# TRANSPORTATION /4

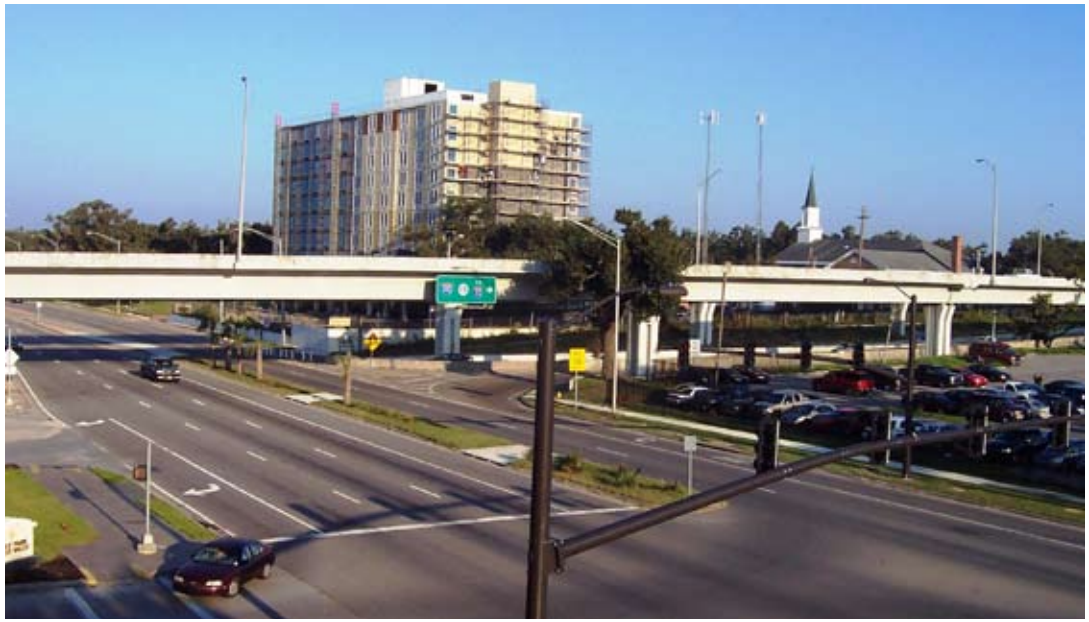
## 4.1/OVERVIEW

Like the rest of the City, Biloxi's transportation system was profoundly impacted by Hurricane Katrina. Prior to Hurricane Katrina, the City was experiencing intensive development of coastal properties adjacent to Highway 90, including condominium, casino, and retail projects. Katrina devastated Highway 90 and other key transportation facilities, highlighting Biloxi's dependence on a constrained network of roadways and bridges connecting to inland areas.

The City of Biloxi operated in a State of Emergency for over two years following Hurricane Katrina's landfall on August 29, 2005. Roadway access to the Biloxi Peninsula is provided by Highway 90 and Pass Road from the west and by three key bridges from the east and north: Highway 90 via the Biloxi Bay Bridge from Oceans Springs and I-110 and Popp's Ferry Road over Back Bay. Katrina destroyed the Biloxi Bay Bridge, undermined and closed Highway 90, significantly damaged the Popp's Ferry Road bridge (which was closed for over four months), and damaged the I-110 bridge.

Thousands of residents were displaced and numerous homes damaged by the hurricane's effects, many to the point that they were not repaired (see Chapter 7, Housing). Increased insurance costs and revised FEMA flood insurance rate maps that raised the base flood elevations have contributed to a slower pace in redevelopment of areas impacted by the storm surge and flooding. This in turn has resulted in significant land areas that have been not built back since Katrina, alleviating some of the pressures on the available capacity of the roads serving them.

The City of Biloxi is in a rebuilding mode, both to replace aging infrastructure and to repair and improve the roadways and facilities that were damaged by Katrina and subsequent storms. Pre-Katrina traffic volumes and congestion have returned following reconstruction of U.S. Highway 90, the Biloxi Bridge, and casinos. Many transportation projects are in progress or under consideration, providing an opportunity for coordinated, long-range planning for a system that supports the future land use and development pattern of Biloxi. In that context, the Transportation Element of the Comprehensive Plan lays out a strategy to develop a multi-modal system that improves mobility and safety and increases the choices available to residents and visitors to move about the City.



### Roadway Functional Classifications

The City, Gulf Regional Planning Commission (GRPC), and Mississippi Department of Transportation (MDOT) work cooperatively in the designation of functional classifications of the City's roadways. Using definitions provided by the *Institute of Transportation Engineers* (ITE) Traffic Engineering Handbook, 5th Edition, pg 350-351, the Functional Classification system is based on the following:

**Interstate Highways** are designed to carry high volumes of traffic at high speeds and levels of service. Access is strictly limited to interchanges, which are carefully located and designed for maximum safety. Longer-distance trips, including goods movement, use such facilities.

**Arterial Streets**, including principal and minor arterials, carry traffic between important activity or population centers. Arterial highways are typically designed with some measure of access control through limits on driveway locations and spacing of intersections. Arterial streets carry both passenger car and commercial (truck) traffic.

**Collector Streets** link the local street system with arterial highways. Such roads "collect" traffic, serve as local through routes for short trips, and provide access to abutting land uses. Collector streets often appear similar to local streets, although collector streets typically carry substantially higher volumes. Commercial traffic is typically limited to local delivery uses.

**Local Streets** provide access to the transportation network from developed land uses. The design character of these roads reflects low speeds and traffic volumes. Accommodation of pedestrians should be a high priority.

This classification system was utilized to designate the functional class of each of the City's roadways. This system is shown on Figure 4.1 *Transportation Classification*. Interstates 10 and 110 are maintained by MDOT. Highways 67 and 90 require MDOT permits for access, but development of adjacent land must also meet the approval of the City. Other arterial and collector streets shown on Figure 4.1 are Federal Aid streets.

## Key Transportation Issues

- Biloxi's roadway system consists of a network of interstate highways, arterial and collector roadways, and local streets (referred to as functional classifications). This existing network is shown on Figure 4.1.

- The growth of the City has stressed the capacity of some of the major corridors. As a result, travelers are experiencing an increase in congestion and traffic delays.

- The evacuation capacity of the Biloxi Peninsula is limited by the capacity of a limited number of bridge connections to the north and east and roadway connections to the west.

- An issue related to the limited number of connections to the peninsula is the lack of direct north-south connections between I-10 and Highway 90 other than I-110. In addition, east-west connections across the City and the County are limited by waterways and federal land restrictions (primarily Keesler Air Force Base).

- Access management controls on the number and location of curb cuts serving adjacent development have been recommended on Highway 90 and Pass Road and are needed to maintain traffic flow and safety along other arterial roadways.

- There are many roadway projects planned or underway post-Katrina to improve access, mobility, capacity and safety through the City.

- Pedestrian facilities destroyed by Hurricane Katrina are being reconstructed along Highway 90. The pedestrian/bicycle path across the new Biloxi Bay Bridge is heavily used and there is great potential to develop additional pedestrian and bicycle facilities in the City as an alternative to automobile use. The CTA's new Bike/Bus program offers bike racks on all fixed-route buses, providing greater flexibility and range for bicyclists.

- The Coast Transit Service (CTA) provides many services within the City of Biloxi, including fixed-route bus service, paratransit service for seniors and persons with disabilities, and car and vanpool services. Like pedestrian and bicycle facilities, there is potential to improve the transit services available in the City as an alternative to automobile use. The 2007 *Gulf Coast Transit Development Plan* identifies additional strategies to expand and improve transit service in Biloxi and the Gulf Coast Region in the future.

- The City's primary air service provider, the Gulfport-Biloxi International Airport, provides commercial, private and cargo services to the residents, military personnel and visitors. Public transit (bus) service between Biloxi and the airport is lacking.

- The City has many businesses and industries that depend on the access to the Mississippi Sound, Back Bay Biloxi, and other waterways surrounding this coastal community.

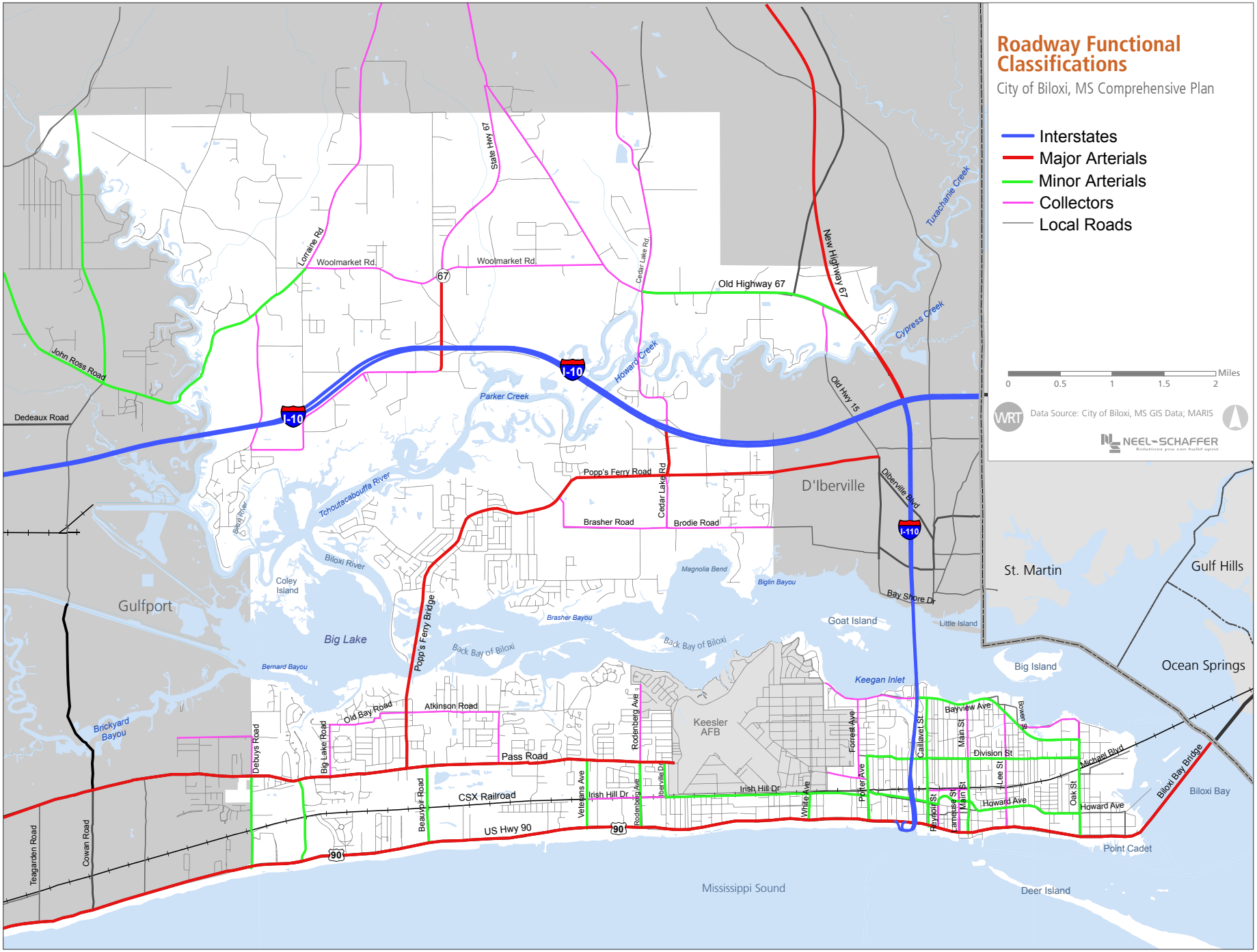



FIGURE 4.1/ROADWAY FUNCTIONAL CLASSIFICATIONS

## 4.2/LONG RANGE GOAL, OBJECTIVES, AND ACTIONS

**Transportation Goal**

Provide a multimodal, interconnected network that provides choices for people to move safely inside and outside Biloxi via vehicular, transit, bicycle, pedestrian, air, and water-borne transportation.

