to the worksite, and sidewalks between transit stops and facility entrances.

Shuttle Services

For employment sites not within walking distance of transit stops, shuttle services to and from nearby transit facilities can make using transit more convenient. Additionally, shuttle services can be provided between buildings on large campuses or for midday lunch trips.

Shift in Travel Time

By providing flexibility in the work schedule, employers can help shift some trips away from peak periods or even reduce the number of total trips necessary during the work week.

Flextime

Flextime generally allows employees to choose when they work, within a certain timeframe. Typically, a company will set core work hours, and employees can arrive before and depart after these core hours as long as they work the appropriate number of hours required for their position. Flextime allows commuters to avoid peak periods of high congestion and reduces the demand on the roadways during these times.

Alternative Work Schedules

Alternative work schedules reduce the number of trips necessary during the work week by allowing employees to work longer, but fewer, days, or by staggering shifts. It should be noted that compressed work weeks can also have an impact on an employee's ability to use public transportation, depending on the transit provider's hours of operations.

Telecommuting

Telecommuting reduces the number of trips on area roadways by allowing employees to work remotely from home, either full-time or for a specified number of days each week.

Route Information

Commuters typically travel to work at the same time every day, using the same mode and route to get there. However, delays due to traffic collisions, bad weather, road construction, or unexpected traffic congestion may cause commuters to look for alternative routes. Employers can facilitate the provision of real-time commute information to employees that will help them select the best route given current traffic conditions. This information can be disseminated through technology such as e-mail or text message alerts, which can also suggest alternative routes.

Location-Specific Solutions

The location of an employee's residence and workplace can have a significant impact on their mode choice, commute time, and may even impact where an employee chooses to work. Businesses are increasingly aware of the implications of worksite location, and there are several strategies available to shorten the work commute and encourage the use of alternative modes.

Live Near Work

Employers can develop materials that encourage employees to live near the worksite by providing information to new employees

regarding areas with reduced commute times or with good access to transit. Another option is called "proximate commuting," which allows employees to work at branch locations near their homes.

Worksite Location and Design

Employers can select employment sites that are close to transit or located near services that reduce their employees' need for cars. For example, Transit-Oriented Development (TOD) encourages residential and commercial development near transit stops and provides access to shopping, restaurants, and other services within walking distance. Locating in a TOD gives a company's employees the option to live within walking distance of work and provides walkable lunch and errand destinations to employees regardless of whether they choose to live in the development or not, reducing the overall number of automobile trips generated by the worksite.

On-Site Employee Services

On-site services for employees are intended to reduce the need for midday trips by car. The need to complete these errands may discourage some employees from using alternative modes for their work commute. Examples of on-site services include cafeterias, cafes, postal services, dry cleaning, health care, child care, fitness facilities, and ATMs.

Parking Management and Incentives

Parking management strategies and incentives encourage the use of alternative modes and can be implemented by both local jurisdictions and employers. These strategies typically rely on dis-incentivizing travel by single occupant vehicle by passing along more of the cost of parking to employees and/or limiting the availability of parking.

Parking Cash-Out

Parking cash-out is an employer-based strategy in which employers provide employees with a bonus or pay increase rather than guaranteeing a parking space, which they may then choose to spend either on parking located at the worksite or to "pocket" the difference by using an alternative mode of transportation.

Park-And-Ride Lots

Park-and-ride lots encourage the use of transit, especially in areas with few local transit options, by allowing travelers that are not within walking distance of a transit stop to drive their vehicles to a transit stop and park there during the day. Park-and-ride lots can also provide a meeting point for carpools and vanpools. The trip to the park-and-ride lot must be a shorter distance than the trip to the final destination, as park-and-ride lots are generally less effective the closer the lot is to the final destination.

Source: SounderBruce (via Flickr)

Parking Management

Parking management refers to various policies and programs that result in more efficient use of parking resources. Improved management of parking facilities can result in potential savings to communities and reduce parking requirements by 20 to 40 percent compared with conventional planning requirements. [2] Examples of parking management strategies available include the following:

[2] Litman. 2013. "Parking Management: Strategies, Evaluation and Planning". *Victoria Transportation Policy Institute*. Available: http://www.vtpi.org/park_man.pdf

- Provide shared parking that serves multiple users or destinations, which is most efficient when the destinations have varied peak periods of activity.
- Implement parking regulations that control who, when, and how long vehicles may park at a particular location.
- Develop more accurate and flexible standards that take into account factors such as residential density, employment density, land use mix, transit accessibility, and income, among other factors, to establish parking requirements for a particular development or area.
- Reduce residential street width requirements to encourage the development of neighborhoods with narrower streets and less parking to encourage the use of alternative modes.
- Provide remote parking and shuttle service to encourage the use of off-site parking facilities that are often shared facilities, served by special shuttle buses or free transit service.
- Limit on-street parking of large vehicles (e.g., vehicles over 22 feet long or trailers) to ease traffic flow and discourage use of public parking for storage of commercial vehicles.
- Prohibit on-street parking on certain routes at certain times (such as on arterials during rush hour) to increase the number of traffic lanes and peak capacity.[3]

Traveler Information Systems

Traveler information systems use technology to detect, analyze, and disseminate traffic and transit conditions to travelers so that they may choose the best means for reaching their destination. Traditional traveler information systems such as radio and TV broadcasts are now being supplemented by websites, real-time roadside and transit displays, and e-mail and text message alerts.

NLCOG can work with local jurisdictions to implement traveler information systems for both predictable settings, such as work zones, planned special events, tourism, and parking management, as well as unpredictable settings, such as a major highway incident, inclement weather, or other unforeseen catastrophic events.

Traveler information systems rely on traffic sensors, aerial surveillance, automatic transit location detection, incident detection, and weather monitoring by both the public and private sectors to inform travelers of delays, incidents, weather conditions, bus arrival times, travel times, emergency alerts, and alternate routes. In response, travelers may change their route, mode of travel, departure time, or destination.

Source: Wikimedia Commons

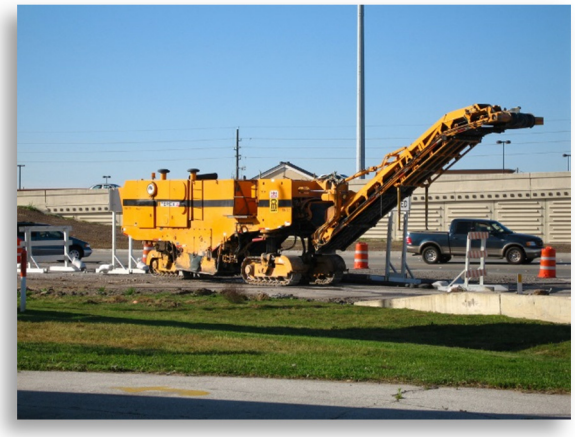
[3] Ibid.

Transportation Systems Management and Operations

Transportation System Management and Operations (TSM&O) strategies seek to improve the performance of existing roadways through increased efficiency and throughput of vehicles on roadways. TSM&O strategies not only rely on traffic engineering solutions – such as signal synchronization and access management – to optimize the existing system, but also rely on resource utilization, infrastructure, personnel, and data management strategies to extend the useful life of the existing transportation system and improve its reliability.

TSM&O Best Practices

In addition to the TSM&O strategies implemented by various agencies in the MPO planning area, there are other strategies that have been successfully implemented in other cities, which serve as best practices for optimizing the performance of the existing transportation system. As the MPO for Bossier and Caddo Parishes, NLCOG can work to educate its planning partners on available TSM&O strategies and associated benefits to encourage strong consideration of TSM&O strategies before investing in costly new construction projects.



Source: Wikimedia Commons

Maintenance

Infrastructure maintenance is a critical aspect of transportation system management and operations. Most infrastructure management agencies prefer to schedule routine repairs and inspections instead of embarking on ad-hoc patching and repairing. Managing the schedule for inspection and street repairs will enable city and parish personnel to efficiently use limited resources. A calendar for repairs and reviews will also provide valuable information to concerned citizens.

Regularly scheduled roadway resurfacing is necessary to provide uniform improvements to the existing roadways and to extend their useful life. Older roads, especially those built according to discontinued standards, should be reviewed with an eye towards upgrading deficient sections to modern criteria. Overlays and patches should be carefully constructed to help prevent uneven transitions and excessive wearing, particularly near new or existing grates and inlets. In locations with bicycle lanes (or anticipated bicycle usage), bicycle compatible grates should be installed to avoid accidents and pinched tires.

Traffic Signal and Intersection Improvements

Roadway users encounter traffic control signage and intersection signals on nearly every route they travel. While the primary function of intersection traffic control is to improve safety at intersections, it is also often a significant source of delay. Improper signage and poor signal timing results in unnecessarily long queues and impacts the reliability of the transportation system. Improving signage, signal timing, and equipment is a very cost-effective way to facilitate traffic flow along a corridor. NLCOG can work with its planning partners to identify corridors which would benefit from traffic signal improvements and prioritize projects.

Effective Signage and Markings

Signage and markings are critical to conveying intersection information to drivers. Stop bars,

crosswalks, signal heads, and movement prohibitions should be well-marked, and routinely inspected and retouched. In locations with high volumes of pedestrians, bicyclists, or school age children, special signage should be placed to alert drivers. Signage and street markings should adhere to the guidelines of the national Manual on Uniform Traffic Control Devices (MUTCD). It is advisable to develop a regional comprehensive street marking and striping policy to address areas of concern, such as school zones and pedestrian crosswalks.

Electronic Infrastructure

Transportation infrastructure is no longer limited to concrete pavement and asphalt. Recent improvements in operations and data collection methods have led to digital controls and integrated computer networks that require maintenance and management. Older technologies are being systematically replaced with newer options. For example, in-pavement magnetic loops are being phased out, while video detection and automatic detection devices for pedestrians and bicycles are gaining popularity. Advances in camera technology such as Gridsmart allow traffic engineers to monitor intersection conditions more efficiently than ever before. Traditional incandescent bulbs for signal heads have been replaced with more efficient light emitting diodes (LEDs). These new technologies offer increased durability and lower overall maintenance costs.

Traffic Signal Optimization

The timing and phasing of signalized intersections should be reviewed periodically, especially in areas of rapid development or increased commercial activity. Most intersections should be reviewed for appropriate timing and phasing every six months, while more heavily traveled intersections could be reviewed more frequently. Whenever possible, the signal heads and controls should be uniform to facilitate ease of coordination and servicing of hardware. In locations of due east or due west travel, back plates and directional signal heads may be advantageous. In locations with significant wind and severe weather concerns, mast arm and pole dimensions should be designed appropriately.

Traffic signals can also be coordinated along a corridor or throughout an entire system. As traffic volumes increase, signal coordination can be used to optimize high priority traffic corridors and increase the throughput of critical thoroughfares.

Adaptive signal control, which adjusts the timing of traffic lights based on real-time travel conditions, can also provide significant relief to congested corridors and cut costs associated with traffic signal timing data collection and computation.

Signal Pre-Emption

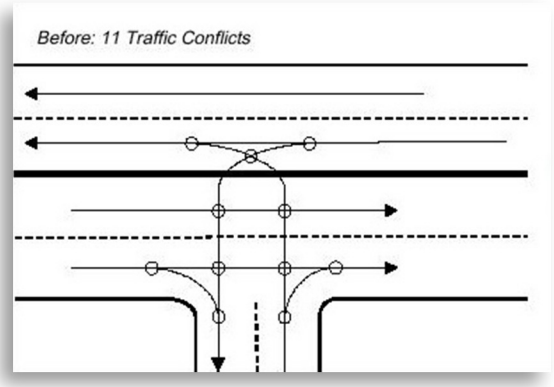
On busy roads with highly used transit routes, transit signal priority or pre-emption can improve the operations of the transit system. Transit signal priority refers to technology that reduces dwell time for transit vehicles at signalized intersections, typically by holding green lights longer or shortening the duration of the red light cycle. The same kinds of technology can also be employed for emergency vehicles. Equipping all intersections to accommodate signal prioritization can facilitate the deployment of such systems commensurate with demand.

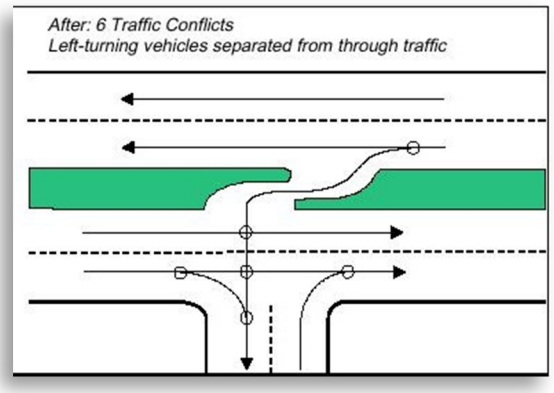
Access Management

Access management refers to the regulation of the number of access points between development and the adjacent roadway network. Most discussions of access management involve the placement and number of driveway curb cuts, although the application can also include the location, size, and function of interior service roads.

Effective access management has significant implications for mobility, accessibility, and safety by reducing crashes, increasing capacity,

reducing travel time and delay, extending the life of the roadway, and reducing vehicular emissions. NLCOG can work with local jurisdictions to identify roadways with congestion and/or safety issues that may be effectively addressed using one of the following access management strategies:





Medians

Raised medians on collector and arterial roadways decrease the potential for accidents by restricting turning movements. Raised medians also provide a refuge area for pedestrians or turning vehicles and reduce mid-block accidents. Medians can also be used as part of an overall corridor access management strategy to reduce vehicle conflicts, increase capacity, and reduce accidents at intersections.

It is important to provide for left turn maneuvers at downstream intersections or through strategically-placed median breaks when medians are used for access management. Medians, which restrict left turn movements, can be relatively narrow and still provide the necessary channelization. Medians at critical intersections can have a specialized dropped, low curb to ensure access for emergency services equipment and personnel.

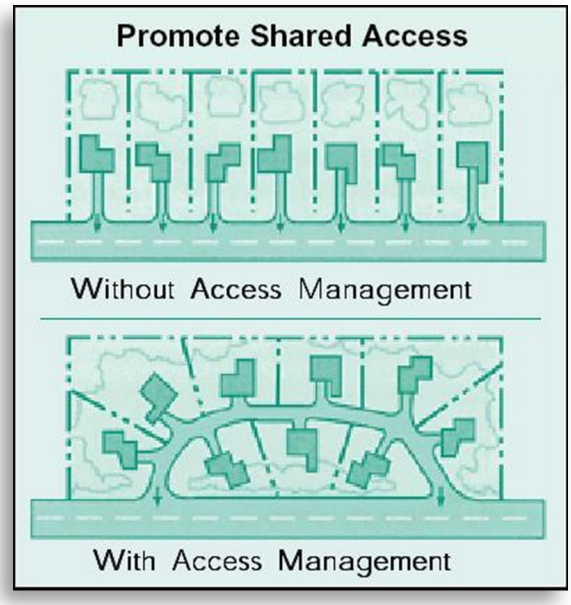
Landscaped medians provide an aesthetic separation between travel lanes. Adequate room for tree growth must be provided. The width of landscaped medians is variable, depending on the varieties of trees and shrubs planted. Prior to the construction of extensively landscaped medians, the maintenance and upkeep of the shrubbery should be evaluated.

Driveway Location and Design

Residential driveways along major roadways can cause critical conflicts between fast-moving traffic and slower traffic entering and exiting the driveways. If the number of residential driveways increases, the roadway will function as a high-speed residential street – which can be extremely dangerous. This situation can be avoided if subdivisions are designed so that lots which face a major roadway have access provided by a residential street at the back of the lot, or by incorporating a reverse frontage road. Residential driveways with shared access to the major roadway provide another method of managing access in this situation.

Driveway Spacing

When too many access points are allowed, especially near an intersection, conflicting vehicle movements result. In the interest of providing safe and reasonable access to a site, planners and engineers should review the impacts of a development with respect to the entire corridor, not just the site itself. Wherever possible, cooperation and consultation between adjacent landowners is encouraged to avoid conflicting designs. Limiting the number of access points per parcel and enforcing minimum lot frontages encourage proper driveway spacing along busy roads.



Internal Site Circulation

Most access management strategies are limited to the roadway right-of-way, but movement of traffic into and out of properties can be dramatically affected by the design of on-site circulation. Typical designs for internal circulation are concerned with the orientation of the buildings, the parking areas, and the highway access points. The optimal internal circulation design approach includes:

- Providing safe and reasonable access to and from the street to motorists, bicyclists, and pedestrians; and
- Providing a reasonable transition between the access and the internal circulation, especially by ensuring that driveways are wide and long enough.[4]

Targeted Traffic Enforcement

Consistent and reliable enforcement of traffic laws helps address public concerns about traffic issues. In areas with complaints about speeding and reckless or inconsiderate driving, responsive law enforcement staff can do much towards gaining the public's trust and compliance. Focused speed studies (using radar trailer and traffic counters) can be employed to discourage speeding on residential streets. NLCOG can work with local law enforcement to identify corridors of concern or crash hotspots in order to maximize the impact of enforcement activities.

Traffic Calming

While targeted traffic enforcement can be an effective strategy for changing driver behavior, it is limited by the resources of law enforcement. Therefore, many municipalities throughout the country have implemented various "self-enforcing" speed and volume control devices. The majority of these measures are referred to as "traffic calming." These physical devices can assist law enforcement in influencing driver behavior.

Traffic calming is often controversial and can be challenging to discuss. Most traffic calming measures are applied to residential streets, but can be applied to higher volume roadways as well. Broadly defined, the goals of traffic calming measures are:

- To slow down the average vehicle speeds for a particular roadway;
- To address excessive volumes for a particular roadway; and
- To remind drivers of or reinforce the residential nature of specific roadways.

Traffic calming measures impact all vehicles. As a result, this can lead to reduced access and response times for emergency and law enforcement personnel. Careful consideration must be given to any proposed traffic calming device, especially if the roadway under review provides critical access for emergency personnel. Representatives of fire, police, and

[4] Center for Transportation Research and Education at Iowa State University (n.d.). *Access Management Toolkit*. Available: http://www.ctre.iastate.edu/research/access/toolkit/23.pdf

emergency services departments should be involved in the review of proposed traffic calming devices. NLCOG can work with its planning partners and emergency response agencies to identify locations suitable for traffic calming implementation. The following are several common traffic calming measures.

