

MISSISSIPPI GULF COAST AREA TRANSPORTATION STUDY 2035 LONG-RANGE TRANSPORTATION PLAN



PREPARED FOR



PREPARED BY



IN ASSOCIATION WITH • WILBUR SMITH ASSOCIATES • MARCH 2011

Cover art by Dereck Ladner

Decorative Artwork on Bicycle/Pedestrian Pathway

U. S. Highway 90 Biloxi Bay Bridge

Photograph by J. Wilkinson

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EXECUTIVE SUMMARY

STUDY AREA

The study area for the Mississippi Gulf Coast Long-Range Transportation Plan encompasses two separate urbanized areas, the Gulfport-Biloxi Urbanized Area (UZA) and the Pascagoula UZA, as well as the balance of the three coastal counties (Hancock, Harrison and Jackson) in which they are contained. This study area stretches from the New Orleans, Louisiana Metropolitan Statistical Area (MSA) on the west to the Mobile, Alabama MSA on the east.

STUDY PURPOSE

The purpose of the study was to update the long-range transportation plan for the Mississippi Gulf Coast Area in accordance with applicable federal law and the metropolitan planning regulations jointly promulgated by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). Those guidelines require the metropolitan planning organization (MPO) for an area to maintain a long-range transportation plan with a horizon of at least 20 years. The horizon for this study was fixed at the year 2035, with interim target years of 2015 for the short-term component and 2025 for the intermediate component. These components are identified as Stage 1 (2011-2015), Stage 2 (2016-2025) and Stage 3 (2026-2035).

STUDY ORGANIZATION

Gulf Regional Planning Commission (GRPC) is the agency designated by the Governor of Mississippi to coordinate long-range transportation planning for the Gulfport-Biloxi and Pascagoula urbanized areas. A Transportation Policy Committee (TPC), comprised primarily of the elected heads of governments in the three counties and 11 municipalities located within the Mississippi Gulf Coast Study Area, serves as the policy-making board of the MPO. A Technical Coordinating Committee (TCC) provides review and evaluation of the technical aspects of planning activities and is made up of local, state and federal transportation planners and engineers and other technically qualified persons with an interest in the transportation system.

LEGISLATIVE AUTHORITY

The *Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users* (SAFETEA-LU) was enacted in 2005 for the purpose of authorizing transportation programs supported by the federal government. SAFETEA-LU continued the requirements for comprehensive transportation planning initially established by the *Federal-Aid Highway Act of 1962*. Key provisions of the act were scheduled to expire at the end of Fiscal Year (FY) 2009 but have been extended to the present date by a series of continuing resolutions.

GOALS AND OBJECTIVES

The purpose of establishing goals and objectives for transportation system development is to provide a rational and coherent basis for evaluating proposed capital and operating improvements related to the movement of people and goods in the study area. A balanced approach must be sought that maximizes the general welfare without unfairly burdening any particular group and that maximizes the utility of the system itself. In addition, the transportation system must be safe, secure, efficient, economically feasible, and in harmony with the character of the area.

STUDY AREA POPULATION

On July 1, 2009 the total estimated population of the study area (Hancock, Harrison and Jackson counties) was 355,075, nearly 9,000 fewer persons than were counted by the 2000 Census and more than 20,000 fewer than were estimated to be living in the area in 2005 prior to Hurricane Katrina. There are 11 municipalities located within the three study area counties, the most populous being Gulfport which had 71,127 residents in 2000 and an estimated population of 72,464 as of July 1, 2005. The city's population was estimated to be 70,732 as of July 1, 2009. The incorporated areas in all three counties are concentrated along the Mississippi Sound. This is consistent with the settlement pattern which has prevailed over the three centuries since the French arrived in 1699.

STUDY AREA ECONOMY

The economy of the Mississippi Gulf Coast historically depended on boat-building, fishing and seafood processing, lumber, brickyards and beachfront resorts. In the nineteenth century, wealthy New Orleanians sought, in the salt air of the coastal plain, to escape yellow fever epidemics by building handsome summer cottages along the beaches of the Mississippi Sound. The New Orleans, Chattanooga and Mobile Railroad, built in 1869, introduced Midwestern "snowbirds" to the charms of the coast, starting a seasonal migration that continues today. The railroad also allowed the establishment of sawmills and brickyards that employed European immigrants from Ireland, Germany and Italy. Commercial fisheries flourished, and a huge seafood processing industry also developed. With the outbreak of World War II, Keesler Air Base was built in Biloxi. In Pascagoula the Ingalls Shipbuilding Company, now Northrop Grumman Shipbuilding, built ships for the U. S. Navy. The National Aeronautics and Space Administration (NASA) established the Stennis Space Center in the mid-1960s in Hancock County as the site for testing the Saturn V rocket booster used to launch manned space missions. Today these military and federal installations, along with the tourism industry that was boosted by the opening of casinos in the 1990s, remain cornerstones of the Mississippi Gulf Coast economy.

STUDY AREA EMPLOYMENT

Employment in Hancock County is concentrated in the government, retail trade, accommodations and food service, and professional, scientific and technical sectors. The economy of Harrison County is dominated by the presence of casinos, hotels and motels, restaurants and two major military installations: the Naval Construction Battalion Center and Keesler Air Force Base. Jackson County has historically been the manufacturing center of the region. Employment at the major shipyards in Pascagoula exceeded 30,000 in the 1970s, before declining due to major layoffs in the 1980s. Nevertheless, manufacturing continues to be the dominant sector in Jackson County, although non-manufacturing jobs in trade, services and government have increased over the years to take the place of manufacturing jobs that have been lost. Jackson is the only one of the three coastal counties which

does not have any casinos. Since 1993, the first full year of casino operations in the area, establishment-based employment in Harrison County has exceeded residence-based employment, making the county a net importer of labor. Although the number of workers living in Hancock and Jackson counties continues to exceed by small margins the number of people working in each of those two counties, establishment-based employment in the study area as a whole has surpassed the resident labor force in recent years.

LAND USE AND DEMOGRAPHIC FORECAST

Travel demand is greatly influenced by the pattern of development and allocation of land uses in an area. Changes in the type, intensity or distribution of land uses will generate new travel demand or modify existing patterns of circulation. GRPC developed a long-range land use and demographic forecast in order to provide the input data necessary for modeling future traffic in the area. The forecast projected that population in the area would increase by more than 100,000 by 2035 and that employment would expand by more than 75,000 jobs during the same long-range planning period.

PUBLIC INVOLVEMENT

Members of the general public, as well as designated transportation stakeholders, were encouraged to participate in the development of a new long-range transportation plan for the region throughout the study effort. Interested individuals were asked to provide input regarding the following: Proposed projects in the current (2030) long-range plan; population and employment growth in the area; goals and objectives for the plan; pedestrian, bicycle and safety issues; transit issues; air quality concerns and funding priorities. A Stakeholders Summit was held on April 13, 2010 to solicit the involvement of knowledgeable individuals with a stake in the development of the regional transportation plan. Three public meetings were held during the week beginning Monday, April 12, 2010. A second Stakeholders Summit was convened on March 1, 2011; and a second round of public meetings took place during the three-day period from March 1 through March 3, 2011, with one meeting being held in each of the three study area counties.

TRAVEL DEMAND MODELING

The Mississippi Gulf Coast Travel Demand Forecasting Model was constructed on Caliper Corporation's *TransCAD 5.0* software platform. The transportation model is driven by a socio-economic database developed by GRPC, including base-year population, housing, employment, hotel and motel rooms, school enrollment, casino gaming area and number of playing positions, used to calibrate the model to actual traffic conditions in 2008 based on annualized average daily traffic (AADT) estimates for hundreds of count locations in the region. Data for the model variables provided the inputs used to estimate the number of trips produced and attracted within individual traffic analysis zones. There are 554 such zones in the study area: 187 in Jackson County, 290 in Harrison County and 77 in Hancock County. Forecast data were used to generate trips for the short-term (2015), intermediate (2025) and long-range (2035) planning years. Projected future traffic was then assigned to an Existing-Plus-Committed (E+C) network in order to identify potential deficiencies likely to occur in the absence of improvements beyond those already committed for implementation. The E+C network included all major roads (and some local streets) that were still in service in 2010, incorporated changes to base-year streets and highways made since 2008, and added new routes opened to traffic after the base-year traffic counts were made. It also included committed improvements programmed for implementation during the next 5-10 years.

NEEDS ASSESSMENT

The process undertaken to identify and assess needs considered in developing the long-range regional transportation plan for the Mississippi Gulf Coast Area elicited essential input from stakeholders, the general public, local officials and other interested parties. Technical work activities included the assessment of existing traffic conditions and the modeling of future travel demand. Local planning activities, especially those spurred by the Hurricane Katrina recovery effort, played a particularly important part in development of the regional transportation plan; and, as always, so did the highway construction program for state-maintained routes in Mississippi. GRPC assigned particular importance to consultation with state and federal agencies having responsibilities likely to be affected by decisions regarding land use and transportation. Finally, the MPO attempted to address the environmental justice implications of all potential transportation improvement projects, in order to ensure that the benefits and burdens associated with proposed improvements included in the plan will be equitably distributed and not cause undue hardship to individuals belonging to groups which have historically had limited opportunities to influence the plan development process. Transportation needs also were identified by the MPO *Congestion Management Plan* (CMP) which draws on performance measures developed from travel-time data to identify specific congestion problems. A total of 33 potentially deficient roadway segments, having volume-to-capacity ratios greater than 1.00, were identified on the basis of the long-range traffic assignment made with the Mississippi Gulf Coast model. Thirteen of those were projected to experience unsatisfactory levels of service (E or F) in 2035.

FUTURE FUNDING

GRPC adopted a fairly conservative methodology for projecting the future availability of funding for transportation improvements. The basic assumption was that the overall level of funding would be consistent with the recent historical trend established by actual expenditures. Actual expenditures during the period from 2005 through 2009, based on data provided by the Mississippi Department of Transportation (MDOT), amounted to approximately \$84.7 million per year. This figure included all projects for which contracts were let that involved state or federal funds, i.e., all except strictly local projects. It did not include emergency relief (ER) or Community Development Block Grant (CDBG) recovery funds provided to repair or replace infrastructure damaged or destroyed by Hurricane Katrina in 2005. The total amount expended for all non-emergency transportation projects during the five-year period analyzed was \$423,564,849. This figure covered all categories, including bridges, demonstration projects, transportation enhancement projects, roadway construction, highway maintenance, traffic counting, landside access to maritime ports, railroad crossings, safety measures and public transit (excluding funds provided directly to transit operators by the Federal Transit Administration or from sources of local match for FTA grants.)

FUNDING ALTERNATIVES

The conceptual funding alternatives defined for consideration envisioned shifting some funds from street and highway construction to other categories in accordance with goals relating to the maintenance of existing infrastructure, expansion of alternative modes, and enhancement of the safety and security of the transportation system. In addition, the pending designation of study area counties as non-attainment areas with respect to the National Ambient Air Quality Standards (NAAQS) will necessitate measures to reduce mobile-source emissions (specifically the precursors for ozone). Finally, uncertainty regarding the economic situation and prospects for future funding heightened concern for the sustainability of the transportation system. The composite alternative selected for the plan called

for increased funding support for bicycle and pedestrian facilities, landside access to maritime ports, railroad grade crossing protection, public transit, safety-related improvements, operational enhancements and maintenance activities. Under this scenario the percentage share of all transportation funds allocated to street and highway construction would be reduced from the historical level of just under 73 percent to 66 percent.

PROJECT EVALUATION

The funding analysis established the limits necessary to develop a fiscally constrained long-range transportation plan. The needs identification process helped in determining what type of improvement would be appropriate in addressing each need. A project evaluation and prioritization process was necessary to determine which improvements could actually be accommodated within the limits of the fiscally constrained Staged Improvement Program for streets and highways. The process adopted involved rating each project on the degree of deficiency to be mitigated and the extent to which the proposed improvement would address the goals and objectives adopted by the MPO. Areas of principal concern for the analysis included existing traffic congestion, projected congestion, transit service potential, goods movement, safety, air quality, environmental justice and the suitability of less costly transportation system management (TSM) measures. In general, the approach adopted was to give extra credit to proposed improvements that would enhance the operational effectiveness of the existing street and highway system and encourage the preservation, maintenance and use of currently available facilities. Where the CMP indicated a deficiency of roadway capacity relative to demand, every effort was made to consider potential solutions other than building a new road or widening an existing one. This meant estimating how particular TSM measures might improve the performance of a given route by calculating the likely change in the volume-to-capacity ratio.

ENVIRONMENTAL OVERVIEW

In addition to the usual considerations relating to wetlands, plant and animal habitat, neighborhood cohesion and so forth, the environmental overview was concerned with the possible long-term effects of climate change on the transportation system and the looming need to develop strategies for curtailing mobile-source emissions of air pollutants monitored by the Mississippi Department of Environmental Quality (MDEQ) and U. S. Environmental Protection Agency (USEPA). Proposed National Ambient Air Quality Standards (NAAQS) could require local governments in Harrison and Jackson counties to adopt measures to reduce the levels of certain pollutants – oxides of nitrogen (NOx) and volatile organic compounds (VOC) – that chemically react in the presence of sunlight to form ozone. While there is still a great deal of uncertainty regarding the future effects of climate change, possible impacts could include relative sea level rise, increased or intensified tropical storm activity, higher atmospheric temperatures and changes in patterns of precipitation, all of which would have significant impacts on the transportation system that would have to be addressed. Possible impacts include the inundation of transportation facilities, damage from floods and storms, and increased construction and maintenance costs for materials resistant to the stress effects associated with higher temperatures and/or greater temperature variability. Transportation planning for the Mississippi Gulf Coast should address the exposures and vulnerabilities of the regional transportation system; the need for a system of benchmarks for monitoring risk as determined by the exposure assessment; potential impacts on people living in the area and the probable extent of harm from immediate and long-term impacts of climate change; and possible adaptations and resilience measures that may be implemented to preserve coastal communities.

ENVIRONMENTAL JUSTICE

The MPO's goal for its participation and consultation activities is to ensure that the long-range transportation plan for the region reflects the needs of all segments of the population and provides benefit to all communities within the planning area as equitably as possible. To attain this goal, the MPO developed a proactive public participation and consultation process to provide complete and understandable information, timely public notice and full public access to key decisions; to support the early and continuing involvement of the public; and to consult with the appropriate local, state and federal resource agencies in developing the plan.

STREETS AND HIGHWAYS

In deciding what type of roadway improvement would best address an identified need, consideration was given first to congestion management strategies intended to increase the operational efficiency of a facility. Demand management measures that increase average vehicle occupancy have the potential to reduce the number of vehicles on the road. Safety improvements have the potential to reduce the incidence of vehicular accidents that disrupt normal traffic operations and lead to additional congestion and delay. Increasing the amount of information available to drivers can enable them to make better decisions, and better individual decisions can add up to an overall enhancement of system performance. Project types incorporated in the Staged Improvement Program for streets and highways include *New Road, Roadway Widening, Corridor Reconstruction/Add Center Turn Lane, Corridor Reconstruction/Access Management, Corridor Reconstruction/Operations and Channelization, Intersection Improvement, New Interchange* and *Minor Intersection Improvement*.

TRANSPORTATION ALTERNATIVES

In accordance with its commitment to transportation modes and strategies which offer alternatives to new street and highway construction, the MPO supports the implementation of such measures wherever they can serve to reduce congestion and facilitate mobility. Alternative strategies include transportation demand management (TDM) measures that seek to reduce the number of vehicles operating on streets and highways in the area. Typically these programs are intended to reduce both traffic congestion and vehicular emissions. Strategies such as designating existing highway lanes for exclusive high-occupancy vehicle (HOV) use, or designating existing parking facilities for exclusive use by carpools and vanpools, can actually help to reduce the number of vehicles on the road. The MPO also cooperates with the Mississippi Coast Transportation Authority (Coast Transit Authority or CTA) in assembling the resources necessary to provide the infrastructure for safe, reliable and efficient access to transit service in targeted corridors. Combined with CTA's fixed-route bus service and ongoing "Bike and Bus" program, the infrastructure in designated transit corridors can facilitate the movement of people by linked modal alternatives – including bicycle, pedestrian and transit modes – between housing, public services and employment sites. HOV lanes on Interstate 10 (I-10) would encourage participation in carpools, vanpools and express bus transit services. The HOV lanes would be linked to park-and-ride facilities located along I-10 for the convenience of drivers willing to park their personal vehicles and join others in alternative modes of travel. Express bus service could connect CTA transit hubs such as the Gulfport Transit Center, Edgewater Mall, Biloxi Transit Center and downtown Ocean Springs. This service would benefit from the implementation of a reserved transit lane on U. S. Highway 90 (US 90) in Biloxi, between Porter Avenue and the Bay of Biloxi Bridge, expediting the movement of buses through this sometimes highly congested area. Bike-and-ride accommodations and rental bicycles could also be provided at the transit centers and other hubs.

TRANSIT DEVELOPMENT PROGRAM

Based on analysis and input from stakeholder groups and the general public, recommendations were developed for an update of the *Transit Development Plan* (TDP). The TDP is a separate planning document, resulting from a parallel process conducted simultaneously with the long-range transportation plan update. Every effort has been made to coordinate these two major components of the Mississippi Gulf Coast Area Transportation Study. The TDP, including recommendations for transit improvements contained therein, is hereby incorporated in the *2035 Mississippi Gulf Coast Long-Range Transportation Plan* by reference. Recommended transit improvements were organized into a five-year implementation plan with an accompanying financial plan. This staging of improvements will allow the next update to define and stage mid-range and long-term recommendations for implementation. Recommendations were grouped according to their ability to improve mobility at the local level (transit connections within cities) or at the regional level (travel between counties, fixed-route transit service alternatives, and large regional transit facilities).

BICYCLE AND PEDESTRIAN FACILITIES

The bicycle and pedestrian element of the long-range transportation plan is intended to build on local, state, regional and national initiatives which seek to improve opportunities for walking and bicycling safely in local communities. The *Let's Move!* campaign to reduce obesity in the nation encourages local governments to create opportunities for families to be more physically active. Elements of the campaign support walking and bicycling activities. The U. S. Department of Transportation (USDOT) supports the development of fully integrated, active transportation networks and encourages communities to go beyond minimum design standards to create safe walking and biking facilities. In recent years, the State of Mississippi has also supported a number of programs to promote walking and biking. To improve upon the safety of bicyclists, the Mississippi Legislature passed the *John Paul Frerer Bicycle Safety Act* which clearly states the rights and duties of both motorists and bicyclists. Bike lanes constructed along Mississippi highways 67 and 605, and the popular shared-use pathways on both the Bay of Saint Louis and Bay of Biloxi bridges on the U. S. Highway 90 (US 90) route, were constructed by the Mississippi Department of Transportation (MDOT). Additionally, the Mississippi Development Authority's CDBG recovery funding improved active living in the downtown neighborhoods by including sidewalks with streetscape projects for many of the cities along the coast. At the regional level, the CTA Bike and Bus Program continues to serve more bicycle riders each month along fixed transit routes: The number of participants increased from less than 650 in the first month of operation to nearly 950 in the ninth.

SAFETY AND SECURITY

Providing a safe transportation system for the Mississippi Gulf Coast region requires cooperation among the engineering, education and enforcement communities. Because both driver and vehicle factors play a major role in many crash types, educating drivers is essential to reducing incidents and fatalities. A multi-faceted approach to transportation safety is recommended for addressing these and other issues. Safety program goals include enhancing the safety of motorists and users of non-motorized modes; increasing safety education outreach and safety-related programs in the region; improving highway-railroad grade crossing protection on major rail lines; and facilitating the safe and expeditious evacuation of the public from affected areas in the event of an impending hurricane or other catastrophe.

FREIGHT MOBILITY

The *Freight Mobility Report* prepared as Part 6 of the *2030 Long-Range Transportation Plan Supplement* was incorporated and made a part of the *2035 Long-Range Transportation Plan* by reference.

STAGED IMPROVEMENT PROGRAM

The Staged Improvement Program includes all street and highway construction projects which it is proposed to implement during the long-range planning period (2011-2035) with state or federal funding assistance. The staging of the program assumed the following amounts would be available to pay for improvements: Stage 1 (2011-2015) - \$304,603,186; Stage 2 (2016-2025) - \$656,612,429; Stage 3 (2026-2035) - \$725,308,617; Total - \$1,686,524,232. In order to develop individual project cost estimates, unit costs based primarily on actual historical data provided by the Mississippi Department of Transportation (MDOT) were used. The projects themselves were culled from three primary sources: The traffic forecast and deficiency analysis undertaken with the travel demand forecasting model developed for GRPC; the *Congestion Management Plan* prepared by GRPC; and local comprehensive and major thoroughfare plans adopted by cities and counties since Hurricane Katrina. GRPC staff engaged in a process of extensive consultation with local planners, engineers and elected officials regarding needed transportation improvements. In addition, the public involvement program for the long-range plan update included meetings with both stakeholders and members of the general public at which participants were given the opportunity to identify needs and influence the development of the conceptual alternatives.

PROGRAM COMPONENTS

The five-year short-term plan component includes 84 projects in all, of which 24 are “committed improvements” already programmed for implementation. The total projected cost for all Stage 1 projects, to be implemented during the period from 2011 through 2015, is \$300,245,178. The 10-year intermediate plan component includes 71 projects in all, of which nine are committed improvements. The total projected cost for all Stage 2 projects, to be implemented during the period from 2016 through 2025, is \$650,019,758. The 10-year long-range plan component includes 70 projects with a total projected cost of \$737,549,076. The total projected cost for all three stages of the Staged Improvement Program is \$1,687,814,012. Thirty projects could not be accommodated within the fiscally constrained street and highway program and were listed as unfunded improvements with a total cost in current (2010) dollars of \$115,178,750.

PLAN ADOPTION

The Draft Staged Improvement Program for street and highway improvements was presented to the Technical Coordinating Committee (TCC) for review at a meeting in the GRPC Annex on February 2, 2011. The TCC adopted a resolution recommending that the Transportation Policy Committee (TPC) approve the draft program for release to the public. The TPC met in the GRPC Annex on February 10, 2011 and adopted a resolution authorizing release of the draft program for public review during a 45-day period preceding adoption in accordance with the established policy of the Mississippi Gulf Coast Metropolitan Planning Organization. A formal vote on adoption was scheduled to take place on March 31, 2011.



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The *2035 Long-Range Transportation Plan* resulted from a team effort on the part of the entire staff of Gulf Regional Planning Commission, including two former staff members, Mitzi Crystal and Beth Laninga, who played key roles in the development of the plan.

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The cooperation of Coast Transit Authority Executive Director Kevin Coggin and his staff was essential to the development of a truly multimodal long-range transportation plan.

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Finally, grateful acknowledgement is made to all of the individual citizens who participated in the Stakeholder Summits and Public Meetings and to those who provided comments on the draft plan. Your input made this plan what it is, and you can rightly take pride, as representatives of the people of the Mississippi Gulf Coast, in *your plan*.



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CHAPTER 1

INTRODUCTION

1.1 METROPOLITAN TRANSPORTATION PLANNING

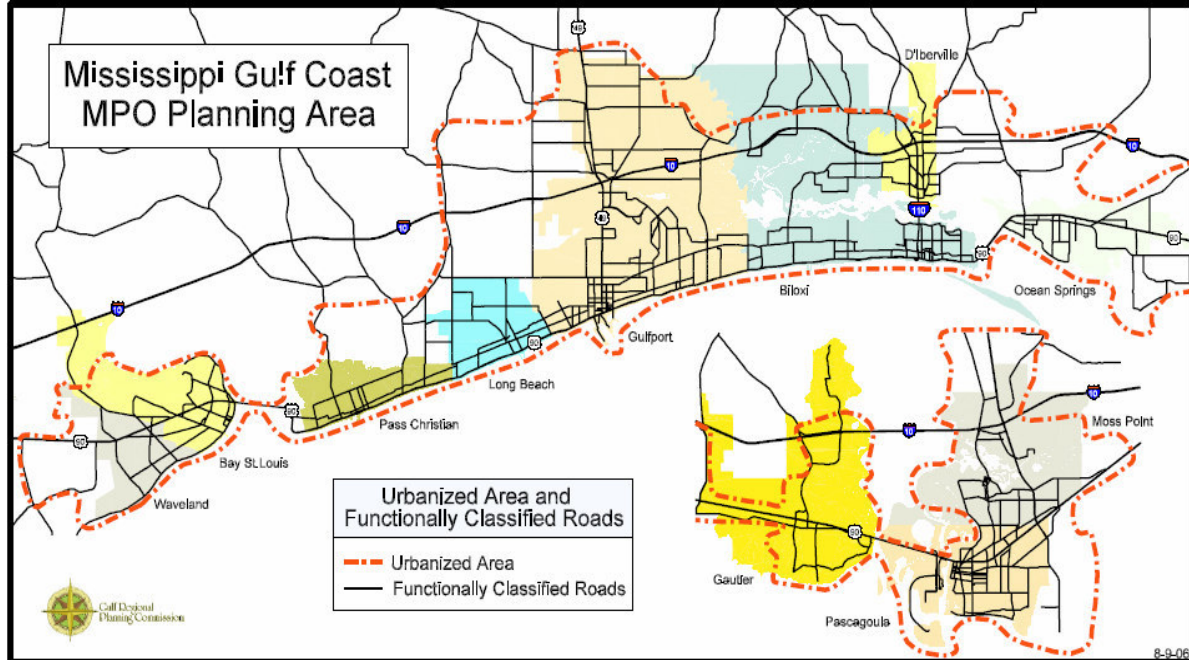
The metropolitan transportation planning regulations promulgated by the U. S. Department of Transportation (USDOT) require the designated metropolitan planning organization (MPO) to establish a planning area boundary that includes at a minimum the urbanized area(s) and “contiguous geographic area(s) likely to become urbanized within the twenty year forecast period covered by the transportation plan” (23 CFR 450.308). There are two urbanized areas located within the Mississippi Gulf Coast region: the Gulfport-Biloxi Urbanized Area (UZA) and the Pascagoula UZA. There are also two distinct metropolitan areas: the Gulfport-Biloxi Metropolitan Statistical Area (MSA) and a separate Pascagoula MSA. The former includes two of the coastal counties—Hancock and Harrison—and Stone County to the north. The second metropolitan area encompasses the third coastal county— Jackson—and George County to its north. The Gulfport-Biloxi UZA actually includes portions of both metropolitan areas. In defining the study area for development of the 2030 long-range regional transportation plan, Gulf Regional Planning Commission (GRPC)—the designated MPO for both metropolitan areas—included both urbanized areas as well as the balance of the three coastal counties (Hancock, Harrison and Jackson) in which they are contained. This study area, stretching from the New Orleans, Louisiana MSA on the west to the Mobile, Alabama MSA on the east, has been retained for development of the 2035 long-range regional transportation plan.

The *Federal-Aid Highway Act of 1962* (PL 87-866) mandated the establishment of MPOs for all urbanized areas with a population of at least 50,000. The metropolitan planning regulations promulgated by the Federal Highway Administration (FHWA), pursuant to the act, required each MPO to develop a long-range regional transportation plan addressing both the existing transportation needs of the area and those projected to occur within a planning period extending at least 20 years into the future. The sophistication and vision of individual transportation plans developed in succeeding years varied substantially in response to the availability of funding resources. In some cases long-range regional transportation plans were developed in conjunction with comprehensive community planning efforts undertaken by local planning offices. Others were prepared by better-funded state highway or transportation departments or regional transportation agencies.

1.2 STUDY PURPOSE

The purpose of this study is to update the long-range transportation plan for the Mississippi Gulf Coast Area (including the Gulfport-Biloxi and Pascagoula urbanized areas and additional portions of Hancock, Harrison and Jackson counties located outside either UZA) in accordance with applicable federal law and the metropolitan planning regulations jointly promulgated by FHWA and the Federal Transit Administration (FTA). The long-range planning horizon will be 2035, with interim target years of 2015 for the short-term component and 2025 for the intermediate component. These components will also be identified as Stage 1 (2015), Stage 2 (2025) and Stage 3 (2035) in describing the Staged Improvement Program. This Metropolitan Transportation Plan is being developed in accordance with current federal

Figure 1-1:
MISSISSIPPI GULF COAST MPO PLANNING AREA



guidelines. Under the joint metropolitan planning regulations, GRPC is designated by the Governor of Mississippi to coordinate long-range transportation planning for the Gulfport-Biloxi and Pascagoula urbanized areas. A Transportation Policy Committee (TPC), comprised primarily of the elected heads of governments in the three counties and 11 municipalities located within the Mississippi Gulf Coast Study Area, serves as the policy-making board of the MPO. A Technical Coordinating Committee (TCC) provides review and evaluation of the technical aspects of planning activities and is made up of local, state and federal transportation planners and engineers and other technically qualified persons with an interest in the transportation system. The TPC acts on recommendation of the technical committee to adopt the long-range regional transportation plan periodically updated as required by law.

1.3 SAFETEA-LU

The *Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users* (SAFETEA-LU) is the current authorizing legislation for transportation programs supported by the federal government. It continued the requirements for comprehensive transportation planning put forth in the *Federal-Aid Highway Act of 1962* and reiterated in subsequent legislation reauthorizing federal transportation programs. It also required that a number of additional factors be considered in developing transportation plans and programs, stating that they should accomplish the following:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety and security of the transportation system for motorized and non-motorized users;

3. Increase the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and non-motorized users;
4. Increase the accessibility and mobility options available to people and for freight;
5. Protect and enhance the environment, promote energy conservation, and improve quality of life, and promote consistency between transportation improvements and State and Local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operation; and
8. Emphasize the preservation of the existing transportation system.

1.4 GOALS AND OBJECTIVES

The goals and objectives adopted for development of the long-range plan are consistent with the SAFETEA-LU requirement that the metropolitan planning process “shall provide for consideration of projects and strategies” that would accomplish the factors listed above. The purpose of establishing goals and objectives for transportation system development is to provide a rational and coherent basis for evaluating proposed capital and operating improvements related to the movement of people and goods in the study area. A balanced approach must be sought that maximizes the general welfare without unfairly burdening any particular group and that maximizes the utility of the system itself. In addition, the transportation system must be safe, secure, efficient, economically feasible, and in harmony with the character of the area. Ultimately, the summary goals and objectives outlined below, along with associated evaluation criteria, are intended to facilitate the development of a long-range regional transportation plan that will enhance travel within the area and make the Mississippi Gulf Coast Area a better place in which to live, work and do business.

Goal 1.0: *Enhance Transportation System Mobility, Accessibility and Quality for All Roadway Users and Modes*

1. Relieve traffic congestion and decrease travel time.
2. Facilitate the design of roadways to accommodate multiple modes of transportation.
3. Make public transportation a choice mode of transportation on the Mississippi Gulf Coast.
4. Enhance the availability, attractiveness, efficiency and quality of public transportation.
5. Enhance mobility for those who are elderly, or physically or mentally impaired, who choose to use existing and future public transportation options.
6. Enhance bicycle, pedestrian and transit mobility and accessibility.
7. Facilitate viable alternative modes of travel for commuters.

Goal 2.0: *Enhance Regional Connectivity and Economic Viability*

1. Improve regional connectivity by enhancing mobility and accessibility between different parts of the metropolitan area.
2. Maximize the economic development potential of the transportation system.
3. Facilitate intermodal goods movement.
4. Ensure existing and future employment, commercial and service centers and housing will be adequately connected by the roadway and transit systems.

Goal 3.0: *Enhance Public Safety and Security*

1. Enhance the safety of motorists and users of non-motorized modes.
2. Improve railroad grade crossing protection on major rail lines.
3. Facilitate the safe and expeditious evacuation of the public from affected areas of the region in the event of an impending hurricane or other catastrophe.
4. Monitor the existing transportation network and encourage design of future transportation facilities in a manner that protects them from susceptibility to the effects of climate variability.

Goal 4.0: *Preserve and Protect Environmental Quality*

1. Enhance air quality in the region by reducing pollution.
2. Promote energy conservation in movement of people and goods
3. Encourage protection of wetlands and environmental resources in construction of transportation facilities.

Goal 5.0: *Support Regional Sustainability and Local Values*

1. Ensure that proposed improvements are consistent with local zoning and other ordinances, transportation and land use plans, community goals and objectives.
2. Actively reach out to the general public and stakeholders to encourage participation in the transportation planning process.
3. Prevent the denial of, reduction in, or significant delay in the receipt of transportation benefits by traditionally underserved populations.
4. Promote projects in underserved areas.
5. Inform and engage local governmental representatives and public and private entities to build consensus around transportation and land use plans.
6. Support land use development policies that capitalize on the efficient and sustainable use of the transportation system.

Goal 6.0: *Preserve Existing Community Resources*

1. Monitor and enhance rehabilitation and modernization of existing transportation infrastructure to ensure system preservation and continued effective operation.
2. Encourage state and local communities to provide continuous dedicated funding assistance for transportation projects.
3. Preserve existing facilities by promoting efficient system management as well as alternative and technologically advanced mitigation measures.

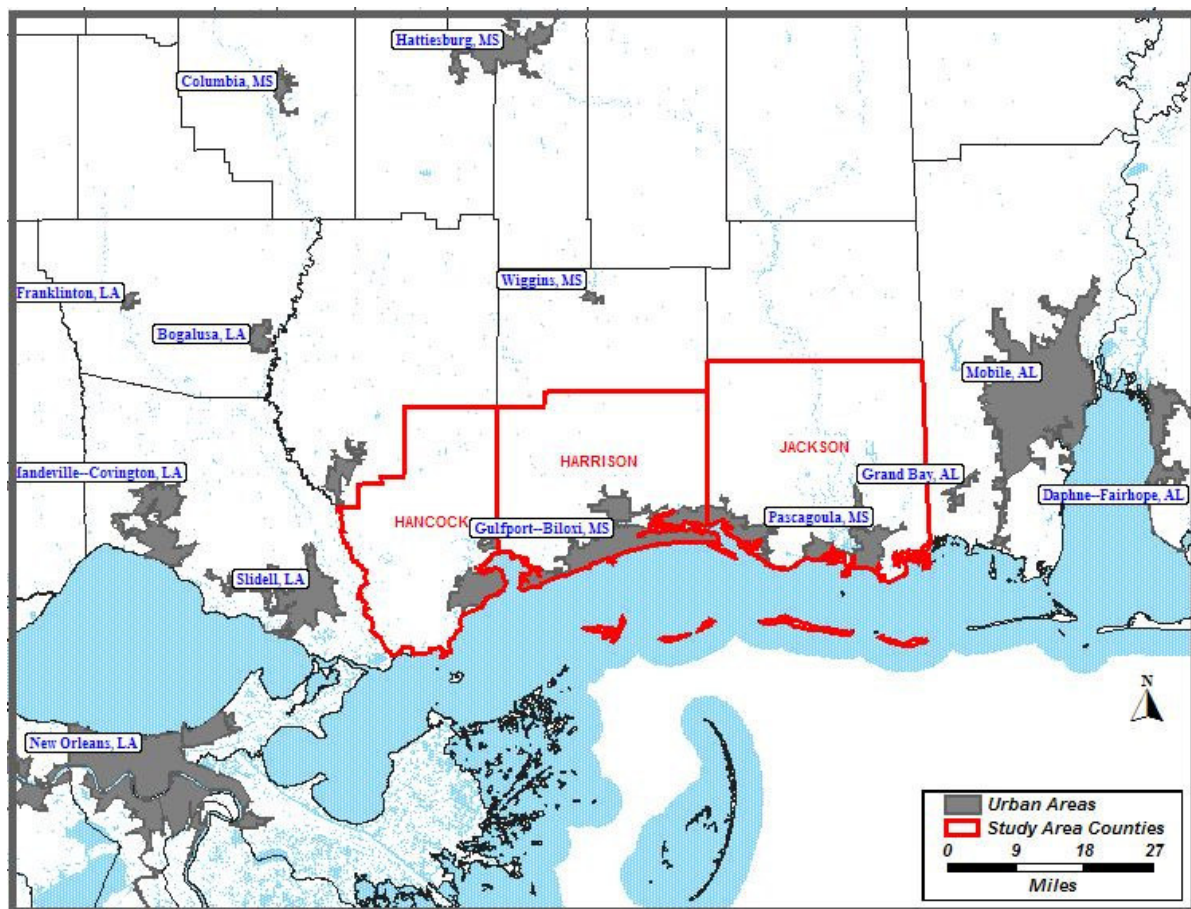
1.5 MISSISSIPPI GULF COAST MPO PLANNING PRIORITIES

The MPO will use the benefits of its planning programs better to direct resources to programs and projects that provide the best return on investment through the Transportation Improvement Program, Long-Range Transportation Plan and other planning studies.

2.1 GEOGRAPHY AND HISTORY

Three coastal counties, Hancock, Harrison and Jackson, comprise the study area (see Figure 2-1). Geographically the largest of the three coastal counties is Jackson (see Table 2-1). Harrison is second in land area and also had the greatest population density in 2000. Hancock is the smallest in physical size and, with the lowest population density, the least urbanized. Each county, however, had a greater density in 2000 than either Mississippi or the United States considered as a whole. There were 363,988 persons living in the three-county area in 2000, according to the decennial census. The 2005 estimate by the U. S. Census Bureau suggested 12,473 additional persons were living in the area—a modest increase of 3.4 percent over five years—making a total of 375,303 by July 1, 2005. This was the last population estimate compiled before the onslaught of Hurricane Katrina.

Figure 2-1:
MISSISSIPPI COASTAL COUNTIES



**Table 2-1:
POPULATION PROFILE OF THE MISSISSIPPI COAST COUNTIES 1990-2009**

POPULATION DEMOGRAPHIC	HANCOCK COUNTY	HARRISON COUNTY	JACKSON COUNTY	MISSISSIPPI	UNITED STATES
2009 Population (Estimated)	40,962	181,191	132,922	2,951,996	307,006,550
2005 Population (Estimated)	46,545	193,187	135,571	2,900,116	296,410,404
2000 Population (Census)	42,967	189,601	131,420	2,844,658	281,421,906
1990 Population (Census)	31,760	165,365	115,243	2,573,216	248,709,873
Percent Change (2000-2009)	-4.7	-4.4	1.1	3.8	9.1
Percent Change (2000-2005)	8.3	1.9	3.2	2.0	5.3
Percent Change (1990-2000)	35.3	14.7	14.0	10.5	13.2
Percent Aged 65+ Yrs (2000)	14.8	11.7	11.3	12.2	12.4
Median Age (2000)	38.5	33.9	34.7	33.8	35.3
Land Area (Square miles)	477	581	727	46,907	3,537,438
Persons per Square Mile (2000)	90.1	326.3	180.8	60.6	79.6

Source: U. S. Census Bureau, Census 2000 - Summary File 1; 2005 and 2009 Population Estimates.

On July 1, 2009 the total estimated population of the three coastal counties was 355,075, which puts the population on that date at 97.6 percent of its 2000 decennial census level, and 94.6 percent of the July 2005 estimate. Within the coastal counties there are 11 municipalities, the largest of which is Gulfport with 71,127 residents in 2000 and estimated population of 72,464 persons as of July 1, 2005, and 70,732 as of July 1, 2009. The incorporated areas are concentrated along the Mississippi Sound. This is consistent with the settlement pattern which has prevailed over the 300-year period since the founding of "Old Biloxy" in 1699.

Over that time period the Mississippi Gulf Coast emerged as a center for boat-building, fishing and seafood processing, lumber and brickyards and beachfront resorts. In the nineteenth century, wealthy New Orleanians sought, in the salt air of the coastal plain, to escape yellow fever epidemics by building handsome summer cottages along the beaches of the Mississippi Sound. Some of these homes may still be seen on Scenic Drive, paralleling U. S. Highway 90 (US 90) in historic Pass Christian; but most were destroyed by Hurricane Katrina in 2005. The New Orleans, Chattanooga and Mobile Railroad, built in 1869, introduced Midwestern "snowbirds" to the charms of the coast, starting a seasonal migration that continues today. The railroad also allowed the establishment of sawmills and brickyards that employed European immigrants from Ireland, Germany and Italy. Commercial fisheries flourished, and a huge seafood processing industry also developed. With the outbreak of World War II, Keesler Air Base was built in Biloxi. In Pascagoula the Ingalls Shipbuilding Company, now Northrop Grumman Shipbuilding, built ships for the United States Navy. The National Aeronautics and Space Administration (NASA) established the Stennis Space Center in the mid-1960s in Hancock County as the site for testing the Saturn V rocket booster used to launch manned space missions.

Today these military and federal installations, along with the tourism industry that was boosted by the opening of gaming casinos in the 1990s, remain cornerstones of the Mississippi coastal economy. On August 29, 2005, Hurricane Katrina made landfall in Hancock County and ravaged the coastal counties, particularly those densely developed areas closest to the water. At this time the three counties are five-and-a-half years into the process of recovery. This recovery period has seen an acceleration of the movement of residential building to the areas north of Interstate 10 (I-10). In addition, some businesses and group home facilities have moved away from the beachfront, preferring to avoid exposure to

catastrophic storm surges that may result from future hurricanes. The recovery which was progressing nicely after the storm has been impeded by the national recession which caused a rise in unemployment on the coast beginning in September 2008. The 2010 BP oil spill also adversely affected both tourism and fishing, and it remains to be seen for how long this effect will last.

2.2 POPULATION AND EMPLOYMENT

Population

The greatest population growth rate, for the decade which ended in 2000, belonged to Hancock County (35.3 percent). Stagnant in its growth for decades, Hancock began to realize an increasing rate of population expansion in the 1960s. This corresponded with the establishment of Stennis Space Center, Hancock's largest employer. The institution of casino gaming in 1992 gave an added boost to growth in the counties. Harrison and Jackson had slower but still healthy growth rates, around 14 percent each, in the decade prior to the 2000 census. In the period from 2000 until Hurricane Katrina hit in 2005, growth continued at a slightly slower pace, due no doubt, at least in part, to the mild recession (the "dotcom bust") that began in 2001. The 2009 total population estimates permit us to make some judgments as to the recovery of the total population since Katrina and the storm's impact on growth. It is apparent from reference to 2009 population estimates that only Jackson County has regained its 2000 population, and has even grown slightly beyond it although it still hasn't regained its July 1, 2005 estimated population level. This was the county sustaining the least storm damage. The other two counties which were more heavily damaged remained in 2009 below their 2000 population levels.

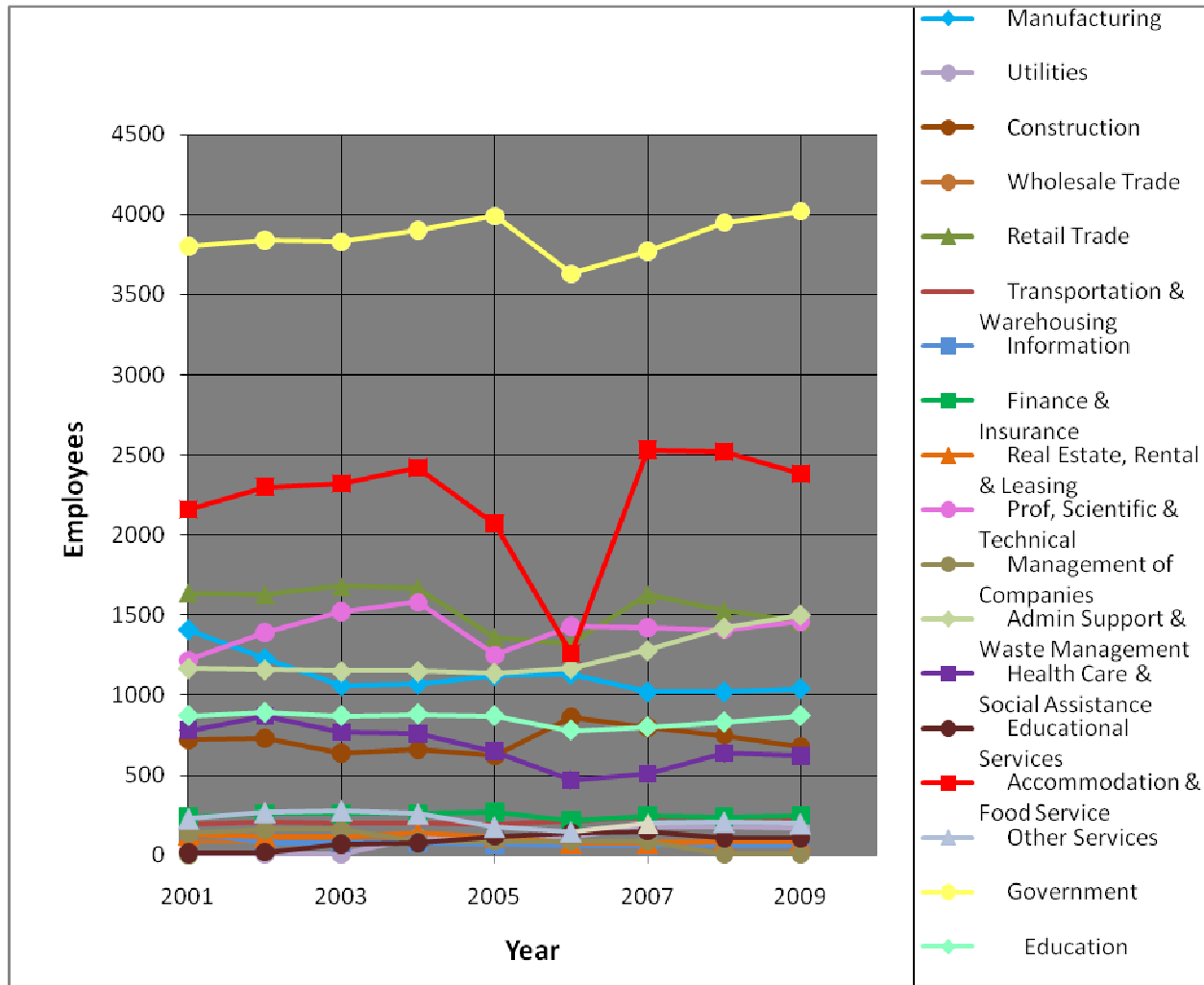
Among the three coastal counties, Hancock in 2000 had the highest percentage of persons over 65 years of age, easily exceeding at 14.8 percent the state and national shares as well. Correspondingly, the median age in Hancock County (38.5 years) was significantly higher than the figures for either Harrison or Jackson counties, the state of Mississippi or the U. S. as a whole. Conversely, Harrison and Jackson had a lower percentage of seniors than the state or the nation, with lower median ages as well. The relative youth of the Harrison population may be attributable in part to the concentration of military personnel in Harrison which has sizable Air Force and Navy installations. In Jackson County the lower median age can be attributed to the presence of a high percentage of young families among households. At this time we await the release of 2010 census data to see how Hurricane Katrina has affected these and other characteristics of specific populations.

Employment

The Mississippi Department of Employment Security (MDES) collects data on both residential and establishment-based employment in the three coastal counties. The establishment-based data is also classified by industrial sector. A look at the history of sectoral growth over the period from 2000 to 2009 gives insight into the nature of each county's economy prior to Hurricane Katrina and the extent of recovery in each sector. For instance, as shown in Figure 2-2, the largest sectors in Hancock County are *Government*, *Retail Trade*, *Accommodation and Food Service* (tourism) and *Professional, Scientific and Technical* services. There was an immediate drop in the Professional, Scientific and Technical, Retail Trade and the Accommodation and Food Service sectors following Hurricane Katrina, while the drop in Government employment was felt the following year.

A similar pattern can be seen in Harrison County (see Figure 2-3). Employment in Harrison's tourist sector plummeted after Katrina, due to the much larger number of workers at casinos and other entertainment venues there, and had only begun to recover before the recession caused another drop.

Figure 2-2:
HANCOCK COUNTY ESTABLISHMENT-BASED EMPLOYMENT, 2001-2009

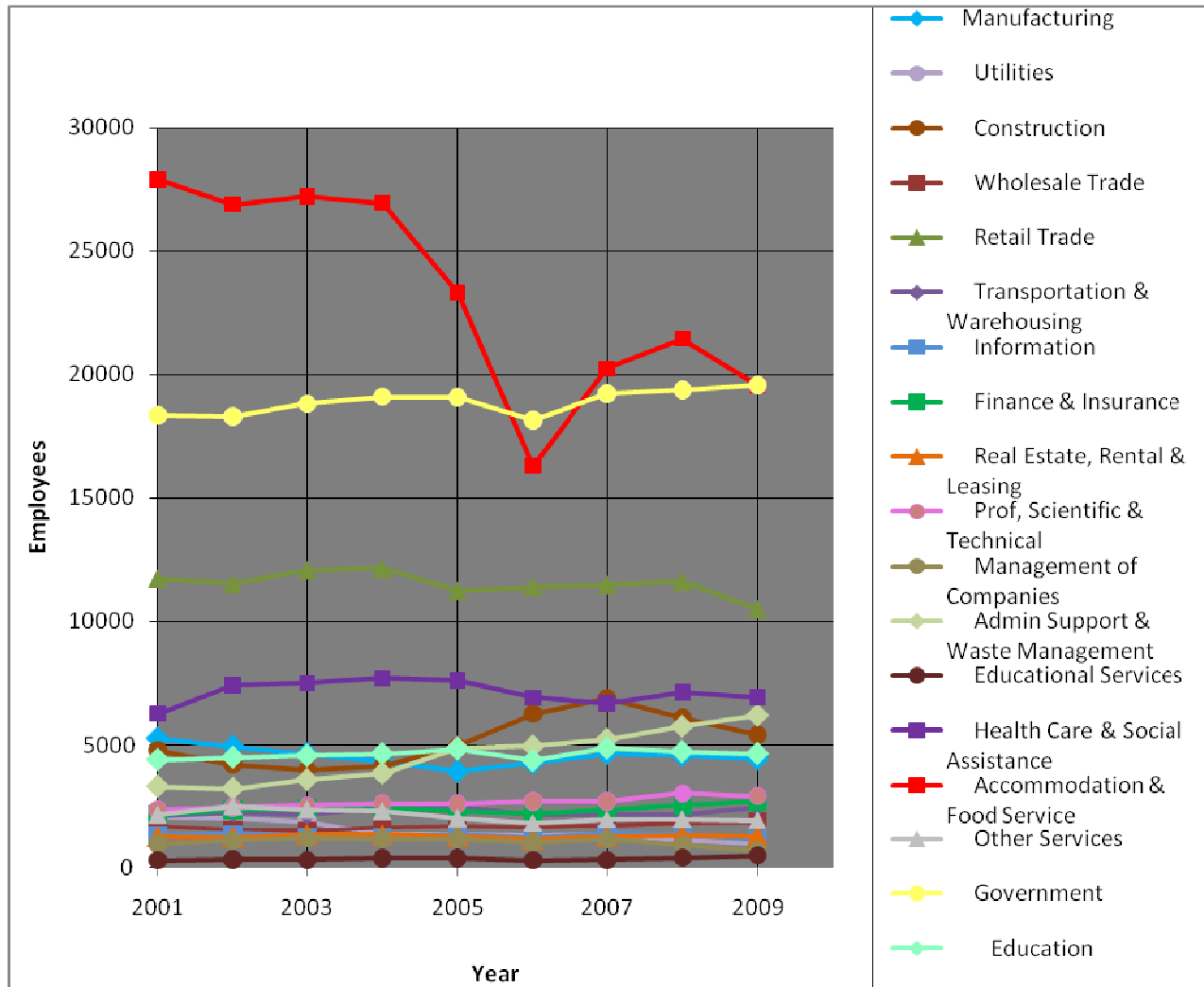


Source: Mississippi Employment Security Commission, Annual Average Employment.

