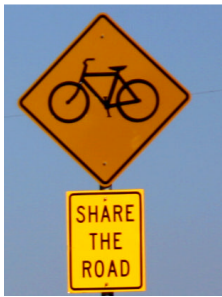
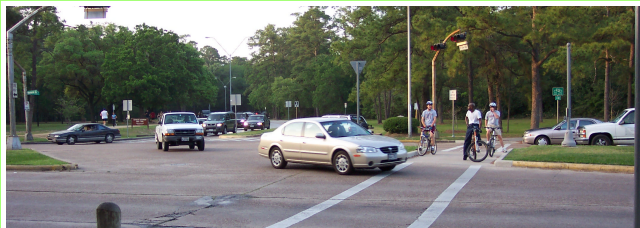
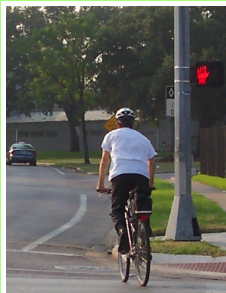
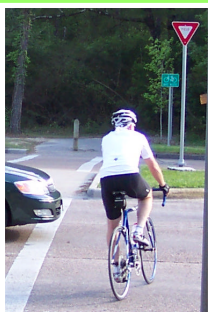


# H-GAC 2035 Regional Bikeway Plan



Updated:  
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## **EXECUTIVE SUMMARY**

### *Purpose*

The purpose of the Houston-Galveston Area Council's (H-GAC) *Regional Bikeway Plan* is to serve as a guide for investment, interagency coordination and best practices in developing facilities for bicyclists in the 8-county Houston-Galveston Transportation Management Area (TMA).

### *Introduction*

A bicycle is defined as a vehicle in the Texas Transportation code (Section 551.101(a)). As such, a person operating a bicycle has both the same rights and responsibilities as the driver of a car. Bicyclists also share motorists' preferences for smooth pavement, minimum interruptions to movement, and direct access to their trip destinations. These conditions can be achieved with on-street designated bikeways, signed routes on shoulders, signed bike routes on streets with low traffic volumes or off-street shared use paths, bicyclist facilities, or bikeways.

### *Existing Conditions*

The current level of bicycle travel within the Transportation Management Area (TMA) is not precisely known. According to the 2000 Census, bicycle trips account for 0.3% of total journeys to work in the TMA, and a considerably higher share in some areas. Data for non-work and recreational trips is not regularly collected. The presumed low share of bicyclist commuter trips has made it difficult for local entities and transportation agencies to justify major expenditures on bicyclist facilities.

However, there is evidence that a considerable bicycling population exists in the TMA, ranging from recreational riders, to youth, to those for whom bicycling is their primary means of transportation. Numerous recreational bicyclist groups are active throughout the region. The National Multiple Sclerosis Society sponsors the largest two-day bicycling event in the nation: the annual Houston to Austin MS-150 ride. As the largest fundraiser event for the national organization, enrollment is limited to 13,000 participants for safety reasons. A large percentage of these experienced riders are from the Houston-Galveston region and should be considered prime candidates to commute or make other non-recreational bicycling trips if suitable facilities are available.

There is also a population which bicycles out of necessity. The 2000 Census reported that 8% of households within the TMA do not have access to a car, ranging to as high as 40% in some neighborhoods. Bicycling can be a key component of transportation among members of these households. Bicycling is also an excellent means of personal mobility and exercise for children and young adults. School age children below driving age (6-15 years) represent 16.2% of the TMA's population. Providing safe pedestrian and bicycle access to schools can reduce school-related congestion. The Texas Bicycle Coalition provides Super Cyclist training to school teachers and encourages bicycle safety training as part of physical education.

Unfortunately, the Houston-Galveston region has one of the highest rates of crashes involving motorists and bicyclists in Texas. In 2001, H-GAC identified crash 'hot spots', locations of concentrated crashes involving motorists and bicyclists. The study found that the highest crash rates occur in low-income communities. Addressing this safety problem will require investments to improve pedestrian and bicycle access, roadway maintenance, and education of both motorists and bicyclists.

Over the past 20 years local governments and transportation agencies have made considerable investments in bicyclist facilities. An extensive network of on-street bike lanes has been established on City of Houston streets, Harris County has been a leader in developing off-street shared use paths, and the Texas Department of Transportation (TxDOT) has included bicyclist-suitable shoulders and 14 foot-wide outside lane widths on a number of state maintained roadways. Additionally, local bikeway networks exist or are being planned in many other cities and master planned communities in the TMA.

Despite this progress, numerous gaps still exist in the TMA's bikeway system. Currently there is not a consistent approach to pedestrian and bicyclist facility design. Bikeways are often difficult to access safely from local street systems, and they fail to connect to some of the TMA's major activity centers. Many bikeways in the region are not sufficiently maintained, which is a major safety hazard and discourages usage. As maintenance is a key component of a successful bikeway network H-GAC includes maintenance plans as a funding criterion in the Transportation Improvement Program (TIP) bikeway project selection process.

### **Progress to Date**

H-GAC's 1996 *Regional Bikeway Plan* identified 161 miles of existing and proposed bikeways within the TMA. In 2006, there were a total of 760 miles of existing and proposed facilities within the 8 county region including:

- Bike Lanes
- Signed Shared Roadways
- Signed Shoulder Routes
- Shared Use Paths/Trails

This *Regional Bikeway Plan* sets forth goals, objectives and strategies to address the above mentioned concerns and increase the viability and safety of bicycling in the TMA.

### *Plan Goals and Objectives:*

The goals of the *Regional Bikeway Plan* are:

- Increase the share of trips in the TMA made by bicyclists
- Reduce the number of crashes involving bicyclists

The objectives toward achieving these goals are:

- Develop the regional bikeway system
- Support development of local bikeway networks
- Enhance bicyclist commuting centers and districts
- Improve bikeway design and maintenance
- Raise public awareness about bicycling and bicyclist safety
- Monitor project development and implementation of RTP and TIP projects.

Recommendations presented within the plan include:

- Give priority funding to bikeway projects that complete gaps in the Regional Bikeway System
- Secure commitments to develop planned bicyclist facilities.
- Add shoulders to roadways with significant bicyclist activity

The major elements and strategies of the *Regional Bikeway Plan* to achieve these objectives are:

#### *Regional Bikeway System*

The Regional Bikeway system provides facilities for bicyclist completing longer trips of 4 or more miles in length. The Regional Bikeway System Map, shown in Figure 1 on Page 9, identifies existing and planned regional bikeways. The *Regional Bikeway Plan* provides a framework for identifying project investments to enhance the reach and connectivity of the regional bikeway system and offers transportation engineers and planners information about existing and proposed bikeways. GIS files containing bikeway data are available on the H-GAC website at <http://www.h-gac.com/HGAC/Programs/GIS/C+and+E+Data/default.htm>

#### *Local Bikeways*

Local bikeways are good for shorter trips (< 4 miles) and for accessing local destinations. Notable examples of local bikeway networks include Alvin, Houston, Lake Jackson, La Porte, Missouri City, Pasadena, Sugar Land, and The Woodlands. Local Bikeway Plans have been incorporated into the Regional Bikeway Plan and are shown on the maps by County. H-GAC plans to continue to work with local entities to identify projects that further the development of local bikeway networks as part of the overall regional transportation system. Roadway planning should include a review of the *Regional Bikeway Plan* to ensure coordination of motorist and bicyclist needs.

#### *Commuting Centers and Special Districts*

The Texas Medical Center and University of Texas Medical Branch in Galveston currently have the highest share of bicyclist commuters in the TMA. Enhancing bikeway access and providing end-of-trip facilities (bike racks, showers and lockers) at these centers is a good strategy for supporting a continued increase in bicyclist commuting. Other employment or activity centers may emerge as viable locations to encourage bicyclist commuting, particularly at those locations where parking is constrained.

Based on demographic, land use, and transportation factors, H-GAC conducted a *Pedestrian and Bicyclist Special District Study* that identified specific geographic areas that are conducive to walking and bicycling. These “special districts” tend to have the most tightly clustered trip destinations and a comparatively high level of pedestrian-bicyclist travel. To date, H-GAC has worked with local partners to develop comprehensive pedestrian bicyclist plans in five of these special districts within the City of Houston and the City of Galveston, with a sixth underway in the City of Sugar Land. Several pedestrian and bicyclist projects have been identified and proposed for funding as part of the 2035 Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP).

#### *Facility Design and Maintenance*

Bicyclists must often travel on roadways not designated or designed as bicyclist facilities. Accordingly, consideration should be given to how bikeways can be accessed by bicyclists from other roadways. The *Regional Bikeway Plan* includes a set of guidelines for accommodating pedestrians and bicyclists in a variety of roadway conditions. Project sponsors are asked to consult these guidelines in their project planning. Upon request, H-GAC can provide assistance in the form of an accommodation review.

In addition to the accommodations guidelines, the *Regional Bikeway Plan* also contains a list of best practices for better integrating bikeways, roadways and land uses. The plan also stresses the importance of bikeway maintenance. Minor roadway debris, cracks and potholes may not present a hazard for a motorist, however, such roadway hazards can be a major obstacle for a bicyclist.

*Public Awareness*

Increasing understanding and awareness of bicyclist rights and responsibilities can improve public acceptance and safety for all system users. Measures have been taken to educate the public about bicyclist activity through public service announcements, driver's education, bicyclist safety classes and published materials. For example, Montgomery County has posted 'Share the Road' signage along many county roadways utilized by the Woodlands Cycling Club (WCC). Bicyclists representing WCC have been working with TxDOT to add 'Share the Road' signage on state roadways to alert motorists that bicyclists may be present.

*Implementation*

Coordination between cities and transportation agencies is essential to accomplish the goals proposed in the *Regional Bikeway Plan*. One key component of coordination will be maintaining an up-to-date Regional Bikeway Map and supporting GIS database. To ensure that the *Regional Bikeway Plan* can be easily updated, local agencies will be encouraged to adopt standard nomenclature, mapping characteristics and GIS formats used by TxDOT and H-GAC.

Numerous bikeway projects in this plan are included in the Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP). Maintaining commitments to implement bikeway projects that are proposed in (RTP) and funded in the TIP is essential to the development of a comprehensive bikeway system. The costs associated with bikeway design, right-of-way acquisition, and construction are often underestimated, resulting in project delay or cancellation. H-GAC will work with project sponsors and other partners to ensure that design requirements are understood and appropriate costs are assigned.

It is important that project sponsors be aware that the perceived higher costs of building bikeways using AASHTO-guidelines may be offset by reduced maintenance costs over the life of the facility. For example, an asphalt trail path may cost less to build, but the asphalt path may require greater maintenance and have a shorter useful lifespan. Well-designed facilities are safer and are constructed to meet anticipated growth.

The AASHTO bikeway guidelines are flexible, and cost-effective design alternatives are available, especially in areas not subject to flooding or where lower usage is projected. H-GAC's *Guidelines for Accommodating Pedestrians and Bicyclists* (Pages 31 to 38) provides a range of recommendations for off-road bikeways, based on AASHTO guidelines.

## REGIONAL BIKEWAYS

The function of the *Regional Bikeways* is to support longer distance bicycling trips, identify existing and planned bikeways and to encourage the development of safer, more convenient and better connected bikeways. H-GAC intends that the plan be used to identify and prioritize future RTP and TIP projects and to serve as a guide to better coordinate roadway and bikeway planning

Building a coordinated regional bikeway system is a challenging task. Adopting conventional bikeway terminology and mapping techniques will allow for greater information sharing and project coordination. H-GAC recommends using standard bikeway terminology developed by the American Association of Transportation Officials (AASHTO) as written in the Guide for the Development of Bicycle Facilities (1999 edition or latest version). All federal-aid roadway and bikeway projects must be designed in accordance with AASHTO guidelines. H-GAC also advises the use of AASHTO guidelines on local projects. The AASHTO bikeway definitions are as follows:

**Bikeway** – A generic term for any road, street, path, or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

**Bike Route System** – A system of bikeways designated by the jurisdiction having authority [over an area,] with appropriate directional and informational route markers, with or without specific route numbers. Bike routes should establish a continuous routing, but may be a combination of any and all types of bikeways.

### On-Street Bikeways

- ***Bicycle Lane or Bike Lane*** - A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicycles.
- ***Signed Shared Roadway (Signed Bike Route)*** - A shared roadway which has been designated by signing as a preferred route for bicycle use.
- ***Shoulder*** – The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of sub-base, base and surface courses. [In Texas, bicyclists are permitted to ride on the roadway's shoulder, and shoulders may be signed as bike routes.]

### Off-Street Bikeways

- ***Shared Use Path*** - A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users.

### Additional Term That May Be Used to Identify An On-Street Bikeways

- ***Wide [Outside] Curb Lane (Signed as a Bike Route)*** – In general, 14 feet of usable lane width is the recommended width for shared use in a wide curb lane [no pavement markings necessary]. Usable width normally would be from edge stripe to lane stripe or from the longitudinal joint of the gutter pan to lane stripe (the gutter pan should not be included as usable width). On stretches of roadway with steep grades, where bicyclists need more maneuvering space, the wide curb lane should be slightly wider where practicable (15 feet is preferred).

In this update of the *Regional Bikeway Plan*, H-GAC has incorporated AASHTO's bikeway terminology into its Geographic Information System (GIS) mapping and coverage. H-GAC's new GIS coverage will contain information on project status and be fully interactive with H-GAC's GIS network of existing and planned roadways. This should enable roadway project sponsors to determine whether their project limits include any designated bikeways and provide appropriate accommodations. It will also allow accommodation considerations to be considered at intersections, over/underpasses and interchanges where roadways traverse bikeways to allow for safe passage by bicyclists.

H-GAC will request that local entities provide bikeway project data in an electronic format to be compatible with H-GAC's GIS System. This should allow for more comprehensive updates to the bikeway system. On-line project viewer capability for bikeway projects will also be developed, similar to what is currently available for Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP) projects.

### **Recommendations for Regional Bikeways**

- *Give priority funding to bikeway projects that complete gaps in the Regional Bikeway System.* Throughout the last 10 years, there have been significant investments in the development of bikeways, yet gaps remain that detract from the overall effectiveness of the bikeway system. Priorities for the future should include completing regional systems, linking existing local bikeways, and identifying needed bikeways. The City of Houston has submitted projects to add mileage to the Brays Bayou shared-use path. The Brays Bayou corridor has the potential to connect further into west Harris County and Fort Bend County, linking to existing and proposed local trail networks in Sugar Land, Missouri City and Cinco Ranch.
- *Secure commitments to develop planned bicyclist facilities.* The results of several Major Investment Studies (MIS) have indicated the public's desire to develop regional bikeways parallel to existing highway corridors. Pedestrian and bicyclists needs have recently been included in many MIS recommendations, such as the US 290/Hempstead Highway MIS that resulted in the planning of an off-road 10-foot wide shared use path from FM 529 to North Post Oak.

The 1996 *Regional Bikeway Plan* identified additional highway corridors within the TMA that could potentially accommodate bikeways, including State Highways 6, 36, 87, 99, 146 and 288. On highways where bicycling may not be possible, such as along State Highway 288 in Brazoria County, there may be a parallel roadway, greenbelt or bayou that offers greater opportunities for bicyclist routes. For example, in Brazoria County FM 521 parallels SH 288, and the shoulders could provide bicyclists a safe path to the Texas Medical Center.

- *Add shoulders to roadways with significant bicyclist activity.* The addition of shoulders can improve safety, mobility and the level-of-service for all modes of transportation. Shoulders are utilized as 'break-down' lanes for stranded motorists, and bicyclists are permitted to ride on shoulders. In addition, buses could utilize the shoulder for acceleration and deceleration when making transit stops. In rural areas, shoulders are often utilized by both pedestrians and bicyclists.

The addition of shoulders along state and county roadways can also be beneficial during hurricane evacuation. Since Hurricane Rita in 2005, TxDOT has modified sections of the concrete traffic barriers in the center of Interstate 10 and US Highway 290 for easy removal



during evacuations and has identified several existing shoulders as hurricane evacuation lanes. A similar approach may be viable along additional FM and County roadways within the region. H-GAC recommends the investigation of opportunities to add shoulders (built to full-depth) for roadways that provide connectivity for bicyclists and can be used for hurricane evacuations.

Existing and proposed regional bikeways are identified on the Regional Bikeway System Map in Figure 1 on Page 9.)

Existing facilities are, for the most part, within public rights of way and provide transportation options beyond recreational travel. This plan does not include the many trail systems that provide internal circulation within parks or privately developed subdivisions. Roadway project sponsors should consult the *Regional Bikeway Plan* to identify existing, planned and proposed bikeways that fall within the study area of their proposed transportation project.

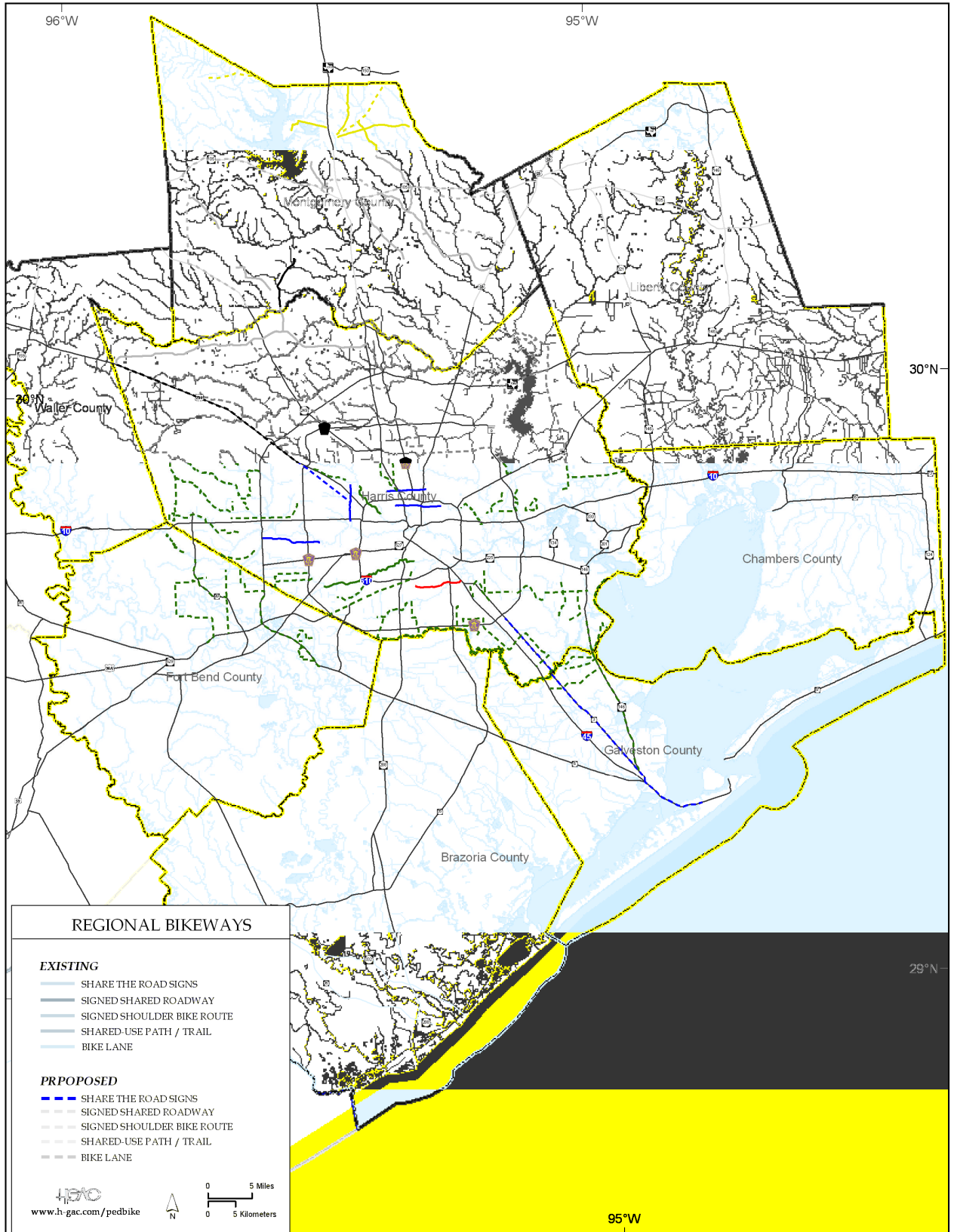


Figure 1. The Houston-Galveston Regional Bikeway System

## IMPLEMENTATION

### **Funding Commitments**

H-GAC's current TIP contains over 41 pedestrian and bicyclist projects, representing an investment of nearly \$87 million. The 2035 RTP, with subsequent amendments, contains an additional 61 pedestrian and bicyclist projects with a projected cost in excess of \$96 million. In addition, a number of local governments have made significant local funding commitments to bikeway development in their current Capital Improvements Programs. Tables listing all of these projects are provided in the Appendix.