Forced Turn Islands

Forced turn islands require vehicles entering an intersection to perform a designated movement.

Roundabouts

Roundabouts force traffic to yield to vehicles already in the intersection and to travel counter-clockwise around the device. Roundabouts have proven effective in reducing neighborhood speeds and discouraging through traffic without compromising throughput. They can also lead to enhanced safety at previously signalized intersections.

Centerline Medians

Medians are designed to reinforce lane assignments, especially along constrained roadways. These medians can serve as general speed reduction devices, or to discourage speeding in specific areas. Medians can be placed near or at intersections to enhance pedestrian accessibility. For wide intersections, the location of a dividing median in combination with a crosswalk can play a large role in reducing the risk associated with pedestrian crossings.

Speed Humps

Speed humps are designed to cause driver discomfort when traversed at speeds higher than the posted speed limit. The hump approaches can be altered to create more or less severe slopes, resulting in greater reduction in travel speeds.

Curb Extensions

Sometimes referred to as "bulb-outs," curb extensions both physically and visually narrow the street space, leading to a reduction in vehicle speeds, as well as shorter crossing distances and heightened visibility for pedestrians. They can be implemented at intersections of streets with on-street parking, mid-block (to provide additional pedestrian crossings), at transit stops, or alternating in a way that forces vehicles to move laterally (also referred to as "chicanes.")

High Occupancy Vehicle Lanes

High Occupancy Vehicle (HOV) lanes are dedicated for use by vehicles with more than one occupant and thereby serve to increase the total number of people that move through a congested corridor. HOV lanes offer substantial travel time savings and reliable, predictable travel times. HOV lanes move significantly more people during congested periods, even if the number of vehicles that use the lane is lower than on adjoining general purpose lanes. In general, carpoolers, vanpoolers, and bus patrons are the primary beneficiaries of HOV lanes. In coordination with its planning partners, the NLCOG can identify corridors that would benefit from the implementation of HOV lanes.

Traffic Incident Management

Traffic Incident Management (TIM) consists of a planned and coordinated process to detect, respond to, and quickly clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM strategies reduce the duration and impacts of traffic incidents and improve the safety of motorists, crash victims, and emergency responders.

Traffic incident management involves coordination among a number of public and private sector partners, including:

- Law enforcement;
- Fire and rescue;
- EMS;
- Transportation departments;
- Public safety communications;
- Emergency management/preparedness;
- Towing and recovery;
- Hazardous materials contractors; and
- Traffic information media.

NLCOG can facilitate coordination among the various TIM stakeholders.

Traffic Data Collection

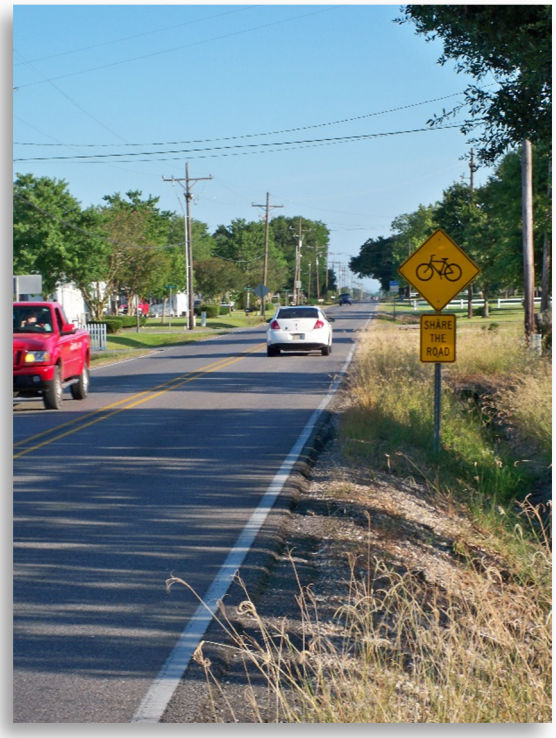
As transportation technology grows increasingly sophisticated, obtaining the amount of data required by new traffic optimization interfaces presents significant challenges to cash-strapped public agencies. Automated traffic data collection creates an opportunity for transportation management agencies to receive a continuous supply of traffic data at a low cost. Because automated traffic data collection gathers data in real-time, it facilitates many of the demand-responsive TSM&O strategies discussed earlier in this chapter (such as traffic signal optimization). New types of traffic data collection, such as Bluetooth and Wi-Fi detectors, are particularly appealing due to their lower operational and maintenance costs compared to in-road loop detectors. These types of detectors have the added benefit of being able to gather traveler information beyond the traditional scope of the private vehicle to include bicycle and pedestrian roadway users.

Safety and Security

Strategies to address safety and security will at times differ significantly from one another and require coordination between different agencies but will more often overlap and involve members of the same agencies. Therefore, the 2040 LRTP considers safety and security both simultaneously and individually.

NLCOG is responsible for addressing safety and security through the programming of transportation improvements. The MPO's role in implementing specific safety and security measures may be more limited, but its role in coordinating regional transportation needs between the various local, state, and federal transportation agencies is vital to creating successful safety and security policies. By integrating the safety and security goals and objectives of regional stakeholders into the transportation planning process, the MPO can ensure that its plans and studies are consistent with and help support safety and security planning in Bossier and Caddo Parishes.

The following sections discuss the various agencies involved in safety and security planning in the NLCOG region, and present recommendations for improving safety and security in the area. Parallel safety and security



planning efforts that have been completed for the region are documented in Chapter 2.

Safety

"Safety" in the transportation planning context typically refers to the mitigation of traffic crashes, transit accidents, and other unintentional events resulting in fatalities, injuries, or loss of property on the transportation network. MAP-21 identifies a national goal for safety to significantly reduce fatalities and injuries on all public roadways. The U.S. Department of Transportation (USDOT) published a related Notice of Proposed Rulemaking (NPRM) in March 2014 proposing that safety targets and progress towards achieving those targets should be measured as 5-year rolling averages for fatalities and serious injuries, as well as the respective rates for every 100 million vehicle miles traveled (VMT).

Safety planning, reducing the number of crashes, and decreasing the amount of fatalities and injuries on the transportation network involve several different projects and programs, ranging from improving the operational efficiency of the transportation network to influencing driving behavior. LADOTD and NCLOG play the lead roles in transportation safety planning, but several non-traditional stakeholders should be included in the transportation safety planning process, including:

- State agencies responsible for safety data collection and management (LADOTD, Louisiana Highway Safety Commission);
- First responders, fire and rescue, and EMS;
- State and local law enforcement;
- Transit agencies;
- Motor vehicle departments;
- Federal agencies; and
- The non-governmental highway safety community (e.g. AAA).

Recommendations

Under MAP-21, states and MPOs are required to adopt a performance- and outcome-based approach to transportation planning that relies heavily on existing and projected data to evaluate the effectiveness of strategies in addressing goals and objectives, including those related to safety. The crash analysis provided in Chapter 4 provides a basis for the safety planning element, and the following recommendations will help the MPO comply with final safety performance management requirements:

Safety Recommendations

- Identify measureable safety goals and objectives;
- Transition to a more data-driven, strategic approach to safety planning;
- Collaborate with key safety stakeholders;
- Coordinate closely with the State in the development, evaluation, and reporting of performance targets that support the statewide safety goals and objectives, as well as regional and local safety goals; and
- Provide training opportunities for MPO staff to increase their knowledge related to transportation safety planning.

Security

Planning for transportation security seeks to mitigate or avoid harm to the transportation network inflicted either intentionally by people (such as terrorist acts or criminal activities), or circumstantially through natural disasters such as hurricanes, earthquakes, or other weather events. Security planning is carried out by multiple levels of government and involves all

four phases of emergency management: preparedness, response, recovery, and mitigation.

In support of state, regional, and local security goals and objectives, the primary role of the MPO is to facilitate coordination between agencies responsible for transportation security, including law enforcement, emergency response, transit agencies, and homeland security departments.

Source: Wikimedia Commons

Recommendations

Countermeasures to reduce the risk of specific and systematic hazards from occurring can fall into three categories: preventative, detective, or responsive. Preventative measures seek to reduce or eliminate the risk of occurrence. Detective measures provide notification that a hazard has occurred. Finally, responsive measures correct and respond to an emergency. The following recommendations are based on regional findings and national best practices in security planning, and are listed in no particular order:

Security Recommendations

- Conduct vulnerability assessments frequently to allocate preventative, detective, and responsive resources;
- Establish communication protocols and ensure entire population will be reached;
- Anticipate equipment needs and store near critical locations;
- Prepare signal-timing plans for evacuation or emergency scenarios;
- Implement TSM&O best practices where possible;
- Identify lessons learned following each response through after action reports;
- Prepare cost accounting methods to ensure reimbursement from states through the Emergency Management Assistance Compact (EMAC);
- Develop Mission Ready Packages (MRPs) for more rapid aid through EMAC; and
- Prepare redundancies in all security measures.

Build Strategies for Roadways

This section builds upon the work completed as part of the needs analyses, discussed in Chapter 4, to identify deficiencies in the transportation network in Caddo and Bossier Parishes. This section outlines the steps taken to address or mitigate the deficiencies identified by developing an unconstrained list of possible improvements to the transportation network, developing a project prioritization process and ranking those improvements according to community values, and testing different combinations of possible improvements to compare the effectiveness of future transportation network scenarios on addressing deficiencies in the system.

Project Selection Process

Once the no-build strategies were considered, potential projects to expand or build new facilities were examined using NLCOG MPO's Project Selection Process, which consists of five (5) steps:

1. Project Call
2. Project Submission
3. Project Review and Evaluation
4. Technical Coordinating Committee Approval and Recommendation
5. Transportation Policy Committee Review and Approval

Project Identification

One of the ways NLCOG identified potential projects for inclusion in the LRTP was through its annual call for projects. This project call was sent to all member governments in the NLCOG MPO study area. To this call, sponsoring agencies submitted projects for evaluation and prioritization. In addition to the project call, potential projects were identified as a result of technical reviews, available planning studies, highway and corridor studies, and consultation with local traffic engineers, planners, and other stakeholders. All projects identified through this process were combined into a list of candidate projects slated for review and evaluation.

Project Review and Evaluation

The project evaluation process used a project scoring tool which combined input gathered from the public during the visioning process, outputs from the roadway deficiencies analysis (volume to capacity (V/C) ratios), and the expertise of the Transportation Coordinating Committee members to assess the community benefits of proposed transportation projects.

The process resulted in a prioritized list of short-term, mid-term, and long-term transportation improvements planned for implementation. Based on this multi-faceted process, the listing of transportation projects is not only reflective of the community's vision, responsive to mobility needs, and technically sound, but it also complies with federal requirements for metropolitan transportation planning.

Planning Factors and Evaluation Criteria

MAP-21 requires the transportation planning process for metropolitan areas to consider strategies and projects that address eight planning factors:

1. Support the **economic vitality** of the metropolitan area, especially by enabling global competitiveness;
2. Increase the **safety** of the transportation system for motorized and non-motorized users;
3. Increase **security** of the transportation system for motorized and non-motorized users;
4. Increase **accessibility and mobility** of people and freight;
5. Protect and enhance the **environment**, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6. Enhance the **integration and connectivity** of the transportation system, across and between modes, for people and freight;
7. Promote **efficient system** management and operation; and
8. Emphasize the **preservation** of the existing transportation system.

Based on these planning factors, a set of project evaluation criteria was developed to ensure each aspect of the factors was taken into consideration in assessing the merits of proposed projects. Additional qualitative measures applicable to the following criteria categories were also utilized during project scoring where applicable. These criteria and measures are listed below.

Improve Safety and Security – protect against unintentional (e.g. traffic collisions) and intentional (e.g. security threats) harm

- ☐ Specifically improves safety and security
- ☐ Reduces automobile crashes/improves roadway safety
- ☐ Significantly increases roadway pavement condition index (PCI)

Protect the Environment – reduce air and noise pollution, protect critical habitats, avoid developing in flood-prone areas, protect historical and cultural resources, etc.

- ☐ Impacts any wetlands, flood protection areas, or culturally/historically significant sites
- ☐ Improves air quality

Reduce Congestion – minimize the time spent in traffic congestion

- ☐ Improves V/C of a roadway or LOS of an intersection
- ☐ Expected to reduce congestion on corridor or region-wide

Support Land Use and Economic Development Goals – coordinate plans for the transportation system with plans for land development; and improve or build transportation infrastructure that increases access to market, attracts employers, makes business more accessible, etc.

- ☐ Has positive impact on economic development/land use
- ☐ Part of regional program or economic development strategy

Increase Connections – improve circulation within the community and to external destinations by connecting roads to provide multiple options for reaching destinations

- ☐ Increases connectivity and reduce travel times

Improve Access – balance access to land uses with the efficient flow of traffic

- ☐ Improves mobility and accessibility without increasing vehicle miles traveled (VMT) and average daily traffic (ADT)
- ☐ Addresses any of the Strategic Highway Safety Plan's (SHSP) Emphasis Areas

Increase Multi-Modal Options and Energy Conservation – provide travelers with more options for reaching their destinations, such as biking, walking, riding the bus, or driving a car; and reduce the use of natural resources

- ☐ Complies with LADOTD complete streets policy
- ☐ Identified as a need in a local or state bicycle/pedestrian plan
- ☐ Impacts fuel consumption or reduces use of single-occupancy vehicles

Improve Quality of Life – ensure the transportation system has a positive impact on the community's standard of living (e.g. safe routes to schools, recreation, etc.)

- ☐ Improves visual environment with context-sensitive solution

Cost Sharing – The (STP Urban Mobility/Rehabilitation) funding category requires a mandatory 20% local match. If the project has more than 30% local match, it was awarded full points for this criterion.

Promote Efficiency – maximize the potential of the existing transportation system (e.g. improved signal timing, limiting the number of driveways on certain roads, preserving the existing system through overlays, etc.)

Connect Modes of Travel – improve the ease with which people can use multiple modes of travel to reach destinations (e.g. ride a bike to a bus stop)

- ☐ Facilitates the transfer of passengers and goods between modes
- ☐ Improves access to existing/proposed transportation terminal facility

Preserve Right-of-Way – plan ahead for the future expansion of the transportation system and guarantees land will be available before development occurs to reduce future costs

Visioning Workshop Rankings of Evaluation Criteria

During the visioning process the public was asked to rank the criteria based on their personal preferences. The results were combined to assign a final ranking of the evaluation criteria based on community values. The following table presents the final criteria ranking and the resulting weighting value used to compute the final project prioritization list.

Criteria	Rank	Weight
Increase Multi-Modal Options	1	2.0
Improve Safety	2	1.9
Improve Quality of Life	3	1.8
Connect Modes of Travel	4	1.7
Improve Access	5	1.6
Support Economic Development Goals	6	1.5
Increase Connections	7	1.4
Reduce Congestions	8	1.3
Promote Efficiency	9	1.2
Conserve Energy	10	1.1
Protect the Environment	11	1.0
Support Land Use Goals	12	0.9
Preserve ROW	13	0.8
Improve Security	14	0.7

Project Scoring

The project scoring process combined the results of the deficiencies analysis with the weighted evaluation criteria to arrive at a final list of prioritized projects that resulted from both qualitative and quantitative evaluation metrics.

Travel Demand Scoring

Each project was assigned a "reduces congestion" criterion score based on the project's location in relation to roadways that have a high V/C ratio according to the roadway deficiencies analysis results.

Transportation Coordinating Committee Scoring

To evaluate the candidate list of projects for inclusion in the LRTP, NLCOG staff coordinated and conducted meetings with the Transportation Coordinating Committee (TCC) work group and provided technical guidance. The TCC work group systematically evaluated each project, fairly and clearly, based on evaluation criteria ranked during outreach to the public and local transportation stakeholders during the visioning process.

Each member of the TCC was asked to score each project based on how well it aligns with, or contributes to, achieving the community's transportation vision. Members assigned one to five points per criterion for every project based on the degree to which they felt the project addressed the criteria (see scoring sheet example).

- Projects with a high direct correlation to the criterion were assigned four or five points;
- Projects with medium influence on the criterion were assigned two to three points; and
- Projects with minimal to no impact on the criterion were assigned zero to one points.

K	L	M	O	P	Q	R
Year(s)	Time Frame	Completed, In Progress, or Already Programed?	Improves Safety	Supports Economic Development Goals	Conserves Energy	Promotes Efficiency
2031-2040	Long-Term		2	1		
2031-2040	Long-Term			1 2 3		

Sample Project Scoring Sheet

For example, if a project was thought to have a significant impact on safety, the project would be assigned four or five points for the "Improves Safety" criterion. If the project did nothing to increase multi-modal options, it would be assigned one point for that criterion. Short-, mid-, and long-term projects were scored at the same time and then divided into separate, ranked lists.

Committee members were able to use their technical expertise and local knowledge to adjust the criteria weights to best meet regional transportation goals and needs.

Policy Committee Adoption of the Prioritized Project List

The projects selected and prioritized by the TCC work group were presented to the NLCOG Transportation Policy Committee (TPC). After vetting the list, the TPC adopted the recommendations. The prioritized list of projects that resulted from this process did not incorporate financial factors or policy constraints. Those elements were analyzed later in the planning process and will be discussed in Chapter 7.

Alternative Transportation Scenarios

In addition to creating scenarios that would explore how variations in land use could affect the transportation network, NLCOG tested three different roadway scenarios (No-Build, Limited Investment, and High Investment) to compare how different levels of transportation funding and investment would impact activity on the transportation system. The three scenarios only reflect projects that add capacity to the transportation network.

No-Build

This scenario was designed to explore the effects on the transportation system if funding for future projects does not materialize as anticipated. Although this scenario is unlikely, it is important to understand how the system would perform with just the current existing plus committed – or "E+C" – network (i.e. roadways that currently exist plus roadway projects already under development with committed funding that ensure they will be built in the near future). This scenario, shown in Figure 5-6, represents the transportation network as is, and serves as a no-build baseline scenario to compare the various levels of transportation investment. This scenario is identical to the Current Growth Trends land use scenario.

Limited Investment

This transportation scenario was designed to reflect a level of transportation investment that roughly corresponds to the level of funding anticipated to be available over the course of the 2040 LRTP. Funding is considered to be limited and does not cover the costs of all transportation projects from the unconstrained project list, but it does allow for investment in projects with identified funding sources. The transportation network in this scenario, shown in Figure 5-7, includes the E+C network as well as capacity expansion projects anticipated to cost less than $50 million taken from the unconstrained project list.