Retail, wholesale, and construction worker numbers too are in decline after beginning a post-Katrina recovery. The large number of government employees is primarily constituted from workers at Keesler Air Force Base (KAFB) and the Naval Construction Battalion Center (NCBC) and remains immune to the recession. As in Hancock, the *Administrative Support and Waste Management* sector has increased since the recession.

A different picture emerges in Jackson County, which has historically been the manufacturing center of the region (see Figure 2-4). At the major shipyards in Pascagoula employment exceeded 30,000 in the 1970s, but major layoffs occurred in the 1980s. Despite these setbacks, manufacturing continues to be the dominant sector in Jackson County, while non-manufacturing jobs have increased to take the place of those manufacturing jobs that have been cut. Jackson's non-manufacturing growth sectors are in trade, services, and government. It needs to be noted that, at this time at least, Jackson County does not permit gaming as do Hancock and Harrison. And, while employment in the *Administrative Support*

Figure 2-3:
HARRISON COUNTY ESTABLISHMENT-BASED EMPLOYMENT, 2001-2009



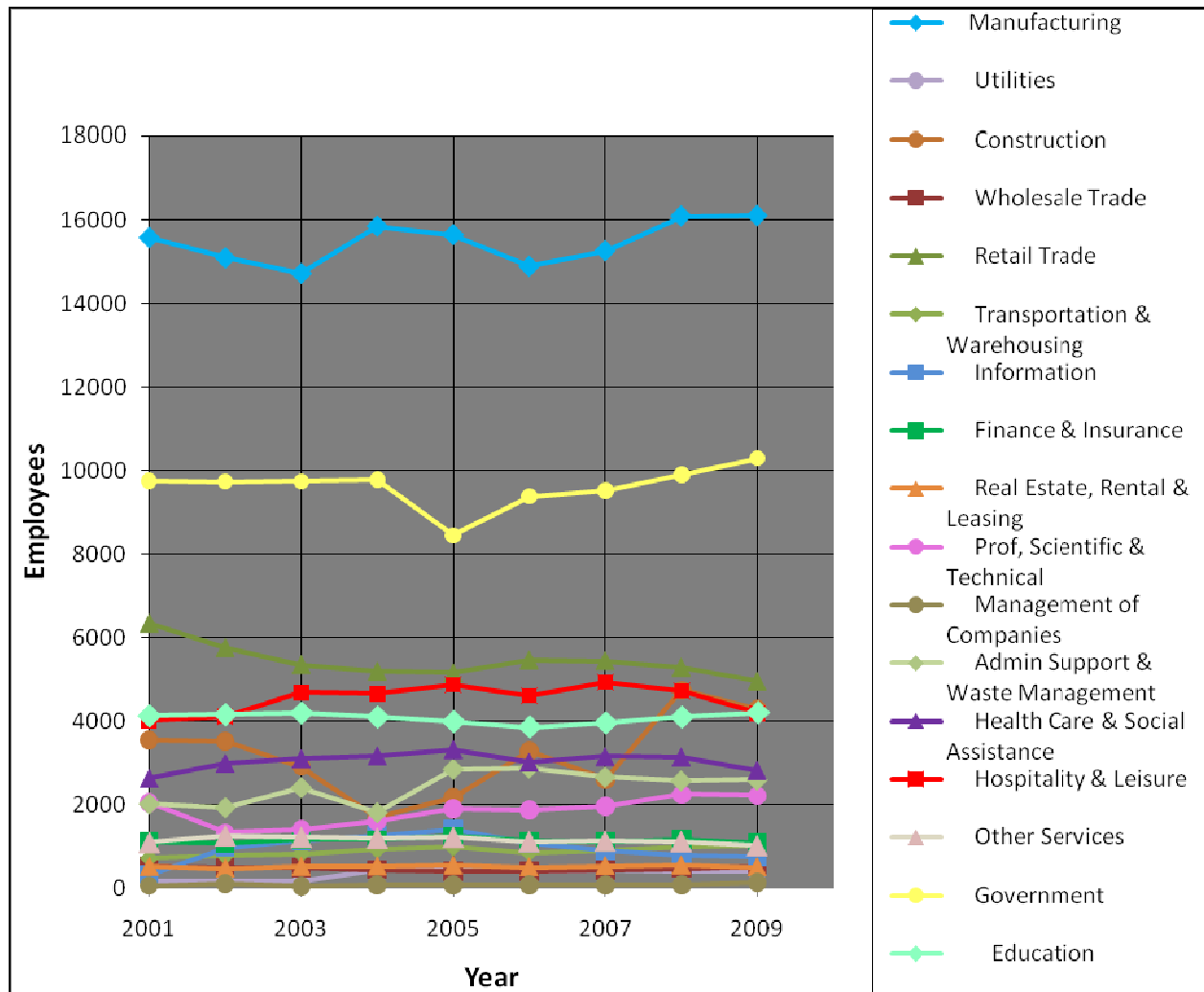
Source: Mississippi Employment Security Commission, Annual Average Employment.

and Waste Management sector has increased in Hancock and Harrison since the recession, this has not happened in Jackson County, although the reason for this is not clear. A very significant employment trend can be seen in Figure 2-5 when one looks at establishment and residence-based employment in Harrison County. During the 1990s Harrison's establishment-based employment began to exceed its residence-based employment, making Harrison a net importer of labor. This occurred for the first time in 1993, the first full year in which casino gaming operated in the county, and the trend has become more pronounced since then.

2.3 LAND USE AND DEMOGRAPHIC FORECAST

Travel demand is greatly influenced by the pattern of development or land use in the study area. Changes in the type or intensity of land use will create new travel demand or modify existing patterns of

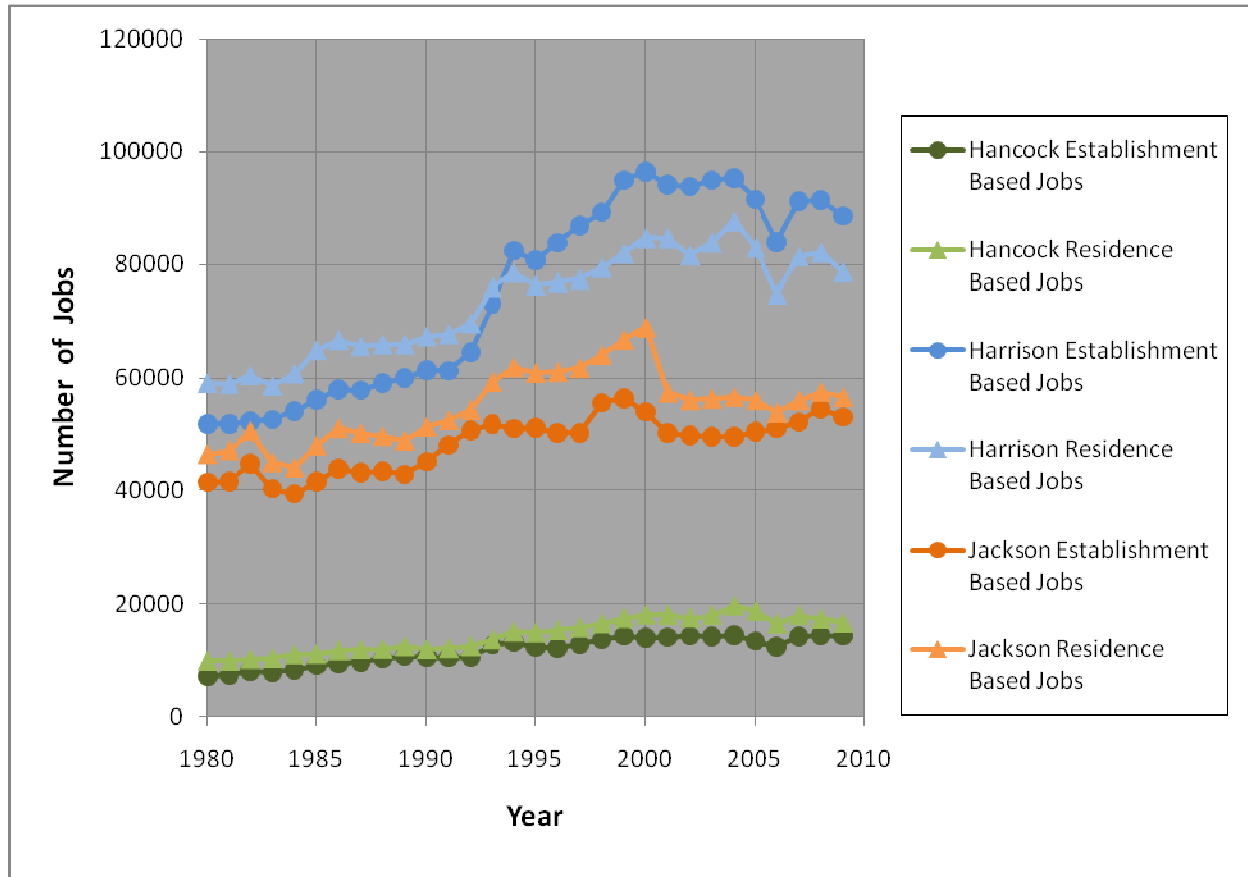
Figure 2-4:
JACKSON COUNTY ESTABLISHMENT-BASED EMPLOYMENT, 2001-2009



Source: Mississippi Department of Employment Security, Annual Average Employment.

circulation. A definite relationship exists between trip-making, land use and demographic data such as population, number of housing units, employment and school attendance. *Claritas* provided projected 2013 population figures along with the 2008 base-year data. The 2015 residential population for each county was obtained by extrapolating these 2013 projections using the average rate of growth from 2008 through 2013. Residential population projections for 2025 and 2035 for each county were arrived at by averaging results obtained by three different methods. Ranges for each county were prepared using the lowest and highest projections from these three methods. The results obtained from the three different methods were averaged to yield a composite forecast – for each county for each year – which provided the household population projections needed for input to the travel demand model after group quarters population was subtracted. The base-year estimate and future population projections are presented in Table 2-2 on the following page.

Figure 2-5:
ESTABLISHMENT-BASED EMPLOYMENT COMPARED TO RESIDENCE-BASED EMPLOYMENT, 2001-2009



Source: Calculated from annual average employment data supplied by the Mississippi Department of Employment Security and total population estimates supplied by the U. S. Census Bureau.

The 2015, 2025, and 2035 establishment-based employment forecasts for each county were arrived at by averaging projections obtained by two different methods. Ranges for each county were established by using the low and high projections. The two data sets were then balanced, and the resulting average employment figure was adopted for input to the travel demand forecasting model. The employment projections are presented in Table 2-3 on the following page.

Table 2-2:
2035 LONG-RANGE PLAN POPULATION FORECAST FOR THE COASTAL COUNTIES

YEAR	HANCOCK	HARRISON	JACKSON	TOTAL
2008	39,729	179,135	131,529	350,393
2015	47,248	194,301	142,696	384,246
2025	52,825	209,040	148,431	410,296
2035	59,041	231,311	168,838	459,189

Source: Woods and Poole Economics, Inc.; U. S. Census Bureau; Mississippi Institutes of Higher Learning; Claritas, Inc.

Table 2-3:
2035 LONG-RANGE PLAN EMPLOYMENT FORECAST FOR THE COASTAL COUNTIES

YEAR	HANCOCK	HARRISON	JACKSON	TOTAL
2008	17,560	108,455	54,702	180,717
2015	20,474	120,116	63,328	203,917
2025	22,985	139,170	66,066	228,220
2035	25,808	159,201	71,113	256,122
<i>Source: Woods and Poole Economics, Inc.; Mississippi Department of Employment Security.</i>				



CHAPTER 3

PUBLIC INVOLVEMENT

The general public and transportation stakeholders were engaged from the beginning of the planning process which resulted in the 2035 Long Range Transportation Plan (LRTP). Initially they were asked to provide input regarding the following: Proposed projects in the current (2030) LRTP; population and employment growth in the area; goals and objectives from the 2030 LRTP; pedestrian, bicycle and safety issues and projects; transit issues; air quality concerns and funding priorities. A second round of stakeholder and public meetings were held to present the draft long-range plan prior to its adoption on March 31, 2011. All the public meetings were advertised in local newspapers and posted on the Gulf Regional Planning Commission (GRPC) website. In addition, over 150 informational flyers were distributed for each round of meetings to local stakeholders by mail or e-mail, alerting them to the upcoming meetings. Meeting notices and summaries, as well as other documentary materials, are included in a separate *Public Involvement Report*. Comment and response on the draft LRTP may be found in Appendix A of this report.

3.1 STAKEHOLDERS SUMMITS

A Stakeholders Summit was held on April 13, 2010 to solicit the involvement of knowledgeable individuals with a stake in the development of the regional transportation plan. The summit was a three-hour meeting covering issues related to future land use and development, air quality and transportation conformity, transportation funding and transportation improvement needs. A background briefing was conducted for a dozen participants who then took part in interactive exercises designed to elicit information on the status of both ongoing and planned developments in the area. Stakeholders also completed a questionnaire intended to obtain input regarding the prioritization of transportation needs (see Section 3.3 below).

A second Stakeholders Summit was held on March 1, 2011 for the purpose of previewing draft plan recommendations, including the Staged Improvement Program for addressing street and highway needs. The meeting also provided an opportunity for the Mississippi Department of Transportation (MDOT) to present the draft statewide transportation plan. Nine stakeholders participated in the two-hour meeting at which operators or advocates of most travel modes were represented.

3.2 PUBLIC MEETINGS

Three public meetings were held during the week beginning Monday, April 12, 2010. Each meeting began at 5:00 p.m., lasted two hours and featured an open-house format with brief remarks by GRPC Executive Director Elaine Wilkinson. There was also an introductory *PowerPoint* presentation running continuously to orient attendees as they arrived at the meeting. In addition, each meeting featured mounted and interactive displays with GRPC staff and consultants stationed to provide answers to questions and receive comments and other input.

A second round of public meetings was held in the first week of March 2011 to present the 2035 LRTP to the general public. Graphic displays and other materials featured information about the Staged Improvement Program, pedestrian and bicycle recommendations, and the regional transit plan. Comment cards provided an opportunity for meeting attendees to express their views regarding missing projects that should have been included in the plan, projects that should not have been included, and other aspects of the plan. Meetings were held on three successive nights at locations in Harrison County (March 1), Jackson County (March 2) and Hancock County (March 3). Attendance increased significantly from the first round of meetings to the second, as indicated by the following table:

	Round One		Round Two	
	Date/Location	Attendance	Date/Location	Attendance
Hancock County	4/15/2010 - Bay St. Louis	2	3/3/2010 – Bay St. Louis	18
Harrison County	4/12/2010 - Gulfport	21	3/1/2011 – Gulfport	26
Jackson County	4/12/2010 - Gautier	11	3/2/2011 – Gautier	19

3.3 SURVEY AND OPINION

Participants in the initial Stakeholder Summit and public meetings were also asked to complete a questionnaire designed to provide guidance in development of the long-range plan. Survey participants were asked to give their opinion of the potential effectiveness of alternative transportation measures in reducing traffic congestion and associated air pollution in the area. The results indicated that improved public transit, high-occupancy lanes and flexible work schedules would be the most effective measures in reducing traffic congestion. The stakeholders were also asked for their thoughts regarding future transportation funding. Numerous participants noted that federal decision-making appears to be shifting towards a multimodal transportation approach and away from funding oriented strictly to personal vehicle use. They concluded that a shift in investment away from new automobile capacity towards new capacity in other modes is desirable. They also urged the restructuring of existing programs and/or advocacy of new programs to provide state and federal funding for transit operations in order to increase service and facilitate greater utilization of alternative modes. Participants in the second Stakeholders Summit and second round of public meetings generally expressed the opinion that these needs had been adequately addressed in the 2035 LRTP.

3.4 WEB INFORMATION

Meeting notices and summaries were made available on the GRPC website prior to the initial round of meetings. Notices and meeting summaries were also made available on the website for the second round of meetings along with the Staged Improvement Program and an on-line comment card.



CHAPTER 4

MODEL DEVELOPMENT

The practice of using computer-driven travel demand forecasting models to project future transportation needs began in the 1960s and became widespread in the 1970s. The advent of travel demand forecasting software for personal computers in the 1980s made modeling virtually universal among metropolitan planning organizations. The Mississippi Gulf Coast Area Regional Travel Demand Forecasting Model was constructed by Neel-Schaffer, Inc., in conjunction with the Mississippi Department of Transportation (MDOT) and GRPC planning staffs, on Caliper Corporation's *TransCAD 5.0* software platform. The transportation model is driven by a socio-economic database developed by Gulf Regional Planning Commission (GRPC), the metropolitan planning organization (MPO) for the Gulfport-Biloxi and Pascagoula urbanized areas. The MPO assembled base-year population, housing, employment, hotel and motel, school and casino data used to calibrate the model to actual traffic conditions in 2008 based on annualized average daily traffic (AADT) estimates for hundreds of count locations in the region. Data for the model variables provided the inputs used to estimate the number of trips produced and attracted within individual traffic analysis zones. There are 554 such zones in the study area: 187 in Jackson County, 290 in Harrison County and 77 in Hancock County. The planning staff of GRPC developed a long-range forecast of future land use and demographic conditions for 2015-2035. The forecast data were used to generate trips for the short-term (2015), intermediate (2025) and long-range (2035) planning years which were then assigned to the Existing-Plus-Committed (E+C) network in order to identify potential deficiencies likely to occur in the absence of additional improvements.

4.1 FOUR-STEP MODELING

The Mississippi Gulf Coast Regional Travel Demand Model adheres to the conventional trip-based four-step modeling approach. The principal model components fall within the following four categories:

- **Trip Generation** – The process of estimating the number of person-trip productions and attractions within each traffic analysis zone (TAZ).
- **Trip Distribution** - The process of creating joined person-trips, each having an origin and a destination, by linking trip productions and attractions across all TAZs.
- **Mode Choice** – The process of estimating the number of person-trips using a particular mode for each origin-destination (OD) interchange. Because of the low frequency of transit, pedestrian and bicycle trips in the modeling area, this step was excluded (as it often is outside the larger urbanized areas).
- **Trip Assignment** – The process of assigning vehicular (auto and truck) trips to specific paths across the region.

Trip Generation

Trip generation is used to determine the number of trips that either begin or end in a given traffic zone. The linking of trips-ends takes place in the trip distribution step following trip generation. The Mississippi Gulf Coast model generates trip productions and attractions for the following *internal* and *external* travel purposes:

Internal Travel Purposes

Home-Based Work (HBW)
Home-Based Shopping (HBSH)
Home-Based Social/Recreational (HBSR)
Home-Based Other (HBO)
Non-Home-Based (NHB)
Gaming (GAME)
Commercial Motor Vehicle (CMVEH)
Truck (TRK)

External Trip Purposes

External-Internal Auto (EIAUTO)
External-Internal Truck (EITRK)
External-External Auto (EEAUTO)
External-External Truck (EETRK)

Internal trips have both ends within the study area. External trips have at least one end outside the study area. Those having one end outside the study area and the other within are categorized as *external-internal* trips. Those having both ends outside the study area (i.e., through-trips with no stop in the study area) are designated *external-external* trips.

For home-based trips, *production* refers to the home end and *attraction* to the non-home end of the trip. For non-home-based, commercial motor vehicle, gaming and truck trips, productions and attractions refer to origins and destinations respectively. The trip generation model uses cross-classification tables for the home-based and non-home-based trip purposes: Trip rates vary by household type, i.e., household size and vehicle availability. The distribution of household types varies from zone to zone. For the commercial motor vehicle and truck trip purposes the model applies a linear regression equation that relates zonal employment and residency (households) to trip productions and attractions. For the gaming purpose the model applies linear regression equations that relate occupied housing units and hotel or motel rooms to productions and casino data (gaming area in square feet and gaming positions, i.e., seats at machines and seats at playing tables) to trip attractions. The remaining trip attraction models utilize linear regression equations that relate zonal employment, households and school attendance to trip attractions.

Trip Distribution

The next step in travel demand modeling is the trip distribution process. This function determines where the trips produced in the trip generation go and, conversely, where the attracted trips come from. The mathematical tool used for this effort is called a gravity model because it makes use of the concepts of distance and mass to quantify the relative attraction of each pair of zones for one another. The model employs the following relational assumptions:

- The number of trips made from zone i to zone j is inversely related to the distance from i to j expressed in terms of travel time.
- The number of trips made from zone i to zone j is directly related to the number of trips produced in i and the number of trips attracted to j .

Productions and attractions are balanced at the study-area level for all trip purposes in order to ensure that every trip will have two ends, one of which can be identified as the origin, the other being designated the destination. For all purposes except gaming, attractions are balanced to productions; for gaming, attractions are held constant. The trip distribution model converts productions and attractions into origins and destinations so that every individual trip will have both a beginning and an end. The result is a zonal matrix or *trip table* representing the number of trips from every zone (*i*) to every other zone (*j*).

Mode Choice

A mode choice model provides a process for estimating the number of trips made by each individual mode for all zonal interchanges. Because transit, pedestrian and bicycle trips represent a very small percentage of all travel in the study area, this step was excluded, as it often is outside the larger urbanized areas. Instead of splitting trips among modes, this step in the Mississippi Gulf Coast model is used to convert person-trips into vehicle-trips based on assumed rates of vehicle occupancy.

Traffic Assignment

Traffic assignment models are used to estimate link flows on a streets network. The input to the traffic assignment model consists of flow matrices representing the volume of traffic by travel purpose between origin-and-destination (O-D) pairs. Other inputs include the network topology, link characteristics and link performance functions. The flow between each pair of TAZs is loaded on the network in a manner determined by the relative travel-time impedance of the alternative paths available for each trip. The *User Equilibrium* approach incorporated in the Mississippi Gulf Coast model utilizes an iterative process, converging on an optimum distribution of traffic which minimizes individual delay such that, in the end, no driver can reduce the time required to complete his trip by shifting to another travel path.

Detailed information regarding the structure of the model and the model development process may be found in *Technical Memorandum No. 1: Travel Demand Model Development*.

4.2 EXISTING-PLUS-COMMITTED NETWORK

The Mississippi Gulf Coast Travel Demand Forecasting Model was calibrated to actual traffic conditions in 2008, the base year for this study. The base-year street and highway network included all major roads (i.e., arterials and collectors) that were existing and in service in 2008, as well as some local streets needed for system continuity. An *Existing-Plus-Committed* (E+C) network was subsequently developed to represent the baseline case for testing future network alternatives. The E+C network includes all major roads (and some local streets) that were still in service in 2010, incorporates changes to base-year streets and highways made since 2008, and adds new routes opened to traffic after the base-year traffic counts were made. It also includes committed improvements, including new facilities and modifications to existing streets and highways, programmed for implementation during the next 5-10 years. These committed projects, as well as improvements completed since 2008, are listed in Table 4-1 and graphically represented in Figure 4-1.

**Table 4-1:
MISSISSIPPI GULF COAST COMPLETED AND COMMITTED ROADWAY IMPROVEMENTS (2010)**

Completed Projects:

ID	County	Route	Location	Improvement
1	Hancock	Coleman Ave	Central Ave to S Beach Blvd	Improve to 3-lane
2	Harrison	Promenade Pkwy	Old Hwy 15 to MS 67	New 4-lane divided
3	Harrison	Airport Exit Rd	Airport Rd W to Airport Rd E	Intersection/Lighting
4	Harrison	US 49	Airport Rd to Turkey Creek	Add median
5	Harrison	MS 67	Hwy 605 to I-110	New 4-lane divided
6	Harrison	US 49	Dedeaux Rd to Community Rd	Add median
7	Jackson	Hwy 611	US 90 to end of route	Improve to 4-lane
8	Jackson	Ocean Springs Rd	Government St	Improve Intersection
9	Jackson	Hanley Road	Government St	Improve Intersection
10	Jackson	Old Spanish Trail	Beachview Dr to Fontainebleau Rd	Improve intersection

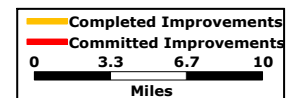
Committed Projects:

ID	County	Route	Location	Improvement
11	Hancock	Port Access Rd	Hwy 607 to US 90	New 4-lane
12	Hancock	MS 43 Kiln Bypass	.82 mi W of Hwy 603 to Texas Flat Rd	New/improved 4-lane divided
13	Hancock	Hwy 607	Pearl River Co to Stennis Space Center	Improve to 4-lane divided
14	Harrison	Popp's Ferry Rd	North shore of Back Bay to south shore	New 4-lane bridge
15	Harrison	Popp's Ferry Rd	Cedar Lake Rd to Lamey St/Gay Rd	Improve to 5-lane
16	Harrison	Popps Ferry Rd Ext	Pass Rd to Biloxi Coliseum/US 90	New 4-lane
17	Harrison	Sangani Blvd	MS 67 to Lamey Bridge Rd	Improve to 4-lane
18	Harrison	Central Ave	Lamey Bridge Rd to Bayshore Dr	Improve to 4-lane
19	Harrison	John Hill Blvd Ext	US 49 to 12th Ave	New 4-lane
20	Harrison	8th Avenue	12th Ave to 34th St	Improve to 4-lane divided
21	Harrison	Dedeaux Rd	Three Rivers Rd to Hwy 605	Improve to 5-lane
22	Harrison	28th St	34th Ave to 23rd Ave	Improve to 4-lane
23	Harrison	Three Rivers Rd	O'Neal Rd to Dedeaux Rd	Improve to 3-lane
24	Harrison	Three Rivers Rd	Creosote Rd to Airport Rd	Improve to 3-lane with circle
25	Harrison	Creosote Rd	US 49 to Three Rivers Rd	Improve to 3-lane
26	Harrison	Seaway Rd	Three Rivers Rd to Lorraine Rd	Improve to 4-lane divided
27	Harrison	O'Neal Rd	Sullivan Lane to Three Rivers Rd	Extend existing 3-lane
28	Harrison	Three Rivers Rd	Angela Dr to Seaway Rd	Improve to 4-lane
29	Harrison	I-10	I-110	New interchange/connectors
30	Harrison	Hwy 601	Canal Rd to 28th St @ 30th Ave	New 4-lane divided
31	Harrison	US 49	School Rd to O'Neal Rd	Improve to 6-lane divided
32	Jackson	Martin Bluff Rd	Gautier-Vancleave Rd to Homestead Blvd	Improve to 3-lane
33	Jackson	MS 57	US 90 to Old Spanish Trail	Improve to 3-lane
34	Jackson	Old Fort Bayou	Webb Rd W to Yellow Jacket Rd	Realign/Improve intersection
35	Jackson	Old Fort Bayou Rd	Washington Ave to Webb Rd W	Improve to 3-lane
36	Jackson	MS 57 Ext	Old Spanish Trail to Fontainebleau Rd	New 4-lane
37	Jackson	Ocean Springs Rd	Reilly Rd to US 90	Improve to 3-lane
38	Jackson	MS 57	Mariposa Lane to I-10	Improve to 4-lane divided
39	Jackson	I-10 Connector	Mallett Rd to Hwy 609	New 3-lane
40	Jackson	Shortcut Road	McPhelah Rd to Jefferson Ave	Improve to 3-lane
41	Jackson	Ingalls Ave	Chicot Rd to Martin St	Improve Intersections
42	Jackson	Hospital Rd	US 90 to Old Mobile Hwy	Improve to 4-lane

Source: Gulf Regional Planning Commission (2010): Transportation Improvement Program (FY 2010-2013)

MISSISSIPPI GULF COAST AREA
TRANSPORTATION STUDY:
2035 LONG-RANGE
TRANSPORTATION PLAN

Figure 4-1:
MISSISSIPPI GULF COAST
EXISTING-PLUS-COMMITTED
NETWORK



Source:
Gulf Regional Planning
Commission
Mississippi Department
of Transportation

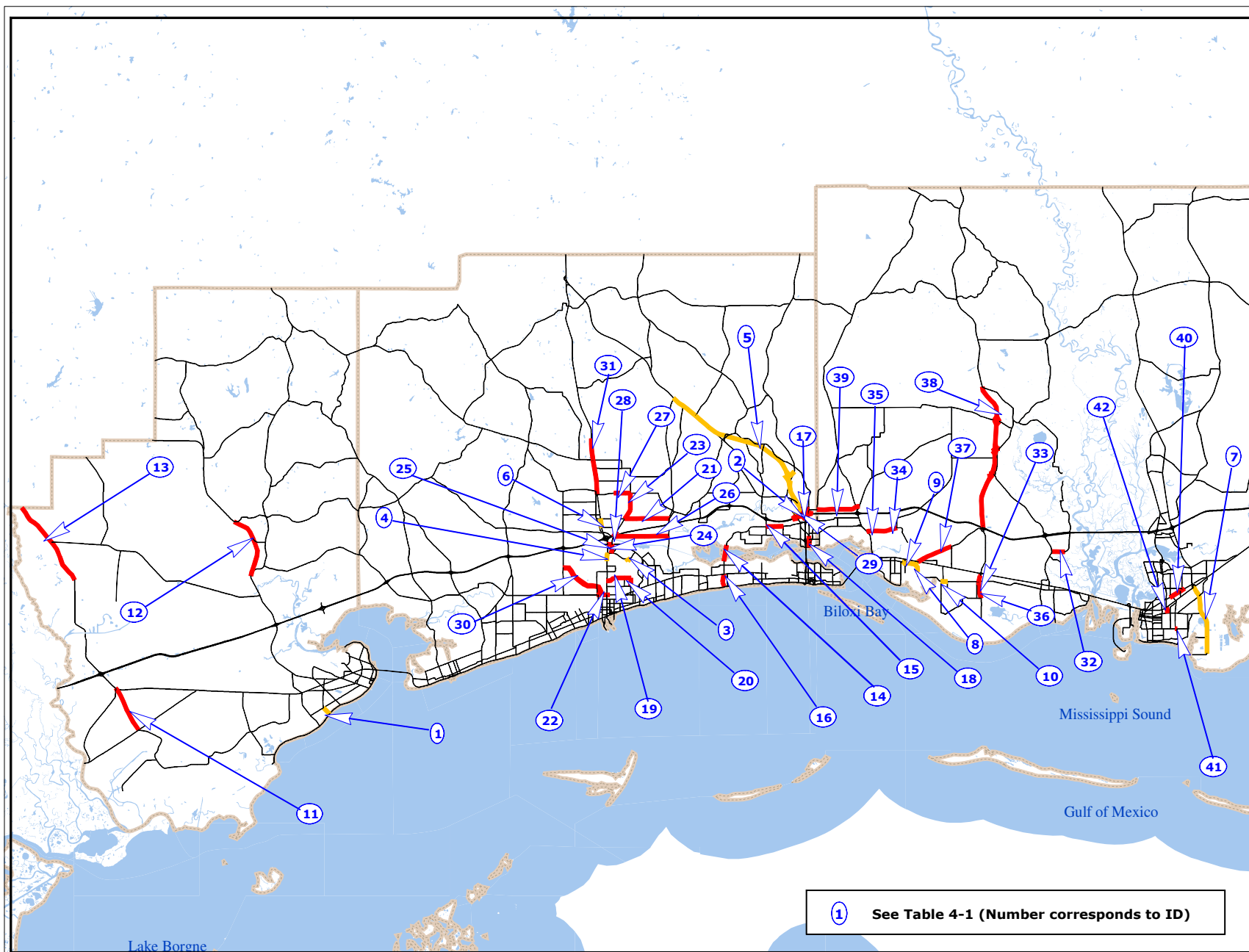
Prepared for



Prepared by



In association with
Wilbur Smith and Associates



This chapter provides an overview of the process undertaken to identify and assess needs to be considered in developing the long-range regional transportation plan for the Mississippi Gulf Coast Area. That process elicited essential input from stakeholders, the general public, local officials and other interested parties. Technical work activities included the assessment of existing traffic conditions and the modeling of future travel demand. Local planning activities, especially those spurred by the Hurricane Katrina recovery effort, played a particularly important part in development of the regional transportation plan; and, as always, so did the highway construction program for state-maintained routes in Mississippi. In addition, Gulf Regional Planning Commission (GRPC), as metropolitan planning organization (MPO) for the Mississippi Gulf Coast, assigned particular importance to the process of consultation with state and federal agencies having responsibilities likely to be affected by decisions regarding land use and transportation. Finally, the MPO attempted to address the environmental justice implications of all potential transportation improvement projects, in order to ensure that the benefits and burdens associated with proposed improvements included in the plan will be equitably distributed and not cause undue hardship to individuals belonging to groups which have historically had limited opportunities to influence the plan development process.

5.1 EXISTING CONGESTION

Transportation needs also are identified by MPO planning efforts such as the *Congestion Management Plan* (CMP) that draws upon performance measures developed from travel-time data to identify specific congestion problems. MPO staff routinely conducts travel-time surveys on the functionally classified collector and arterial roadways within the Gulfport-Biloxi and Pascagoula urbanized areas. Data from the CMP are used in the continuing transportation planning process to provide decision-makers with an understanding of existing traffic flow conditions. The CMP uses performance measures describing the degree to which travel delay affects specific travel corridors to inform decision-making and to strengthen the link between planning goals and investment decisions.

The CMP draws upon operational *level-of-service* (LOS) performance measures developed from travel-time data to identify specific congestion problems. GRPC staff undertakes the assessment of mobility on all functionally classified collector and arterial roadway segments within the study network. Travel-time data are used to identify

Level of Service Thresholds

LOS C describes stable operations; however, driver ability to maneuver and change lanes in midblock locations may be more restricted than *LOS B*, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds (typically 50-70 percent of the free-flow speed for the relevant roadway class).

LOS D borders on a range in which small increases in flow may cause substantial increases in delay and decreases in travel speed. *LOS D* may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. Average travel speeds are about 40-50 percent of free-flow speed.

LOS E is characterized by significant delays and average travel speeds of 33-40 percent or less of the free-flow speed. Such operations are caused by a combination of adverse signal progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

LOS F is characterized by urban street flow at extremely low speeds, typically 25-33percent of the free-flow speed. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

areas likely to experience recurring congestion. Congestion may be occurring either at intersections or between intersecting streets on a given roadway. The roadway segments listed in tables 5-1, 5-2 and 5-3 have been identified as having operational service levels of C, D, E or F (see box above). (See also figures 5-1, 5-2, 5-3 and 5-4.)

5.2 PROJECTED DEFICIENCIES

There are six possible levels of service, ranging from A (optimum) to F (failure). It is customary to consider roadway segments with operational LOS E or F deficient. LOS D is considered marginal. In order to project future levels of service on the Existing-Plus-Committed (E+C) network, the Mississippi Gulf Coast Travel Demand Forecasting Model was used to generate a traffic assignment for the long-range planning horizon. For each roadway segment with V/C projected to be greater than 1.0 in 2035, a preliminary level of service was calculated in order to pinpoint projected deficiencies.

The calculation of operational LOS normally requires assembling data for a number of land use and roadway characteristics, including local terrain, type of roadway, number of lanes, lane width, shoulder width, free-flow speed, number of access-points and vehicle mix (percent trucks), among others. However, for the purposes of long-range planning, the Florida Department of Transportation (FDOT) developed a quick method for estimating LOS, using V/C, based on empirical data for collectors, arterials and freeways; divided and undivided roadways; two-lane and multilane facilities; and different levels of daily vehicular capacity. This approach was adapted to the needs of the present study, and the volume-to-capacity ratios shown in Table 5.4 were used to derive a preliminary estimate of LOS for potentially deficient roadway segments with V/C greater than 1.0. While there is not an exact correspondence between LOS and V/C, the latter measure provides a convenient and fairly reliable indicator of the operational performance expressed as LOS.

A total of 33 potentially deficient roadway segments were identified on the basis of the long-range traffic assignment made with the Mississippi Gulf Coast model. All showed some increase in traffic from 2008 to 2035; a number showed very substantial increases (see Table 5-4). Two-way volumes on three segments of Interstate 10 (I-10), between Highway 605 and Interstate 110 (I-110), were projected to increase from around 80,000 vehicles per day (VPD) to more than 100,000 VPD. The largest relative increase was recorded for Forts Lake Road near the eastern limit of the study area, with fewer than 5,000 VPD in 2008 but more than 19,000 VPD projected in 2035.

Thirteen of the potentially deficient roadway segments were projected to experience LOS E or F in 2035 (see Table 5-5 and figures 5-5, 5-6, 5-7 and 5-8). Among six segments registering LOS E were the three consecutive sections of I-10 mentioned above and the I-110 crossing of the Back Bay of Biloxi. The

Table 5-1:
HANCOCK COUNTY ROADWAY SEGMENTS WITH LEVEL OF SERVICE C, D, E OR F

ID	JURISDICTION	ROUTE	LIMITS
48	Waveland	US Highway 90	Old Spanish Trail to Highway 603
97	Bay St Louis	Highway 603	Longfellow Drive to US 90
117	Bay St Louis	US Highway 90	Nicholson Avenue to McLaurin Street
144	Bay St Louis	US Highway 90	Drinkwater Road to Dunbar Avenue
155	Bay St Louis	US Highway 90	Dunbar Ave to 2 nd Street

Source: *Gulf Regional Planning Commission (2010): Congestion Management Plan*. Identification numbers (ID) refer to project locations shown in figures 5-1 to 5-4.

Table 5-2:

HARRISON COUNTY ROADWAY SEGMENTS WITH LEVEL OF SERVICE C, D, E OR F

ID	JURISDICTION	ROUTE	LIMITS
258	Long Beach	Klondyke Road	Commission Road to Cleveland Avenue
234	Long Beach	Klondyke Road	28 th Street to Commission Road
363	Gulfport	US Highway 90	Broad Avenue to 42 nd Avenue
600	Gulfport	30th Avenue	17 th Street to 16 th Street
379	Gulfport	US Highway 49	13 th Street to US 90
403	Gulfport	US Highway 90	30 th Avenue to 27 th Avenue
388	Gulfport	28 th Street	30 th Ave to 34 th Avenue
424	Gulfport	US Highway 49	34 th to 28 th Street
440	Gulfport	Hewes Avenue	Railroad Street to US 90
457	Gulfport	US Highway 90	Texas Avenue to Courthouse Road
450	Gulfport	Pass Road	Hewes Avenue to Washington Avenue
446	Gulfport	Pass Road	Washington Avenue to Courthouse Road
463	Gulfport	Pass Road	Courthouse Road to Teagarden Road
443	Gulfport	Pass Road	Teagarden Road to Cowan Road
473	Gulfport	Cowan Road	Pass Road to Magnolia Street
1001	Gulfport	US Highway 49	Airport Road to Polk Street
996	Gulfport	US Highway 49	Airport Road to Creosote Road
1003	Gulfport	Creosote Road	US 49 to Three Rivers Road
997	Gulfport	Creosote Road	Three Rivers Road to Rippy Road
999	Gulfport	Three Rivers Road	Creosote Road to Rippy Road
1004	Gulfport	Three Rivers Road	Creosote Road to Seaway Road
321	Gulfport	US Highway 49	Landon Road to I-10
991	Gulfport	US Highway 49	Dedaux Road to Community Road
989	Gulfport	US Highway 49	Oneal Road to Orange Grove Road
983	Gulfport	O'Neal Road	Hwy 49 to Three Rivers Road
1026	Gulfport	Lorraine Road	I-10 to Seaway Road
480	Biloxi	Beauvoir Rd	Pass Road to US 90
335	Biloxi	Pass Road	Debuys Road to Eisenhower Drive
482	Biloxi	Pass Road	Big Lake Road to Popps Ferry Road
485	Biloxi	Pass Road	Beauvoir Road to Popps Ferry Road
34	Biloxi	Popps Ferry Road	Pass Road to Atkinson Road
1060	Biloxi	Cedar Lake Road	I-10 to Popps Ferry Road
1034	Biloxi	Popps Ferry Road	Cedar Lake Road to Lamey Street
1067	D'Iberville	Automall Parkway	D'Iberville Boulevard to Rodriguez Street
1120	D'Iberville	Central Avenue	Quave Road to Lemoyne Boulevard
1145	D'Iberville	Central Avenue	Rodriguez Street to Quave Road
506	Biloxi	White Avenue	Irish Hill Drive to US 90
503	Biloxi	US Highway 90	White Avenue to Porter Avenue
504	Biloxi	Irish Hill Drive	White Avenue to Porter Avenue
540	Biloxi	US Highway 90	I-110 to Caillavet Street
615	Biloxi	US Highway 90	Reynoir Street to Lameuse Street
1-VC	Long Beach	Railroad Street	Klondyke Road to Jeff Davis Avenue
2-VC	D'Iberville	D'Iberville Boulevard	Automall Parkway to Popps Ferry Road
3-VC	D'Iberville	D'Iberville Boulevard	Popps Ferry Road to Big Ridge Road
4-VC	Gulfport	Canal Road	I-10 to Landon Road

Source: Gulf Regional Planning Commission (2010): Congestion Management Plan. Identification numbers (ID) refer to project locations shown in figures 5-1 to 5-4.

Table 5-3:**JACKSON COUNTY ROADWAY SEGMENTS WITH LEVEL OF SERVICE C, D, E OR F**

ID	JURISDICTION	ROUTE	LIMITS
1252	Jackson County	Highway 609	Old Fort Bayou Road to US 90
1284	Jackson County	Highway 609	Big Ridge Road to Lemoyne Boulevard
1283	Ocean Springs	US Highway 90	Hwy 609 to MLK Boulevard
1351	Ocean Springs	US Highway 90	Holcomb Boulevard to Hanley Road
1325	Ocean Springs	US Highway 90	Hanley Road to Ocean Springs Road
1348	Ocean Springs	US Highway 90	Ocean Springs Road to Deana Road
738	Ocean Springs	US Highway 90	Deana Road to Hanshaw Road
753	Gautier	US Highway 90	Dolphin Drive to Gautier-Vancleave Road
761	Gautier	Gautier-Vancleave Rd	Dolphin Drive to US 90
821	Pascagoula	US Highway 90	Pine Street to Pascagoula Street
777	Pascagoula	US Highway 90	Telephone Road to Market Street
769	Pascagoula	Telephone Road	Market Street to 14 th Street
892	Pascagoula	US Highway 90	14 th Street to Hospital Road
931	Pascagoula	US Highway 90	Hospital Rd to Chicot Rd
925	Pascagoula	US Highway 90	Veterans Boulevard to Hwy 611
9	Moss Point	MS Highway 63	MLK Drive to Grierson Street

Source: Gulf Regional Planning Commission (2010): Congestion Management Plan. Identification numbers (ID) refer to project locations shown in figures 5-1 to 5-4.

seven LOS F segments included four in Harrison County (three in Biloxi and one in D'Iberville) and three in Jackson County. Among the latter were a section of U. S. Highway 90 (US 90) in Ocean Springs, Forts Lake Road and Franklin Creek Road connecting it to I-10 near the Alabama state line.

5.3 LOCAL PLANS AND NEEDS IDENTIFICATION

MPO staff worked with the Technical Coordinating Committee (TCC) and other stakeholders to make sure that all high-priority local projects were included in the analysis. Efforts included staff involvement in events such as the "Regional Coordinated Transportation Summit" in November 2010 and the "Odyssey Day" event on October 15, 2010 which collected input from stakeholders regarding needed transportation improvements.

A Stakeholder Summit was held on April 13, 2010 to solicit the involvement of knowledgeable individuals with an interest in the development of the regional transportation plan. The summit was a three-hour meeting covering issues related to future land use and development, air quality and transportation conformity, transportation funding, and transportation improvement needs. The summit included interactive exercises to obtain information on the status of current and future developments in the area. Results of this meeting included project ideas that were considered in the development of the 2035 Staged Improvement Plan presented in this document.

Throughout the process of identifying proposed transportation projects, MPO staff met with representatives of individual jurisdictions to discuss local transportation plans. Projects were also identified through research into the local comprehensive plans in the region, many of which were developed or updated after Hurricane Katrina. The results of these efforts were inventoried and put into a composite list of projects to be considered for the plan.