The long-range goal of the Transportation Element of the Comprehensive Plan is to create a multi-modal, interconnected transportation network. The objectives and actions to support this goal are organized according to the different travel modes comprising the network (vehicular, transit, bicycle, pedestrian, air, and waterborne transportation). While they are addressed separately in the objectives and actions, it is important that these modes work together to form a truly multi-modal system (e.g., "complete streets" that accommodate pedestrian, bicycle, and transit service in addition to vehicles—see Objective 4-3).

## Vehicular Travel

### Objective 4-1 Provide a roadway network with adequate east-west and north-south connections to move people safely to, through, and out of Biloxi.

Action 4-1-1 Develop a phased roadway improvement program and identify funding sources to establish critical links in the system.

Action 4-1-2 Advance the east-west corridor project along the CSX rail line as a long-term, multi-modal alternative to Highway 90.

The continued growth of the City has stressed the capacity of some of the major routes to accommodate increased traffic. Major corridors in the City providing access that is vital to the economy, as well as to public health, safety, and welfare through emergency evacuation needs, include Interstate 10, Interstate 110, US Highway 90, Pass Road, Popp's Ferry Road, Highway 67, and Cedar Lake Road (from I-10 to Popp's Ferry Road). Of particular importance, the ability to safely evacuate the Biloxi Peninsula during storms is limited by the capacity of the three bridges accessing the peninsula from the north and east and the roadways connecting to the west.

Table 4.1 summarizes the traffic volumes in the City, comparing 2007 average daily traffic (ADT) count data, 2030 traffic projections, and existing roadway capacity. Several key links in North Biloxi, including Woolmarket Road, Shorecrest Road and Old Highway 67, are already at traffic volumes beyond the 2030 projected ADT. Volumes shown in bold are greater then existing generalized roadway capacity. Of the four above capacity volumes in 2007, two are currently on the City's project priority list (Popp's Ferry Rd between Atkinson Rd and Sunkist Country Club Rd and Popp's Ferry Rd from Cedar Lake Road to the City Limits). The transportation model, developed by GRPC, includes daily traffic volume forecasts on major roadway links and is based on committed and planned growth.[1]

A related issue is the limited number of north/south arterial roadways that connect Highway 90 and I-10 within the Gulfport/Biloxi peninsula area. These connections include Highway 49, Cowan Road, I-110, and Highway 609, as well as an indirect route via Beauvoir Road, Pass Road, Popp's Ferry Road, and Cedar Lake Road to the I-10 interchange. Prior plans involving a new Interstate highway, known as the East Harrison County Connector, have been discontinued and current long-range plans do not include this route.

The proper functioning of Biloxi's corridor roadways is critical to the mobility and ultimate viability of the City. Breakdown in the ability to accommodate vehicular traffic will significantly hamper future development, economic productivity, and the ability to safely evacuate residents and visitors during storms as delays increase. The following text provides an overview of conditions along key transportation corridors, followed by a listing of improvement projects planned to maintain mobility and the capacity of roadways throughout Biloxi. All improvements to major intersections should accommodate crossing for pedestrians. Adequate maintenance and operational improvements, including access management strategies, are also key to the continued operation of these facilities at acceptable levels (see Objective 4-2).

[1] The State of Mississippi and several MPO's have consolidated the travel demand modeling process into one statewide update to provide more uniformity across the state. The Mississippi Unified Long-Range Transportation Infrastructure Plan (MULTIPLAN) is scheduled to begin in late 2009 and will provide a valuable tool for Biloxi in developing a phased roadway improvement program.

TABLE 4.1/TRAFFIC VOLUMES AND PROJECTIONS

| Roadway Segment | 2007 ADT | 2030 Projected ADT | Roadway Capacity |
|---|---|---|---|
| Highway 90 between Debuys & Rodenberg | 24,750 | **47,400** | 31,200 |
| Highway 90 between Rodenberg & I-110 | **39,700** | **53,100** | 31,200 |
| Highway 90 between Lee & Oak | 12,000 | **33,500** | 31,200 |
| Pass Rd between Debuys & Beauvoir | **31,300** | **37,700** | 29,640 |
| Pass Rd between Beauvoir & Veterans | 22,000 | **39,100** | 29,640 |
| Pass Rd between Veterans & Rodenberg | 16,000 | **33,600** | 29,640 |
| Debuys Rd between Hwy 90 & Pass | 6,350 | 11,750 | 14,800 |
| Eisenhower Dr between Hwy 90 & CT Switzer | 4,600 | 14,200 | 14,800 |
| Eisenhower Dr between CT Switzer & Pass | 11,000 | **16,100** | 14,800 |
| Atkinson Rd between Popp's Ferry & Jim Money | 7,400 | 10,900 | 11,840 |
| Beauvoir Rd | 12,000 | 15,800 | 23,400 |
| Veterans Ave between Irish Hill & Pass | 5,200 | 13,500 | 14,800 |
| Rodenberg Ave between Hwy 90 & Irish Hill | 5,000 | 11,600 | 14,800 |
| Iberville Dr between Irish Hill & Pass | 9,100 | **11,900** | 11,840 |
| Irish Hill Dr between Veterans & Iberville | 4,350 | 7,850 | 11,840 |
| Irish Hill Dr between White & Porter | 9,200 | **16,900** | 11,840 |
| White Ave | 7,000 | 14,200 | 23,400 |
| Porter Ave between Hwy 90 & Irish Hill | 3,800 | **13,600** | 11,840 |
| Porter Ave between Howard & Division | 6,800 | **22,000** | 11,840 |
| Howard Ave between Porter and I-110 | 6,400 | **16,200** | 11,840 |
| Howard Ave between Lee & Oak | 2,900 | 10,700 | 11,840 |
| Division St between Porter and I-110 | 12,000 | **21,300** | 14,800 |
| Division St between Caillavet & Main | 6,300 | **16,000** | 14,800 |
| Division St between Lee & Oak | 2,700 | 13,900 | 14,800 |
| Bayview Ave Between Porter & Caillavet | 15,500 | **31,700** | 23,400 |
| Bayview Ave between Caillavet & Main | 8,800 | **23,400** | 14,800 |
| Caillavet St between Hwy 90 & Esters | 6,950 | **24,800** | 23,400 |
| Caillavet St between Esters & Bayview | 4,350 | 22,400 | 31,200 |
| Martin Luther King, Jr. Blvd between Lameuse & Main | 3,800 | 8,400 | 15,540 |
| Main St between Hwy 90 & Howard | 2,100 | 3,600 | 15,540 |
| Main St between Esters & Division | 2,700 | 6,400 | 11,840 |
| Oak St between Hwy 90 & Howard | 2,900 | **16,000** | 11,840 |
| Oak St between Howard & Back Bay | 5,000 | 7,600 | 11,840 |
| Myrtle St between Hwy 90 & Howard | 5,500 | 14,300 | 14,800 |
| Popp's Ferry Rd between Atkinson & Sunkist | **22,000** | **24,900** | 15,540 |
| Popp's Ferry Rd between Riverview & Cedar Lake | 19,500 | 19,650 | 29,640 |
| Popp's Ferry Rd east of Cedar Lake Rd | **13,000** | **18,600** | 11,840 |
| Brodie Rd | 4,700 | 4,200 | 11,840 |
| Cedar Lake Rd south of Popp's Ferry | 5,100 | 5,600 | 11,840 |
| Cedar Lake Rd between Popp's Ferry & I-10 | 24,000 | **31,800** | 29,640 |
| Cedar Lake Rd north of I-10 | 5,100 | 7,700 | 11,840 |
| Woolmarket Rd between Lorraine & Hwy 67 | 5,900 | 2,200 | 11,840 |
| Woolmarket Rd between Hwy 67 & Old Hwy 67 | 3,900 | 4,800 | 11,840 |
| Lorraine Rd south of Shorecrest | 4,700 | 6,800 | 11,840 |
| Shorecrest Rd between I-10 and Lorraine | 2,300 | 600 | 11,840 |
| Highway 67 between I-10 and Woolmarket Rd | 9,800 | **13,000** | 11,840 |
| Highway 67 north of Woolmarket Rd | 7,700 | 4,600 | 11,840 |
| Old Highway 67 between MS Hwy 67 & Hudson Krohn | 10,000 | 10,700 | 11,840 |
| Old Highway 67 north of Woolmarket Rd | 4,400 | 2,900 | 11,840 |
| Hudson Krohn Rd | 4,800 | 4,900 | 11,840 |
| Source: GRPC, Regional Demand Forecasting Model | | | |

*Interstate 10 (I-10)*

I-10 is currently being reviewed by MDOT as part of a multi-state improvement project that includes Intelligent Transportation Systems (ITS) upgrades to improve interchange operations and to provide surveillance systems for improved mobility during hurricane evacuations.[2] Existing and new retail developments near I-10 interchanges throughout Harrison County have increased traffic, impacting the capacity of the adjacent interchange ramps. Interchange improvements are needed to maintain sufficient capacity to support the additional growth expected in future years. In Biloxi, Cedar Lake Road at I-10 is currently operating near capacity. Additionally, future plans in the Woolmarket area are anticipated to warrant a new interchange at the Shorecrest Road alignment.

*Interstate 110 (I-110)*

In the early 2000s, as GRPC and MDOT evaluated future transportation plans, I-110 was forecast to exceed capacity due to casino and other growth along Biloxi's waterfront. To alleviate this capacity deficiency, the East Harrison County Connector was conceived as a new interstate connection to Highway 90 that would extend south from the existing I-110/Highway 67 Road interchange. As noted, this project was removed from the regional Long-Range Transportation Plan in 2007, prompting MDOT to commission a study to evaluate potential interchange and capacity improvements to the I-110 corridor. Currently, the I-110 corridor is over capacity, primarily in the PM peak hours, during which Keesler Air Force Base and other commuter traffic leaves the peninsula and a large portion exit at the D'Iberville Rodriguez interchange. The MDOT study includes improvements to this interchange that will reduce congestion and build up of traffic at the exit ramps. Auxiliary lane construction and capacity improvements are needed along I-110 to maintain acceptable access and evacuation capacity.