High Investment

This scenario assumes a dramatic increase in available transportation funding. In this case, there is very high investment in the transportation network. Funding is no longer limited and is available to match the costs of all projects listed in the unconstrained project list. The transportation network in this scenario, shown in Figure 5-8, consist of the E+C network and all capacity expansion projects included in the unconstrained project list developed for the 2040 LRTP.

Figure 5-6: No-Build Transportation Scenario

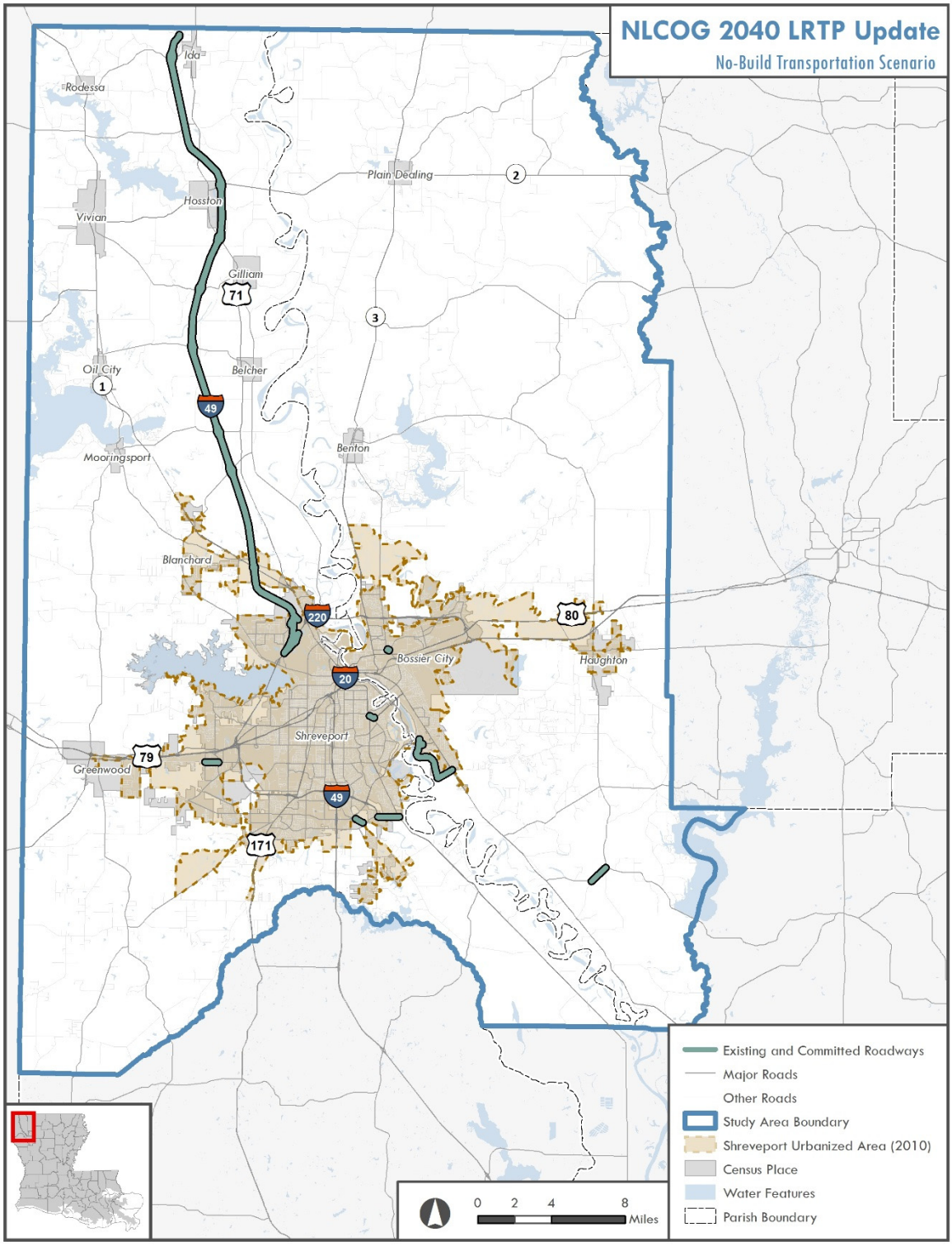


Figure 5-7: Limited Investment Transportation Scenario

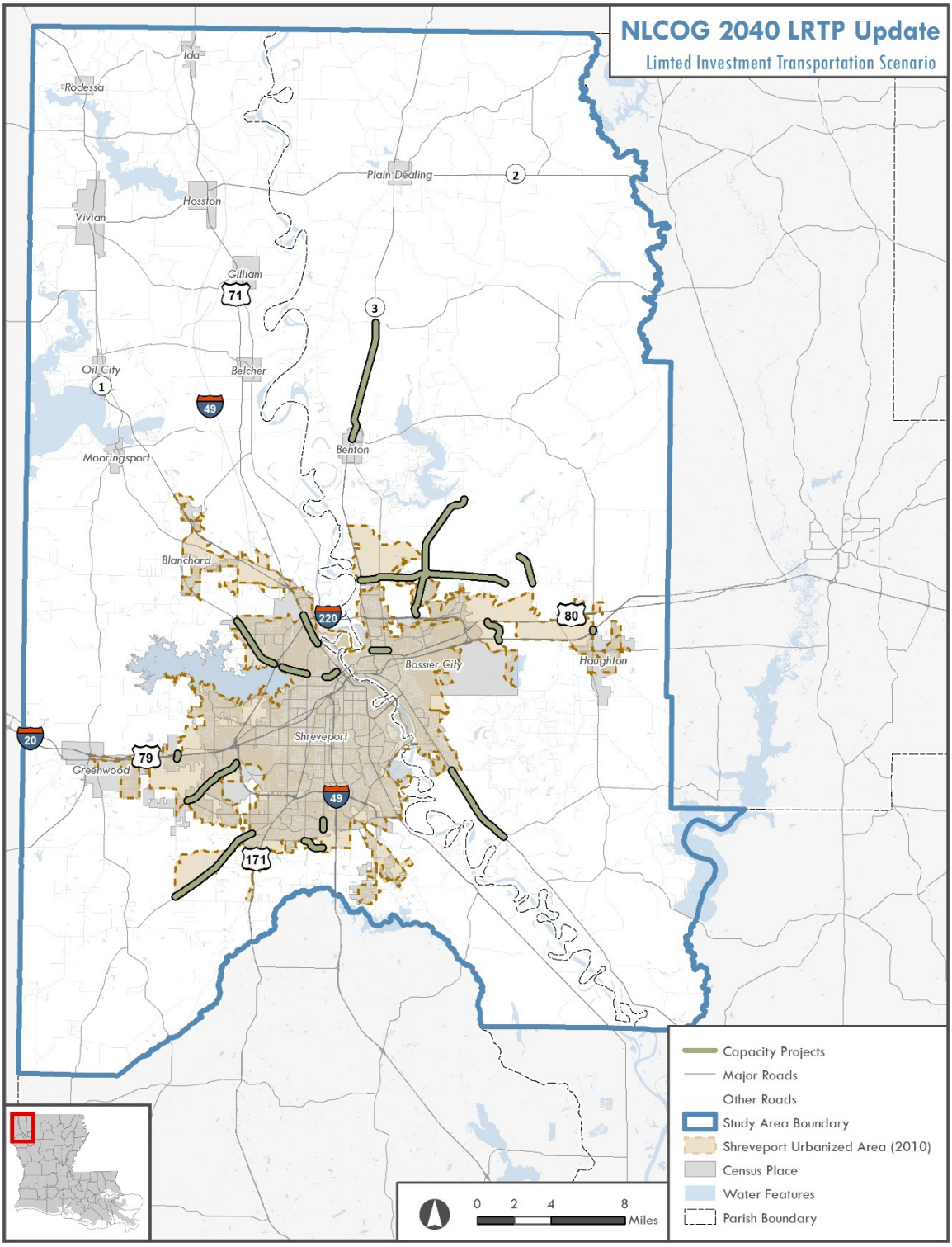
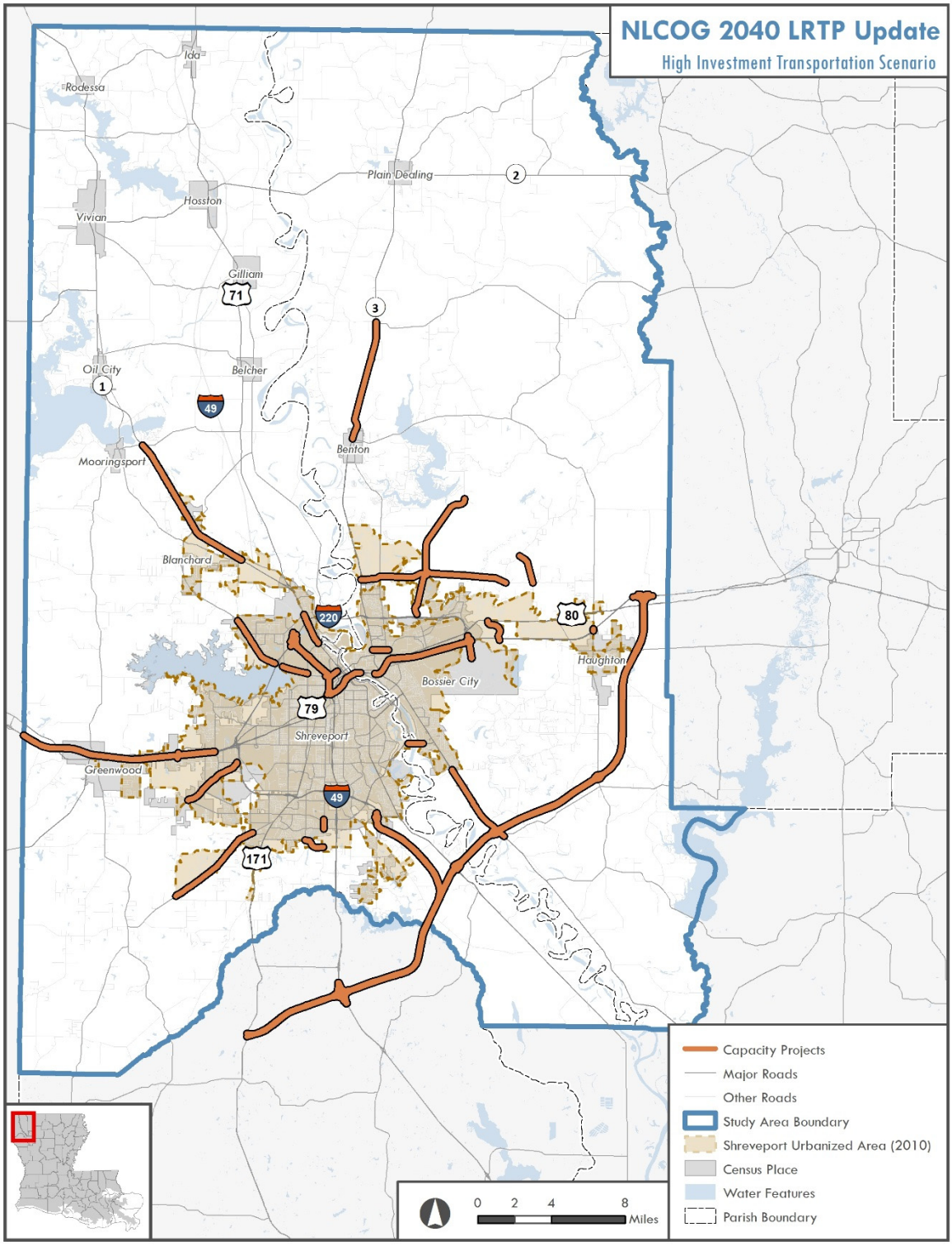


Figure 5-8: High Investment Transportation Scenario



Results

While some of the projects included in these scenarios are centrally located within the urban area, the majority are located at the edge of incorporated areas and/or in unincorporated areas within Caddo and Bossier Parishes. Beyond the potential traffic implications, these transportation scenarios may also have environmental and economic implications that warrant discussion. All these potential impacts will be discussed further in the following sections. Tables 5-3 and 5-4 provide an overview of all the scenario results.

Table 5-3: Percent Difference between 2010 and All Future Scenarios

Scenario Group	VMT	VHT	Average Speed	Total Regional Hwy Daily Delay	Total Regional Arterial Daily Delay	Regional Congestion Index
2010 Base	-	-	-	-	-	-
Current Growth Trends/No-Build	29.0%	44.1%	-0.1%	130%	154%	-2.5%
Downtown High Growth	27.2%	44.4%	-0.3%	140%	165%	-3.1%
TOD	15.5%	24.6%	-0.3%	112%	64%	-6.9%
Limited Investment	28.6%	42.1%	0.0%	121%	138%	-3.8%
High Investment	32.6%	36.7%	0.1%	73%	85%	-24.1%

Table 5-4: Percent Difference between Current Trends and All Alternative Future Scenarios

Scenario Group	VMT	VHT	Average Speed	Total Regional Hwy Daily Delay	Total Regional Arterial Daily Delay	Regional Congestion Index
Current Growth Trends/No-Build	-	-	-	-	-	-
Downtown High Growth	-1.37%	0.18%	-0.15%	4.61%	4.26%	-0.58%
TOD	-10.46%	-13.56%	-0.19%	-7.69%	-35.37%	-4.58%
Limited Investment	-0.35%	-1.36%	0.17%	-3.76%	-6.32%	-1.40%
High Investment	2.77%	-5.13%	0.21%	-24.79%	-27.06%	-22.13%

Limited Investment Transportation Scenario

The transportation system under the Limited Investment scenario is predicted to perform slightly better than under the current trends scenario in 2040, according to the TDM analysis. Under this scenario, VMT and VHT are predicted to increase by about 29% and 42%, respectively from 2010 to 2040. These results represent a difference from the current trends scenario of less than 1% for VMT and less than 1.5% for VHT in 2040. The difference between this scenario and the current trends scenario for total regional daily delay is greater, relatively speaking, with the limited investment scenario resulting in almost 4% less regional delay on the highway network and over 6% less delay on the arterial network.

This scenario could also lead to environmental and economic impacts. Sprawling land use patterns may be encouraged as a result of many of the projects being concentrated at the edges of incorporated areas as well as in unincorporated areas of the region. Environmental implications of suburban growth may include negative impacts on air quality and encroachment on sensitive lands. Additionally, while the region maintains a large service industry supported by economic activity generated by BAFB, increasingly spread out development could make it harder for people with low-paying service jobs to get to work and could also make it harder for employers to find employees.

High Investment Transportation Scenario

The High Investment scenario was the only scenario under which VMT increased beyond the level predicted for the current trends scenario, producing a 2040 VMT over 444,000 more than the 2040 current trends scenario. However, VHT results are significantly lower than those predicted for the current trends scenario, indicating that more people will be driving and/or drivers will be traveling farther, but at faster speeds. The analysis indicates that this scenario would result in the least amount of increase in regional highway daily delay among all scenarios, at 73%, and the second lowest increase in regional arterial daily delay, at 85%, from 2010 to 2040. It also resulted in the largest decrease in the average regional congestion index.

The analysis indicates this scenario will increase average speed and reduce regional delay more than the limited investment scenario. However, it will also induce demand on the transportation system as reflected in the higher VMT result. Additionally, the potential environmental and economic impacts described in the limited investment scenario are also potential outcomes of this scenario. Furthermore, this investment scenario comes with a high price tag, which may not be realistic based on historical transportation funding trends.

Conclusion

The regional results of the 2010 Base and 2040 Future Year land use and transportation scenarios, produced from the scenario planning TDM analysis, are provided in Table 5-5. The various outcomes of these scenarios, as well as the other no-build and build strategies discussed in this chapter can provide policy makers with tools to balance transportation system performance with regional needs, goals, and constraints.