Congestion
Management Plan
Traffic Flow Deficiencies

Legend

Level of Service DE or F

WAVELAND
AND
BAY SAINT LOUIS

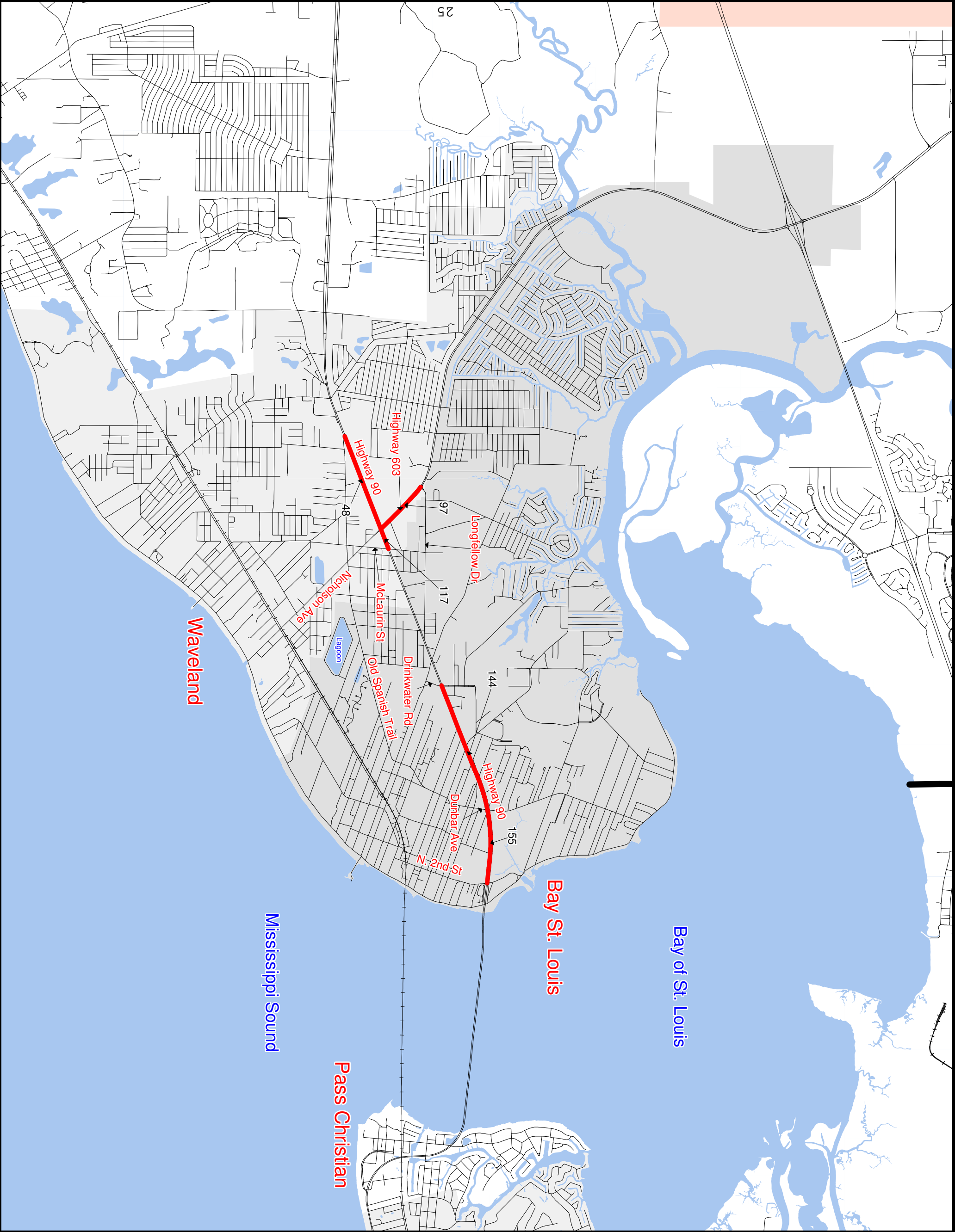


Figure:5.1

Congestion
Management Plan
Traffic Flow Deficiencies

Legend

Level of Service DE or F

GULFPORT
AND
BILOXI

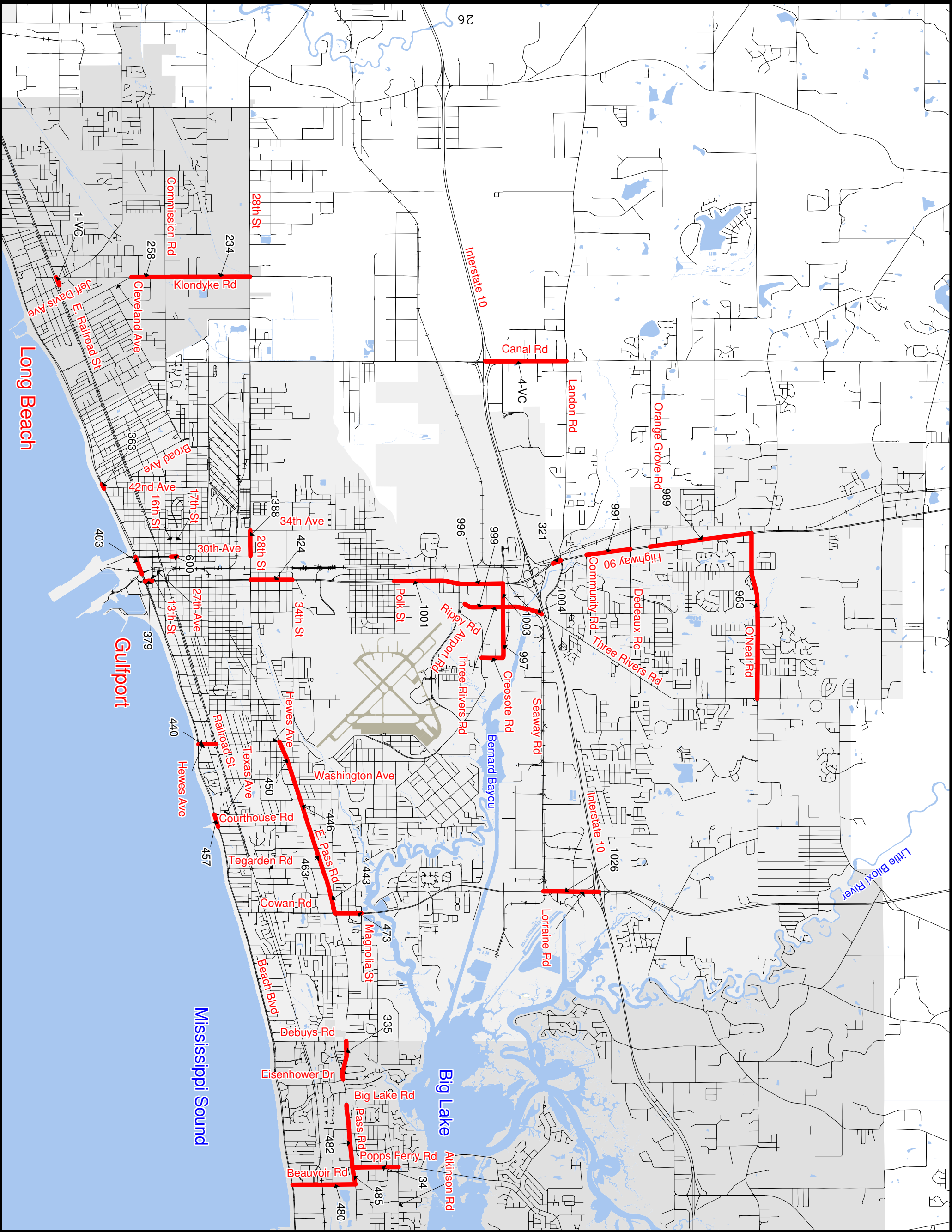
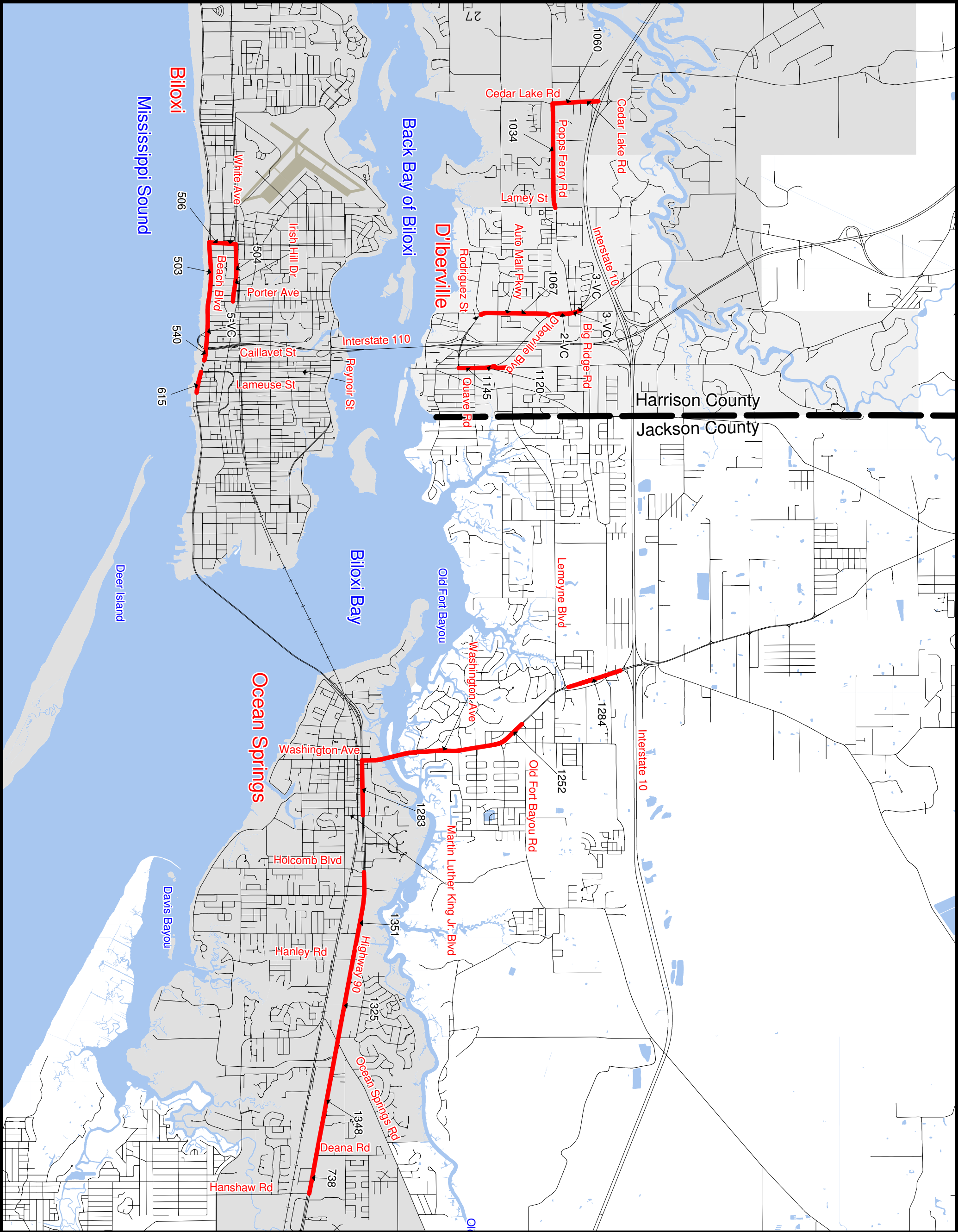


Figure:5.2

Congestion
Management Plan
Traffic Flow Deficiencies



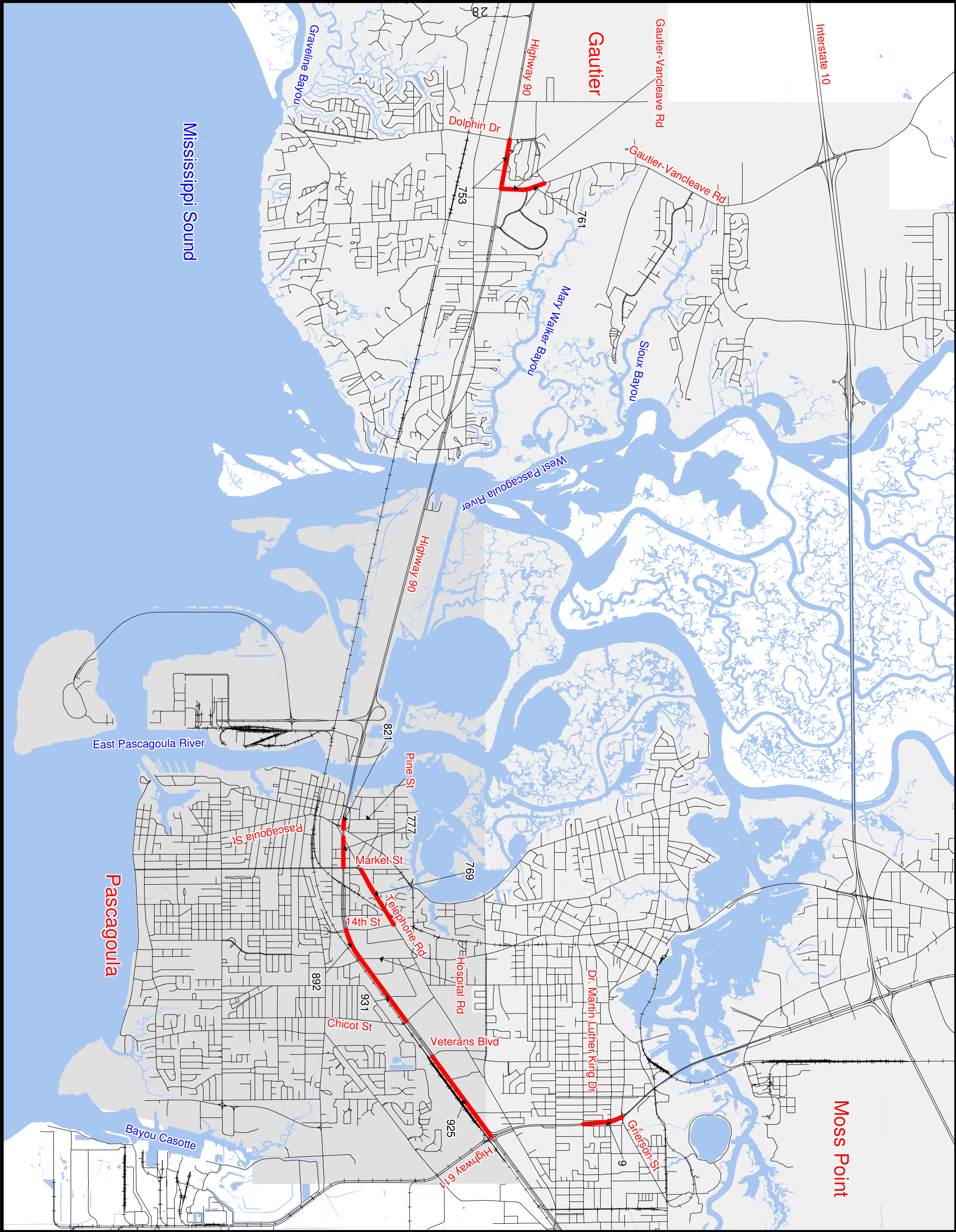
Legend

Level of Service DE or F

BILOXI
AND
OCEAN SPRINGS



Figure:5.3



Congestion Management Plan

Traffic Flow Deficiencies

Legend

Level of Service DE or F

GAUTIER,
PASCAGOULA
AND
MOSS POINT

Figure:5.4



**Table 5-4:
MISSISSIPPI GULF COAST PROJECTED DAILY TRAFFIC FOR POTENTIALLY DEFICIENT
ROADWAY SEGMENTS**

COUNTY	ROUTE	FROM (N/W)	TO (S/E)	PROJECTED DAILY TRAFFIC			
				2008	2015	2025	2035
Hancock	Texas Flat Road	Mainline Road	MS 43	12352	12435	14816	17569
Hancock	MS 43	I-10 WB On-Ramp	I-10 EB On-Ramp	24493	24756	27583	31453
Harrison	County Farm Rd	I-10 WB On-Ramp	I-10 EB On-Ramp	9521	9719	10740	12275
Harrison	Canal Road	I-10 WB On-Ramp	Highway 601	19415	19710	21871	24733
Harrison	Highway 605	Lorraine Road	I-10 EB On-Ramp	35742	35872	40212	43095
Harrison	Popps Ferry Rd	N Country Club Lane	Popps Ferry Bridge	17368	17732	20179	24615
Harrison	US 90	White Avenue	I-110 SB Off-Ramp	36034	36262	40592	46644
Harrison	Forrest Avenue	Columbus Street	Division Street	13765	12414	13991	15320
Harrison	US 90	Lee Street	Oak Street	14818	15378	18657	25159
Harrison	Pass Road	Cowan Road	Popps Ferry Road	36416	36660	38724	43979
Harrison	Lorraine Road	Industrial Seaway	Pass Road	35187	35573	38538	42588
Harrison	25th Avenue	28th Street	Pass Road	34466	35252	36710	41348
Harrison	15th Street	38th Avenue	33rd Avenue	17936	17540	19640	22014
Jackson	Washington Ave	Lemoyne Boulevard	US 90	37635	38421	41933	46919
Jackson	Government St	Ocean Springs Road	Old Spanish Trail	12845	12694	15121	20542
Jackson	Highway 613	Saracennia Road	I-10	18262	18718	22023	25875
Jackson	Forts Lake Road	Revolutionary Road	Presley's Outing Rd	4611	4611	9408	19193
Harrison	US 49	I-10	Creosote Road	59103	60012	65222	72972
Harrison	Bayview Ave	Benachi Avenue	I-110 NB On-Ramp	13866	14611	17147	18933
Jackson	US 90	Hanley Road	Ocean Springs Road	35856	36696	39008	45193
Harrison	MS 67	Sangani Boulevard	I-10 WB On-Ramp	39240	39913	47083	51810
Harrison	Mallett Road	Lamey Bridge Road	Daisy Vestry Road	13615	14158	16575	22219
Harrison	I-10	Highway 605	Woolmarket	81052	79272	89215	101194
Harrison	I-10	Woolmarket	Cedar Lake Road	82388	80570	90839	102727
Harrison	I-10	Cedar Lake Road	I-110	79494	77872	87655	101417
Harrison	I-110	Rodriquez Street	Bayview Avenue	80722	81776	91169	104306
Harrison	Big Ridge Road	Popps Ferry Rd Ext	Lamey Bridge Road	13779	13852	18970	23168
Harrison	Division Street	I-110 SB Off-Ramp	I-110 NB On-Ramp	14323	13794	15807	18571
Jackson	Forts Lake Road	Presley's Outing Rd	Independence Road	7353	7464	13892	26178
Jackson	Franklin Creek Rd	Independence Road	I-10 WB On-Ramp	7353	7464	13892	26178
Harrison	Howard Avenue	Oak Street	Myrtle Street	9413	9667	10901	13549
Harrison	Myrtle Street	Howard Avenue	US 90	9413	9667	10901	13549
Jackson	US 90	Vermont Avenue	Hanley Road	45785	46267	50318	56202

Source: Neel-Schaffer, Inc.


**Table 5-5:
MISSISSIPPI GULF COAST PROJECTED OPERATIONAL LEVEL OF SERVICE
FOR POTENTIALLY DEFICIENT ROADWAY SEGMENTS**

COUNTY	ROUTE	FROM (N/W)	TO (S/E)	PROJECTED LEVEL OF SERVICE			
				2008	2015	2025	2035
Hancock	Texas Flat Road	Mainline Road	MS 43	C	C	C	D
Hancock	MS 43	I-10 WB On-Ramp	I-10 EB On-Ramp	C	C	C	D
Harrison	County Farm Rd	I-10 WB On-Ramp	I-10 EB On-Ramp	C	C	C	D
Harrison	Canal Road	I-10 WB On-Ramp	Highway 601	C	C	C	D
Harrison	Highway 605	Lorraine Road	I-10 EB On-Ramp	C	C	C	D
Harrison	Popps Ferry Rd	N Country Club Lane	Popps Ferry Bridge	C	C	C	D
Harrison	US 90	White Avenue	I-110 SB Off-Ramp	C	C	C	D
Harrison	Forrest Avenue	Columbus Street	Division Street	C	C	C	D
Harrison	US 90	Lee Street	Oak Street	C	C	C	D
Harrison	Pass Road	Cowan Road	Popps Ferry Road	C	C	C	D
Harrison	Lorraine Road	Industrial Seaway	Pass Road	C	C	C	D
Harrison	25th Avenue	28th Street	Pass Road	C	C	C	D
Harrison	15th Street	38th Avenue	33rd Avenue	C	C	C	D
Jackson	Washington Ave	Lemoyne Boulevard	US 90	C	C	C	D
Jackson	Government St	Ocean Springs Road	Old Spanish Trail	C	C	C	D
Jackson	Highway 613	Saracennia Road	I-10	C	C	C	D
Jackson	Forts Lake Road	Revolutionary Road	Presley's Outing Rd	C	C	C	D
Harrison	US 49	I-10	Creosote Road	D	D	D	D
Harrison	Bayview Ave	Benachi Avenue	I-110 NB On-Ramp	D	D	D	D
Jackson	US 90	Hanley Road	Ocean Springs Road	D	D	D	D
Harrison	MS 67	Sangani Boulevard	I-10 WB On-Ramp	C	C	D	E
Harrison	Mallett Road	Lamey Bridge Road	Daisy Vestry Road	C	C	D	E
Harrison	I-10	Highway 605	Woolmarket	C	C	D	E
Harrison	I-10	Woolmarket	Cedar Lake Road	C	C	D	E
Harrison	I-10	Cedar Lake Road	I-110	C	C	D	E
Harrison	I-110	Rodriquez Street	Bayview Avenue	C	C	D	E
Harrison	Big Ridge Road	Popps Ferry Rd Ext	Lamey Bridge Road	C	C	D	F
Harrison	Division Street	I-110 SB Off-Ramp	I-110 NB On-Ramp	C	C	D	F
Jackson	Forts Lake Road	Presley's Outing Rd	Independence Road	C	C	D	F
Jackson	Franklin Creek Rd	Independence Road	I-10 WB On-Ramp	C	C	D	F
Harrison	Howard Avenue	Oak Street	Myrtle Street	D	D	E	F
Harrison	Myrtle Street	Howard Avenue	US 90	D	D	E	F
Jackson	US 90	Vermont Avenue	Hanley Road	D	D	E	F

Source: Neel-Schaffer, Inc.

2035 Forecasted Transportation System Deficiencies

Legend

 Level of Service DE or F

HANCOCK COUNTY

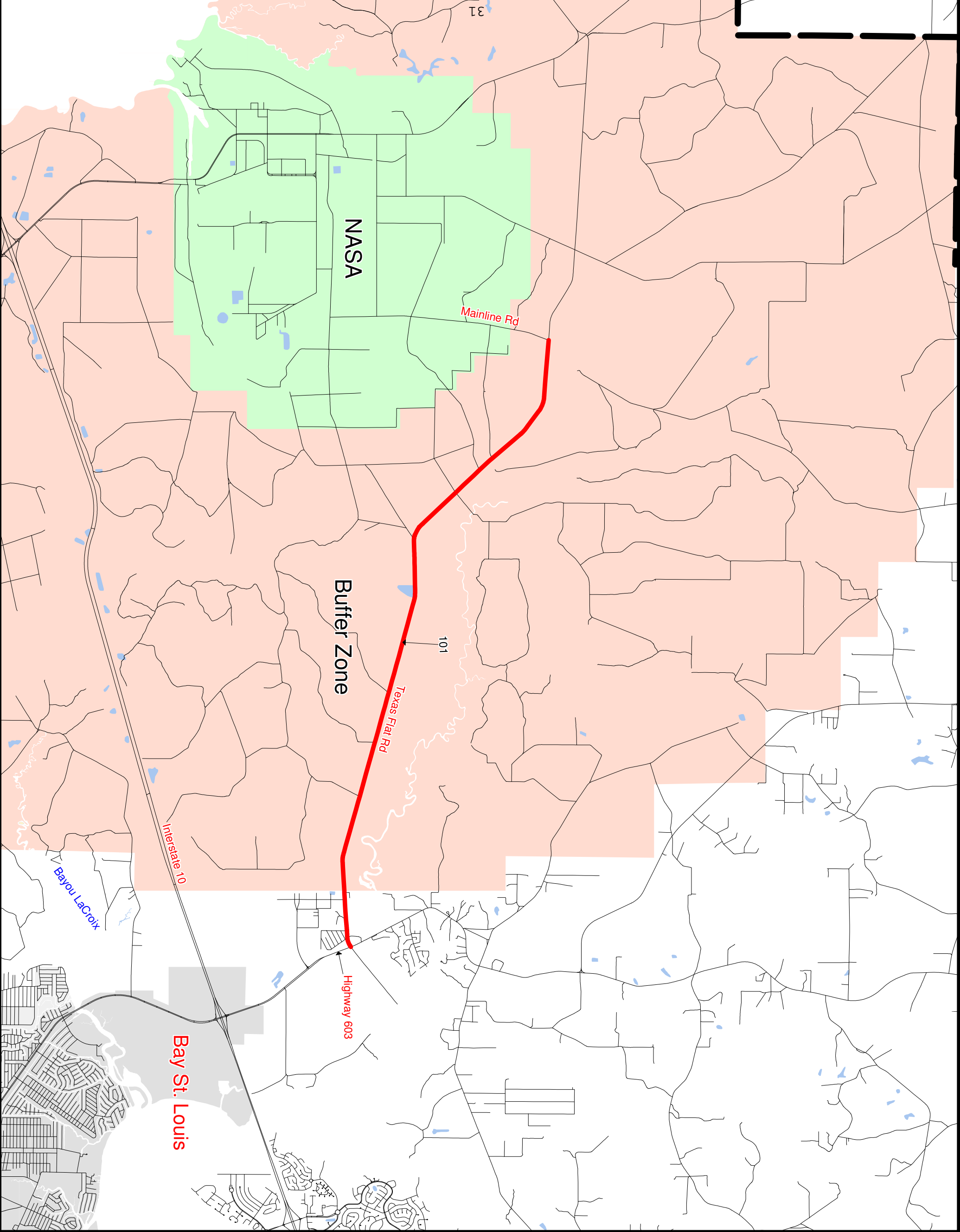
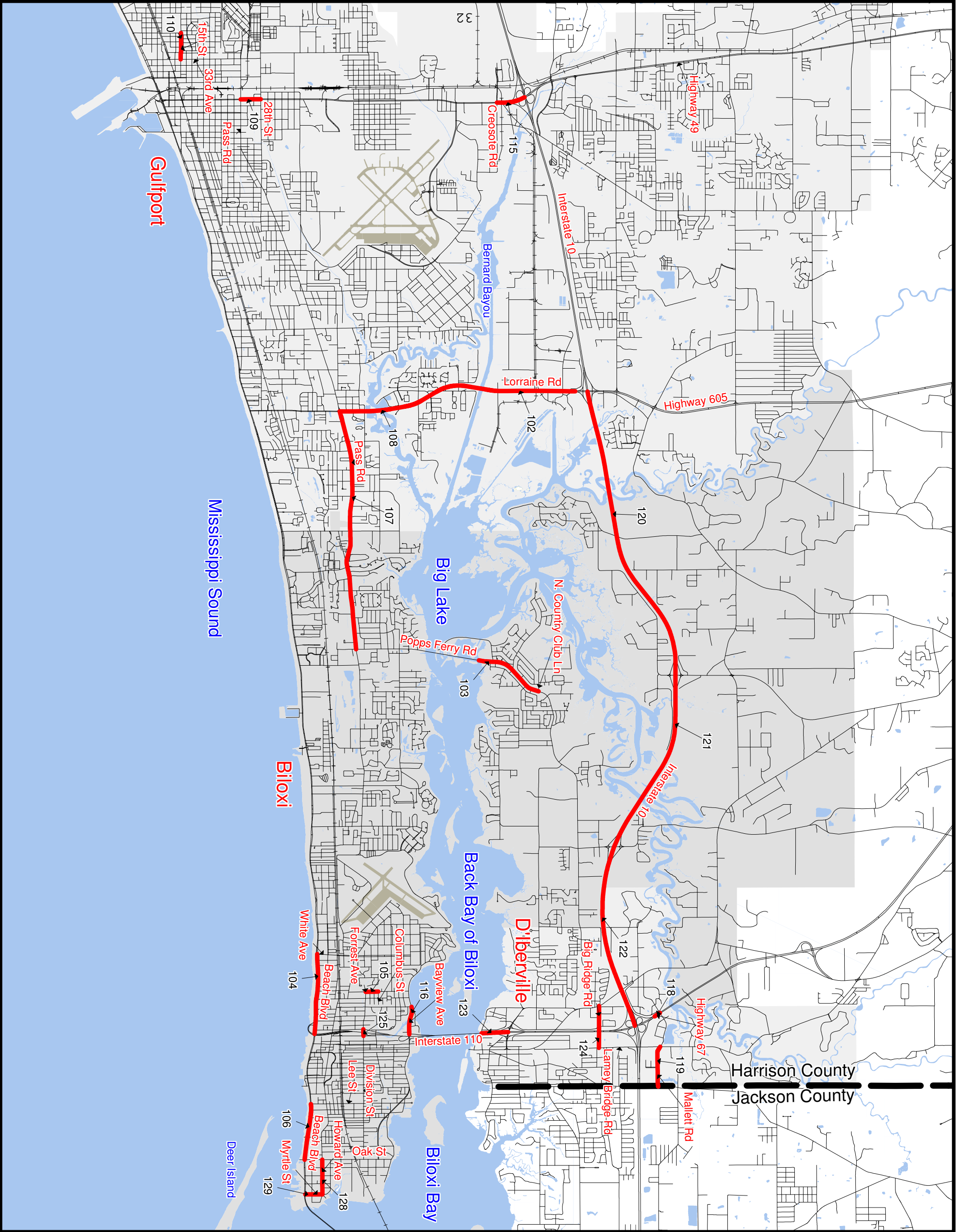


Figure:5.5



2035 Forecasted Transportation System Deficiencies

Legend

Level of Service DE or F

GULFPORT AND BILOXI



Figure:5.6

2035 Forecasted
Transportation System
Deficiencies

Legend

Level of Service DE or F

BLOXI
AND
OCEAN SPRINGS

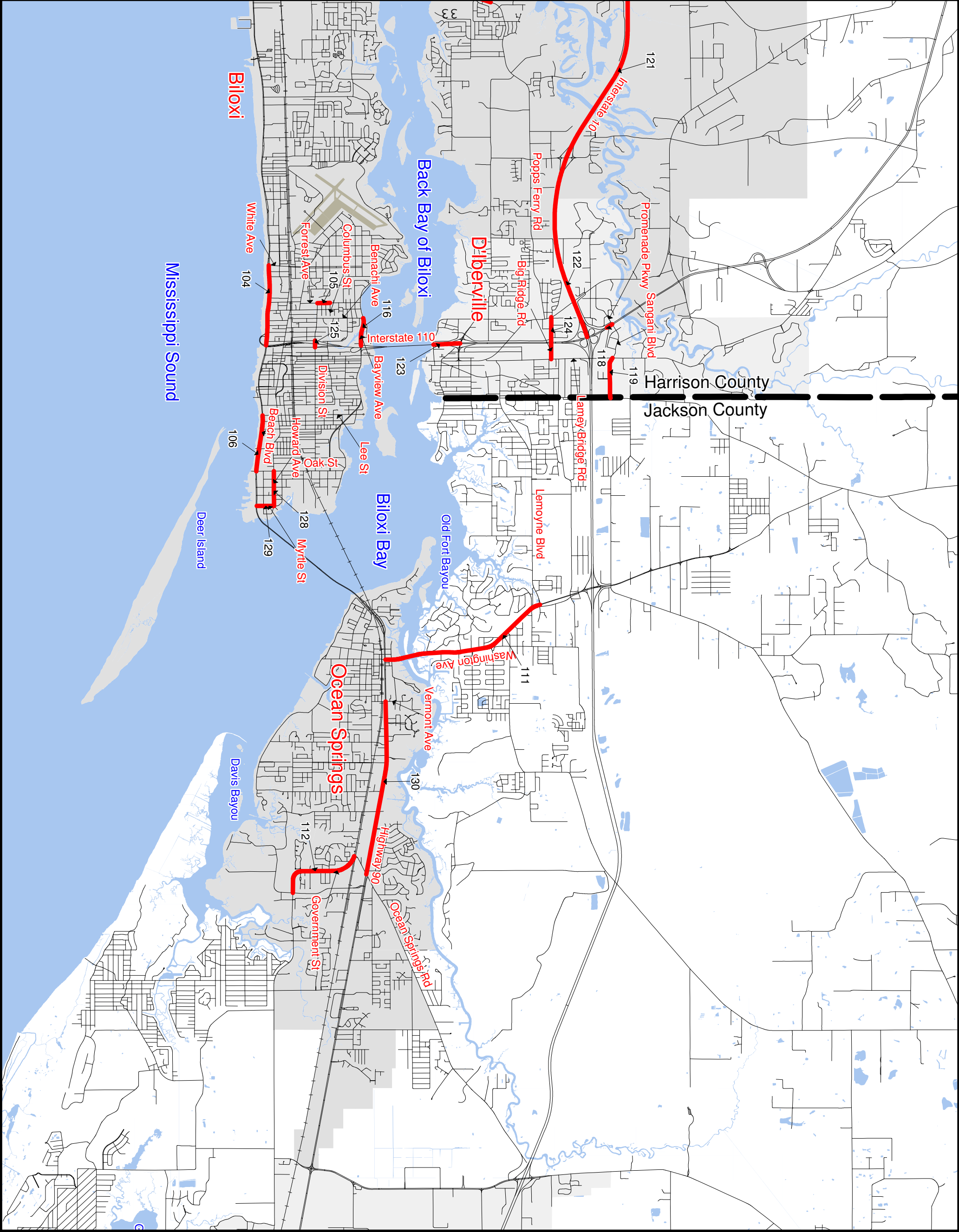


Figure:5.7

2035 Forecasted Transportation System Deficiencies

Legend

Level of Service DE or F

JACKSON COUNTY

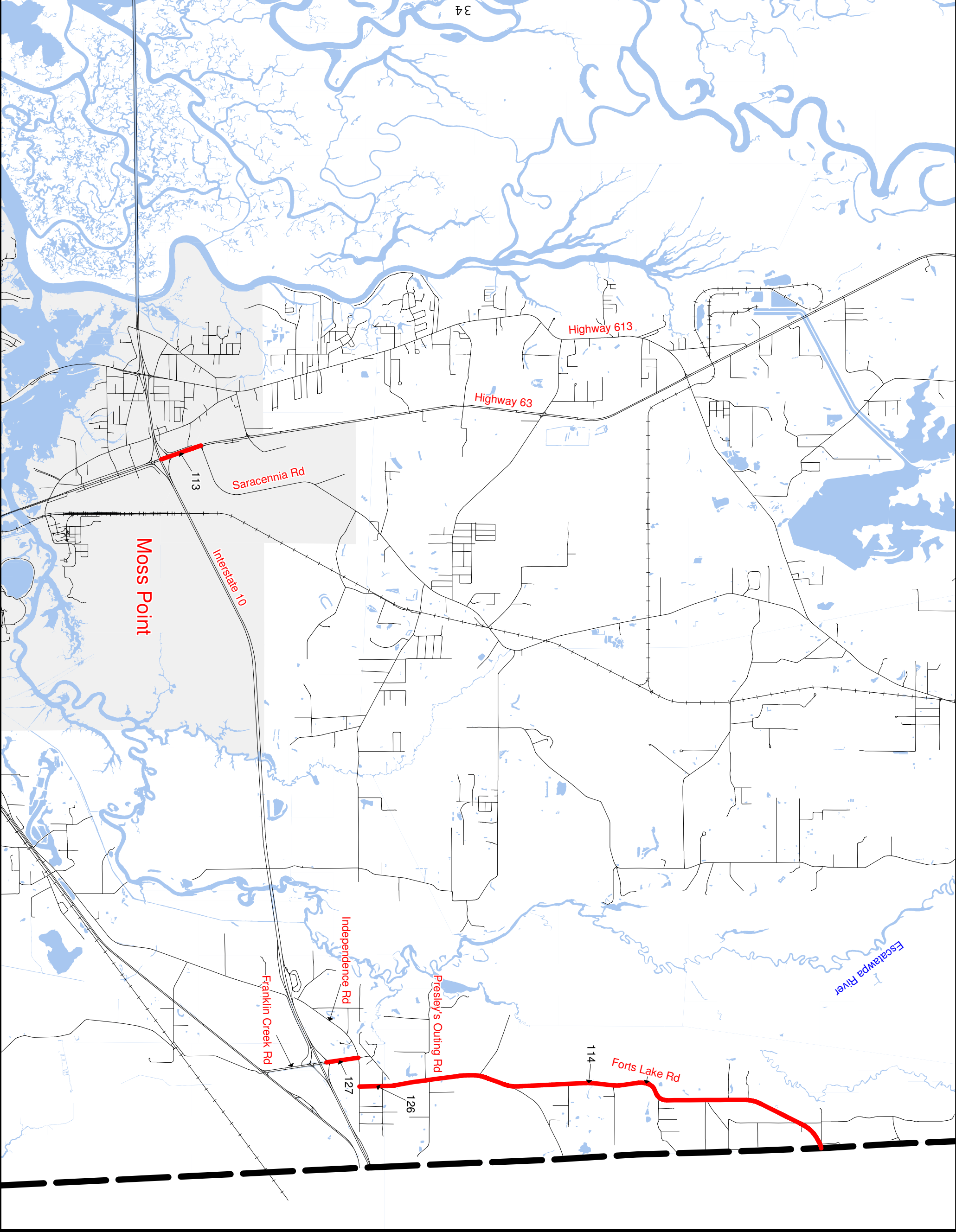


Figure:5.8

This chapter describes the process adopted for developing a budget for the Mississippi Gulf Coast Long-Range Transportation Plan based on the amount of funding expected to be available for transportation improvements over the long-range planning period from 2011 through 2035. In order to achieve compliance with the requirement that the long-range plan be fiscally constrained, it was necessary to prepare projections of future funding that would establish reasonable limits for programming projects to be implemented during the short-term (2011-2015), intermediate (2016-2025) and long-range (2026-2035) planning periods. The methodology applied to that task is outlined in the first part of this chapter (Section 6.1). Section 6.2 presents the conceptual alternatives considered for the distribution of transportation funds among the different categories of expenditure. And Section 6.3 describes briefly how cost estimates for individual street or highway improvement projects were developed and how the projects were aggregated into a fiscally constrained Staged Improvement Program.

6.1 FUNDING ANALYSIS

Any planning activity necessarily involves making assumptions about the future that are fraught with risk. Among the more significant risks is the possibility that the funding necessary to implement the plan will not be available when it is required. This risk is especially acute under current economic conditions when the nation is confronted by an unprecedented fiscal crisis. The federal legislation authorizing expenditures for highway and transit programs – the *Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users* (SAFETEA-LU) – expired on September 30, 2009 and has been operating on a series of short-term extensions since that date. The new Congress will be confronted with some very difficult choices about what to fund in light of the massive budget deficit and national debt that threaten to undermine both the economic wellbeing and long-term security of the United States. There is strong sentiment in favor of limiting or eliminating altogether the earmarking process which has been an increasingly important source of funding for transportation projects over the past 25 years. In view of these circumstances, Gulf Regional Planning Commission (GRPC), the metropolitan planning organization (MPO) for the Mississippi Gulf Coast, elected to adopt a fairly conservative projection methodology that has served the agency well in the past.

There is strong sentiment in favor of limiting or eliminating altogether the earmarking process which has been an increasingly important source of funding for transportation projects over the past 25 years.

The basic assumption underlying the projection of future funding for transportation improvements is that the overall level of funding will be consistent with the recent historical trend established by actual expenditures. This approach yielded a projection of \$53.5 million per year for street and highway construction projects used in developing the 2030 Long-Range Transportation Plan. Actual expenditures during the period from 2005 through 2009, based on data provided by the Mississippi Department of Transportation (MDOT), were somewhat higher – about \$61.4 million per year. This figure includes all projects for which contracts were let that involved state or federal funds, i.e., all except strictly local projects. It does not include emergency relief (ER) funds provided to repair or replace infrastructure

damaged or destroyed by Hurricane Katrina in 2005. The total amount expended for all other (non-emergency) transportation projects during the five-year period analyzed was \$423,564,849 or \$84,712,970 per year (see Table 6.1). These figures cover all categories, including bridges, demonstration projects, transportation enhancement projects, roadway construction, maintenance, traffic counting, ports, railroad crossings, safety measures and public transit. (Note, however, that the amounts do not include funds provided directly to transit operators by the Federal Transit Administration or from sources of local match for FTA grants.)

In order to develop an accurate assessment of the funding trend, the annual amounts for categories and sub-categories shown in Table 6.1 were converted to real (2010) dollars (see Table 6.2). That raised the overall total to almost \$450 million or nearly \$90 million per year. The annualized figure for street and highway construction projects – \$65.5 million – was \$4.1 million greater than the uninflated annual average (\$61.4 million) cited above. In order to develop more sustainable projections of future funding, the decision was made to utilize the 2010 real-dollar estimates of annualized expenditures as the basis for assumptions regarding amounts that will be available during the long-range planning period.

The conceptual funding alternatives defined for consideration were conceived as variants of the historical distribution described above. First the average annual amounts for individual categories of transportation expenditure were converted to percentages (see Table 6.3). Over the last five years for which data were available (2005-2009), expenditures for street and highway construction represented approximately 72 percent of all spending for transportation funded with state or federal assistance, not including Federal Transit Administration (FTA) grants awarded directly to public transit operators. A little more than 11 percent went to highway maintenance and six percent to bridge replacement projects. The balance of about ten percent was split among the remaining seven categories: Intelligent transportation systems (ITS) and demonstration projects, bicycle and pedestrian facilities, the GRPC traffic counting program, ports, railroads, safety-related improvements and transit.

The conceptual alternatives envisioned shifting some funds from construction to other categories in accordance with goals relating to the maintenance of existing infrastructure, expansion of alternative modes, and enhancement of the safety and security of the transportation system. In addition, the pending designation of study area counties as non-attainment areas with respect to the National Ambient Air Quality Standards (NAAQS) will necessitate measures to reduce mobile-source emissions (specifically the precursors for ozone). Finally the uncertainty attending the economic situation and prospects for future funding dictates heightened concern for the sustainability of the transportation system. The forecast for continuing growth made prior to Hurricane Katrina and the economic recession of recent years has been dampened by the loss of population and jobs resulting from the twin disasters. The revised forecast when input to the regional travel demand forecasting model (as described in *Technical Memorandum No. 2: Travel Forecast and Deficiency Analysis*) results in lower traffic volumes and levels of congestion than were foreseen in developing the 2030 Long-Range Transportation Plan. The need for new streets and highways has clearly abated somewhat while the need to maintain existing streets and highways has increased correspondingly.

The following three conceptual alternatives were proposed to begin addressing these needs:

- *Multimodal* – An alternative increasing funding support for modes other than private-vehicle highway travel: Bicycle and pedestrian, marine ports, railroads and transit;

Table 6.1:

FUNDING FOR TRANSPORTATION IMPROVEMENTS ON THE MISSISSIPPI GULF COAST BY NON-EMERGENCY SOURCE (2005-2009)

SOURCE/PROGRAM	2005	2006	2007	2008	2009	TOTAL	ANNUAL AVG
Bridge Replacement	\$1,800,000	\$0	\$7,000,000	\$16,182,200	\$1,264,000	\$26,246,200	\$5,249,240
Bridge Total	\$1,800,000	\$0	\$7,000,000	\$16,182,200	\$1,264,000	\$26,246,200	\$5,249,240
Demonstration	\$125,000	\$0	\$3,799,892	\$150,000	\$0	\$4,074,892	\$814,978
Intelligent Transportation Systems	\$0	\$0	\$0	\$0	\$10,000,000	\$10,000,000	\$2,000,000
Remote Sensing Demonstration	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Demonstration Total	\$125,000	\$0	\$3,799,892	\$150,000	\$10,000,000	\$14,074,892	\$2,814,978
Transportation Enhancement	\$0	\$0	\$0	\$161,600	\$0	\$161,600	\$32,320
Enhancement Total	\$0	\$0	\$0	\$161,600	\$0	\$161,600	\$32,320
National Highway System	\$3,039,842	\$33,405,669	\$2,588,083	\$2,761,458	\$35,284,160	\$77,079,212	\$15,415,842
Surface Transportation Program	\$46,764,410	\$71,762,037	\$31,155,767	\$28,573,071	\$44,884,794	\$223,140,079	\$44,628,016
State Project	\$50,000	\$250,000	\$4,000,000	\$2,434,300	\$200,000	\$6,934,300	\$1,386,860
Highway Total	\$49,854,252	\$105,417,706	\$37,743,850	\$33,768,829	\$80,368,954	\$307,153,591	\$61,430,718
Interstate Maintenance	\$60,087	\$7,647,153	\$16,400,000	\$14,611,200	\$125,000	\$38,843,440	\$7,768,688
Maintenance Paving	\$1,406,039	\$0	\$0	\$5,454,746	\$1,459,300	\$8,320,085	\$1,664,017
Maintenance Repair	\$30,668	\$40,323	\$371,846	\$333,428	\$155,617	\$931,882	\$186,376
Maintenance Total	\$1,496,794	\$7,687,476	\$16,771,846	\$20,399,374	\$1,739,917	\$48,095,407	\$9,619,081
GRPC Traffic Count Program	\$0	\$0	\$183,337	\$0	\$0	\$183,337	\$36,667
Other Total	\$0	\$0	\$183,337	\$0	\$0	\$183,337	\$36,667
Port Improvements (MPP)	\$772,500	\$2,831,778	\$1,070,000	\$559,325	\$800,000	\$6,033,603	\$1,206,721
Port Total	\$772,500	\$2,831,778	\$1,070,000	\$559,325	\$800,000	\$6,033,603	\$1,206,721
FRA (Railroad)	\$913,000	\$576,000	\$164,000	\$300,000	\$2,244,425	\$4,197,425	\$839,485
High-Speed Rail	\$0	\$1,791,000	\$528,196	\$226,135	\$0	\$2,545,331	\$509,066
Railroad Total	\$913,000	\$2,367,000	\$692,196	\$526,135	\$2,244,425	\$6,742,756	\$1,348,551
High Hazard STP	\$0	\$0	\$4,501,016	\$1,987,900	\$5,142,400	\$11,631,316	\$2,326,263
Safe Routes to Schools Program	\$0	\$0	\$0	\$151,371	\$0	\$151,371	\$30,274
Safety Total	\$0	\$0	\$4,501,016	\$2,139,271	\$5,142,400	\$11,782,687	\$2,356,537
FTA (Transit)	\$441,930	\$813,124	\$875,722	\$480,000	\$480,000	\$3,090,776	\$618,155
Transit Total	\$441,930	\$813,124	\$875,722	\$480,000	\$480,000	\$3,090,776	\$618,155
TOTAL	\$55,403,476	\$119,117,084	\$72,637,859	\$74,366,734	\$102,039,696	\$423,564,849	\$84,712,970

Source: Mississippi Department of Transportation.

Table 6.2:
FUNDING FOR TRANSPORTATION IMPROVEMENTS ON THE MISSISSIPPI GULF COAST BY NON-EMERGENCY SOURCE (2005-2009)

Amounts Converted to 2010 Dollars

SOURCE/PROGRAM	2005	2006	2007	2008	2009	TOTAL	ANNUAL AVG
Bridge Replacement	\$2,039,940	\$0	\$7,438,200	\$16,426,551	\$1,291,176	\$27,195,867	\$5,439,173
Bridge Total	\$2,039,940	\$0	\$7,438,200	\$16,426,551	\$1,291,176	\$27,195,867	\$5,439,173
Demonstration	\$141,663	\$0	\$4,037,765	\$152,265	\$0	\$4,331,693	\$866,339
Intelligent Transportation Systems	\$0	\$0	\$0	\$0	\$10,215,000	\$10,215,000	\$2,043,000
Remote Sensing Demonstration	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Demonstration Total	\$141,663	\$0	\$4,037,765	\$152,265	\$10,215,000	\$14,546,693	\$2,909,339
Transportation Enhancement	\$0	\$0	\$0	\$164,040	\$0	\$164,040	\$32,808
Enhancement Total	\$0	\$0	\$0	\$164,040	\$0	\$164,040	\$32,808
National Highway System	\$3,445,053	\$36,355,390	\$2,750,097	\$2,803,156	\$36,042,769	\$81,396,465	\$16,279,293
Surface Transportation Program	\$52,998,106	\$78,098,625	\$33,106,118	\$29,004,524	\$45,849,817	\$239,057,190	\$47,811,438
State Project	\$56,665	\$272,075	\$4,250,400	\$2,471,058	\$204,300	\$7,254,498	\$1,450,900
Highway Total	\$56,499,824	\$114,726,089	\$40,106,615	\$34,278,738	\$82,096,887	\$327,708,153	\$65,541,631
Interstate Maintenance	\$68,097	\$8,322,397	\$17,426,640	\$14,831,829	\$127,688	\$40,776,650	\$8,155,330
Maintenance Paving	\$1,593,464	\$0	\$0	\$5,537,113	\$1,490,675	\$8,621,252	\$1,724,250
Maintenance Repair	\$34,756	\$43,884	\$395,124	\$338,463	\$158,963	\$971,189	\$194,238
Maintenance Total	\$1,696,317	\$8,366,280	\$17,821,764	\$20,707,405	\$1,777,325	\$50,369,090	\$10,073,818
GRPC Traffic Count Program	\$0	\$0	\$194,814	\$0	\$0	\$194,814	\$38,963
Other Total	\$0	\$0	\$194,814	\$0	\$0	\$194,814	\$38,963
Port Improvements (MPP)	\$875,474	\$3,081,824	\$1,136,982	\$567,771	\$817,200	\$6,479,251	\$1,295,850
Port Total	\$875,474	\$3,081,824	\$1,136,982	\$567,771	\$817,200	\$6,479,251	\$1,295,850
FRA (Railroad)	\$1,034,703	\$626,861	\$174,266	\$304,530	\$2,292,680	\$4,433,040	\$886,608
High-Speed Rail	\$0	\$1,949,145	\$561,261	\$229,550	\$0	\$2,739,956	\$547,991
Railroad Total	\$1,034,703	\$2,576,006	\$735,527	\$534,080	\$2,292,680	\$7,172,996	\$1,434,599
High Hazard STP	\$0	\$0	\$4,782,780	\$2,017,917	\$5,252,962	\$12,053,658	\$2,410,732
Safe Routes to Schools Program	\$0	\$0	\$0	\$153,657	\$0	\$153,657	\$30,731
Safety Total	\$0	\$0	\$4,782,780	\$2,171,574	\$5,252,962	\$12,207,315	\$2,441,463
FTA (Transit)	\$500,839	\$884,923	\$930,542	\$487,248	\$490,320	\$3,293,872	\$658,774
Transit Total	\$500,839	\$884,923	\$930,542	\$487,248	\$490,320	\$3,293,872	\$658,774
TOTAL	\$62,789,762	\$129,636,126	\$77,185,992	\$75,490,676	\$104,234,554	\$449,332,092	\$89,866,418

Source: Mississippi Department of Transportation, Neel-Schaffer, Inc.

Table 6.3:
CONCEPTUAL ALTERNATIVES FOR MISSISSIPPI GULF COAST LONG-RANGE TRANSPORTATION PLAN:
PERCENTAGE DISTRIBUTION OF FUNDING BY TYPE OF IMPROVEMENT

CATEGORY	HISTORICAL	MULTIMODAL	SAFETY/OPS/MAINT	COMPOSITE
Bridge Replacement	6.05	6.05	7.50	6.78
ITS/Demonstration	3.24	3.24	5.00	4.12
Bicycle/Pedestrian	0.04	2.00	0.04	1.02
Highway Construction	72.93	68.74	63.25	66.00
Highway Maintenance	11.21	11.21	15.00	13.11
Traffic Counting	0.04	0.04	0.04	0.04
Marine Ports	1.44	2.00	1.44	1.72
Railroads/Crossings	1.60	2.00	2.00	2.00
Safety	2.72	2.72	5.00	3.86
Transit	0.73	2.00	0.73	1.37
TOTAL	100.00	100.00	100.00	100.00

Notes:

Historical represents relative distribution of non-emergency funding for transportation improvements from 2005 through 2009.

Multimodal assumes increased relative expenditure for alternative modes: Bicycle, pedestrian, transit, ports, railroads.

Safety/Ops/Maint assumes increased relative expenditure for safety, operations and maintenance of existing system.

Composite assumes increased relative expenditure for both alternative modes and safety, operations and maintenance.

Table 6.4:
CONCEPTUAL ALTERNATIVES FOR MISSISSIPPI GULF COAST LONG-RANGE TRANSPORTATION PLAN:
ANNUAL DISTRIBUTION OF FUNDING BY TYPE OF IMPROVEMENT (2010 DOLLARS)

CATEGORY	HISTORICAL	MULTIMODAL	SAFETY/OPS/MAINT	COMPOSITE
Bridge Replacement	\$5,436,918	\$5,436,918	\$6,739,981	\$6,088,450
ITS/Demonstration	\$2,911,672	\$2,911,672	\$4,493,321	\$3,702,496
Bicycle/Pedestrian	\$35,947	\$1,797,328	\$35,947	\$916,637
Highway Construction	\$65,539,579	\$61,774,176	\$56,840,509	\$59,307,343
Highway Maintenance	\$10,074,025	\$10,074,025	\$13,479,963	\$11,776,994
Traffic Counting	\$35,947	\$35,947	\$35,947	\$35,947
Marine Ports	\$1,294,076	\$1,797,328	\$1,294,076	\$1,545,702
Railroads/Crossings	\$1,437,863	\$1,797,328	\$1,797,328	\$1,797,328
Safety	\$2,444,367	\$2,444,367	\$4,493,321	\$3,468,844
Transit	\$656,025	\$1,797,328	\$656,025	\$1,226,677
TOTAL	\$89,866,418	\$89,866,418	\$89,866,418	\$89,866,418

Note: Historical represents average annual non-emergency funding for transportation improvements from 2005 through 2009.

- *Safety, Operations and Maintenance* – An alternative increasing support for safety-related improvements, operational enhancements and maintenance activities; and
- *Composite* – An alternative boosting the relative distribution of funds to both alternative modes and to safety, operations and maintenance categories.

As indicated in Table 6.3, all three alternatives would reduce the relative amount allocated to street and highway construction in order to benefit other categories. The Composite alternative would increase the percentage share of funding for all non-construction categories (except the GRPC traffic counting program) and for that reason was considered the alternative of choice. Under this scenario the percentage share allocated to street and highway construction would be reduced from the historical level of just under 73 percent to 66 percent. This corresponds to a decrease of approximately \$6 million per year in 2010 dollars (see Table 6.4). Instead of the \$65.5 million per year based on recent historical expenditures, \$59.3 million would be programmed for construction.

Assuming an inflation rate of one percent per annum, and adopting the distribution of funds proposed for the Composite alternative, results in the categorical amounts and plan stage totals shown in Table 6-5. Overall, the plan assumes that roughly \$2.56 billion will be available for transportation improvements in the area over the next 25 years; it proposes that a little less than \$1.69 billion of that total be used for street and highway construction. The remaining \$877 million would be divided among the eight other categories identified in the table. The source of these funds is not addressed by this analysis. The assumption is made that federal programs will be reauthorized at some point or replaced by new programs that cover all of the indicated categories. If the practice of earmarking appropriations for specific projects is discontinued, it is likely that the new legislation will allow greater flexibility in the use of funds made available to the states through the Federal Highway Administration. Neither has any attempt been made to determine the distribution of transportation funds among the implementing agencies. The MPO Transportation Policy Committee (TPC) includes representatives of three counties, 11 municipalities, the Mississippi Coast Transportation Authority (CTA) and Mississippi Department of Transportation (MDOT). It is assumed that all agencies represented on the TPC will participate in implementing the plan.

Table 6-5:
2011-2035 PROJECTED DISTRIBUTION OF FUNDING BY TYPE OF IMPROVEMENT AND PLAN STAGE

CATEGORY	STAGE 1 2011-2015	STAGE 2 2016-2025	STAGE 3 2026-2035	TOTAL 2011-2035
Bridge Replacement	\$31,715,030	\$68,365,939	\$75,518,529	\$175,599,498
ITS/Demonstration	\$19,260,515	\$41,518,585	\$45,862,348	\$106,641,447
Bicycle/Pedestrian	\$4,722,530	\$10,180,038	\$11,245,095	\$26,147,663
Highway Construction	\$304,603,186	\$656,612,429	\$725,308,617	\$1,686,524,231
Highway Maintenance	\$60,999,346	\$131,492,153	\$145,249,142	\$337,740,641
Traffic Counting	\$185,197	\$399,217	\$440,984	\$1,025,399
Marine Ports	\$7,917,183	\$17,066,534	\$18,852,071	\$43,835,787
Railroads/Crossings	\$9,259,863	\$19,960,858	\$22,049,206	\$51,269,926
Safety	\$18,010,433	\$38,823,869	\$42,885,705	\$99,720,007
Transit	\$6,319,856	\$13,623,286	\$15,048,583	\$34,991,725
TOTAL	\$462,993,139	\$998,042,907	\$1,102,460,278	\$2,563,496,324

Note: Amounts shown assume an inflation rate of one percent per annum.

6.2 PROJECT EVALUATION

The funding analysis described in the preceding section established the limits necessary to develop a fiscally constrained long-range transportation plan. The needs identification process outlined in the preceding chapter helped in determining what type of improvement would be appropriate in addressing each need: Adding turn or travel lanes, roadway reconstruction, channelization, intersection improvement, access management or other. A project evaluation and prioritization process was necessary to determine which improvements could actually be accommodated within the limits of the fiscally constrained Staged Improvement Program for streets and highways. The process adopted involved rating each project on the degree of deficiency to be mitigated and the extent to which the proposed improvement would address the goals and objectives adopted by the metropolitan planning organization (MPO). The following are some of the questions posed in addressing areas of principal concern for the analysis:

Existing Congestion

Did the *Congestion Management Plan* (CMP) identify a route proposed for improvement as having a traffic flow deficiency? If so, what is the operational level of service (LOS) for the section to be improved? (Points were awarded based on the severity of existing congestion.)

Projected Congestion

Did an assignment generated by the regional travel demand model indicate a route proposed for improvement was likely to experience a traffic flow deficiency in the future? If so, what was the projected volume/capacity for the section to be improved? (Points were awarded based on the severity of the projected congestion.)

Transit

Would a proposed improvement enhance the operational efficiency and attractiveness of the Mississippi Gulf Coast public transit system? Would a proposed project reduce congestion on a roadway that serves as a transit route or enhance access to transit via roadways connecting to a transit route?

Goods Movement

Will a proposed improvement enhance the movement of goods to and from commercial and industrial sites and other places of employment?

Safety

Is a proposed improvement located on a route or in an area having a high incidence of vehicular collisions and/or accidents involving injury or fatality?