Development in the vicinity of Sangani Boulevard area in D'Iberville has increased the traffic volumes and delays at the north (Highway 15) approach to the I-110/I-10 interchange. Retail development in the west quadrant of this interchange will further decrease its capacity. In addition, opening of the final segment of the new Highway 67 connection by MDOT will provide a limited access connection between I-110 and US Highway 49. This connection is anticipated to increase traffic on I-110 and ultimately will require that a grade separated interchange be constructed at Sangani Boulevard to maintain acceptable levels of service on I-110 to the south.

Another issue is that the I-110 ramp to westbound Highway 90 does not meet current design standards. Ultimately, the interchange will need to be reconfigured to improve both capacity and safety.

*U.S. Highway 90*

Highway 90 is a vital component of the City of Biloxi's transportation infrastructure. In addition to being the only principal arterial roadway extending east-west across the Biloxi Peninsula from Ocean Springs to Gulfport, it also provides access for adjacent developments. During Hurricane Katrina, Highway 90 sustained major damage and significant portions of the roadway were closed within Harrison County while emergency repairs were made. Traffic circulation was greatly impacted, as people were forced to use Irish Hill Drive (a minor arterial that terminates at Veterans Avenue) as an alternative. MDOT is currently improving the Highway 90 corridor and implementing access management strategies, including closures of

[2] Intelligent Transportation Systems (ITS) refers to the use of advanced computer and communications technology to enhance the operation and management of the surface transportation system.

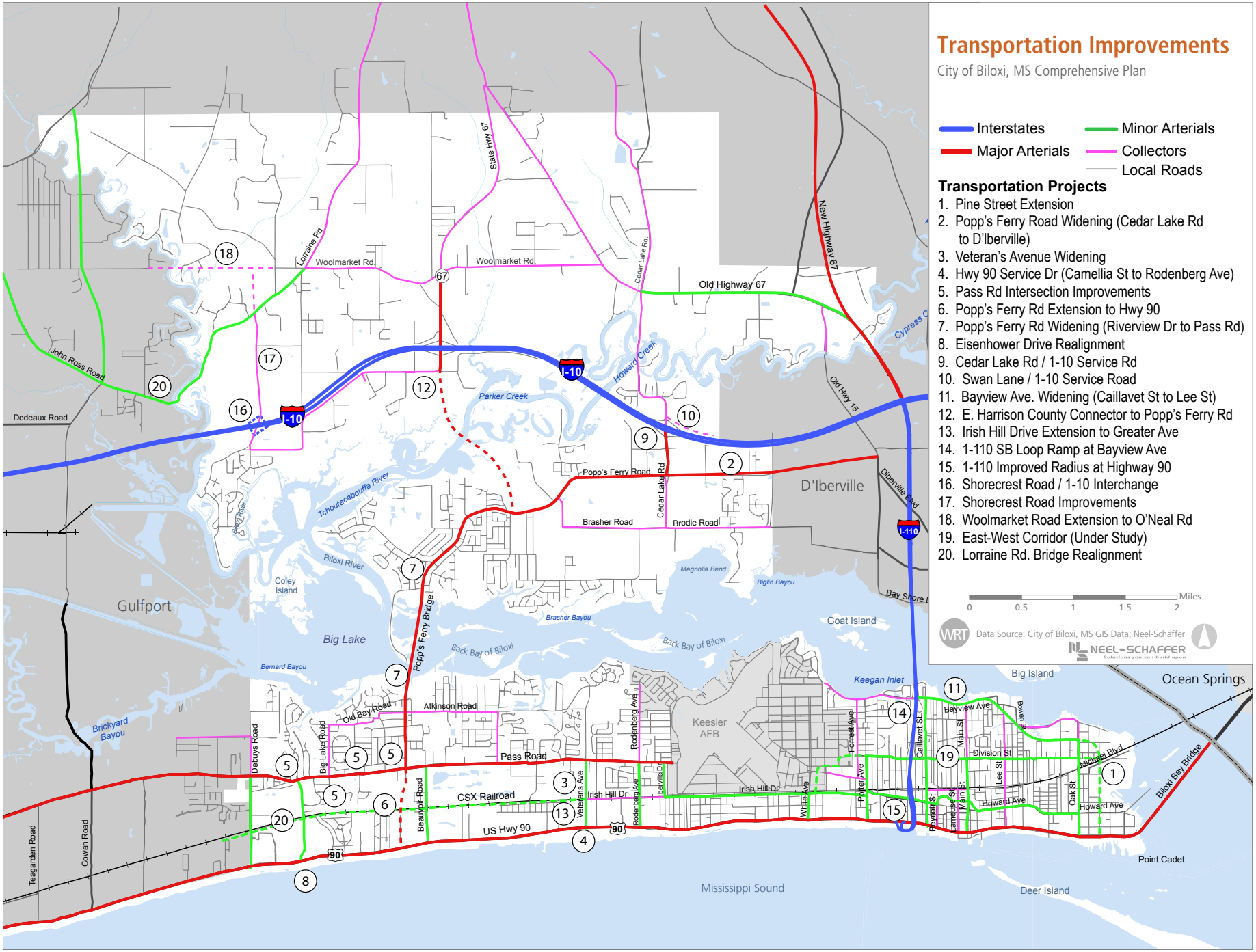



FIGURE 4.2/PLANNED TRANSPORTATION IMPROVEMENTS

driveways to businesses that were destroyed by Katrina. The signal system is also being interconnected and coordinated to improve through traffic movement.

*Pass Road*

Access to West Biloxi and Keesler Air Force Base from the west is provided via Pass Road. This key east-west roadway provides access from Keesler to US Highway 49 in Gulfport, a critical link for the City when Highway 90 was closed following Katrina. Adjoining properties are mostly built out and Pass Road is in need of upgrades to maintain and improve vehicular movement. Past studies by the City have evaluated and developed designs for improvements to many of the existing signalized intersections. The lane widths are narrow and the spacing of driveways typically do not meet current access management standards. The limited right-of-way width has resulted in utilities being placed within sidewalks and clear zones throughout the roadway corridor.

*Popp's Ferry Road*

The City has placed a high priority on improving Popp's Ferry Road capacity as a critical connector from the peninsula to Cedar Lake Road and I-10 in North Biloxi. Improvement projects have been implemented in stages over the last 10 years, including widening of the segment between Cedar Lake Road and Riverview Drive to a five-lane roadway and the segment from Riverview Drive to the Back Bay bridge to a three-lane roadway. Further improvements are under development. Design plans have been developed for widening Popp's Ferry Road to a five-lane roadway from Cedar Lake Road east to the D'Iberville city limits. An Environmental Study is underway to evaluate widening Popp's Ferry Road from Riverview Drive south to Pass Road. In addition, the City is evaluating an extension of Popp's Ferry Road south of the CSX Railroad to connect with Highway 90 by crossing the Coliseum property.

*Cedar Lake Road*

Cedar Lake Road provides the primary connection between West Biloxi and I-10, as well as an indirect connection to Highway 90, both via Popp's Ferry Road. Retail development along the Cedar Lake Road corridor in recent years has significantly increased traffic volumes. Ramp improvements and access management controls are needed to maintain access and mobility for the corridor. The City recently interconnected the traffic signals at the I-10 interchange and coordinated them with the adjacent signal to the south at Medical Park Drive. Additionally, the City has commissioned a study of the interchange to identify improvements needed to increase capacity while providing access to the adjacent property to the north and east.

*Highway 67*

Completed by MDOT in 2009, this arterial highway connects I-10 at I-110 to Highway 49 north of Saucier, providing a new regional connection to the north from the Biloxi peninsula.

Many proposed roadway improvements are in various stages of planning throughout the City. These improvements are shown on Figure 4.2 and summarized below. Generally, they are listed in order from programmed short-term projects to more speculative long-term projects. The numbers after each project refer to the key on Figure 4.2.

*Pine Street Extension (1)*
The Pine Street Extension is planned to complete the East Biloxi Transportation Loop, which currently consists of Highway 90, Caillavet Street, Bayview Avenue and Back Bay Boulevard. This extension of Back Bay Boulevard east and south to Highway 90 along the Pine Street alignment is planned as a four-lane divided roadway.

*Popp's Ferry Road Widening from Cedar Lake Road to D'Iberville (2)*
This project is currently in the design phase. The plans include widening Popp's Ferry Road from a two-lane open ditch section to a five-lane curb and gutter section with a center two-way left turn lane.

*Veterans Avenue Widening (3)*
Veterans Avenue is planned to be improved from a two-lane roadway to a four-lane divided roadway. Intersection improvements at Highway 90, Irish Hill Drive, and Pass Road are planned as part of this project, which is currently in the design phase.

*Highway 90 Service Drive from Camellia Street to Rodenberg Avenue (4)*
The service drive on the south side of Highway 90 between Camellia Street and Rodenberg Avenue is currently being restored through the ongoing MDOT Highway 90 project. MDOT is reclaiming the right-of-way from adjacent landowners (who have been utilizing it as an extension of their parking lots) in order to construct the service drive, which will provide local access for the businesses while limiting direct access to Highway 90.

*Pass Road Intersection Improvements (5)*
This phased project includes radius improvements, auxiliary lane construction, and signal upgrades. Ultimately all the traffic signals along Pass Road in Biloxi will be interconnected to operate with coordinated timings and major intersections will be widened to allow auxiliary turn lanes and improved lane widths.

*Popp's Ferry Road Extension to Highway 90 (6)*
The extension of Popp's Ferry Road is planned in two phases: 1) a connection from Pass Road to the Mississippi Coast Coliseum south of the CSX Railroad and 2) a connection from the Coliseum to Highway 90. This project will improve traffic flow along Pass Road between Popp's Ferry Road and Beauvoir Road by providing a direct connection to Highway 90.

*Popp's Ferry Road Widening from Riverview Drive to Pass Road (7)*
This project is in the preliminary stages of an Environmental Assessment to analyze various route alternatives for the roadway widening. The construction of a new Popp's Ferry Road Bridge is planned as part of this project.

*Eisenhower Drive Realignment (8)*
Until recent years, Eisenhower Drive south of the CSX Railroad in West Biloxi was a private street, providing access to the retail developments along this corridor. With the redevelopment of the adjacent property, Eisenhower Drive has been dedicated to the City and is now a public street. The southern terminus was recently improved through the ongoing Highway 90 reconstruction project to remove the abrupt curve in the road and provide a direct extension to Highway 90.

*Cedar Lake Road/I-10 Interchange Improvements (9)*
The City has commissioned a study to identify capacity and circulation improvements to improve traffic flow along Cedar Lake Road from Medical Park Drive to Easy Lane, including the I-10 eastbound and westbound ramps.

*Spring Lane/I-10 Service Road (10)*
Connecting Cedar Lake Road to the D'Iberville city limits north of I-10 is included in the Cedar Lake Road improvement study. In addition, a service road is proposed as an extension of Spring Lane to serve new development along the I-10 corridor frontage.