Table 5-5: Base and Future Scenario Results

Scenario Group	VMT	VHT	Average Speed	Total Regional Hwy Daily Delay	Total Regional Arterial Daily Delay	Regional Congestion Index
2010 Base	12,446,217	289,493	46.7	16,781	19,937	0.487
Current Growth Trends/No-Build	16,057,737	417,164	46.64	38,511	50,606	0.475
Downtown High Growth	15,837,583	417,912	46.57	40,287	52,760	0.472
TOD	14,377,347	360,611	46.55	35,549	32,707	0.453
Limited Investment	16,002,282	411,496	46.72	37,064	47409	0.468
High Investment	16,501,776	395,757	46.74	28,966	36909	0.370

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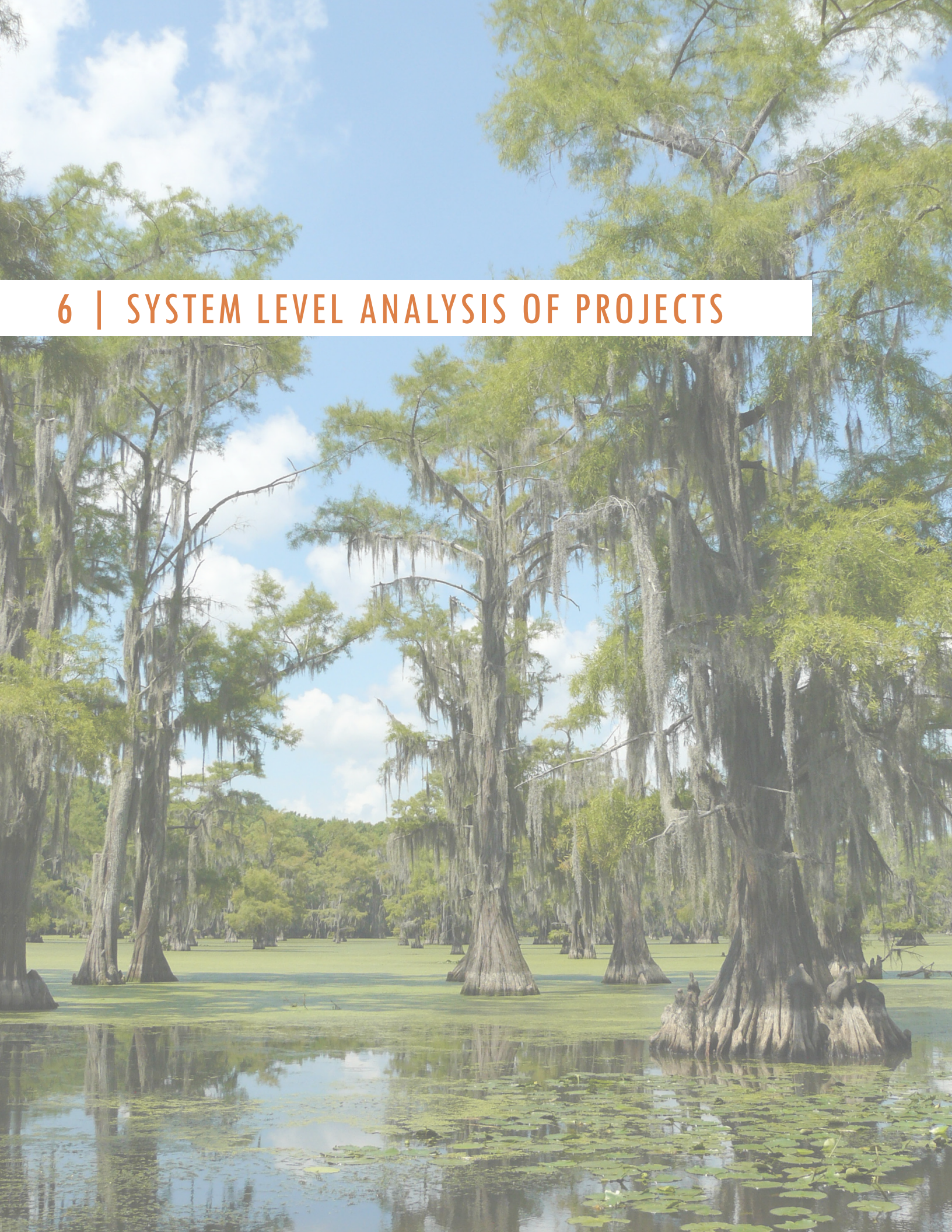


6 | SYSTEM LEVEL ANALYSIS OF PROJECTS

Metropolitan transportation planning is not solely concerned with the best way to move people and goods. In addition to mobility concerns, the planning process also examines the interaction of proposed transportation improvements with the natural and human environment. For the purposes of the metropolitan transportation plan, potential impacts on environmental resources and quality of life in the region are evaluated at a system-wide level. A more detailed analysis of the specific impacts associated with a project is typically performed later in the project development process to fulfill requirements under the National Environmental Protection Act (NEPA).

The primary goal of the systems-level analysis is to evaluate whether the proposed program of unconstrained potential transportation improvements may negatively impact the environment or result in disparate impacts to certain populations. It is intended to serve as a guide for implementing agencies and elected officials as projects progress through the development process. While it is not always possible to avoid negative impacts to environmentally sensitive areas, the goal of the environmental mitigation analysis is to balance the need for transportation improvements with environmental protection and quality of life considerations and, where possible, to increase access to natural and cultural resources in the region. Mitigation activities should be considered during all phases of project planning, design, construction, and maintenance.

In addition to environmental and cultural resources, the systems-level analysis addresses environmental justice considerations to ensure both the benefits and the burdens of the transportation system are distributed equitably across the region. The term environmental justice first emerged in the metropolitan transportation planning discussion in 1994 with the issuance of Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The executive order was based upon Title VI of the Civil Rights Act and is meant to ensure that minority and low income populations are not adversely affected by federal actions.

Identifying potential impacts on the environment, as well as low-income and minority populations, involves a three step process that includes:

- Defining and developing an inventory of environmental resources/minority and low-income populations;
- Identifying and assessing the potential impacts of proposed transportation improvements on these resources; and
- Addressing possible mitigation activities system-wide.

Source: Robert and Talbot Trudeau (via Flickr)

Environmental Mitigation Analysis

The Shreveport-Bossier City area lies at the northwestern-most corner of the state of Louisiana, within the Piney Woods region of the United States. The Red River, which divides Bossier and Caddo parishes, forms one of the most prominent natural features in the metropolitan area, carving a wide, flat bottomlands ripe for agricultural development through the otherwise gently rolling, forested landscape. The area is also home to Caddo Lake, one of the largest naturally occurring freshwater lakes in the area, as well as several wildlife management areas intended to preserve the region's biodiversity.

The location of the region's environmental and cultural resources, including lakes and streams, wetlands, floodplains, parks, open space, recreational areas, and historic sites, were first inventoried as part of the environmental analysis. The data and information used to conduct the analysis included flood plain maps from the Federal Emergency Management Agency (FEMA), wetlands maps from the U.S. Fish and Wildlife Service, historic sites from the National Register of Historic Places, and state and federal wildlife and environmental protection resources. These inventoried resources are shown in Figures 6-1 and 6-2.

Figure 6-1: Environmental, Historic, and Cultural Resources

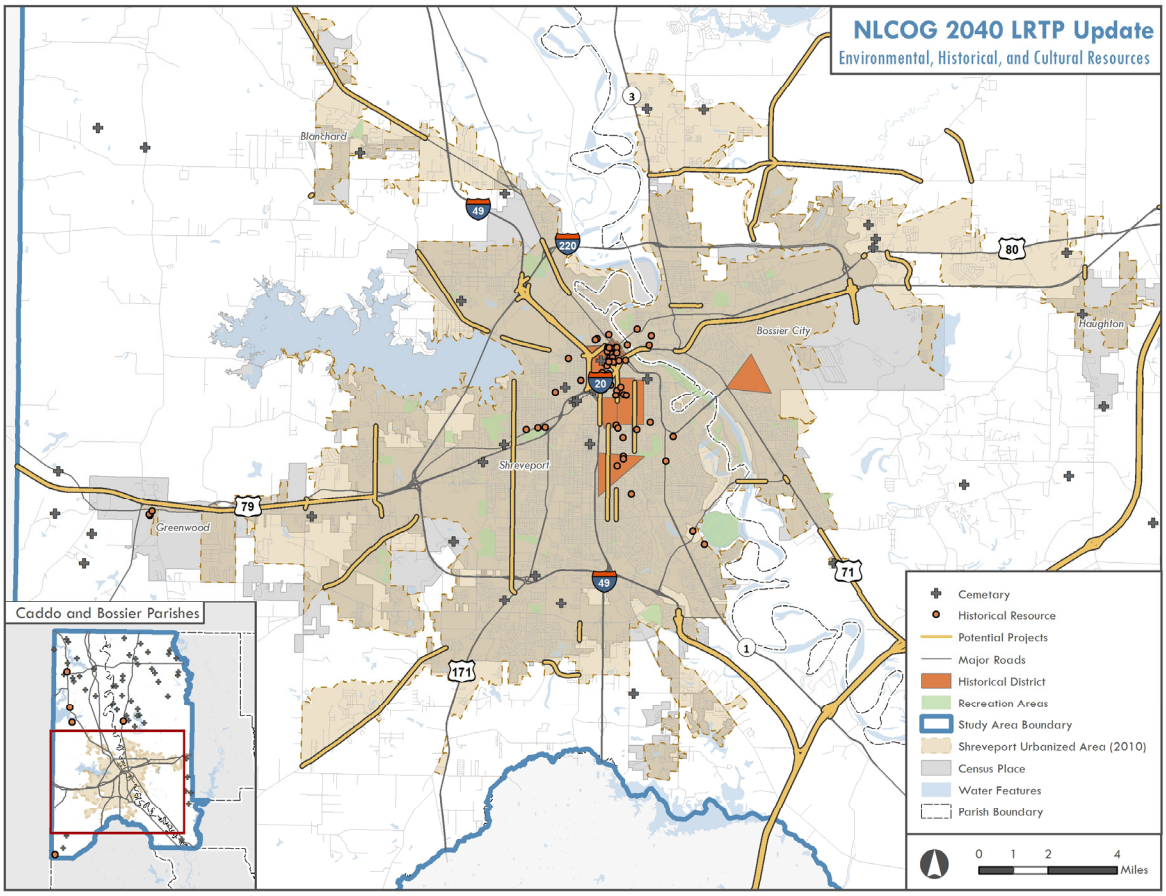
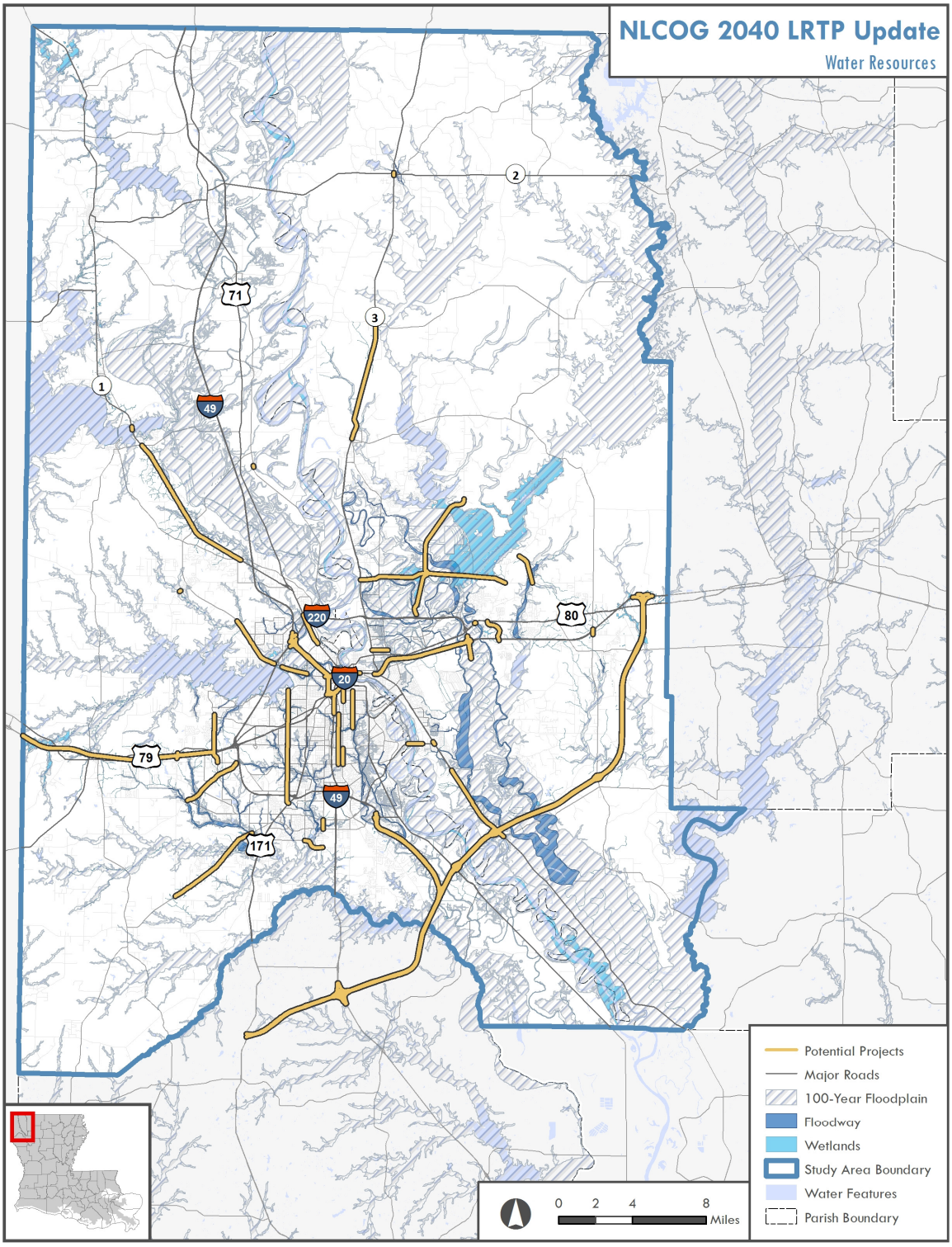


Figure 6-2: Water Resources



In order to determine how projects identified in this plan might affect these resources, an FHWA-endorsed GIS methodology originally developed by the Southeast Michigan Council of Governments was employed. The analysis assembles projects into types, and then buffer zones are generated and mapped for each type of project. The three project types identified for this analysis include system preservation, capacity expansion, and safety and other projects. Table 6-1 presents the number of proposed projects for each type included in the systems-level analysis. Some projects, such as overlays, were excluded from this analysis; therefore the total number of projects explored in this section does not reflect the total number of projects in the 2040 LRTP.

Table 6-1: Project Types Analyzed

Project Type	Total Number of Proposed Projects Analyzed
System Preservation	11
Capacity Expansion	28
Safety and Other	2
Total	**41**

Source: Shreveport-Bossier City CVB (via Flickr)

Buffer sizes were determined based on the type of project and environmental resource being examined. Smaller "areas of influence" were computed for certain project types depending on the environmental resource. Some resources, such as recreation areas and historic sites, may only be impacted by projects in close physical proximity, while others (such as water resources) may still be impacted by a project some distance away. Table 6-2 summarizes the buffer sizes assigned to each project type according to the resource being examined.

Once buffer sizes were determined, buffers and environmental resources were mapped to identify areas of overlap, as these are areas where an impact is possible. Figure 6-3 provides an example of the buffer analysis, showing proposed projects as well as areas of possible project impacts.

Table 6-2: Project Buffer Sizes

Environmental Resource	System Preservation	Capacity Expansion	Safety and Other
Floodways	.25 miles	.25 miles	.25 miles
Wetlands and Other Waters	.25 miles	.25 miles	.25 miles
Cemeteries	250 feet	250 feet	250 feet
Historic Sites	250 feet	250 feet	250 feet
Parks and Recreation Areas	250 feet	250 feet	250 feet

Figure 6-3: Example Buffer Analysis

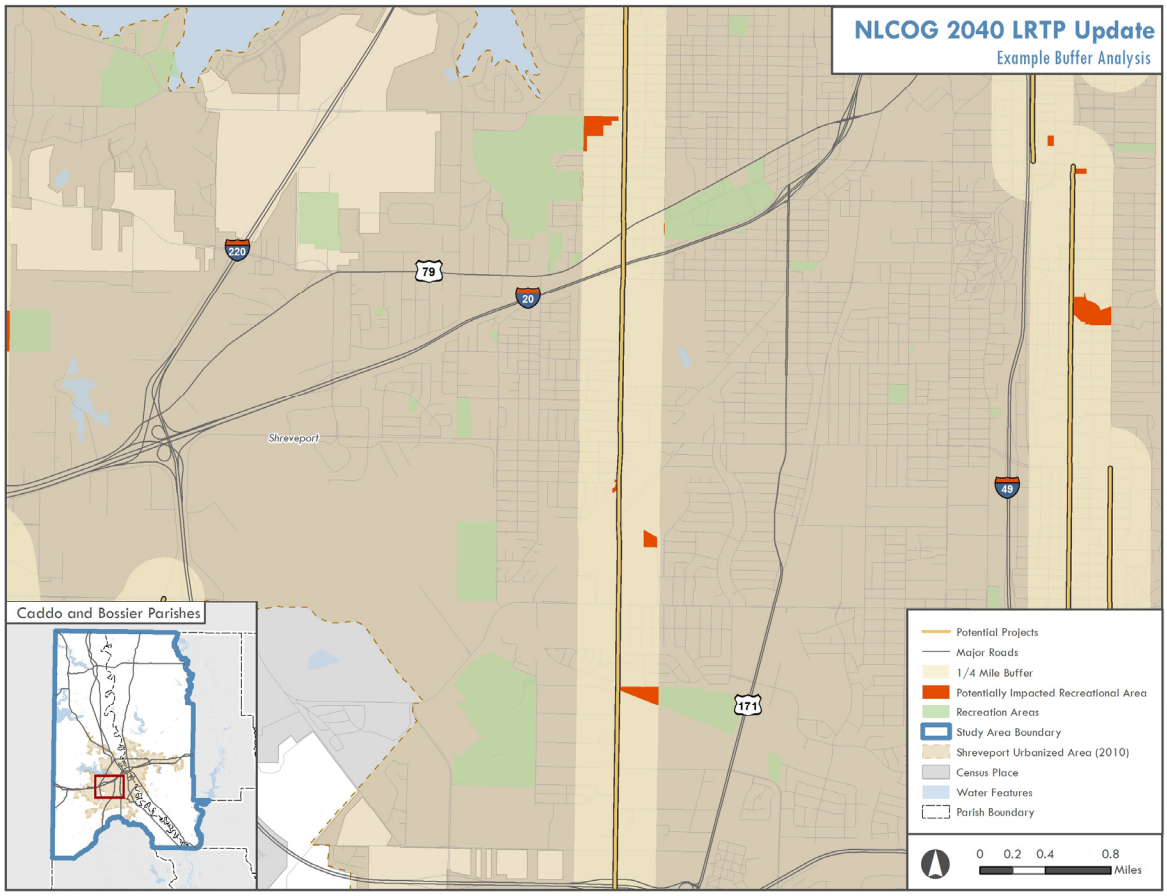


Table 6-3 quantifies the number of possible impacts to the inventoried environmental resources for each project type. The risk to wetlands and flood prone areas is the greatest with 41 and 36 projects, respectively, potentially impacting those resources. The list of proposed potential improvements presents few concerns regarding cemeteries or historic resources with only one project within close proximity of a cemetery and seven potentially impacting a historic site or district, while nine projects are located within close proximity to a park or recreation area. Table 6-4 lists the historic sites and districts and parks and recreation areas that may be impacted by the proposed transportation improvements.