Air Quality

Is a proposed improvement likely to reduce mobile-source emissions in an area by lessening the amount of vehicle idling associated with traffic congestion and vehicular delay?

Environmental Justice

Would a proposed improvement enhance the delivery of transportation benefits to disadvantaged people? Alternatively, would it serve to withhold, reduce or delay the delivery of such benefits to individuals and groups historically deprived of an equitable share in the distribution of transportation benefits?

Transportation System Management (TSM) Measures

Would a proposed improvement enhance the efficiency of the existing system without requiring costly investment in new capital? (TSM measures such as improving intersection geometry and signalization, implementing access management or intelligent transportation system (ITS) strategies, or upgrading transit or other high-occupancy vehicle services were given extra points in the evaluation.)

In general, the approach adopted was to give extra credit to proposed improvements that would enhance the operational effectiveness of the existing street and highway system and encourage the preservation, maintenance and use of currently available facilities. Where the CMP indicated a deficiency of roadway capacity relative to demand, every effort was made to consider potential solutions other than building a new road or widening an existing one. This meant estimating how particular TSM measures might improve the performance of a given route by calculating the likely change in the volume-to-capacity ratio.

6.3 ENVIRONMENTAL OVERVIEW

This section addresses the impact of the key climate drivers that affect the integrity of the transportation system in the Mississippi Gulf Coast area and the damaging impact of mobile-source pollution on air quality in the region. Most of the information on climate impacts is taken from the report to the U.S. Congress, *Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study, Phase 1, US DOT, 2007* (ICC). The ICC report was prepared by a team of scientists, academicians and transportation practitioners, under the direction of the U. S. Department of Transportation (USDOT) and guided by a Federal Advisory Committee. Congress commissioned the study, seeking information to better understand the potential impact of climate change on the transportation system. Specifically, the members of Congress sought answers to the following questions:

1. How important are the anticipated changes in climate?
2. Can we anticipate them with confidence?
3. What information is useful to transportation decisions?
4. How can decision-makers address uncertainty?

The second issue addressed in this section is air quality. The Mississippi Gulf Coast has been recommended by the Governor of Mississippi to be designated as nonattainment for ozone under the 2008 National Ambient Air Quality Standards (NAAQS). The United States Environmental Protection Agency (USEPA) has not formalized the designation because further study of the NAAQS has stalled the process. The State of Mississippi awaits the final ruling which will almost certainly impose even more stringent standards than did the 2008 NAAQS.

While the EPA ruling is still under review, the Mississippi Gulf Coast continues to be designated an attainment area for ozone. However, if the USEPA's final ruling on the NAAQS lowers the 2008 standard from .075 parts per million (ppm) to somewhere in the proposed range of .070 to .060 ppm, it is most likely that Harrison and Jackson counties will be designated as nonattainment for ozone under the Clean Air Act (see Table 6-6). If the 2008 NAAQS stand, only Harrison County will be designated nonattainment. The ozone levels have been declining, but there remains an uncertainty about the long-

Table 6-6: RECENT DECLINES IN OZONE LEVELS FOR HARRISON AND JACKSON COUNTIES

COUNTY	AIRS ID	SITE	3-YEAR AVERAGE 2006-2008	3-YEAR AVERAGE 2008-2010
Harrison	28-047-0008	Gulfport	81	77
Jackson	28-059-0006	Pascagoula	78	74

Mississippi Department of Environmental Quality (MDEQ), Air Division, 2010.

term impacts of growth, development and climate conditions. Indeed, if the temperatures are rising consistent with the ICC report on climate change, the situation could worsen. Suffice it to say that there is an imminent need to study and propose measures that will effectively reduce mobile-source emissions and ozone.

6.3.1 Climate Change and Transportation Planning

The ICC study describes the central Gulf Coast as one of the warmest, wettest regions of the United States and one with very little topographic relief. Changes in precipitation and runoff have a dramatic impact on the fragile ecosystems and coastal communities by changing the hydro-climatology of the region. For transportation, changes in runoff are important to virtually all modes, as the flooding from locally intense rainfall and runoff can force the closure of state and local highways and affect port activities. Changes in temperature and the moisture regime also are relevant to many aspects of transportation planning, construction and maintenance; for example, airport runway length requirements are determined by the mean maximum temperature for the hottest month of the year. According to the ICC study, as the climate and sea surface warm, an increase in the intensity of hurricanes making landfall along the Gulf Coast can be expected; and as the oceans warm and ice sheets melt, sea level rise is likely to accelerate. Sea level rise has the greatest impact in areas of subsidence.

The ICC study identified key climate drivers within the Gulf Coast that warrant continued monitoring, assessment and investigation of the vulnerabilities that may threaten facilities and the public in both the near term and long term. These include the following climate drivers:

- Sea level rise;
- Hurricanes and less intense tropical storms;
- Temperature; and
- Precipitation.

Relative Sea Level Rise – The land within the Gulf Coast that is experiencing subsidence is facing much higher increases in relative sea level rise (the combination of local land surface movement and change in mean sea level) than most other parts of the U. S. coast. The analysis of even a middle range of potential sea level rise of 0.3m to 0.9m (2 to 4 feet) indicates that a vast portion of the Gulf Coast from Houston to Mobile may be inundated in the future. On the Mississippi Gulf Coast these conditions threaten the Hancock County coastline and some areas in Jackson County.

Storm Activity – The region is vulnerable today to transportation infrastructure damage during hurricanes and, given the potential for increases in the number of hurricanes designated as Category 3 and above, this vulnerability will likely increase.

Average and Extreme Temperature Increase – Based on ICC model runs under three different climate change emission scenarios, the average temperature in the Gulf Coast region appears likely to increase by at least $1.5^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ($2.7^{\circ}\text{F} \pm 1.8^{\circ}\text{F}$) during the next 50 years, with the greatest increase in temperature occurring in the summer. The number of days above 32.2°C (90°F) could increase by as much as 50 percent during the next 50 years.

Precipitation Change and Extreme Rainfall Events – Future changes in precipitation are much more difficult to model than temperature. At this stage, climate modeling capacity is insufficient to quantify effects of individual precipitation events, but the potential for temporary flooding in this region is clear. In an area where flooding already is a concern, this tendency could be exacerbated by extreme rainfall events. This impact will become increasingly important as relative sea level rises, putting more of the study area at risk.

Impact of Climate Change on Transportation Facilities and Services

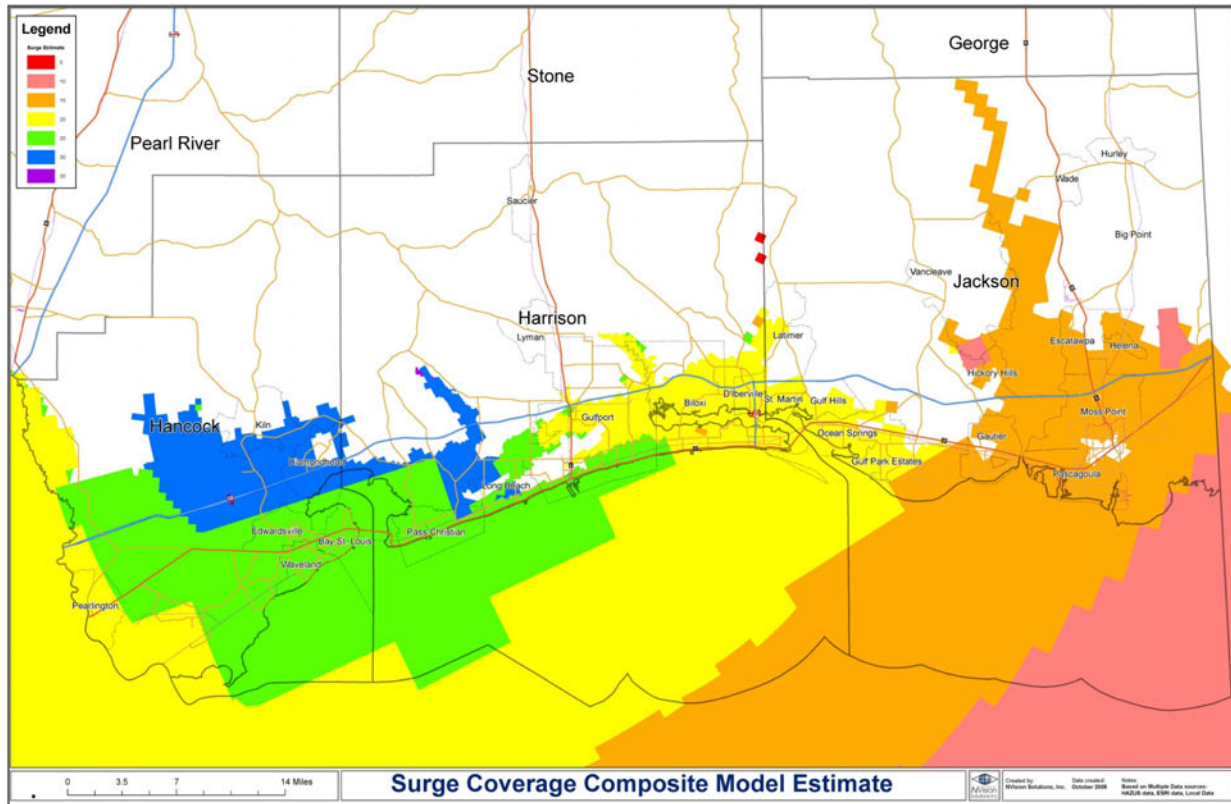
Based on the trends in climate and coastal change, transportation infrastructure and the services that require them are vulnerable to future climate changes as well as other natural phenomena. While more study is needed to specify how vulnerable they are and what steps could be taken to reduce that vulnerability, it is clear from the ICC study that transportation planners in this region should not ignore these potential impacts.

Inundation from Relative Sea Level Rise – While greater or lesser rises in relative sea level are possible, the ICC study analyzed the effects of relative sea level rise of 0.6 m and 1.2 m (2 and 4 feet) as realistic scenarios. Based on these levels, an untenable portion of the (Houston to Mobile) region's road, rail, and port network is at risk of permanent flooding. Furthermore, the crucial connectivity of the intermodal system in the area means that the services of the network can be threatened even if small segments are inundated. The vulnerability and risk of the Mississippi Gulf Coast facilities need to be studied to determine the extent of involvement in long-term sea-level rise.

Flooding and Damage from Storm Activity – As the central Gulf Coast already is vulnerable to hurricanes, so is its transportation infrastructure. The ICC study examined the potential for short-term flooding associated with a 5.5m or 7.0m (18 or 23-foot) storm surge. Based on these relatively common levels, a great deal of the study area's infrastructure is subject to temporary flooding. The nature and extent of the flooding depends on where a hurricane makes landfall and its specific characteristics. Hurricanes Katrina and Rita demonstrated that this temporary flooding can extend for miles inland (see Figure 6-1). The two photographs in Figure 6-2 were taken the day of Hurricane Katrina (August 29, 2005), shortly after the floodwaters had receded in Hancock County, Ground Zero for storm impacts. The photograph on the left in the figure was taken from Interstate 10 at Mississippi Highway 43 (MS 43), observing the complete inundation of one of the two highways connecting the cities of Bay St. Louis and Waveland to the interstate. The photograph on the right captures the destruction of the CSX rail line at the Bay St. Louis railroad bridge, which was completely destroyed.

Effects of Temperature Increase – As the average temperature in the central Gulf Coast is expected to rise by 0.5°C to 2.5°C (0.9°F to 4.5°F), the daily high temperatures, particularly in summer, and the number of days above 32.2°C (90°F) also will likely increase. These combined effects will raise costs related to the construction, maintenance and operation of transportation infrastructure and vehicles.

Figure 6-1:
HURRICANE KATRINA SURGE IMPACT (AUGUST 29, 2005)



Source: National Oceanic and Atmospheric Administration (2005)

Maintenance costs will increase for some types of infrastructure because they deteriorate more quickly at temperatures above 32 °C (90°F). Increase in daily high temperatures could increase the potential for rail buckling in certain types of track. Construction costs could increase because of restrictions on days above 32°C (90°F), since it might not be possible to deploy work crews during extreme heat events and concrete strength is affected by the temperature at which it sets. Increases in daily high temperatures would affect aircraft performance and runway length because runways need to be longer when daily temperatures are higher (all other things being equal). While potentially costly and burdensome, these impacts may be addressed by transportation agencies by absorbing the increased costs and increasing the level of maintenance for affected facilities.

Effects of Increased Extreme Precipitation Events – Of more concern is the potential for short-term flooding due to heavier downpours. Even if average precipitation declines, the intensity of those storms can lead to temporary flooding as culverts and other drainage systems are overloaded. Furthermore, the Louisiana Department of Transportation and Development (LaDOTD) reports that prolonged flooding of one to five weeks can damage the pavement substructure and necessitate rehabilitation (Gaspard *et al.*, 2007). The central Gulf Coast already is prone to temporary flooding, and transportation managers struggle with the disruptions these events cause. As the climate changes, flooding will probably become more frequent and more disruptive; as the intensity of these downpours will likely increase. As relative sea level rises, it appears likely that even more infrastructure will be at risk because overall water levels already will be so much higher. While these impacts cannot be quantified at present, transportation managers can monitor where flooding occurs and how the sea is rising as an early warning system for

Figure 6-2:
PHOTOGRAPHS OF DAMAGE FROM HURRICANE KATRINA (AUGUST 29, 2005)



Photos by County and Federal emergency responders

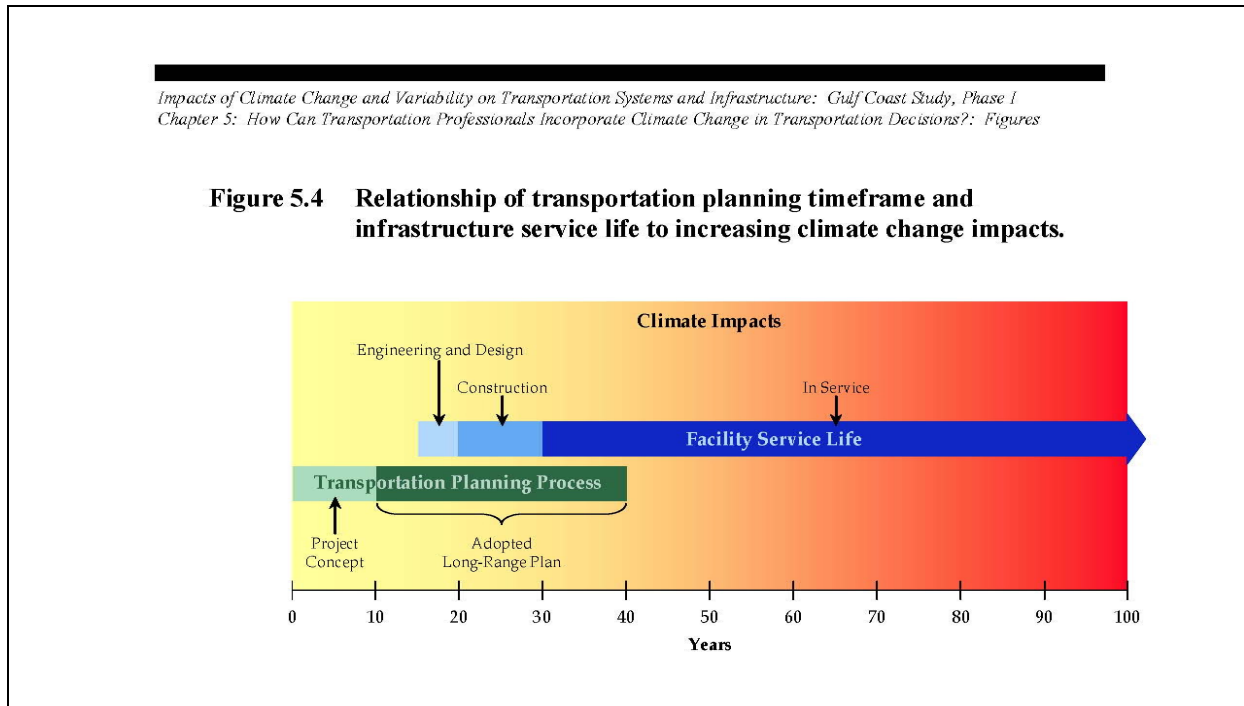
facilities at immediate risk that warrant high-priority attention. In a transportation system that already is under stress due to congestion, and with people and freight haulers increasingly dependent on just-in-time delivery, the economic, safety, and social ramifications of even temporary flooding may be significant.

Implications for Transportation Planning

As noted in the ICC study, the transportation network provides crucial service to millions of people and transports enormous quantities of freight. It is a network under increasing strain to meet transportation demand as the American public's desire for travel and low-cost goods and services continues to grow. Even minor disruption to this system causes ripple effects that erode the resources of transportation agencies as well as the goodwill and trust of the public. Good stewardship requires that the transportation network be as robust and resilient as possible within the constraints of available resources. The ICC study raises clear cause for concern regarding the vulnerability of transportation infrastructure and services in the central Gulf Coast due to climate and coastal changes. These changes threaten to cause both major and minor disruptions to the smooth provision of transport service through the study area. Transportation agencies – bearing the responsibility to be effective stewards of the network and future investment in it – need to consider these impacts carefully.

Steps can be taken to address the potential impacts to varying degrees. The ICC study demonstrates that there is benefit to examining the long-term impacts of climate change on transportation. Climate data and modeling scenarios may be productively employed to improve planning for transportation infrastructure and services, even if there is not as much information or specificity as transportation planners might prefer. State and local planners need to examine these potentialities in greater detail within the context of smaller study areas and specific facilities. But to effectively consider them, changes are likely necessary in the timeframes adopted and approaches taken.

Figure 6-3:
PLANNING TIMEFRAMES



Source: National Oceanic and Atmospheric Administration (2005)

Planning Timeframes – Current practice limits the ability of transportation planners to examine potential conditions far enough into the future to adequately plan for impacts on transportation systems resulting from the natural environment and climate change. In some cases, insufficient attention is paid to longer-term impacts (see Figure 6-3). The longevity of transportation infrastructure argues for a long timeframe to examine potential impacts from climate change and other elements of the natural environment.

Connectivity – In addition to analysis at the level of particular facilities – such as an airport, bridge, or a length of rail line – it would be useful for planners to examine the connectivity of the intermodal system for vulnerability (assessed at the local, regional, national and international levels) to long-term changes in the natural environment, including changes induced by climate. This would help to identify critical links in the system and ways to buttress them against exposure to climate factors or other variables, or to create redundancies to maintain critical mobility for directly and indirectly affected populations alike.

Planning Comprehensively - Transportation plans, programs and projects historically have been developed to meet the needs of planned or projected future land uses and anticipated patterns of population and employment location. In recent years, however, transportation and land use have been addressed in a much more interactive or coordinated manner. Rather than land use being viewed as driving transportation decisions, transportation investment and management decisions are increasingly being made collaboratively and in concert with growth management and economic development decisions. In this view, the manner in which transportation infrastructure is developed and managed is seen as one tool for helping to achieve desirable growth objectives.

Planning Vision – The long-range transportation plan addresses the uncertainty that exists on the

Mississippi Gulf Coast with regard to future development within the area devastated by the tidal surge associated with Hurricane Katrina and the need to inventory facilities that are highly vulnerable to the impacts of climate change. Among the goals and objectives adopted for the long-range plan, objectives 3 and 4 under “Goal 3: Enhance Public Safety and Security” state the following:

3.3. Facilitate the safe and expeditious evacuation of the public from the area in the event of an impending hurricane or other catastrophe.

3.4. Monitor the existing transportation network and encourage the design of future transportation facilities in a manner that protects them from susceptibility to climate variability.

Planning Collaboratively - Existing institutional arrangements may not be sufficient for transportation agencies to address fully and respond to issues of climate change. Increased collaboration may be necessary for transportation planning and investment decision-makers to respond effectively to climate-change issues, including partnering with climate-change specialists. GRPC currently is consulting with agencies concerned with natural resources, conservation and historical preservation to achieve greater collaboration in the planning process. Collaborating on climate change might be a natural extension of that consultation process.

Planning Data and Studies – Transportation planners have proposed several “next steps of study” that may provide stronger data and a more comprehensive understanding of potential system disruption due to climate change as it impacts the economic and social stability of the coast. Such studies would include the following:

- The exposures and vulnerabilities of the transportation system on the Gulf Coast;
- The need for a system of benchmarks for monitoring risk as determined by the exposure assessment;
- Potential impacts on people living within the area and the probable extent of harm from immediate and long-term impacts of climate change; and
- Possible adaptations and resilience measures that may be implemented to preserve coastal communities.

6.3.2 Air Quality and Transportation Planning

Ozone (O₃) is a gas composed of three oxygen atoms. It is not usually emitted directly into the air but at ground-level is created by a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Ozone has the same chemical structure whether it occurs miles above the earth or at ground-level and can be "good" or "bad," depending on its location in the atmosphere. "Good" ozone occurs naturally in the stratosphere approximately 10 to 30 miles above the earth's surface and forms a layer that protects life on earth from the sun's harmful rays.

In the earth's lower atmosphere, ground-level ozone is considered "bad." Motor-vehicle exhaust and industrial emissions, gasoline vapors and chemical solvents, as well as natural sources, emit NO_x and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form in harmful concentrations in the air. As a result, it is known as a summertime air pollutant. Many urban areas tend to have high levels of "bad" ozone, but even

rural areas are also subject to increased ozone levels; because wind carries ozone and pollutants that form it hundreds of miles away from their original sources.

Why is the Mississippi Gulf Coast registering high levels of ozone? It may seem reasonable that the coastal breezes would blow harmful pollutants out of the area. In fact, the coastal topography and meteorological conditions, considered so beautiful and temperate, are factors in the creation of ozone. According to the Mississippi Department of Environmental Quality (MDEQ), the diurnal land-sea breeze recirculation caused by the proximity of the Gulf of Mexico, and by weather conditions associated with light steering winds, results in higher ozone concentrations along the coastline. (See *Technical Support for the 2008 Ozone Standard Designation Recommendation for the State of Mississippi*, Mississippi Department of Environmental Quality, Air Division, March 2009).

There are several factors that contribute to the problem of reducing pollution from mobile sources. One is the strongly guarded right held by most every American, that mobility is independence; consequently, vehicle ownership is high in this country. The second factor is the national economy that relies on an intermodal transportation system, particularly heavy trucks. The nation's highways are increasingly congested with trucks and cars. The third factor contributing to mobile source pollution is the land development practice that has shaped the landscape, with developers building subdivisions further and further away from the central city, creating longer commutes for people and goods.

Impact of Poor Air Quality

Scientists have been studying the effects of ozone on human health for many years. So far, they have found that ozone primarily affects the respiratory system. Roughly one of every three people in the U. S. is at risk of experiencing ozone-related health effects:

- Ozone can irritate an individual's respiratory system and reduce lung function;
- Ozone may make it more difficult for an individual to breathe as deeply and vigorously as one normally would; and
- Ozone can inflame and damage the lining of the lung, exacerbating asthma symptoms.

As reported in *The Burden of Asthma in Mississippi: 2009 Asthma Surveillance Summary Report* (Mississippi Department of Health, 2010), approximately 76,710 Mississippi children (or 10.4 percent of all persons less than 18 years of age) and 144,009 Mississippi adults (6.6 percent of all persons 18 or older) currently have asthma. Who's at risk from ground-level ozone? Four groups of people are particularly sensitive to ozone. The individuals in these groups become sensitive to ozone when they are active outdoors, because physical activity (such as jogging or outdoor work) causes people to breathe faster and more deeply. During activity, ozone penetrates deeper into the parts of the lungs that are more vulnerable to injury. Sensitive groups include the following:

1. Children - Active children are the group at highest risk from ozone exposure. Many children spend a large part of their summer vacations outdoors, engaging in vigorous activities either in their neighborhoods or at summer camps. Children's lungs are still developing, and ozone can harm that development process.
2. Adults who are active outdoors - Healthy adults of all ages who exercise or work vigorously outdoors are considered a "sensitive group" because they have a higher level of exposure to ozone than people who are less active outdoors.

3. People with respiratory diseases such as asthma - Asthma and other chronic respiratory diseases make the lungs more vulnerable to ozone's effects. People with these conditions will generally experience the effects of ozone pollution earlier and at lower levels than less-sensitive individuals.

Impact of Nonattainment on Transportation Planning

If Mississippi Gulf Coast counties are designated nonattainment areas, MDEQ will work closely with the appropriate federal agencies, other state agencies, local public agencies and the private sector to develop a State Implementation Plan (SIP) designed to bring the region into compliance with the *Clean Air Act* by attaining, and maintaining, emission levels consistent with the NAAQS. The SIP will have to be approved by the USEPA and will contain provisions for enforcement if specific measures are not taken to bring the region into compliance.

Transportation Planning for Attainment

GRPC has worked closely with MDEQ to take the lead in planning for air quality attainment and has become an advocate for sustainable planning and land development policies that reduce vehicle miles traveled and create healthy communities and safe travel corridors for all modes.

In establishing Harrison and Jackson as counties to be recommended for nonattainment status under the *Clean Air Act*, MDEQ considered a number of factors in their technical review:

1. Air quality analysis;
2. Location of emission sources and contribution to ozone concentration;
3. *Population density and urbanization*;
4. *Traffic and commuting*;
5. *Growth rates and patterns*;
6. Meteorology (weather and transport);
7. Geography and topography;
8. Jurisdictional boundaries;
9. Level of control of emissions.

Transportation professionals and local officials can influence *Factors 3, 4 and 5*. The long-range transportation plan and local comprehensive plans establish visions, goals and objectives, and land use polices for the growth and development of Mississippi Gulf Coast communities. The factors that the MDEQ analysis considers negative in assessing an area for attainment/nonattainment status can in fact promote and support air quality goals:

Traffic and commuting – Traffic operations studies and improvements serve to reduce congestion at key intersections, and the adoption of sustainable land development policies can reduce vehicle miles traveled.

Growth rates and patterns – Growth within a strong economy brings opportunity for greater education and advocacy of environmental protection. Planned development and growth that is consistent with

sustainable practices can have less impact on the environment and enhance land preservation and conservation practices.

Population density and urbanization – A sustainable urban form has increased densities to reduce the need to travel by car; and schools, parks, shopping and employment are located close to homes to encourage walking, transit and biking. Denser developments are shown to be hardened against storm-related impacts.

The goals and objectives of the long range transportation plan attest to a vision of a sustainable regional transportation system, in particular the following goals:

Goal 1 - Enhance Transportation System Mobility, Accessibility and Quality for All Roadway Users and Modes;

Goal 2 - Enhance Public Safety and Security;

Goal 3 - Preserve and Protect Environmental Quality; and

Goal 4 - Support Regional Sustainability and Local Values.

GRPC and the MPO staff have been actively engaged in promoting environmental awareness and sustainable planning in several capacities:

The Gulf Coast Ozone Action Group - The OAG has been meeting since February 2009. The members include representatives of state agencies, nonprofit organizations, private industry and local public agencies. It was organized by the MDEQ and is chaired by the GRPC. This is the precursor to the formal organization that will be formed once the region is designated nonattainment. This group meets to stay aware of regulations, exchange ideas for voluntary action plans, undertake educational initiatives and support Ozone Action Day activities.

The Inter-Agency Consultation Group – The IAC is comprised of federal and state agencies and MPO staff. Members converse routinely on matters pertaining to regulations and planning activities in order to increase the skills and knowledge of planners and regulators who will be involved in developing and implementing the SIP.

The Transportation Air Quality Group – The TAQ was established by the MPO to keep Transportation Policy Committee and Technical Coordinating Committee members informed regarding the status of federal regulations and the implications for transportation planning and project development.

GRPC/MPO Work Program and Special Projects – The transportation planning work that is support by the annual work program for the MPO includes tasks specific to air quality, such as the following:

- Stage 0 planning for proposed transportation improvements can include an assessment of traffic and emission impacts.
- Enhanced collaboration with resource agencies to share plans, priorities and data will create consistency of study timelines and baseline data used for forecasting.
- An education campaign to support improved air quality is under development and will involve students in promoting civic participation and individual responsibility for taking measures to reduce the pollution that causes ozone (see Table 6-7). GRPC will be developing a website and lesson plans for continuing education about air quality.

Table 6.7: POTENTIAL MEASURES TO REDUCE PRECURSORS TO THE CREATION OF OZONE

<i>LAND USE/TRANSPORTATION POLICIES</i>
<ol style="list-style-type: none"> 1. Increase infill development. 2. Develop strategies to promote more compact development patterns. 3. Encourage increased public transit opportunities as part of review of housing development. 4. In addition to reviewing transportation projects for carbon monoxide impacts, review for effects on ozone and fine particles. 5. State, regional and local transportation and air quality officials should continue to consider the air quality impacts of proposed transportation policies. 6. Develop strategies to reduce vehicle miles traveled (VMT) from all sectors of mobile source trips.
<i>MOBILE SOURCE STRATEGIES</i>
<ol style="list-style-type: none"> 1. Encourage local businesses to upgrade fleet vehicles to hybrid vehicles or other vehicles using cleaner fuel. 2. Idling restrictions, especially diesel engine idling. 3. Increase number of truck docking facilities for powering electric compressors to replace use of diesel engines. 4. Diesel retrofit. 5. Speed limit enforcement. 6. Improved mass transit; increase ridership. 7. Increased outreach on preferential mobility choices - more fuel efficient vehicles, vehicle maintenance, biking. 8. Improve TRIMARC, incident management, roadside assistance. 9. Traffic light signalization improvements. 10. Free tire pressure station, free air, free on-board diagnostics checks, gas caps.
<i>AREA SOURCES</i>
<ol style="list-style-type: none"> 1. Railroads/railyards - cleaner switch engines; idling restrictions. 2. Airport measures—ground support equipment, gate electrification, single engine taxi.
<i>NON-ROAD SOURCES</i>
<ol style="list-style-type: none"> 1. Diesel retrofit (construction equipment).
<i>OTHER STRATEGIES</i>
<ol style="list-style-type: none"> 1. Develop a “green star” program to recognize voluntary efforts by companies, agencies, organizations, and citizens to reduce ozone precursor emissions. 2. Increase opportunities for public outreach and education activities. Such activities should be undertaken by businesses and private organizations as well as by government agencies, and include information on available technologies and opportunities, such as building weatherization and energy audits. 3. Public outreach and education activities should be developed to target specific sectors (large businesses, small businesses, organizations, and citizens), addressing the role that each sector could play in implementing changes. 4. Government-provided incentives for business-, organization-, and citizen implemented actions to reduce ozone precursor emissions, including tax credits and low-cost loans.

Planning is underway to create a regional sustainability plan, with the MPO staff fully engaged in measures to reduce vehicle miles traveled and to promote alternative transportation.

Long-Range Transportation Plan – The long-range plan has statements of goals and objectives that support the concept of environmental planning within the context of regional transportation planning and project development. Additional work undertaken to advocate policies and actions supporting environmental soundness include the following:

- *MOVES* modeling - The *MOVES* mobile-source emissions model was developed by the USEPA for mandated use in nonattainment areas. *MOVES* must be used by MPOs in nonattainment areas to evaluate the impact of the long-range regional transportation plan on emissions for the purpose of demonstrating *transportation-air quality conformity* in support of the SIP. It must also be used to evaluate the air quality impacts of transportation improvements to be undertaken with federal funding as well as the effects of other large-scale transportation improvements. GRPC will use *MOVES* in conjunction with the Long-Range Transportation Plan to establish a baseline emissions inventory for the region and to prepare for ongoing emissions testing through training and scenario planning.
- The Transportation Policy Committee should consider endorsing measures to accomplish the following: 1) A regional reduction in vehicle miles traveled and 2) A regional reduction in mobile-source emissions of greenhouse gases.

6.4 ENVIRONMENTAL JUSTICE

Gulf Regional Planning Commission has adopted the following “Policy Statement Regarding Traditionally Underserved Populations”:

Gulf Regional Planning Commission assures that no person shall on the grounds of race, color, national origin, or sex, as provided by the Federal-Aid Highway Act of 1973, Title VI of the Civil Rights Act of 1964, and the Civil Rights Restoration Act of 1987 (P.L. 100.259) be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity. In addition to the previously mentioned laws, the MPO’s policy addresses two Executive Orders issued by President Clinton regarding fairness and inclusiveness. Executive Order 12898 mandates that federal agencies address equity and fairness, or Environmental Justice, toward low-income and minority persons and populations. Executive Order 13166 mandates that federal agencies ensure that people who have Limited English Proficiency have meaningful access to federally conducted and/or funded programs and activities. Not only is intentional discrimination prohibited, but neutral actions that have the same effect as discrimination are also prohibited. In the event GRPC distributes federal aid funds to a sub-recipient, all written agreements will include Title VI language in and will be monitored for compliance.

MPO’s Commitment to Traditionally Underserved Populations

The MPO’s goal for its participation and consultation activities is to ensure that the transportation plans for the region reflect the needs of the population and provide benefit to all communities within the planning area as equitably as possible. To attain this goal, the MPO has developed a proactive public

participation and consultation process to provide complete and understandable information, timely public notice and full public access to key decisions, to support early and continuing involvement of the public and to consult with the resource agencies in developing the MPO documents and plans that meet the requirements of 23 C.F.R. 450.316, including but not limited to various state and federal resource agencies, local agencies, and Native American Indian tribes.

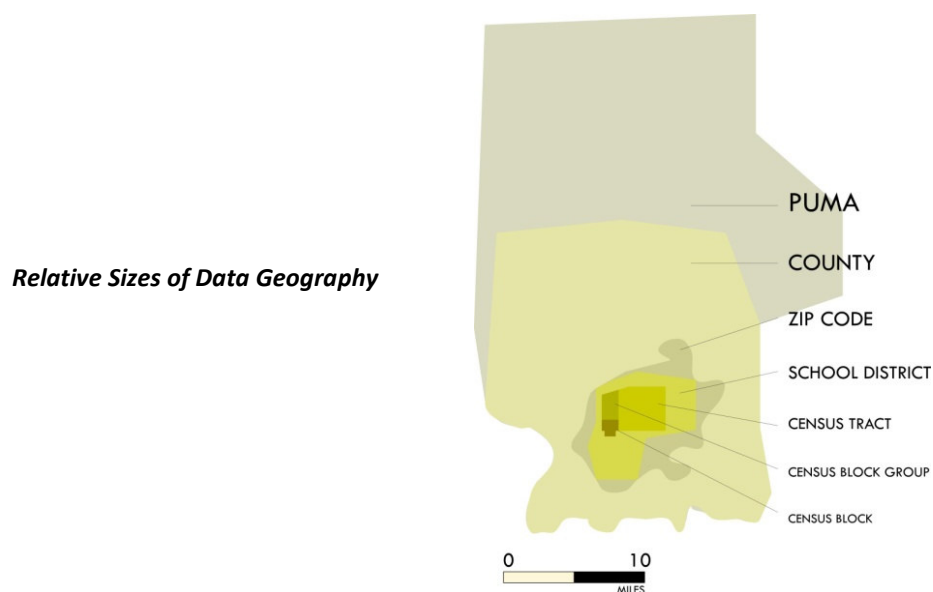
Needs of Traditionally Underserved Populations

In order to provide for realistic opportunities for the traditionally underserved people in our region, the MPO will do the following:

- Provide options at public meetings for those who are unable to hear the proceedings, as long as there is sufficient advanced request for translation or auditory enhancement;
- Create opportunities that can accommodate those persons with difficult schedules or mobility limitations that would prevent them from gaining access to public meeting locations;
- Provide a variety of outreach channels in print, event, digital, and other forms – the more critical and widespread the impact to the public, the more variety should be included in the MPO outreach efforts; and
- Recognize that not every project, service, or proposed change is important to everyone, and that acting in a fiscally responsible manner means that we need to understand the needs of our constituents to produce products and outreach tailored to our monetary, time, and personnel resources. This also means that the MPO staff need to listen and review our public practices to ensure that we are really reaching our citizens in a way that most benefits them: No public engagement technique can be said to be cost-effective if it doesn't reach and engage its audience productively.

Identifying Traditionally Underserved Populations on the Mississippi Gulf Coast

In order to spatially locate traditionally underserved population several data sources were used. The geographic level at which they are applicable is shown in the following figure:



The age of the 2000 Census data is felt particularly acutely in a post-Katrina era where many Mississippi Gulf Coast populations have been dispossessed or relocated to other areas. For that reason the MPO elected to provide a variety of indicators to identify the spatial locations of traditionally underserved populations that represented the latest available data as of the writing of the non-discrimination plan. The *American Community Survey (ACS)*, *Public Use Microdata Sample (PUMS)*, and other data sources listed in Table 6-8 were used to supplement the Census data. The MPO refers to these statistics as *alternative indicators*. Using the Census data and alternative indicators, maps of *Low-Income*, *Senior*, *Mobility-Disabled*, *Minority and Non-White*, and *Linguistically Isolated* populations were produced. From these a composite map depicting concentrations of traditionally underserved populations was prepared (see Figure 6-4).

MPO's Participation Goals for Traditionally Underserved Populations

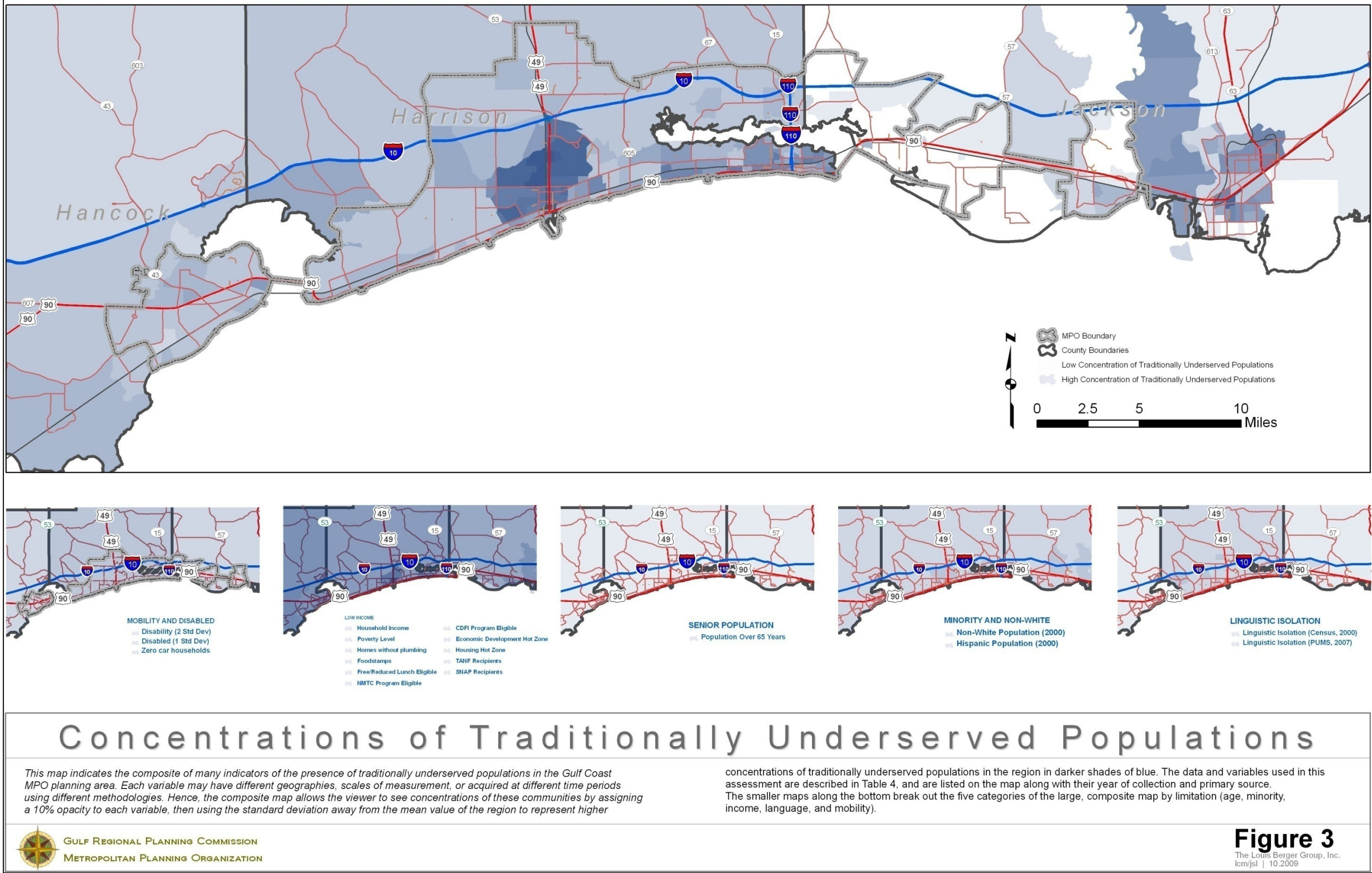
In order to ensure that the MPO is progressing towards its goal of engaging Title VI populations, Table 6-9 lists performance indicators that will be reported annually and during the every-four-year federal certification review process.

**Table 6-8:
ALTERNATIVE INDICATORS OF WELL-BEING**

ALTERNATIVE INDICATORS	UNIT	YEAR	GEOGRAPHY			
			County	Tract	BG	Other
Income Indicators						
Community Development Financial Institution (CDFI) Fund	Eligible Persons	2009		X		
BEA Distressed Communities	Eligible Persons	2009		X		
Food Stamps	Dollar Value Expended	2007	X			PUMA
Free and Reduced Lunch Eligible	Number of Eligible Children 5 to 17	2007				School District
New Markets Tax Credit (NMTC)	Eligible Persons	2009		X		
(Lacking) Complete Plumbing Facilities	Households	2007				PUMA
Household Income (proportionate to parent area)	Dollar Value	2007				PUMA
TANF (Temporary Assistance for Needy Families) Recipients	Eligible Persons	2008				Zip Code
SNAP (Supplemental Nutrition Assistance Program) Recipients	Eligible Persons	2008				Zip Code
Limited Mobility Indicators						
Zero-Car Households	Eligible Persons	2007				PUMA
Supplementary Security Income Recipients	Eligible Persons	2007				PUMA
English Proficiency Indicators						
Linguistic Isolation	Eligible Persons	2007				PUMA
Elderly Indicators						
Social Security Income Recipients	Eligible Persons	2007				PUMA

Source: Gulf Regional Planning Commission

Figure 6-4:
CONCENTRATIONS OF TRADITIONALLY UNDERSERVED POPULATIONS ON THE MISSISSIPPI GULF COAST



Source: Gulf Regional Planning Commission

**Table 6-9:
TITLE VI PERFORMANCE INDICATORS**

MEASURE	DESCRIPTION	PERFORMANCE TARGET	
Complaints	The number of officially recorded Title VI complaints received at the MPO annually	Zero per year	0
Engagement of Title VI Populations	The annual number of meetings held in core Title VI population areas	Conduct at least two public meetings or group outreach meetings in core traditionally underserved population areas annually	2
Allocation of Funds to Title VI Areas	Location of programmed funding	Additional priority will be given to TIP and other projects in identified Title VI population areas	No Target
Contract Participation	Minority / DBE Awards in the MPO-funded contracts	Additional priority will be given to firms and teams that have DBE participation (on MDOT DBE pre-qualifications listing)	No Target
Nondiscrimination Language in MPO Contracts	The number of contracts with the MPO funding that have Nondiscrimination Language as shown below or equivalent language	All contracts (100%)	100%

Considerations for Participation Methods for Traditionally Underserved Populations

The preceding discussion uses the term “traditionally underserved populations” as a broad way of capturing a very diverse set of people. Low-income populations may not engage with the MPO in the same way or degree as Hispanics; limited-English proficiency populations would not respond to written materials in the same manner as either population. Repeated experience working with people has revealed some common elements in successful public engagement and education efforts, and these are simply defined as follows:

- **Make the Message Simple** - Use standard terminology and manners of writing and speaking without overuse of jargon specific to our business practice. Where we do use specific terms, we need to explain them first.
- **Make the Message Interesting** - Because we select language carefully does not mean that we should dilute our message or its content. The goal is still to convey detailed information about options that are relevant to the audience, and takes full advantage of graphic design to help transmit important elements of the content.
- **Go to Them** - Conducting public meetings is standard practice, and even required in the case of some public hearings. However, the public meeting the way it is traditionally practiced is not effective at engaging the general populace in many communities (although there are exceptions and better practices that can help create better attendance and participation), much less traditionally underserved groups. Tying a presentation about a proposed service or project into an existing meeting like a police action meeting, homeowner’s association committee, seasonal festival, or established event guarantees an audience and helps integrate the project into the community’s consciousness in a familiar setting.

- **Multiple Channels Work Better** - Relying on a single tool that the agency does really well may seem cost-effective, but even the best newsletter, website, or other mechanism has a very low value if it doesn't allow the participant to participate in the discussion. Figure 6-5 indicates how to think of levels of distribution (towards box "2" is better) and engagement (towards box "3" is better). A "perfect" outreach technique would have both high engagement and high distribution, falling into Area 4 of the chart. Asking where each technique might fall into this chart for different communities is a good start towards identifying the most cost-effective outreach plan for each project or planning process. Learning how different engagement tools can work together to reinforce messages to different groups of people is a paramount consideration not only when the project is nearing its launch, but also during budgeting and the development of the Unified Planning Work Program.

**Figure 6-5:
PUBLIC ENGAGEMENT EVALUATION MATRIX**

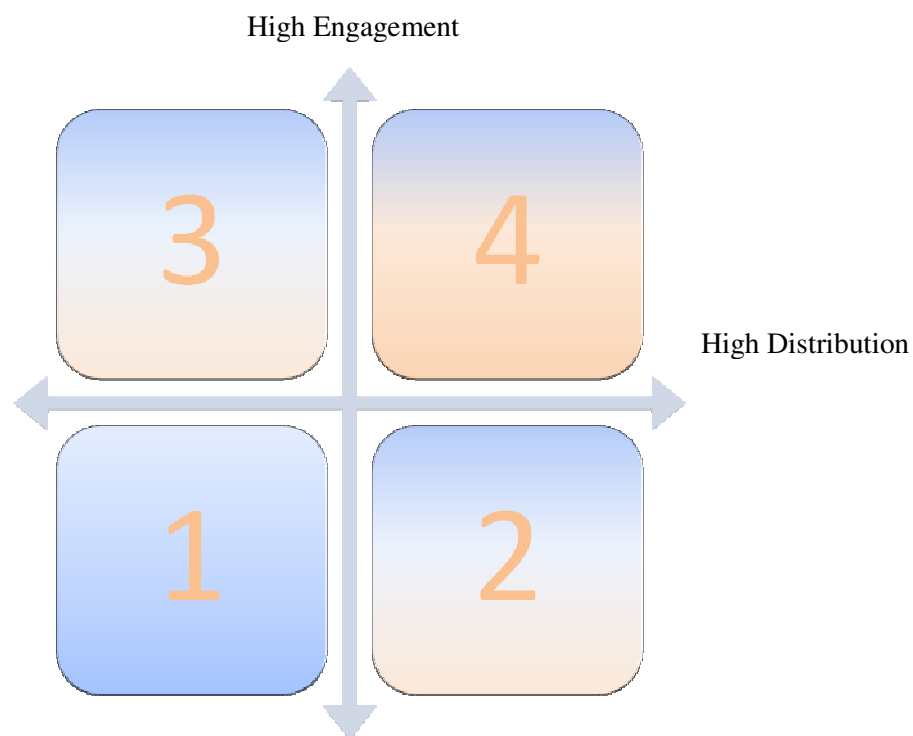


Table 6-10 on the following page describes not only preferred outreach techniques but also what groups they would be effective in reaching as well as how they can work in combination to best effect. Each value in the cells to the right represents a position on the chart in Figure 6-5. Note that some of the most favored techniques, such as public meetings and project or agency websites, may not be effective at either reaching a broad distribution (a "2" value) or engaging the public (a "3" value). Some techniques, such as websites and visualization, enhance most or all of the other techniques.^{1,2}

¹ USDOT, Federal Highway Administration, "How to Engage Low-Literacy and Limited-English-Proficiency Populations in Transportation Planning." Publication No. FHWA-HEP-06-009. Prepared by PBS&J, 2006.

² Miami-Dade Transportation and Community Mapping, website (<http://mpoportal.fiu.edu/pim.cfm>). 2009.

Table 6-10: ENGAGEMENT TECHNIQUES FOR TRADITIONALLY UNDERSERVED POPULATIONS

(ID No.) Technique	Complements Other Techniques	Senior	Mobility	LEP	Low-Income	Minority	Partner Agencies
		Distribution/Engagement Potential (see note)					
(1) Public Meetings and Hearings	4, 8, 10, 12, 13	1	1	1	1	1	0
(2) Citizen Advisory Committees	7, 13	3	3	1	3	3	0
(3) Stakeholder Working Groups or Focus Groups	13	3	3	3	3	3	4
(4) Project Website	*	1	2	1	1	1	2
(5) Public Access Computer Kiosk	7, 15	1	1	1	1	1	1
(6) Information Station Extension	7, 8	4	2	2	2	2	0
(7) Surveys, Paper and On-Line	1, 6, 10, 12	2	2	2	2	2	2
(8) Brochures, Flyers, and Newsletters	1, 6	2	2	1	2	2	2
(9) Agency Consultations	13	0	0	0	0	0	3
(10) Direct Mailing / Email Distribution Lists	1, 3, 6	2	2	1	2	2	2
(11) Policy or Technical Committee Meetings	9, 13	1	1	1	1	1	2
(12) Newspaper Advertisements	1, 3, 6	2	2	1	2	2	0
(13) Maps, Renderings, and Other Visualization	*	3	3	3	3	3	3
(14) Webcasts and Webinars	2, 3, 7, 8	2	2	1	1	1	3
(15) Interactive, On-Line Mapping	4, 5	2	2	2	1	1	4
(16) School-based Activities	4, 5, 7,8,12	4	4	4	4	4	0
(17) Imbedded Hyperlinks Surveys for Businesses	4,7	1	4	1	1	4	0
(18) Java or Soft Drink Jackets	8, 12	2	0	0	0	2	0
(19) One-in-one Oral Surveys	1,3,7,	4	4	4	4	4	4
(20) Phone Trees	1,2,3,8,10,12	4	4	4	4	4	2
(21) Interpreters and Translated Materials	1,2,3,4,7,10,12	3	2	3	3	3	1
(22) Public Service Announcements	8,10,12	3	3	3	3	3	0
(23) Interactive Games (Strings and Ribbons)	1,2,3,9,11	4	4	4	4	4	4
(24) Piggy-backing on Existing Events	1,2,3,9,11,14	4	4	4	4	4	4

Notes: (1) 1=low engagement, low distribution; 2=high engagement; 3=high distribution; 4= high engagement, high distribution;
(2) *refers to a technique that generally supports all other techniques.

In deciding what type of roadway improvement would best address an identified need, consideration was given first to congestion management strategies intended to increase the operational efficiency of a facility. Demand management measures that increase average vehicle occupancy have the potential to reduce the number of vehicles on the road. Safety improvements have the potential to reduce the incidence of vehicular accidents that disrupt normal traffic operations and lead to additional congestion and delay. Increasing the amount of information available to drivers can enable them to make better decisions, and better individual decisions can add up to an overall enhancement of system performance.