H-GAC will take the following actions to implement the Regional Bikeway Plan and fulfill the pedestrian-bicyclist mobility goals of the 2035 Regional Transportation Plan:

### **Update the *Regional Bikeway Plan* Frequently**

Actions since 2025 RTP

- H-GAC has updated project status information and has revised the GIS format for the Regional Bikeway Plan map.

*Future Actions*

- Adopt GIS format for displaying pedestrian and bikeway data
- H-GAC will release annual updates of the regional bikeway inventory in GIS format.
- H-GAC will work with local entities to receive bikeway project updates electronically, using locally adopted GIS formats.

### **Promote Consistent Use of Terminology and Mapping Conventions**

Actions since 2025 RTP

- H-GAC has updated GIS mapping to include new mapping conventions and terminology, consistent with AASHTO's Guide for the Development of Bicycle Facilities.

*Future Actions*

- H-GAC will promote the use of consistent terminology and mapping conventions among local entities in the TMA.

### **Preserve Bicyclist Facilities**

Actions since 2025 RTP

- H-GAC has developed the Regional Bikeway Map in a new GIS format that allows for interactivity similar to the RTP and TIP project viewer. This will allow agencies and the general public to access this information online, which should encourage project coordination. Please visit <http://ce.h-gac.com/websites/pedbike/bikeway07/viewer.htm>

*Future Actions*

- H-GAC will provide project sponsors with information on planned bikeways within their project limits and provide training on how to use H-GAC's on-line bikeway information.

### **Support Local Planning Efforts**

#### Actions since 2025 RTP

- H-GAC has provided technical assistance to agencies and local governments on accommodation review, planning, coordination, design and funding strategies.
- H-GAC specific projects include pedestrian-bicyclist accommodation review of the Kirby reconstruction project, ‘special districts studies performed in the Third Ward, Gulfton, Montrose, Galveston, Sugar Land and other technical assistance programs.

#### *Future Actions*

- H-GAC will continue to assist local entities in the development of pedestrian and bicyclist plans and projects.

### **Develop a Bikeway Design and Conditions Inventory**

#### Actions since 2025 RTP

- H-GAC has incorporated additional bikeway facility type and design information into GIS system.

#### *Future Actions*

- H-GAC will work with local governments to develop and provide bikeway facility conditions information.
- H-GAC will conduct additional training on bikeway facility suitability and project phasing.

### **Develop Community-Based Pedestrian-Bicyclist Circulation Plans**

#### Actions since 2025 RTP

- H-GAC has completed a Pedestrian-Bicyclist Special Districts study covering the TMA.
- H-GAC has completed five Special District Studies (Houston’s Third Ward, Gulfton and Montrose neighborhoods and two on Galveston Island).
- H-GAC is currently conducting a Special District Study for Sugar Land Town Square
- Project Sponsors have submitted two implementation projects from these studies in the current TIP, and several more are in development.

#### *Future Actions*

- H-GAC will continue seeking local partners for future pedestrian and bicyclist “special district” studies, and assist local sponsors in moving forward with implementation.
- H-GAC will maintain and update the Regional Bikeway GIS database and promote its use in project planning throughout the TMA.

### **Promote Appropriate Design**

#### Actions since 2025 RTP

- H-GAC and TxDOT have worked with local sponsors to identify cost-effective solutions to construct bikeways that meet AASHTO guidelines.

#### *Future Actions*

- H-GAC will develop a workshop on pedestrian and bikeway suitability, cost estimation and design.

- H-GAC will showcase successful design solutions with the Pedestrian-Bicyclist Subcommittee.

### **Establish Long-Term Maintenance as part of Project Planning**

#### *Actions since 2025 RTP*

- H-GAC has added project maintenance plan criteria to the TIP evaluation process.
- H-GAC continues to work with project sponsors to make maintenance a key component of their local planning efforts and their long-term maintenance plans for projects submitted to the RTP and TIP.

#### *Future Actions*

- H-GAC will propose a list of typical pedestrian and bikeway maintenance needs.
- H-GAC will conduct training workshops on effective maintenance programs.
- H-GAC will identify innovative funding sources and potential volunteer resources for project maintenance.

### **Develop Data and Projections of Bikeway Usage**

#### *Actions since 2025 RTP*

- H-GAC supports the regional pedestrian-bicyclist count program initiated by the Institute of Transportation Engineers (ITE).

#### *Future Actions*

- H-GAC will build on lessons learned from the regional pedestrian-bicyclist count program and support the expansion of ITE's program.
- H-GAC will create local guidelines for future "before and after" pedestrian and bicyclist studies.
- H-GAC will request funding in future Unified Planning Work Program (UPWP) updates to conduct additional "before and after" studies to quantify pedestrian and bicyclist use and purposes for various trips made on selected facilities.
- H-GAC will refine the "special districts" study techniques to identify non-home-based pedestrian-bicyclist travel demand.

### **Provide Funding Resources**

#### *Actions since 2025 RTP*

- H-GAC expanded its list of potential funding sources in this plan update.
- H-GAC provided TxDOT support in the review and ranking of project nominations submitted in the 2005-2006 Statewide Enhancements Program Call for Projects. This call was subsequently cancelled and STEP applicants were encouraged to apply for funding during the call for projects for the 2008-2011 TIP.

#### *Future Actions*

- H-GAC will actively promote the development of RTP-listed bikeways in future TIP calls for projects.
- H-GAC will provide assistance in seeking funds to implement American's with Disability Act (ADA) compliant sidewalks and crosswalks identified as part of the pedestrian-bicyclist 'Special Districts' studies.

- H-GAC will work with project sponsors to identify pedestrian and bicyclist accommodations that can be included as part of current transportation projects and within existing budgets.

### **Improve Project Selection Criteria**

#### *Actions since 2025 RTP*

- H-GAC has substantially revised the Pedestrian-bicyclist project selection criteria after 2025 RTP and is included within the TELUS project monitoring system.

#### *Future Actions*

- H-GAC Pedestrian-Bicyclist Subcommittee members will join TIP subcommittee in project evaluation to ensure cost-effective projects.

### **Maintain Project Commitments**

#### *Actions since 2025 RTP*

- H-GAC staff has contacted project sponsors of all TIP and RTP projects and has provided technical assistance with project development.

#### *Future Action*

- H-GAC will revise policies on project cost overruns and procedures for “de-listing”, or removing projects from the TIP.
- H-GAC plans to use GIS project status tracking features to identify stalled TIP projects and possibly to reallocate or to reprioritize previously awarded TIP funding.

**APPENDIX A:**

**LOCAL BIKEWAYS**

## **LOCAL BIKEWAY NETWORKS**

The purpose of a local bikeway plan is to develop bikeways that facilitate the movement of bicyclists within the community and provide connectivity between residences and various local destinations, such as schools, colleges, libraries, post offices, community centers, shopping centers, and supermarkets. Local commuter bicyclist trips include similar destinations, including local and regional employment centers. Enhancing opportunities for local residents to use a bicycle for short trips can improve the level of service on local roadways, encourage individual health, support air quality initiatives, and may increase the availability of parking.

### **General Recommendations for Local Bikeways**

H-GAC plans to work with local entities within the TMA, including TxDOT, county agencies, cities, the general public, bicycling organizations and special interest groups to promote and fund local bikeway initiatives. Signed shoulder routes along state roadways, particularly in Chambers, Fort Bend, Galveston and Liberty Counties, may be a logical solution for bicycling commuting between developed areas.

Many state roadways include shoulders, however, segments have been usurped by the introduction of left, center, and right-turn lanes. In some instances grooved rumble strips have caused deterioration of asphalt surfaces, causing the accumulation of debris which may restrict bicyclist movements. H-GAC recommends investigating alternative methods such as thermoplastic markings with similar rumble strip characteristics that do not require perforation of the roadway surface.

H-GAC also recommends that local communities adopt a policy requiring shared use paths and on-street bikeway as part of a new subdivision design, with an emphasis on connecting to the regional bikeway system, neighborhoods and town centers and pedestrian-bicyclist districts.

An update of recently completed and current local bikeway initiatives, as well as identified bicyclist needs, is presented below.

### **Brazoria County**

Brazoria County has a Census 2005 population estimate of 278,484 and includes two suburban areas, the Pearland-Manvel-Alvin area in the northern portion of the county, and Brazosport in the southern portion. Brazosport contains primarily industrial development. The remainder of the county is predominantly rural with a few medium sized communities.

Pearland and the surrounding area make up about 35 percent of the county's population, followed by Lake Jackson and Alvin. The top ranked areas for bicyclist and pedestrian trip conversion and safety improvements are in Alvin, Freeport, Angleton, Clute and Lake Jackson. TxDOT Houston-district has signed shoulders as bicyclist routes along 4.5 miles of state roadways in Brazoria County, including segments of FM 524 and FM 1462, and has designated a bike lane along FM 518 in Webster, approximately one mile in length. H-GAC recommends that TxDOT consider developing additional bicyclist facilities to link the Brazoria County cities utilizing existing tour routes developed by the Pearland Cycling Club ([www.pearlandcyclingclub.org](http://www.pearlandcyclingclub.org)). The Pearland Cycling Club is a very active, community-based cycling group that bicycles throughout Pearland, Brazoria County and southern Harris County. The Pearland Cycling Club has also developed biking routes for frequently traveled destinations such as Alvin, Lake Jackson, Freeport and other popular locations within the county.



As a response to ‘suburbanization’ and growing residential needs from metropolitan Houston, the Brazoria County Mobility Plan (July 2002) recommends pedestrian and bicyclist accommodations as part of the plan. The plan includes a recommendation that Brazoria County adopt roadway design standards that accommodate bicyclists on all new or added capacity county roadways. At a minimum, all new rural county roads should provide eight-foot wide outside shoulders, with a preferred outside shoulder width of eleven feet or more. In addition, all new curb and gutter roads will have a minimum two-foot curb off-set between the outer lane and curb with sidewalks, accessible to persons with disabilities.

In the 1996 *Regional Bikeway Plan*, several bikeway needs were identified to link cities and centers of activities within Brazoria County, and to establish links with adjacent counties and major employment centers, including the Texas Medical Center in Harris County. These included the use of shoulders along State Highway 6, FM 1462, FM 521, as well as CR 171 and CR 543. A study of SH 288, traveling south from Houston, revealed a need to accommodate bicyclists within the corridor. TxDOT Houston-District has submitted a project to the 2008-2011 TIP that would add feeder roads to SH 288, which would include fourteen foot-wide outside lanes to accommodate bicyclist travel. Field investigations and roadway assessments will be needed to verify the appropriateness of designating these roadways as bicyclist facilities.

#### *City of Alvin*

The City of Alvin has successfully constructed bicyclist lanes, signed shoulders and hike and bike trails to accommodate bicyclist movements through the municipality. The City is continuing to expand upon its network of shared use paths to link residential land uses with schools and parks within the city. Alvin’s Mustang Trail System had received funding support from both the TxDOT STEP program and the TIP.

#### *City of Lake Jackson*

Lake Jackson has developed a Master Plan for Pedestrian/Bicyclist Trails projects and is in various stages of developing several facilities. A shared use path project along Oyster Creek Drive has recently been constructed. Unfortunately, this new trail does not allow for water to drain across the facility and standing water makes the trail impassable. Lake Jackson has also received authorization from the Texas Parks and Wildlife Department for the Dow Centennial Trail. For future bicyclist facilities, the City of Lake Jackson has requested that TxDOT consider a bike route along SH 322 as part of their planned expansion of this facility.






#### *City of Pearland*

The City of Pearland is currently developing a trail master plan and is in the process of locating all public, semi-public, (e.g. Pearland ISD), and private trail segments throughout the city limits and ETJ, as applicable. In addition, the City will perform an inventory of sidewalks throughout the community since existing – or needed – sidewalk segments will contribute to a comprehensive trail network as connectors between trail segments. Existing or missing curb cuts and handicap ramps will be denoted and mapped. The City’s thoroughfare plan and capital improvement program are particularly important tools to identify possible trails within new or expanded rights-of-way.






The City’s conceptual trail system map will be used to coordinate with each of the public and semi-public agencies to determine the viability, acceptance, and requirements for use as public trail corridors. This input will be used in the preparation of the final trail system. The final plan will indicate off-street trails and on-street bike lanes as well as sidewalk connections and trailhead locations. Emphasis will be placed on off-street trails or those rights-of-way for which adequate separation from the vehicular travel lanes can be maintained.

# BIKEWAY FACILITIES BRAZORIA COUNTY

## EXISTING

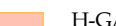




-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

## PROPOSED

-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

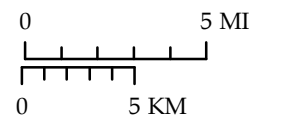
## REGIONAL BIKEWAY PLAN

-  IDENTIFIED BIKEWAY NEEDS

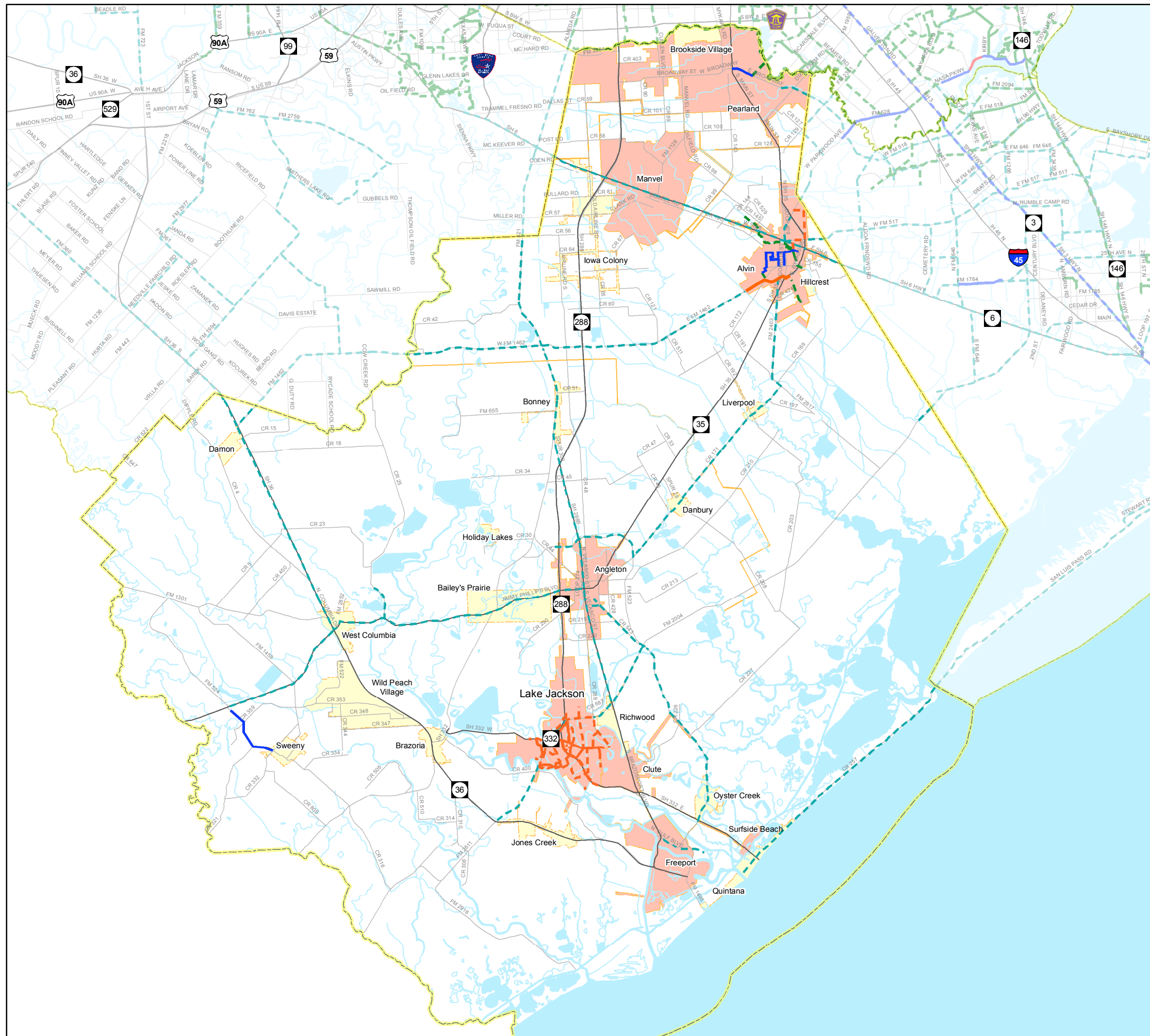
-  H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS
-  CITY, TOWN OR PLACE
-  COUNTY BOUNDARY
-  MAJOR ROAD OR HIGHWAY
-  WATERWAY



[www.h-gac.com/pedbike](http://www.h-gac.com/pedbike)



Data Sources: Brazoria County  
City of Lake Jackson, H-GAC  
Map Source: H-GAC, September 2007



**Chambers County**

Chambers County has a Census 2005 population estimate of 28,411 making it the least populated county in the 8-county TMA. It is a largely rural county with several important wildlife areas. Chambers County has considerable coastal frontage along Trinity and Galveston bays, but it remains largely agricultural. There are ten existing county parks, as well as the Anahuac National Wildlife Refuge.






The highest scoring areas for potential bicyclist and pedestrian trip conversion and safety improvements are in communities of Winnie-Stowell and Anahuac. Bicyclist planning and facility development in Chambers County has been limited to shared use paths developed within, and in conjunction with, recreational facilities.

Within the 1996 Regional Bikeway Plan, there were several identified bikeway needs to link cities and centers of activities within Chambers County and to connect with adjacent networks. Roadways identified as needs for bicyclists included the use of shoulders along US Highway 90, State Highways 65, 124 and 146, FM 1405, FM 563 and 565. Adopting these roadways as bicyclist facilities would link the cities of Winnie and Stowell with Anahuac and provide connections to Dayton and Liberty within Liberty County. Field investigations and roadway assessments would need to be conducted to verify the appropriateness of designating these roadways as bicyclist facilities.






While TxDOT Beaumont-district has not assigned shoulders as bicyclist routes along any state roadway in Chambers County, there are many opportunities to link population centers with the designation of bicyclist routes along state roadways.