Table 6-3: Number of Possible Impacts to Inventoried Environmental Resources

Project Type	Floodway	Wetlands/Waters	Cemeteries	Historic Sites/Districts	Parks and Recreation
System Preservation (11 Projects)	10	11	0	4	5
Capacity Expansion (28 Projects)	24	28	1	3	4
Safety and Other (2 Projects)	2	2	0	0	0

Table 6-4: Resource-Specific Impacts of Potential Projects

Proposed Project	Resource
Fairfield Ave Resurfacing	South Highlands Historic District
	Betty Virginia Park
	Randle T. Moore Senior Citizen Center
Fairfield Ave Resurfacing; Line Ave/Common Ave; Southern Rd	Fairfield Historic District
Gilbert Dr	Bayou Pierre
	Highland Park
Gilbert Dr; Line Ave/Common Ave	Highland Historic District
I-20 Red River Bridge/Approaches	Central Railroad Station
	Red River Bicycle Trail
I-49 Inner City Connector	Allendale Park
	SWEPCO Park
I-49 Inner City Connector ; N Market St Widening	Paul Lynch Park
I-49 Inner City Connector; LA 173 Widening	St. Paul's Bottoms
Jewella Ave	Atkins Park
	Wildwood Park
Jewella Joint Panel Repair	Jewella Overpass Park
Line Ave/Common Ave	B'Nai Zion Temple
	Shreveport Woman's Department Club Building
	Princess Park
Line Ave/Common Ave; LA 173 Widening	Shreveport Commercial Historic District
Pines Rd	Bill Cockrell (Westside)
Shed Rd Phase VII	Walbrook Neighborhood Park

The systems-level analysis of potential environmental impacts is intended to function as a resource for agencies and elected officials that will ultimately implement any of the potential projects. Detailed, project-level analysis is required in order to definitively identify adverse impacts from specific projects. The buffer analysis is a useful method for narrowing the focus of such studies, but it should be noted that proximity or overlap of a project buffer and environmental resource alone does not mean an impact is present (nor does the lack of an overlap indicate that an impact won't occur).

Potential Mitigation Activities

Federal regulations require the metropolitan planning process to include "a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan." FHWA recommends an ordered approach to mitigation known as "sequencing" that involves understanding the affected environment and assessing transportation effects through project development. This ordered approach involves:

- Avoiding the impact altogether;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
- Compensating for the impact by replacing or providing substitute resources.

Recognizing that the type and the level of mitigation activities will vary depending on the scope of the project, NLCOG proposes a toolbox of mitigation measures and general areas where these activities can be implemented. These measures, listed in Table 6-5, are intended to be regional in scope and may not necessarily address potential project-level impacts. As proposed projects progress through the project development process, mitigation should be an integral part of alternatives development and the analysis process from the start in order to maximize effectiveness.

Table 6-5: Potential Mitigation Activities

Resource	Mitigation Measures

Wetlands or water resources	☐ Avoidance, minimization, compensation
	  ☐ Preservation
	  ☐ Creation
	  ☐ Restoration
	  ☐ In-lieu fees
	  ☐ Riparian buffers
	☐ Design exceptions and variances
	☐ Environmental compliance monitoring

Forested and other natural areas	☐ Avoidance, minimization ☐ Replacement property for open space easements to be of equal fair market value and of equivalent usefulness ☐ Design exceptions and variances ☐ Environmental compliance monitoring
Agricultural areas	☐ Avoidance, minimization ☐ Design exceptions and variances ☐ Environmental compliance monitoring
Endangered and threatened species	☐ Avoidance, minimization ☐ Time-of-year restrictions ☐ Construction sequencing ☐ Design exceptions and variances ☐ Species research/fact sheets ☐ Memoranda of Agreements for species management ☐ Environmental compliance monitoring
Ambient air quality	☐ Transportation control measures ☐ Transportation emission reduction measures
Cultural resources	☐ Avoidance, minimization ☐ Landscaping for historic properties ☐ Preservation in place or excavation for archeological sites ☐ Design exceptions and variances ☐ Environmental compliance monitoring
Parks and recreation areas	☐ Avoidance, minimization, mitigation ☐ Design exceptions and variances ☐ Environmental compliance monitoring

Air Quality

Improving regional air quality and maintaining compliance with federal air quality standards is a fundamental consideration in the metropolitan transportation planning process. The construction of new transportation infrastructure increases the capacity for vehicles on regional roadways, which has the potential to increase traffic-related air pollutants in the NLCOG study area.

In 1963, in response to increasing air pollution, the U.S. Congress passed the original Clean Air Act which established a federal program for researching techniques to monitor and control air pollution. The Clean Air Act of 1970 increased federal enforcement authority and authorized the development of national ambient air quality standards to limit common and widespread pollutants. These standards, known as the National Ambient Air Quality Standards (NAAQS), define the allowable concentration of pollution in the air for six "criteria" pollutants, including carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide.

Source: Wikimedia Commons

The Clean Air Act identifies two types of national ambient air quality standards:

- Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.
- Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The existing standards for each of the six "criteria" pollutants are listed in Table 6-6. The units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m3). The existing standard for Ozone was established by a 2008 Final Rule. In November 2014, the EPA proposed to revise the primary and secondary standards to somewhere within the range of 0.065 and 0.070 ppm. After the proposed rule was published in December 2014, the EPA accepted written comments on the proposed rule until March 17, 2015. The EPA issued its final rule strengthening the ozone standards to 0.070 ppm on October 1, 2015. EPA will issue guidance on conformity requirements for transportation planning within the next year. Until then, the LRTP is only required to maintain compliance with the 2008 standard definition.

Table 6-6: Existing Standards for Criteria Pollutants

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead		Primary and Secondary	Rolling 3-month average	0.15 µg/m3	Not to be exceeded
Nitrogen Dioxide		Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		Primary and Secondary	Annual	53 ppb	Annual mean
Ozone		Primary and Secondary	8-hour	0.075 ppm	Annual fourth-highest maximum daily 8-hour concentration, averaged over 3 years
Particle Pollution	$PM_{2.5}$	Primary	Annual	12 µg/m3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m3	Annual mean, averaged over 3 years
	PM_{10}	Primary and Secondary	24-hour	35 µg/m3	98th percentile, averaged over 3 years
		Primary and Secondary	24-hour	150 µg/m3	Not to be exceeded more than once per year, averaged over 3 years
Sulfur Dioxide		Primary	1-hour	75 ppb	9th percentile of daily 1-hour maximum, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

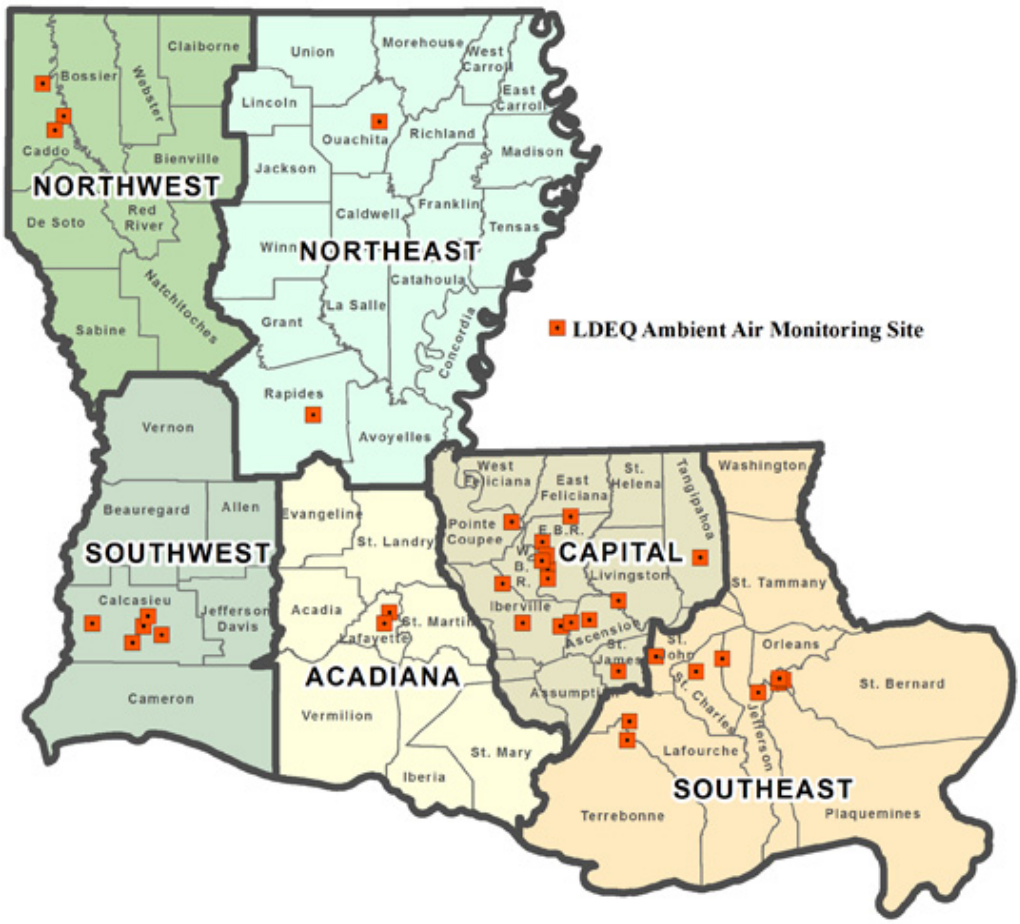
Regions are designated by the EPA as either in attainment or nonattainment for NAAQS. Attainment means the concentration of each pollutant does not exceed NAAQS. Non-attainment means the concentration of at least one pollutant exceeds the maximum defined threshold. If an area is designated as non-attainment, the State must develop and submit a State Implementation Plan (SIP). The SIP addresses each pollutant that exceeds NAAQS and establishes an overall regional plan to reduce air pollution emission levels, designed to return the area to, and maintain, attainment status. Once a nonattainment area meets the standards, EPA will designate the area to attainment as a "maintenance area." Maintenance areas are required to have a Maintenance Plan in place to ensure continued attainment of the respective air quality standard. The Clean Air Act defines specific timetables to attain air quality standards, and requires non-attainment areas to demonstrate reasonable progress in reducing air pollutants until the area achieves attainment.

Air Quality in the NLCOG Study Area

There are three air quality monitoring sites in the NWLA region that form part of Louisiana's monitoring network. The Dixie site monitors ozone continuously using a U.V. absorption method; The Shreveport Airport site monitors four air pollutants: ozone, which it monitors continuously using a U.V. absorption method; fine particulate matter (PM 2.5), which it monitors continuously using a continuous tapered element oscillating microbalance (TEOM)

method and every 6th day using a chemical speciation method; course particulate matter (PM 10), which it monitors continuously using a continuous beta attenuation monitor (BAM) method; and sulfur dioxide, which it monitors continuously using a U.V. florescence method. The Shreveport Calumet site monitors PM 2.5 both for 24 hours every third day and for 24 hours every 12th day using the sequential Federal Reference Method (FRM). The locations of all Louisiana air monitoring sites are shown in Figure 6-4 and are overseen by the Louisiana Department of Environmental Quality (LDEQ)'s Assessment Division.

Figure 6-4: Louisiana Air Monitoring Sites



Louisiana only has two areas designated as nonattainment: the five parishes of the Baton Rouge metropolitan area are nonattainment for ozone, while St. Bernard Parish is nonattainment for sulfur dioxide. Even though Caddo and Bossier parishes currently achieve attainment status, maintaining that status is a community priority that will rely on coordinated, proactive planning. Since transportation plays a prominent role in generating regional air pollution, this plan includes mobility-enhancing strategies that minimize negative impacts on air quality, such as reducing vehicle miles traveled, improving access to transit, and encouraging non-motorized modes of transportation. All of these issues were factored into the project selection process used to prioritize the final list of projects included in the 2040 LRTP.

Environmental Justice Analysis

Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, educational level, or income with respect to the development, implementation, and enforcement of environmental laws. Environmental Justice seeks to ensure that minority and low-income communities have access to public information for human health, environmental planning, regulations, and enforcement. It ensures that no population, especially the elderly and children, are forced to shoulder a disproportionate burden of the negative human health and environmental impacts of pollution or other environmental hazards. Title VI of the Civil Rights Act (42 US Code 2000 and Executive Order 12898) requires an environmental justice review, which entails a thorough evaluation of project effects to persons belonging to low-income populations and minority groups.

Source: Wikimedia Commons

Using the guidance contained in the metropolitan planning regulations, the study team incorporated environmental justice considerations into the development of the 2040 LRTP through the following steps:

Environmental Justice and the LRTP

1. The study team identified and mapped the locations of minority and low-income populations and performed a GIS-based analysis of the proximity of proposed transportation improvements to environmental justice communities;
2. Using the MPO's adopted public participation plan as a guide, the study team designed and implemented an early and meaningful public participation program that provided an opportunity for the public to be partners in the planning process;
3. In the development of the 2040 LRTP, at least one public involvement meeting per round was held in an area defined by the 2010 census as being of low to moderate income or having a predominantly minority population;
4. The study team ensured that public transportation providers, upon which the environmental justice community is most dependent, were strong partners in the planning process; and
5. The study team focused on developing a multimodal transportation system that served diverse travel markets and supported the trip purposes of various transportation consumers, including the identified environmental justice population

Identifying potential impacts on environmental justice communities involves a three-step process similar to the one used for the environmental mitigation analysis, including:

- Defining and developing an inventory of minority and low-income populations;
- Identifying and assessing the potential impacts of proposed transportation improvements on these communities; and
- Addressing possible mitigation activities at a system-wide level.

NLCOG identified the locations of minority and low-income environmental justice population concentrations using appropriate U.S. Census data. These populations were identified at the census block group level (based on 2009-2013 American Community Survey data). A block group is considered a minority census block group when the minority population of the block group is at least 50 percent of the total population. The concentrations of minority, environmental justice populations are generally concentrated centrally in the study area within the city limits of Shreveport and Bossier City.

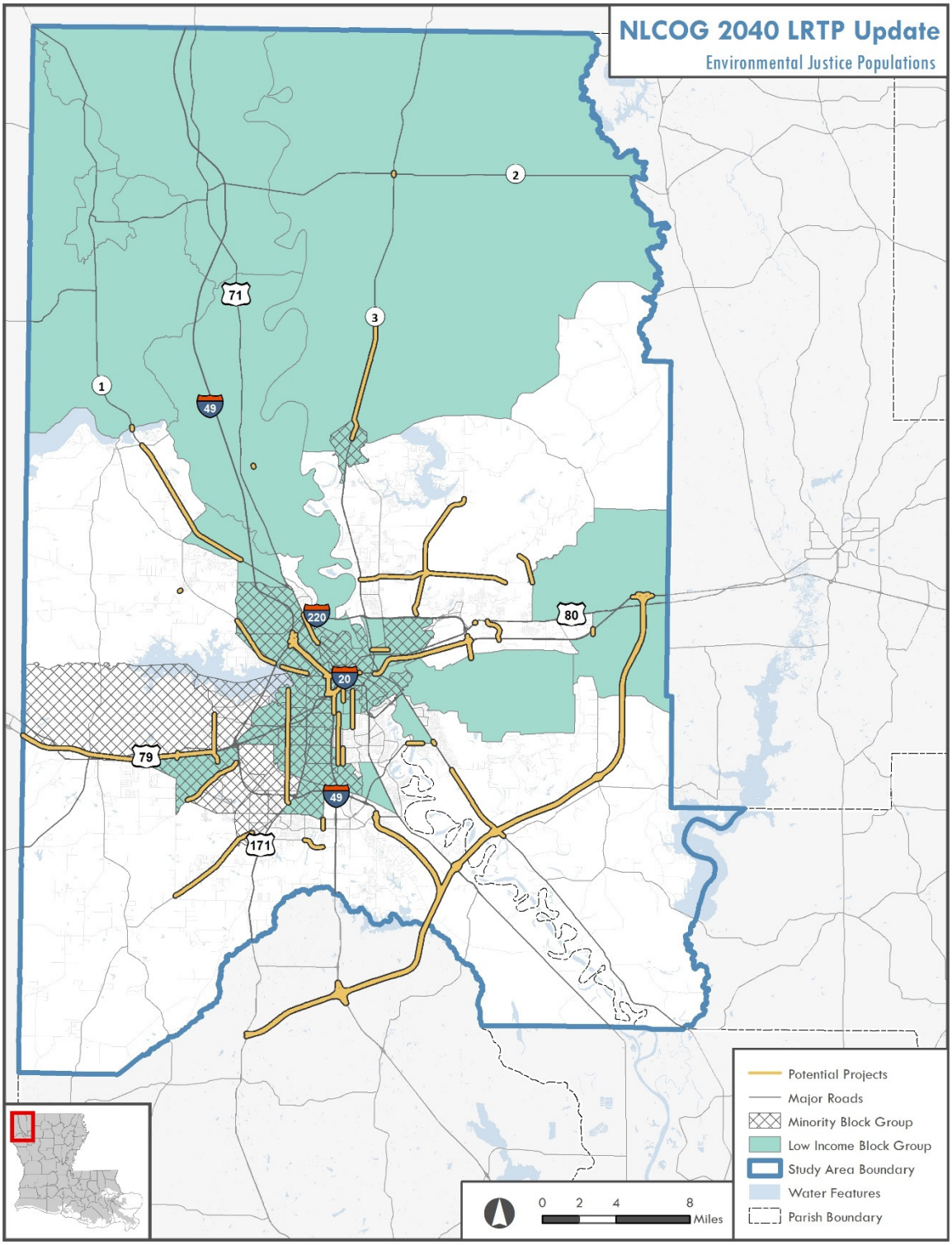
The Department of Housing and Urban Development defines low-income as "a family whose annual income does not exceed 80 percent of the median income for the area." Based on the 2009-2013 American Community Survey data, the average median household income in the study area is about $47,150. Therefore, any census block group with a median household income equal to or less than $37,720 is considered to be a low-income, environmental justice population. Of the planning area's census block groups, there are 50 block groups considered low-income, environmental justice areas. Figure 6-5 shows the location of minority and low-income populations in the NLCOG region in relation to the unconstrained program of potential projects.

As stated earlier, project-scale studies should be conducted in the planning and environmental phases of each project to determine actual impacts to these communities. Over 71 percent of the minority communities and 72 percent of low income areas intersect prioritized projects. Table 6-7 summarizes the number of projects per type that may impact minority or low income groups.

Table 6-7: Summary of EJ Analysis

Project Type	Minority	% of projects	Low Income	% of projects
System Preservation	7	64%	9	82%
Capacity Expansion	14	50%	21	75%
Safety and Other	0	0%	1	50%
Total	**21**	**51%**	**31**	**76%**

Figure 6-5: Environmental Justice and Proposed Projects



No safety projects intersect minority block groups, while half (one project) may impact low income communities. Over 63 percent and over 81 percent of system preservation projects, respectively, may potentially impact minority and low income communities. 50 percent of capacity expansion projects may impact minority communities, while over 75 percent may potentially impact low income areas.