Transportation improvement strategies applied to streets and highways in the *Congestion Management Plan*, and in the development of the 2035 Long-Range Transportation Plan, are described below. (These are also listed in Table 7-1, on the following page, along with other congestion-management measures involving alternative modes.) Street and highway improvement types incorporated in the Staged Improvement Program include the following:

- New Road
- Roadway Widening
- Corridor Reconstruction/Add Center Turn Lane
- Corridor Reconstruction/Access Management
- Corridor Reconstruction/Operations and Channelization
- Intersection Improvement
- New Interchange
- Minor Intersection Improvement

New Road and Roadway Widening

Roadway widening or new construction is not always possible due to constraints which may be either physical or fiscal (or both). However, in some cases adding lanes to an existing facility or building a new road may be the only effective means of reducing congestion on an existing route. This option may be more difficult to pursue in the future if one of more Mississippi Gulf Coast counties are designated as *nonattainment areas* for the National Ambient Air Quality Standards (NAAQS). The Environmental Protection Agency (EPA) is considering the adoption of new standards that would result in Harrison and Jackson counties being designated nonattainment areas with respect to the mobile-source emissions that act as precursors for ozone. This would mean that new construction, or expansion of existing facilities, to provide additional capacity not specifically intended for high-occupancy vehicles, could not be undertaken with federal assistance unless it could be established that demand reduction measures and operational improvements could not meet the need for additional capacity in the affected corridor.

Corridor Reconstruction/Add Center Turn Lane

One alternative to new construction or roadway widening would be reconstruction of an existing two-lane road to add a continuous center turn-lane, or raised median with strategically located turn lanes, to remove vehicles making left turns from the traffic stream. This three-lane, or divided two-lane, typical

section theoretically provides more vehicular capacity than a conventional (undivided) two-lane road by eliminating the delays associated with through traffic being blocked by drivers waiting for breaks in oncoming traffic to make left turns. The presence of a continuous turn-lane, landscaped median or refuge islands can also serve to enhance access to adjacent property by removing turning traffic from travel lanes when driveway or side-street volumes are significant. Landscaped medians and islands will not only serve to maintain travel speeds but will provide pedestrian refuge and additional aesthetic benefits. A three-lane avenue is indicated when driveways and access roadways generate frequent turns.

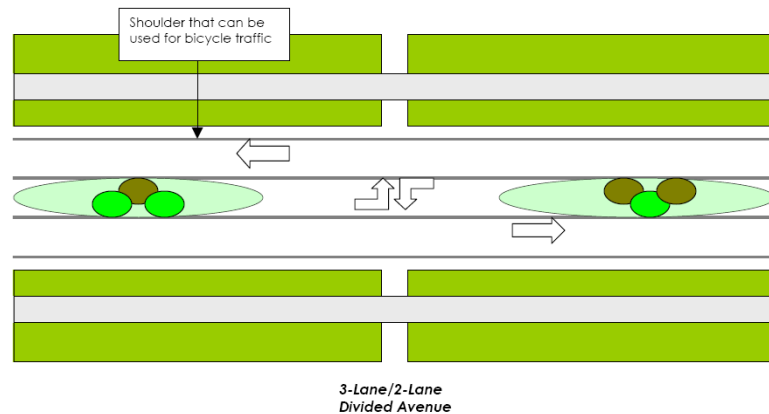


Table 7-1:
POTENTIAL CONGESTION MANAGEMENT MEASURES

Minor Intersection Improvements <ul style="list-style-type: none"> • Signal re-timing • Remove signal • Restrict turns • Restrict trucks • Restrict parking • Improve signage • Re-striping • One-way operations 	Intersection Improvements <ul style="list-style-type: none"> • Add signal • Geometric improvement • Add turn lanes • Roundabout • Traffic circle • Intersection beacon 	Corridor Reconstruction - Access Management <ul style="list-style-type: none"> • Frontage roads • Driveway control • Add/improve medians • Reconstruct roadway • Improved shoulders • Lane widening
		Corridor Reconstruction - CTL <ul style="list-style-type: none"> • Add center turn lane
Transit system Improvements <ul style="list-style-type: none"> • Express bus • Expanded service • Commuter rail • Real time info on transit schedules and vehicles • Bike and Bus program • Traffic signal preemption • Improved transit stop • Improved transfers 	Improved Bike/Pedestrian Mobility <ul style="list-style-type: none"> • Suitable roads for bikes • Suitable roads for pedestrians • Improve transit access for pedestrians • Bike route systems • Marketing "Bike and Bus" programs 	Corridor Reconstruction; Operations and Channelization <ul style="list-style-type: none"> • Synchronize signals • Pavement signs • Reversible lanes • Add turn lanes • Auxiliary lanes • Ramp metering • Acceleration lanes • Deceleration lanes • Extended turn lanes • Movable median barrier
Add Base Capacity to Roadway <ul style="list-style-type: none"> • Add lanes • Extend roadway • Bridge re-construction • Interchange re-construction 	New Construction <ul style="list-style-type: none"> • New road • New interchange • Overpass • Underpass 	Travel Demand Management <ul style="list-style-type: none"> • HOV lanes • Carpool programs • Park and ride lots • Flexible work hours • Vanpool program • Bus Lanes

Corridor Reconstruction/Access Management

Corridor reconstruction may also be undertaken for the purpose of implementing access management measures. Adding a median or combining driveways to limit access will reduce the number of conflict

point on a roadway. This type of improvement may also involve adding shoulders, widening existing shoulders or widening existing travel lanes.

Corridor Reconstruction/Operations and Channelization

Corridor reconstruction may be used for the purpose refreshing an existing street or highway by renewing its layout and operational features. Measures may include new pavement markings, new signage, new and extended turn lanes or auxiliary lanes that improve traffic flow by upgrading operational characteristics of the roadway.

Intersection Improvement Reconstruction of an intersection may be undertaken in order to improve its geometric layout and functionality by adding turn-lanes and enhanced traffic control devices such as signals or upgraded signal systems. Another possible improvement that should be considered where appropriate would be the installation of a *roundabout* or traffic circle to replace an existing stop-controlled intersection.

New Interchange

Construction of a new interchange providing access to an interstate highway represents a major capital investment in its own right. Frequently it also requires reconstruction of an existing road to be connected to the fully controlled-access facility or construction of an entirely new road to be connected.

Minor Intersection Improvement

Minor intersection improvement typically involves minimal expenditure and could be accomplished with existing city, county or state staff resources. It may include the removal of a signal, re-timing of a signal or installation of signs or other devices for the purpose of restricting or directing movements in order to improve the traffic flow and safety of an intersection.

8.1 BACKGROUND

The Mississippi Gulf Coast Metropolitan Planning Organization (MPO) is committed to the development of transportation strategies and modes which offer alternatives to the construction of new street and highway capacity and supports the implementation of such measures wherever they can serve to reduce congestion and advance mobility. Alternative strategies include *transportation demand management* measures that seek to reduce the number vehicles operating on streets and highways in the area. Typically these programs are intended to reduce both traffic congestion and vehicular emissions. Strategies such as designating existing highway lanes for exclusive high-occupancy vehicle use, or designating existing parking facilities for exclusive use by carpools and vanpools, can actually help to reduce the number of vehicles on the road.

It is recommended that an “Alternatives Analysis for Regional Mobility/Transit Corridor Alternative Plan” be developed that will focus on increasing the number of daily trips that utilize transit, bicycling and walking. The purpose of such an initiative would be to make alternative transportation options more attractive to people who have never used them for daily travel and to encourage more regular use by existing users. As alternative transportation options become more efficient, accessible and safe, they become more attractive to potential users. When more people use transit, headways can decrease and transit coverage can increase making it more efficient and accessible. If the number of daily transit, bicycle and walking trips increases, the number of automobile trips will decrease. This result will lower not only vehicle miles of travel (VMT) in the region: It will also reduce mobile-source emissions, lower costs incurred by commuters, and provide for a healthier population enjoying the benefits of improved air quality and increased physical activity.

It is recommended that an “Alternatives Analysis for Regional Mobility/Transit Corridor Alternative” be developed that will focus on increasing the number of daily trips that utilize transit, bicycling and walking.

Under the proposed initiative, the MPO would cooperate with the Mississippi Coast Transportation Authority (CTA) in assembling the resources necessary to provide the infrastructure for safe, reliable and efficient alternative options for transportation access and mobility within targeted corridors. Combined with CTA’s fixed-route bus service and ongoing “Bike and Bus” program, the infrastructure in designated transit corridors would facilitate the movement of people by linked modal alternatives – including bicycle, pedestrian and transit modes – between housing, public services and employment sites. High-occupancy vehicle (HOV) lanes on Interstate 10 (I-10) would encourage participation in carpools, vanpools and express bus transit services. The HOV lanes would be linked to park-and-ride facilities located along I-10 for the convenience of drivers willing to park their personal vehicles and join others in alternative modes of travel. Express bus service could connect CTA transit hubs such as the Gulfport Transit Center, Edgewater Mall, Biloxi Transit Center and downtown Ocean Springs. This service would benefit from the implementation of a reserved transit lane on U. S. Highway 90 (US 90) in Biloxi, between Porter Avenue and the Biloxi Bay Bridge, expediting the movement of buses through this

sometimes highly congested area. Bike-and-ride accommodations and rental bicycles could also be provided at the transit centers and other hubs.

8.2 INFRASTRUCTURE

There are a number of capital improvements that can be made to support alternative transportation modes. These include signal priority and preemption systems, HOV and transit-only lanes, park-and-ride facilities, and transit stop facilities and amenities.

Transit Signal Priority

Transit signal priority is an operational strategy that facilitates the movement of in-service transit vehicles through signal-controlled intersections. The installation of signal preemption equipment on traffic signals and buses enables transit vehicles to avoid being caught in queues at intersections, reducing travel delay and thereby improving travel time and transit service reliability. A signal override system could be incorporated into recommended improvements on US 90 in Biloxi between White Avenue and the Bay of Biloxi Bridge to make express transit service in this corridor more attractive to commuters.

HOV/Transit Lane

This would involve adding (or modifying) lanes reserved for buses, vans or automobiles with a driver and at least one passenger. Such lanes are also known as carpool lanes, commuter lanes, restricted lanes, diamond lanes, or express lanes. HOV lanes on I-10 from Canal Road to Highway 609 are recommended in the 2035 Staged Improvement Program presented in Chapter 13. The travel demand model shows capacity deficiencies on the interstate in the year 2035 with 6 lanes. In lieu of adding general purpose lanes to the affected sections of I-10, it is recommended that HOV lanes be added to encourage and facilitate the development and use of ridesharing options. Dedicated transit lanes might also be incorporated into recommended improvements on US 90 in Biloxi between White Avenue and the Biloxi Bay Bridge. There is already a continuous right-turn lane on the eastbound side of the existing highway. Dedicated transit lanes would allow buses to travel through this congested area with much less delay at signalized intersections. Such lanes can be used only by drivers of right-turning personal vehicles and buses provided fixed-route transit service.

Park-and-Ride Facilities

Park-and-ride facilities are parking lots with connections to roadways that commuters use for the journey to work, allowing drivers of personal vehicles and their passengers to park and transfer to a bus or carpool to complete their trip. The vehicle is stored in the car park during the day and retrieved when the owner returns. Park-and-ride lots are included in the 2035 Staged Improvement Program presented in Chapter 13 of this document.

Transit Stop Accommodations and Amenities

Well-designed transit routes and stops are essential to a usable system. The stops should be designed to provide safe and convenient access and should be comfortable places for people to wait. Adequate bus stop signage, lighting and shelters with seating and trash receptacles are highly desirable features. Bus stops should be highly visible easily accessible for passengers on foot. Safe and convenient roadway crossings are essential. Proper placement of bus stops is a key to user safety. For example, placing bus stops on the near side of intersections or crosswalks may block a pedestrian's view of approaching traffic and the approaching driver's view of pedestrians. Approaching motorists may be unable to stop

in time when a pedestrian steps out into traffic in front of a bus. Relocating the bus stop to the far side of the intersection can improve pedestrian safety, since such placement eliminates the sight distance restriction caused by the bus. The bus stop location should be fully accessible to persons in wheel-chairs and should have paved connections to sidewalks where landscape buffers exist. Adequate clearance should be provided for the operation of wheelchair lifts.

8.3 PROGRAMS

Ongoing and proposed programs designed to encourage and facilitate the use of alternative modes include the CTA Bike-and-Bus Program, the Mississippi Gulf Coast Commuter Program, proposed Express Bus Transit Service and the Gulfport Employment Shuttle.

CTA Bike-and-Bus Program

CTA's Bike-and-Bus program has grown steadily since its inception in the fall of 2009. This program has tremendous potential as an added travel option for Mississippi Gulf Coast residents and visitors. As shown on the "Commuter Alternatives" map, a person can access many shopping and employment destinations by riding buses to area hubs and then completing the trip by bicycle (see figure 8-1). The red buffers on the map indicate areas within two miles of a transit hub. These are designated "Bike-and-Bus service areas" supported by a proposed express bus on US 90 in Harrison County.



Bike and Bus Ridership

Sept. 2009 – 458
Oct. 2009 – 646
Nov. 2009 – 662
Dec. 2009 – 483
Jan. 2010 – 587
Feb. 2010 – 685
Mar. 2010 – 765
Apr. 2010 – 831
May 2010 – 891
June 2010 – 946

Coast Commuter Program

The Mississippi Gulf Coast Commuter Program is a service of CTA launched at Northrop Grumman Shipyard in Pascagoula on November 7, 2006. Coast Commuter promotes and facilitates commute alternatives such as carpooling, vanpooling and transit. Coast Commuter solutions are available to any commuter interested in sharing the ride to work, and to area employers that interested in providing commute solutions for their employees.



Express Transit Service

An express service that will transport commuters from Ocean Springs to Biloxi to Gulfport with a minimal travel time and short headways would be very attractive to the many commuters that drive single-occupancy vehicles within this corridor every day. A program such as this will need to be heavily marketed, showing convenience and cost saving to the potential user. Development of a well-defined identity for the service, supported by suitable labeling and promotional activities, is essential to the success of this service. An express service is recommended as a part of the *Transit Development Plan* outlined in Chapter 9 of this document.

Gulfport Employment Shuttle

An employment shuttle is a regularly scheduled circulator connecting a transit center or other hub and other points of major employment in a central business district. The Transit Development Plan presented in Chapter 9 of this document recommends providing a regularly scheduled circulator between the Gulfport Transit Center and key employment centers in downtown Gulfport. Service would be oriented initially to peak employment arrival (AM), midday and departure (PM) periods.

Commuter Alternatives System

Legend

- Transit Center
- Bike and Bus Hub Service Area
- HOV Lane
- Transit Lane and Signal Priority
- Express Transit (Phase 1)
- Express Transit (Phase 2)
- Planned Park and Ride
- Existing Park and Ride

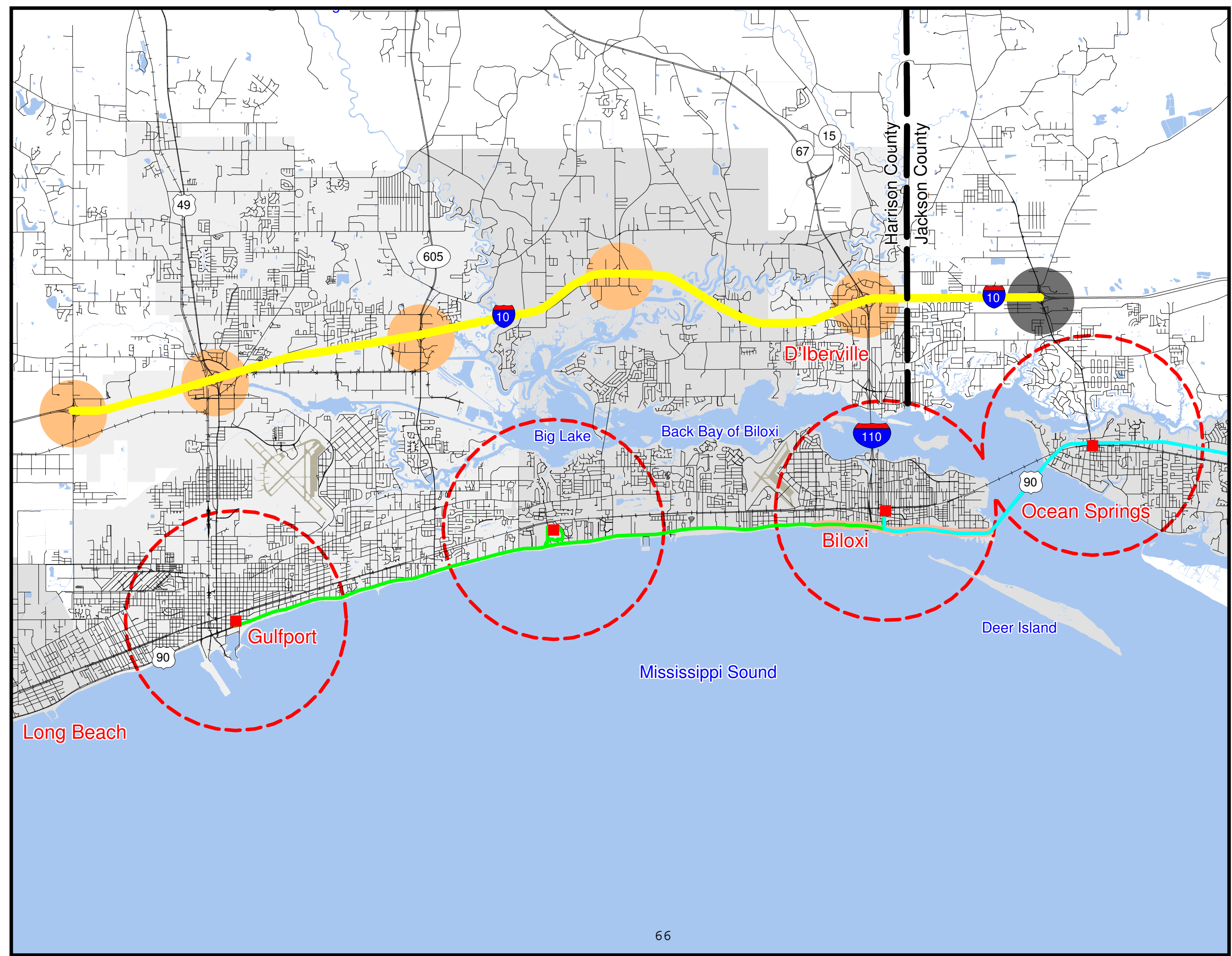


Figure:8.1



CHAPTER 9

TRANSIT DEVELOPMENT PROGRAM

9.1 BACKGROUND

Based on analysis and input from stakeholder groups and the general public, recommendations were developed for an update of the *Transit Development Plan* (TDP). The TDP is a separate planning document, resulting from a parallel process conducted simultaneously with the long-range transportation plan update. Every effort has been made to coordinate these two major components of the Mississippi Gulf Coast Area Transportation Study. The TDP is hereby incorporated in the *2035 Mississippi Gulf Coast Long-Range Transportation Plan* by reference, and the recommendations presented in that document are summarized in this chapter. Recommended transit improvements were organized into a five-year implementation plan with an accompanying financial plan. This staging of improvements will allow the next update to define and stage mid-range and long-term recommendations for implementation. Recommendations have been grouped according to their ability to improve mobility at the local level (transit connections within cities) or at the regional level (travel between counties, fixed-route transit service alternatives, and large regional transit facilities).

9.2 GENERAL TRANSIT SYSTEM IMPROVEMENTS

Continued Operation of Existing CTA services

The existing Mississippi Coast Transportation Authority ("Coast Transit Authority" or CTA) service portfolio, from fixed routes to vanpools, should be maintained. System-wide ridership continues to increase. Data for Fiscal Year (FY) 2010 show an 11.8 percent increase in total passengers compared to FY 2009. This continues a trend of increasing ridership recorded since FY 2007.

Improvement in Frequency on Key CTA Routes and Services

CTA services oriented to commuter and working populations continue to grow. There is an interest in expanding opportunities to bring more commuters in the region to transit, particularly as part of the regional response to the pending designation of Harrison and Jackson counties as *nonattainment areas* with regard to revised National Ambient Air Quality Standards (NAAQS).

Implementation of New Bus Technology

CTA has an interest in expanding the number of flex-fuel and bio-fuel vehicles in their fleet. Therefore, as part of the review of capital needs for new services, the cost estimates include the optional conversion for vehicles to accept multiple fueling options.

Implementation of More Inter-County Transit

The public process completed to date stressed the need for more transportation between counties on the Mississippi Gulf Coast, as well as between the urbanized portions of the three coastal counties and adjacent rural areas. The need for county-to-county and urban-rural transportation is expected to increase, especially with regard to travel for medical purposes and other human services. CTA's focus on its *Americans with Disabilities Act* (ADA)-compliant "Paratransit Plus" service will continue to address

needs within individual counties. General public transit will grow as a result of the fixed-route expansion, which will add services within underserved areas, as well as connections between these areas and the Gulfport-Biloxi Urbanized Area, including Ocean Springs.

Planning for Continued Graying of the Population

The Mississippi Gulf Coast, like many other areas in the United States, has a growing share of population that will be aged 65 and older by the next census. Many of these individuals will become part of the audience for ADA Paratransit Plus and other specialized transportation services. The short-term plan establishes a core paratransit service outside of the fixed-route network within each county. Plans to grow this service have been included as part of the mid-range and long-term programs. However, careful watch should continue on this population group and the rate of trip denials to determine the appropriate time for adding vehicles, service hours and days of operation.

Improving Coordination with Human Service Transportation Providers and Recipients

CTA has committed through its Accessible Transportation Advisory Committee (ATAC) to incorporate the views and needs of the human services community into the service planning and implementation process. This will be ongoing. As part of the TDP, vehicles will be added to the ADA Paratransit Plus services as a way to allow them to cross county lines and transport individuals to key demand locations (hospitals, doctors' offices, etc.). Complementing this will be the start of a transportation voucher program as a demonstration project and a request for funding to support a transit coordinator's position.

Expanding Transit and Land Use Connectivity

CTA continues to upgrade its passenger stops as part of the ongoing capital improvement program. All future route expansions will incorporate the standards of this program so that the geographic distribution of new stops and related amenities is consistent Title VI service standards and current planning assumptions.

Updating Transit Marketing Program

CTA will need to restart its transit marketing and promotions program to take advantage of the increasing ridership, as well as to cultivate new constituencies for transit services. This could complement similar activities to diversify the marketing of the Mississippi Gulf Coast as a center for retirees, tourism, business investment, conventions and trade activities.

9.3 RECOMMENDED LOCAL MOBILITY PROGRAM

Tables 9-1 and 9-2 provide an overview of the recommended local mobility program for the short-term (2011-2015) and mid-range (2016-2025) planning periods. In preparing cost projections, a review of current federal funding provided to the State of Mississippi, as well as a comparative cost of operations, has been undertaken to determine potential funding availability and streams. As of the preparation of this report, there has been no new transportation bill coming from the United States Congress; and all funding levels are being set through continuing budget resolutions.

For the purposes of financial constraint, it is assumed that additional local funding through a combination of passenger fares and direct appropriation will be used to leverage available federal funds. The result will be a near equal distribution of costs between these sources for all services. Deficits in funding, identified in the table, will need to be covered in one of three ways:

**Table 9-1:
SHORT-TERM (2011-2015) LOCAL MOBILITY PROGRAM**

COUNTY	CONCEPT	DESCRIPTION
Hancock	ADA Paratransit Plus Service, 1 Vehicle	Defined as county-wide paratransit service, with fares established according to \$2 zone map within each county, based on current CTA program in Harrison and Jackson counties. Support expansion of service in Hancock County to full-week service (1 vehicle in county to start, add 2nd based on demand).
Hancock	Bay Saint Louis fixed route 1 Vehicle, 45-minute headway	Commence general public fixed-route service in Bay Saint Louis, 5-6 days per week, with an operating schedule of up to 14 hours per day. ADA Paratransit Plus service within a ¾-mile radius of fixed route.
Hancock	Beachcomber Service (east of Gulfport on US 90), 1 Vehicle, 45-minute headway	Commence general public fixed-route service between Bay Saint Louis and Gulfport along US 90, 5-6 days per week, up to 14 revenue hours per day. ADA Paratransit Plus service within a ¾-mile radius of fixed route.
Harrison	ADA Plus Paratransit Service, 1 Vehicle	Defined as county-wide paratransit service with fares established according to \$2 zone map within each county, based on current CTA program in Harrison and Jackson counties. Support expansion of service in Harrison County to one additional vehicle (2 vehicles total).
Harrison	Popp's Ferry Road fixed route, 1 Vehicle, 90-minute headway	Commence general public fixed-route service along Popp's Ferry from the Edgewater Mall Station to The Promenade, 5-6 Days per week, with an operating schedule of up to 14 hours per day. ADA Paratransit Plus service within a ¾-mile radius of fixed route.
Harrison	Intercity commuter express bus (Biloxi to Gulfport), 2 Vehicles, 30-minute headway	Commence premium public flex-route service between the Biloxi Transit Center, Edgewater Mall and Gulfport Transit Center, 5 days per week, initially during the peak commute times (6-9 AM and 4-7 PM).
Harrison	Gulfport Route 37, 1 vehicle, 45-minute headway	Reduce headway on existing general public fixed route operating between Downtown Gulfport and the Crossroads Shopping Center.
Harrison	Gulfport Employment Shuttle, 1 Vehicle, 7.5-minute headway	Provide a regularly scheduled circulator between the Gulfport Transit Center and other points of major employment in Downtown Gulfport. Service would be oriented initially to peak employment arrival (AM), midday and departure (PM) periods. Capacity could be supplemented during peak by vehicles in service on routes 38/37.
Harrison	MS Gulf Coast Coliseum District Circulator, up to 3 vehicles, up to 7.5-minute headway	Provide regularly scheduled circulator between Biloxi, Gulfport and Coast Coliseum during conventions and other special events. Service would be made possible through provision of additional vehicle capacity on Beachcomber line. As demand warrants, a review of potential stand-alone service would commence. Service would connect major generators in the Convention Center District (Edgewater Mall to Treasure Bay/Pass Road to US 90) to support hotel and associated development during long-term buildout of the Convention Center.

Table 9-1 (Cont.)		
Jackson	ADA Paratransit Plus service, 1 vehicle	Defined as countywide paratransit service, fares established following \$2 zone map in each county, based on current CTA program in Harrison and Jackson counties. Support expansion of service in Jackson County to one additional vehicle (2 vehicles total).
Jackson	Ocean Springs Route 7, 1 vehicle, 45-minute headway	Reduce headway on existing general public fixed route operating between Downtown Biloxi and the Wal-Mart in Ocean Springs.
Jackson	Pascagoula fixed route, 1 vehicle, 45-minute headway	Commence general public fixed-route service in Pascagoula, 5 days per week, up to 14 revenue hours per day. Depending on demand, service could be expanded to six days per week (Monday-Saturday). ADA Paratransit Plus service within a ¾-mile radius of fixed route.
Jackson	Pascagoula to Gautier, Phase I, 1 vehicle	Commence general public service between Pascagoula and Gautier, 5 days per week, up 14 hours per day, initially as demand-response service. Connect with Pascagoula service at designated point in downtown. Depending on demand, service could be expanded into fixed route depicted as part of the mid-term program.

Source: Coast Transit Authority (2011).

**Table 9-2:
MID-RANGE (2016-2025) LOCAL MOBILITY PROGRAM**

COUNTY	CONCEPT	DESCRIPTION
Hancock	Beachcomber (Bay Saint Louis to Buccaneer State Park), 1 vehicle, 45-minute headway	Commence general public fixed-route service between Bay Saint Louis and Buccaneer State Park via Downtown Waveland. Service could commence initially as seasonal (Memorial Day to Labor Day) in connection with the reopening of the state park. Service would be offered 5 days per week, up to 14 revenue hours per day. Depending on demand, service could be expanded to 6 days per week (Monday-Saturday). ADA Paratransit Plus service within a ¾-mile radius of fixed route.
Hancock	Diamondhead fixed route, 1 vehicle, 90-minute headway	Commence general public fixed-route service between Bay Saint Louis and Diamondhead. Service could commence as seasonal, summer only, for 5 days per week, up to 14 revenue hours per day. Depending on demand, service could transition to 6 days per week (Monday-Saturday). ADA Paratransit Plus service within a ¾ mile-radius of fixed route.
Hancock	ADA Paratransit Plus service	Establish need for expansion of service through additional vehicles and appointment windows, based on trip denials.
Harrison	Gulfport Employment Shuttle	Provide regularly scheduled circulator between the Gulfport Transit Center and other points of major employment in Downtown Gulfport. Expansion of service to include daylong operations. Capacity could be supplemented during peak by vehicles in service on routes 38 and 37.

Table 9-2 (Cont.)		
Harrison	MS Gulf Coast Coliseum District Circulator	Provide regularly scheduled circulator between Biloxi and Gulfport and the MS Gulf Coast Coliseum during conventions and other special events. This service would be made possible through provision of additional vehicle capacity on the Beachcomber line. As demand warrants, a review of potential stand-alone service would commence. This service would connect major generators in the Convention Center District (Edgewater Mall to Treasure Bay/Pass Road to US 90) which could support hotel and associated development as part of the long-term buildout of the Convention Center.
Harrison	ADA Paratransit Plus service	Establish need for expansion of service through additional vehicles and appointment windows based on trip denials.
Jackson	Moss Point fixed-route service, 1 vehicle, 45-minute headway	Commence general public fixed-route service between Pascagoula and Moss Point, 5 days per week, up to 14 revenue hours per day. Depending on demand, service could be expanded to six days per week (Monday-Saturday). ADA Paratransit Plus service within a ¾-mile radius of route.
Jackson	Gautier fixed-route service, 1 vehicle, 45-minute headway	Commence general public fixed-route service between Pascagoula and Gautier, 5 days per week, up to 14 revenue hours per day. Depending on demand, service could be expanded to six days per week (Monday-Saturday). ADA Paratransit Plus service within a ¾-mile radius of route.
Jackson	ADA Paratransit Plus service	Establish need for expansion of service through additional vehicles and appointment windows based on trip denials.

Source: Coast Transit Authority (2011).

Flexing of Funds from Highways to Transit

There are options for utilizing a portion of the federal highway funds allocated to the Gulfport-Biloxi and Pascagoula metropolitan areas to support transit capital and operations. However, flexing requires commitment by the Transportation Policy Committee (TPC) as well as a local sponsor to provide the required matching funds.

Local Funds

Local governments can increase the amount of their sponsorship to cover any deficits created by expansion of local services. However, it is suggested, given the current patterns for local funding, that a discussion begin within the region regarding establishment of one or more dedicated sources of revenue to support transit development.

Other Sources

Grants, demonstrations and state funds are all available resources which CTA can draw on to develop and implement new services and facilities. As part of their ongoing due diligence, CTA will continue to identify funds from a variety of sources which could expand the transit authority's ability to serve the public.

9.4 RECOMMENDED REGIONAL MOBILITY PROGRAM

The regional mobility program includes a combination of capital and planning activities (see tables 9-3, 9-4 and 9-5). Many of the projects in this program are not new to the TDP. These projects have been grouped together based on their ability to expand data development and collection, and to result in facilities and service alternatives which have the potential to broaden the region's transit rider base.

**Table 9-3:
SHORT-TERM (2011-2015) REGIONAL MOBILITY PROGRAM**

DESCRIPTION	YEAR	FUNDING SOURCE
Alternatives Analysis for Regional Mobility/Transit Corridor Alternative [via BRT, streetcar along US 90, and/or light rail]	2011	Congressional earmarked funds through FTA (existing)
CTA fare payment (fare card) system implemented	2011	FTA capital funds (existing)
CTA website upgrade	2011	Operating funds (existing)
Identify approach for addressing regional air quality non-attainment status (vanpool/carpool, alternative fuels, park-and-ride, technology)	2011	FTA transit planning funds (through MPO)
Define final feasibility of the CTA Gulf Coast Attractions Route	2012	FTA capital and local funds
Identify and hire CTA Mobility Manager	2012	FTA New Freedom funds (new application)
Commence with CTA Travel Voucher Program demonstration in Hancock County	2012	FTA New Freedom funds (new application)
CTA to participate in regional planning initiative to develop and launch bicycle access program	2012	MPO Transportation Systems Planning Program
Complete analysis of transit market (commuters, tourists, paratransit, general public)	2012	CTA planning funds
Complete evaluation and purchase of sites for future park-and-ride facilities along I-10	2013	FTA transit planning funds (through MPO)
Work with interested colleges and universities on the MS Gulf Coast to build their participation in the carpool/vanpool matching program	2013	FTA transit planning funds (through MPO)
Implement general public vanpool program between CTA park-and-ride lots and transit centers (Biloxi, Edgewater, Gulfport, D'Iberville)	2014	FTA transit planning funds to develop (through MPO), FTA capital and operating funds to implement
Construction of Gulfport West Intermodal Center and D'Iberville Transit Center	2014/2015	FTA capital funds

Source: Coast Transit Authority (2011).

**Table 9-4:
MID-RANGE (2016-2025) REGIONAL MOBILITY PROGRAM**

DESCRIPTION	YEAR	FUNDING SOURCE
Implement through construction or cooperative endeavor additional park-and-ride facilities on MS Gulf Coast	2016-2025	FTA capital and local funds
Implement Phase I of the identified regional mobility alternative in Harrison County (Gulfport to Biloxi)	2016-2025	FTA capital and local funds

Source: Coast Transit Authority (2011).

**Table 9-5:
LONG-TERM (2026-2035) REGIONAL MOBILITY PROGRAM**

DESCRIPTION	YEAR	FUNDING SOURCE
Implement Phase II of the identified regional mobility alternative in Harrison and Jackson County (Biloxi to Pascagoula)	2026-2035	FTA capital and local funds
Implement Phase III of the identified regional mobility alternative in Harrison and Hancock County (Gulfport to Bay St. Louis)	2026-2035	FTA capital and local funds
Implementation of regional light-rail mobility alternative (tri-county light rail)	2026-2035	FTA capital, local and private funds

Source: Coast Transit Authority (2011).

10.1 BACKGROUND

The Pedestrian/Bicycle Plan (the *Plan*) presented in this chapter attempts to build on the pedestrian and bicycle component of the Mississippi Gulf Coast Area Transportation Study (MGCATS) *2030 Long Range Transportation Plan* (LRTP), as well as national, state, regional and local momentum to improve opportunities for residents to bicycle and walk in their communities safely. A practical transportation system provides a number of travel choices, including transit, bicycling, wheel chair, and walking.



National Momentum

The *Let's Move!* Campaign to reduce obesity in the nation encourages local governments to create opportunities for families to be more physically active. Elements of the campaign support walking and bicycling activities. The U. S. Department of Transportation (USDOT) supports the development of fully integrated, active transportation networks and encourages communities to go beyond the minimum design standards to create safe walking and biking facilities. This is a hopeful sign for continued support to enhance livability.

U. S. Transportation Secretary LaHood's recognition of two Mississippi cities—Tupelo and Hernando—for adopting *Complete Streets* policies is a sign of the times, recognizing that providing a functional transportation network for all users is important to making America's communities more livable.

“Livability means being able to take your kids to school, go to work, see a doctor, drop by the grocery or Post Office, go out to dinner and a movie, and play with your kids at the park—all without having to get in your car.” – Ray LaHood, <http://fastlane.dot.gov/>

In June 2009 the U. S. Department of Housing and Urban Development (HUD), USDOT, and the U. S. Environmental Protection Agency (USEPA) established the Partnership for Sustainable Communities. The purpose is to coordinate federal housing, transportation and environmental investments, promote equitable development, protect public health and the environment, and help address the challenges of climate change. A product of the Partnership is the joint funding effort formed between USDOT and HUD as described below. New federal programs such as USDOT's TIGER II Discretionary Program and HUD's Sustainable Community Challenge Grant Program provide 75 million dollars in grant funding opportunities for planning activities leading to projects that integrate transportation, housing and economic development. These opportunities allow local governments to be more creative with federal resources when planning for projects, especially when transportation plans are designed to promote livability and energy efficiency. Gulf Regional Planning Commission (GRPC) and local partners

successfully applied for the HUD's Sustainable Communities Regional Planning Grant Program, receiving a grant award in 2010. The three-year planning process will get underway in 2011.

State Momentum

In recent years, the State of Mississippi has supported a number of programs to promote walking and biking. Realizing the health and economic benefits to the state, the *Let's Go Walking* campaign championed by Marsha Barbour was established by Blue Cross and Blue Shield of Mississippi. The media campaign has featured local and state leaders and encourages Mississippians to improve their health by walking. To improve upon the safety of bicyclists, the Mississippi Legislature passed the *John Paul Frerer Bicycle Safety Act* which clearly states the rights and duties of motorists and bicyclists. Bike lanes constructed along Mississippi highways 67 and 605, and the popular shared-use pathways on both the Bay of Saint Louis and Bay of Biloxi bridges on the U. S. Highway 90 (US 90) route were constructed by the Mississippi Department of Transportation (MDOT). Additionally, the Mississippi Development Authority's Community Development Block Grant Recovery funding improved active living in the downtown neighborhoods by including sidewalks with streetscape projects for many of the cities along the coast.

Regional Momentum

Gulf Regional Planning Commission (GRPC) is an active participant working with local governmental and partnership efforts to promote safe bicycling and walking facilities. GRPC works with advocacy groups to increase regional walking and bicycling trips by identifying potential routes and funding, conducting bicycle suitability assessments and sidewalk inventories, and assisting with grant writing and mapping.

Table 10-1: DISTRIBUTION OF PERSON-TRIPS BY TRAVEL MODE (MISSISSIPPI GULF COAST COUNTIES)

YEAR	AUTOMOBILE		TRANSIT		WALKING		BICYCLE	
	Trips	Pct of Total	Trips	Pct of Total	Trips	Pct of Total	Trips	Pct of Total
1990	120,948	93.5	496	0.3	4905	3.7	538	0.4
200	152,253	95.3	635	0.4	4767	3.0	358	0.2
2008	124,433	94.0	481	0.4	3379	2.6	239	0.2
Source: www.hud.gov/sustainability								

The Mississippi Coast Transportation Authority (Coast Transit Authority or CTA) Bike and Bus Program continues to serve more bicycle riders each month along fixed transit routes:

<i>Bike and Bus Ridership (2009-2010)</i>								
Oct	Nov	Dec	Jan	Feb	Mar	April	May	June
646	662	483	587	685	765	831	891	946

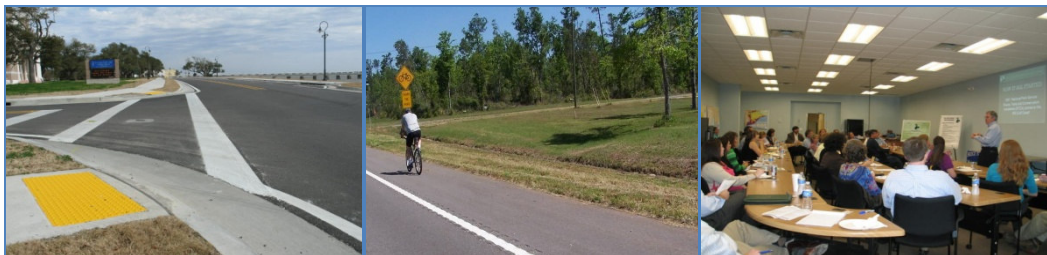
Along with MDOT, CTA and local planning departments, GRPC continues to work with and learn from bicycle and pedestrian partners to enhance mobility along Mississippi's coast. The following are among these resource agencies:

- MDOT - Safe Route to School and Transportation Enhancement Program

- Bike/Walk Mississippi
- Gulf Coast Heritage Trails Partnership
- Hancock County Greenways Committee
- Long Beach Sidewalk Committee
- National Park Service - Rivers and Trails Conservation Assistance Program
- Live Oak Alliance of Mississippi
- Land Trust for the Mississippi Coastal Plain

Local Momentum

Many new programs in cities and counties along the coast promote walking and biking. Certain Hurricane Katrina recovery funding created new sidewalks and streetscapes in downtowns across the region. Most recently, the City of Pascagoula adopted a Complete Streets Policy and with the assistance of Community Development Block Grant (CDBG) funding is making use of the policy by building new sidewalks in redeveloping neighborhoods and near schools. The City of Long Beach adopted a sidewalk ordinance requiring new construction projects, public and private, to include sidewalks. Gautier and Moss Point have improved their walkability with recovery funding. Ocean Springs connected the bridge path to the city's beachfront and downtown with a shared-use path and sidewalks. The Hancock County Chamber of Commerce Greenways Committee works with local governments and the business community to further the goal of improving walkability by 20 percent. Biloxi and Gulfport installed bike racks in their downtowns. Cities and counties are recognizing the need to improve facilities as indicated in policies and bicycle/pedestrian plans recommended within their updated comprehensive plans. The above-listed regional resource agencies are working on a local level as well.



10.2 PUBLIC INVOLVEMENT

Public input received from the MGCATS stakeholder and public meetings held in April 2010 identified a need for bicycle routes and sidewalks in all three counties. The primary focus of all the input concerned building bicycle and pedestrian facilities along the region's federal and state highways, adjacent to CSX and KCS railroad tracks, and on minor arterials and collectors where supported by a city or county master plan. If new facilities are to be built, residents expressed a desire to ensure quality design and construction. There was also interest in building wide shoulders on those principal arterials where they did not exist and providing "Share the Road" signs on state-aid roads. Another issue identified was the lack of crosswalks to access businesses on U. S. Highway 49 (US 49).

In addition to the public meetings, GRPC collected proposed bicycle route information over an 18-month period from general discussions at Gulf Coast Heritage Trails Partnership meetings in Harrison and Jackson counties, Hancock County Greenways Committee meetings, Long Beach Sidewalk Committee meetings, and from meetings and interviews with local planners.

Public policy input was collected by GRPC planners' review of recently updated comprehensive plans.



For the first time since the 1970's, the majority of local comprehensive planning processes addressed bicycle and pedestrian needs for their communities. With the assistance of volunteers from Gulf Coast Heritage Trails Partnership and the Spanish Trail District of Boy Scouts of America, GRPC organized bicycle suitability assessments of roads for Gautier and Pascagoula, as plan drafts had not yet addressed planned bicycle needs.

Proposed and existing bicycle-pedestrian maps were developed based on the aforementioned input. In January of 2011, a diverse group of bicycle and pedestrian advocates were asked to review and prioritize routes and provide input on the proposed system within their communities. A large number of routes were identified as priority, far exceeding previous Transportation Enhancement funding and Transportation Improvement funding that was spent on bicycle and pedestrian projects over the past five years. Please refer to the *Bicycle and Pedestrian Existing and Proposed Route Network* section of the plan.

10.3 BICYCLE AND PEDESTRIAN GOALS AND OBJECTIVES

The Pedestrian/Bicycle Plan goals and objectives have been adjusted to concur with current challenges and the overall goals and objectives of the 2035 Long-Range Transportation Plan:

1. **Goal:** Develop a well balanced transportation system inclusive of accessible bicycle and pedestrian facilities that allows one to safely walk or bicycle to school, to work, to the store, or to adjacent neighborhoods.
 - Objective:** Provide a comprehensive inventory of existing and planned bicycle and pedestrian facilities.
 - Objective:** Identify existing barriers that impede opportunities to walk and bike.
 - Objective:** Include bicycle and pedestrian transportation in the review process during planning and design of projects.
 - Objective:** Encourage dedication of Transportation Improvement Program funds for development of biking and walking facilities.
 - Objective:** Encourage modification of existing roadways to accommodate biking and walking.
2. **Goal:** Provide a safe, integrated network of bikeways and pedestrian circulation throughout the Mississippi Gulf Coast region for transportation and recreation.
 - Objective:** Provide public education regarding the benefits that walking and bicycling facilities serving neighborhoods, employment centers, transit stops, parks and schools offer for personal health and individual mobility.
 - Objective:** Work with MDOT, the Mississippi Development Authority (MDA), CSX Transportation, the Mississippi Forestry Commission, U. S. Forest Service,

National Park Service, Mississippi Department of Wildlife, Fisheries and Parks, conservation groups, utility districts, local trails partnerships and local chambers of commerce to encourage trails along rights-of-way for transportation and recreation.

3. **Goal:** Integrate pedestrian and bicycle facilities with intermodal transfer facilities (park-and-ride, transit routes and train depots) to promote alternative modes of travel, including transit and passenger rail.

Objective: Encourage local governments to investigate suitable locations for transit pads, bike lockers, bike racks, etc. and to encourage construction of facilities as a component of mixed-use developments.

Objective: Work with local governments to connect transit stops and depots with sidewalks and/or bike lanes.

4. **Goal:** Promote walkable community design, Complete Streets, and Safe Routes to Schools.

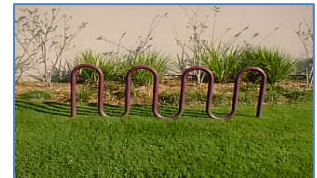
Objective: Support MDOT's promotion and education of the Safe Routes to School Program.

Objective: Encourage local governments to include bike/pedestrian facilities as part of development proposals, including connecting to existing facilities and planned facilities.

Objective: Encourage adoption of Complete Streets policies and promote the construction of complete streets.

10.4 BICYCLE AND PEDESTRIAN EXISTING AND PROPOSED ROUTE NETWORK

No specific funding amount is programmed for future bicycle and pedestrian improvements, but bicycle and pedestrian projects are eligible to compete with roadway capacity, safety improvement, and transportation enhancement projects. Constructing bicycle and pedestrian facilities is challenging for local governments when bound by fiscal constraints and many priorities. Building a walkable community takes a concerted effort of planning and partnering, resulting in incremental rewards that will eventually establish an active connecting network. Rising costs for traditional means of transportation along with the greater need for physical activity combine to warrant development of alternative modes of transportation.



The region's existing facilities include pedestrian and shared-use paths, shared roadways, bicycle lanes, and bike-on-bus racks. There are a number of dedicated facilities along the Mississippi Gulf Coast totaling approximately 33.54 miles of bike lanes, 8.5 miles of shared-use paths, and 12 miles of signed bike routes. There are over 40 miles of shared roadways where bicyclists consistently ride with traffic. An inventory of sidewalk locations was conducted for the region, and continued maintenance of the inventory is planned to support future planning and implementation efforts.

Methodology

The maps included in the county summaries to follow illustrate proposed and existing bicycle routes. The tables reference only a sample of priority routes for the planned network. The maps also illustrate existing sidewalks and pedestrian generators and/or points of interest. The proposed routes are intended to show potential for increased connectivity with consideration to serving urban, rural, and minority populations. The bike routes were identified based on input and recommendations from local government comprehensive plans, the Hancock County Greenways Plan, the Federal Emergency Management Agency (FEMA) long-term recovery plans, the 2030 Long Range Transportation Plan, and input from public meetings, local advocates and planners.

Sidewalks

An inventory of existing sidewalks was conducted in the spring of 2010. Sidewalk locations are presented in the maps included in the county summaries to follow. No proposed sidewalks are indicated on the maps. Gaps in the sidewalk network are noticeable around schools. School locations are identified with quarter-mile and half-mile walking radii to highlight locations where safe routes to school are needed. Transit centers and other points of interests are posted on the map to illustrate locations that generate pedestrian activity.

Bike Routes

The American Association of State Highway and Transportation Officials (AASHTO) definitions for facility types were used. The map identifies existing routes by type; proposed bike route types are unspecified. Over 400 miles of proposed routes were identified. The tables list only the priority routes by type. These were determined by local planners and advocates. The table also indicates whether the route segments access transit, schools, recreational facilities, commercial centers, job centers, and/or existing routes. The proposed facility types have not been evaluated in terms of right-of-way costs or potential conflicts with utilities, drainage facilities or wetlands.

10.5 HANCOCK COUNTY

Hancock County bicycle and pedestrian facilities include bikeways, sidewalks and shared-used paths built and maintained by the county, the City of Bay Saint Louis and the City of Waveland. These are listed in tables 10-2, 10-3 and 10-4 and graphically represented in figures 10-1, 10-2 and 10-3. Bay Saint Louis has a four-foot-wide bicycle lane on both sides of Dunbar Avenue connecting adjacent neighborhoods to parks, businesses and the Dunbar Avenue Fishing Pier. In Old Town Bay St. Louis, a historical biking and walking route has been designated by signage. In Hancock County, Beach Boulevard connects the US 90 Leo Seal Bridge shared-use pathway with sidewalks to Old Town and to the county's Sand Beach Pedestrian Pathway and Bikeway at Washington Street. This 12-foot wide shared-use pathway runs along the beach at the seawall for approximately three miles between Washington Street Pier in Bay Saint Louis and Garfield Ladner Pier in Waveland.

The City of Waveland recently completed five-foot-sidewalk projects on Central Avenue, Coleman Avenue, Nicholson Avenue and St. Joseph Street. Bay Saint Louis is pursuing Surface Transportation Program (STP) funding to increase sidewalk connections along Old Spanish Trail. The U. S. Army Corps of Engineers is replacing the seawall that, when completed, will have a pedestrian pathway approximately 10 feet wide between the Bay of Saint Louis US 90 bridge and Washington Street. The Live Oak Alliance and the Greenways Committee are working with the local governments to implement a Complete Streets strategy.



**Dunbar Avenue
Bike Lane
(Left)**



**Sand Beach
Shared Use Pathway
(Right)**

Coastal Impact Assistance Program (CIAP) funds and Tidelands funds are in place to extend the shared-use sand beach pathway approximately one mile to Buccaneer State Park. CIAP funding is in place to build a five-mile shared-use pathway in the county to serve the Infinity Science Center. The route will connect the Old Log Town community on the Pearl River to the Science Center. The Greenways Committee, in cooperation with Stennis Space Center (SSC) and the local governments, recently applied for scenic byway designation for Beach Boulevard and a number of roadways and highways in the SSC buffer zone which include a network of bike paths.