# BIKEWAY FACILITIES CHAMBERS COUNTY

## EXISTING






-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

## PROPOSED

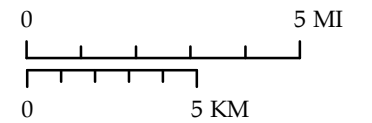
-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

## REGIONAL BIKEWAY PLAN

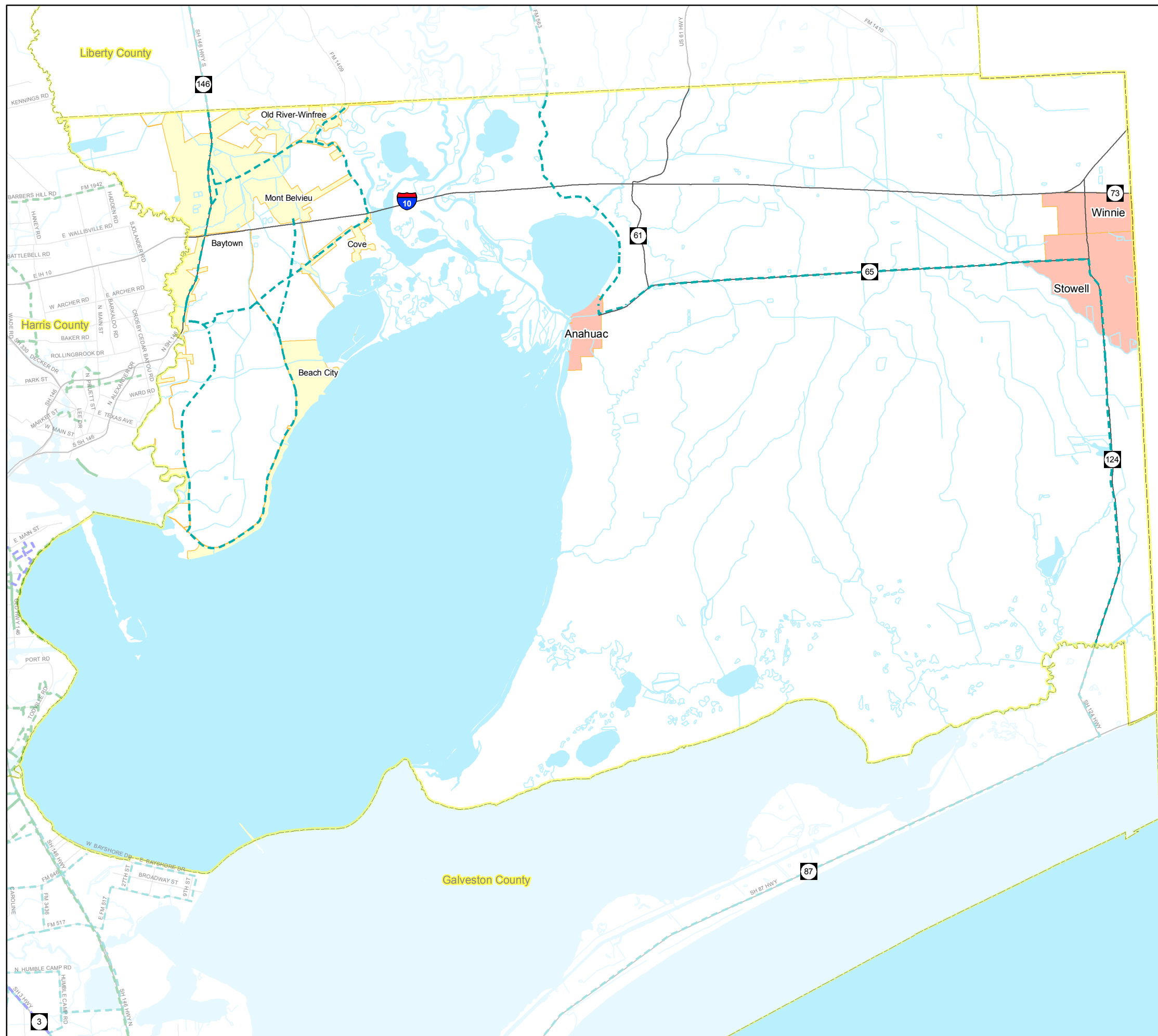
-  IDENTIFIED BIKEWAY NEEDS

-  H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS
-  CITY, TOWN OR PLACE
-  COUNTY BOUNDARY
-  MAJOR ROAD OR HIGHWAY
-  WATERWAY

  
www.h-gac.com/pedbike



Data Sources: Chambers County, H-GAC  
Map Source: H-GAC, September 2007



**Fort Bend County**

Fort Bend County has a Census 2005 population estimate of 463,650, making it the 10th largest county in Texas. Fort Bend County continues to grow rapidly as one of the region's major suburban centers; the most populated places are on the periphery of Houston, including Sugar Land, Missouri City and the portion of the City of Houston in Fort Bend County. West of the Brazos River, the county remains much more rural in character. The highest scoring areas for potential bicyclist and pedestrian trip conversion and safety improvements are in the center of the county, in the Richmond/Rosenberg area. An unincorporated portion of the Stafford-Missouri City area (at FM-1092 & US-90-Alt) is the location of another cluster of high-scoring districts

Many of the master-planned communities in Fort Bend County have internal networks of shared use path facilities. Existing public bicyclist facilities in the county consist of shared use paths in recreational areas and wide shoulders that have been added as a part of several roadway improvements.

The Fort Bend County Parks Department has planned a trail system that will connect to the Harris County and Fort Bend County Regional Park Trail System utilizing available right-of-way (ROW) adjacent to the main highways. The trail system will have four main arteries from Highway US 90A to the Barker Reservoir Trail System. The first trail will be from US 90A at the Brazos River Bridge to FM 359, and then extending along FM 1093 to Grand Parkway (HWY 99), terminating at the intersection of Oak Mist at Summits Lane. The second trail will connect to the first, starting at the intersection of the Grand Parkway (HWY 99) at Harlem Road, continuing to the intersection of Oak Mist at Summits Lane. The third trail will be a connector trail, from Highway US 90A at Harlem Road, and extending to FM 1093 at Alief Clodine, at the westernmost portion of the existing Harris County hike and bike trail. The fourth trail will connect State Highway 6 South at Kitty Hollow Park, which will be bike access only, the intersection of Old Richmond Road at Boss Gaston Road, then extending to FM 1464, connecting to the existing Harris County trail at the intersection of Alief Clodine at Bridge Crest.

These trails will also link to other possible routes (*Missouri City and Sugar Land*) as the county begins to develop pathways to the Regional Park. Materials that will be used on this project will vary, however, there is a preference for natural surface where possible. Trails consist of approximately 47.5 miles. Each trail will identify schools, churches, recreational facilities, and work centers throughout Fort Bend County.

Within the 1996 *Regional Bikeway Plan*, there were several identified bikeway needs to link cities, planned developments and centers of activities within Fort Bend County, but also to establish links with adjacent counties and major employment centers. Roadways identified as needs for bicyclists included the use of shoulders along State Highways 6 and 36, FM 359, 360, 361, 1093, 1463 1875, 1994 and 2977. Adopting these roadways as bicyclist facilities would link the cities of Richmond and Rosenberg with planned developments within Fort Bend and into Brazoria, Harris and Waller Counties, and also provide connections to hike and bike trails planned and under development in Sugar Land, Missouri City and Stafford. Field investigations and roadway assessments would need to be conducted to verify the appropriateness of designating these roadways as bicyclist facilities.

*City of Missouri City*

Missouri City has constructed two hike and bike trails, while serving largely recreational purposes, these bikeway facilities serve as a base to initiate the development of a local bikeway network. The city has several bikeway projects identified in the 2035 RTP as short-term projects. These proposed projects include the construction of additional shared use paths, as well as

restriping of roadways to include bike lanes. These projects are slated to start construction during the 2006-2008 TIP time frame. The City is currently planning to expand their trail system and have applied for funding in the 2008-2011 TIP.

*City of Sugar Land*

The City of Sugar Land has developed a shared use path system that connects park facilities within the city, as well as a new hike and bike trail that links residences to the new University of Houston-Sugar Land campus built adjacent to State Highways 6 and 59. Sugar Land has also constructed two bridges that offer great accommodations for pedestrians and bicyclists. Two pedestrian-bicyclist bridges will also be constructed over Oyster Creek and "Ditch A" to connect existing hike and bike trail facilities within the City. The City of Sugar Land continues to implement local improvements to improve quality of life and reduce the dependence upon motor vehicles for short trips.

The City has developed a new Town Square and has teamed with H-GAC to develop a pedestrian-bicyclist 'special districts' plan for pedestrian and bicyclist links between surrounding residential and commercial land uses and the Town Square. The City is also in the process of updating their hike and bike trail plan. During this process many opportunities for bicyclist facilities were identified although some planned alignments traverse areas that are sensitive to some local residents. The City of Sugar Land will be conducting a public outreach campaign to update their hike and bike trail plan during 2007.

*City of Richmond*






The City of Richmond has not developed a bicyclist plan nor does it have any existing bicyclist facilities.

*City of Rosenberg*






The City of Rosenberg had identified portions of the city where major streets do not have sidewalks. A sidewalk project has recently been let for construction, these new walkways will be installed along State Highway 36 between the intersection with US 90A and Seabourne Creek Park. An abandoned railroad right-of-way (ROW) to the west of the city has been identified as having potential for future pedestrian and bicyclist use.

# BIKEWAY FACILITIES FORT BEND COUNTY

## EXISTING






-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE


## PROPOSED

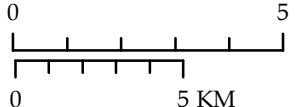
-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

## REGIONAL BIKEWAY PLAN

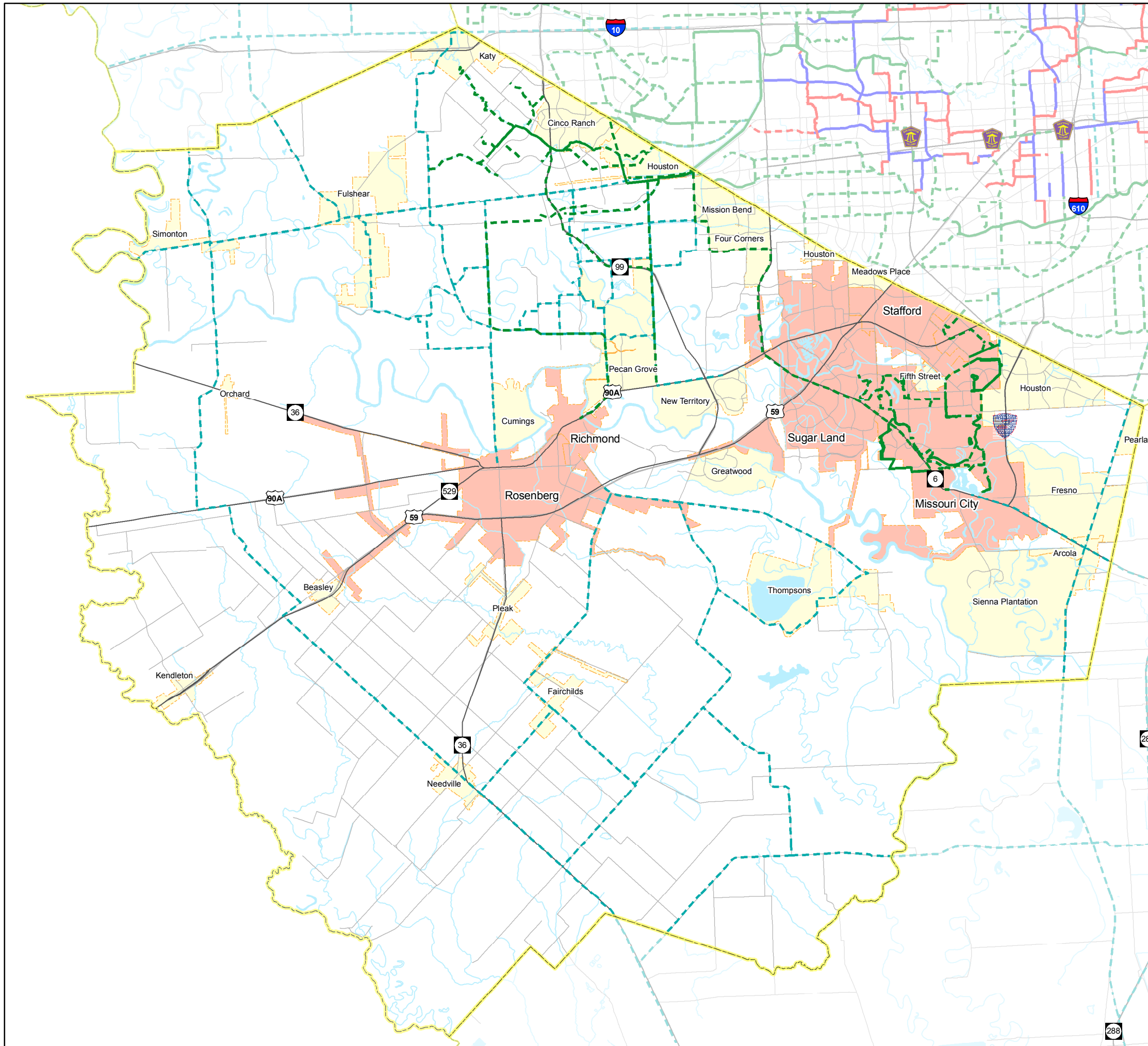
-  IDENTIFIED BIKEWAY NEEDS

-  H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS
-  CITY, TOWN OR PLACE
-  COUNTY BOUNDARY
-  MAJOR ROAD OR HIGHWAY
-  WATERWAY

 [www.h-gac.com/pedbike](http://www.h-gac.com/pedbike)



Data Sources: Houston Energy Corridor Management District, City of Houston, City of Missouri City, Fort Bend County, H-GAC  
Map Source: H-GAC, September 2007



**Galveston County**

Galveston County has a 2005 Census population estimate of 277,563, approximately one-quarter of which resides in the City of Galveston on Galveston Island. The next most populated places within Galveston County are League City, Texas City and Friendswood. The county has three areas with distinct land use patterns: the highly-urbanized eastern portion of Galveston Island; the Texas City-La Marque area, which is highly industrialized with adjacent residential development; and League City-Friendswood, a fast-growing suburban area. High scoring districts, representing potential for bicyclist and pedestrian trip conversion and safety improvements, were clustered in two separate areas of Galveston and two separate areas of Texas City.

Much of Galveston County's bicyclist planning and facility development has been limited to shared use paths within and in conjunction with recreational facilities. TxDOT Houston-District has assigned bicycle lanes as bicyclist routes along 3.4 miles of state roadway in Galveston County, including segments of FM 528 and FM 1764. The reconstruction of the I-45 Causeway onto Galveston Island will be a significant improvement to bicycling within the county, as once the project is completed, twelve foot-wide shoulders will be provided in both directions of the new bridge structure. While bicycle access was not allowed upon the old bridges, the provision of wide shoulders along the new bridge structure strongly suggests that TxDOT could allow for bicyclists to utilize the new bridges to access Galveston Island.

There were several bicycle facilities recommended as part of Major Investment Studies (MIS) within Galveston County. The MIS developed for Interstate 45 recommends that a continuous bicycle route be developed, parallel to I-45, along State Highway 3. In addition, the MIS developed for State Highway 146 recommends the inclusion of a hike and bike trail to parallel the widening of SH 146 thru Galveston County.

Within the 1996 *Regional Bikeway Plan*, there were several identified bikeway needs, including the use of shoulders along State Highways 3, 6, 146 and 187, Loop 197 South, as well as FM 517, 518, 646, 1764 and 2094. Adopting these roadways as bicyclist facilities would link the cities of Texas City and Friendswood with the City of Alvin within Brazoria County, and also destinations within Harris County, and hike and bike trails planned and under development in League City and Galveston. Field investigations and roadway assessments will need to be conducted to verify the appropriateness of designating these roadways as bicyclist facilities.

*City of Friendswood*

As part of the 1996 *H-GAC Regional Bikeway Plan*, the City of Friendswood formed a Bicycle Advisory Committee, whose purpose was to develop several bicyclist projects and review the local street system to monitor volumes of bicyclist activity. While no projects have been submitted for funding or implementation, one specific recommendation has been implemented: five-foot-wide bicycle lanes have been striped along FM 528. There are no other existing or planned bicyclist facilities within the City of Friendswood.

*City of Galveston*

There are no existing or proposed bicyclist facilities within the City of Galveston. While several roadways have bicycle route signage posted, the City of Galveston has not officially designated these as signed shared roadways. The University of Texas Medical Branch (UTMB) generates significant levels of pedestrian and bicyclist activity, and according to the 2000 Census, nearly 300 people use a bicycle to commute to the medical facility on a daily basis.



The City of Galveston has developed an intermodal committee to review the possibilities for developing hike and bike trails along the eastern portion of Galveston Island. The City of Galveston and H-GAC have completed a Pedestrian-Bicyclist Special Districts plan to improve mobility and safety for non-motorized modes. The study included several public meetings that focused on concerns raised by the walking and cycling public and to develop a list of priorities towards developing improvement projects. While safer routes to schools was a listed concerns, their was also strong public support for the development of an official bicycle route system on Galveston Island, with major destinations including the Strand, Galveston Seawall, and UTMB as well as access across the channel to Texas A&M University on Pelican Island. Galveston City Council unanimously approved the sponsorship of pedestrian-bicyclist projects that were recommended as part of the study. For more information, this study may be found on the H-GAC publications website.

#### *City of League City*

The City of League City had developed a bikeways plan as part of their parks master plan. The planned network of hike and bike trails will provide essential connections between local residential neighborhoods and schools, parks, a park and ride lot, and businesses along busy roadways.

Within the 2004-2006 TIP, the City had a project to construct a hike and bike trail along SH 96, utilizing both STEP and CMAQ funding. This project was eventually cancelled because a significant bridge was built without bicyclist accommodations. The bridge was constructed to carry State Highway 96 across a set of north-south railroad tracks that bisects the City. Although a bicyclist facility was proposed for SH 96, the project was not considered part of the overall highway widening, resulting in a lack of bicyclist accommodations on the bridge. This state bridge is a barrier to bicyclist mobility, while shoulders are provided along SH 96, they are discontinued at the peak of the bridge. Bicyclists riding along SH 96 must merge into the travel lane at the least optimal point just beyond the top of the bridge, outside the line of sight for motorists. Unfortunately, this safety hazard will remain until the bridge is reconstructed.

The City of League City and TxDOT have been working together to reprogram dollars towards another bicyclist facility. However, all STEP funding for the SH 96 hike and bike trail project were lost, as STEP funding is not transferable to other trail projects. As an alternative to the cancelled SH 96 bicyclist project, a hike and bike trail has been constructed along FM 518.

#### *City of Seabrook*






A system of natural surface trails have been developed by the City of Seabrook through the city's Parks Department. While the purpose of these trails is recreational, rather than transportation, these crushed granite trails attract considerable pedestrian and bicyclist traffic and are considered an asset to the community.

#### *City of Texas City*






The city of Texas City has developed an extensive bikeway system, consisting of bike lanes and hike and bike trails, connecting schools, residences and parks within the community. There are 12 miles of trails to connect residences with schools, parks, activity centers and points of interest, and link to on-street bicycle lanes, where needed, to cover the entire city. There are no new pedestrian or bicyclist projects planned at this time.