Similar to the environmental mitigation analysis, a more detailed, project-level analysis will need to be performed to better understand the likely impacts of transportation improvements on environmental justice populations. The proximity of projects to environmental justice populations may have both positive and negative impacts. For example, it is assumed that the mobility, access, and safety benefits of most projects accrue most strongly to those areas in close proximity to the project. Therefore, if the project objectives are consistent with the travel market needs of adjacent communities, the project is viewed as having a positive impact.

On the other hand, the physical impacts of project construction and footprint also have the greatest negative impacts on adjacent communities. Large infrastructure projects whose objectives are not consistent with community needs represent potential negative impacts. Examples include the construction of a new railway line that may create safety and noise pollution concerns, the construction of a new roadway that divides an existing community or creates barriers to other resources and/or activities, or improvements that may increase freight traffic or the movement of hazardous materials through low-income areas.

The key consideration in determining unintended consequences or disparate impacts to environmental justice populations is how the project objectives match the community's transportation needs. NLCOG is committed to working with project sponsors to mitigate negative impacts on environmental justice communities using measures such as impact avoidance or minimization and context sensitive solutions (appropriate functional and/or aesthetic design features).

Source: Shreveport-Bossier City CVB (via Flickr)

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7 | FINANCIAL ANALYSIS

According to federal regulations, transportation improvement projects included in a long range transportation plan (LRTP) must fall within the financial capabilities of the community. The final project list included in the LRTP must therefore be fiscally constrained – i.e., the amount of revenues available for projects must be greater than or equal to the anticipated cost of the projects.

This chapter includes a list of funding sources and dollar amounts anticipated to be available to fund projects included in the NLCOG 2040 LRTP. It also outlines the process by which historic trends in funding were assessed and funding levels were forecast to determine the amount of funds available.

Because federal regulations stipulate that the financial forecast take into account the change in value of the dollar due to inflation, revenues and costs discussed in this chapter were calculated in year-of-receipt and year-of-expenditure dollars, respectively.

Calculating Revenues

This section summarizes the process used to forecast roadway and transit revenue over the 25-year time period in the 2040 LRTP. A more detailed financial analysis can be found in the Technical Supplement.

Source: Shreveport-Bossier City CVB (via Flickr)

Roadway Revenues

Roadway Funding Sources

The following section describes the state and federal funding sources available for roadway projects, as well as several local programs that can be used to fund local roadway projects.

Potential Federal Funding Sources

National Highway Performance Program (NHPP)

Most activities that were previously funded under the SAFETEA-LU National Highway System (NHS) program are now eligible under the National Highway Performance Program (NHPP), the purpose of which is to:

- Provide support for the condition and performance of the National Highway System;
- Provide support for the construction of new facilities on the NHS; and
- Ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.

NHPP provides funding for construction and maintenance projects located on the newly expanded National Highway System (NHS), which includes the entire Interstate system and all other highways classified as principal arterials. MAP-21 eliminated the programs with dedicated funding for repair by consolidating the Interstate Maintenance and Highway Bridge Repair programs and shifting these funds to the new NHPP. NHPP provides funding for improvements to rural and urban roads that are part of the NHS, including the Interstate System and designated connections to major intermodal terminals. Under certain circumstances, NHS funds may also be used to fund transit improvements in NHS corridors.

Surface Transportation Program (STP)

The STP is a block grant funding program with subcategories for states and urban areas. STP funding may be used for projects to preserve or improve conditions and performance on any Federal-aid highway, bridge projects on any public road, facilities for non-motorized transportation, transit capital projects, and public bus terminals and facilities. These funds can be used for any road, including an NHS roadway, which is not functionally classified as a local road or rural minor collector. The state portion can be used on roads within (or outside) an urbanized area, while the urban portion can only be used on roads within an urbanized area. The funding ratio is 80/20.

Subcategories of the STP funds are:

- STP greater than 200,000 population (STP>200K)
- STP less than 200,000 population (STP<200K)
- STP less than 5,000 population (STP <5K)
- STP Flexible (STP-FLEX)
- STP Off-System Bridge (STP Bridge)

Highway Safety Improvement Program (HSIP)

The purpose of the Highway Safety Improvement Program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands.

Special assessments have also been used to generate funds for general improvements within special districts, such as central business districts. In some cases, these assessments are paid over a period of time, rather than as a lump sum payment.

HSIP requires that the State develop, implement, and update a Strategic Highway Safety Plan (SHSP); produce a program of projects or strategies to reduce identified safety problems; and evaluate the SHSP on a regular basis. The SHSP is a statewide coordinated plan developed in cooperation with a broad range of multidisciplinary stakeholders. As a part of the plan, states are required to have a safety data system to perform problem identification and countermeasure analysis on all public roads; adopt strategic and performance-based goals; advance data collection, analysis, and integration capabilities; determine priorities for the correction of identified safety problems; and establish evaluation procedures.

MAP-21 authorized a lump sum for this program, and it is the responsibility of the State to divide up these funds according to the State's priorities. However, there are a few set-asides from the State's HSIP apportionment:

- Railway-highway crossings
- State's Transportation Alternatives Program (TAP)
- State Planning and Research

For a project to be eligible under the HSIP program, the project must be consistent with the State's SHSP and also correct or improve a hazardous road location or feature or address a highway safety problem. Workforce development, training, and education activities are also eligible uses of HSIP funds.

Transportation Alternatives Program (TAP)

MAP-21 established the Transportation Alternatives Program (TAP) to provide funding for a variety of alternative transportation projects that were previously eligible activities under separately funded programs. Unless a State opts out, it must use a specified portion of its TAP funds for recreational trails projects. Eligible activities include:

- Transportation alternatives
- Recreational Trails Program (RTP)
- Safe Routes to Schools (SRTS) program
- Planning, designing, or constructing roadways within the right-of way of former Interstate routes or other divided highways

Source: Wikimedia Commons

States and MPOs – for urbanized areas with more than 200,000 people – conduct a competitive application process for use of the sub-allocated funds. Options are included to allow States flexibility in use of these funds.

Congestion Mitigation and Air Quality (CMAQ)

Urban areas which do not meet ambient air quality standards are designated as nonattainment areas by the U.S. Environmental Protection Agency (USEPA). CMAQ funds are apportioned to those urban areas for use on projects that contribute to the reduction of mobile source air pollution through reducing vehicle miles traveled, fuel consumption, or other identifiable factors. Starting in FY 2013, all CMAQ projects will require a 20% local match, with the exception of carpool & vanpool projects, which will remain 100% federal. Because the NLCOG Study Area is currently an attainment area, projects in the LRTP are not eligible for CMAQ funds.

Potential State Funding Sources

State transportation funding comes from several sources of revenue. Traditionally this revenue is used to match federal sources and to fund the operations of the Department of Transportation and Development. The basic funding source for the state program comes from the State Transportation Trust Fund (TFF), which includes 20-cent gasoline tax, license fees, interest, weight permits and fines, and aviation fuel tax. Additional funding comes from the State Highway Improvement Fund (HIF).

State Bond Monies (ST-BONDS)

State Secured Bonds are acquired through the Capital Outlay Program. The Capital Outlay Program is a complex program for funding the state's annual construction budget and the multi-year nature of most projects.

State Cash (ST-CASH)

State Cash is funded primarily through the general fund. Traditionally this source of revenue has been for maintenance projects.

State General Fund Revenues (ST-GEN)

The State General Fund is funded primarily through previous year's revenue surplus funds. Revenue surplus funds can be recognized by the states Revenue Estimating Committee only at the end of a fiscal year. According to the Louisiana Constitution, any surplus can only be used for capital construction, retirement or payment of debt, providing payments against the unfunded accrued liability of the retirement systems, or placed in the Budget Stabilization or "Rainy Day" fund.

Miscellaneous Revenue Sources

Miscellaneous Revenue Sources constitutes the remainder of state funding. These sources include the I-49 Unclaimed Property fund, maintenance funds, funding from the state overlay program, reimbursable expenses incurred by other agencies, and public works funding from the Department's non-transportation section.

Potential Local Funding Sources

Any costs not covered by federal and state programs will be the responsibility of the local governmental jurisdictions. Local funding can come from a variety of sources including property taxes, sales taxes, user fees, special assessments, and impact fees. Each of these potential sources is important and warrants further discussion.

Property Taxes

Property taxation has historically been the primary source of revenue for local governments in the United States. Property taxes account for more than 80 percent of all local tax revenues. Property is not subject to federal government taxation, and state governments have, in recent years, shown an increasing willingness to leave this important source of funding to local governments.

General Sales Taxes

The general sales and use tax is also an important revenue source for local governments. The most commonly known form of the general sales tax is the retail sales tax. The retail sales tax is imposed on a wide range of commodities, and the rate is usually a uniform percentage of the selling price.

User Fees

User fees are fees collected from those who utilize a service or facility. The fees are collected to pay for the cost of a facility, finance the cost of operations, and/or generate revenue for other uses. User fees are commonly charged for public parks, water and sewer services, transit systems, and solid waste facilities. The theory behind the user fee is that those who directly benefit from these public services pay for the costs.

Special Assessments

Special assessment is a method of generating funds for public improvements, whereby the cost of a public improvement is collected from those who directly benefit from the improvement. In many instances, new streets are financed by special assessment. The owners of property located adjacent to the new streets are assessed a portion of the cost of the new streets based on the amount of frontage they own along the new streets.

Special assessments have also been used to generate funds for general improvements within special districts, such as central business districts. In some cases, these assessments are paid over a period of time, rather than as a lump sum payment.

Impact Fees

Development impact fees have been generally well received in other states and municipalities in the United States. New developments create increased traffic volumes on the streets around them, and development impact fees are a way of attempting to place a portion of the burden of funding improvements on developers who are creating or adding to the need for improvements.

Bond Issues

Property tax and sales tax funds can be used on a pay-as-you-go basis, or the revenues from them can be used to pay off general obligation or revenue bonds. These bonds are issued by local governments upon approval of the voting public.

Source: Wikimedia Commons

Maintenance and Operations

The maintenance and operation of the transportation system was considered in the development of the 2040 LRTP and staged improvement program. Typically, maintenance costs are applicable to the system as a whole. Where possible, maintenance projects are identified individually. However, it is not possible to develop project specific

maintenance schedules beyond the near term. The maintenance costs identified in this plan are the responsibility of various governmental jurisdictions.

The balancing act of meeting identified transportation improvement needs and maintaining the present transportation system will continue to place local decision makers and revenue forecasts somewhat at odds. Recommendations in this plan are conservative, because they factor in the impact of maintenance costs in the determination of available funding.

A variety of both federal and state funds are used to implement the statewide overlay, maintenance, and operations program. This includes Surface Transportation Funds, National Highway System Funds, General Louisiana Trust Fund monies, and State of Louisiana general funds.

Historical Funding for Roadways

In order to determine the financial feasibility of implementing a program of projects in the LRTP, an analysis of historical funding was conducted. A database of project lettings in Caddo and Bossier Parishes from 2000-2014 was obtained from LADOTD. These databases contain all sources of state and federal funding, as well as both recurring and non-recurring funds.

In the next step, the projects were grouped by year. To estimate the funding available for historical projects in 2015 dollars, an average annual Consumer Price Index (CPI) factor was calculated using the historical South Urban Areas CPI factors that are shown in Table 7-1 and applied to the historical dollar amounts. In order to better estimate the expected future revenues, the non-recurring funds were excluded from each year's total historical revenue.

Table 7-1: Regional State and Federal Roadway Funding (2000-2014)

Fiscal Year	Net Revenue	CPI Factor	2015 Value
00-01	$21,327,166	1.34	$28,578,402
01-02	$70,450,588	1.32	$92,994,776
02-03	$10,038,013	1.29	$12,949,037
03-04	$37,956,634	1.26	$47,825,359
04-05	$27,099,559	1.22	$33,061,462
05-06	$40,333,399	1.18	$47,593,411
06-07	$19,553,252	1.15	$22,486,240
07-08	$30,684,517	1.11	$34,059,814
08-09	$19,657,787	1.11	$21,820,144
09-10	$58,781,981	1.09	$64,072,359
10-11	$42,120,192	1.06	$44,647,404
11-12	$32,401,150	1.04	$33,697,196
12-13	$35,752,493	1.02	$36,467,543
13-14	$69,085,723	1.01	$69,776,580
14-15*	*$7,533,510*	*1.00*	*$7,533,510*

Note: FY 14-15 was excluded from final annual average calculations

From this list of annual recurring revenues, an average was calculated in order to establish a baseline for projecting future revenues. The calculated baseline average excludes the most recent fiscal year as data for lettings in that year was incomplete. The total revenues were summed and divided by the number of years to obtain the historic average revenue that was available to the NLCOG area over the last 15 years.

Roadway Revenue Forecast

The feasibility of the financially constrained plan can be assessed by comparing the estimated cost of the programmed improvements to the projected funds available from various funding sources. Recurring funding was projected by analyzing historical data on expenditures for roadway construction in the study area.

Historical information obtained from the LADOTD indicates that on average, in the last 15 years, contracts totaling $38.7 million per year in 2015 dollars have been let for construction and maintenance of the transportation infrastructure within Caddo and Bossier Parishes (not including one-time expenses). However, as a result of changes in funding methodologies since 2009, it was determined that an annual average roadway revenue from 2009-2013 would be a more appropriate number to use to forecast future roadway funding. The average annual recurring roadway revenue from the last five years is $49.7 million from all recurring sources. This amount was used as the baseline to forecast funding to 2040.

Source: Wikimedia Commons

An inflation factor of four percent per year was applied to the $49.7 million to forecast the annual availability of funds through 2040. The resulting total amount of funding forecasted to be available over the life of the Fiscally Constrained Plan is approximately $2.5 billion.

Financially Constrained Plan

The annual forecast amounts were aggregated to the three time periods of the LRTP resulting in the following levels (Table 7-2) of funding estimated to be available for each stage.

Table 7-2: Roadway Funding by Stage

Stage	Amount
Current (2016-2020)	$302,620,536
Short-Term (2021-2030)	$895,677,214
Long-Term (2031-2040)	$1,325,860,884
Total	**$2,524,158,634**

Transit Revenues

Transit Funding Sources

Transit providers in the study area are funded through a combination of federal, state, and local sources. Aside from local funding, the Federal Transit Administration (FTA) administers the primary funding programs utilized by transit providers in the study area. Of these programs, the Section 5307 Urbanized Area Formula program is the largest source of funding. Other FTA funding programs are more limited in nature.

Potential Funding Sources - Federal

Section 5307 (Urbanized Area Formula Program)

This formula-based program (49 U.S.C. 5307) provides capital, operating, and planning funding to urbanized areas, or urban areas with a population of 50,000 or more, as designated by the U.S. Department of Commerce, Bureau of the Census. However, as the NLCOG region is larger than 200,000 in population, operating costs are not covered under this program. For areas with populations of 200,000 or more, the formula is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles, as well as population and population density, and number of low-income individuals.

Section 5311 (Formula Grants for Rural Areas)

This formula-based program (49 U.S.C. 5311) provides states and tribal governments with funding for administration, capital, planning, and operating assistance to support public transportation in rural areas, defined as areas with fewer than 50,000 residents. There are set-asides within this program for the Intercity Bus Program, the Rural Transit Assistance Program (RTAP), Public Transportation on Indian Reservations, and the Appalachian Development Public Transportation Program.

Section 5310 (Enhanced Mobility of Seniors and Individuals with Disabilities)

The Enhanced Mobility program provides formula funding to assist in meeting the transportation needs of the elderly and persons with disabilities when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs. The purpose of this program is to enhance mobility for seniors and persons with disabilities by providing funds for programs to serve the special needs of transit-dependent populations beyond traditional public transportation services and paratransit services.

Funds from the 5310 program can be used for both capital improvements and operating expenses. However, at least 55% of program funds must be used on capital projects that are public transportation projects planned, designed, and carried out to meet the special needs of seniors and individuals with disabilities when public transportation is insufficient, inappropriate, or unavailable. The remaining 45% of program funds may be used for:

- Public transportation projects that exceed the requirements of the Americans with Disabilities Act (ADA)
- Public transportation projects that improve access to fixed-route service and decrease reliance by individuals with disabilities on complementary paratransit
- Alternatives to public transportation that assist seniors and individuals with disabilities

Funds are apportioned for urbanized and rural areas based on the number of seniors and individuals with disabilities. The federal share for capital projects (including acquisition of public transportation services) is 80%; the federal share for operating assistance is 50%.

Section 5339 (Bus and Bus Facilities)

This formula-based program (49 U.S.C. 5339) provides capital funding to states and designated recipients to replace, rehabilitate, and purchase buses, vans, and related equipment, and to construct bus-related facilities.

Other FTA Formula and Discretionary Grants

There are several other FTA grant programs with funding available. Most of these grant programs are focused on fixed guideway systems or on temporary assistance.

Flexible Federal Funding Sources

Funding from the National Highway Performance Program (NHPP), the Surface Transportation Program (STP), and Transportation Alternatives Program (TAP) can be "flexed" to transit projects, with certain eligibility restrictions depending on the funding source.

Potential State Funding Sources

The State provides funding for transit operating assistance through DOTD grants. In addition, the cities of Bossier and Shreveport provide grants for operating assistance which are primarily used as the match requirement for federal grant programs. The state of Louisiana also uses funding from the Transportation Trust Fund for capital acquisition for the transit providers operating under 49 U.S.C. 5310 and 5311.

Potential Local Funding Sources

Local funding sources include all of the same potential sources as local roadway revenue, outlined previously. Additionally, SporTran, the fixed-route transit provider for the metro area, generates revenues from multiple sources including ridership fees (e.g. fares), advertising, and other miscellaneous revenue sources.

Historical Funding for Transit

Historical data was gathered from the LADOTD and National Transit Database (NTD) regarding transit funding in the NLCOG study area.

SporTran revenue data was obtained from the NTD from the past ten years for which data was available. The NTD provides extensive information on historic funding, including federal, state, and local operating revenue, other operating revenue (e.g. fares), as well as federal and state capital funding. Historical revenues from each revenue source are shown by year in Table 7-3. Figures in this table have been adjusted so that all values are in 2015 dollars, using the CPI for South Urban Consumers.