Table 10-2: HANCOCK COUNTY RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	Kiln-De-lisle Rd	County Limits	Highway 603		xx	xx	xx		xx	
BL	Gex Drive	Diamond-head Dr N	Yacht Club Drive							
BL	Yacht Club Dr	Gex Drive	Diamond-head Drive S			xx				
SR	US 90/ Front St	Waveland Avenue	Highway 607			xx	xx			xx
BL	US Highway 90	US Highway 90	Pearl River			xx	xx			
SU	Discovery Trail	Log Town Road	Infinity Science Center			xx				
BL	Highway 604	US Highway 90	Highway 607							
SU	Lake-shore Rd	US Highway 90	Beach Boulevard		xx				xx	
BL	Lower Bay Rd	US Highway 90	Lakeshore Road		xx		xx		xx	
BL	Clermont Boulevard	Beach Boulevard	Lower Bay Road						xx	
SU	Beach Boulevard	City Limits	Bayou Caddy			xx		xx	xx	

Table 10-3: WAVELAND RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
SR	Waveland Avenue	Beach Boulevard	US Highway 90						xx	
BL	Old Spanish Trail	US Highway 90	City Limits		xx				xx	
SU/BL	Central Avenue	Waveland Avenue	City Limits			xx			xx	xx
BL	St. Joseph Street	Coleman Av /Herlihy St	Fell Street		xx					
BL	McLaurin Avenue	Fell Street	Longfellow Drive		xx		xx			
BL	US Highway 90	City Limits	City Limits				xx	xx	xx	

Table 10-4: BAY SAINT LOUIS RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
SU	Beach Boulevard	Washington Street	Cedar Point			xx	xx		xx	Xx
BL	US Highway 90	Bay Saint Louis Bridge	City Limits				xx	xx	xx	Xx
BL	Old Spanish Trail	City Limits	Dunbar Avenue		xx	xx			xx	
BL	Dunbar Avenue	St Francis Street	US Highway 90		xx	xx	xx		xx	Xx
BL	Ulman Avenue	Beach Boulevard	US Highway 90			xx			xx	
BL	Felicity Street	Beach Boulevard	Casino Drive					xx		Xx
BL	Bluemead-ow Road	US Highway 90	Casino Drive		xx	xx	xx	xx		
SU	Pine Street	Blue Meadow Road	Athletic Drive		xx		xx			
SU	Athletic Drive	Pine Street	Dunbar Avenue		xx	xx			xx	Xx
BL	Drinkwater/Green Meadow	Blue Meadow Road	Washington Street			xx		xx		
BL	Hwy 603	US Hwy 90	County Limits		xx	xx	xx		xx	
SR	Carroll Av	US Hwy 90	Pine Street		xx	xx				
SU/BL	Central Avenue	City Limits	Washington Street						xx	Xx

Existing and Proposed Bicycle-Pedestrian Facilities

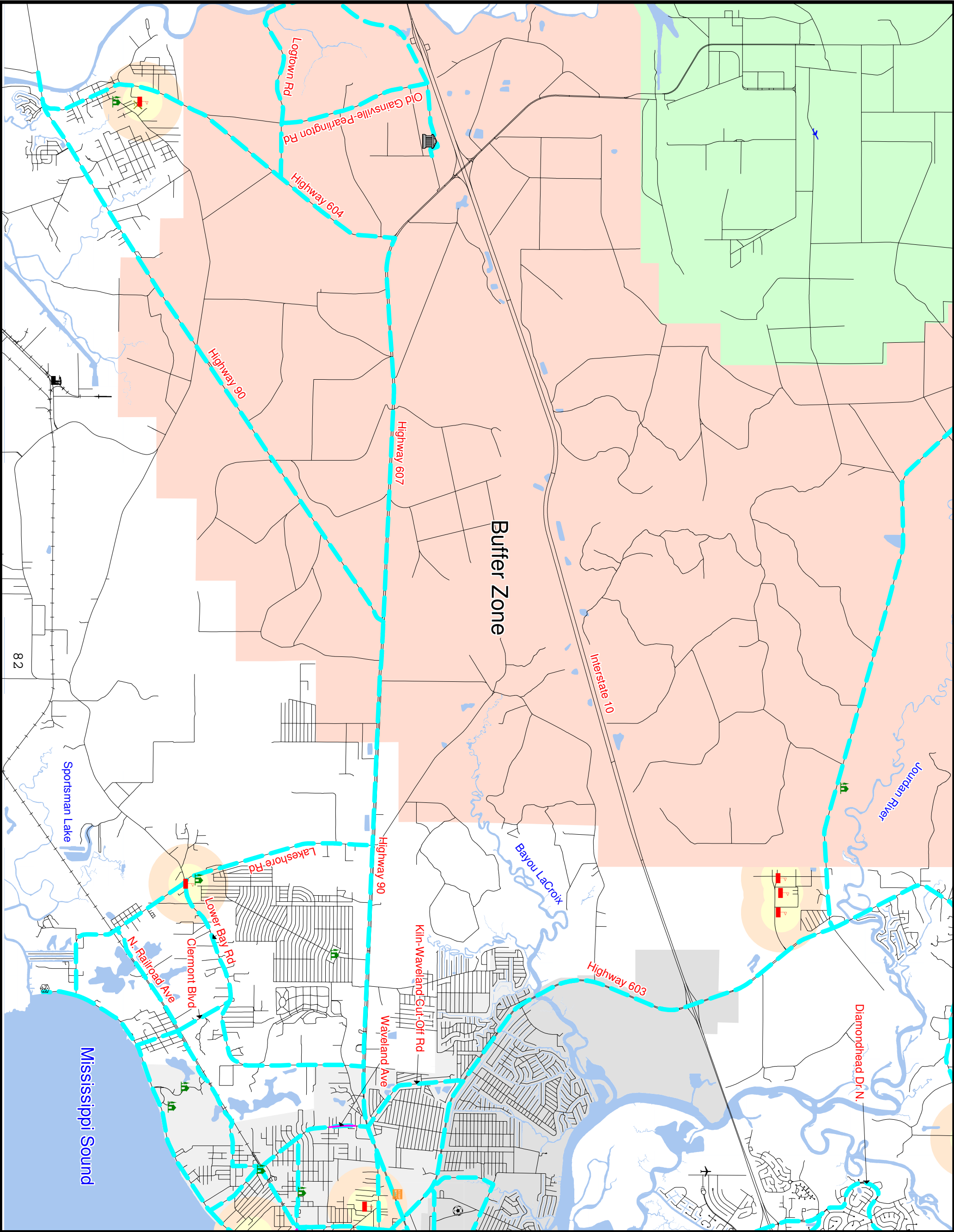
Legend

- Sidewalk
- Bike Lane
- Shared Use Pathway
- Signed Shared Roadway
- Shared Roadway
- Separated Pedestrian Pathway
- Adventure Cycling Route South Tier
- Proposed Bike Routes
- Quarter Mile Walk to School Radius
- Half Mile Walk to School Radius
- Points of Interest
 - Mall or Shopping Center
 - School
 - Hospital
 - Golf Course
 - Northrop Grumman Shipyard
 - Casino
 - Transit Center
 - Keesler Air Force Base
 - Medical Facility
 - Industrial Facility
 - Sports Complex
 - Airport
 - Parks/Recreational Area
 - Seabee Base
 - Soccer Complex
 - Infinity Science Museum
 - NASA

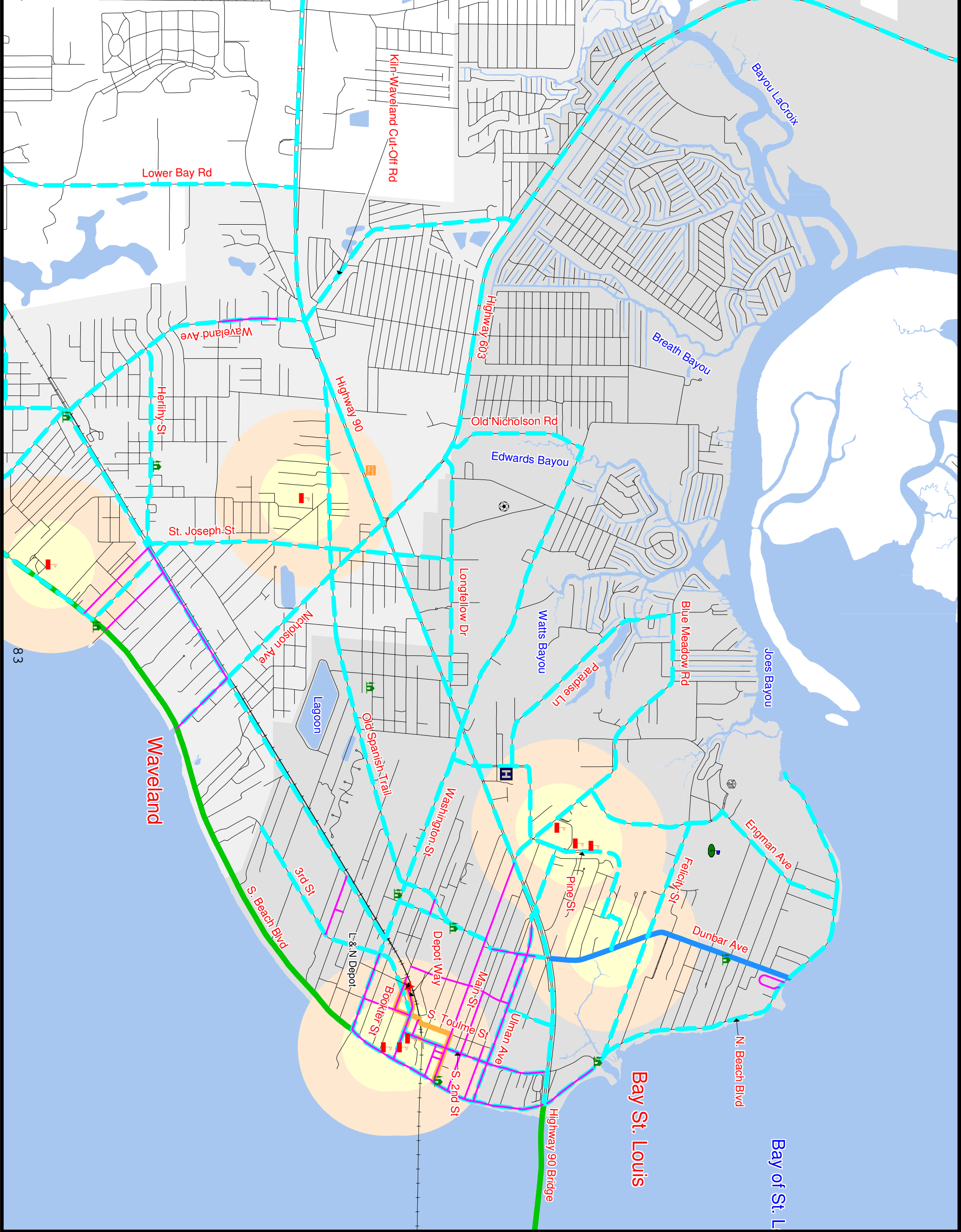
HANCOCK COUNTY



Figure:10.1



Existing and Proposed Bicycle-Pedestrian Facilities



Legend

- Sidewalk
- Bike Lane
- Shared Use Pathway
- Signed Shared Roadway
- Shared Roadway
- Separated Pedestrian Pathway
- Adventure Cycling Route South Tier
- Proposed Bike Routes
- Quarter Mile Walk to School Radius
- Half Mile Walk to School Radius
- Points of Interest
- Mall or Shopping Center
- School
- Hospital
- Golf Course
- Northrop Grumman Shipyard
- Casino
- Transit Center
- Keesler Air Force Base
- Medical Facility
- Industrial Facility
- Sports Complex
- Airport
- Parks/Recreational Area
- Seabee Base
- Soccer Complex
- Infinity Science Museum
- NASA

WAVELAND
AND
BAY SAINT LOUIS



Figure:10.2

Existing and Proposed
Bicycle-Pedestrian
Facilities

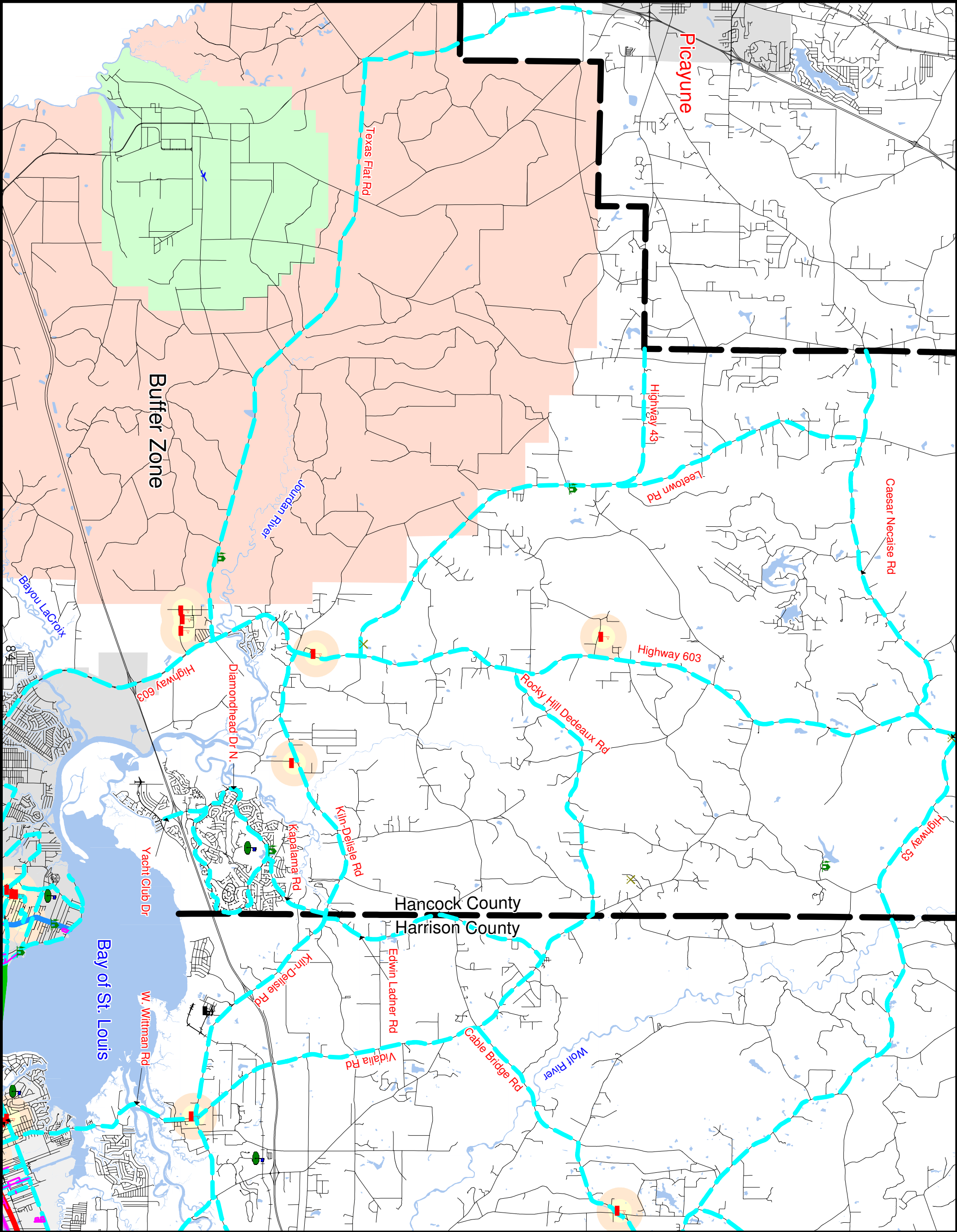
Legend

- Sidewalk
- Bike Lane
- Shared Use Pathway
- Signed Shared Roadway
- Shared Roadway
- Separated Pedestrian Pathway
- Adventure Cycling Route South Tier
- Proposed Bike Routes
- Quarter Mile Walk to School Radius
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 - Hospital
 - Golf Course
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 - Casino
 - Transit Center
 - Keesler Air Force Base
 - Medical Facility
 - Industrial Facility
 - Sports Complex
 - Airport
 - Parks/Recreational Area
 - Seabee Base
 - Soccer Complex
 - Infinity Science Museum
 - NASA

HANCOCK
AND
HARRISON
COUNTIES



Figure:10.3



10.6 HARRISON COUNTY

Harrison County bicycle and pedestrian facilities include bikeways, sidewalks and shared-used paths built and maintained by the county and the cities of Pass Christian, Long Beach, Gulfport, Biloxi and D'Iberville. These are listed in tables 10-5, 10-6, 10-7, 10-8, 10-9 and 10-10 and graphically represented in figures 10-4, 10-5 and 10-6. The Harrison County Sand Beach Pedestrian Pathway is located adjacent to the beach and runs along the seawall from the Biloxi-Ocean Springs Bridge to the Bay Saint Louis Bridge at Henderson Point. In sections where the 12-foot pedestrian path remains unbuilt, a sidewalk is provided on Beach Boulevard (US 90) adjacent to the seawall. Segments along the seawall in Gulfport and Biloxi are currently under construction with Transportation Enhancement Program funding.

On the north side of US 90, a four-foot sidewalk was built by MDOT that runs from bay-to-bay except for a few locations where limitations prevented the sidewalk from being installed. These sidewalks connect to the two 12-foot-wide shared-use paths on the US 90 bridges over the Bay of Saint Louis and Bay of Biloxi. Mississippi Highway 67 (MS 67) has the majority of bike-lane mileage between Highway 49 and the City of D'Iberville. The Highway 605 bike lane runs from MS 67 south, along Lorraine and Cowan roads, Highway 90.

Utilizing Surface Transportation Program funding, the City of Gulfport is working with the Harrison County Development Commission to build a shared-use pathway along Seaway Road. The city also plans to incorporate sidewalks on Dedeaux Road during a capacity improvement project.



Highway 90 and Highway 49 Intersection in Gulfport



Jeff Davis Avenue in Long Beach

10.7 JACKSON COUNTY

Jackson County bicycle and pedestrian facilities include bikeways, sidewalks and shared-used paths built and maintained by the county and the cities of Ocean Springs, Gautier, Pascagoula and Moss Point. These are listed in tables 10-11, 10-12, 10-13 and 10-14 and graphically represented in figures 10-7, 10-8, 10-9 and 10-10. In Jackson County, along the beach adjacent to Front Beach Drive in Ocean Springs, a 10-foot-wide shared-use pathway was recently completed connecting the harbor to the US 90 Biloxi-Ocean Springs Bridge shared-use pathway. Ocean Springs also has the popular signed Live Oak Bike Route that runs through town. Sidewalks are planned on Porter Street and Washington Avenue to Fort

Bayou. Pascagoula recently completed a portion of their planned historical bike and walking route that will connect downtown to the lighthouse on Highway 90, to the riverfront and to the planned Promenade walkway along the beachfront. Sidewalk projects are also planned to connect schools and to help restore neighborhoods. The City of Gautier has a shared-use pathway under construction along a portion of Highway 90, is proposing sidewalks along a segment of Martin Bluff Road, and is working with Coast in Motion Bike Club on designating a signed bike route through town. Moss Point recently completed a streetscape project on their Main Street and is working with Gulf Coast Heritage Trails Partnership to develop a bike route.



Washington Avenue in Ocean Springs

Table 10-5: HARRISON COUNTY RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	US Highway 49	Gulfport City Limits	County Line Road		xx		xx		xx	
SU	Old Highway 49	MS Highway 53	Pine Street (Howison)			xx				
BL	Beatline Road	28 th Street	CSX Railroad Crossing				xx		xx	
BL	County Farm Rd	Railroad Crossing	MS Highway 53		xx	xx			xx	
BL	Landon Road	City Limits	County Farm Road		xx	xx				
BL	Menge Avenue	Kiln-Delisle Road	City Limits		xx				xx	
SR	Kiln-Delisle Road	Menge Avenue	Edwin Ladner Road		xx	xx		xx		
SR	Wittman Road	City Limits	Kiln Delisle Road		xx		xx			
BL	Espy Avenue	Pineville Avenue	Red Creek Road		xx	xx		xx		
BL	Espy Avenue	Demourelle Road	Pineville Avenue		xx	xx		xx		

Table 10-6: PASS CHRISTIAN RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	Cedar Avenue	US Highway 90	North Street							
BL	Henderson Ave	US Highway 90	County Limits		xx				xx	
BL	Fleitas Street	US Highway 90	North Street			xx				
BL	Menge Avenue	US Highway 90	Demourelle Road			xx			xx	
BL	2nd Street	Church Avenue	White Harbor Road		xx	xx	xx	xx	xx	
BL	North Street	Cedar Avenue	Menge Avenue		xx		xx	xx	xx	

Table 10-7: LONG BEACH RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	Beatline Road	Railroad Street	28 th Street				xx	xx	xx	
BL	White Harbor Rd	US Highway 90	Railroad Avenue						xx	
BL	Pineville Avenue	Railroad Street	Espy Avenue		xx		xx		xx	
BL	Daugherty Road	Beatline Avenue	Pineville Avenue			xx			xx	
BL	Klondyke Road	Railroad Street	28 th Street			xx	xx			
BL	Cleveland Avenue	Klondyke Avenue	US Highway 90		xx	xx	xx		xx	
SU	US Highway 90	City Limits	City Limits			xx	xx		xx	
SU	Railroad Street	City Limits	Beatline Avenue		xx	xx	xx		xx	
BL	E Old Pass Road	Cleveland Avenue	City Limits		xx					
BL	Allen Road	Cleveland Avenue	65th to Lewis Avenue		xx	xx				
BL	Commission Road	Daugherty Road	City Limits		xx			xx	xx	

Table 10-8: GULFPORT RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES										
RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Com-mercial Centers	Jobs	Local Plans	Connect Existing Routes
SU	US High- way 90	City Limits	City Limits	xx					xx	
BL	Railroad Street	City Limits	33 rd Avenue							
BL	E Railroad Street	20th Avenue	Texas Avenue							
BL	Pass Road	33rd Avenue	Biloxi City Limits	xx	Xx		xx	xx	xx	
BL	28th Street	Canal Road	Pass Road	xx				xx	xx	
BL	33rd Avenue	US High- way 90	28 th Street	xx		xx				
BL	34th Avenue	28 th Street	Martin Luther King Drive							
BL	M L King Jr Drive	34th Avenue	US High- way 49		Xx	xx				
SU	Arkansas Av/Old 49	M L King Jr Drive	Creosote Road				xx			
BL	Mill Road	Magnolia Street	Kahler Street							
BL	Court- house Rd	US High- way 90	Kahler Street	xx	xx	xx	xx			xx
BL	Airport Road	Hewes Avenue	US High- way 49	xx			xx	xx		
BL	Hewes Avenue	US High- way 90	Airport Road			xx	xx	xx		xx
SU	Seaway Road	Three Rivers Road	Lorraine Road			xx	xx	xx	xx	
BL	Three Rivers Rd	Airport Road	Highway 605	xx	Xx	xx	xx	xx	xx	
BL	Dedeaux Road	Three Rivers Road	Highway 605		Xx	xx	xx	xx	xx	
BL	Landon Road	US High- way 49	Canal Road							
BL	Canal Road	28 th Street	MS High- way 53						xx	
BL	US High- way 49	Pass Road	MS High- way 53	xx	xx	xx	xx	xx	xx	
SU	Old Hwy 49	Landon Road	MS High- way 53	Xx	xx	xx	xx			
BL	Old Pass Road	City Limits	15 th Street	xx	xx	xx	xx	xx		
BL	15th Street	Old Pass Road	33 rd Avenue	xx	xx	xx				

Table 10-8:	Gulfport	(Continued)								
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	15th Street	Old Pass Road	33 rd Avenue	xx	xx	xx				
BL	Community Road	US Highway 49	Klein Road	xx	xx	xx	xx	xx	xx	
BL	Angela Drive	Klein Road	Three Rivers Road		xx	xx				
BL	Klein Road	Angela Drive	Dedeaux Road		xx		xx			

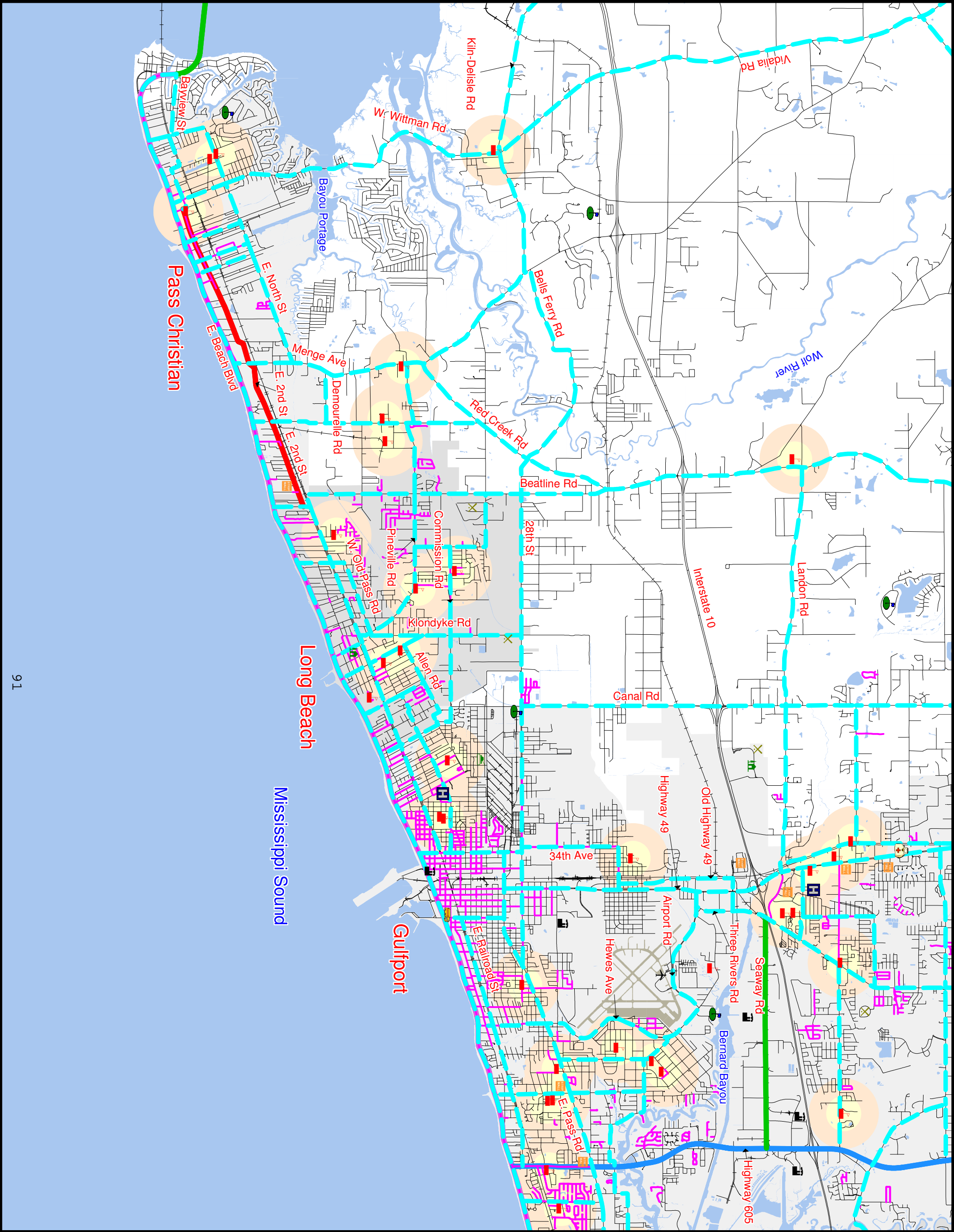
Table 10-9: BILOXI RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES										
PRIORITY OBJECTIVES										
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
SU	Popp's Ferry Rd	City Limits	Pass Road		xx				xx	
SR	Brodie Road	City Limits	Cedar Lake Road		xx				xx	
SU	Jam Lane	Richards Drive	Popp's Ferry Road		xx	xx			xx	
SR	Brasher Road	Wells Drive	Camp Wilkes Road		xx	xx			xx	
SR	Camp Wilkes Rd	Brasher Road	Popp's Ferry Road						xx	
BL	Atkinson Road	Popp's Ferry Road	Veterans Avenue			xx			xx	
SU	Veterans Avenue	Atkinson Road	US Highway 90					xx	xx	
SU	Pass Road	Rodeo Drive	City Limits	xx			xx	xx	xx	
BL	DeBuys Road	US Highway 90	Switzer Road	xx	xx				xx	
BL	Eisenhower Dr	Pass Road	US Highway 90	xx			xx	xx	xx	
SU	US Highway 90	City Limits	US 90 Bridge	xx	xx				xx	
BL	C T Switzer Sr Rd	DeBuys Road	Eisenhower Drive	xx			xx	xx	xx	
SR	Irish Hill Drive	Veterans Avenue	Porter Avenue	xx					xx	
SR	Rodenberg Ave	Pass Road	US Highway 90	xx		xx	xx		xx	

Table 10-9:	Biloxi	(Continued)								
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
SU	Division Street	Porter Avenue	Oak Street	xx		xx	xx		xx	
SU	Oak Street	US Highway 90	Bayview Avenue	xx					xx	
SU	Bayview Avenue	Oak Lawn Place	Oak Street	xx		xx		xx	xx	
SR	Main Street	Howard Avenue	Bayview Avenue	xx			xx	xx	xx	

Table 10-10: D'IBERVILLE RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES										
RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	Sangani Boulevard	Mallet Road	MS Highway 15	xx		xx	xx	xx		
BL	Mallet Road	Daisy Vestry Road	Sangani Boulevard				xx			
BL	Popp's Ferry Rd	D'Iberville Boulevard	Gay Road				xx			
BL	Gay Road	Popp's Ferry Road	Brodie Road							
BL	Brodie Road	Gay Road	Rodriguez Street	xx	xx	xx				
BL	Rodriguez Street	Brodie Road	Gorenflo Road	xx			xx			
BL	Lamey Bridge Rd	Central Avenue	Mallet Road	xx	xx	xx	xx			
BL	Automall Parkway	D'Iberville Boulevard	Rodriguez Street	xx		xx	xx			
BL	MS Highway 67	Sangani Boulevard	Tchoutacabouffa River				xx			xx



Existing and Proposed
Bicycle-Pedestrian
Facilities

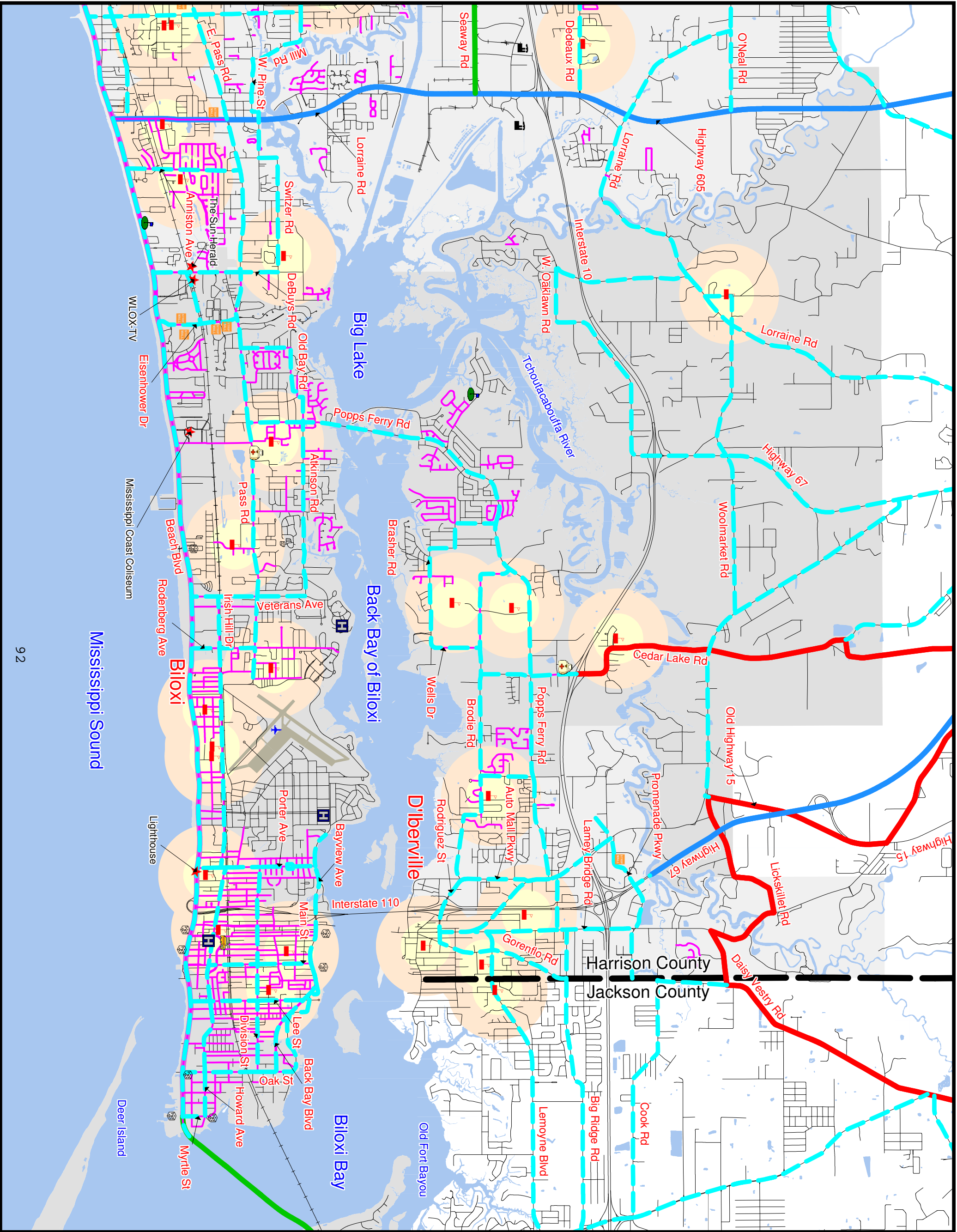
Legend

- Sidewalk
- Bike Lane
- Shared Use Pathway
- Signed Shared Roadway
- Shared Roadway
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- Adventure Cycling Route South Tier
- Proposed Bike Routes
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- Half Mile Walk to School Radius
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- School
- Hospital
- Golf Course
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- Casino
- Transit Center
- Keesler Air Force Base
- Medical Facility
- Industrial Facility
- Sports Complex
- Airport
- Parks/Recreational Area
- Seabee Base
- Soccer Complex
- Infinity Science Museum
- NASA

PASS CHRISTIAN
LONG BEACH
AND
GULFPORT



Figure:10.4



Existing and Proposed
Bicycle-Pedestrian
Facilities

Legend

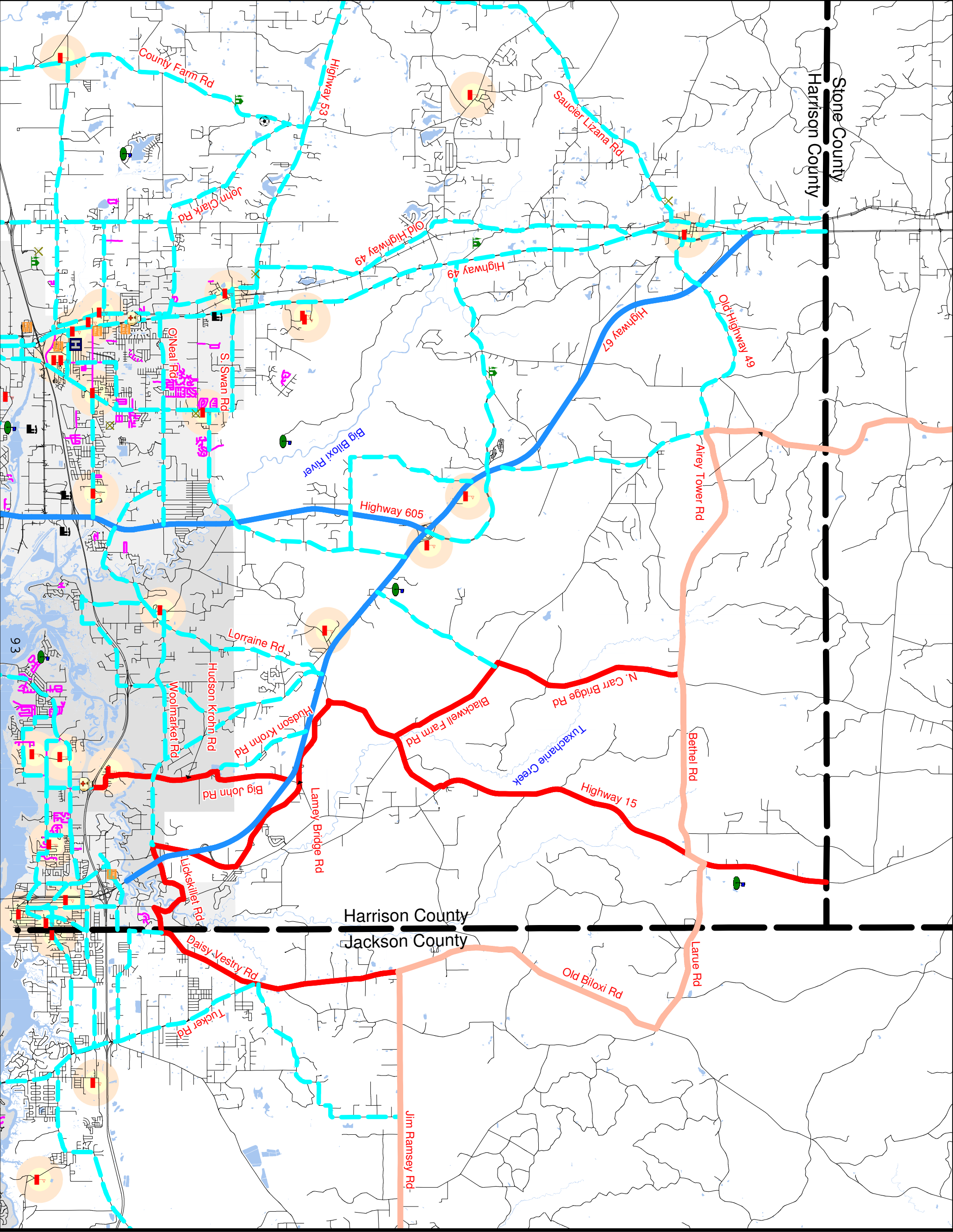
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- Infinity Science Museum
- NASA

BILOXI
AND
D'IBERVILLE



Figure:10.5

Existing and Proposed
Bicycle-Pedestrian
Facilities



- Legend**
- Sidewalk
 - Bike Lane
 - Shared Use Pathway
 - Signed Shared Roadway
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 - NASA

HARRISON COUNTY



Figure:10.6

Table 10-11: JACKSON COUNTY RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	Tucker Road	Interstate 10	Daisy Vestry Road			xx	xx			Xx
BL	Old Fort Bayou Rd	Highway 609	Jim Ramsey Road		xx		xx		xx	xx
BL	Lemoyne Blvd	Highway 609	Lamey Bridge Road		xx	xx	xx		xx	
BL	Jim Ramsey Road	MS Highway 57	Daisy Vestry Road						xx	
SR	Old River Road	MS Highway 57	Wade-Vancleave						xx	
SU	Wade-Vancleave	MS Highway 57	MS Highway 63						xx	
SU	Highway 614	MS Highway 63	State Line		xx	xx	xx		xx	xx

Table 10-12: OCEAN SPRINGS RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL/SU	US 90/Bienville	Biloxi Bay Bridge	MS Highway 57	xx		xx	xx			
SR	Government St	Washington Ave	Old Spanish Trail	xx	xx	xx	xx		xx	xx
SU	Old Spanish Trail	Government St	MS Highway 57		xx	xx	xx			
SR	Washington Ave	Front Beach Dr	Northern City Limits	xx		xx	xx			xx
BL	Holcomb Blvd	Shearwater Drive	Government Street	xx	xx	xx		xx		xx
BL	Halstead Road	East Beach Drive	Government Street			xx			xx	
BL	Magnolia Park Rd	Brumbaugh Ave	GINs Parkway			xx			xx	
BL	GINs Pkwy	Magnolia Park Road	US Highway 90			xx	xx		xx	
BL	Ocean Springs	Bienville Boulevard	MS Highway 57				xx	xx	xx	

Table 10-13: GAUTIER RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	US Highway 90	City Limits	Beasley Road		xx	xx	xx	xx		Xx
BL	US Highway 90	Johnson Road	City Limits				xx			Xx
SU	Old Spanish Trail	City Limits	Graveline Road		xx		xx			
BL	Graveline Road	Dolphin Road	Old Spanish Trail		xx	xx				
BL	De La Pointe Dr	Highway 90	Graveline Road				xx			
BL	Dolphin Road	Graveline Road	De La Pointe Drive				xx	xx		
BL	Ladnier Road	Graveline Road	US Highway 90		xx	xx	xx	xx		
BL	Dolphin Drive	Dolphin Road	Gautier/Vancleave Rd				xx			
BL	Gautier/Vancleave	US Highway 90	MS Highway 57		xx	xx	xx			

Table 10-14: MOSS POINT RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	Hwy 613 /Main St	City Limits	City Limits			xx	xx	xx	Xx	
BL	Griffin St /River Rd	Jefferson Avenue	Dantzler Street		xx				Xx	
BL	Magnolia Street	Jefferson Avenue	Dantzler Street		xx	xx			Xx	
BL	Dantzler Street	Griffin Street	Main Street		xx	xx			Xx	
BL	Orange Grove Rd	MS Highway 63	Mill Street		xx	xx			Xx	
BL	M L King Jr Blvd	Main Street	Mill Street		xx	xx	xx		Xx	
BL	Jefferson Avenue	Main Street	Shortcut Road							

Table 10-15: PASCAGOULA RECOMMENDED BICYCLE FACILITIES AND PRIORITY OBJECTIVES

RECOMMENDED BICYCLE FACILITIES				PRIORITY OBJECTIVES						
Type	Street Name	From	To	Transit Access	School Access	Parks/ Recreation	Commercial Centers	Jobs	Local Plans	Connect Existing Routes
BL	US Highway 90	City Limits	City Limits				xx	xx	xx	
BL	Telephone Road	US Highway 90	Highway 613/Main St		xx		xx	xx		
BL	Main Street	Telephone Road	Jefferson Avenue			xx	xx			
BL	Old Mobile Ave	Old Mobile Highway	City Limits							
BL	Market Street	Beach Boulevard	Jackson Avenue				xx			
BL	Pascagoula St	Beach Boulevard	Jefferson Avenue				xx			
BL	Ingalls Avenue	Pascagoula Street	Martin Road		xx		xx			
SU	Beach Blvd	West End	Martin Road			xx			xx	xx

10.8 BICYCLE AND PEDESTRIAN PROGRAMS AND INITIATIVES

Safe Routes to School

MDOT promotes a Safe Routes to School (SRTS) program that organizes sustained efforts by parents, schools, community leaders, local and state governments to improve the health and well-being of children by enabling and encouraging them to walk and bike to school. To develop safe and functional pedestrian and bicycling facilities requires a comprehensive approach that includes extensive education, engineering, enforcement, and evaluation. GRPC plans to continue working with MDOT and Bike Walk Mississippi's Safe Routes to School State Project Network to promote and develop programs within the metropolitan areas.



Complete Streets Policies

Although pedestrian and bike accessibility and mobility near schools is of the utmost importance, connecting other destinations – such as stores, libraries, community centers and recreational facilities – also represents an important component of the effort to build a multimodal transportation network.

GRPC is pursuing the development of a Complete Streets Policy for the metropolitan planning organization (MPO) to adopt as a means of encouraging local governments to use Surface Transportation Program funds to implement transportation improvements that meet needs of all users. The policy will be developed with input from the Technical Coordinating Committee and for adoption by the Transportation Policy Committee.

Existing and Proposed
Bicycle-Pedestrian
Facilities

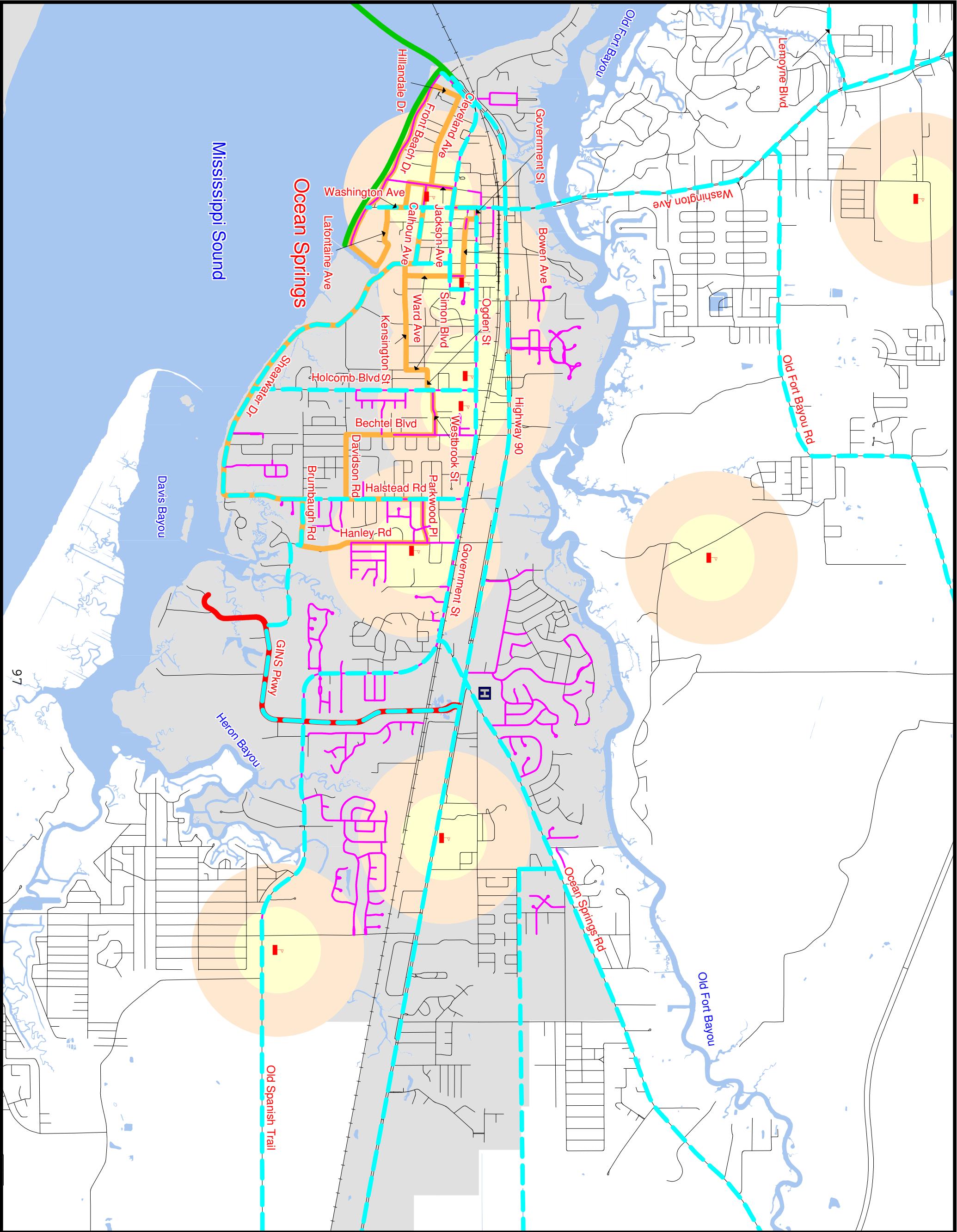
Legend

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 - Transit Center
 - Keesler Air Force Base
 - Medical Facility
 - Industrial Facility
 - Sports Complex
 - Airport
 - Parks/Recreational Area
 - Seabee Base
 - Soccer Complex
 - Infinity Science Museum
 - NASA

OCEAN SPRINGS



Figure:10.7



Existing and Proposed
Bicycle-Pedestrian
Facilities

Legend

- Sidewalk
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GAUTIER

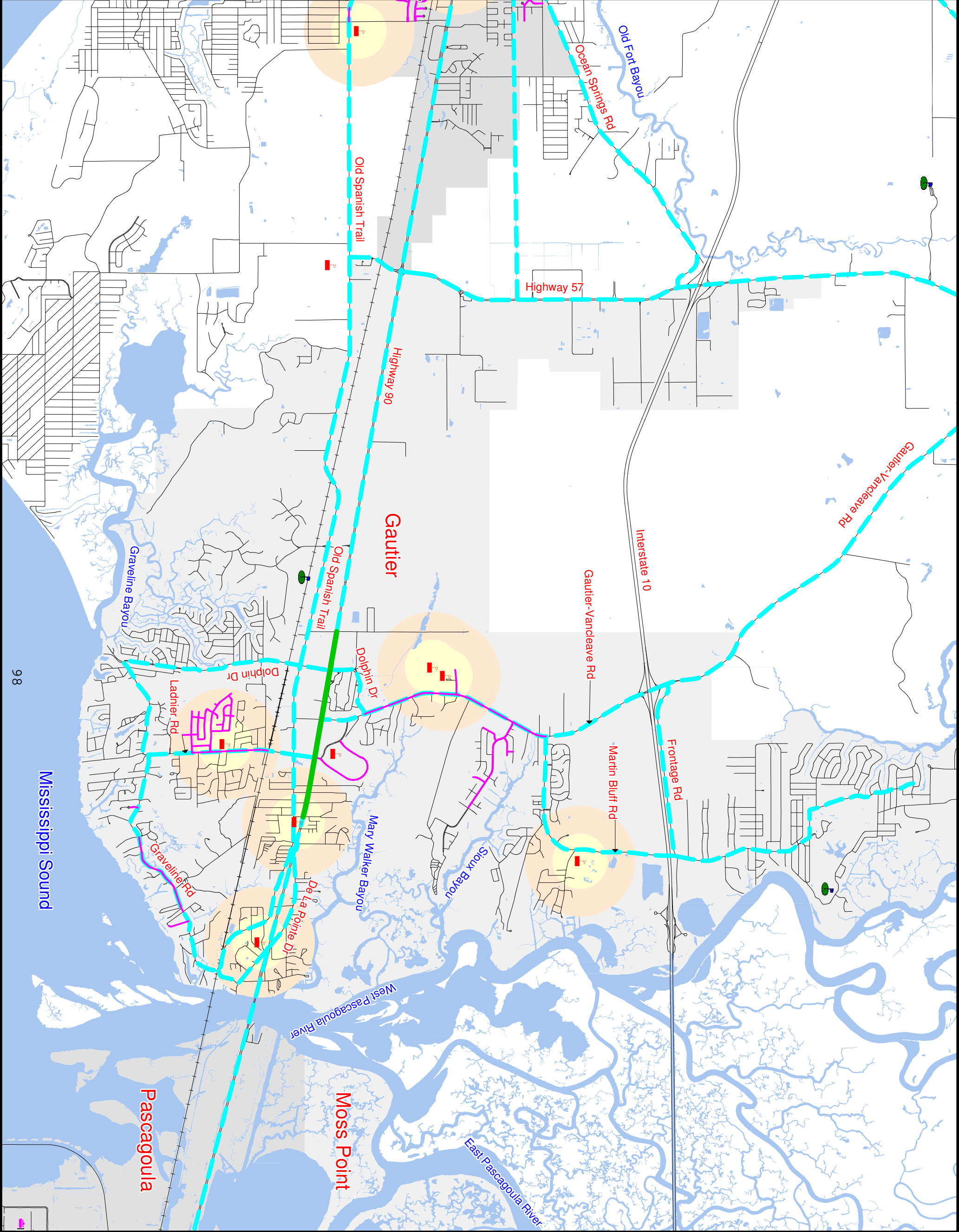
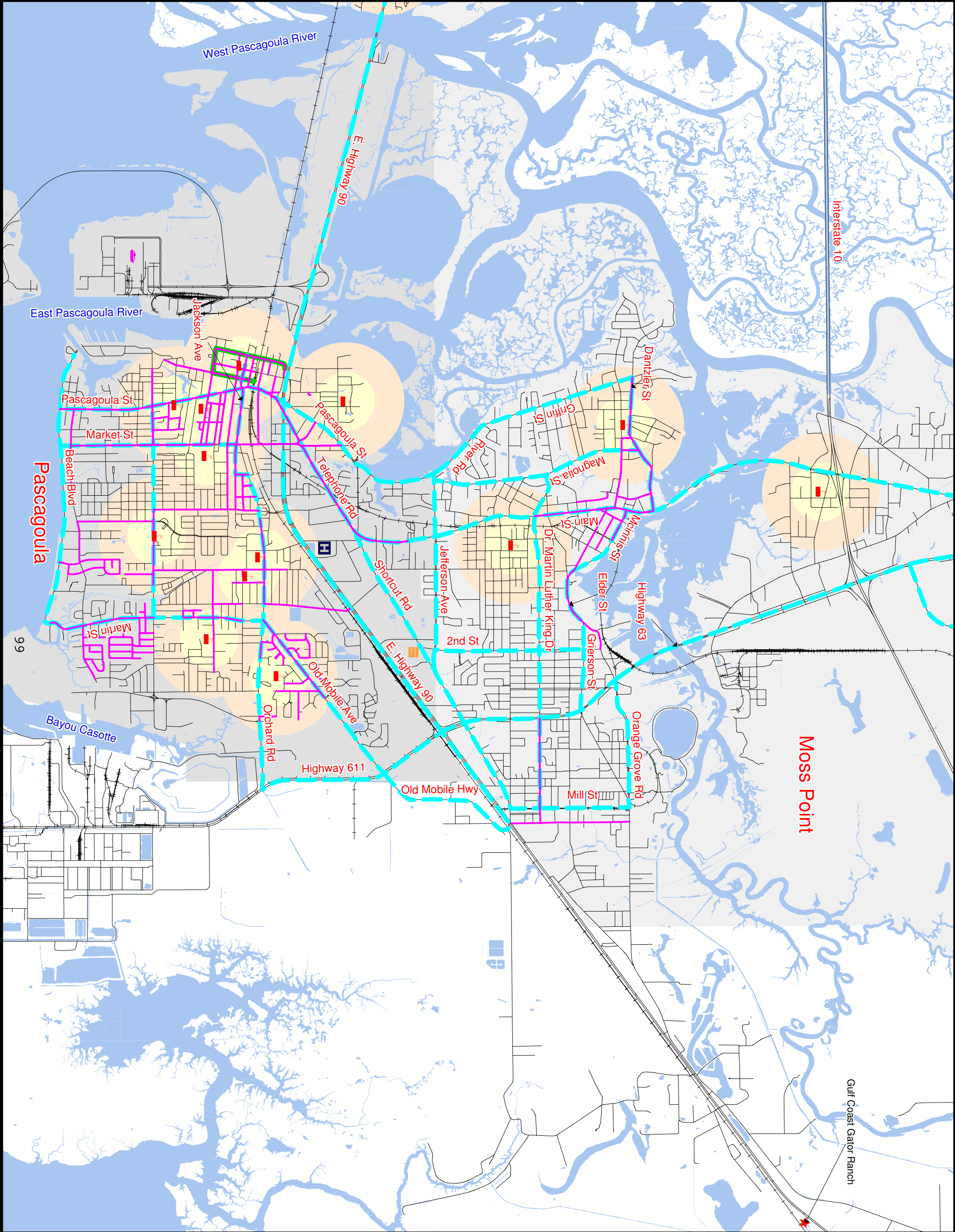
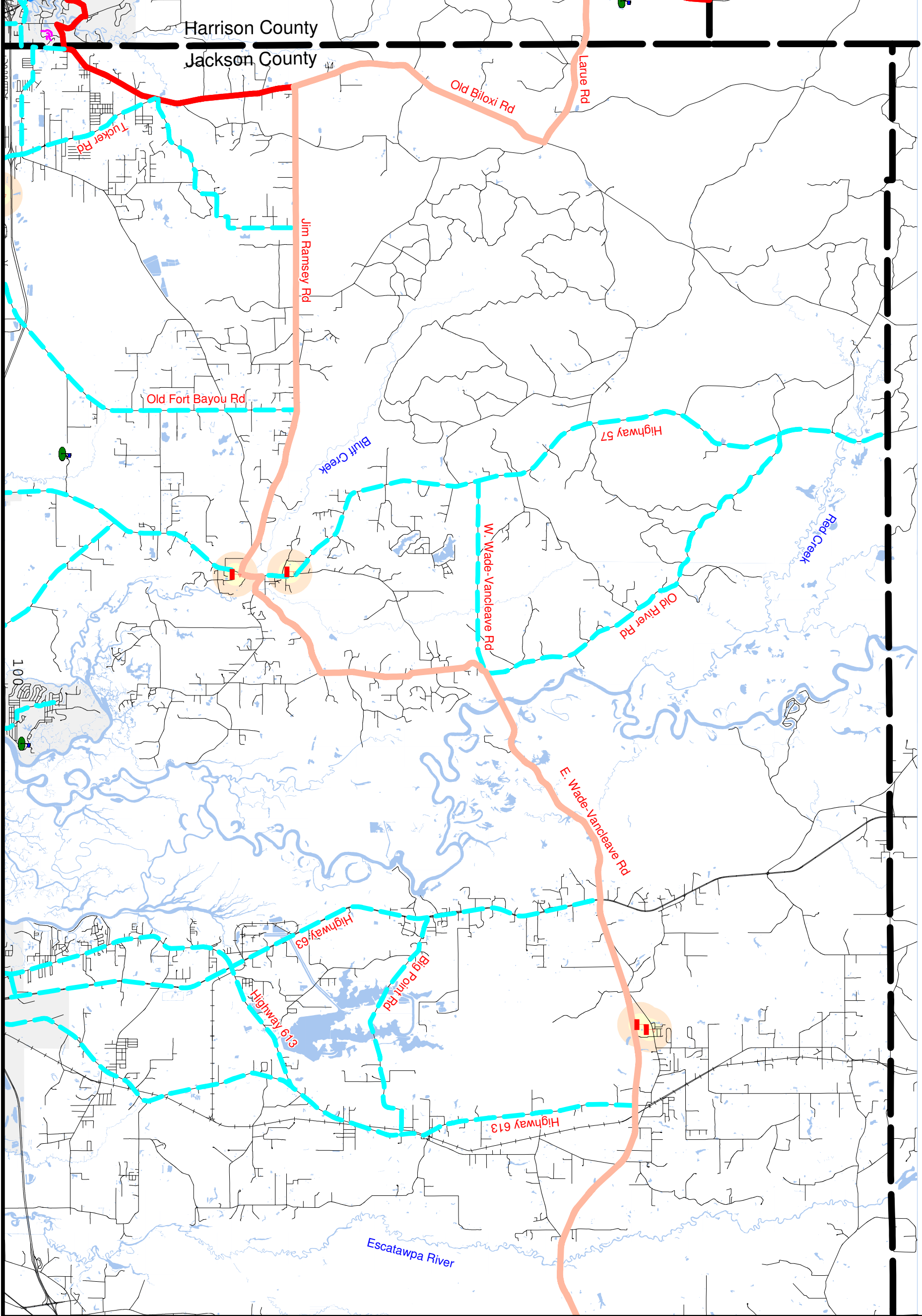


Figure:10.8

Existing and Proposed
Bicycle-Pedestrian
Facilities



Existing and Proposed Bicycle-Pedestrian Facilities



Legend

- Sidewalk
- Bike Lane
- Shared Use Pathway
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JACKSON COUNTY

Providing facilities for pedestrian and bicycle trips, and promoting awareness of non-motorized modes as viable alternatives for trip-making, will improve public health and safety and reduce automobile travel, resulting in less highway congestion, better air-quality and fewer parking problems. Allowing safe access for all residents will improve the overall quality of life of the region.