*Bayview Avenue Widening from Caillavet Street to Lee Street (11)*
Improvements to Bayview Avenue from Caillavet Street to Lee Street will support the completion of the East Biloxi Transportation Loop (see Pine Street extension above). This project is planned to include widening of Bayview Avenue to a five-lane section with a center two-way left turn lane and intersection improvements at Lee Street and Holley Street.

*Arterial Connection from Woolmarket to Popp's Ferry Road (12)*
As an alternative to the highly-debated and now discontinued East Harrison County Connector, this arterial roadway will provide an additional connection from Woolmarket to areas south of I-10. The preferred route is an extension of Highway 67 (existing) across the Tchoutacabouffa River to a connection at Popp's Ferry Road in the vicinity of Jam Lane. Environmental impacts on the river and adjoining wetlands as a result of construction and operation of this roadway will need to be addressed.

*Irish Hill Drive Extension to Greater Avenue (13)*
This proposed extension of Irish Hill Drive to the west will improve the access to the residential area served by Greater and Southern Avenues. Currently, this neighborhood is accessed by the unsignalized intersection of Iris Street at Pass Road and the signalized intersection of Camellia Street at Highway 90.

*I-110 Southbound Loop Ramp at Bayview Avenue (14)*
The construction of a loop ramp that connects southbound I-110 to eastbound Bayview Avenue in the southwest quadrant of the interchange would reduce congestion, eliminate the traffic signal, and provide a free-flow movement from I-110 to Bayview Avenue.

*I-110 Improved Radius at Highway 90 (15)*
Improving the southbound I-110 to westbound Highway 90 ramp by providing a wider horizontal curve would improve a deficient condition that results in traffic conflicts at Highway 90.

*Shorecrest Road/I-10 Interchange (16)*
With the growth of the City to the north, a new interstate interchange is anticipated to be needed at I-10 and Shorecrest Road. This interchange would provide additional access for residents in the areas of Eagle Point and west Woolmarket. The project is included in the GRPC Long-Range Transportation Plan.

*Shorecrest Road Improvements (17)*
The need for Shorecrest Road corridor improvements, in conjunction with the new I-10 interchange, is tied to the current momentum of growth in Biloxi to the north. The potential improvements include a boulevard corridor extending north of I-10 into Woolmarket. If high-density projects are proposed in this area of the City, the extension of Shorecrest Road to the north will improve circulation and interstate access.

*Woolmarket Road Extension to O'Neal Road (18)*
The extension of Woolmarket Road west across the Biloxi River to O'Neal Road in Gulfport would improve east-west connectivity in Harrison County. Currently there are only three east-west crossings of the Biloxi River: I-10, Lorraine Road and Three Rivers Road. This project is included in the GRPC Long-Range Transportation Plan. Environmental impacts on the river and adjoining wetlands as a result of construction and operation of this roadway will need to be addressed.

*East-West Corridor (19)*
GRPC commissioned a supplement to the Long-Range Transportation Plan to address the potential for a new east-west, multi-modal transportation corridor north of Highway 90 and south of I-10. As noted, such a corridor is needed to provide an alternate route to Highway 90. This project has been referred to as the East-West Corridor and a route immediately adjacent to and parallel to the CSX corridor has been identified. The next stage of the study would be to conduct an environmental review, but no funding has been identified at this time to support such a study.

*Lorraine Road Bridge Replacement (20)*
The Lorraine Road Bridge across the Biloxi River is planned to be replaced through a joint project between the City of Biloxi and the City of Gulfport. The east bridge approach will be shifted to the south and the roadway will be realigned to the east to improve its abrupt horizontal curvature.

In addition to new roadway projects, the City has an obligation to maintain and upgrade the existing roadway network to acceptable standards. A phased roadway improvement program is needed to prioritize roadways in need of upgrades and improvements. The City maintains approximately 215 miles of roadway, which does not include the MDOT-maintained Highway 90, Interstates 10 and 110, and Highway 67. The City's roadways have both asphalt and concrete pavement. Asphalt roadways require mid-life resurfacings to maintain them in good condition. Resurfacing asphalt roadways on a ten-year cycle would require the City to resurface approximately 20 miles of roadway each year. Concrete roadways may only require small sections to be replaced as the need arises.

The City has the opportunity to implement a roadway resurfacing program as an extension of the current Infrastructure Repair Program. This four-year program includes resurfacing approximately 100 miles of roadway. Three other critical roadways (Irish Hill Drive, Pass Road and Popp's Ferry Road south of Popp's Ferry Bridge) were repaved in 2009 with FHWA assistance. Roadways that are not affected by these recent programs, yet are in need of improvements, should be identified and prioritized to continue a phased improvement program over a five-year period.

TABLE 4.2/THRESHOLD DEVELOPMENT INTENSITY REQUIRING TRAFFIC STUDY

| Land Use | Intensity of Development |
|---|---|
| Single Family Residential | 90 Units |
| Apartment | 150 Units |
| Condominium/Townhouse | 190 Units |
| Mobile Home Park | 170 Units |
| Shopping Center | 6,000 SF GLA |
| Fast Food Restaurant | 3,000 SF |
| Gas Station with Convenience Store | 7 fueling positions or 1,600 SF |
| Bank | 2,000 SF GFA |
| General Office | 67,000 SF GFA |
| Medical/Dental Office | 29,000 SF |

*Notes: GLA-Gross Leasable Area, GFA – Gross Floor Area*

*Source: ITE Transportation Impact Analysis for Site Development, 2005*

## Objective 4-2 Increase the efficiency of the existing roadway network through operational measures and targeted capacity improvements.

Action 4-2-1 Establish traffic impact study requirements for developments exceeding traffic generation thresholds.

Action 4-2-2 Implement access management controls (i.e., limits on the number and locations of curb cuts) to maintain traffic flow and safety along arterial and collector streets.

Action 4-2-3 Implement targeted improvements (e.g., signal timing coordination, dedicated turn lanes, and lane expansions) where warranted to address congestion and safety issues.

As the City continues to redevelop and grow post-Katrina, measures will be needed to maintain sufficient roadway capacity to accommodate projected traffic increases from new residential, nonresidential, and mixed-use development. Three key issues need to be addressed: off-site traffic impacts, access management, and cross access. Specifically, traffic impacts related to driveway operations and nearby intersection operations need to be considered for redevelopment or new development projects.

The Institute of Transportation Engineers (ITE) has developed land use thresholds above which a Traffic Impact Study should be prepared by a Professional Engineer to evaluate the off-site traffic impacts relative to industry standards for maintaining acceptable levels-of-service (LOS). The threshold for this re-

quirement is 100 peak hour trips, and the intensity of development that would trigger this requirement is listed in Table 4.1.

In addition to traffic impact analysis and mitigation requirements for significant new developments, establishing access management guidelines would significantly improve mobility and safety along arterial roadways within Biloxi while still allowing reasonable access to adjacent properties. Implementation of access management programs has been demonstrated to improve the safety of roadway corridors, reduce crashes, and improve traffic circulation. Potential access management techniques include auxiliary lane construction, median closures, median modifications, driveway closures, and improved driveway spacing.

Recommended access management components and standards include criteria used to minimize the conflict points and speed differentials. Table 4.2 and the accompanying illustration show a range of recommended access management standards for arterial streets.

**Access Management**

Use of access management techniques is intended to facilitate the major flow of traffic while accommodating adequately spaced driveway locations and traffic signals that serve adjacent streets and developments. Such techniques include:

- Limiting the number of conflict points
- Separating conflict points
- Reducing acceleration and deceleration impacts at access points
- Removing turning vehicles from through travel lanes
- Spacing of major intersections to facilitate progressive travel speeds along arteries
- Providing adequate site storage

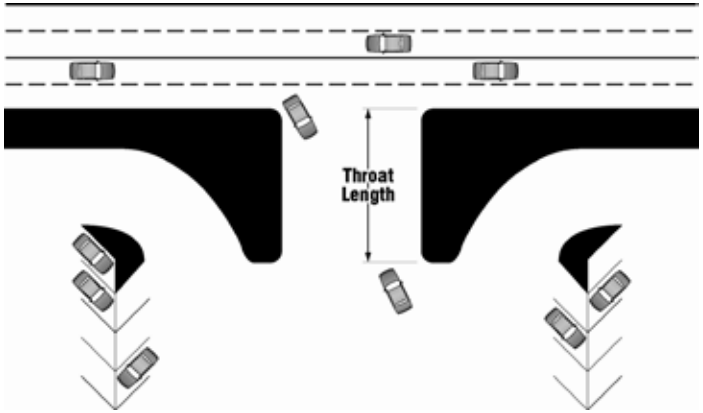
TABLE 4.3/ACCESS MANAGEMENT
ARTERIAL ROADWAY STANDARDS

| | |
|---|---|
| Signal Spacing | ¼-mile minimum |
| Driveway Spacing | |
| Commercial | 100 ft minimum,<br>< 50 vph at site |
| | 350 ft minimum,<br>< 50 vph at site |
| Non-Commercial | 50 ft minimum |
| One-Way Driveways | 25 ft minimum |
| Boundary Spacing | 12.5 ft minimum |
| Number of Driveways | No more than 2 with ≤ 300 ft |
| Frontage Road Separation | > 25 ft minimum mid-block,<br>150 ft minimum at signals |
| | > 300 ft preferred |

*Source: MDOT Access Management Guide , October 2007*

ACCESS MANAGEMENT:

DRIVEWAY THROAT LENGTH STANDARDS

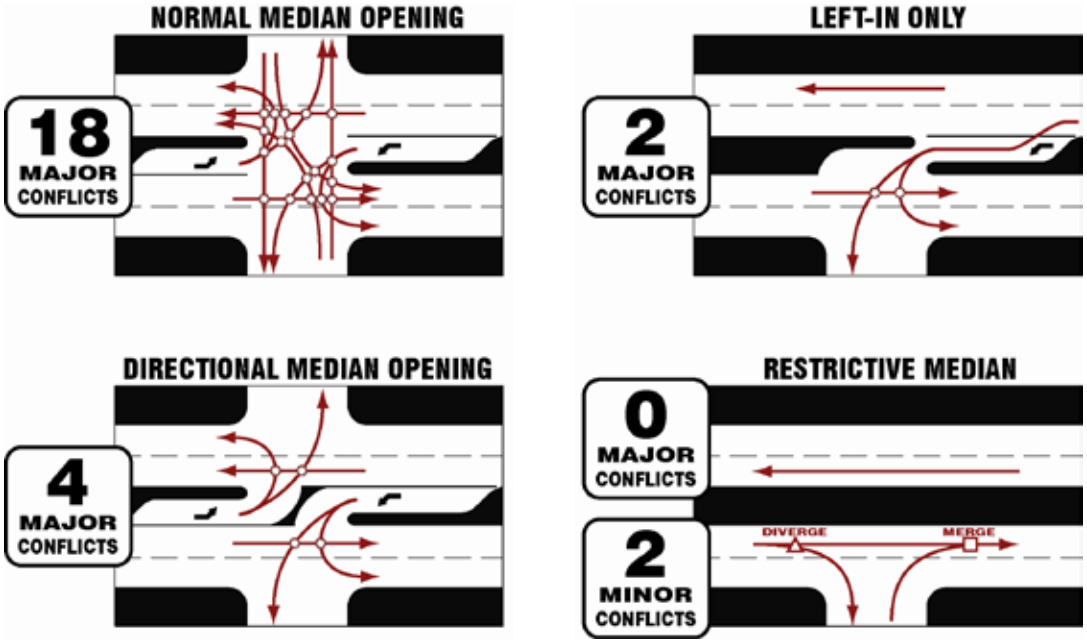



| Site Activity | Throat Lengths |
|---|---|
| Regional Shopping Center (Mall) | 250 ft |
| Community Shopping Center (Supermarket, Drug Store) | 80 ft |
| Small Strip Shopping Center | 30 ft |
| Regional Office Complex | 250 ft |
| Office Center | 80 ft |
| Small Commercial Developments | 30 ft |