Table 7-3: Historical Transit Revenues

Year	SporTran[1]								Bossier COA
	Operating[2]					Capital			All Revenue[3]
	Federal	State	Local	Fares	Other	Federal	State	Local	
2000	$1,616,943	$889,221	$4,273,346	$2,582,215	$19,766	$2,989,411	-	$731,072	-
2001	$2,028,243	$583,752	$4,690,455	$2,539,994	$20,636	$476,403	-	$118,987	-
2002	$2,095,450	$536,603	$4,789,966	$2,628,627	$23,515	$330,748	-	$82,694	-
2003	$2,218,332	$587,428	$4,736,752	$2,456,196	$48,325	$4,176,479	-	$893,679	-
2004	$2,120,521	$575,541	$5,280,596	$2,363,691	$37,953	$298,779	-	$72,145	-
2005	$1,875,075	$480,319	$6,293,109	$2,340,666	$125,148	$2,380,999	-	$496,243	-
2006	$2,508,731	$481,425	$6,140,879	$2,471,068	$35,798	$268,647	-	$67,167	-
2007	$2,612,859	$464,679	$6,859,821	$2,568,066	$99,140	$1,319,160	$166,223	$155,620	-
2008	$3,489,467	$552,438	$6,984,485	$2,766,001	$59,688	$848,038	$92,835	$124,744	-
2009	$2,844,279	$754,858	$6,665,801	$2,779,401	$36,837	$581,524	$116,014	$32,220	-
2010	$4,085,854	$769,344	$5,519,678	$2,734,187	$23,208	$2,823,201	-	$57,873	-
2011	$3,079,090	$616,801	$7,455,473	$2,777,882	$25,615	$5,938,912	-	-	-
2012	$3,137,673	$571,323	$7,414,248	$2,750,370	$27,478	$1,191,244	-	-	-
2013	$3,336,842	$553,703	$7,726,197	$2,633,834	$55,074	$1,197,214	-	$122,104	-
2014	-	-	-	-	-	-	-	-	$302,883
2015	-	-	-	-	-	-	-	-	$312,835
Annual Average	**$2,646,383**	**$601,245**	**$6,059,343**	**$2,599,443**	**$45,584**	**$1,772,911**	**$26,791**	**$211,039**	**$307,860**

1 – Source: National Transit Database

2 – "Operating" as defined by NTD includes recurring capital expenses from federal programs (i.e. 5307)

3 – Source: LADTOD

Source: Shreveport-Bossier City CVB (via Flickr)

Operating revenue data for the past two years was obtained from LADOTD for the Bossier Council on Aging, which is a small human service transportation provider in Bossier Parish. The National Transit Database and LADOTD do not provide data for other providers in the region.

Transit Revenue Forecast

After the historical funding totals were converted to 2015 dollars, an annual average was calculated for each revenue source. This resulted in annual funding levels for SporTran of nearly $14 million, with $9.3 million from federal, state, and local sources, $2.6 million from fares, and roughly $2 million from federal and state capital assistance. Bossier COA has annual operating revenues of approximately $300k. It is assumed that local funding will continue to be available to match and supplement federal funds as needed. The annual averages for all funding sources, in 2015 dollars, were then projected to the future years using an inflation rate of four percent.

Financially Constrained Plan

The year-of-receipt annual amounts were then aggregated to the three time periods of the LRTP resulting in the following transit funding anticipated to be available for each stage shown in Table 7-4.

Calculating Costs

Federal regulations define "total project cost" for the purpose of estimating fiscal constraint in the LRTP to include:

- Planning elements (e.g. environmental studies and functional studies);
- Engineering costs (e.g. preliminary engineering and design);
- Preconstruction activities (e.g. ROW acquisition);
- Construction activities; and
- Contingencies.

The following assumptions helped guide the development of cost estimates for the proposed projects in the LRTP as well as the maintenance and operation of the existing transportation system.

Table 7-4: Transit Funding Forecasts by Stage

Stage	SporTran			Bossier COA	Total
	Federal, State, and Local Funding/Grants	Fares and Other Revenue	Capital Funding	All Revenue	
Current	$52,425,942	$14,899,372	$11,326,456	$1,734,165	**$80,385,935**
Short Term	$140,494,215	$39,928,241	$30,353,323	$4,647,319	**$215,423,099**
Long Term	$207,965,759	$59,103,550	$44,930,333	$6,879,168	**$318,878,811**
Total	**$400,885,916**	**$113,931,164**	**$86,610,112**	**$13,260,652**	**$614,687,844**

1. Because federal regulations do not require that the cost of maintenance and operations activities be computed for individual projects, the funding needed for maintenance and operation of the transportation infrastructure was estimated on a system-wide level.
2. Whenever a detailed engineering estimate for a particular project was not available, generalized planning-level cost figures were used to assess the cost of each of the project's elements. These generalized cost figures were based on estimates provided by LADOTD and other available resources.
3. Transit costs reflect the historic annual average of costs as recorded by the NTD.
4. Transit project costs were calculated using an annual inflation rate of 4% based on LADOTD guidance.

Table 7-5 shows the typical planning-level improvement costs for different types of transportation improvements calculated in 2015 dollars from the historical regional transportation project letting data provided by LADOTD. In addition to construction costs, these figures include planning-level engineering, right-of-way, and utility cost estimates. These non-construction costs can vary significantly on a location- and project-specific basis.

Source: Wikimedia Commons

Table 7-5: Typical Improvement Costs by Type

Improvement Type	Unit	Cost (2015)
New 4 Lane Freeway	Mile	$18,100,000
New 2 Lane Roadway	Mile	$8,164,000
New 4 Lane Arterial	Mile	$14,758,000
Interstate Widening	Mile	$11,000,000
Interstate Rehab	Mile	$3,800,000
Arterial Widening	Mile	$9,100,000
Center Turn Lane	Mile	$3,000,000
Reconstruction	Mile	$8,700,000
Overlay (2 lanes)	Mile	$423,000
Overlay (4 lanes)	Mile	$1,500,000
ITS	Mile	$3,300,000
New Bridge	Each	$5,181,000
Bridge Replacement	Each	$3,445,000
RR Crossing	Each	$597,000
Intersection Improvement	Each	$1,900,000
Interchange Improvement	Each	$9,027,500
New Interchange	Each	$24,000,000
Underpass	Each	$16,485,000
RR Overpass	Each	$9,812,500
Concrete Panel and Joint Repair (2 lane)	Mile	$421,000
Concrete Panel and Joint Repair (4 lane)	Mile	$842,000

Both typical improvement costs and local knowledge of other project costs were used to develop cost estimates for the projects considered for the LRTP. In keeping with federal regulations, cost estimates were computed in year-of-expenditure (YOE) dollars using the inflation factors outlined in the revenue forecast discussion in accordance with FHWA and LADOTD guidance for project costs. Table 7-6 displays the aggregate total estimated project costs for each time period addressed by the LRTP. Each time period figure accounts for general system maintenance and operation costs. The complete list of projects considered for inclusion in the LRTP, along with estimated YOE costs, can be found in Chapter 8.

Table 7-6: 2040 Cost Forecast (All Projects)

	Roadway	Transit	Total
Current Stage (2015-2020)	$284,190,462	$80,374,833	**$364,565,295**
Short-Term Stage (2021-2030)	$855,093,324	$215,456,286	**$1,070,549,610**
Long-Term Stage (2031-2040)	$1,260,992,193	$318,190,409	**$1,579,182,602**
Total	**$2,400,275,979**	**$614,021,528**	**$3,014,297,507**

Constraining the Plan

The anticipated total program revenue for both highway and transit is expected to be roughly $3.14 billion over the 25-year planning horizon of the LRTP. Total program costs are estimated to be about $3.02 billion in YOE dollars. Because the total program revenue is expected to be greater than program costs, the NLCOG 2040 LRTP can be considered fiscally constrained.

8 | PRIORITIZED PROJECT LIST

This chapter provides tables and maps that describe and illustrate the package of projects included in the 2040 LRTP. The fiscally constrained projects have been grouped into three time periods/stages:

- Current Stage: 2016-2020
- Short-Term Stage: 2021-2030
- Long-Term Stage: 2031-2040

Additionally, roadway projects have been grouped into three program categories:

Capacity Expansion

Includes projects that add additional capacity on a roadway, either through the addition of more lanes of traffic or through operational improvements that increase the effective capacity of a roadway (e.g. intersection improvements).

System Preservation

Includes projects that maintain the transportation system in a state of good repair, including roadway resurfacing, overlays, and bridge replacements.

Safety and Other

Includes projects that enhance the safety of roadway, either through physical means (such as through the installation of highway median cable barriers) or through operational enhancements. Also includes system-wide projects such as roadside assistance patrols.

For roadway projects, the tables include a column called "TCC Score" that lists the ranking of the project relative to other projects in the same category as assigned by the Technical Coordinating Committee during the project prioritization process (discussed in Chapter 5). Most projects included in the Current Stage were taken from the current Transportation Improvement Program (TIP) and were not ranked during the project prioritization process. These projects are identified with a "T" in the ID field (e.g. T9).

Additionally, a list of vision projects has been included; these projects are important to the region, but are currently unfunded within the 2040 planning horizon. These projects include a field that lists the congestion reduction ranking for each project relative to the other unfunded projects as computed by the Travel Demand Model.

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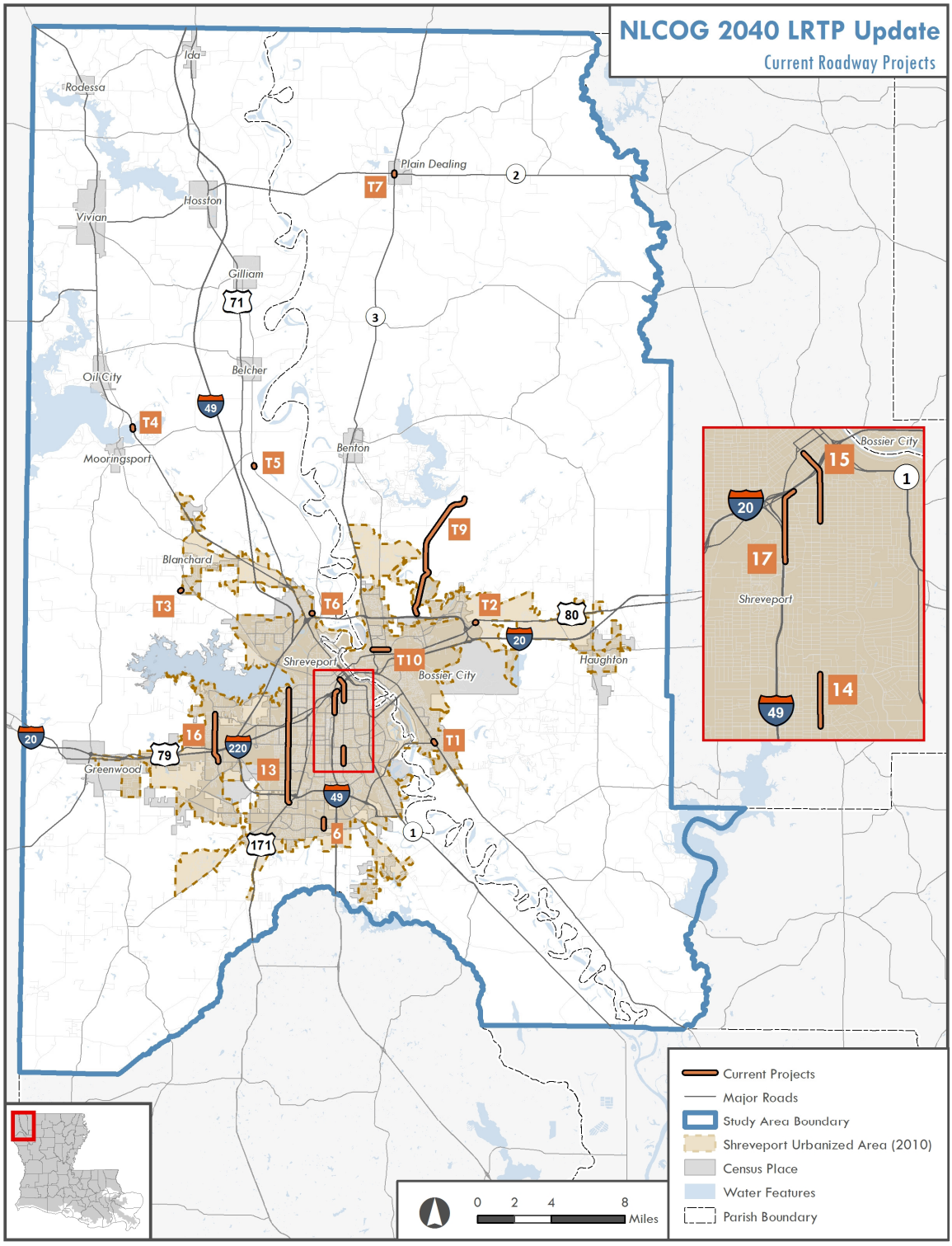
Roadway Projects

Current Stage (2016-2020)

ID	Project Name	Route	Scope	Limits	Program Category	YOE Cost (000s)	Primary Funding Source	TCC Score
T7	LA 3 Left Turn Lane	LA 3	Install left turn lane	LA 3 at Cnt. Sec. 044-02	Capacity Expansion	$435	HSIP	N/A
T9	North-South Corridor (Swan-Lake Rd widen and Extension)	Local	Phase I: widen to 3-ln urban collector section; Phase II: new 2-ln rural collector section	Phase 1: Widening from I-220 to Flat River; Phase 2: New Construction from Flat River to Crouch Road	Capacity Expansion	$20,466	STP > 200k	N/A
T10	Shed Road Phase VII	Local	Widen to 5-ln section	LA 3 (Benton Rd) to LA 3105 (Airline Dr)	Capacity Expansion	$8,808	STP > 200k, STP FLEX	N/A
6	Linwood Ave Widening	Local	Widen to 4-ln urban minor arterial section	LA 526 to Flournoy Lucas Rd	Capacity Expansion	$5,537	Fed/State/Loc	1
18	Caddo/Bossier Parish M.A.P.	Safety	Motorist Assistance Patrol	Regional	Safety & Other	$2,250	STP > 200k	2
T1/ 37	US 71 J-Turn Intersection	US 71	Add J-Turn Intersection	US 71 at Jimmie Davis Bridge	Safety & Other	$850	NHS	1
T6	Cul-de-Sac @ I-49 N C of A Line	I-49 Segment K	Road Closure with Cul-de-Sac	Phelps Rd/Montana St	Safety & Other	$1,545	STGEN, LADOTD	N/A
T8	LA 538 Roundabout at Ravendale	LA 538	Add roundabout	LA 538 at Ravendale	Safety & Other	$1,193	HSIP	N/A
T2	Bayou Fifi Bridge	Local	Bridge replacement	US 80 at Bayou Fifi	System Preservation	$1,121	STP FLEX	N/A
T3	Blanchard Furrh Road / Chotaw Bayou	Local	Bridge replacement	Blanchard Furrh Road at Choctaw Bayou	System Preservation	$1,152	HBP OFF	N/A
T4	Caddo Lake Bridge	LA 1	Bridge replacement	LA 1 at Caddo Lake	System Preservation	$26,243	STP FLEX	N/A
T5	Creek Bridge and Irish	Local	Bridge replacement	LA 3049 at Irish Bayou	System Preservation	$990	HBP OFF	N/A
13	Jewella Ave	Local	Joint and panel repair	Mansfield to Milam	System Preservation	$6,322	STP > 200k	3
14	Line Ave	Local	Joint and panel repair	70th to Southfield	System Preservation	$902	STP > 200k	5
15	Line Ave/Common Ave	Local	Joint and panel repair	Olive to Crockett	System Preservation	$1,260	STP > 200k	2
16	Pines Rd	Local	Joint and panel repair	70th to Jefferson Paige	System Preservation	$2,756	STP > 200k	4
17	Southern Rd	Local	Resurface Asphalt Roadways	Kings Highway to Fairfield	System Preservation	$1,260	STP > 200k	1
Line Item	Maintenance and Safety Line Item	Various	Bridge repair, drainage, signage, signalization, ITS, striping, overlay, pavement, rehabilitation	Various	System Preservation and/or Safety & Other	$201,099	HSIP, HBP, RAIL PD, IM, STP Flex, NHPP	N/A

Figure 8-1: Current Stage Roadway Projects

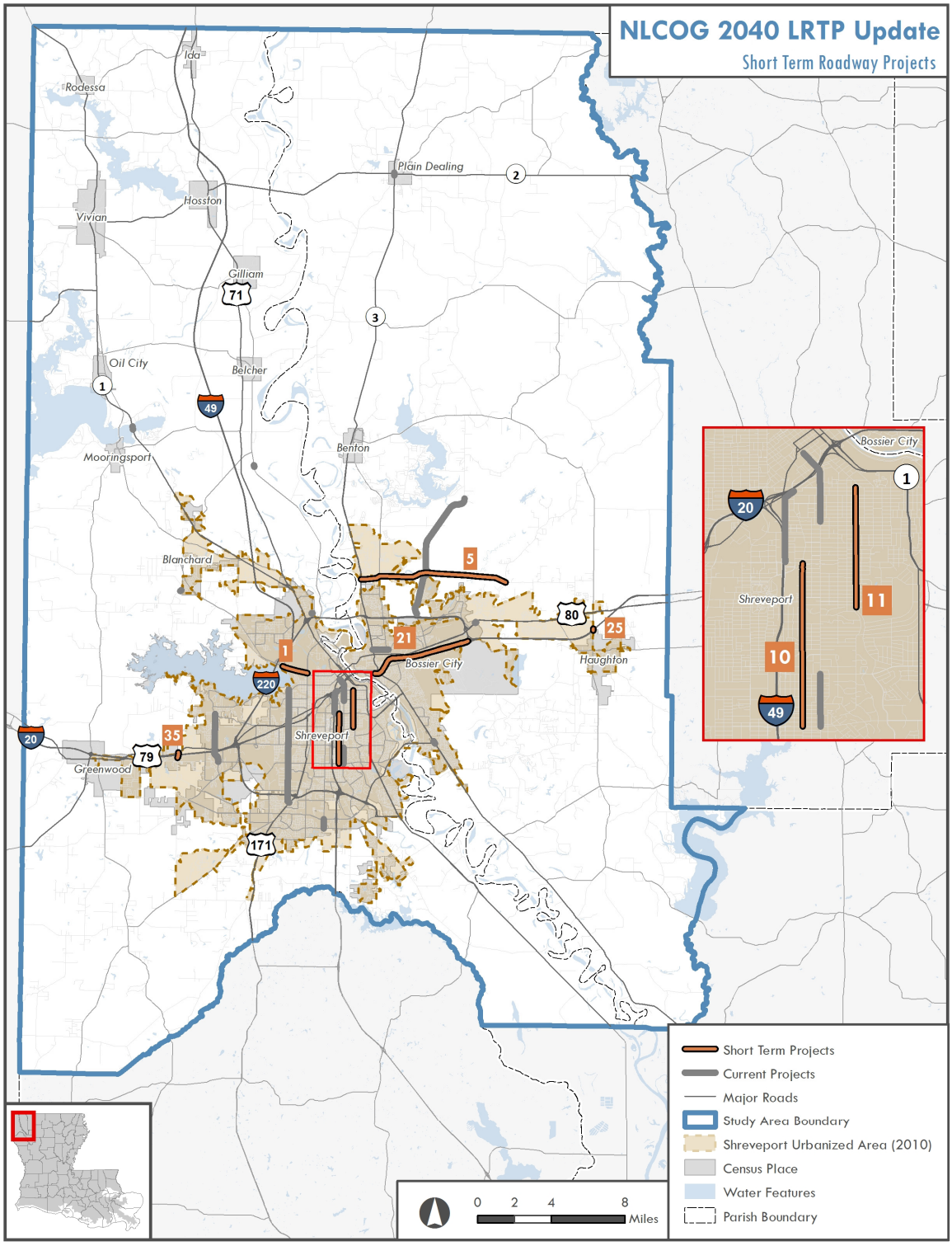


Short-Term Stage (2021-2030)