Approximately 30 percent of Americans do not drive. There is a demand for modal alternatives that do not involve the use of personal vehicles, especially around schools, parks and neighborhoods near service-oriented businesses. Presently, the poor economy and increased fuel prices cause more residents to walk, bicycle and/or use transit for reasons of utility. Building streets with sidewalks and bike lanes improves safety and can increase property values. According to the Federal Highway Administration (FHWA), pedestrian and vehicular accidents are decreased by 50 percent when sidewalks are present; and installation of key traffic calming measures reduces vehicular and pedestrian accidents by 25 percent.

Legal Right to Ride or Walk

Residents have the legal right to ride their bicycle or walk on a highway. The operator of the bicycle has all of the rights and all of the duties applicable to the driver of a vehicle. A new law requires that motorists when passing a bicyclist must leave not less than three (3) feet between the vehicle and the bicycle.

Design Guideline Sources

Engineering safe, walkable and bikeable facilities takes extensive research and the application of creative design features. Good design invites the right use. Pedestrian and bicycle routes should be designed according to appropriate guidelines while being sensitive to the route's location for proper mobility and safety. While there are number of different resources for bike and pedestrian design, MDOT recommends that local governments use the pedestrian and bicycle facility design guidelines formulated by AASHTO. Another acceptable guide sponsored by the FHWA is the Institute of Transportation Engineers (ITE) *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*. Since certain bicycle facility types are not always feasible, alternative designs exist such as roadways with wide lanes, shoulders or sidewalks which may be suitable for bicycle or pedestrian traffic. Signs and road paint can also be used to mark streets appropriately for bicycle riding and to encourage travel on designated roadways.

10.9 FUNDING SOURCES

There are many tangible economic, environmental, social and health benefits that accrue to a community when bicycle and pedestrian projects are designed and built to meet the needs of the public. Nevertheless, financing bicycle and pedestrian facilities is a great challenge. Existing programs should continue to be pursued. New funding opportunities which should be considered include special assessments, developer-built projects, bicycle licensing/registration fees, local corporate and/or foundation (public/private) partnerships.

Surface Transportation Program (STP)

STP remains one of the principal sources of federal funding for transportation improvements in urbanized areas. Ten percent of STP funds apportioned to a state are set aside for Transportation Enhancement Program (TEP) activities. TEP funding is available to local governments, communities, and non-profit organizations that have projects directly related to surface transportation. As TEP funds are administered to states, the details of individual state programs are different; but each state works with

FHWA to ensure that projects meet the specified criteria. In addition to being related to surface transportation needs, projects also must pertain to one of the following twelve eligible activities:

- Provision of pedestrian and bicycle facilities;
- Provision of pedestrian and bicycle safety and education activities;
- Acquisition of scenic or historic easements and sites;
- Scenic or historic highway programs, including tourist and welcome centers;
- Landscaping and scenic beautification;
- Historic preservation;
- Rehabilitation and operation of historic transportation buildings, structures, or facilities;
- Conversion of abandoned railway corridors to bicycle or walking trails;
- Control and removal of outdoor advertising;
- Archaeological planning and research;
- Environmental mitigation of highway runoff pollution, reducing vehicle-caused wildlife mortality or maintaining plant and animal habitat connectivity;
- Establishment of transportation museums.

Congestion Mitigation and Air Quality (CMAQ) Program

The Congestion Mitigation and Air Quality (CMAQ) Program was created in 1991 under the *Intermodal Surface Transportation Efficiency Act* (ISTEA) to fund transportation-related projects that are designed to reduce traffic congestion and improve air quality. CMAQ has seven major project categories:

- Transit;
- Shared ride;
- Traffic flow improvements;
- Demand management;
- Pedestrian/bicycle;
- Inspection/maintenance (I/M) and other transportation control measures (TCMs);
- Surface Transportation Program (STP)/CMAQ.

Highway Safety Improvement Program (HSIP)

This federal-aid program, launched in FY 2006, sought to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Bicycle and pedestrian projects are eligible but account for a very low percentage of construction funds.

Recreational Trails Program (RTP)

RTP is aimed at providing funds to develop and maintain recreational trails and trail-related facilities. Funding can be used for both motorized (four-wheel vehicles, all terrain vehicles, etc.) and non-motorized (pedestrian, bicycling, equestrian, skiing, etc.) recreational trail use.

Scenic Byways

Bicycle and pedestrian projects have typically constituted a small percentage (two to three percent) of scenic byways projects.

Safe Routes to School Program (SRTS)

This program fosters partnerships with local governments, schools (K-8), communities and parents. Funds are available on a competitive application basis once a year to improve the livability of roadways

creating safe routes to schools and to develop outreach programs to encourage children to walk and bike to school.

Highway Safety Program

The Section 402 Highway Safety Program is used to support states focusing on education and enforcement programs. This has been a small but important source of funding for bicycle and pedestrian safety education programs.

Community Development Block Grant (CDBG)

Funding streets, sidewalks and streetscapes are eligible activities under the CDBG program, provided the local project meets program threshold requirements.

Tidelands Trust Funds

These funds are available to local governments along the Mississippi Gulf Coast, and bicycle and pedestrian projects are eligible as long as they meet program requirements for providing public access to the waterfront.

Local Funds

When budgeting allows, most local government can provide maintenance, restriping, bike routes, paved shoulders and signage.

11.1 INTRODUCTION

Providing a safe transportation system for the Mississippi Gulf Coast region requires cooperation among the engineering, education and enforcement communities. Because both driver and vehicle factors play a major role in many crash types, educating drivers is essential to reducing incidents and fatalities. A multi-faceted approach to transportation safety is recommended for addressing these and other issues.

This chapter discusses transportation safety methods and programs. One of the main objectives of this chapter is the enhancement of public safety in the Mississippi Gulf Coast region. This includes the safety of motorists and users of non-motorized modes. Other goals of the safety plan include methods of increasing safety education outreach and safety-related programs.

The benefits of using safety countermeasures are discussed, some of which include the following: Improved roadway lane/shoulder design to more safely accommodate bicyclists on selected routes; installation of reflective raised centerline markers, rumble-strips and reflective lane demarcation; and signage to reduce lane departures.

Other safety methods reviewed in this chapter include increasing the use of access management, traffic calming measures, increased use of medians, increased use of median crossover prevention measures, and the increased use of other proven innovative measures to reduce accidents and/or the severity of accidents. Programs for improving and increasing education for rail safety are also discussed, and a description of the current emergency transit evacuation program is provided.

11.2 SAFETY GOALS

Safety program goals include the following:

- Enhance the safety of motorists and users of non-motorized modes;
- Increase safety education outreach and safety-related programs in the region;
- Improve highway-railroad grade crossing protection on major rail lines;
- Facilitate the safe and expeditious evacuation of the public from affected areas in the event of an impending hurricane or other catastrophe.

11.3 SAFETY COUNTERMEASURES

The main goal of the safety plan is to enhance the safety of motorists and users of non-motorized modes. There are many different methods that can be used to increase transportation safety. Incorporating the nine safety counter-measures recommended by the Federal Highway Administration

(FHWA) can help improve overall safety in the region. It is recommended that the metropolitan planning organization (MPO) adopt these counter-measures when appropriate in the planning process. A description of each proposed counter-measure, a cost range, and supporting data and benefits are provided below.

Road Safety Audit

A Road Safety Audit (RSA) is a safety-performance examination of an existing or proposed future road or intersection by an independent, multi-disciplinary team. These are low in cost, requiring little more than time and team coordination. Crash reduction percentages from 20 to 80 percent have been recorded on past projects where an RSA was done in advance. Lifecycle costs also are reduced, since safer designs often carry lower maintenance costs. Societal costs of collisions are reduced by safer roads and fewer severe crashes. More information is available at the FHWA safety website (<http://safety.fhwa.dot.gov/rsa>).

Rumble Strips and Rumble Stripes

Rumble strips are ground into the pavement outside the travel lane. Rumble stripes are ground into the pavement and painted over with the appropriate striping. Cost will vary based on the application. Prices range between \$0.20 and \$3.00 per linear foot. Over 50 percent of California's fatal crashes are a result of road departure. This application provides an audible warning and physical vibration to alert drivers they are leaving the roadway. The application of rumble stripes or strips has shown good results in reducing run off the road (ROR) crashes. More information is available at the FHWA safety website (http://safety.fhwa.dot.gov/roadway_depth/rumble/index.html).

Median Barriers

Median barriers separate opposing traffic on a divided highway and are used to redirect vehicles striking either side of the barrier. Costs for installation of a median barrier range from medium to high, depending on the material used. The average cost is \$76,500 per mile. Cross-median crashes can be some of the most severe, and most result in serious injury or death. Median barriers can significantly reduce the occurrence of cross-median crashes and the overall severity of median-related crashes. More information is available at the FHWA safety website (http://safety.fhwa.dot.gov/tools/median_barrier.htm).

Safety Edge

A safety edge is a paving technique in which the interface between the roadway and graded shoulder is paved at an angle to eliminate vertical drop-off. This very low-cost technique requires a slight change in the paving equipment. Research between 2002 and 2004 showed that pavement edges may have been a contributing factor in as many as 15-20 percent of ROR crashes. When a driver drifts off the roadway and tries to steer back onto the pavement the action may result in oversteering. A safety edge minimizes that occurrence by reducing the vertical angle between the shoulder and pavement. More information is available at the FHWA safety website (http://safety.fhwa.dot.gov/roadway_dept/docs/sa07023/).

Roundabouts

Roundabouts are circular intersections with specific design and traffic-control features that ensure low travel speeds (<30 mph) through the circulatory roadway. While fairly expensive to



implement, they are good for the following locations and situations:

- Intersection locations with a history of accidents;
- Locations with high delays;
- Intersections with more than four legs;
- Intersections with high left-turn flows;
- Intersections where queues need to be minimized;
- Intersections with irregular approach geometry;
- Locations where there is a need to provide inexpensive-to-operate traffic control as an alternative to a traffic signal;
- Locations where there is a high proportion of U-turns;
- Locations with abundant right-of-way;
- Locations where storage capacity for a signalized intersection is restricted;
- Intersections that are important from an urban design or visual point of view.

Roundabouts offer the following advantages:

- Roundabouts can moderate traffic speeds on an arterial.
- They are generally aesthetically pleasing if well landscaped.
- They enhance safety compared to traffic signals.
- They can minimize queuing at the approaches to an intersection.
- They are less expensive to operate than traffic signals.

Disadvantages include the following:

- They may be difficult for large vehicles (such as fire trucks) to circumnavigate.
- They must be designed so that the circulating lane does not encroach on crosswalks.
- They may require the elimination of some on-street parking.
- Landscaping must be maintained, either by residents or by the municipality.

The effectiveness of roundabouts in improving vehicular safety is demonstrated by an average reduction of 29 percent in the overall number of accidents, with a reduction from 9.3 to 5.9 accidents per year for affected locations, according to *“Roundabouts: An Informational Guide”*. State Farm Insurance cites an even better average reduction in the overall number of accidents (39 percent) with the number of accidents involving injury reduced by 76 percent.

Left- and Right-Turn Lanes

Installation of turn lanes reduces crash potential and motorist inconvenience, and improves operational efficiency. Costs range from medium to high, as some installations may require additional right-of-way. Rear-end crashes are the most frequent type of collisions at intersections. Adding turn lanes provides separation between turning and through traffic and reduces these types of conflicts. It is desirable to offset opposing left-turn lanes to increase the visibility of approaching vehicles. More information is available at the FHWA safety website (<http://safety.fhwa.dot.gov/intersections/intersectionsap.htm>).

Yellow Change Intervals

The duration of the amber signal interval should be appropriate for the speed and distance traveled at a signalized intersection. This represents a very low-cost measure, since only time and interagency

coordination are required. Yellow change intervals that are not consistent with normal operating speeds create a dilemma zone in which drivers can neither stop safely nor reach the intersection before the signal turns red. Increasing yellow time to meet the needs of traffic can dramatically reduce redlight-running.

Median and Pedestrian Refuge Areas

Median and pedestrian refuge areas provide additional protection for pedestrians and lessen their risk of exposure to oncoming traffic. These are low-cost retrofit improvements, with even lower costs for new roadway projects. Pedestrian fatalities account for approximately 700 deaths or 17 percent of all fatalities in California. Providing raised medians or pedestrian refuge areas has resulted in a 46-percent reduction in accidents involving pedestrians. Raised medians or refuge areas are especially important at multi-lane intersections with high volumes of traffic. More information is available at the FHWA safety website (http://safety.fhwa.dot.gov/ped_bike/univcourse/swless15.htm).

Walkways

Pathways, sidewalks, or paved shoulders should be provided wherever possible, especially in urban areas and near school zones where there are high volumes of bikes and pedestrians. Costs tend to be medium to high, depending on the amount and type of application. *Walking-along-road* pedestrian accidents represent approximately 7.5 percent of all walk-related mishaps. The presence of a path, sidewalk, or paved shoulder can provide a significant reduction in this type of accident. Additional information may be found at the FHWA environmental website (www.fhwa.dot.gov/environment/bikeped/design.htm#d4).

11.4 SAFETY EDUCATION PROGRAMS

A primary goal of the safety plan is to increase safety education outreach and safety-related programs in the region. An important element of the MPO's safety program is continued cooperation with and support for MDOT's safety education programs, including the number of safety education visits to the region. MDOT offers a variety of safety education programs that not only strive to make highways safer through engineering and construction methods, but seek to educate the public on the importance of being proactive in ensuring their own safety while traveling on roadways. MDOT offers the following programs that are available for presentations at schools and safety events statewide. These programs give the audience an up-close look at the tragic consequences that can occur when unsafe driving decisions are made. Additional information may be found on the MDOT website (www.mdottrafficsafety.com)

Rollover Simulator

Rollover Rover is a truck cab that spins on its own axis at 35 mph to simulate a rollover crash. Cloth dummies placed inside the simulator are used to illustrate the effects of the rollover crash on unrestrained occupants. The demonstration is part of MDOT's *Drive Smart Mississippi* program to increase seatbelt usage in the state. Rollover Rover is available for demonstrations at schools attended by students in grades kindergarten through college, and for various other safety-related events.

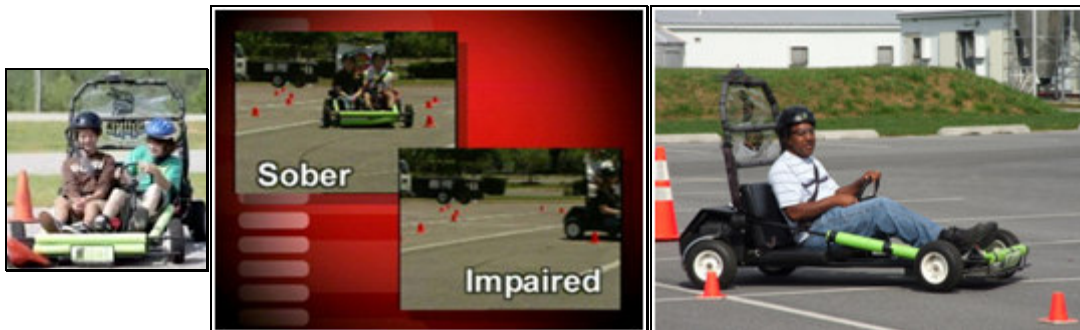


Seatbelt Convincer

The Seatbelt Convincer illustrates the benefits of seatbelt use – even when involved in a low-speed collision. The Convincer simulates a low-impact crash and the benefit of seatbelts and airbags. The participant is restrained and sits in a carriage at the top of a slide. The slide is released, allowing gravity to pull the carriage forward, eventually reaching a speed of at least five miles per hour before colliding with bumpers at the front of the system. The Convincer allows riders to experience the force generated in a low-speed collision.

Simulated Impaired Driving Experience

SIDNE (Simulated Impaired Driving Experience) is a battery-powered go-cart that simulates the effects of impairment on driving skills. The simulator operates in two modes: Normal and impaired. In normal mode, the simulator's steering, braking, and acceleration systems respond appropriately. In impaired mode, SIDNE reacts with delayed steering, braking, and acceleration, similar to how a driver would react if driving while impaired.



Fatal Vision® Goggles

Fatal Vision® Goggles are training tools used to demonstrate visually various levels of impairment and the dangers of impaired driving. The goggles distort vision and cause the wearer to behave similarly to one impaired by alcohol or drugs. The demonstration of the goggles often includes the wearer attempting to play basketball, throwing soft foam balls back and forth to other students, attempting to walk a straight line, as well as other various skills to demonstrate the difficulty of performing basic tasks while wearing the goggles.

Room to Live Video

The *Room to Live* video was a 2007 production of Fox 9 News/KMSP-TV in Minneapolis, Minnesota. The Fox 9 News investigative team, over the course of several months, investigated crashes where occupants were severely injured or killed in rollover crashes. The reporter takes viewers on a tour of several of the post-crash vehicles that were involved in these rollovers, giving an up-close perspective on the interior of each vehicle. In all instances, the passenger compartment of the vehicle was mostly intact and had very little intrusion into the cockpit or “cage” area of the vehicle, showing that had the driver been wearing a seatbelt, he or she would have had “room to live.” The video is a moving visual representation of the startling reality that in these instances seat belts could have made the difference between life and death or between minor injury and permanent disability.

Mississippi Operation Lifesaver

One of the MPO’s goals is to improve highway-railroad grade crossing protection on major rail lines. This can be accomplished through reducing the number of rail crossings without adequate signage, gates and warning lights, and increasing education on rail in the region. Mississippi Operation Lifesaver, Inc. (MSOL) is an important partner for the MPO in promoting rail safety by planning for expanded crossing protection. MSOL is a nonprofit public safety education organization that works to reduce the number of incidents at highway-rail grade crossings and trespassing on railroad rights-of-way. To accomplish its mission, MSOL promotes the “3 Es of Safety”:

- Education – Operation Lifesaver strives to increase public awareness about dangers encountered around railroads. The program seeks to educate both drivers and pedestrians to make safe decisions at crossings and around railroad tracks.
- Engineering – Engineering is responsible for keeping crossings as safe as possible and making improvements where needed. Operation Lifesaver encourages continued engineering research and innovation to improve the safety of railroad crossings.
- Enforcement – Operation Lifesaver promotes active enforcement of traffic laws relating to crossing signs and signals and private property laws related to trespassing.

MSOL has been working toward eliminating highway-rail grade crossing and trespassing incidents in Mississippi for more than three decades. This is accomplished by volunteer certified presenters who educate the public by giving free age and group-appropriate presentations to schoolchildren, school transportation personnel, professional drivers, law enforcement officers, emergency response personnel, civic clubs and church groups. All Operation Lifesaver presentations are supported by visual materials, age-appropriate videos, and brochures. Presentations for adult groups are usually one hour long, while presentations to schools will vary, depending on the age group. It is recommended that the MPO work with MSOL to increase the number of safety presentations given in the area, and to consult with MSOL when planning road projects near rail lines.

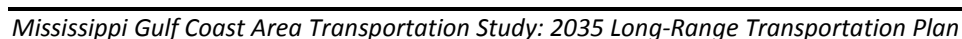
Safe Routes to School

Another valuable safety program is MDOT’s Safe Routes to School (SRTS). This program enables and encourages children, including those with disabilities, to walk and bicycle to school safely. The program sets out to make walking and biking more appealing transportation options for students in grades kindergarten through eighth, thereby encouraging a healthy and active lifestyle from an early age.

General Population Evacuation

Coast Transit Authority Evacuation Program

Figure 11-1: MISSISSIPPI GULF COAST AREA EMERGENCY EVACUATION NETWORK



CTA initiates its evacuation transportation program after the Harrison County Emergency Management Agency issues a hurricane evacuation notice and instructions. CTA then attempts to contact the disabled and elderly who have preregistered for the program. Once an evacuation notice is issued, registered persons must call CTA to confirm that they will need transportation assistance. CTA maintains a database of registered users that includes the name, address, telephone number, number of adults and children, the shelter they will go to, and any relevant medical information. Currently, there are approximately 335 persons registered in the program. Evacuees are transported to the following shelters:

- North Bay Elementary (1825 Popp's Ferry Road in Biloxi);
- Harrison Central Elementary (15451 Dedeaux Road in Gulfport);
- Gulfport Central Elementary (1043 Pass Road in Gulfport);
- D'Iberville Civic Center (10395 Auto Mall Parkway in D'Iberville);
- West Harrison Community Center (4470 Espy Avenue in Pass Christian).

In order to increase the safety, efficiency and effectiveness of the program, the following measures are recommended for implementation:

- Increase advertisement and public awareness of relevant human services websites;
- Place a program description brochure on the CTA website;
- Increase specialized safety training sessions for drivers;
- Conduct follow-up surveys of evacuees after the event to gauge the effectiveness of the program.

11.6 SAFETY STAKEHOLDER COMMITTEE

During the development of the 2030 Long-Range Transportation Plan, the MPO formed a Safety Committee to discuss system performance, policy and potential improvement projects from the engineering, enforcement, education and emergency response perspectives. It is recommended that an ongoing partnership be established to involve these actors in the development of future safety projects by implementing the following practices:

Collaboration

The Safety Committee meets annually to discuss goals, objectives and trends based on regional developments and the engineering, enforcement, emergency response and education perspectives. In the annual meeting, the partnership pinpoints specific locations where engineering solutions may enhance safety.

Safety Audit

GRPC will follow up at each nominated location with safety audits to pinpoint any specific risk factors that need to be avoided and engineering solutions that can be incorporated into infrastructure projects. A safety audit is a procedure by which GRPC staff may survey a perceived high-risk location to pinpoint specific risk factors which can be reduced or neutralized through improved infrastructure. The audit identifies physical characteristics of a potential high-risk location and selects counter-measures consistent with applicable best practices.

Project Development

The results of safety audits will provide the basis for incorporation of safety features into the design of projects listed in the Transportation Improvement Program (TIP) as well as suggesting projects that may be developed in response to input from the safety partnership. Given improvement costs and the length of the project development cycle, safety audit findings should be taken as one factor in the consideration of projects for inclusion in the TIP. The technical and financial feasibility of possible safety features arising from safety audits should be reviewed by GRPC staff as part of the project development process.

Benchmarking and Review

As safety features are incorporated into the region's transportation infrastructure and other policy actors implement non-engineering solutions, it is expected that aspects of safety performance will improve. For example, specific intersections, roadways or areas of concern will be addressed such that a particular safety problem is less of an issue at any given location. However, as demographics, traffic patterns and other local factors change, new issues will emerge. By reviewing overall crash patterns and rates annually, the GRPC can identify emerging issues in transportation safety for consideration by the safety partnership.

The review of progress on problem areas identified in previous stakeholder meetings, the status of targeted improvements and assessment of emerging issues forms the basis for the next year's partnership agenda. As trends and conditions change from year to year, the goals set forth in the Long Range Transportation Plan may also be reviewed, modified or prioritized to meet current needs.



CHAPTER 12

FREIGHT MOBILITY

The *Freight Mobility Report* prepared as Part 6 of the *2030 Long-Range Transportation Plan Supplement* is hereby incorporated and made a part of the *2035 Long-Range Transportation Plan* by reference.



CHAPTER 13

STAGED IMPROVEMENT PROGRAM

The Staged Improvement Program includes all street and highway construction projects which it is proposed to implement during the long-range planning period (2011-2035) with state or federal funding assistance. The staging of the program assumed the availability of the following amounts based on the Composite alternative described in Chapter 6:

Stage 1 (2011-2015)	\$300,245,178
Stage 2 (2016-2025)	\$650,019,758
Stage 3 (2026-2035)	\$737,549,076
Total	\$1,687,814,012

In order to develop individual project cost estimates, unit costs based primarily on actual historical data provided by the Mississippi Department of Transportation (MDOT) were used. Obviously these unit costs are generic in character and do not take into consideration the specific features of individual projects which have not yet been identified in the overwhelming majority of cases. The projects themselves were culled from three primary sources:

- The traffic forecast and deficiency analysis described in the 2035 Long-Range Transportation Plan Technical Report bound separately;
- The *Congestion Management Plan* developed by Gulf Regional Planning Commission (GRPC); and
- Local comprehensive and major thoroughfare plans developed by cities and counties since Hurricane Katrina.

GRPC staff engaged in a process of extensive consultation with local planners, engineers and elected officials regarding needed transportation improvements. In addition, the public involvement program for the long-range plan update included meetings with both stakeholders and members of the general public at which participants were given the opportunity to identify needs and influence the development of the conceptual alternatives previously described (see Chapter 6).

Cost estimates were derived for more than 250 projects proposed for inclusion in the long-range transportation plan. These included 33 projects already committed for implementation. The remainder were prioritized by GRPC staff into four classes based on the relative immediacy of need. Once individual cost estimates were available, the projects were distributed among the three programmatic stages. In order to be consistent with the inflationary assumption made regarding available funding, the estimated cost of each project was inflated one percent per annum. This involved distributing all projects assigned to a given stage evenly across the five or ten-year period covered and then applying an inflationary factor consistent with the position of each improvement in the sequencing of projects.

Stage 1 of the Staged Improvement Program includes 24 committed projects and 60 projects assigned to the Priority 1 class with a total projected cost of \$300,245,178 (see Table 13-1). Stage 2 includes nine additional committed projects, 31 Priority 1 projects and 31 Priority 2 Projects with a total projected cost of \$650,019,758 (see Table 13-2). Stage 3 includes four priority 2 projects, 58 priority 3 projects and eight priority 4 projects with a total cost of \$737,549,076 (see Table 13-3). The total projected cost for all three stages of the Staged Improvement Program is \$1,687,814,012. Thirty Priority 4 projects could not be accommodated and were listed as unfunded improvements with a total cost in current dollars of \$115,178,750 (see Table 13-4). Project locations are shown in figures 13-1 to 13-5.

The Staged Improvement Program for Street and Highway Improvements was presented to the Technical Coordinating Committee (TCC) for review at a meeting in the GRPC Annex on February 2, 2011. The TCC adopted a resolution recommending that the Transportation Policy Committee (TPC) approve the Draft Staged Improvement Program for release to the public. The TPC met in the GRPC Annex on February 10, 2011 and adopted a resolution authorizing release of the draft program for public review during a 45-day period preceding adoption in accordance with the established policy of the Mississippi Gulf Coast Metropolitan Planning Organization. A formal vote on adoption is scheduled to take place on March 31, 2011.

Table 13-1:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: STAGE 1 STREET AND HIGHWAY IMPROVEMENTS (2011-2015)

NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
1	Hancock	MS 43 Kiln Bypass	.82 mi W of Hwy 603	Texas Flat Rd	3.90	New 4-Lane Arterial	\$46,800,000
2	Harrison	28th Street	34th Ave	23rd Ave	0.74	Widen to 4-Lane Divided	\$2,221,331
3	Harrison	John Hill Boulevard Ext	US 49	12th Ave	1.12	Reconstruct and Extend 4-Lane Arterial	\$13,456,122
4	Harrison	8th Avenue Connector	12th Avenue	34th Street	0.88	Widen to 4-Lane Divided	\$2,644,752
5	Harrison	Creosote Road	US 49	Three Rivers Rd	0.28	Center Turn Lane	\$785,882
6	Harrison	Dedeaux Rd	Three Rivers Rd	Hwy 605	2.67	Widen to 4-Lane Divided	\$8,034,043
7	Harrison	Highway 601	Canal Rd	28th St @ 30th Ave	3.08	New 4-Lane Freeway	\$46,366,458
8	Harrison	I-110	Big Ridge Road	--	1	New Half-Interchange	\$10,293,099
9	Harrison	Popp's Ferry Road	Cedar Lake Rd	Lamey St/Gay Road	1.00	Widen to 4-Lane Divided	\$7,033,648
10	Harrison	Popp's Ferry Road	North Shore of Back Bay	South shore of Back Bay	0.95	New Bridge	\$38,205,555
11	Harrison	Popp's Ferry Road Ext	D'Iberville Boulevard	Big Ridge Road	0.25	New 2-Lane Divided	\$1,257,515
12	Harrison	Sangani Blvd	MS 67	Lamey Bridge Rd	0.46	Widen to 4-Lane Divided	\$1,389,129
13	Harrison	Three Rivers Road	Angela Dr	Seaway Rd	0.35	Widen to 4-Lane	\$1,057,580
14	Harrison	Three Rivers Road	Creosote Rd	Airport Rd	0.54	Center Turn Lane	\$1,523,828
15	Harrison	Three Rivers Road	O'Neal Rd	Dedeaux Rd	1.61	Center Turn Lane	\$4,545,990
16	Jackson	Hospital Road	US 90	Old Mobile Hwy	0.33	Widen to 4-Lane	\$998,941
17	Jackson	I-10 Connector	Mallett Rd	Seaman Road	2.58	New 2-Lane Divided	\$13,024,315
18	Jackson	Martin Bluff Road	Gautier-Vancleave Rd	Homestead Blvd	0.78	Center Turn Lane	\$2,206,369
19	Jackson	MS 57	US 90	Old Spanish Trail	0.40	Center Turn Lane	\$1,132,150
20	Jackson	MS 57 Extension	Old Spanish Trail	Fontainebleau Rd	1.03	New 2-Lane Divided	\$5,208,988
21	Jackson	Ocean Springs Road	Reilly Rd	US 90	2.17	Center Turn Lane	\$6,149,280
22	Jackson	Old Fort Bayou Road	Washington Ave	Webb Rd W	1.18	Center Turn Lane	\$3,345,853
23	Jackson	Old Fort Bayou Road	Webb Rd W	Yellow Jacket Rd	0.65	Realign Road and Improve Intersection	\$2,735,841
24	Jackson	Shortcut Road	McPhelah Rd	Jefferson Ave	0.99	Center Turn Lane	\$2,810,481
25	Hancock	I-10	MS 43/Highway 603	--	1	Park-and-Ride Lot	\$507,245
26	Hancock	MS 43/Highway 603	Longfellow Road	--	1	Intersection Improvements	\$761,324
27	Hancock	Nicholson Avenue	McLaurin Street	--	1	Intersection Improvements	\$761,780
28	Hancock	US 90	Old Spanish Trail	MS 43/Highway 603	0.87	Reconstruction and Access Management	\$1,547,341
29	Hancock	US 90	Old Spanish Trail	MS 43/Highway 603	2	Intersection Improvements	\$1,525,388
30	Hancock	US 90	Walmart Drive	--	1	Minor Intersection Improvements	\$50,877
31	Harrison	28th Street	Canal Road	34th Avenue	1.99	Reconstruction with Center Turn Lane	\$5,673,105
32	Harrison	28th Street	Klondyke Road	Canal Road	1.01	Reconstruction with Center Turn Lane	\$2,881,041
33	Harrison	Canal Road	28th Street	--	1	Intersection Improvements	\$764,525
34	Harrison	Canal Road	Landon Road	16th Street	2	Intersection Improvements	\$1,529,967
35	Harrison	Canal Road	Landon Road	I-10	0.85	Reconstruction with Center Turn Lane	\$2,429,003
36	Harrison	Cedar Lake Road	I-10	Popp's Ferry Road	0.34	Reconstruction and Channelization	\$208,325
37	Harrison	Cedar Lake Road	Medical Park Drive	--	1	Minor Intersection Improvements	\$51,091

Table 13-1:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: STAGE 1 STREET AND HIGHWAY IMPROVEMENTS (2011-2015)

NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
38	Harrison	Cedar Lake Road	Popp's Ferry Road	--	1	Intersection Improvements	\$766,820
39	Harrison	Cowan Road	Magnolia Street	Pass Road	0.31	Reconstruction and Access Management	\$554,999
40	Harrison	Creosote Road	Three Rivers Road	East end of E-W section	0.60	Reconstruction with Center Turn Lane	\$1,719,736
41	Harrison	DeBuys Road	Runnymede Drive	Pass Road	0.62	Reconstruction with Center Turn Lane	\$1,778,127
42	Harrison	D'Iberville Blvd	Popp's Ferry Road	Auto Mall Parkway	0.19	Arterial Widening	\$584,182
43	Harrison	I-10	MS 67	--	1	Park-and-Ride Lot	\$512,748
44	Harrison	Irish Hill Drive	Porter Avenue	Gill Avenue	2	Intersection Improvements	\$1,539,165
45	Harrison	Irish Hill Drive	White Avenue	--	1	Intersection Improvements	\$770,044
46	Harrison	Irish Hill Drive	White Avenue	Porter Avenue	0.56	Reconstruction and Access Management	\$1,006,794
47	Harrison	Klondyke Road	28th Street	Commission Road	2	Intersection Improvements	\$1,541,935
48	Harrison	Lamey Bridge Road	I-10	Toncrey Road	0.75	Arterial Widening	\$2,314,290
49	Harrison	Lorraine Road	Intraplex Parkway	Seaway Road	2	Intersection Improvements	\$1,543,785
50	Harrison	MS 67	Sangani Blvd/Promenade	--	1	Ramps and Overpass	\$10,555,522
51	Harrison	O'Neal Road	Three Rivers Road	--	1	Intersection Improvements	\$772,818
52	Harrison	Pass Road	28th Street	Washington Avenue (W)	1.43	Reconstruction and Access Management	\$2,580,184
53	Harrison	Pass Road	Big Lake Road	Rich Avenue	0.54	Reconstruction and Access Management	\$974,919
54	Harrison	Pass Road	Cowan Road	--	1	Minor Intersection Improvements	\$51,614
55	Harrison	Pass Road	Cowan Road	DeBuys Road	1.54	Reconstruction and Access Management	\$2,783,660
56	Harrison	Pass Road	DeBuys Road	Eisenhower Drive	0.47	Reconstruction and Access Management	\$850,068
57	Harrison	Pass Road	Eisenhower Drive	Big Lake Road	0.31	Reconstruction and Access Management	\$561,019
58	Harrison	Pass Road	Rich Avenue	Beauvoir Road	0.41	Reconstruction and Access Management	\$742,438
59	Harrison	Pass Road	Washington Avenue	Courthouse Road	2	Intersection Improvements	\$1,553,066
60	Harrison	Pass Road	Washington Avenue (E)	Cowan Road	0.26	Reconstruction and Access Management	\$471,379
61	Harrison	Pass Road	Washington Avenue (W)	Washington Avenue (E)	1.33	Reconstruction and Access Management	\$2,412,732
62	Harrison	Pass Road	Hardy Court	--	1	Minor Intersection Improvements	\$51,862
63	Harrison	Pass Road	Teagarden Road	--	1	Minor Intersection Improvements	\$51,893
64	Harrison	Popp's Ferry Road	Atkinson Road	Pass Road	0.55	Reconstruction and Access Management	\$999,542
65	Harrison	Railroad Street	Klondyke Road	Jeff Davis Avenue	2	Intersection Improvements	\$1,558,662
66	Harrison	Three Rivers Road	Dedaux Road	Angela Drive	0.89	Reconstruction with Center Turn Lane	\$2,591,010
67	Harrison	US 49	28th Street	Pass Road	0.25	Arterial Widening	\$780,266
68	Harrison	US 49	Creosote Road	Airport Road	0.52	Reconstruction and Access Management	\$947,290
69	Harrison	US 49	John Hill Boulevard	Pass Road	0.82	Reconstruction and Access Management	\$1,494,700
70	Harrison	US 49	Landon Road	--	1	Intersection Improvements	\$781,670
71	Harrison	US 49	Landon Road	Creosote Road	0.74	Reconstruction and Channelization	\$463,026
72	Harrison	US 90	25th Avenue	--	1	Intersection Improvements	\$782,608
73	Harrison	US 90	30th Avenue	25th Avenue	0.30	Reconstruction and Channelization	\$187,939
74	Harrison	US 90	Broad Avenue	--	1	Intersection Improvements	\$783,547

Table 13-1:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: STAGE 1 STREET AND HIGHWAY IMPROVEMENTS (2011-2015)

NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
75	Harrison	US 90	I-110	--	1	Intersection Improvements	\$784,017
76	Harrison	US 90	I-110	Main Street	0.52	Reconstruction and Channelization	\$326,346
77	Harrison	US 90	White Avenue	--	1	Intersection Improvements	\$784,957
78	Harrison	US 90	Courthouse Road	--	1	Minor Intersection Improvements	\$52,362
79	Harrison	US 90	Cowan Road	--	1	Minor Intersection Improvements	\$52,393
80	Harrison	US 90	Hewes Avenue	--	1	Minor Intersection Improvements	\$52,425
81	Harrison	US 90	Porter Avenue	--	1	Intersection Improvements	\$786,841
82	Harrison	US 90	Main Street	Bay of Biloxi Bridge	1.56	Reconstruction and Access Management	\$2,865,820
83	Jackson	Government Street	Holcomb Boulevard	--	1	Intersection Improvements	\$787,785
255	Jackson	Hanshaw Rd-Beachview	Hanshaw Road	Old Spanish Tr@Beachview	0.27	Construct 2-Lane Connector	\$1,418,013
Stage 1 Total (2011-2015)							\$300,245,178

Notes:

MI/NO represents project length in miles or number of locations or facilities.

COST is the projected cost of the project when implemented, assuming an inflation rate of one percent per annum.

Table 13-2:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: STAGE 2 STREET AND HIGHWAY IMPROVEMENTS (2016-2025)

NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
84	Hancock	Hwy 607	Pearl River Co	SSC (End exist 4-lane)	5.40	Widen to 4-Lane Divided	\$17,026,363
85	Hancock	Port Access Rd	Hwy 607	US 90	2.85	New 4-Lane Arterial	\$35,994,954
86	Harrison	Central Ave	Lamey Bridge Rd	Bayshore Dr	0.66	Widen to 4-Lane	\$2,086,841
87	Harrison	I-10	I-110	--	--	New Interchange with C-D Roads	\$32,454,724
88	Harrison	O'Neal Road	Sullivan Lane	Three Rivers Rd	0.97	Center Turn Lane	\$2,870,590
89	Harrison	Popp's Ferry Road Extension	Pass Rd	Biloxi Coliseum/US 90	0.88	New 4-Lane Arterial	\$11,176,711
90	Harrison	Seaway Rd	Three Rivers Rd	Lorraine Rd	3.31	Widen to 4-Lane Divided	\$10,524,658
91	Harrison	US 49	School Rd	O'Neal Rd	3.33	Widen to 6-Lane Divided	\$10,603,100
92	Jackson	MS 57	Mariposa Lane	I-10	9.20	Realign/Reconstruct as 4-Lane Arterial	\$82,137,813
93	Harrison	28th Street	23rd Avenue	Pass Road	0.97	Reconstruction with Center Turn Lane	\$2,890,776
94	Harrison	Bayview Avenue	Braun Street	Reynoir Street	0.48	Arterial Widening	\$1,534,814
95	Harrison	Bayview Avenue	Forrest Avenue	I-110	0.50	Arterial Widening	\$1,601,007
96	Harrison	Canal Road	I-10	28th Street	2.55	Reconstruction with Center Turn Lane	\$7,631,481
97	Harrison	Creosote Road	East end of E-W section	Washington Avenue	0.41	Realign/Construct New 2-Lane Roadway	\$2,194,184
98	Harrison	Pine Street	Back Bay Boulevard	US 90	1.06	New/Reconstructed 4-Lane Arterial	\$5,112,652
99	Harrison	Railroad Street	Klondyke Road	Jeff Davis Avenue	0.11	Arterial Widening	\$354,202
100	Harrison	US 90	Porter Avenue	I-110	0.46	Arterial Widening	\$1,483,284
101	Harrison	Washington Ave	Airport Road	S Vista Drive	0.46	Arterial Widening	\$1,485,364
102	Harrison	Woolmarket Connector	I-10	Popp's Ferry Road	1.51	Construct 2-Lane Roadway	\$8,137,845
103	Jackson	Gautier-Vancleave Road	Dolphin Drive	US 90	0.39	Reconstruction and Access Management	\$736,671
104	Jackson	Government Street	Ocean Springs Road	Beachview Drive	2.30	Reconstruction with Center Turn Lane	\$6,960,904
105	Jackson	Highway 609	Big Ridge Road	Old Fort Bayou Bridge	2.04	Reconstruction and Access Management	\$3,864,173
106	Jackson	Highway 613	Robertson Lake Bridge	Bellview Street	0.33	Reconstruction and Access Management	\$625,964
107	Jackson	I-10	Gautier-Vancleave Rd	--	1	Park-and-Ride Lot	\$542,720
108	Jackson	I-10	Highway 613	--	1	Park-and-Ride Lot	\$543,481
109	Jackson	Ingalls Avenue	Chicot Rd	Martin St	2	Intersection Improvements	\$1,632,729
110	Jackson	Old Mobile Avenue	Eden Street	--	1	Intersection Improvements	\$817,510
111	Jackson	Telephone Road	14th Street	--	1	Intersection Improvements	\$818,656
112	Jackson	US 90	14th Street	Chicot Street	1.00	Reconstruction and Access Management	\$1,912,877
113	Jackson	US 90	Chicot Street	Highway 611	1.31	Reconstruction and Access Management	\$2,509,383
114	Jackson	US 90	Grierson Street	--	1	Minor Intersection Improvements	\$54,807
115	Jackson	US 90	Washington Avenue	--	1	Minor Intersection Improvements	\$54,884
116	Jackson	US 90	Bechtel Boulevard	--	1	Intersection Improvements	\$824,413
117	Jackson	US 90	Hanley Road	--	1	Intersection Improvements	\$825,569
118	Jackson	US 90	Hanshaw Road	--	1	Intersection Improvements	\$826,727
119	Jackson	US 90	Ocean Springs Road	Hanshaw Road	1.48	Reconstruction and Access Management	\$2,858,967
120	Jackson	US 90	Vermont Avenue	Holcomb Boulevard	2	Intersection Improvements	\$1,658,095

Table 13-2:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: STAGE 2 STREET AND HIGHWAY IMPROVEMENTS (2016-2025)

NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
121	Jackson	US 90	Vermont Avenue	Ocean Springs Road	2.22	Reconstruction and Access Management	\$4,300,488
122	Jackson	Washington Avenue	Old Fort Bayou Bridge	US 90	0.10	Reconstruction and Channelization	\$66,510
123	Jackson	Washington Avenue	LeMoyne Boulevard	Old Fort Bayou Road	2	Intersection Improvements	\$1,665,081
124	Hancock	Kiln-Waveland Cutoff Road	MS 43/Highway 603	US 90	1.44	Reconstruction and Access Management	\$2,801,258
125	Hancock	Longfellow Drive	MS 43/Highway 603	US 90	1.34	Reconstruction and Access Management	\$2,610,382
126	Hancock	Longfellow Drive	US 90	--	1	Intersection Improvements	\$836,048
127	Harrison	Auto Mall Pkwy/Rodriquez St	D'Iberville Boulevard	I-110	0.87	Reconstruction and Access Management	\$1,699,558
128	Harrison	D Avenue Extension	31st Street	US 90	0.87	Construct 4-Lane Roadway	\$11,670,453
129	Harrison	D'Iberville Blvd	Promenade Parkway	Popp's Ferry Road	0.68	Reconstruction and Access Management	\$1,332,118
130	Harrison	Hewes Avenue	End of 4-Lane Section	Glover Street	0.54	Arterial Widening	\$1,816,015
131	Harrison	Highway 601	28th Street	US 90	1.37	New 4-Lane Freeway	\$23,068,798
132	Harrison	Highway 601	28th Street/Pass Road	--	--	Interchange with C-D Roads	\$23,044,944
133	Harrison	Highway 601	I-10	Greenville Street	1.33	New 4-Lane Freeway	\$22,458,117
134	Harrison	Highway 601	US 90	--	--	Overpass to Mississippi State Port	\$11,554,814
135	Harrison	I-10	Canal Road	Hwy 609	18.25	Add High-Occupancy Vehicle Lanes	\$175,117,487
136	Harrison	I-10	Highway 601	--	--	Interchange with C-D Roads	\$59,914,541
137	Harrison	I-10	Lorraine Road	--	1	Park-and-Ride Lot	\$566,024
138	Harrison	I-10	Canal Road	--	1	Park-and-Ride Lot	\$566,818
139	Harrison	Jody Nelson Drive/D Avenue	Hewes Avenue	30th Street	0.75	Arterial Widening/Construct 4-Lane Road	\$5,108,517
140	Harrison	Klondyke Road	28th Street	Commission Road	1.02	Reconstruction with Center Turn Lane	\$3,246,752
141	Harrison	Klondyke Road	Commission Road	Railroad Street	1.29	Reconstruction with Center Turn Lane	\$4,111,945
142	Harrison	Lamey Bridge Road	LeMoyne Boulevard	Central Avenue	0.14	Reconstruction, Access Mgmt, Intersections	\$399,003
143	Harrison	Landon Road	Canal Road	34th Avenue	1.83	Reconstruction with Center Turn Lane	\$5,849,598
144	Harrison	LeMoyne Boulevard	Gorenflo Road	--	1	Intersection Improvements	\$857,407
145	Harrison	North Street Extension	Menge Ave	Espy Avenue	0.82	Construct 2-Lane Roadway	\$4,693,729
146	Harrison	US 49	Dedaux Road	Community Road	0.52	Reconstruction and Access Management	\$1,043,240
147	Harrison	US 49	O'Neal Road	Orange Grove Road	1.22	Reconstruction and Access Management	\$2,451,034
148	Jackson	Beachview Drive	Old Spanish Trail	Spring Avenue	0.99	Reconstruction and Access Management	\$1,991,743
149	Jackson	Beasley Road	Wm Payne Adams Blvd	Old Spanish Trail	0.44	Reconstruction with Center Turn Lane	\$1,418,337
150	Jackson	Bechtel Boulevard	Government Street	--	1	Intersection Improvements	\$864,647
151	Jackson	Hanshaw Road	US 90	Old Spanish Trail	0.89	Reconstruction with Center Turn Lane	\$2,876,962
152	Jackson	Main Street	Jefferson Avenue	Telephone Road	0.69	Arterial Widening	\$2,393,123
153	Jackson	Old Mobile Highway	Hospital Road	Orchard Road	0.60	Reconstruction and Access Management	\$1,215,605
154	Jackson	Old Spanish Trail	Beasley Road	Dolphin Drive	0.32	Reconstruction with Center Turn Lane	\$1,038,771

Stage 2 Total (2016-2025)

\$650,019,758

Notes : MI/NO represents project length in miles or number of locations or facilities. COST is the projected cost of the project when implemented, assuming an inflation rate of one percent per annum.