*Source: MDOT Access Management Guide, October 2007*

ACCESS MANAGEMENT:

MEDIAN OPENING CONFLICT POINTS




Management of median openings is critical to access control and maintaining safety and traffic flow along arterial roadways. The type of movements allowed at median openings, whether full access or limited movements, determine the number of potential conflicts that can occur, thus making them more (or less) disruptive to through traffic. Additionally, the spacing between median openings impacts traffic flows; a minimum spacing of 880 feet is recommended between full median openings. Median openings allowing limited movements can be spaced at closer intervals, as the most disruptive

movement is a left turn onto the arterial from a minor street. Figure 4.5 illustrates the different types of median openings and corresponding potential access management conflicts.

Interconnecting adjacent developments via access easements (lateral or cross access) is a vitally important access management strategy that reduces dependency on arterial and collector streets for all traffic movements. Such cross access allows developments to capture internal trips between adjacent land uses, reducing traffic volumes on the main arterial or collector street.

In addition to applying traffic impact requirements and access management standards to new developments within the City, the existing street network should be evaluated to identify targeted improvements needed to address safety concerns and improve capacity. Such improvements may include signal timing coordination, construction of dedicated turn lanes, turning radius improvements, roadway widening, and right-of-way dedication.

The City has developed standard right-of-way widths and pavement widths for public streets within the City. The standard widths are defined as follows:

TABLE 4.4/RIGHT OF WAY AND PAVEMENT STANDARDS

| Classification | Minimum ROW | Pavement Width *(Back of Curb to Back of Curb)* |
|---|---|---|
| Major Arterial | 100 feet | 64 feet (5-12′ lanes) |
| Minor Arterial | 80 feet | 52 feet (4-12′ lanes) |
| Collector Street | 60 feet | 40 feet (3-12′ lanes) |
| Local Street | 50 feet | 28 feet (2-12′ lanes) |
| Cul-de-sac (radius) | 60 feet | 50 feet |

New developments are required to donate the necessary right-of-way if the existing width does not meet the current standards.

Biloxi has moved forward with several projects to improve the safety and capacity of the existing roadway network. Some of the more significant improvements needed, such as Pass Road intersection improvements, Cedar Lake Road/I-10 interchange improvements, and improvements to the I-110 connection to Highway 90, are discussed above under Objective 4-1. Other examples include:

### Brasher Road Improvements

This project is currently under construction, with plans to widen the roadway to two 12-foot lanes and some minor utility improvements.

### Brodie Road Improvements

This two-lane, open-ditch roadway is planned to be improved to a three-lane roadway with curb and gutter. Scheduled to begin construction in 2009, this project should also include utility upgrades and new sewer installation.

### Howard Avenue Improvements

This street reconstruction project is not intended to address capacity issues, but rather to create an attractive streetscape connecting Downtown and East Biloxi. Phase One is underway from Martin Luther King Jr. Boulevard to Ahern Drive and will be completed in 2009. Future improvements are expected to address the section of Howard Avenue between Ahern Drive and Myrtle Street. Typical improvements may include roadway narrowing, designated on-street parking adjacent to commercial properties, tree plantings, new brick sidewalks, and decorative street lighting.

## Objective 4-3 Provide a multimodal street network that accommodates vehicular, transit, pedestrian, and bicycle travel.

Action 4-3-1 Develop a "Complete Streets" policy and design standards to accommodate pedestrians, bicyclists, and transit service in roadway and intersection improvement projects.

While past engineering approaches have emphasized moving vehicular traffic as a priority over other travel modes, present-day thinking has evolved to creating "Complete Streets" that also accommodate pedestrians, bicyclists, and transit service safely and in an attractive environment. This goal is consistent with public input during the planning process calling for a transportation network that provides more opportunities for walking, biking, and transit use. Reducing dependency on driving as virtually the only viable means of moving about Biloxi would also reduce gas consumption and vehicular emissions, supporting the sustainability goals of the Comprehensive Plan. Therefore, it is recommended that the City develop a Complete Streets Policy with standards to accommodate the needs of pedestrians, bicyclists, transit service, and vehicular traffic in Biloxi's roadway network. This policy would provide the necessary guidance for new roadway projects and for roadway improvement projects within the City.

With Complete Streets legislation introduced in both the U.S. Senate and Congress in 2009, a Complete Streets Policy would position Biloxi well for the future. As a first step, an advisory committee could be established to develop the policy. The advisory committee could include representatives from GRPC (the designated MPO for the region), Coast Transit Authority, Gulf Coast Bicycle Club, and consultant firms involved in transportation issues, as well as local citizens for input regarding the needs to be addressed by this policy. Once developed, the City's Complete Streets Policy could serve as a model for other local jurisdictions, GRPC, and MDOT.

## Objective 4-4 Provide for public and private parking that is adequate to meet needs and compatible with community character and development quality.

Action 4-4-1 Improve parking standards for private development in the LDO to reduce requirements for the number of spaces based on national "best practices"; provide flexibility in meeting requirements; address parking lot location and landscaping through design standards; and clarify surfacing, marking, and configuration requirements.

Action 4-4-2 Develop a comprehensive parking strategy for the Downtown designed to provide conveniently located parking in "zones" defined by a 1/8-mile walking radius.

The LDO identifies minimum off-street parking space requirements for a comprehensive list of land uses. If a specific land use is not listed in the LDO, the Director of Community Development determines the minimum parking requirements based on a land use with similar parking characteristics. The LDO does not specify minimum requirements for all land uses; uses such as parks, sporting recreational facilities (e.g., swimming pool, tennis courts) and yacht clubs require a parking

study based on actual comparable data and/or national standards developed by the Urban Land Institute (ULI) or ITE.

The LDO requires that calculation of minimum parking spaces for mixed-use developments be based on the sum of the requirements for all land uses. Adjustments to the requirements can than be made based on the establishment of Accessory Uses and Shared Parking Analysis. The Accessory Use parking adjustment is geared toward the gaming industry, but can be applied to other similar developments without the gaming component. Shared Parking Analysis may be applied to retail/restaurant development. Developers may be guided by the LDO to utilize the ULI shared parking standards, or other recognized source.

The current LDO requirements in many cases reflect outdated standards and should be reviewed for opportunities to reduce the number of required spaces based on national "best practices." The provisions could also be improved by providing more flexibility to reduce the number of parking spaces by allowing the developer to submit an alternative parking plan. Such a plan could make use of techniques such as shared or off-site parking, transportation demand management, and deferment of a portion of the parking space requirement.

The LDO does not adequately address the topic of on-street parking. Providing such parking may be beneficial in the Central Business District (CBD) and along commercial/mixed-use corridors, such as Howard Avenue, Caillavet Street, and Division Street. Given that parking is a critical factor for the economic success of the Downtown and off-street parking is not required in the CBD, a comprehensive Downtown parking strategy should be developed that proactively anticipates the needs of new development (see Chapter 10, Downtown Revitalization Strategy).

## Transit Service

### Objective 4-5 Work with Coast Transit Authority (CTA) to improve transit service in Biloxi and the Gulf Coast Region.

Action 4-5-1 Implement improvements to existing routes and services to attract new ridership per CTA's Gulf Coast Transit Development Plan (2007, update anticipated in 2010).

Action 4-5-2 Pursue longer term actions to develop a multimodal network of transit services per the Governor's Commission on Recovery, Rebuilding, Renewal Transportation Report (2006) and the Gulf Coast Transit Development Plan (2007), including: streetcar service along Highway 90 with connections to Downtown, a "Coliseum District Circulator", east-west corridor bus rapid transit, intercity high-speed rail passenger service, and water taxi service.

Action 4-5-3 Work with CTA to coordinate future transit service with land use consistent with Comprehensive Plan long-range goals and objectives, including existing activity centers and new mixed-use centers as Biloxi grows to the north *(See also Land Use Objective 2.2).*

Transit service in the City is provided by the Coast Transit Authority (CTA), a nonprofit that is independently managed by a Board of Commissioners and receives state and federal funding for public transportation along the Mississippi Gulf

Coast. CTA currently operates ten fixed-route services, six of which are exclusively in the City of Biloxi. Transfer stations at the Transit Center in Downtown Biloxi and the Edgewater Mall provide riders with connections to routes servicing Gulfport and Ocean Springs. CTA also provides "curb-to-curb" ADA/paratransit service for persons with disabilities who are unable to access or use the fixed-route services. In addition, a special services program for senior citizens provides contracted services for special trips (e.g., grocery shopping, medical appointments, transportation to Senior Centers, field trips, and transportation for area nursing homes).

Fixed-route service frequencies vary from 30 minutes on Keesler Route 24 to 45 or 90 minutes for the remaining six fixed routes. The schedule frequencies are set to multiples of 45 minutes so that route schedules can be time-coordinated. The arrival and departure times of all routes are coordinated at the two system transfer locations, one in Gulfport and one in Biloxi, to provide transfer times of between five and ten minutes among all routes.

CTA discontinued several pre-Katrina fixed routes due to low demand following the hurricane. Service on the Beachcomber Route was resumed in May 2009. The Beach East route in Biloxi is still not operating at this time due to lack of residences and businesses along the route.

In addition to its transit services, CTA has initiated the Coast Commuter service, a carpool and vanpool program targeted to long-distance commuters to jobs on the Gulf Coast. The carpool service is a "ride-match" system in which riders are introduced to other potential carpool members in their area. The vanpool service provides vans for use by commuter groups, who typically share the responsibility of driving and operating costs such as van payments, gasoline, and parking.

As illustrated in Figure 4.6, existing transit service in Biloxi is limited to the main thoroughfares of Highway 90, Pass Road, Irish Hill Drive, and the Casino Loop Route in East Biloxi. Additional fixed-route services that should be considered include a new Popp's Ferry Road–D'Iberville Route and a new "Coliseum District Circulator." The Beachcomber service was recently restored along the beachfront route on Highway 90, originating at Long Beach Harbor and terminating at Point Cadet. New transit shelters are planned for two primary routes - Pass Road and Highway 90. The proposed Popp's Ferry-D'Iberville Route would originate at the Edgewater Mall, run along Pass Road and Popp's Ferry Road, and terminate in D'Iberville at the Sangani Boulevard retail center. This route would provide transit service to North Biloxi and connect the peninsula with the major retail shopping area located north of the I-10/I-110 interchange. The Coliseum District Circulator would serve the Convention Center District as it develops into the visitor hub of West Biloxi.