# BIKEWAY FACILITIES GALVESTON COUNTY

## EXISTING






-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE


## PROPOSED

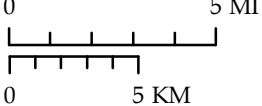
-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
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## REGIONAL BIKEWAY PLAN

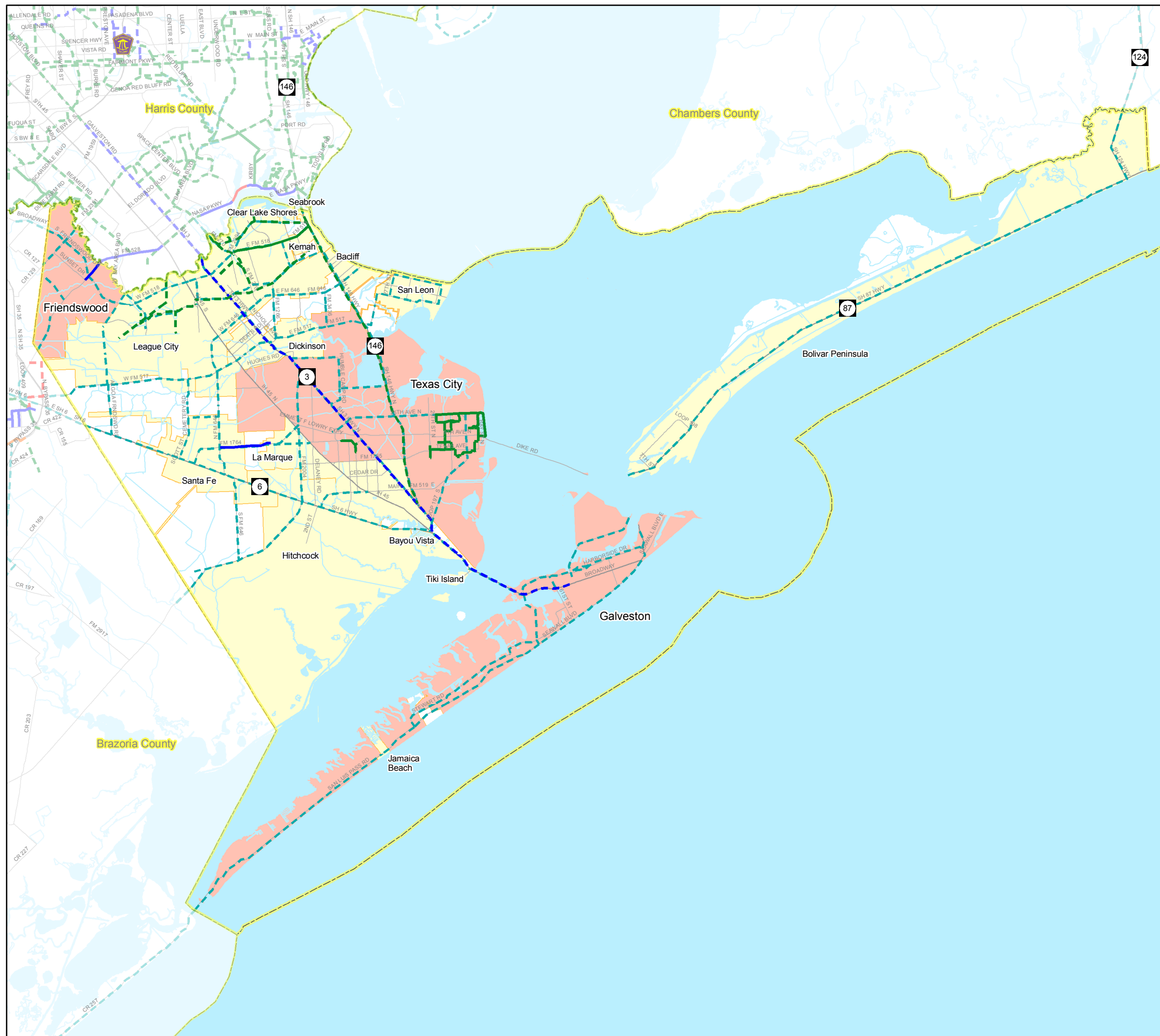
-  IDENTIFIED BIKEWAY NEEDS

-  H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS
-  CITY, TOWN OR PLACE
-  COUNTY BOUNDARY
-  MAJOR ROAD OR HIGHWAY
-  WATERWAY

 [www.h-gac.com/pedbike](http://www.h-gac.com/pedbike)



Data Sources: Galveston County, H-GAC  
Map Source: H-GAC, September 2007



## **Harris County**

Harris County has a 2005 Census population estimate of 3,693,050. It is the most populous county in the state, and has the vast majority of the population and employment for the 8-county region. The majority (55 percent) of the population resides within the city of Houston, with the remainder residing in other incorporated areas (18%), or unincorporated areas (27%). Harris County contains the full spectrum of land use types and intensity. There are urban neighborhoods, mainly in Houston, and numerous major employment centers. Most of the highest scoring districts in the region with respect to potential for bicyclist and pedestrian trip conversion and safety improvements are found in Harris County and in the City of Houston. However, most of the county's residential and retail development is in suburban style land use patterns.

Harris County, through its Parks Department, Flood Control District, and Commissioner Precinct Offices, has developed an extensive shared use path system. In May 2003, the Commissioners Court adopted a Parks Master Plan that will vastly expand this system, providing shared use paths along most bayous, links between recreational facilities, and between existing, planned and proposed facilities of the City of Houston and Fort Bend County. Shared use paths are currently under design include one along South Mayde Creek, an extension of the trails from Terry Hershey Park to the Metro Park & Ride lot, as well as a pedestrian bridge east of Dairy Ashford Road. Harris County has 25 bikeway projects in the RTP, a number of have also received STEP funding commitments from TxDOT.

In addition to bikeway projects sponsored by Harris County, several improvement districts have bikeway projects underway or planned. The Greater Greenspoint Management District has three proposed RTP projects to develop a shared use path system and supporting amenities. A trail project of the Westchase District also received a STEP funding commitment. METRO has contributed \$8.8 million to the city of Houston for implementation of its bikeway plan

TxDOT Houston-District has assigned several state roadways as bicyclist facilities within Harris County. There are 43.2 miles of shoulders as bicyclist routes, along FM 526 (northbound only), FM 2920 and FM 2978. TxDOT has assigned 12.4 miles of designated bicycle lanes along portions of FM 528, NASA Road 1, and FM 1960. TxDOT has also assigned 4.3 miles of signed shared roadways along FM 529 and NASA Road 1.

Within the 1996 *Regional Bikeway Plan*, there were several identified bikeway needs to link cities, planned developments, activity centers and recreational amenities within Harris County. Roadways identified as needs for bicyclists included the continued use of FM 529, extending shoulders along Clay Road, as well as shoulders along State Highways 90. Adopting these roadways as bicyclist facilities would link the City of Houston with planned developments within Harris County and into Liberty and Waller Counties. Field investigations and roadway assessments would need to be conducted to verify the appropriateness of designating these roadways as bicyclist facilities.

### City of Baytown

The City of Baytown has three shared use path projects in H-GAC's current TIP. The Goose Creek facility was recently let for construction and should now be operational.

### City of Bellaire

The City of Bellaire has a 2.5-mile shared use path along Newcastle Street between Beechnut and a one-half mile trail along Holly Street. Pedestrian and bike trails/paths were listed as the top need by Bellaire citizens in a 1999 survey and Bellaire has been actively pursuing the

construction of sidewalks and hike and bike trails that would connect all four major quadrants of the city.

*Bay Area Transportation Partnership*

Several miles of bike lanes and shared-use paths have been designed and constructed by the various communities in the Clear Lake area. The Bay Area Transportation Partnership (BATP), a coalition of these communities and other organizations, has been working with Harris County and TxDOT officials to inventory these facilities and develop a master plan for bicyclist and pedestrian facilities. This inventory, initiated in August 2003, along with the subsequent master plan, will help the BATP set priorities and implementation strategies for improving connectivity of bikeways within southeast Harris County.

*Greater Greenspoint Management District*

The Greenspoint Management District (GGMD) includes approximately 12 square miles surrounding the Beltway 8 and North I-45 intersection. The GGMD boundary includes the City of Houston and Harris County Precincts One & Four, among others. The District is working on planning and implementing many paths, trails and bike lanes projects. These include an existing shared-use trail along the south bank of Greens Bayou from Greens Road. There are several planned bicyclist projects, including a shared-used trail along the banks of Greens Bayou from Ella Road to Greens Road, as well as a potential shared-use trail connecting existing trail from the south bank of Greens Bayou at Imperial Valley to the proposed GGMD Park, west of Hardy Road. Both of these projects are funded by STEP grants.

The TIRZ#11 has included planned pedestrian walkways along the Airline corridor from West Road to Aldine-Bender in its CIP, as are proposed connections of the four quadrants of the district, divided by the Beltway 8 & I-45 intersection. Streets involved in this concept are Greenspoint, Aldine Bender, Greens Crossing & Greens Road. Funded construction of the Greenspoint Drive extension commence in January 2007. These projects may also include the development of bike lanes. Further out, proposed connections may be enhanced to provide access to transit services.

The GGMD is in the process of conducting a Parks Master Plan to aide in the development of green space. It will focus on public safety, floodway/floodplain protection and the integration of parks and passive recreation areas. Planned facilities include shared-use paths north of Green's Bayou from just east of I-45 to just west of Imperial Valley Drive. (routes have not yet been proposed). An inter-connected multi-use trail system is planned, connecting as many parks, neighborhoods and trip destinations, as possible. This study identifies coordination opportunities with trail projects of other agencies.

*City of Houston*

The City of Houston has made significant progress in the implementation of its Comprehensive Bikeway Plan. Additions to the city's bikeway plan include a new hike and bike trail along Halls Bayou, as well as the temporary suspension of bicycle lanes along W. Alabama, as part of the traffic mitigation plan for the reconstruction of the Route 59/527 Spur. A bicyclist route was assigned to Fairview and other local streets as a substitute for the facility.

Bicycle parking for over 1,600 bicycles has been added at public and private facilities. Ongoing efforts continue to promote bicycle parking through partnerships, donations and the active participation by employers who want to promote and support cycling among their employees. This support also includes the identification of locations for shower facilities.

The City is making efforts to include bicycle and pedestrian accommodations in road and bridge CIP projects beyond specific bikeway projects. To date, the City of Houston has completed 300 miles of on-street (280 miles) and off-street bikeways (20 miles). The remaining 45 miles of planned and funded bikeways (shared-use paths) are completing design and beginning construction. This effort includes 30 miles of STEP and CMAQ funded bikeways and 14 miles in a joint project between the City of Houston and the U. S. Army Corps of Engineers along Sims Bayou. In total, the city has received \$54 million in federal funding for 33 projects. Seventeen have been completed and 10 are beginning construction in the current fiscal year. The remaining projects are scheduled for the following fiscal year and are in development.

As with all transportation systems, the Houston Bikeway Network has been modified to reflect changes in traffic, roadway and highway changes. These modifications have included:

- Converting a 1-mile segment of bike lanes along W. Dallas to shared lanes.
- Relocation of bike lanes along W. Alabama to Fairview maintaining east and west connectivity to improve access to Downtown.
- TxDOT replacement of bike lanes along Old Katy Road with a hike and bike trail. The replacement bikeway has been relocated just north of I-10, and includes a trail that connects to the existing Dairy Ashford bike lanes, a bicycle/pedestrian bridge that connects to the Kirkwood bike lanes, and a second bicycle/pedestrian bridge at Chatterton with on-street connections through the neighborhood to Brittmore, where the City is including a bike route to add bicycle accommodations that connect to existing bikeways on Westview and Clay road.
- Removal of bicycle lanes along Westpark by the Harris County Toll Road Authority (HCTRA) as part of the construction of the Westpark Toll Road. H-GAC is working with the City of Houston and HCTRA to identify potential bicyclist facilities to reconnect the bikeway network within the Gulfton district.

To enhance education and awareness, the City of Houston funded, produced and distributed 50,000 free bikeway network maps. These maps are available through Houston Public Libraries, the Downtown visitor's center, participating local bike shops, and online. The City also maintains a comprehensive bikeway web site at [www.houstonbikeways.org](http://www.houstonbikeways.org) and produces a quarterly newsletter. Over 500,000 Bike Smart bilingual (English/Spanish) handbooks were produced and distributed in partnership with the Houston Chronicle, HISD, AIS and SBISD leveraging local and federal funds.

Six years ago, the city initiated a Bike-To-Work Day event. Houston expanded this event to a month-long awareness effort with corporate, agency and private partners. This year, the City of Houston sponsored its second Tour de Houston to lead urban 20, 40, and 70-mile bike ride along local streets.

The City of Houston continues efforts to create a bicycle-friendly community by maintaining and creating partnerships with local agencies, private enterprises, and the local and national bicycle community. These efforts translate into programs for employees and all Houstonians and enhance the transportation options for walking and cycling.

#### *City of La Porte*

The city of La Porte adopted a bicyclist and pedestrian trail implementation plan in June 2003. Currently the only facilities are within city parks, however, the city's goal is to develop a network of paths, trails, bike lanes and routes that are multipurpose, accessible where possible, convenient

and that connect to residential neighborhoods, parks, schools, workplaces, shopping and major open spaces. La Porte’s network would connect to neighboring trail systems within the city of Pasadena and the Clear Lake area. Elements of the La Porte shared use path network are included in the RTP.

City of Pasadena

The City of Pasadena is in the process of implementing a 20 year hike and bike trail master plan. The plan’s primary goal is to provide a world-class, interconnected greenway and bayou-oriented multi-use trail system within the City of Pasadena connecting as many parks, schools, neighborhoods, employments centers and other destinations as possible. The plan’s objectives are as follows:

- Provide a perimeter trail around the entire city.
- Utilize as many aesthetically pleasing, natural settings as possible, especially the City’s bayous and utility corridors.
- Provide an effective management and maintenance plan that promotes responsible use of the trail system.
- Use materials that are user-friendly and minimize the need for maintenance and/or replacement.
- Develop an effective funding and implementation plan.

Considerations also included in this plan are recreational and alternative transportation uses, public safety, floodway/floodplain protection, integration of linear parks and passive recreation, water pollution control, habitat enhancement, and natural resources protection. The Pasadena Police Department has played a vital role in the promotion of public safety along the proposed trail system. PPD has purchased new bike patrol equipment for 12 officers with plans to add an additional 6 officers to the patrol early next year.

Current City of Pasadena Projects Underway:

Armand Bayou Hike and Bike Trail	\$ 2,500,000.00
Holly Bay Trail Spur and Pedestrian Bridge	\$ 500,000.00
<u>Vince Bayou Bike and Bike Trail (Strawberry to Burke/Crenshaw Park)</u>	<u>\$ 2,000,000.00</u>
Total Projects Underway	\$ 5,000,000.00




Pedestrian Bridge Construction:

One of the objectives the City of Pasadena is to minimize maintenance wherever possible. The City has had experience with pedestrian bridges made of wood and found them to be a liability if not constantly inspected. Railings failed regularly and sections of decking needed to be replaced at odd intervals making scheduling and execution cumbersome.






This is why the City of Pasadena has selected steel truss bridges with concrete decking for all new construction. These bridges are made of a special grade of steel (“weathered steel”) that allows surface rust to form which in turn acts as a protective coating. The rust will not come off on your hands. The bridges can also be constructed to meet AASHTO requirements which include the ability to withstand emergency vehicle crossings. The concrete decking alleviates the need for deck replacement and ensures a smooth surface enhancing the user’s experience. Continental Bridges and Steadfast Bridges are the two companies hired by the City of Pasadena to fabricate the pedestrian bridges. Both are outstanding in quality and highly recommended.

# BIKEWAY FACILITIES HARRIS COUNTY

## EXISTING

-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE





## PROPOSED

-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

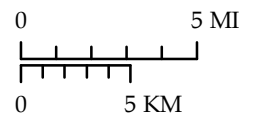
## REGIONAL BIKEWAY PLAN

-  IDENTIFIED BIKEWAY NEEDS

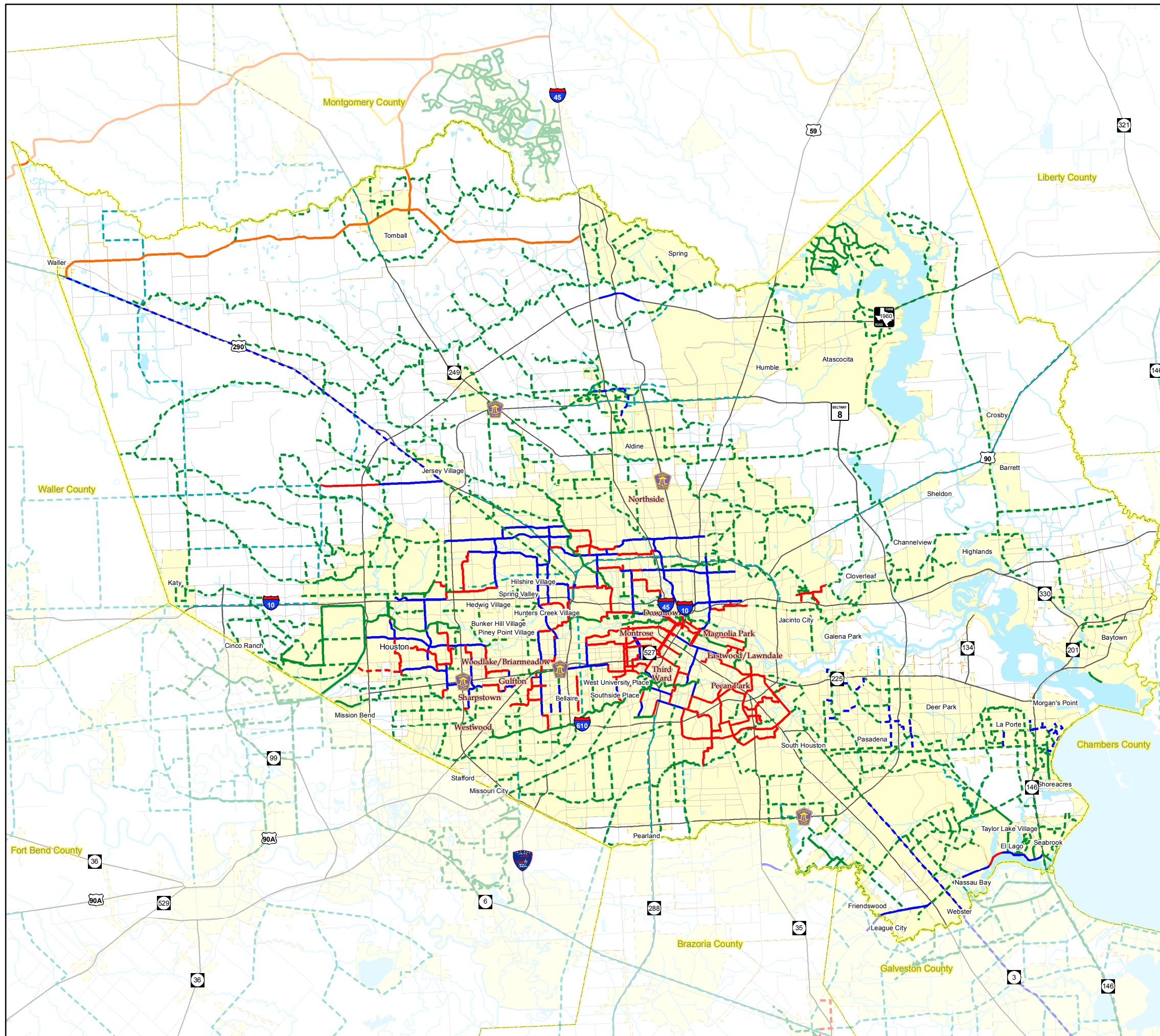
## H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS

-  CITY, TOWN OR PLACE
-  COUNTY BOUNDARY
-  MAJOR ROAD OR HIGHWAY
-  WATERWAY

  
www.h-gac.com/pedbike








Data Sources: Houston Energy Corridor Management District,  
City of Houston, Harris County Flood Control  
Harris County Public Infrastructure, H-GAC  
Map Source: H-GAC, September 2007