Table 13-3:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: STAGE 3 STREET AND HIGHWAY IMPROVEMENTS (2026-2035)

NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
155	Harrison	Highway 601	US 49	I-10	13.54	Construct 4-Lane Roadway with Ramps	\$194,439,081
156	Jackson	I-10	MS 63	--	1	Park-and-Ride Lot	\$581,310
157	Jackson	Old Spanish Trail	Dolphin Drive	--	1	Intersection Improvements	\$873,206
158	Jackson	William Payne Adams Blvd	Beasley Road	Dolphin Drive	0.33	Reconstruction with Center Turn Lane	\$1,077,320
159	Hancock	Blue Meadow Road	Hollywood Boulevard	US 90	0.60	Reconstruction with Center Turn Lane	\$1,961,549
160	Hancock	Lakeshore Road	Lower Bay Road	Beach Boulevard	2.22	Reconstruction and Access Management	\$4,542,535
161	Hancock	Lakeshore Road	US 90	Lower Bay Road	2.42	Reconstruction and Access Management	\$4,958,817
162	Hancock	Lower Bay Road	Lakeshore Road	US 90	4.01	Reconstruction and Access Management	\$8,228,571
163	Hancock	MS 43	Pearl River County Line	Kiln Bypass	9.58	Arterial Widening	\$33,747,848
164	Hancock	MS 43/Highway 603	Kiln-Delisle Road	--	1	Intersection Improvements	\$881,938
165	Hancock	MS 43/Highway 603	Sugar Field Road	Kiln-Waveland Cutoff Rd	1.22	Reconstruction and Access Management	\$2,514,154
166	Hancock	Old Spanish Trail	Nicholson Avenue	Sycamore Street	1.81	Reconstruction and Access Management	\$3,735,321
167	Hancock	US 90	Blue Meadow Road	Dunbar Avenue	0.58	Reconstruction and Access Management	\$1,198,656
168	Hancock	US 90	Dunbar Avenue	--	1	Intersection Improvements	\$886,967
169	Hancock	US 90	MS 43/Highway 603	Washington Street	1.23	Reconstruction and Access Management	\$2,549,215
170	Hancock	US 90	Washington Street	--	1	Intersection Improvements	\$889,492
171	Hancock	US 90	Washington Street	Dunbar Avenue	0.81	Reconstruction and Access Management	\$1,683,531
172	Harrison	20th Avenue	28th Street	Pass Road	0.26	Construct 2-Lane Roadway	\$1,546,175
173	Harrison	20th Avenue	34th Street	28th Street	0.50	Reconstruction and Access Management	\$1,042,175
174	Harrison	20th Avenue	Pass Road	US 90	0.86	Reconstruction and Access Management	\$1,795,091
175	Harrison	28th Street	Beatline Road	Klondyke Road	1.99	Reconstruction and Access Management	\$4,159,667
176	Harrison	Atkinson Road	Popp's Ferry Road	Jim Money Road	0.89	Reconstruction with Center Turn Lane	\$2,980,800
177	Harrison	Auto Mall Parkway	D'Iberville Boulevard	--	1	Intersection Improvements	\$898,387
178	Harrison	Courthouse Road	Pass Road	US 90	1.03	Reconstruction and Access Management	\$2,162,194
179	Harrison	Eisenhower Drive	Pass Road	CSX Railroad	0.35	Reconstruction and Access Management	\$735,771
180	Harrison	Factory Shop Boulevard Ext	Factory Shop Boulevard	Canal Road	2.21	Construct 2-Lane Roadway	\$13,292,797
181	Harrison	Forrest Avenue	Bayview Avenue	Division Street	0.54	Reconstruction and Access Management	\$1,138,422
182	Harrison	Gorenflo Road	Big Ridge Road	LeMoyne Boulevard	0.80	Reconstruction and Access Management	\$1,688,950
183	Harrison	Gorenflo Road	LeMoyne Boulevard	Racetrack Road	0.78	Reconstruction with Center Turn Lane	\$2,638,510
184	Harrison	Henderson Avenue	Royal Circle	US 90	1.21	Reconstruction and Access Management	\$2,561,810
185	Harrison	Hewes Avenue	Pass Road	US 90	0.94	Reconstruction and Access Management	\$1,992,997
186	Harrison	I-10	Woolmarket Interchange	--	1	Park-and-Ride Lot	\$606,636
187	Harrison	Klondyke Road Extension	Canal Road	28th Street	3.40	Construct 2-Lane Roadway	\$20,654,961
188	Harrison	Landon Road	County Farm Road	Canal Road	3.42	Reconstruction and Access Management	\$7,282,105
189	Harrison	MS 15	Cedar Hammock Road	MS 67	6.82	Arterial Widening	\$24,929,626
190	Harrison	North Street	Cedar Avenue	Market Street	1.44	Reconstruction and Access Management	\$3,074,879
191	Harrison	O'Neal Road	Three Rivers Road	Highway 605	2.44	Reconstruction and Access Management	\$5,217,623

Table 13-3:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: STAGE 3 STREET AND HIGHWAY IMPROVEMENTS (2026-2035)

NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
192	Harrison	O'Neal Road Extension	Highway 605	John Lee Road	1.84	Construct 2-Lane Roadway	\$11,257,708
193	Harrison	Popp's Ferry Road	Riverview Drive	Back Bay of Biloxi Bridge	0.83	Arterial Widening	\$3,051,257
194	Harrison	Three Rivers Road Ext	8th Avenue Connector	34th Street	0.50	Construct 2-Lane Roadway	\$3,067,869
195	Harrison	Three Rivers Road Ext	Airport Road	8th Avenue Connector	1.75	Construct 2-Lane Roadway	\$10,752,816
196	Harrison	US 49	Creosote Road	--	1	Intersection Improvements	\$922,981
197	Harrison	US 90	White Avenue	Porter Avenue	0.58	Reconstruction and Access Management	\$1,250,878
198	Harrison	Veterans Avenue	Pass Road	US 90	0.66	Reconstruction with Center Turn Lane	\$2,280,700
199	Harrison	Woolmarket Road	Old Highway 67	Old Highway 67	1.58	Reconstruction and Access Management	\$3,417,265
200	Jackson	2nd Street	Grierson Street	Shortcut Road	1.40	Reconstruction and Access Management	\$3,032,264
201	Jackson	Eglin Road	I-10	Ocean Springs Connector	1.92	Reconstruction and Access Management	\$4,164,448
202	Jackson	Forts Lake-Franklin Creek	Franklin Creek Road	I-10	0.98	Reconstruction with Center Turn Lane	\$3,405,804
203	Jackson	Groveland Road Extension	Deena Drive	MS 57	2.88	Construct 2-Lane Roadway	\$17,898,448
204	Jackson	Highway 613	Old Saracennia Road	I-10	0.97	Reconstruction and Access Management	\$2,112,905
205	Jackson	I-10	Highway 609	MS 57	7.38	Interstate Widening	\$78,192,095
206	Jackson	I-10	MS 57	Gautier-Vancleave Rd	3.80	Interstate Widening	\$40,318,784
207	Jackson	I-10	Old Fort Bayou Road	--	--	New Interchange	\$25,625,721
208	Jackson	I-10 Frontage Road	Gautier-Vancleave Rd	Martin Bluff Road	1.31	Reconstruction with Center Turn Lane	\$4,591,651
209	Jackson	Ingalls Avenue	Market Street	14th Street	0.55	Reconstruction and Access Management	\$1,206,584
210	Jackson	Martin Bluff Alternate	Broadmoor Drive	I-10 Frontage Road	1.39	Construct 2-Lane Roadway	\$8,724,872
211	Jackson	McClelland Road Extension	Tucker Road	Seaman Road	1.08	Construct 2-Lane Roadway	\$6,788,680
212	Jackson	Money Farm/Walker Rd Ext	Washington Avenue	Old Fort Bayou Road	2.73	Reconstruction/Construct 2-Lane Roadway	\$11,599,663
213	Jackson	MS 63	Old Saracennia Road	I-10	0.84	Arterial Widening	\$3,177,070
214	Jackson	Ocean Springs Connector	Eglin Road	Government Street	1.75	Construct 2-Lane Roadway	\$11,047,186
215	Jackson	Orchard Road	Old Mobile Avenue	Louise Street	0.59	Reconstruction and Access Management	\$1,305,422
216	Jackson	Ritcher Road	MS 57	Gautier-Vancleave Rd	3.65	Reconstruction/Construct 2-Lane Roadway	\$23,106,872
217	Hancock	Highway 603/MS 43	Cuevas Road	Paradise Road	2.57	Reconstruction and Access Management	\$5,702,520
218	Harrison	Airport Connector	I-10	Washington Avenue	1.19	Construct 2-Lane Roadway	\$7,554,921
219	Harrison	Caillavet Street	Bayview Avenue	--	1	Intersection Improvements	\$953,656
220	Harrison	County Farm Road	I-10	Red Creek Road	1.03	Reconstruction with Center Turn Lane	\$3,672,340
221	Harrison	I-10	Stewart Road	--	--	New Interchange	\$26,140,798
222	Harrison	I-10 Frontage Road	County Farm Road	Klondyke Road Ext	2.25	Construct 2-Lane Roadway	\$14,365,967
223	Harrison	Red Creek Road	Beatline Road	Espy Avenue	2.06	Reconstruction with Center Turn Lane	\$7,376,068
224	Harrison	Stewart Road	Dedeaux Road	I-10	0.74	Reconstruct/Construct 2-Lane Roadway	\$3,198,324
233	Harrison	Espy Avenue	Red Creek Road	US 90	3.22	Reconstruction with Center Turn Lane	\$11,530,493
241	Harrison	O'Neal/Dedeaux Connector	O'Neal Road	Dedeaux Road	1.50	Construct 2-Lane Roadway	\$9,604,957
Stage 3 Total (2026-2035)							\$737,549,076

Notes : MI/NO represents project length in miles or number of locations/facilities. COST is projected cost of project when implemented, assuming 1-percent annual inflation.

Table 13-4:

MISSISSIPPI GULF COAST STAGED IMPROVEMENT PROGRAM: UNFUNDED STREET AND HIGHWAY IMPROVEMENTS

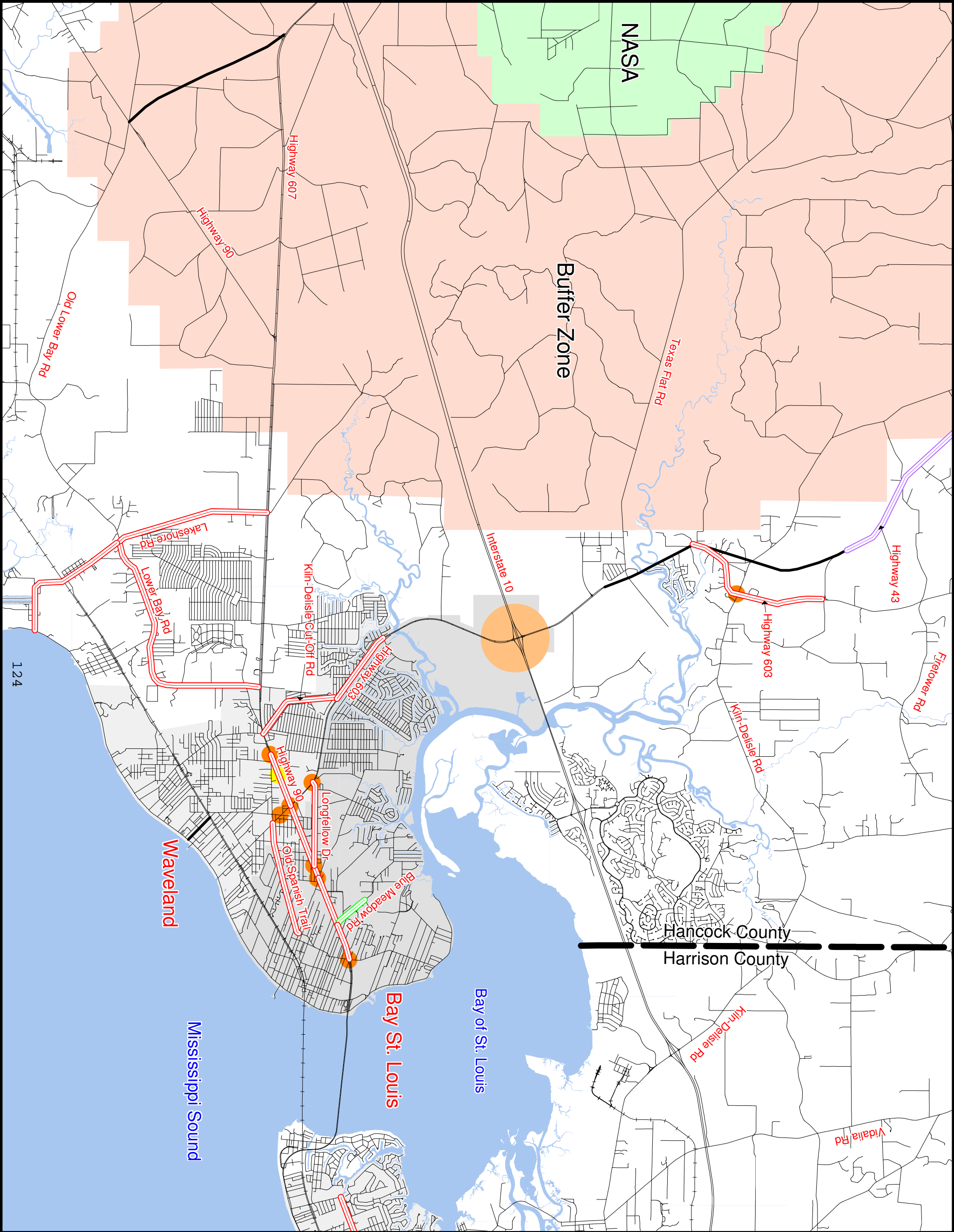
NO	COUNTY	ROUTE	FROM (NORTH/WEST)	TO (SOUTH/EAST)	MI/NO	IMPROVEMENT	COST
225	Hancock	3rd Street	Bay Oaks Drive	Bookter Street	1.28	Reconstruction and Access Management	\$2,240,000
226	Hancock	Engman Avenue	N Beach Boulevard	Felicity Street	1.04	Reconstruction and Access Management	\$1,820,000
227	Hancock	Kiln-Delisle Road	Highway 603/MS 43	I-10	8.42	Reconstruction and Access Management	\$14,735,000
228	Hancock	Necaise Avenue	Ulman Avenue	Bookter Street	0.59	Reconstruction and Access Management	\$1,032,500
229	Harrison	Beatline Road	28th Street	Railroad Street	3.05	Reconstruction and Access Management	\$8,540,000
230	Harrison	Beatline Road Extension	Railroad Street	US 90	0.48	Construct 2-Lane Roadway	\$2,400,000
231	Harrison	Central Avenue	Quave Road	--	1	Minor Intersection Improvements	\$50,000
232	Harrison	Duckworth Road	Old Highway 49	Three Rivers Road	2.30	Reconstruction and Access Management	\$4,025,000
234	Harrison	Fleitas Avenue	North Street	US 90	0.81	Reconstruction and Access Management	\$1,417,500
235	Harrison	I-10	Shorecrest Road	--	--	New Interchange	\$20,500,000
236	Harrison	John Clark Road	Canal Road	US 49	2.07	Reconstruction and Access Management	\$3,622,500
237	Harrison	John Road	Three Rivers Road	O'Neal Road	0.97	Reconstruction and Access Management	\$1,697,500
238	Harrison	Lamey Bridge Road	Johnson Still Road	Sangani Boulevard	0.76	Reconstruction and Access Management	\$1,330,000
239	Harrison	Market Street	North Street	CSX Railroad	0.51	Reconstruction and Access Management	\$892,500
240	Harrison	North Swan Road	US 49	East End of E-W Section	1.69	Reconstruction and Access Management	\$2,957,500
242	Harrison	Shorecrest Road	Lorraine Road	I-10	1.05	Reconstruction with Center Turn Lane	\$2,940,000
243	Harrison	South Swan Road	US 49	Three Rivers Road	2.12	Reconstruction and Access Management	\$3,710,000
244	Multi-Co	LeMoyne Boulevard Connect	Lamey Bridge Road	LeMoyne Blvd@Cheyenne	1.32	Construct 2-Lane Roadway	\$6,600,000
245	Jackson	Audubon Lane	Ritcher Road	US 90	0.71	Reconstruct/Construct 2-Lane Roadway	\$2,396,250
246	Jackson	De la Pointe Drive	Suter Road	US 90	1.00	Reconstruction and Access Management	\$1,750,000
247	Jackson	Gautier-Vancleave Road	Martin Bluff Road	Dolphin Road	1.76	Reconstruction and Access Management	\$3,080,000
248	Jackson	Gautier-Vancleave Road	MS 57	I-10	4.64	Reconstruction and Access Management	\$8,120,000
249	Jackson	Gulf Is Nat Seashore Pkwy	Government Street	--	--	New Interchange	\$5,000,000
250	Jackson	Market Street	US 90	Ingalls Avenue	1.09	Reconstruction and Access Management	\$1,907,500
251	Jackson	Radio Road	Ritcher Road	Old Spanish Trail	0.85	Reconstruct/Construct 2-Lane Roadway	\$3,400,000
252	Jackson	River Oaks Drive	De la Pointe Drive	Oak Street	0.47	Reconstruction and Access Management	\$822,500
253	Jackson	Seaman Road	Jordan Road	Tucker Road	2.11	Reconstruction and Access Management	\$3,692,500
254	Jackson	Shell Landing Boulevard Ext	Ritcher Road	US 90	0.90	Construct 2-Lane Roadway	\$4,500,000
Total Unfunded							\$115,178,750

Notes:

MI/NO represents project length in miles or number of locations or facilities.

COST is estimated project cost in current dollars.

2035 Staged Improvement Program



Legend

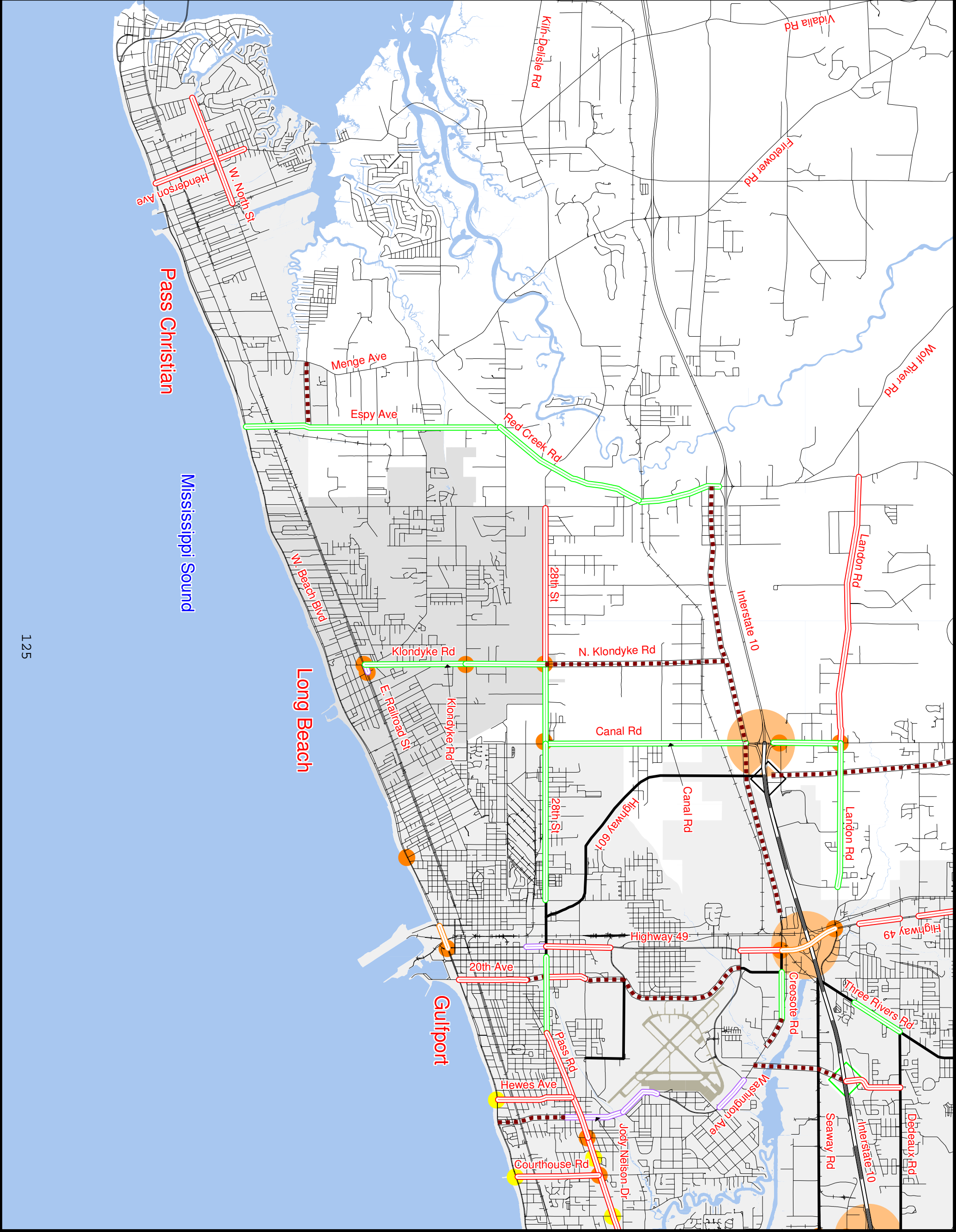
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- Committed Intersection Improvements
- Intersection Improvement
- New Interchange
- Minor Intersection Improvements
- Roadway Widening
- Corridor Reconstruction - CTL
- Corridor Reconstruction, Operations & Channelization
- HOV Lanes
- New Roadway
- Reconstruction and Access Management
- Committed Corridors
- Planned Park and Ride
- Existing Park and Ride

HANCOCK COUNTY



Figure:13.1

2035 Staged Improvement Program

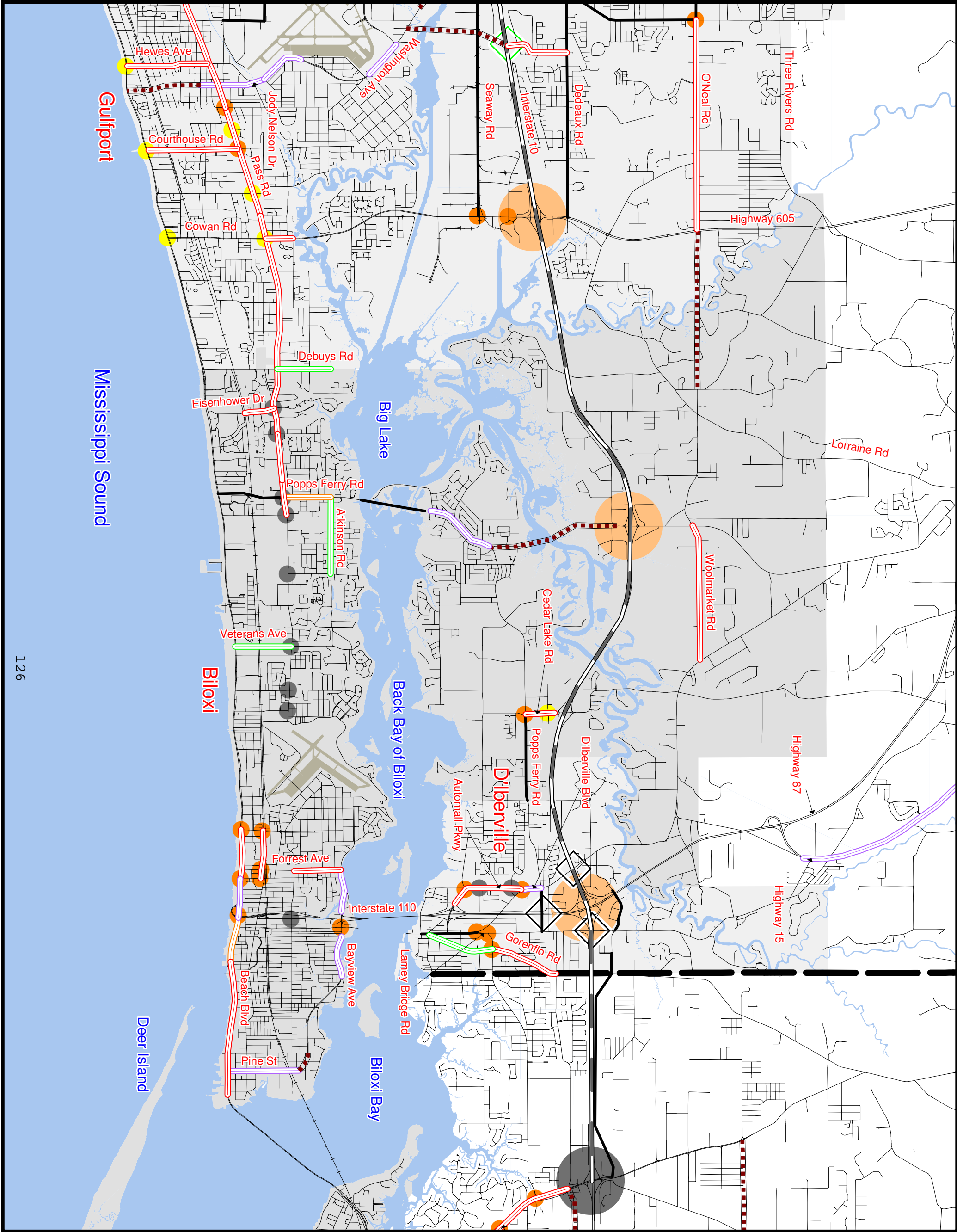


PASS CHRISTIAN
LONG BEACH
AND
GULFPORT



Figure:13.2

2035 Staged Improvement Program

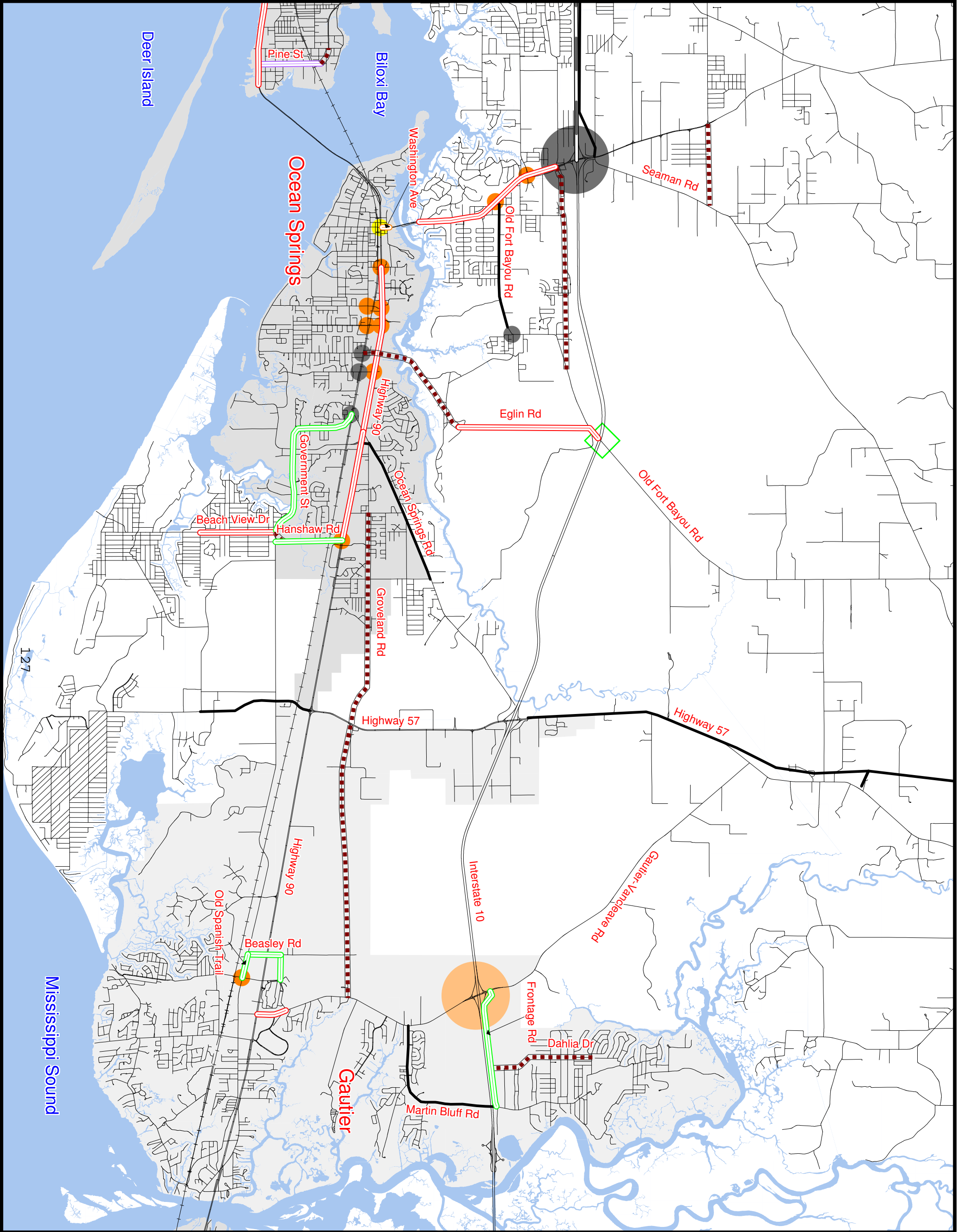


GULFPORT
BILOXI
AND
DIBERVILLE



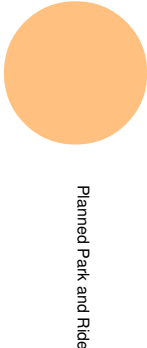
Figure:13.3

2035 Staged Improvement Program

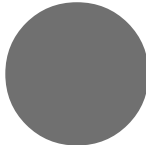


Legend

- Committed Interchange
- Committed Intersection Improvements
- Intersection Improvement
- New Interchange
- Minor Intersection Improvements
- Roadway Widening
- Corridor Reconstruction - CTL
- Corridor Reconstruction, Operations & Channelization
- HOV Lanes
- New Roadway
- Reconstruction and Access Management
- Committed Corridors



Planned Park and Ride



Existing Park and Ride

OCEAN SPRINGS
AND
GAUTIER



Figure:13.4

2035 Staged Improvement Program

Legend

- Committed Interchange
- Committed Intersection Improvements
- Intersection Improvement
- New Interchange
- Minor Intersection Improvements
- Roadway Widening
- Corridor Reconstruction - CTL
- Corridor Reconstruction, Operations & Channelization
- HOV Lanes
- New Roadway
- Reconstruction and Access Management
- Committed Corridors

- Planned Park and Ride
- Existing Park and Ride

PASCAGOULA AND MOSS POINT

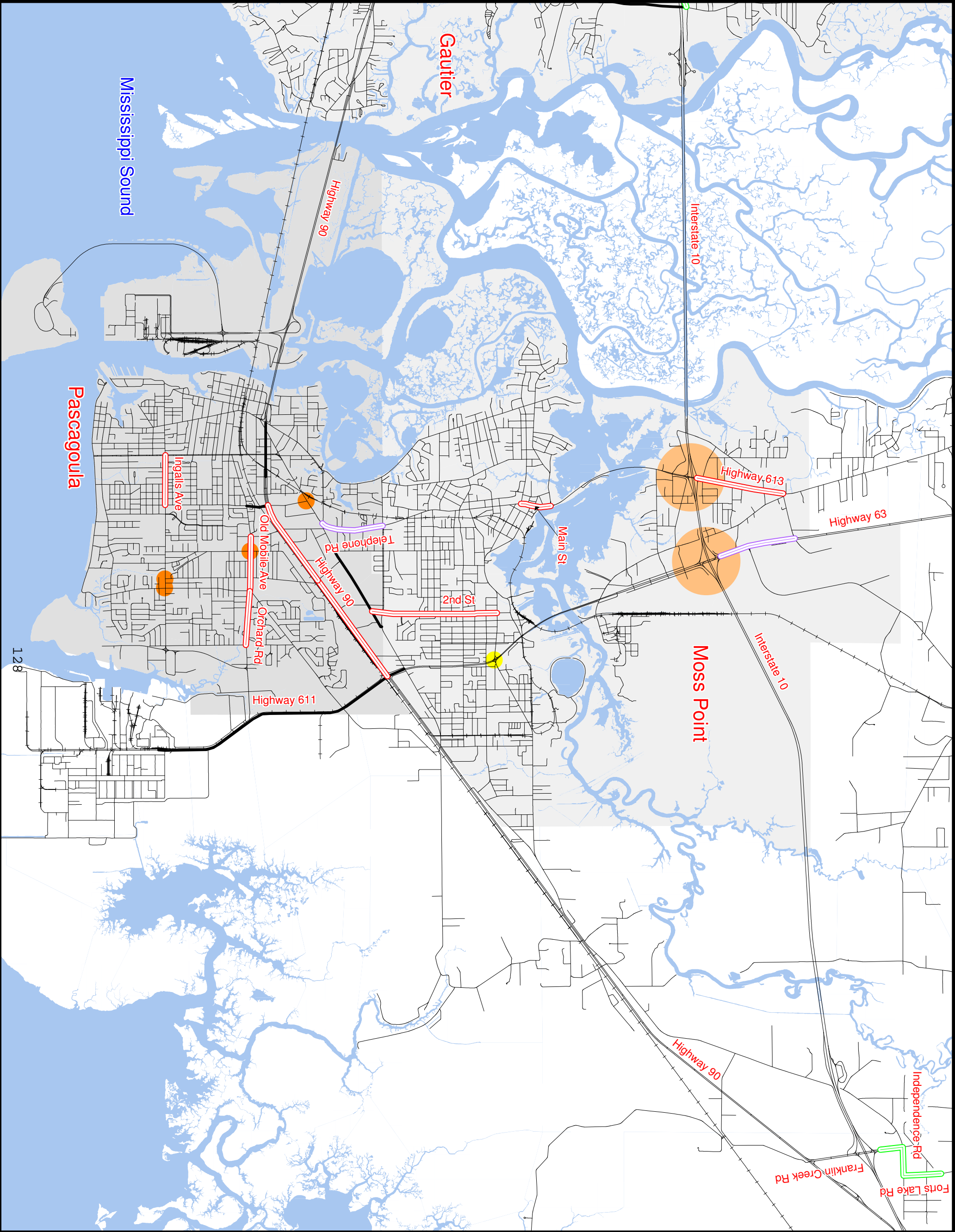


Figure:13.5



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APPENDIX A COMMENT AND RESPONSE

COMMENT ON THE DRAFT 2035 LONG-RANGE TRANSPORTATION PLAN RECEIVED DURING THE PUBLIC REVIEW PERIOD

----Comments Submitted Via Email----

Comment: Sir, I attended the 3/3/2011 meeting on Multiplan 2035 in Bay St. Louis and talked with a few GRPC and MDOT folks about noise from I-10 in the Diamondhead Community. I left some written comments there but would like to also submit this. A goal of Multiplan 2035 is Environmental Stewardship. A big part of environmental stewardship should be the effect on communities. I did not see this specifically mentioned in the plan. One of the effects on communities near highways is traffic noise. I suggest that the long range plan specifically include considerations of traffic noise abatement where highways pass near communities. This does not mean only man-made sound barriers which are expensive; noise can also be reduced by using a quiet road surface (asphalt, not concrete), by locating rumble strips outside of the road side lines, and by maximizing foliage along the sides and in medians. The Diamondhead Community is in the process of submitting a more detailed proposal to MDOT for reducing noise from I-10 by the above methods. We hope and request that this work be included in your near-term plans and be completed soon. I live in Diamondhead and am working with a number of others as part of the Diamondhead Community Association. Our detailed proposal mentioned above has the support of the Diamondhead Property Owners Association and of the Hancock County Board of Supervisors. We appreciate your support as we try to complete this program. I'm sending a copy to Jeff Loftus with whom I worked two years ago on re-planting storm damaged trees along I-10, and a copy to Bill Johnson with whom we are working now. [Harold Preble]

Response: GRPC submitted this comment to the Mississippi Department of Transportation (MDOT).

Comment: Regarding Table 2.1, 2010 census numbers are now available and should be used instead of the 2009 estimate.

For Tables 5.1 thru 5.3, the roadway segments that are at LOS E or F should be further delineated from those operating at LOS C or D, perhaps by using a red or similar color to denote the LOS E/F segments.

On a related note, the maps in Figures 5.1 thru 5.4 should be further refined, with LOS D being reflected by a lighter color to show segments approaching, but not at congestion. Especially since FHWA and most state jurisdictions consider LOS D an acceptable level-of-service in an urban area.

Response: The planning and preparation of this Long Range Plan update did not coincide with the release of the 2010 Census data. The plan was in draft from when the data came out. We wish we could have used it.

The LOS maps showing congestion were used to help us identify roadway projects for consideration. This was one of the many methods we used to identify projects. Once projects were identified, they were prioritized based on the plan's goals and objectives. The LOS data was used to help prioritize the projects by giving points based on the severity of operational deficiencies (LOS F getting higher points than LOS C). I agree with the statement made about most states recognizing D as an acceptable LOS. Our region has never discussed this but probably should have something adopted though the MPO.

Comment: Regarding the CTA Bike-and-Bus Program in Section 8.3, I'm not sure if CTA buses have bike racks on the front. But if they don't, they need to and this should be included in the LRTP. And if the buses do have bike racks, it should be mentioned in the Bike-and-Bus Program paragraph.

Regarding Chapter 10, I'm glad to see the increased focus in bicycle/pedestrian travel and I hope this continues and expands in the future.

Response: CTA buses have bike racks on the front of them. The MPO has put a priority on improving bicycle and pedestrian facilities on the Mississippi Gulf Coast.

Comment: For the proposed projects listed in Tables 13.1 thru 13.4, the final LRTP document should include an appendix that shows more detailed information on each project, similar to what was done with the last GCATS update.

Below are comments on specific projects that are within Tables 13.1 thru 13.4:

- Project #89, the Popps Ferry Rd extension to US 90, should be moved to Stage 1 if at all possible.
- Project #102, the Woolmarket Connector, should be as a 4-lane roadway, not 2-lane.

Response: In an effort to limit the number of pages that this document included, the detailed descriptions that were done in the 2030 GCATS were left out. Your comment indicating that this section was important will go into consideration for the next GCATS update. I

agree with the comments regarding project #89 and project #102. When these projects come up for consideration for funding allocation this would be amended.

Comment: I was surprised to see Project #135, I-10 HOV lanes, listed. Are GRPC and MDOT serious about including HOV lanes? If so, I see this as a long-term need, not mid-term. It's going to take a *LONG* time for I-10 traffic volumes to increase to the point where more than 6 lanes are needed. As such, this project should be moved from Stage 2 to Stage 3. This would enable some sooner-needed projects to move from Stage 3 to Stage 2. For example, MS 43 widening (#163), US 90 improvements (#167-#171), and I-10 widening in Jackson County (#205-#206).

Previous GCATS updates included a project to widen I-10 to 6 lanes between the Diamondhead interchange (Exit 16) and the Long Beach interchange (Exit 28), but it does not appear in this draft. It should be included for several reasons. It maintains 6-lane continuity, instead of going 6-to-4-to-6 as currently exists. It has high traffic volumes for a 4-lane freeway, and in fact per MDOT traffic counts has a higher volume at Menge Ave than another 4-lane segment that is proposed for widening (project #s 205 and 206, between MS 609 and Gautier-Vancleve Rd). Given the higher traffic volumes, at least at/east of Menge Ave, part of this project should be given a higher priority than #205 and #206 and should be placed in the 2016-2025 timeframe if at all possible.

Response: The travel demand model only showed capacity deficiencies on I-10 between the Lorraine/Cowan interchange and I-110 in the year 2035. This is why these decisions were made. In the event that a project in Stage 3 gains support and needs to be moved up in priority, the HOV lanes could be moved to Stage 3.

Comment: Kiln-Delisle Rd is a very busy connector between Kiln and I-10, almost functioning as an arterial. The segments in Harrison County and near Kiln (from MS 43/603 to roughly Bayou Cocoa Point Dr near Annunciation Catholic Church) are substandard and in need of improvement, especially shoulders. Including a project here would also be an opportunity to tie in a reconstruction project with a bicycle facility, as bike lanes are proposed along the road per Table 10.2.

Response: This is a very busy road. Improvements to this roadway were included in the 2030 GCATS but due to fiscal constraint this project was left out of this plan update. However, the intersection of this roadway and Hwy 603 is included in the plan.

Comment:

1. There are some critical needs that are missing? If so, what are they?

Pedestrian access & bicycle safe route is needed on Atkinson Road, Biloxi. I suggest traffic calming devices on Atkinson, not speed enhancing. Biloxi Community Living Center (nursing home or rehab) residents travel Atkinson on the MLane. An off road multi-use path will serve the nursing home, the residents walking, the school children at Popp's Ferry Elementary, and the Shrewsbury Park families. Access to Shrewsbury Park tennis, basketball, walking and playground will be enhanced.

2. There are some projects that should be deleted? If so, what are they and why?

Popp's Ferry Pass Road to Atkinson, has an unneeded continuous Turn Lane with few and left turn locations and a continuous Right Turn lane N bound. Popp's Ferry is a bicycle commuter corridor and 14' lanes with Sharrows and Share the Road are needed.

3. Please list the top three projects that you would like to see happen ASAP. And why?

Bike Lane on US 90 Biloxi Bay to St. Louis Bay. Set the lane dimension at Two feet from the bunker curb. Narrow each MLane by one foot, surface mark the lane, sign the Bike Route and enforce the 45 mile posted limit.

Response:

Comments regarding Atkinson Road and Popp Ferry Road will be noted in this plan as well as incorporated into a project file to be used when this project is considered for funding. US 90 bike lane suggestions will be incorporated into the MPO's Bicycle and Pedestrian Plan.

Comment:

3. Please list the top three projects that you would like to see happen ASAP. And why?

- ① THREE RIVERS ROAD TO HWY 90. THIS WILL REDUCE TRAFFIC ON HWY 49
- ② CONNECT CREOSOTE ROAD TO WASHINGTON. THIS WILL REDUCE TRAFFIC ON AIRPORT ROAD & ELIMINATE TRAFFIC THROUGH THE TURKEY CREEK COMMUNITY
- ③ AIRPORT CONNECTOR TO I-10. BETTER ACCESS TO AIRPORT & REDUCE TRAFFIC ON HWY 49.

Response: Comments regarding the Three Rivers Road extension, Creosote Road extension, and the I-10 Airport Connector projects will be noted in this plan as well as incorporated into a project file to be used when these projects are considered for funding.

Comment:

1. There are some critical needs that are missing? If so, what are they?

May need some additional improvements from I-110 @ Division Street.

2. There are some projects that should be deleted? If so, what are they and why?

Possibly Forrest Ave in Blx. - Gate may shift south of Division Street

3. Please list the top three projects that you would like to see happen ASAP. And why?

- i) Irish Hill Drive - White to Porter - assist w/ moving traffic near Keesler Gate
- Cedar Lake Rd - I-10 to Poppy's Ferry Rd - more Keesler employees to work quickly
- Cedar Lake Rd Medical Park drive - more Keesler

Response: Comments #1 & #2 above suggest improvements that would likely happen depending on Keesler Air Force Base future traffic circulation plans. Once those plans have been made the 2035 Long Range Transportation Plan could be amended to accommodate the proposed improvements. Comments regarding Irish Hill Drive and Cedar Lake Road will

be noted in this plan as well as incorporated into a project file to be used when these projects are considered for funding.

Comment:

1. There are some critical needs that are missing? If so, what are they?

- FUNDING, FUNDING, FUNDING
- NOISE BARRIER DIAMONDHEAD/I-10

3. Please list the top three projects that you would like to see happen ASAP. And why?

- 43/603, 43/602, 43/603

Response: GRPC submitted this comment to Mississippi Department of Transportation (MDOT).

Comment:

1. There are some critical needs that are missing? If so, what are they?

May need to consider improvements near
Division Street or Judge Selig - Keesler AFB
is considering a new gate on the east.

2. There are some projects that should be deleted? If so, what are they and why?

Forrest Ave - Keesler may be planning a new
east gate which will be near
Judge Selig or Division Street.

Response: Comments #1 & #2 above suggest improvements that would likely happen depending on Keesler Air Force Base future traffic circulation plans. Once those plans have been made the 2035 Long Range Transportation Plan could be amended to accommodate the proposed improvements.

Comment:

1. There are some critical needs that are missing? If so, what are they?

Frontage Road Gautier Vancleave To Martin Bluff would benefit by pedestrian bicycle facility. Frontage Road connects Sandhill Crane Refuge to Hickory Hills.

Gautier Vancleave Road from Sandhill Crane Refuge to Gulf Coast Community College and commercial district allows active transportation for adults and families when there is a shared-use path separated from the high speed, high density traffic.

3. Please list the top three projects that you would like to see happen ASAP. And why?

1. Martin Bluff Road accomodates Hickory Hills and apartment complex children to Martin Bluff Elementary. This requires an off road shared use path for children & seniors citizens.
2. Shared use, off road path from Sandhill Crane Refuge to U.S. 90 via Gautier Vancleave Road. This serves the businesses in Gautier, the visitors in RV parks and tourists from Sandhill Crane Refuge.

You can also provide comments on the plan via the web site www.grpc.com until March 27, 2011

3. Designate a dollar amount for bicycle/pedestrian projects in each ~~Phase~~ (stage) protected from transfer to other categories. PLEASE COMPLETE THE REVERSE SIDE Make the dollar amt as a percentage equal to the bike sed death rate in the area

Response:

Comments regarding Gautier-Vancleave Road, Martin Bluff Road and the I-10 Frontage Road will be noted in this plan as well as incorporated into a project file to be used when these projects are considered for funding. The comments will be used in the MPO's bicycle and pedestrian planning. Suggestions for Martin Bluff Road will be sent to the City of Gautier to be considered as the ongoing development the Martin Bluff Road project reaches the design phase. The comments regarding a designation of funds for bicycle and pedestrian facilities are being considered by the MPO at this time. The MPO will consider setting aside a certain percentage of the Gulf Coast MPO's STP funds for this purpose.

----Comments Submitted at the Harrison County Public Meeting----

Comment:

1. There are some critical needs that are missing? If so, what are they?

A. I DON'T THINK CONTINGENCY PLANNING IS ADEQUATELY ADDRESSED
B. I DON'T THINK THE IMPACT OF THE BIG SHIPS ON THE PORT OF GULF PORT IS ADEQUATELY ADDRESSED.

3. Please list the top three projects that you would like to see happen ASAP. And why?

A. I would like to see PASSENGER RAIL SERVICE — PROBABLY NOT ASAP.
B. DEVELOPMENT OF NEW TRADITIONAL TRANSPORTATION — like Bicycles & walking.
C. I would like to see public transportation improvement

Response: Alternative transportation analysis that is identified in the Transit Development Plan will address improved transit service for the commuter. This analysis will look at vanpool services, express transit and bicycles as a part of an improved transportation system on the Gulf Coast.

Comment:

3. Please list the top three projects that you would like to see happen ASAP. And why?

PASS ROAD corridor around the intersection of LOWAN ROAD. Open configuration allows for excessive variations of traffic flow which conflicts causing collisions.

Response: Comments regarding Pass Road and Cowan Rd will be noted in this plan as well as incorporated into a project file to be used when these projects are considered for funding. This information will be extremely useful as we address safety concerns in the planning process and give priority to the funding of projects that will mitigate safety concerns.

Comment:

1. There are some critical needs that are missing? If so, what are they?

The Canal Road / Port Connector and Port NIS railroad need to be separated from Hwy 90.

3. Please list the top three projects that you would like to see happen ASAP. And why?

Canal Road / Port Connector
To be ready for Port restoration and to move trucks off of 25th Ave.

Response: The comments regarding the Canal Road connector are noted. These comments will be sent to MDOT.

Comment:

1. There are some critical needs that are missing? If so, what are they?

HAVE MORE PUBLIC INPUT AND INFORMATION SHARING.
(SEE BACK) HAVE MORE MATERIALS AVAILABLE FOR THE FEW WHO DO
ATTEND SO THEY CAN SHARE THE INFO WITH OTHERS AT GROUP MEETINGS

2. There are some projects that should be deleted? If so, what are they and why?

- THE ELEVATED HIGHWAY PROPOSED FOR GULFPORT. - POLLUTION - NOT WANTED
- PROJECTS FOR THE TUNICA AREA TAKING FUNDS FROM ROAD DEVELOPMENT IN THE SOUTH.

3. Please list the top three projects that you would like to see happen ASAP. And why?

- IMPROVE CANAL ROAD TO AND FROM I-10
- IMPROVE 49 TO AT LEAST 3 LANES - PARTICULARLY IMPROVE 49 SOUTH FROM JACKSON TO GULFPORT - IT IS OLD AND HAZARDOUS
- IMPROVE BICYCLE PATHS ALONG THE COAST SAFELY FOR CYCLISTS AND CHILDREN
- FIND ANOTHER RD OTHER THAN 49 FOR THE INCREASED PORT ACTIVITY

Response: The MPO is working hard to place priority on bicycle and pedestrians need on the coast. Comment regarding Canal Road is appreciated and will help elevate the priority of initiating a project on this corridor. Comments regarding US 49 and the port connector will be sent to MDOT.

----Comments Submitted at the Hancock County Public Meeting----

- Comment:** Comments made by Diamondhead POA with approval of the Diamondhead POA and Hancock County. In line with the “Environmental Stewardship” goal of section 1.2.
- * The Diamondhead Community has a problem with noise from I-10. So question other communities do also.
 - * We understand that a man-made sound barrier would be expensive and that funds are getting tighter.
 - * We believe that other ways of reducing noise can be effective and affordable, such as
 - Maximizing the natural foliage along sides of I-10 and planting new foliage;
 - Re-paving with a “quieter” road surface such as asphalt;
 - Relocating the rumble strips to be outside the highway side lines.
 - * We and Hancock County are in the process of submitting a more detailed plan to MDOT to reduce noise by these means
 - * We request that the Multiplan 2035 include specifically Noise Abatement where traveled highways are close to residential areas.
 - * We also request that the Hancock County-Diamondhead proposed Noise Reduction Plan be included in MDOT’s short range plans. [Harold Preble]
- Response:** GRPC submitted this comment to Mississippi Department of Transportation (MDOT).
-

U. S. Highway 90 Biloxi Bay Bridge
Photograph by J. Wilkinson