Over time, transit service should be expanded to the north in coordination with development of the mixed-use activity centers proposed by the Future Land Use Plan. Initial plans could include establishment of a park-and-ride facilities along the I-10 corridor. Co-located with new retail/mixed-use development in the Woolmarket and Cedar Lakes activity centers, such facilities would provide central parking locations for residents from the north, east and west to commute south to the peninsula. Transit service associated with the park-and-ride facilities would also provide residents of the Biloxi peninsula with access to commercial / retail areas adjacent to I-10.

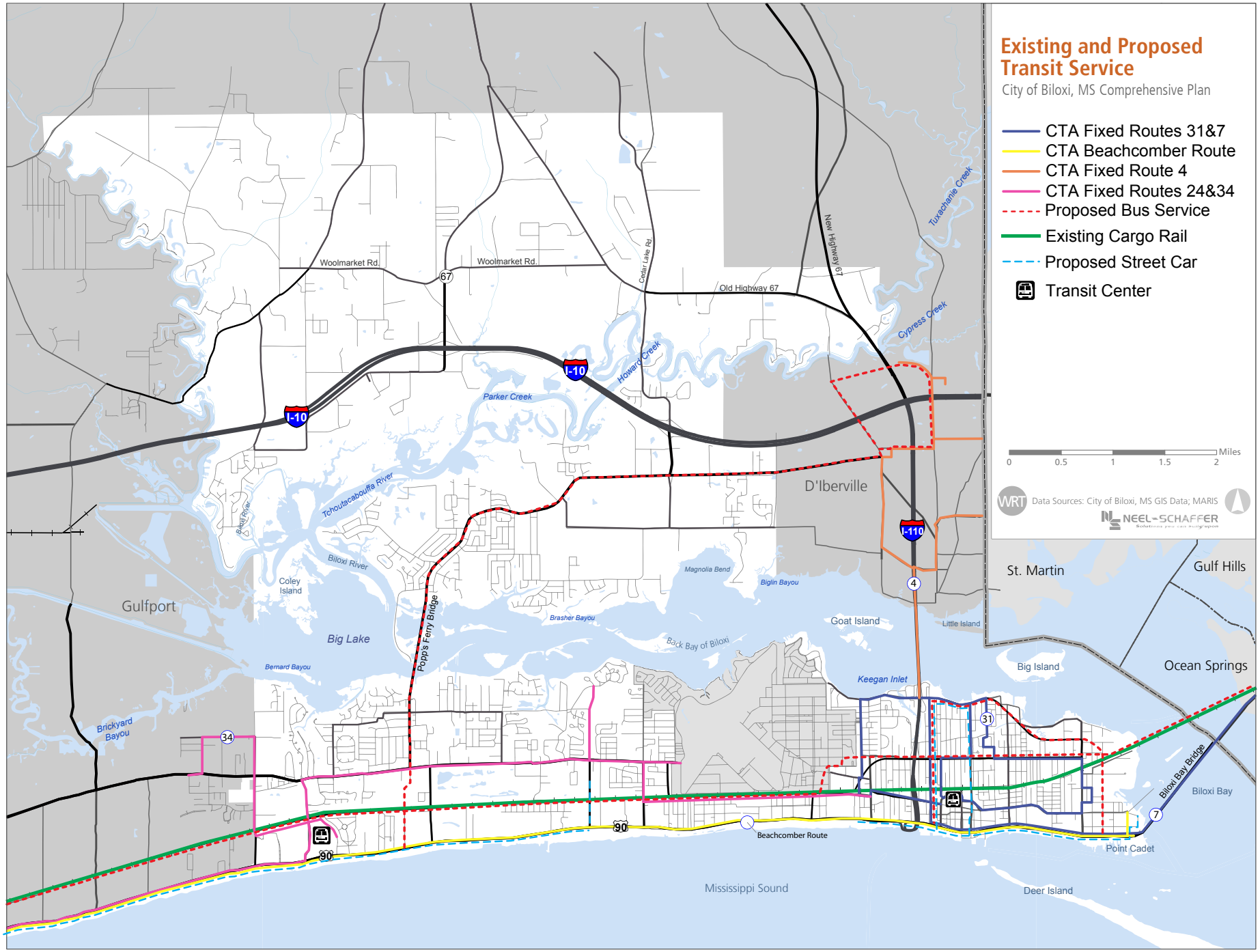



FIGURE 4.3/EXISTING AND PROPOSED TRANSIT SERVICE

CTA's Gulf Coast Transit Development Plan includes consideration of a "Streetcar Trolley" (rubber tire) system to meet the needs of the tourism industry in Biloxi. The CTA is using rubber tire trolleys on the Beachcomber route. Other potential routes include the Light House/Point Cadet Streetcar Line along Highway 90 from the Biloxi Lighthouse and future Visitor's Center to Point Cadet; the Biloxi Streetcar Line, serving the Downtown and Back Bay casinos via a loop along Caillavet Street, Bayview Avenue, and Main Street; and the Coliseum District Streetcar Line, serving the West Biloxi Convention Center District.

East-west service along the Mississippi Gulf Coast is another long-range transit development project. As part of the proposed East-West Corridor (see Action 4-1-2), Bus Rapid Transit could be provided along the existing CSX railroad corridor, enhancing the potential for a multi-modal transit hub in Biloxi. Such service would operate with limited stops at major north-south arterial roads using dedicated traffic signals with transit priority capabilities. East-West Corridor development should include these transit features in the planning stages.

In the event that CSX discontinues use of the existing rail corridor, inter-city, high-speed passenger rail service could operate in Mississippi between Bay St. Louis and Pascagoula with stops in other communities, including Biloxi. If properly implemented with a convenient timetable, this service could potentially reduce automobile traffic along the Highway 90 and I-10 corridors. Scheduling would need to be coordinated with express train service operating between Mobile and New Orleans. Amtrak recently completed the *Gulf Coast Service Plan Report (July 2009)*. The study proposes three options for restoring passenger service along the Gulf Coast.

Water taxi service has also been discussed as an alternative means of travel between casinos and other waterfront tourist attractions. While the term "taxi" typically refers to an on-demand service, this service would operate with a fixed route and schedule. This mode of transportation could be promoted as a tourist attraction, incorporating tours and sight-seeing opportunities. Ideally, it would be funded privately or with grants and is dependent on partnerships with the private sector to provide the necessary facilities for boarding and off-loading. Key public waterfront sites such as the Lighthouse and Point Cadet could be included in the route.

## Bicycle Travel

### Objective 4-6 Develop a network of bicycle routes throughout the City.

Action 4-6-1 Identify opportunities to establish dedicated bike lanes or designated bike routes along existing roadway corridors as components of the citywide bicycle network.

Action 4-6-2 Incorporate dedicated bike lanes or other accommodations for bicyclists into roadway improvement projects consistent with a "Complete Streets" Policy and design standards (Action 4-3-1).

Action 4-6-3 Designate and develop a network of on-street bike routes and off-street multi-use (biking and walking) paths in Woolmarket as Biloxi grows to the north, including connections to mixed-use activity centers.

Action 4-6-4 Establish and maintain a continuous multi-use recreational trail along the Mississippi Sound per the Sand Beach Master Plan as a major component in the bicycle network.

Action 4-6-5 Incorporate sidewalks and bike lanes (safe routes to school) within a ¼-mile to ½-mile radius of schools.

Biloxi's mild climate and flat terrain make it ideally suited for establishment of a bicycle network serving recreational users, visitors, commuters, and others. Figure 4.4 illustrates a conceptual citywide bicycle network consisting of existing and proposed routes. This concept was developed with input from the Gulf Coast Bicycle Club, the *Harrison County Comprehensive Plan,* and the *Sand Beach Master Plan*.

The proposed network is envisioned to consist of three types of facilities: off-road paths, bicycle lanes, and shared roadways. Each type of facility is described below. Accepted standards such as the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities or the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) can be used to guide the construction of new bicycle facilities within the City. In addition to bicycle routes, parking for bicycles should be provided at destinations such as parks, community facilities, and shopping centers and included in new developments through LDO requirements.

### Off-Road Paths

Generally referred to as trails and used by pedestrians, bicyclists, and other non-motorized users, off-road paths are detached or separate from public roads. They may be located within or independent of the road right-of-way (e.g., a rail-trail or greenway trail).

The minimum width of a two-way, off road path is eight feet; however, ten feet is recommended. The minimum width of a one-way, off-road path is six feet; signing and pavement markings are required to maintain proper use as a one-way facility. A ten-foot minimum vertical clearance under bridges and tree canopies is required.

Trails should be planned, designed and constructed to avoid or minimize degradation of natural resources. Trails are recommended to be soft-surface (crushed aggregate, clay or stabilized earth) except where necessary to prevent erosion and/or resource damage.