ID	Project Name	Route	Scope	Limits	Program Category	YOE Cost (000s)	Primary Funding Source	TCC Score
1	LA 173 Improvements	LA 173	Widen to 4-ln urban minor arterial section	Jct LA 3094 to Jct I-220	Capacity Expansion	$28,845	STP FLEX	16
5	Winfield Rd Extension (EW Corridor)	Local	New 2-ln urban collector section	East terminus at Winfield Rd/Bellevue Rd intersection west to LA 3	Capacity Expansion	$119,979	Federal, BPPJ	10
21	I-20 Widening (Bossier City Urban Section)	I-20	Widen and realign to 6-ln interstate section	US 71/LA 3 interchange to I-220 (east)	Capacity Expansion	$108,168	None	4*
25	LA 157 Bridge Widening overpass at I-20	LA 157	Widen existing bridge structure and approaches to 4-ln	LA 157 overpass at I-20 (Haughton)	Capacity Expansion	$41,374	Fed/State/Loc	15
35	LA 526 Bridge Widening overpass at I-20	LA 526	Widen existing bridge structure and approaches to 4-ln	LA 526 (Bert Kouns) overpass at I-20	Capacity Expansion	$29,623	Fed/State/Loc	4
10	Fairfield Ave	Local	Resurface Asphalt Roadways	70th to St. Vincent	System Preservation	$2,072	STP > 200k	7
11	Gilbert Dr	Local	Resurface Asphalt Roadways	Gregg to Stoner	System Preservation	$5,403	STP > 200k	6
Line Item	Maintenance/Safety/ Rehab Line Items	Various	Bridge repair, drainage, signage, signalization, ITS, striping, overlay, pavement, rehabilitation	Various	System Preservation and/or Safety & Other	$519,626	HSIP, HBP, RAIL PD, IM, STP Flex, NHPP	N/A

**Project ID21 (I-20 Bossier City Widening) was not initially scored by TCC; score reflects congestion score determined from travel demand model analysis*

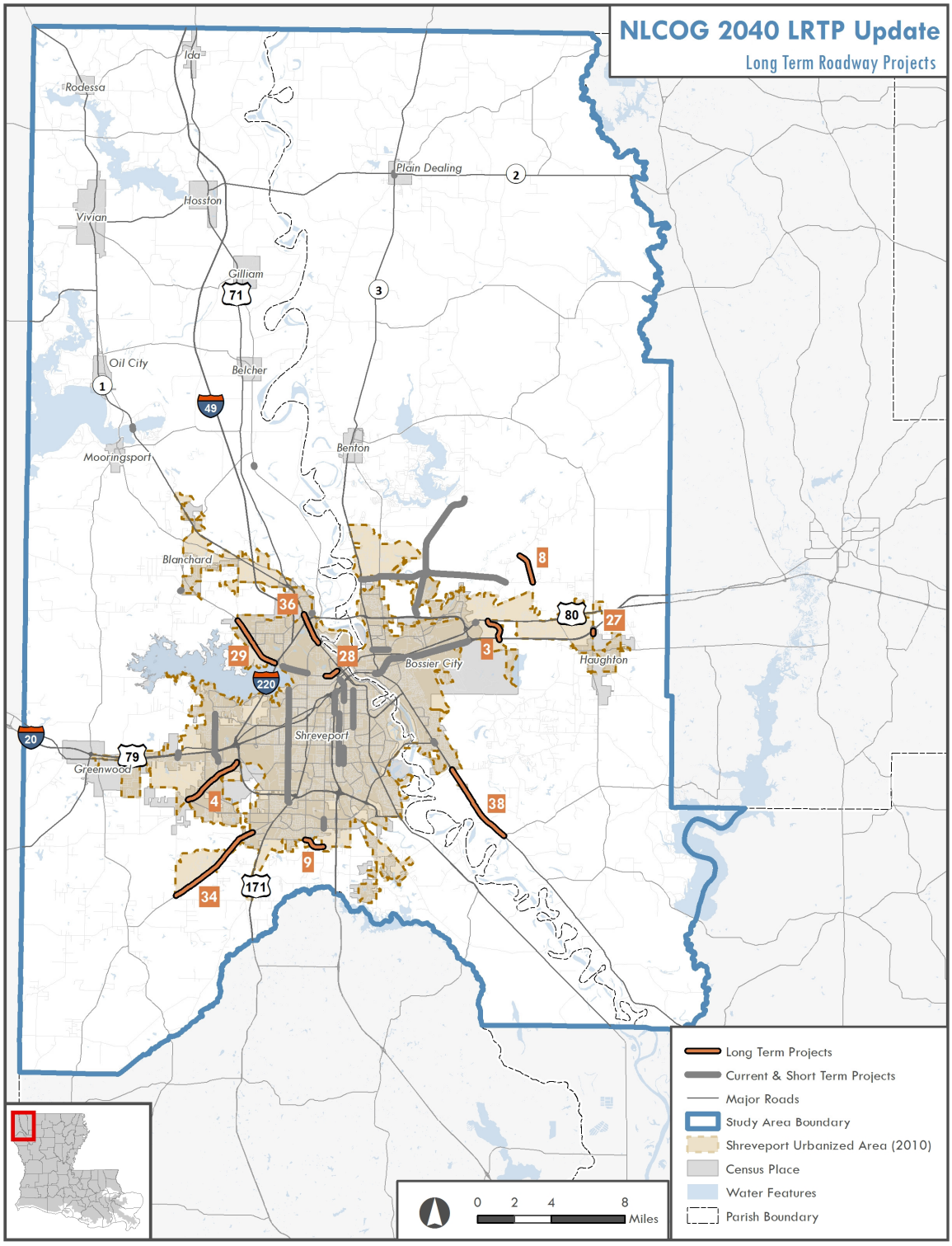
Figure 8-2: Short-Term Stage Roadway Projects



Long-Term Stage (2031-2040)

ID	Project Name	Route	Scope	Limits	Program Category	YOE Cost (000s)	Primary Funding Source	TCC Score
3	Bodcau Station Rd Widening	Local	Widen to 4-ln local road section	I-20 to US 80 (Texas St)	Capacity Expansion	$34,450	Fed/State/Loc	14
4	Buncomb Rd Widening	Local	Widen to 3-ln urban minor arterial section	LA 511 (W 70th St) to LA 526	Capacity Expansion	$27,193	Fed/State/Loc	7
8	Wafer Rd Extension	Local	New 2-ln urban collector section	Current Wafer Rd/Winfield Rd intersection north to Bellevue Rd	Capacity Expansion	$37,219	Federal, BPPJ	12
9	Williamson Way Extension	Local	New extension 2-ln urban minor arterial section	Kingston Rd to Linwood Ave	Capacity Expansion	$25,465	Fed/State/Loc	9
27	LA 157 at LA 3227 Intersection Improvements	LA 157	Add LT lane from EB LA 3227 to LA 157; add RT lane from WB LA 3227 to LA 157; widen la 157 to 6-ln between LA 3227 and I-20 ent ramps	LA 157 to LA 3227 intersection (Haughton)	Capacity Expansion	$5,065	Fed/State/Loc	5
28	LA 173 (Ford/Caddo St) Widening	LA 173	Widen to 4-ln urban minor arterial section	Marshall St west to Pierre Ave	Capacity Expansion	$11,837	Fed/State/Loc	2
29	Shreveport-Blanchard Hwy Widening	LA 173	Widen to 4-ln urban minor arterial section	Roy Rd to I-220	Capacity Expansion	$79,575	Fed/State/Loc	8
34	Colquitt Rd Widening	LA 525	Widen to 4-ln urban minor arterial section	Dean Rd to Woolworth Rd	Capacity Expansion	$132,948	Fed/State/Loc	11
36	N. Market St. Improvements	US 71	Capacity improvements	N. Hearne to bridge at 12-mile Bayou	Capacity Expansion	$26,444	Fed/State/Loc	3
38	US 71 Widening	US 71	Widen to 4-ln rural arterial section	LA 612 (Sligo Rd) to LA 527	Capacity Expansion	$111,599	Fed/State/Loc	6
Line Item	Maintenance/Safety/Rehab Line Items	Various	Bridge repair, drainage, signage, signalization, ITS, striping, overlay, pavement, rehabilitation	Various	System Preservation and/or Safety & Other	$769,197	HSIP, HBP, RAIL PD, IM, STP Flex, NHPP	N/A

Figure 8-3: Long-Term Stage Roadway Projects

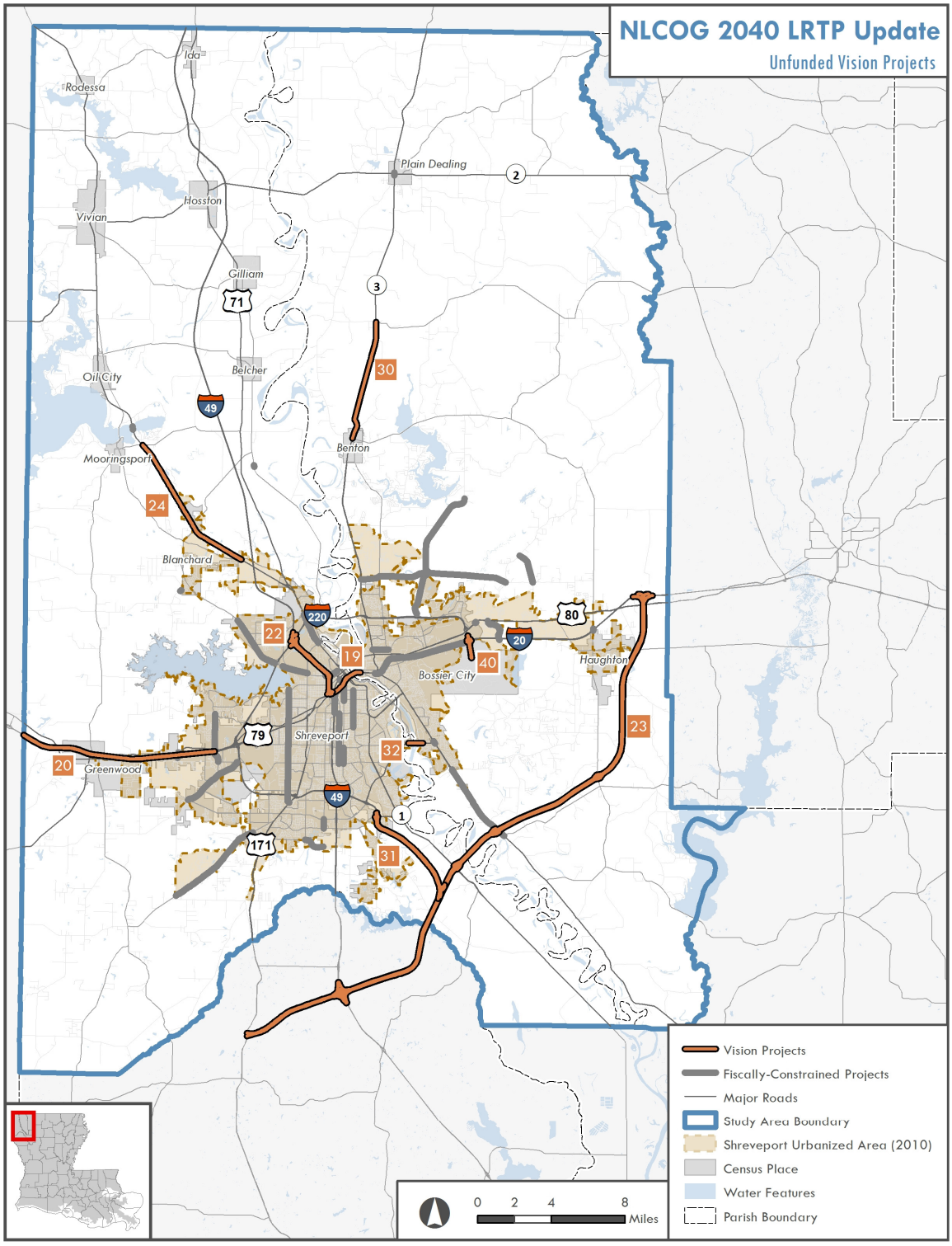


Vision Roadway Projects (Unfunded Needs)

ID	Project Name	Route	Scope	Limits	Program Category	YOE Cost (000s)	Primary Funding Source	Congestion Score
19	I-20 Red River Bridge/Approaches	I-20	New bridge structure/improve approaches/reconfigure ent/exit ramps	I-20 Red River crossing between I-49 and Traffic St interchanges	Capacity Expansion	$426,560	None	5
20	I-20 Widening	I-20	Widen to 6-ln intersection	Texas SL to Pines Rd	Capacity Expansion	$311,442	None	8
22	I-49 Inner City Connector, New Interstate	I-49	New interstate section	I-49/I-20 interchange (south) to I-220/new I-49 north interchange	Capacity Expansion	$193,501	None	6
23	I-69 (SIU-15)	I-69	New 4-ln interstate construction w/ Red River Bridge structure	I-20 to US 171 (Shreveport urban section)	Capacity Expansion	$3,182,735	None	1
24	LA 1 Widening (TX SL to LA 538)/LA 173 to 169	LA 1	Widen to 4-ln rural arterial section	LA 538 to LA 173, LA 173 to LA 169	Capacity Expansion	$199,422	None	9
30	LA 3 Widening	LA 3	Widen to 4-ln rural minor arterial section	LA 160 to LA 162	Capacity Expansion	$158,907	None	13*
31	Inner Loop Ext.	LA 3132	New 4-ln freeway expressway	LA 523 to I-69 (Port)	Capacity Expansion	$354,671	None	2
32	Jimmie Davis Bridge	LA 511	New 2-ln bridge structure w/ bike/ped facilities	LA 511 (J Davis Hwy) Red River crossing	Capacity Expansion	$220,105	None	3
40	I-220 South Extension	I-220	New 4-ln interstate construction; 4 ramps and new C-D road	I-220 at I-20 interchange (Bossier City) and south to Barksdale AFB	Capacity Expansion	$328,366	None	7

**Project ID30 was originally scored by the TCC; score reflects the project ranking within the "Capacity Expansion" category as determined by the TCC*

Figure 8-4: Vision Roadway Projects



Transit Projects

Current Stage (2016-2020)

Agency	Description	Funding Source(s)	Total YOE Cost (000s)
SporTran	Preventative Maintenance	Section 5307 (Capital)	$19,408
SporTran	Non-Fixed Route ADA Paratransit service	Section 5307 (Operating)	$1,917
SporTran	Project Administration	Section 5307 (Operating)	$313
SporTran	NLCOG Planning	Section 5307 (Operating)	$211
SporTran	Training/Travel	Section 5307 (Operating)	$56
SporTran	Elderly/Disabled Transit Assistance	Section 5310	$282
SporTran	Local Operating Costs	Local	$45,127
SporTran	Capital Expenses - Fixed Route Bus	Section 5339 and 5307 (Capital)	$10,808
SporTran	Capital Expenses - Demand Response	Other	$518
Bossier COA	Operating Expenses	Section 5310 and Local	$1,734

Short-Term Stage (2021-2030)

Agency	Description	Funding Source(s)	Total YOE Cost (000s)
SporTran	Preventative Maintenance	Section 5307 (Capital)	$52,025
SporTran	Non-Fixed Route ADA Paratransit service	Section 5307 (Operating)	$5,138
SporTran	Project Administration	Section 5307 (Operating)	$840
SporTran	NLCOG Planning	Section 5307 (Operating)	$566
SporTran	Training/Travel	Section 5307 (Operating)	$151
SporTran	Elderly/Disabled Transit Assistance	Section 5310	$755
SporTran	Local Operating Costs	Local	$120,970
SporTran	Capital Expenses - Fixed Route Bus	Section 5339 and 5307 (Capital)	$28,973
SporTran	Capital Expenses - Demand Response	Other	$1,389
Bossier COA	Operating Expenses	Section 5310 and Local	$4,649

Long-Term Stage (2031-2040)

Agency	Description	Funding Source(s)	Total YOE Cost (000s)
SporTran	Preventative Maintenance	Section 5307 (Capital)	$76,831
SporTran	Non-Fixed Route ADA Paratransit service	Section 5307 (Operating)	$7,588
SporTran	Project Administration	Section 5307 (Operating)	$1,240
SporTran	NLCOG Planning	Section 5307 (Operating)	$836
SporTran	Training/Travel	Section 5307 (Operating)	$223
SporTran	Elderly/Disabled Transit Assistance	Section 5310	$1,115
SporTran	Local Operating Costs	Local	$178,652
SporTran	Capital Expenses - Fixed Route Bus	Section 5339 and 5307 (Capital)	$42,788
SporTran	Capital Expenses - Demand Response	Other	$2,051
Bossier COA	Operating Expenses	Section 5310 and Local	$6,865

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