# BIKEWAY FACILITIES CITY OF HOUSTON

## EXISTING






-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

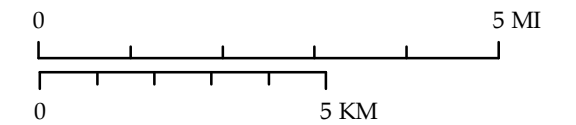
## PROPOSED

-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

## REGIONAL BIKEWAY PLAN

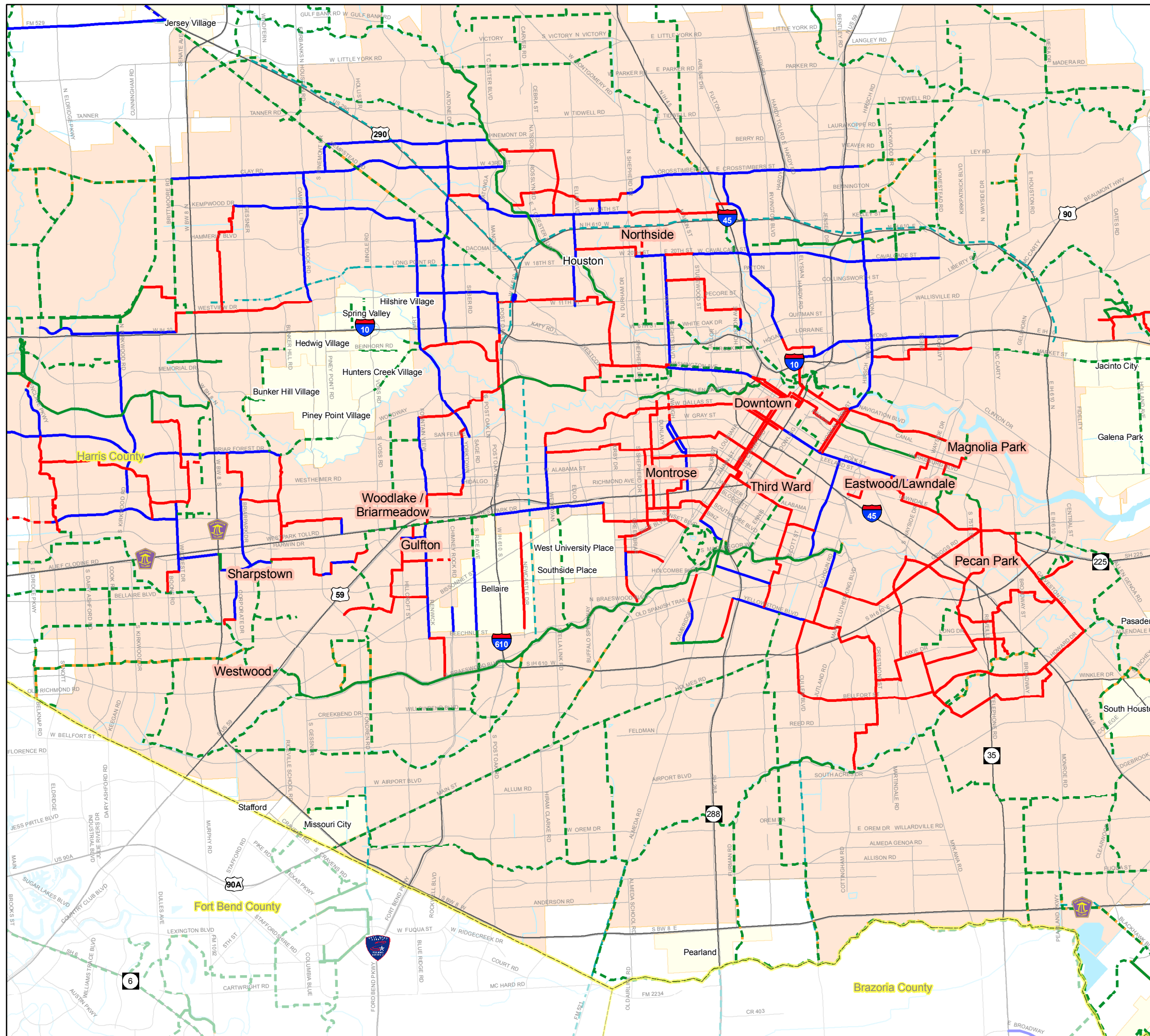
-  IDENTIFIED BIKEWAY NEEDS

-  H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS
-  CITY, TOWN OR PLACE
-  COUNTY BOUNDARY
-  MAJOR ROAD OR HIGHWAY
-  WATERWAY



[www.h-gac.com/pedbike](http://www.h-gac.com/pedbike)

Data Sources: Houston Energy Corridor Management District,  
City of Houston, Harris County Flood Control,  
Harris County Public Infrastructure, H-GAC  
Map Source: H-GAC, September 2007





**Liberty County**






Liberty County has a 2005 Census population estimate of 75,141. The county seat and largest city is Liberty, but the majority of the population lives in unincorporated areas. Liberty County features numerous highly-forested areas and its predominant land use is agriculture. The county has three primary towns: Cleveland, Dayton and Liberty. The Trinity River bisects the county, and major flooding along its course has limited development. However, completion of a new freeway between Liberty County and Houston may spur development activity in the area. With respect to potential for bicyclist and pedestrian trip travel, the highest scoring district is located in Cleveland in the north part of the county. Current bicyclist planning and facility development in Liberty County has been limited to recreational facilities developed within and in conjunction with park facilities.

While TxDOT Houston-District has not assigned any state roadways as bicyclist routes within Liberty County, there are many opportunities to link Cleveland, Dayton and Liberty with the designation of bicyclist routes along state roadways.






Within the 1996 *Regional Bikeway Plan*, there were a few identified bikeway needs to link the cities of Dayton and Liberty within Liberty County and connect to Harris and Chambers counties. Bicyclist needs included the use of shoulders along US Highway 90, State Highway 146, and FM 563. In addition to what was identified within the previous plan, State Highways 105, 146 and 321 could also link the lower portion of Liberty County with the City of Cleveland and destinations within Montgomery County. Field investigations and roadway assessments will need to be conducted to verify the appropriateness of designating these roadways as bicyclist facilities.

# BIKEWAY FACILITIES LIBERTY COUNTY

## EXISTING






-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

## PROPOSED

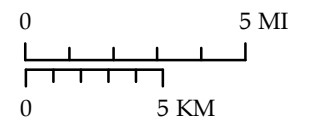
-  SHARE THE ROAD SIGNS
-  SIGNED SHARED ROADWAY
-  SIGNED SHOULDER BIKE ROUTE
-  SHARED-USE PATH / TRAIL
-  BIKE LANE

## REGIONAL BIKEWAY PLAN

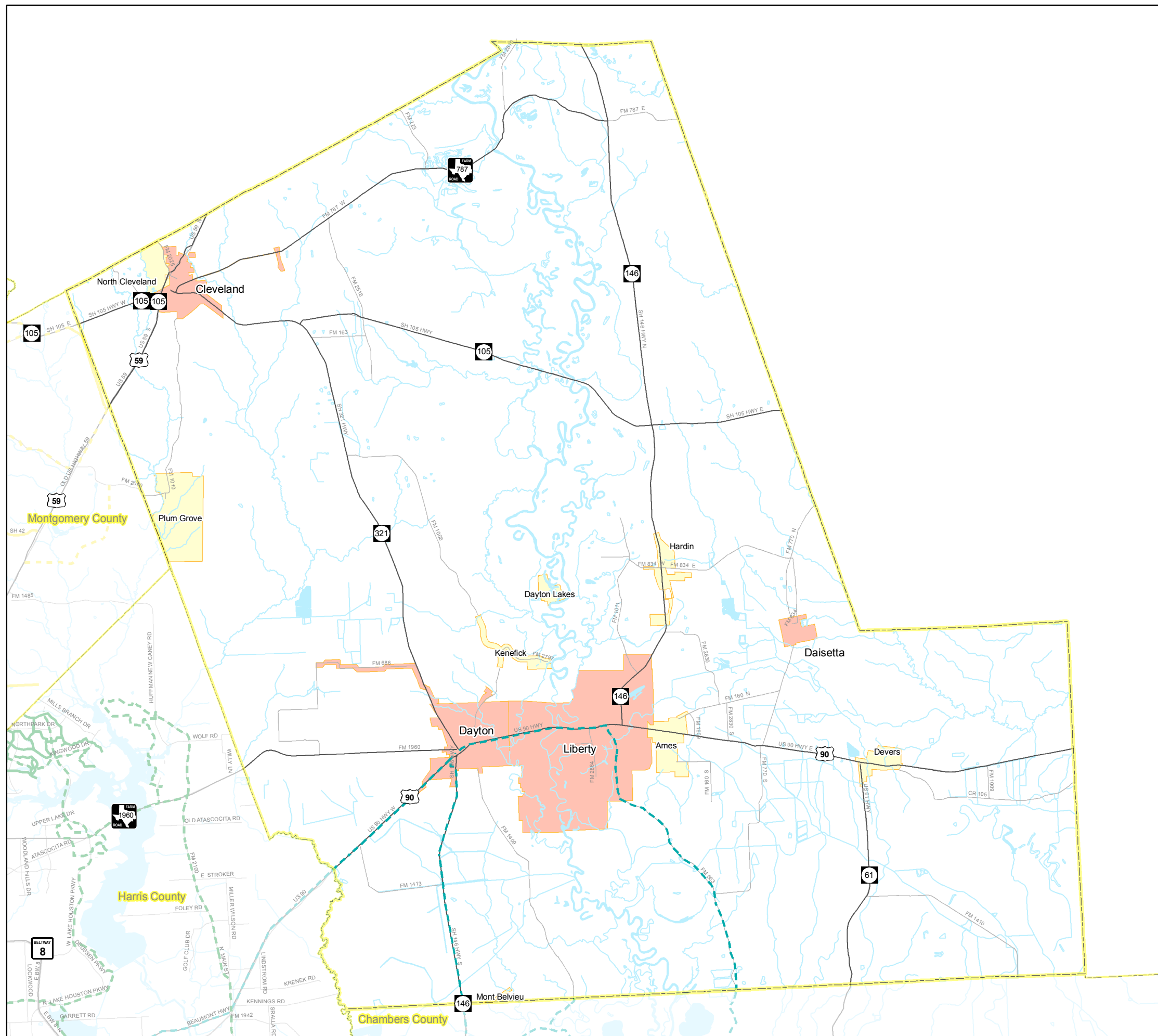
-  IDENTIFIED BIKEWAY NEEDS

-  H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS
-  CITY, TOWN OR PLACE
-  COUNTY BOUNDARY
-  MAJOR ROAD OR HIGHWAY
-  WATERWAY

  
www.h-gac.com/pedbike



Data Sources: Liberty County, H-GAC  
Map Source: H-GAC, September 2007



**Montgomery County**

Montgomery County has a 2005 Census population estimate of 378,033. Interstate 45 bisects the county and much of the population growth in the county is occurring in this corridor. After Fort Bend, Montgomery County is the fastest-growing county in the region. The Woodlands is located in southern Montgomery County, and has attracted considerable residential, commercial and light industrial development. The Kingwood and Porter areas, in the southeast portion of the county area, are also growing rapidly. Conroe, a medium-sized city in central Montgomery County, is also growing and may eventually extend as far as the Woodlands to the south. Lake Conroe, to the northwest, is a major recreational destination within the TMA. With the exception of several small towns, most of the rest of the county is agricultural or wooded and the County includes portions of the Sam Houston National Forest. Potential for bicyclist and pedestrian districts include the City of Conroe, the Woodlands and the Spring Creek area near I-45 at the southern portion of the county.

The Montgomery County Mobility Plan (February 1998) identified a series of bikeways planned for the City of Conroe and several state roadways west of Interstate 45. The initial bikeway system in Conroe would provide east-west access along FM2854 and SH 105 to the north, and Gladstell and Silverdale to the south. The primary north-south corridors would be along Loop 336 to the west, and along First Street and the adjacent railroad right-of-way (ROW). Conroe's primary focus is to provide some principal bikeways for intra-city travel, linking major parks, the park and ride lots, and the YMCA. Local streets and other low-traffic roadways would expand the area covered by the bikeway network to include most of the city. From this plan, the City of Conroe had submitted a bicycle lane project into the TIP for funding. This project has not yet been implemented.

Most of the existing bikeways in Montgomery County are located in the southern portion of the County. Approximately 83 miles of eight-foot concrete shared use paths connect residential area with schools, village centers, churches, parks, and other developments. The majority of these facilities are in the Woodlands, however, there are also facilities in Chateau Woods, Oak Ridge North, and Shenandoah. The TxDOT Houston-District has assigned shoulders as bicyclist routes along 29.14 miles of state roadway in Montgomery County, including portions of FM 1488 and FM 2978. These roadways offer bicyclists great connections between Montgomery and Harris Counties. However, shoulders have been usurped for the provision of center turn lanes along several segments of FM 1488, requiring bicyclists to share the lane with vehicles traveling in excess of 50 miles per hour.

The Woodlands Cycling Club (WCC) is a group of very active bicyclists and elite athletes that utilize many roadways in Montgomery County for training and group riding. The WCC had experienced several tragedies with bicyclists being struck and killed by errant motorists along stretches of state and county roadways. The Woodlands Cycling Club developed a Bicycle Advisory Committee (WCC BAC) to address this safety issue by reaching out to Montgomery County Commissioners and TxDOT to address safety issues along certain roadways, as well as to develop a 'Share the Road' campaign along roadways the bicyclists travel. In 2003, the Montgomery County Commissioners purchased and installed 'Share the Road' signs along county roadways. In 2004, TxDOT Houston-district recommended the installation of 'Share the Road' signs along many state roadways, however, this has not yet been implemented.

Within the 1996 *Regional Bikeway Plan*, several other bikeway needs were identified. TxDOT has proposed 'Share the Road' routes along many additional roadways, including FM 149, 1097, 1791 and 2854. Adopting these roadways as bicyclist facilities would link the cities of Conroe,

Montgomery and Willis, with destinations in Harris, Liberty and Waller Counties, and also link to facilities planned along the Spring Creek Greenway within Montgomery and Harris Counties. Field investigations and roadway assessments will need to be conducted to verify the appropriateness of designating these roadways as bicyclist facilities.

# BIKEWAY FACILITIES MONTGOMERY COUNTY

## EXISTING

- SHARE THE ROAD SIGNS
- SIGNED SHARED ROADWAY
- SIGNED SHOULDER BIKE ROUTE
- SHARED-USE PATH / TRAIL
- BIKE LANE

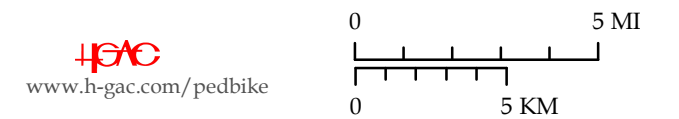
## PROPOSED

- - - SHARE THE ROAD SIGNS
- - - SIGNED SHARED ROADWAY
- - - SIGNED SHOULDER BIKE ROUTE
- - - SHARED-USE PATH / TRAIL
- - - BIKE LANE

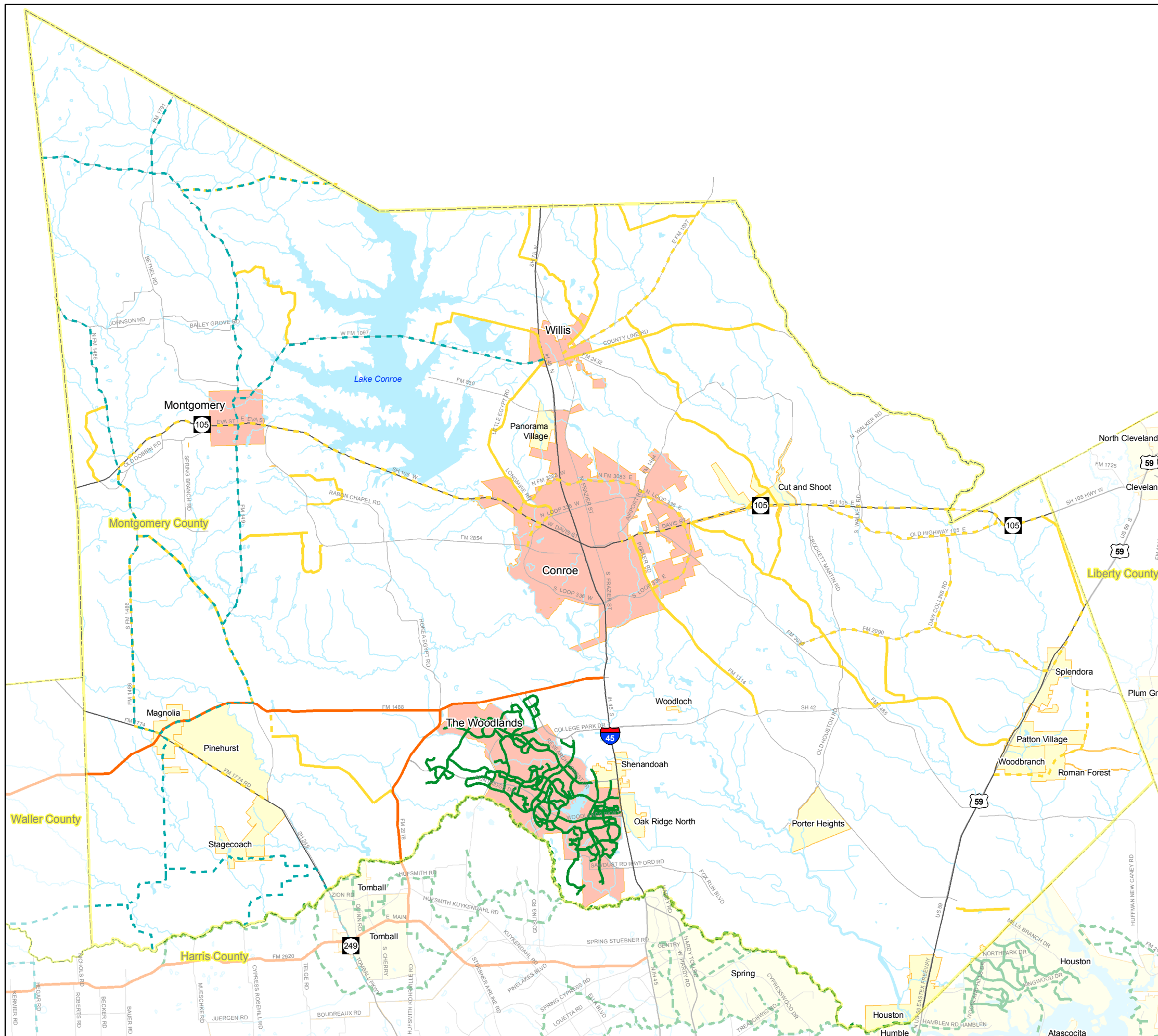
## REGIONAL BIKEWAY PLAN

- - - IDENTIFIED BIKEWAY NEEDS

- H-GAC PEDESTRIAN-BICYCLE SPECIAL DISTRICTS
- CITY, TOWN OR PLACE
- COUNTY BOUNDARY
- MAJOR ROAD OR HIGHWAY
- ~ WATERWAY



Data Sources: Montgomery County, H-GAC  
Map Source: H-GAC, September 2007



**Waller County**

Waller County has a 2000 Census population estimate of 34,821, the second least populated county in the TMA after Chambers County. Waller County is primarily an agricultural area, but also includes some forested areas. Waller County is traversed by two major highways, Interstate 10 and US 290, and continues to face additional development pressure during the planning horizon. The results of the H-GAC Special Districts study identified several locations with the potential for bicyclist and pedestrian trip conversion and safety improvements in Waller, Brookshire, Hempstead and Prairie View.

Bicyclist and pedestrian facility development in Waller County has been limited to construction of several off-road multipurpose trails that are primarily utilized for recreational purposes within parks. While TxDOT-Houston district has assigned shoulders as bicyclist routes along 19 miles of FM 1488 in Waller County, there are many additional opportunities to link population centers with the designation of bicyclist routes along state roadways.

Within the 1996 *Regional Bikeway Plan*, there were several identified bikeway needs. Routes identified included the use of shoulders along US Highway 90 (Business), State Highway 6 and 290 (Business), FM 359, 362, 529 and 2855. Adopting these roadways as bicyclist facilities would link the cities of Brookshire, Hempstead, Prairie View with planned developments within Fort Bend and provide connections to signed shoulder bicycle routes provided along FM 1488 and 2920.



**APPENDIX B:**

**BICYCLIST COMMUTING CENTERS AND PEDESTRIAN-BICYCLIST DISTRICTS**



## **BICYCLIST COMMUTING CENTERS AND PEDESTRIAN-BICYCLIST DISTRICTS**

There are two distinct locations of peak bicyclist commuter activity within the TMA, both of which are linked to the region's major medical centers. Within each county there are also districts that currently generate a significant level of pedestrian and bicyclist travel. Strategic investments to improve pedestrian and bicycle facilities within and between these centers and districts appear to have the greatest potential for replacing short auto-based trips with a walking or biking trip. The following is a description of areas within the TMA that are candidates for such investments.