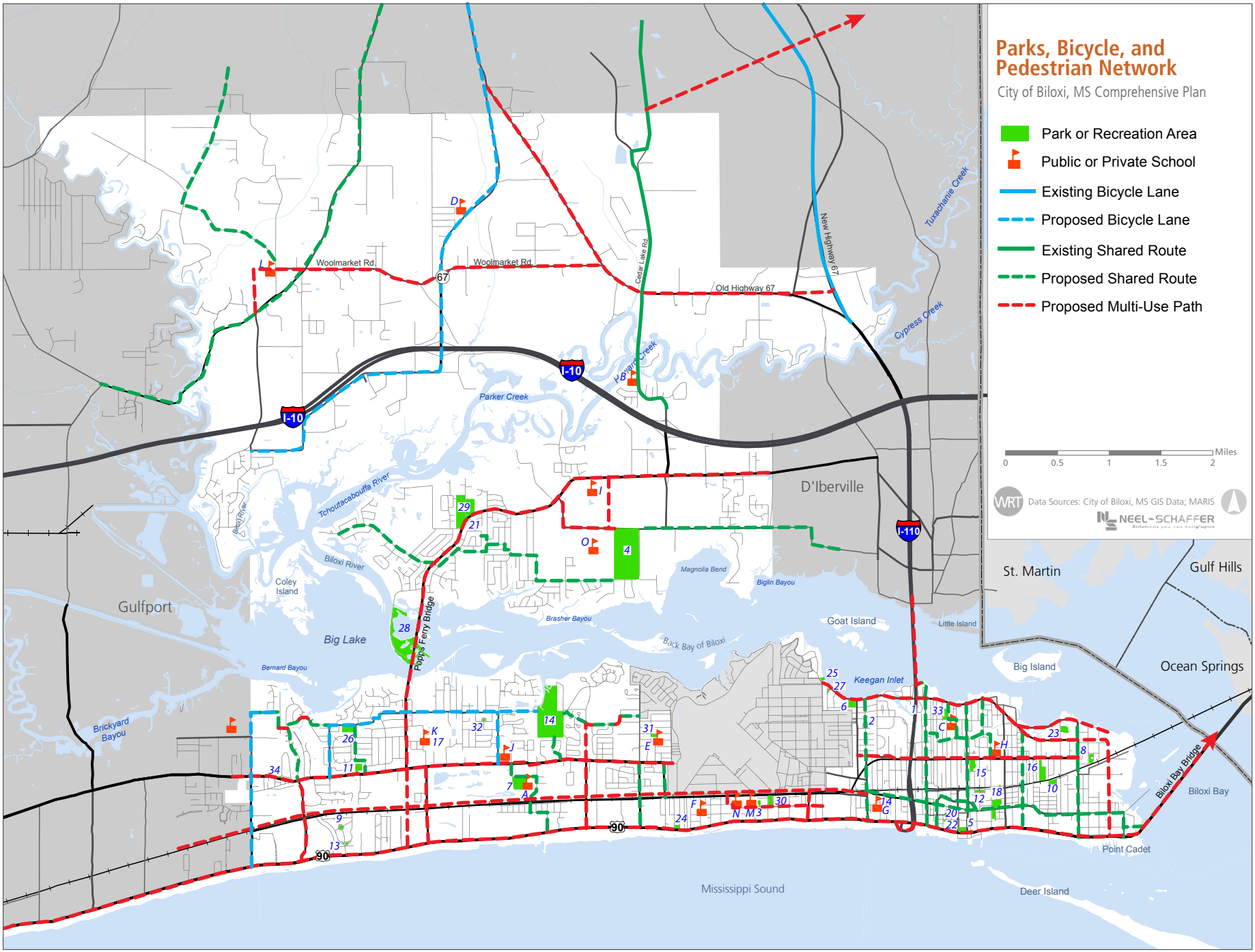
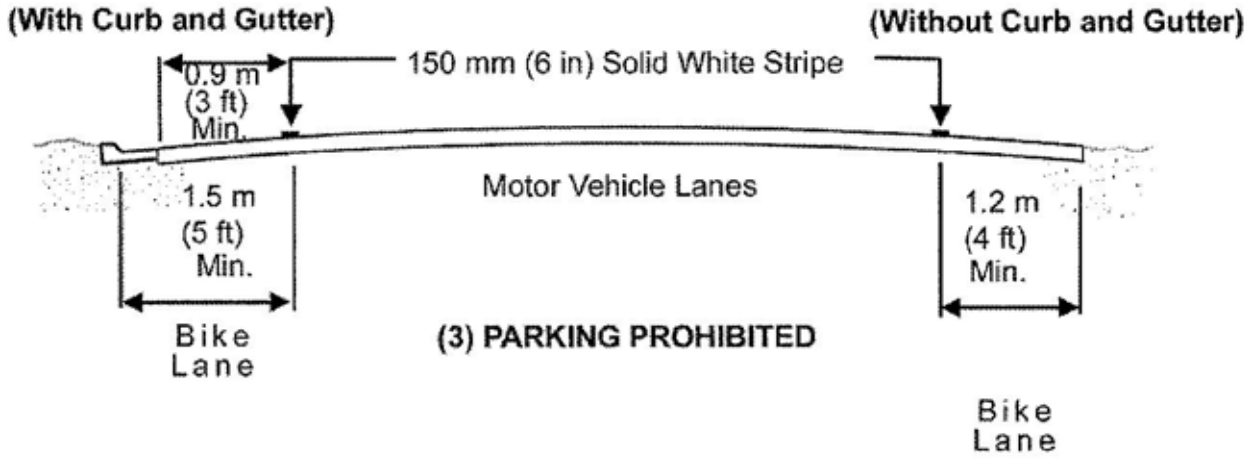
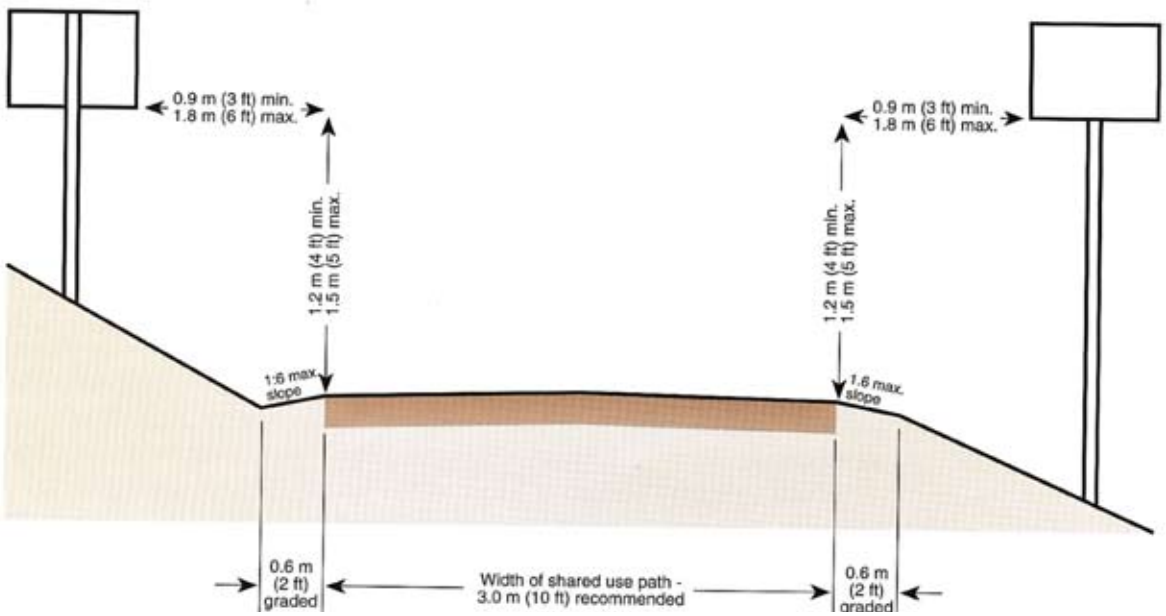



FIGURE 4.4/PARKS, BICYCLE, AND PEDESTRIAN NETWORK

TYPICAL BIKE LANE CROSS SECTION




OFF-ROAD PATH CROSS SECTION (TWO-WAY)




*Source: AASHTO Guide for the Development of Bicycle Facilities, 1999*

*Bike Lane and Multi-use Path Examples (NYC and Chicago)*

### Bicycle Lanes

A bicycle lane is a portion of the roadway that is demarcated by signage and/or pavement markings for exclusive use by bicyclists. Bicycle lanes are typically one-way in the same direction as the prevailing vehicular traffic. The MUTCD contains signing and striping standards for use in demarcating bicycle lanes.

For roadways with curb and gutter, the minimum width of a bicycle lane is three feet from the outside travel lane to the edge of pavement. For a roadway without curb and gutter, the minimum width of a bicycle lane is four feet from the outside travel lane to the edge of pavement. In areas where on-street parking is designated, the minimum width of a bicycle lane is five feet from the outside travel lane to the parking area.

To improve bicyclists' safety, drainage grates must be bicycle-safe and manhole covers should be at-grade. Bicycle lane widths may need to be adjusted to avoid potential safety hazards.

### Shared Roadways

A roadway without a separate bicycle path or lanes can have signage alerting drivers that it is utilized by both motor vehicle and bicycle traffic. Bicyclists may be accommodated through shared use of normal travel lanes with motorized vehicles, a wider travel lane (14+ feet), or paved shoulders. Unless bicycle traffic is explicitly prohibited, most streets function as shared roadways even if not specifically designated by signage.

## Pedestrian Travel

### Objective 4-7 Provide safe routes for walking throughout Biloxi.

Action 4-7-1 Develop a continuous "Biloxi Peninsula Path" as the major spine in Biloxi's pedestrian network.

Action 4-7-2 Conduct a citywide sidewalk inventory and develop a plan to increase sidewalk coverage throughout Biloxi. Prioritize segments that provide the greatest connectivity, especially to/from neighborhoods and key destinations (schools, commercial centers, parks and community facilities, transit stops, etc.).

Action 4-7-3 Incorporate sidewalks or separate pedestrian paths into all roadway improvement projects consistent with a "Complete Streets" Policy and design standards (Action 4-3-1).

Action 4-7-4 Consistent with the Comprehensive Plan Land Use Long-Range Goals and Objectives, enact policies and regulations to encourage compact, walkable, mixed-use development patterns. (See Land Use Objective 3-8)

Action 4-7-5 Require all new developments to provide sidewalks.

Action 4-7-6 Conduct safety assessments at all major intersections to determine if improvements are needed to protect pedestrians and bicyclists.

Prior to Hurricane Katrina, the primary area of pedestrian circulation was along the Highway 90 corridor, utilizing the Harrison County Sand Beach boardwalk and the sidewalks between the casinos. MDOT has restored the sidewalks along Highway 90 and has constructed new ones in some areas where they did not exist before Hurricane Katrina. The Harrison County Sand Beach Authority is working to replace the former wooden boardwalk with a concrete walkway along the Mississippi Sound in Harrison County.

The restored Sand Beach walkway is envisioned as part of a "Biloxi Peninsula Path" that wraps around the peninsula from the Biloxi/Gulfport boundary to Biloxi Bay (connecting to the Biloxi Bay Bridge walkway to Ocean Springs—see below) and on to the Back Bay of Biloxi, where it would terminate at Caillavet Street and the IP Casino. This public pathway would connect many existing and proposed attractions, such as the Sand Beach, the casinos, the new Lighthouse Visitor's Center and Park, the Museum District, Point Cadet, and the proposed Seafood Village on the Back Bay. Strong pedestrian connections should be established from the Sand Beach and the casinos across Beach Boulevard to the Downtown.

New roadway projects are being designed and constructed with pedestrian and bicycle-friendly facilities. The Biloxi-Ocean Springs Bridge was reconstructed after Katrina with a 10-foot pedestrian/bicycle path that is heavily used and provides the possibility of connectivity to future pathways and trails in and between Biloxi and Ocean Springs. Recent roadway projects, such as Caillavet Street and Popp's Ferry Road, were constructed with ADA accessible sidewalks and sidewalk ramps.


To guide further improvements to Biloxi's pedestrian network, an inventory should be conducted to identify where sidewalks exist, where existing sidewalks are in need of repairs or improvements, where obstructions from utility poles or signage exist, and where new sidewalks need to be installed to fill gaps within the network. The Downtown should be a priority area for this inventory, ideally in conjunction with an update to the 1999 parking study (see Action 4-4-2). Sidewalks exist along most Downtown streets, but may not meet ADA requirements. A Downtown sidewalk inventory should verify sidewalk locations, conformance with ADAAG (American with Disabilities Act Accessibility Guidelines), and access to parking lots.

Pass Road is another major area of concern for pedestrian safety and accessibility. Insufficient lane widths, utility poles located in close proximity to the road and/or within sidewalks, and lack of sidewalk ramps are just a few examples of the issues facing pedestrians within the Pass Road corridor. Priority may also be given to projects that qualify for Safe Routes to School, a federal program that provides funding for pedestrian improvements serving schools.

The development of sidewalks and other pedestrian facilities should be coordinated with land use objectives and actions to promote walkable, mixed-use development patterns. The LDO should require new developments to incorporate sidewalks along all streets and to provide sidewalk connections to adjacent developments. Above-grade pedestrian crossings should be considered for developments expected to generate high levels of pedestrian traffic next to major arterial roadways with multiple lanes for pedestrians to cross.

## Air Travel

**Objective 4-8** Improve connections between the Gulfport-Biloxi International Airport and Biloxi to strengthen its role as a "gateway" to the City for visitors and for local residents and businesses to connect to the outside world.

Action 4-8-1 Explore the feasibility of providing transit service between the City of Biloxi and the Airport with CTA.

Commercial air service for the City of Biloxi is available at the Gulfport-Biloxi International Airport, located off Highway 49 one mile south of I-10 in Gulfport approximately 20-30 minutes (via automobile) from most areas of Biloxi. The airport is served by five commercial airlines and a domestic and international air cargo facility. Other facilities at the airport property include the Air National Guard and a general aviation service for private charters and flight training.

Various casinos, as well as Keesler Air Force Base, operate shuttle services for their patrons and military personnel, via shuttle buses and limousines. Taxi services also provide transportation to and from the airport, but CTA does not currently operate fixed-route service.

As Biloxi and adjoining coastal areas continue their growth and recovery from Hurricane Katrina, the City should work with Coast Transit Authority to monitor possibilities to develop public bus service between the Airport and Biloxi. Such service may need to be developed in stages as demand grows. A

recent expansion of the Airport parking facilities has reduced immediate pressures to provide transit service. Visitors that would be the most likely candidates for this service are already provided transportation to and from the airport via shuttle services operated by Keesler Air Force Base and the casinos. A route could be considered to serve the Highway 90 beachfront as it is redeveloped with condominiums and other developments. Business districts could also be identified as potential stops to serve persons visiting the City for work purposes. Curb-to-curb bus service may be most the most beneficial form of service for local residents.

## Waterways

**Objective 4-9** Maintain and improve water access for the various industries that depend on the access to the Mississippi Sound, Back Bay Biloxi, and other waterways.

Action 4-9-1 Rebuild and expand the availability of dock and marina facilities available to the public and the recreational boating and commercial fishing industries. *[Also see Economic Development Action 8-2-5]*

Action 4-9-2 Continue to work with the Mississippi Department of Marine Resources (DMR) and the Coast Guard to identify shallow areas and debris within Biloxi's waterways and channels that may pose threats to the marine industries.

Action 4-9-3 Explore the feasibility of upgrading the Cedar Lake Road drawbridge and providing public facilities in this area to attract recreational boaters.

Action 4-9-4 Move forward with the replacement of the Popp's Ferry Road bridge with a new elevated bridge that will either eliminate the need for a drawbridge or significantly reduce the number of bridge openings.

Biloxi's seafood, charter fishing, recreational and commercial boating, and visitor industries all depend on the waterways for access, mobility, and recreation. It is important that the

City maintain and improve its water facilities to support this vital part of the economy.

The Ports Division of the Department of Parks and Recreation manages Biloxi's public marinas, docks, and piers (Table 4-4 and Figure 4-5). Many of these facilities were damaged by Hurricane Katrina and are being reconstructed or will be restored at a future date. Given the high demand for use of both recreational and commercial marinas and their role in Biloxi's economy, it is important that they be rebuilt as soon as possible and opportunities to develop additional facilities identified.

Like other storms, Hurricane Katrina threatened marine traffic as a result of debris and silt settling into navigable channels. With the assistance of DMR and the Coast Guard, the threat was removed and the waterways became safe for vessels to travel. Although Hurricane Katrina was an extreme case, this situation may also be caused by smaller storms with significant rain and flooding. In order to maintain safe clearance for vessels, Biloxi's waterways require continuous monitoring to ensure that the various industries that utilize them are not be negatively affected by debris or heavy siltation.

TABLE 4.5/WATER RECREATION FACILITIES *(SEE FIGURE 4.5, ACTIVE FACILITY UNLESS OTHERWISE NOTED)*

| | |
|---|---|
| 1 | West Biloxi Pier *(repairs underway, est. completion 2010)* |
| 2 | Broadwater Marina *(inactive due to hurricane damage, privately owned)* |
| 3 | Veterans Avenue Pier *(inactive due to hurricane damage)* |
| 4 | Porter Avenue South Pier *(inactive, est. construction 2010)* |
| 5 | Hopkins Street Pier *(I-110 Boardwalk Loop)* |
| 6 | Public Pier and Large Vessel Dock |
| 7 | Beau Rivage Marina |
| 8 | Windjammer Marina |
| 9 | Commercial Harbor |
| 10 | Small Craft Harbor |
| 11 | Biloxi Yacht Club Dock |
| 12 | Kuhn Street Pier *(inactive, future construction)* and Boat Ramp |
| 13 | Schooner Pier |
| 14 | Oak Street Pier and Boat Ramp *(inactive due to hurricane damage)* |
| 15 | Point Cadet Marina |
| 16 | Harbor Park Pier |
| 17 | Biloxi/O.S Fishing Bridge *(inactive, est. completion 2011)* |
| 18 | Palace Casino Marina |
| 19 | Bay Point High and Dry Marina |
| 20 | Rebel Boat Works Marina |
| 21 | Central Bay Seafood dock |
| 22 | Pelican Point Marina and Storage |
| 23 | Lighthouse Fishing Dock |
| 24 | Old Ice Wharf Pier |
| 25 | Back Bay Fishing Pier |
| 26 | Porter Avenue North Pier |
| 27 | Forrest Avenue Pier and Boat Ramp |
| 28 | Keesler AFB Marina (restricted access) |
| 29 | Hiller Park Boat Ramp |
| 30 | Causeway Park Pier, Boardwalk and Boat Ramp |
| 31 | Parkers Creek Boat Ramp |
| 32 | Little Joe's Fishing Camp Boat Ramp |
| 33 | MS Power Coal Barge Storage Area |

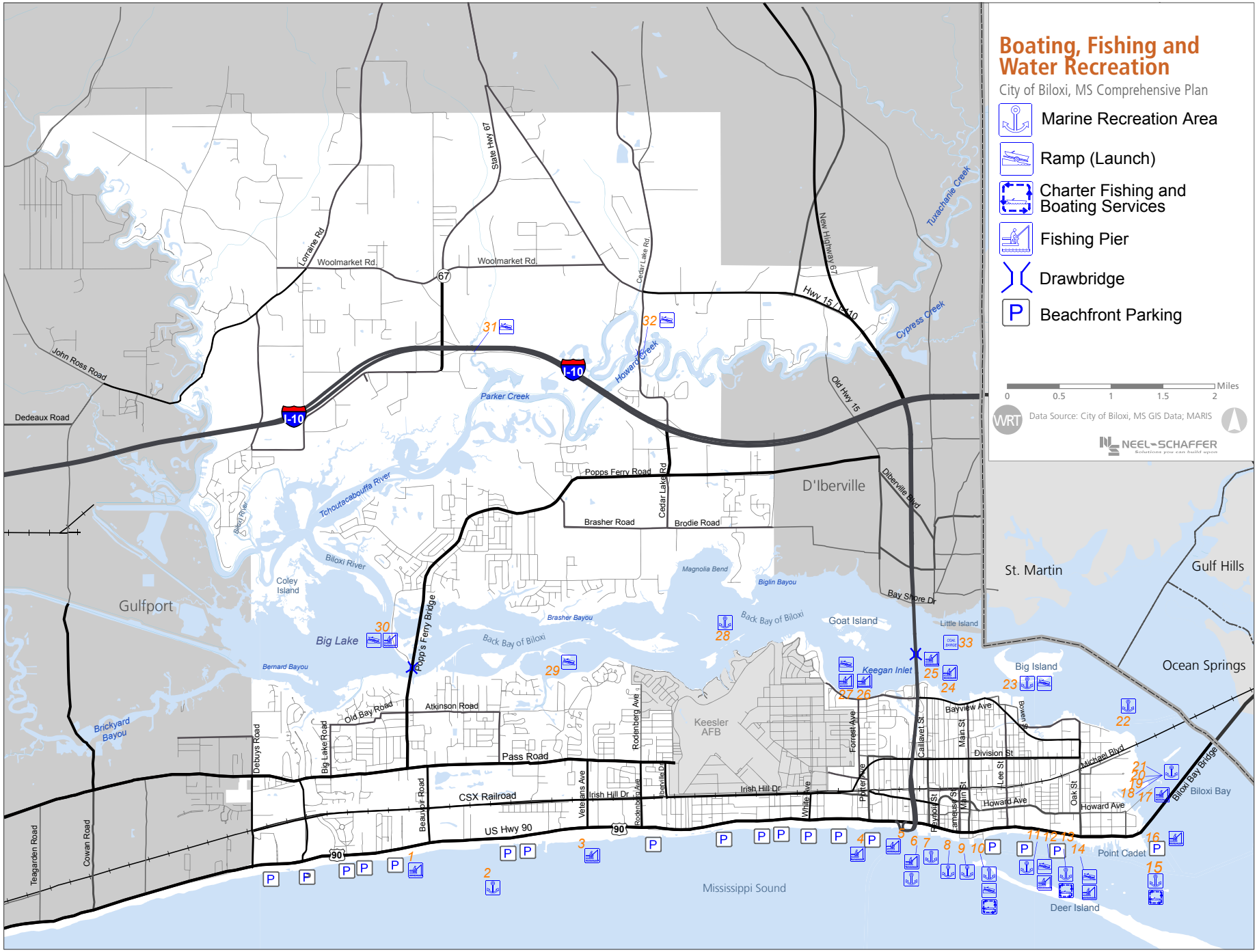



FIGURE 4.5/BOATING, FISHING, AND WATER RECREATION

The Cedar Lake Road drawbridge over the Tchoutacabouffa River does not have enough large vessel traffic to warrant a permanent bridge tender. If a vessel must traverse the channel beneath the bridge, 24-hour notice must be given to the City's Public Works Department to have a bridge tender on site at the necessary time. A new drawbridge with higher clearance could limit the number of calls to open the drawbridge and also reduce flooding impacts on Cedar Lake Road. The height of vessels requiring the drawbridge to open should be studied when considering a recommended elevation. In conjunction with the new bridge, this area should also be considered for upgraded public facilities (e.g., a marina facility and/or boat launch) to attract recreational boaters to the river.

The City is currently preparing an Environmental Document as part of the design process to replace the Popp's Ferry Road Bridge with a new elevated bridge that will reduce or eliminate the need for a draw bridge. Currently, a curfew is in place from 7:30-9:00 am and 4:30-6:00 pm, prohibiting the opening of the drawbridge during vehicular peak hours. The destruction of the bridge following Hurricane Katrina in 2005 and the drawbridge collapse in 2009 indicate the importance of this project.