In 2004, H-GAC completed a study to identify "special districts" in the TMA with the potential for strategic investment in pedestrian and bicyclist facilities. Many of these "special districts" also had environmental justice and safety concerns, including high percentage of households without access to a vehicle and higher than average concentrations of crashes involving pedestrians and bicyclists.

### **Regionally Significant Bicyclist Commuting Centers**

There are two employment centers within the TMA that generate a significant level of bicyclist commuters: the Texas Medical Center in Houston and the University of Texas Medical Branch (UTMB) in Galveston. There may be many reasons for the higher concentration of bicyclist trips (e.g., the medical community is more sensitive to healthy behavior, existence of bicyclist facilities, high concentration of students); however, the high cost of parking may also be a key factor. These growing employment centers present opportunities for encouraging even greater use of walking and bicycling to relieve congestion and parking pressures.

#### *Texas Medical Center*

The Texas Medical Center (TMC) draws the greatest amount of commuter bicyclists of any employment center in the TMA. According to the 2000 census, there were 50,238 work trips, of which 36,973 drove alone, 7,927 carpooled, 4,018 took the bus, 430 walked, 379 biked, and 511 used other means (motorcycle, taxi, permanent telecommute).

The 430 walking trips and the 379 biking trips represent 0.9% and 0.8% respectively of all trips. Based on the 2000 Census, the Texas Medical Center has the highest concentration of bicyclist trips within a census tract in the region (even greater than Downtown Houston), and the third highest concentration of walking trips in the region (after downtown and the University of Texas Medical Branch in Galveston). Recent observations made by H-GAC and TMC staff indicate that over 1,000 bicyclists now commute to the TMC on a daily basis.

Figure 2, below, shows the major concentrations of trip origins to the TMC superimposed upon the existing local bikeways. While the network is extensive, there are gaps, with a limited number of direct access points into TMC. Additional incentives for walking and bicycle commuting could be provided, including secure and weather-protected bicycle parking with improved security, continuous sidewalks, more frequent crosswalks, and access to showers and lockers. H-GAC plans to continue to work with the TMC and its transportation partners to identify potential projects that improve access and provide amenities needed to support bicyclist commuting.

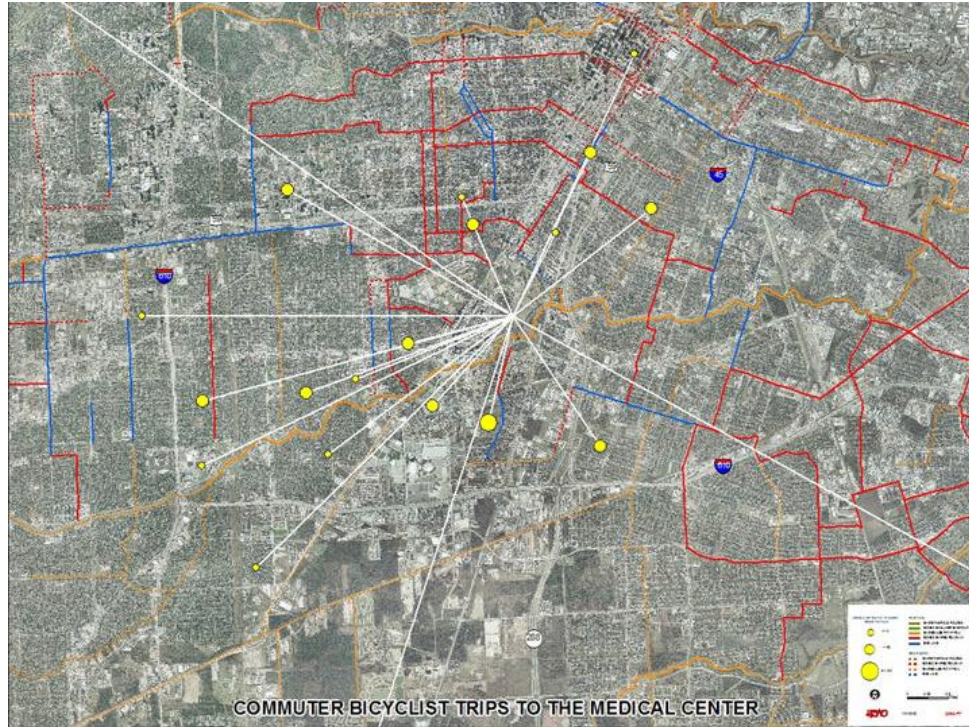


Figure 2. Commuter Bicyclist Trips to the Texas Medical Center.

#### *University of Texas Medical Branch-Galveston*

Bicycling commuting is considerable in the vicinity of the University of Texas Medical Branch (UTMB). The 2000 Census indicated that UTMB had 10,470 daily work trips. Of these 89% were by private vehicle, 1.3% were by bus, 2.2% were by bicycle and 5.3% were walking trips – significantly higher than the regional average of 0.3% by bicycling and 2.1% by walking.

The dense residential development surrounding UTMB makes walking and biking feasible. In particular, the 234 commute trips by bicyclists were nearly equal to the number of bicyclists commuting to the Texas Medical Center in Houston, a much larger campus. An analysis of the locations from which UTMB bicyclist commute trips showed that most lived in the vicinity, but many came from elsewhere on the island and some came from the mainland.

#### **Pedestrian-Bicyclist Special Districts**

##### *Background*

The H-GAC 2004 *Pedestrian-Bicyclist Special Districts Study* identified geographic areas with the greatest potential demand for pedestrian and bicyclist travel. The highest overall ranking districts in the TMA were within the City of Houston (see Figure 3, Page 49 below) and the City of Galveston (see Figure 4 on Page 51).

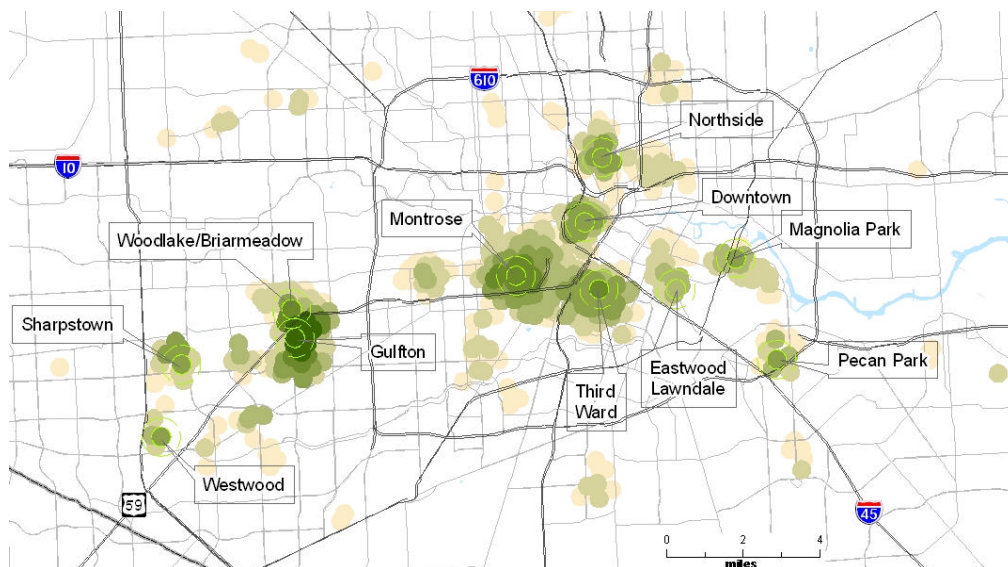


Figure 3. Top Scoring Districts within the City of Houston, Harris County.

### *Pilot Studies*

Each high ranking pedestrian-bicyclist special district was further assessed as a potential pilot project to show how pedestrian and bicyclist improvements could be planned at a district level. Houston's **Third Ward** area was selected as the site of the first pilot study in 2004, due to its potential for strong local partnerships and synergy with other plans and projects. Community meetings were organized in coordination with the City of Houston Planning and Development Department, the OST/Almeda Corridors Redevelopment Authority—Tax Increment Reinvestment Zone (TIRZ) #7, the Greater Southeast Management District, and the Third Ward Redevelopment Council. From input received at the meetings, consultants prepared a conceptual plan for pedestrian and bicyclist improvements.

In addition to the pilot study, Pedestrian and Bicyclist Special District Studies have been completed for the Gulfton Area, Montrose Area, and Galveston. The Special District Studies produced conceptual plans and recommendations for improving pedestrian and bicyclist mobility within the study areas.

### *Third Ward Special District Study*

Within the **Third Ward**, many households do not have access to a motor vehicle. Many residents of this community are dependent upon transit, bicycling and walking to commute. While the Third Ward contains only 5% of METRO's service area, it contributes 23% of the transit organizations total ridership. Projects identified in this plan were focused upon improving safety and mobility for pedestrians. These projects included a modern 'roundabout' to replace the traffic signal at the intersection of Dowling and Elgin, new sidewalks along Elgin, Ennis, Alabama and Dowling streets, as well as curb extensions and crossing islands at the intersections of Holman at Delano and Holman at Ennis. The sidewalk, crossing islands and curb extension projects identified in this plan were submitted into the 2006-08 TIP, sponsored by the Greater Southeast Management District, with the support from the City of Houston and elected officials. Three million dollars was allocated within the 2006-2008 TIP for implementation of pedestrian and bicyclist improvement projects developed as a result of the special districts studies where the local entity agreed to provide the 20% local match.

### Gulfton Special District Study

In 2005, H-GAC developed the Gulfton and Montrose Pedestrian and Bicyclist Special District Studies. The **Gulfton** district is the most densely populated neighborhood in Houston. Many of its residents walk or commute by bicycle, as over 40% of Gulfton households do not have access to a motor vehicle. The Gulfton district also leads the region in crashes involving pedestrians and bicyclists. In 2003, the Harris County Toll Road Authority (HCTRA) constructed the Westpark Toll Road, usurping several miles of designated bicycle lanes previously installed along Westpark by the City of Houston. North and southbound pedestrian movements were negatively impacted by the completion of the toll road, due to the placement of barriers, such as guard rails, and elimination of crosswalks and sidewalks that were previously available to cross the roadway. In 2006, HCTRA made significant improvements to pedestrian safety across Westpark, but more are needed.

H-GAC is working with HCTRA and the City of Houston to develop a plan to restore additional pedestrian and bicyclist facilities to the corridor. The proposed improvements include strategic segments of shared use paths along Westpark and the Bering Channel, which is maintained by the Harris County Flood Control District (HCFCD), sidewalks along Westpark, and improved access to the METRO Hillcroft Transit Center.

### Montrose Special District Study

In general Montrose's population is young, well-educated and affluent, with a propensity to walk or take public transportation. Improving pedestrian access to transit was a high priority identified in the public charrette process. The reconstruction of Spur 527, which links the Southwest Freeway with downtown Houston, created a temporary barrier to pedestrians and bicyclists. Existing sidewalks and crosswalks beneath the highway structure were removed, and no accommodations for pedestrians were provided during construction. During construction pedestrians had to utilize the roadway to cross beneath Spur 527 to access METRO's Main Street light rail train. Upon completion, the reconstruction of Spur 572 produced significant improvements for pedestrians and bicyclists in the vicinity. Several projects were developed from the Montrose Special Districts Study as a direct result of strong public input, including the development of a bicycle route along Waugh Boulevard to connect with the Heights, and other bicycle routes to link Montrose with the Texas Medical Center and Hermann Park. Sidewalk projects were also recommended for segments of Westheimer, Montrose and Richmond Boulevard.

### Galveston Special Districts Study

In 2006, H-GAC worked with the City of **Galveston** to develop a pedestrian-bicyclist plan for two Pedestrian and Bicyclist Special Districts on Galveston Island. Issues identified include a substantial number of pedestrian-bicyclist crashes with motor vehicles along Broadway/State Highway 87, which acts as a barrier for students to reach several elementary schools. Results from public meetings indicate that residents want new sidewalks in strategic areas. There was an overwhelming demand for the development of a bicycle master plan for the City of Galveston. The City of Galveston is sponsoring seventeen pedestrian-bicyclist improvement projects that were developed as part of this study, including bike lanes and signed shared roadways, sidewalks, bicycle racks at businesses, and pedestrian improvements across Broadway/State Highway 87.



Figure 4. Top Scoring Districts within the City of Galveston.

*Next Steps*

H-GAC has begun work with the City of **Sugar Land** to develop a pedestrian-bicyclist mobility plan for the city’s Town Square. H-GAC will continue to seeking partners to develop pedestrian-bicyclist mobility plans throughout the TMA. In future years, H-GAC plans to partner with other communities to develop additional pedestrian-bicyclists improvement projects. Other districts identified include:

Brazoria County:

- Alvin
- Angleton
- Clute
- Lake Jackson
- Freeport
- Manvel
- Pearland

Galveston County:

- Friendswood
- Texas City

Liberty County:

- Cleveland
- Daisetta
- Dayton
- Liberty

Chambers County:

- Anahuac
- Winnie-Stowell

Fort Bend County:

- Missouri City
- Richmond
- Rosenberg
- Stafford

Harris County:

- Eastwood/Lawndale
- Magnolia Park
- Northside
- Pecan Park
- Sharpstown
- Westwood

Montgomery County:

- Conroe
- South Montgomery County
- Willis
- Woodlands

Waller County:

- Brookshire
- Hempstead
- Prairie View
- Waller

**APPENDIX C:**

**BIKEWAY DESIGN AND MAINTENANCE**

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## **GUIDELINES FOR ACCOMMODATING PEDESTRIANS AND BICYCLISTS**

### **Summary**

The Houston-Galveston Area Council (H-GAC) staff collaborated with the Regional Pedestrian and Bicycle Subcommittee to develop guidelines to encourage the consideration of pedestrian and bicyclist accommodations in planning and design of future Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP) projects.

The guidelines also stress the importance of pedestrian and bicycle facility maintenance. Debris, cracks and potholes that may not present a hazard for a motorist can be a major obstacle for a pedestrian and/or a bicyclist.

### **Purpose and Need**

In recent years, the eight-county Houston-Galveston TMA has averaged more than 1,000 crashes per year involving pedestrians or bicyclists. Additionally, the 2000 U.S. Census reported that more than 7% of households in the TMA do not have access to an automobile. School, work, transit, shopping, and other destinations will be difficult to reach safely on foot or by bicycle if adequate accommodations do not exist.

Bicycle and pedestrian accommodations provide people options to use alternative modes of transportation. Having the opportunity to choose to walk or bike can reduce short motor vehicle trips, which can have a positive effect on air quality, congestion, and individual health.

Starting early in the planning process is key to successfully integrating pedestrian and bicyclist accommodations into roadway projects, especially where new Right-of-Way (ROW) must be acquired. Bikeway and pedestrian accommodations are more difficult to introduce once a project's ROW and budget are fixed and design flexibility becomes limited. Early planning can avoid costly retrofits.

### **Pedestrian-Bicyclist Considerations**

The following factors should be considered as part of all transportation improvement projects:

- Pedestrian and bicyclist demand
- Documented safety problems
- Surrounding land uses, trip generators and transit facilities
- Project impact on existing/ planned pedestrian and bicyclist facilities
- Facility suitability
- Ability to maintain roadway performance
- Design and ROW constraints
- Budget constraints
- Public Support

Considering all modes of transportation should result in a project design that can cost-effectively serve the needs of motorists, pedestrians and bicyclists.

### **Choosing Appropriate On-Street Accommodations**

Appropriate bicyclist accommodations require consideration of a great many factors, such as roadway classification, the number of travel lanes, traffic volume, and posted/observed speed of traffic. The type and density of land uses adjacent to a roadway also influences the level of pedestrian and bicyclist activity. Transportation engineers and planners should consider pedestrian and bicycle accommodations as part of all transportation improvement projects.

When evaluating a roadway improvement project, if evidence of pedestrians and/or bicyclists exists, or bicycling will be permitted, consideration should be given to including appropriate accommodations as part of the project scope, project development, ROW needs, and the project budget.

Another important consideration is whether the roadway is one where pedestrian and bicyclist travel will be *permitted* (basic accommodations), or one where it will be *encouraged* (enhanced accommodation). Basic accommodations are intended to provide safe access for pedestrians and bicyclists between their trip origins and destination, as well as linkages to bikeways and other facilities designed for heavier pedestrian and bicyclist usage.

#### *Enhanced Accommodations*

For facilities where there is greater pedestrian and bicyclist demand, or where these modes are to be encouraged, enhanced accommodation may be necessary. For pedestrians, wider sidewalks and buffers, trees/landscaping, and “traffic calming” measures may be appropriate. Factors that may warrant an “enhanced” level of accommodation include the following:

- Project area is densely developed
- Project area has known pedestrian and bicyclist travel demand
- There exists a high incidence of pedestrian/bicyclist crashes
- Project provides access to or crosses an existing or planned bicyclist facility.
- Project is in a special district where pedestrian and bicyclist travel is actively promoted.
- Project provides access to known generators of pedestrian and bicyclist travel, such as schools, parks, and transit facilities.

#### *Basic Accommodations*

Smooth pavement is a critical factor when considering on-street bike routes. Uneven seams within the drainage area of the outer roadway, greatly affect bicyclist safety. Bicycle-friendly storm inlets, with grates that are perpendicular to the direction of traffic, are recommended. Grates parallel to the direction of traffic can be a hazard to bicyclists. These simple accommodations provide safer conditions for on-street bicycling.

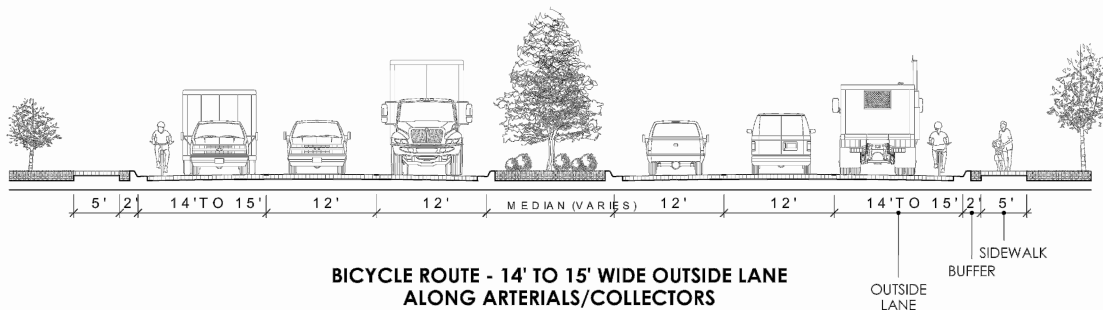
In rural or less developed suburban areas, a paved shoulder may be used by stranded motorists, pedestrians and bicyclists. As part of transportation planning, entities should consider acquiring sufficient ROW for both current and future bicycle and pedestrian accommodations. H-GAC recommends a minimum 5' foot sidewalk with 2' to 3-foot buffer with crosswalks as needed. In urbanized areas, a wide outside travel lane (14 to 15 feet) may be sufficient to accommodate proficient bicyclists.

*Wide [Outside] Curb Lane (Signed as a Bike Route)* – In general, 14 feet of usable lane width is the recommended width for shared use in a wide curb lane [no pavement markings necessary]. Usable width normally would be from edge stripe to lane stripe or from the longitudinal joint of

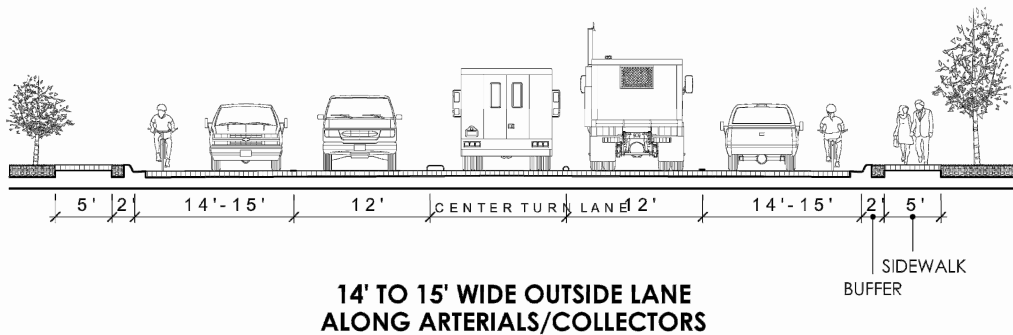


the gutter pan to lane stripe (the gutter pan should not be included as usable width). On stretches of roadway with steep grades, where bicyclists need more maneuvering space, the wide curb lane should be slightly wider where practicable (15 feet is preferred).

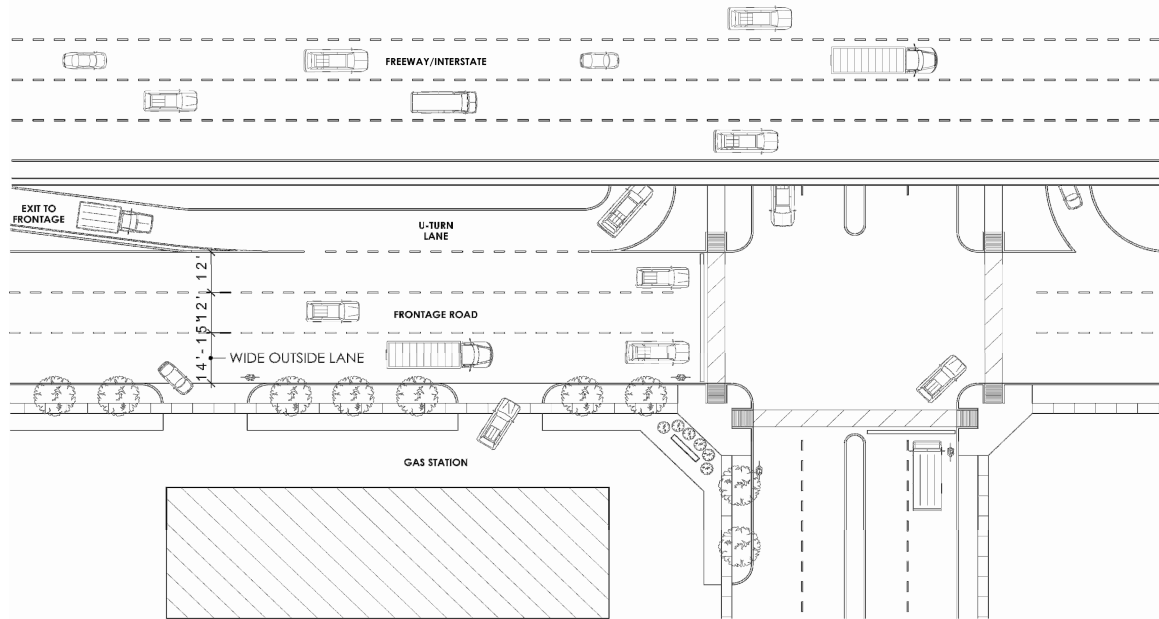
A wide outside lane allows motorists and bicyclists to share the outer travel lane with minimum disruption to roadway speeds while reducing conflicts between bicyclists and large vehicles with protruding features, such as large side-view mirrors and large cargo areas and trailers. The lanes are wide enough for vehicles to pass bicyclists, but not for motor vehicles to overtake slow-moving motor vehicles. These roadways can be designated as bicycle routes by local jurisdictions to generate additional bicyclists, or can be used to accommodate existing levels of bicyclists, providing basic access to destinations along specific segments of roadway, such as along frontage roads that intersect designated bicyclist routes in areas with densely developed land uses. For safety, a thorough evaluation of the roadway characteristics, in combination with sound engineering judgment, is needed when considering signing a wide outside lane as a bike route. See Figures 5-7 for examples.



**Figure 5.** A wide outside lane may be shared by motorists and bicyclists.



**Figure 6.** A wide outside lane maybe shared by motorists and bicyclists.



14' TO 15' OUTSIDE DRIVING LANE ALONG FRONTAGE ROADS

**Figure 7.** A wide outside lane may be shared by motorists and bicyclists.

*Signed Shared Roadway (Signed Bike Route)* - A shared roadway which has been designated by signing as a preferred route for bicycle use.

These bicyclist facilities are designated on roadways with lower traffic volumes/speeds, good pavement conditions, and delineated by bike route signage but not striping. These facilities are generally best in neighborhood settings, along roadways with low traffic volumes, and in many locations, the presence of shade trees enhance trips during summer months. This type of bicyclist facility generates bicyclist activity as an origin for many bicyclists trip, also creating bicyclist 'corridors' for commuters utilizing the roadway for a more pleasurable route towards their destination. Signed shared roadways are easily implemented and should be designed to guide bicyclists towards safe, signalized crossings of busier roadways, utilizing existing signalized intersections to streets with greater traffic volumes and higher vehicular speeds.

### **On-Street Bikeways**

*Designated Bicycle Lane or Bike Lane* - A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicycles.

On-street designated bike lanes are five to six foot-wide designated lanes for bicyclists, indicated with pavement markings and bike route signage, and include intersection treatments to delineate the area for which bicyclists shall travel. When there is available roadway widths, bike lanes provide good access to land uses along roadways and allow for longer trips within urbanized areas.

Bike lanes also offer the bicyclist a designated area of roadway, that when designed properly, can link centers of activity with a continuous facility. Bike lanes require a dedication of roadway area, alongside the outermost travel lane of a roadway, and can also serve as a buffer between pedestrians and moving traffic. Bike lanes require additional maintenance of pavement markings,

and regular street sweeping is recommended as debris can collect along the outer edge of the roadway, requiring bicyclists to travel outside the bike lane to avoid harmful obstacles, such as glass and other roadway related objects. See figures 8 and 9 for examples of bicycle lanes.

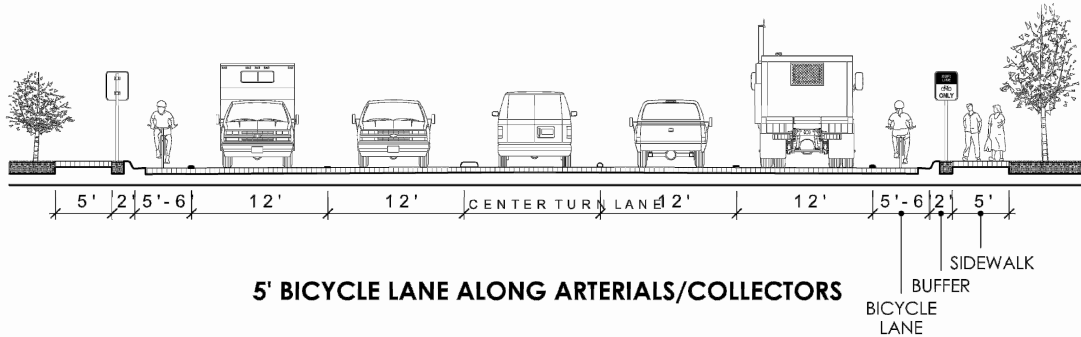


Figure 8. Designated bicycle lanes offer bicyclists a dedicated portion of the roadway.

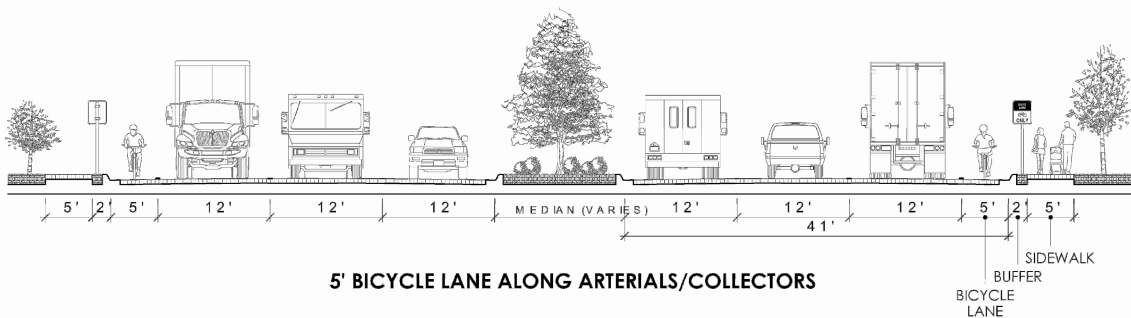


Figure 9. Designated bicycle lanes can serve as a buffer between pedestrians and traffic.

*Signed Shoulder Bike Routes* – The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of sub-base, base and surface courses. [In Texas, bicyclists are permitted to ride on the roadway’s shoulder, and shoulders may be signed as bike routes.] Signed shoulder routes are most appropriate for rural or less developed suburban areas. While shoulders benefit all roadway users, their utility for bicyclists is diminished with the introduction of additional lanes for center turns and exclusive right turn lanes. If a center or right turn lanes becomes necessary, H-GAC recommends purchasing additional right-of-way to maintain the continuity of the shoulder.

**Choosing Appropriate Off-Street Bikeways**

*Shared Use Path* - A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users

There are situations where off-street accommodations may better serve the needs of pedestrians and bicyclists. For example, a major highway frontage road may provide the most direct alignment between major trip generators/attractions, but the speed of the roadway and lack of

available shoulder may not support bicyclist travel. In these situations, a parallel off-road, shared use path may be more appropriate to accommodate pedestrian and bicyclist traffic. In addition, an off-road shared use path may be safer for younger or less experienced bicyclists. Off-road or “behind the curb” paths are safest where there are widely-spaced intersections and a limited amount of driveways to cross. The banks of the bayous in the Houston-Galveston TMA present many opportunities for off-road shared use paths. As part of all new and widened drainage facilities H-GAC recommends that flood management districts provide a shelf for future off-road paths. Paths adjacent to drainage easements require additional maintenance and clearing of debris after severe storm events. Off-road shared use paths with federal or state funding must be designed and constructed in compliance with the American Association of State Highways and Transportation Official’s (AASHTO) Guide for the Development of Bicycle Facilities. H-GAC supports and promotes the use of AASHTO’s bikeway guide.

**In designing off-street facilities, it is important to minimize the number of conflict points between pedestrians/bicyclists and turning vehicles.** Off-road or “behind the curb” facilities are safest where there are widely-spaced intersections and a limited amount of driveways for the shared use path to cross. Off-road facilities should be designed in compliance with the guidelines developed by the American Association of State Highway and Transportation Officials (AASHTO). Table 1 (Page 66) summarizes these guidelines.

In cases where it is not feasible to provide off-street accommodations immediately adjacent to the roadway, a parallel on- or off-street facility may provide sufficient accommodation for bicyclists and pedestrians. In these instances, it is important that project planners consider how pedestrians and bicyclists will access the land uses on the roadway that does not have direct accommodation. Please see Figure 10, Pg. 59, for an example of an off-street accommodation along arterial/collector streets.

#### Design Guidelines for Shared-Use Off-Street Paths

As defined by AASHTO, a Shared Use Path is ‘a bikeway that is physically separated from motorized vehicle traffic by an open space or barrier, and either within the highway right-of-way or within an independent right-of-way’ (AASHTO 1999). Users are non-motorized and may include but are not limited to: bicycles, in-line skaters, roller skaters, wheelchair users, (both non-motorized and motorized), and pedestrians, including walkers, runners, people with baby strollers, people walking animals, etc.

General design guidelines for shared-use paths include:

- For most conditions, a paved width of 10 feet is recommended; if bicyclist traffic and general use is expect to be low, 8 feet wide may be sufficient. However, when considerable use is anticipated, a width of 12 feet is desirable.
- AASHTO recommends a wide separation between the shared use path and the adjacent roadway/shoulder. When this is not possible and the distance between the edge of the shoulder/roadway and the shared use path is less than 5 feet, a suitable physical barrier is recommended.
- AASHTO recommends a minimum 2-foot-wide horizontal clear area (3 feet or more is desirable) on both sides of the path with a minimum 1:6 slope side slope and a vertical clearance of 10 feet.
- The Americans with Disabilities Act (ADA) was passed in 1973. Because shared use paths are used by both pedestrians and bicyclists, all ADA criteria must be met in addition to AASHTO bicycle guidelines.

- Grades on shared-use paths should be kept to a minimum during long inclines, however, these can exceed 5 percent for shorter sections to minimize impacts to adjacent properties and maintain reasonable costs. While ADA recommends grades between 5-8 percent, some design flexibility may be required to overcome obstacles.
- Reinforced concrete with a lime treated base is recommended for shared use path construction. For projects that are not within a floodplain, asphalt may be sufficient but may require a greater commitment to maintaining the facility.
- Appropriate signage should be placed in advance to alert bicyclists about intersections, steep grades, and sharp turns; however, signage should be limited to preserve the natural environment.



Figure 10. Off-road shared use path adjacent to an arterial/collector street.

### Right of Way Considerations

Limited ROW poses the greatest challenge for integrating pedestrian and bicyclist facilities into roadway design. For example, expanding a thoroughfare from four to six lanes within an existing 100' ROW can limit the opportunity to accommodate pedestrians, bicyclists, and utility needs.

Under Texas law, agencies may acquire up to 120' of ROW for major thoroughfares, and can exceed this limit if additional transportation improvements are consistent with the Regional Transportation Plan adopted by the Metropolitan Planning Organization. Municipalities may set their own ROW requirements through their Major Thoroughfare Plans and development ordinances. H-GAC encourages counties and cities to consider whether their ROW policies allow for pedestrian and bicyclist accommodations.

Pedestrian and bicyclist accommodations may not be feasible reconstruction projects with limited ROW. However, the following measures can improve pedestrian and bicyclist conditions:

#### Pedestrian Accommodations

- Removal of physical obstacles within an existing sidewalk, such as utility poles and signs.
- Add appropriate crosswalks and pedestrian signals as warranted.

#### Bicyclist Accommodations

- Eliminate construction joints within the outside lane.
- Use bicyclist compatible storm grates and utility covers.
- Provide smooth pavement conditions.
- Reduce rumble stripe width on shoulders to allow bicycle access.

In locations with high pedestrian and bicyclist activity, where bicycle-pedestrian crashes are more frequent, some additional measures may be warranted. For example, reducing the width of the roadway median and/or interior lane(s) may provide space for a wide outside lane, a designated bike lane, or a sidewalk.

## **PEDESTRIAN – BICYCLIST ACCOMMODATION REVIEW PROCESS**

Pedestrian and bicyclist accommodations should be considered as part of the design for all new or added capacity roadway projects within the TMA. Providing better access for all modes of transportation will support local transit and rail plans, and allow pedestrians and bicyclists safer access to paths and bike routes that have been designed specifically for their use. Where on-street bicyclist accommodations are not feasible, safe access at reasonable intervals to the nearest parallel bikeway facility may be a viable option. Roadway design considerations, such as curb cuts and bicyclist friendly drainage grates may be warranted, especially on roadways where bicycling is permitted and where access to an existing or proposed bikeway is needed.

H-GAC's pedestrian-bicyclist accommodation review process provides entities an opportunity to document the consideration of non-motorized modes of transportation in a variety of projects, such as new roadway construction and added capacity improvements, including intersections, as well as new or replacement bridges. Upon request, H-GAC will provide a review of existing land uses, investigate proposed projects that may be constructed within the project study area, assess existing pedestrian and bicyclist facilities, and provide an analysis of the considerations for the proposed project plan. In most conditions, it is likely that the project review process will provide improvements for non-motorized modes. There may be aspects of the design that can be modified to accommodate pedestrians and bicyclists and provide mobility.

### **Pedestrian-Bicyclist Accommodations through Construction Zones**

Agencies constructing public roadways are bound by the federal standards established in the Manual on Uniform Traffic Control Devices (MUTCD). Projects within state right-of-way must be designed in conformance with the Texas Manual of Uniform Traffic Control Devices (TMUTCD). As part of both the MUTCD and TMUTCD there are guidelines for roadway construction zones, including recommendations for providing temporary accommodations for pedestrians and bicyclists.

Construction zones have often restricted pedestrian movements. Construction plans often lack temporary accommodations for pedestrians or bicyclists, resulting in the creation of a barrier. Construction may last from a few weeks to several years. H-GAC recommends that documentation of pedestrian-bicyclist accommodations be included during project planning and as part of the project's construction plans, which may include temporary crosswalks and sidewalks, and bicycle routes during the construction period. In addition, subsequent RTP/TIP applications for transportation project funding should indicate how pedestrians and bicyclists will be accommodated during construction on all appropriate roadway, bridge and highway transportation projects.

### **Use of H-GAC's Guidelines for Accommodating Pedestrians and Bicyclists in Project Development**

H-GAC's *Recommended Accommodations for Pedestrians and Bicyclists* is included within calls for RTP and TIP project. Sponsor training regarding the use of the guidelines for pedestrian and bicyclist accommodations is provided at TIP project development workshops. Sponsors should consult the guidelines in considering pedestrian and bicyclist accommodations for RTP/TIP projects including new roadways, widening of existing roadways, and major roadway reconstruction. Other projects for which pedestrian and bicyclist consideration may be appropriate include resurfacing, reconstruction without additional ROW and signalization.

Pedestrian and bicyclist considerations should begin during the Major Investment Study (MIS), if one is required for the project. For projects that do not require an MIS, pedestrian and bicyclist considerations should be part of the project's Preliminary Engineering (PE) study. H-GAC will provide up-to-date information regarding the location of existing and proposed bikeways. This information will be available to project sponsors as part of project development. Project sponsors are asked to consider and identify pedestrian and bicyclist accommodations as part of their candidate project submittal for the RTP and TIP. H-GAC staff will review the TIP project application and offer comments and suggestions regarding pedestrian and bicyclist accommodations that would be most appropriate for the project. Please see Figure 11 (page 41) for an illustration of this process.

#### *Preliminary Engineering Considerations*

Details pertaining to the development and design of transportation projects begin to take form during project assessment and Preliminary Engineering (PE) study. It is during these processes that transportation needs and constraints are identified. Two key components of project development are the identification of available right-of-way (ROW) and the type of environmental documentation required.

Within the limits of ROW, project engineers and planners must accommodate all modes of transportation. However, typical data collection techniques focus solely upon volumes of vehicles and the location and amount of crashes within the project study area, without consideration of pedestrian-bicyclist activity or adjacent land uses.

#### *TIP Pedestrian and Bicyclists Accommodation Checklist*

H-GAC has developed a checklist of factors that should be reviewed as part of the consideration of pedestrian and bicyclist accommodations and which may be included in the Preliminary Engineering report. Upon request, H-GAC will provide assistance to the sponsor in obtaining information regarding existing, planned or proposed bikeways, and will offer comments to encourage appropriate accommodations for pedestrians and bicyclists within the given limits of the project. Please see Figure 12 H-GAC Pedestrian and Bicyclist Consideration Checklist, (page 64) for recommended considerations.

#### *TIP Pedestrian and Bicyclists Accommodation Checklist*

The Transportation Improvement Program (TIP) identifies funding for projects ready to move into final design and construction. Project sponsors apply for funding during the TIP Call for Projects. As part of the TIP process, project sponsors are required to submit project details, design plans, as well as document public process and commitments of local funding match to obtain federal funding. Applications are ranked and scored to select those projects which offer optimal benefits towards achieving the region's transportation goals. The identification of pedestrian and bicyclists accommodations are now required as part of the TIP application process. Project sponsors are required to document the pedestrian and bicyclist facilities that are included within the project design (if applicable or known), and asked to describe any constraints that restrict or limit the inclusion of pedestrian and bicyclist facilities as part of their project. Please see Figure 13 H-GAC Transportation Improvement Program (TIP) Pedestrian and Bicyclist Accommodation Checklist (page 65) for a list of pedestrian and bicyclist facilities to be considered as part of proposed TIP projects.

Figure 11

**H-GAC PEDESTRIAN-BICYCLE CONSIDERATION PROCESS**

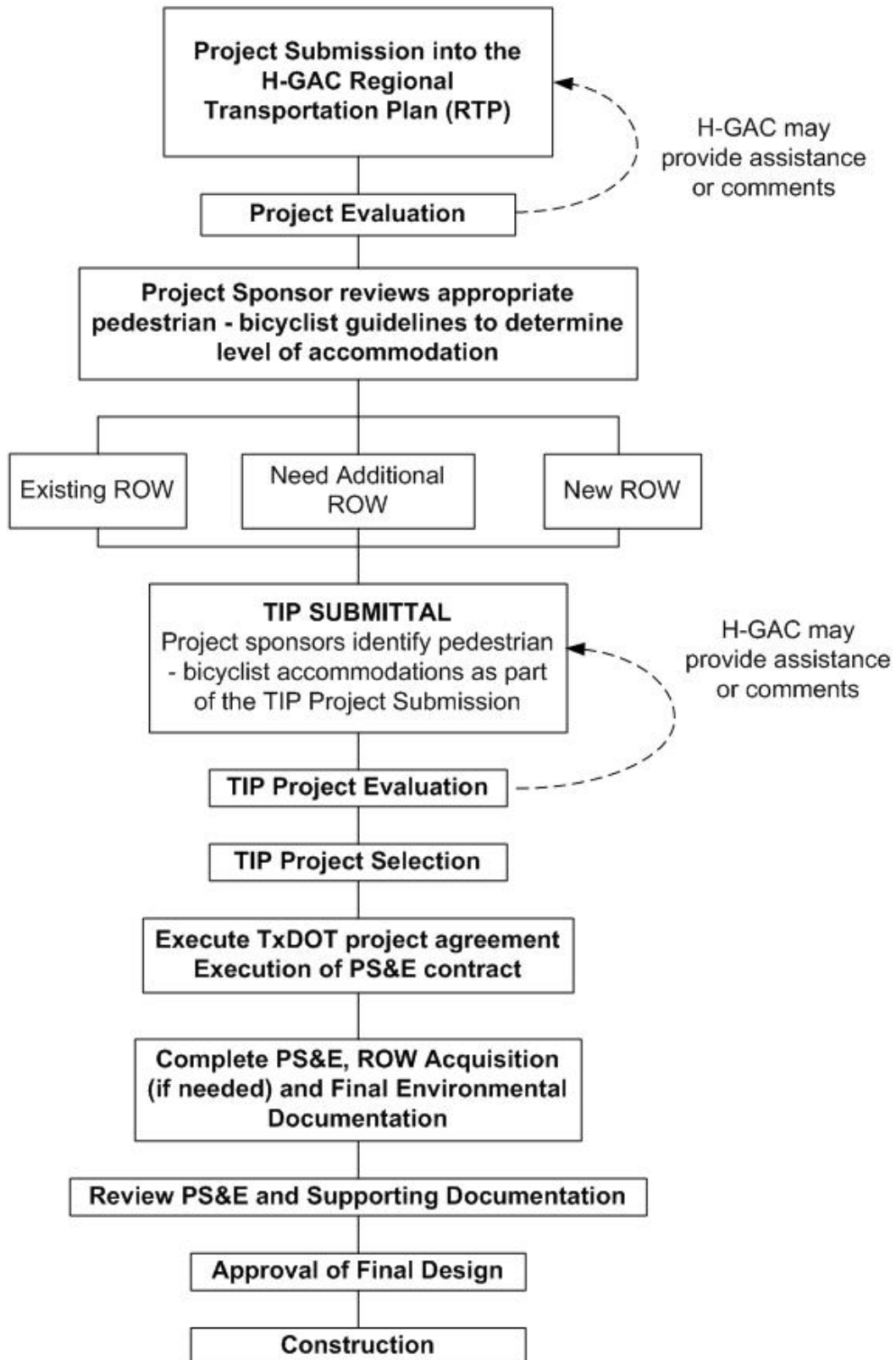




Figure 12

**H-GAC Pedestrian and Bicyclist Consideration Checklist**

*(Upon request, H-GAC will assist the project sponsor in compiling this information.)*

The following checklist outlines the factors project sponsors should evaluate in considering appropriate accommodations for pedestrians and bicyclists in their roadway projects.

Sponsor: \_\_\_\_\_  
Project Name and location: \_\_\_\_\_  
In Urbanized Area? Yes \_\_\_ No \_\_\_ (Describe) \_\_\_\_\_  
Existing or Proposed Transit Route? Yes \_\_\_ No \_\_\_ \_\_\_\_\_  
Type of Project: \_\_\_\_\_  
Check one: New/Expanded ROW \_\_\_\_\_ Retrofit \_\_\_\_\_

Please include the following information in the description of Project Purpose, Scope and Need:

**1. Pedestrian and bicyclist travel demand in project area**

- a. Available counts or observations of pedestrian and bicyclist activity? Yes \_\_\_ No \_\_\_  
\_\_\_\_\_
- b. Available pedestrian and bicyclist crash data? Yes \_\_\_ No \_\_\_ (Describe) \_\_\_\_\_  
\_\_\_\_\_
- c. Available current/projected population and employment? Yes \_\_\_ No \_\_\_  
\_\_\_\_\_
- d. Existing pedestrian-bicyclist facilities? Yes \_\_\_ No \_\_\_ (Describe) \_\_\_\_\_  
\_\_\_\_\_
- e. Percentage of households without a vehicle? (most recent Census) \_\_\_\_\_ %
- f. Is the study area an H-GAC Pedestrian-Bicyclist Special District? Yes \_\_\_ No \_\_\_

**2. Relationship to existing or planned pedestrian and/or bicyclist facilities.**

- a. Regional Bikeway Plan Yes \_\_\_ No \_\_\_ \_\_\_\_\_
- b. Pedestrian-Bicyclist District Yes \_\_\_ No \_\_\_ \_\_\_\_\_
- c. Local pedestrian or bicyclist plan Yes \_\_\_ No \_\_\_ \_\_\_\_\_
- d. Other relevant local plans Yes \_\_\_ No \_\_\_ \_\_\_\_\_

**3. Please explain the project context**

- a. General land use patterns in project area
- b. Significant pedestrian and bicyclist trip generators accessed by the project
  - i. Schools Yes \_\_\_ No \_\_\_ Name(s): \_\_\_\_\_
  - ii. Parks and recreation facilities Yes \_\_\_ No \_\_\_ Name(s): \_\_\_\_\_  
\_\_\_\_\_
  - iii. Neighborhood retail Yes \_\_\_ No \_\_\_ Describe: \_\_\_\_\_  
\_\_\_\_\_
  - iv. Transit (Y/N) \_\_\_ Locations: \_\_\_\_\_
  - v. Other \_\_\_\_\_

**4. Right of Way (ROW) needs to provide pedestrian-bicyclist accommodations**

- a. Is additional ROW needed? Yes \_\_\_ No \_\_\_ Describe: \_\_\_\_\_  
\_\_\_\_\_
- b. Width of proposed pedestrian and bicyclist facilities: \_\_\_\_\_  
\_\_\_\_\_
- c. Additional cost to project: \$ \_\_\_\_\_

Figure 13

**H-GAC Transportation Improvement Program (TIP)  
Pedestrian and Bicyclist Accommodation Checklist**

*(Upon request, H-GAC will assist the project sponsor in compiling this information.)*

The following checklist outlines the types of pedestrian and bicyclist accommodations that should be address in the PE/EA and included in the project cost estimate.

Sponsor: \_\_\_\_\_

Project Name and location: \_\_\_\_\_

In Urbanized Area? (Y/N) \_\_\_ Existing or Proposed Transit Route? (Y/N) \_\_\_

Type of Project: \_\_\_\_\_

Check one:                    New/Expanded ROW \_\_\_\_\_ Retrofit \_\_\_\_\_

1. Please include evaluation of pedestrian and bicyclist factors from RTP Project Purpose, Scope and Need (if available) and describe significant changes in any of these conditions within the project area.
2. From the following list, please identify and describe any pedestrian and bicyclist facilities being considered in project planning (if applicable or known). Costs for these facilities should also be included in the project cost estimate.

**Description of Pedestrian Facilities**

Sidewalks/Width \_\_\_\_\_

Buffer/Width \_\_\_\_\_

Crosswalks/Width/Frequency \_\_\_\_\_

Over/underpass accommodations \_\_\_\_\_

Bridge accommodations \_\_\_\_\_

Intersection/median accommodations (if known) \_\_\_\_\_

Off-road or other accommodations (describe) \_\_\_\_\_

**Description of Bicyclist Facilities**

Wide outside lane/width \_\_\_\_\_

Shoulder or bicyclist lane/width \_\_\_\_\_

Over/underpass accommodations (if applicable/known) \_\_\_\_\_

Bridge accommodations (if applicable/known) \_\_\_\_\_

Intersection/median accommodations (if known) \_\_\_\_\_

Off-road or other accommodations (describe) \_\_\_\_\_

3. Please describe any constraints that restrict or limit the inclusion pedestrian and bicyclist facilities on this project. \_\_\_\_\_  
\_\_\_\_\_
4. If available, would additional ROW provide opportunities to provide recommended and desirable levels of pedestrian and bicyclist accommodations. (Y/N) \_\_\_\_\_
5. Please describe the local support for pedestrian and bicyclist accommodations.  
\_\_\_\_\_

Recommended Accommodations for Pedestrians and Bicyclists

Facility	Accommodations		Facility	Accommodations	
	Pedestrian	Bicycle		Pedestrian	Bicycle
Secondary Arterial / Major Collector	5' sidewalk, 2' buffer; width of buffer may be decreased if parallel to an on-road designated bicycle lane	14-15' outside lane or 6- 8' shoulder or 5-6' bicycle lane on designated routes	Bridges / Overpasses	6-10' sidewalk along bridge structure, extension of 5' sidewalk, with 2' buffer, linking to existing sidewalk network	14-15' outside lane or 6- 8' shoulder or 5-6' bicycle lane on designated routes
Principal Arterials	5' sidewalk, 2' buffer; width of buffer may be decreased if parallel to an on-road designated bicycle lane	14-15' outside lane or 6- 8' shoulder or 5-6' bicycle lane on designated routes	Underpasses	6-10' sidewalk along bridge structure, extension of 5' sidewalk, with 2' buffer, linking to existing sidewalk network	14-15' outside lane or 6- 8' shoulder or 5-6' bicycle lane on designated routes
Frontage Roads along Interstates and Freeways	ROW for sidewalk adjacent to frontage road or parallel arterial (placement to occur as demand dictates) ADA compliant crosswalks where on/off-ramp interseects existing sidewalks	15' outside lane on frontage road or accommodation on nearby parallel arterial or off-street facility, appropriate crossings at off-ramps, interchanges	Major Intersections	Pedestrian push button activation of the traffic signal, 6-10' ADA compliant crosswalks	Maintain shoulder along approach and departure lanes through intersection; 5-6' bicycle lane on designated routes
Best Practices	Purchase of ROW for sidewalks (placement will occur as demand dictates)	Use (W11-1) Share The Road sign along designated routes; maintain existing facilities	Exceptions	Use designated local pedestrian/bicycle plan guidelines if in compliance with AASHTO/ADA. Review to identify accommodation possible within project constraints (Limited ROW, Design Constraints or Special Conditions)	

## **BEST DESIGN PRACTICES FOR PEDESTRIAN AND BICYCLIST ACCOMODATIONS**

Retrofitting bike lanes on existing roadways that are not well-suited for bicyclist travel is a common bikeway design problem in the Transportation Management Area (TMA). Smooth pavement conditions, proper placement of existing gutter seams, orientation of storm sewer grates, traffic volumes, posted and actual speed of traffic, right-of-way, and the width of travel lanes area all key factors affecting on-street bikeway design. These factors should be considered when retrofitting a roadway to accommodate bicyclists. If existing roadway conditions are unsuitable, it may be desirable to defer striping of a bike lane until the roadway is scheduled for resurfacing.

Achieving greater consistency in bikeway design is a regional goal, and will provide bicyclists improved safety and comfort when traveling across various jurisdictions. The American Association of state Highway and transportation Office, guide for the Development of Bicycle Facilities, provides information on bikeway design. H-GAC's *Guidelines for Accommodating Pedestrians and Bicyclists* provide additional guidance for developing consistent designs for on- and off-street bikeways in a variety of settings (see pages 31 to 38).

Better accommodation of pedestrians and bicyclists within the regional transportation network may encourage people to convert some of their trips to these non-motorized modes of travel. However, the layout and design of local streets, subdivisions, commercial areas, schools and parks play a major part in making our communities more conducive to walking and bicycling.

To assist in this endeavor, H-GAC is developing a set of 'Best Design Practices' for accommodating pedestrian and bicyclist access into local planning. Upon request, H-GAC will conduct training and provide individual technical assistance to help implement these practices on all appropriate transportation projects. These practices will encompass the following areas:

### **Improving Pedestrian/Bicyclist Accommodation within Residential Areas**

- Sidewalks widths and connectivity
- Street pattern layouts to enhance pedestrian circulation flow
- Cul-de-sacs and pedestrian easements
- Lighting
- Bicyclist route connectivity and signage
- Access to transit

### **Improving Pedestrian/Bicyclist Accommodation within Commercial Areas**

- Building scale and setback
- Sidewalk, crosswalk and intersection design
- Coordinating sidewalk dining and shopping with pedestrian through movements
- Pedestrians access to and through parking lots
- Bicyclist parking
- Accommodating transit access and use within shopping districts
- Defining bicyclist access routes into commercial districts
- Lighting, amenities and security

### **Improving Pedestrian/Bicyclist Access to Schools and Open Space**

- Identifying school site locations and evaluating pedestrian-bicyclist needs
- Planning safe routes to schools
- Minimizing conflicts with vehicle/bus drop off areas

- Providing access to public parks and open space
- Connecting on-street bikeways with off-road shared use paths

#### Improving Pedestrian/Bicyclist Safety

- Safety education programs
- Security and traffic enforcement

#### **General Walking Observations**

The following observations were made during the course of the H-GAC's Pedestrian-Bicyclist Special District studies. The list below represents several best practices for improving pedestrian mobility and safety.

- Slower streets with lower traffic volumes can be safer for walking.
- Narrow sidewalks of less than 4 feet in width generally prohibit two or more pedestrians from walking side by side.
- Sidewalks throughout the TMA are typically 4-foot; H-GAC recommends 5-foot-wide sidewalks to allow for 2 adults to walk comfortably together or to accommodate pedestrians passing in same or opposite directions. 5-foot-wide sidewalks are a standard that is recognized by pedestrian experts and the Americans with Disabilities Act (ADA).
- Wide and continuous sidewalks are needed along busy streets where pedestrian traffic exists. Sidewalks throughout the TMA are frequently discontinuous. Additional consideration is needed to provide continuous sidewalks (5-foot recommended minimum width) or right-of-way (ROW) for future development.
- Gateways and openings between private properties and public sidewalks may provide opportunities to expand sidewalk access between various land uses.
- Obstructions in sidewalks such as utility poles, signs and bus shelters create conflict for pedestrians, especially those who are wheelchair bound.
- Pedestrian bulb outs can improve sight distances at intersections, where curbside parking exists, and offer safer conditions for pedestrians and bicyclists using crosswalks.
- A wide median refuge may be included in design to provide pedestrian protection and a refuge area for pedestrians crossing multiple-lane roadways.
- Control measures such as Crossing Guards at school zones and pedestrian actuated traffic lights are recommended at crossings with high traffic volume.
- Additional ADA compliant ramps are needed at intersections (where missing). Local entities are urged to take a sidewalk inventory of their jurisdiction.
- Drainage ditches and gutters along curbed roadways may not be in conformity with current ADA guidelines.
- Including a planting strip between the sidewalk and the curbed roadway allows green space while acting as a buffer to protect pedestrians.
- People walk in the street when sidewalks are discontinuous.
- Traffic calming measures may be appropriate where heavy pedestrian traffic exists.
- Mid block crossings are needed where blocks are longer than 500'.

**General Cycling Observations**

The following observations were made during the course of the H-GAC's Pedestrian-Bicyclist Special District studies. The list below represents several recommended best practices for improving bicyclist mobility and safety.

- Avoid bottlenecks at curbside parking, which may force cyclists into difficult situations with motorists.
- Maintain curb lanes and design bicyclist friendly storm sewer grates.
- Cyclists should be aware of existing traffic and their own position on the roadway, while motorists need to be aware that bicyclists are permitted to travel on most roadways. Education is needed for both modes of transportation to become more responsive to each other's presence. This may reduce motor vehicle/bicyclist crashes.
- Reducing the number of thru-movement travel lanes to provide designated bike lanes when warranted; a traffic study may support such a recommendation. However, counts of bicyclists are not a reliable source of information; therefore, field observations and sound engineering judgment will be needed to determine actual traffic needs.
- The bicycling environment would be improved with bike racks installed on public buses, commuter and light rail lines.
- Appropriate pavement markings and signage are needed to communicate proper traffic movements for both motorist and bicyclist safety, especially at intersections where crashes are more common.
- Sight distances, bottlenecks, construction sites, curbside parking, driveways and turning lanes all pose safety concerns for bicyclists and should be carefully considered during roadway planning and design.
- Bicyclist detection devices are recommended at all signalized intersections along dedicated bicyclist routes.
- Consider pedestrian pushbuttons at signalized intersections to allow sufficient time for pedestrian and bicyclist crossings. 'Count-down' signals are recommended for locations with excessive pedestrian-bicyclist traffic.

**Maintenance**

Consistent maintenance is required to build a safe, usable bikeway system. H-GAC encourages local governments to adopt a maintenance plan for existing bikeway facilities that includes the following actions:

- Frequent street sweeping and debris removal, particularly after flooding
- Sign repair or replacement
- Repair cracked pavement
- Maintain pavement markings on designated bikeways

Bikeway projects proposed for inclusion in the RTP and TIP should include a maintenance plan which will be evaluated as part of the project's criteria for funding.

**APPENDIX D:**

**FUNDING COMMITMENTS**

## PROJECT STATUS LISTING

This Appendix contains the project listing that identifies individual projects for the bicycle pedestrian related programs in the Regional Transportation Plan (RTP). This project listing is sorted by Sponsor then by the street name, and project limits. The details of each project are explained in table below.

### Organization

MPO ID	ID given to all projects used for identification by H-GAC.
Key Map	Page in the Key Maps where project is located
Proj Status	Estimated time frame in which the project is to be implemented. Key is located in Table below.
Sponsor	Sponsor of the project usually the agency submitting project.
CSJ #	Control Section Job Number is a number given to projects that are implemented by TxDOT.
Sponsor ID	Number sponsor assigns their projects such as a CIP number.
Street	Street/Highway where project is located. If project is not located on a specific street then VA or N/A is listed for street.
From Limit	Beginning limit of the project.
To Limit	Ending limit of the project.
Project Description	Scope of work or description of project as submitted by the sponsor.
Length	Length of the project in miles.
Let Date	Estimated date for project to be let to contract.
Total Cost	Current estimated cost of project.

### Project Status Key

LET	Project has been awarded a contract for construction or new services that have begun
LONG	Projects that are considered Long Range (11 to 25 years)
SHORT	Projects that are considered Short Range (4 to 10 years)
TIP	Projects that are in the Transportation Improvement Program (1-3 Years)



### ***Pedestrian and Bicyclist Projects in the Regional Transportation Plan***

<b><i>Sponsor</i></b>	<b><i>Let</i></b>	<b><i>TIP</i></b>	<b><i>Short</i></b>	<b><i>Long</i></b>	<b><i>Grand Total</i></b>
CITY OF ALVIN		\$840,000	\$89,550		\$929,550
CITY OF BAYTOWN	\$1,406,250	\$1,361,919			\$2,768,169
CITY OF GALVESTON		\$220,000			\$220,000
CITY OF HOUSTON	\$3,024,869	\$50,006,888	\$48,503,404	\$10,850,000	\$112,385,161
CITY OF LA MARQUE		\$46,205			\$46,205
CITY OF LA PORTE			\$1,825,200	\$8,724,800	\$10,550,000
CITY OF LAKE JACKSON	\$1,286,040				\$1,286,040
CITY OF LEAGUE CITY		\$1,023,079	\$1,649,000		\$2,672,079
CITY OF MISSOURI CITY			\$18,150,600		\$18,150,600
CITY OF PASADENA		\$1,952,198			\$1,952,198
CITY OF PINEY POINT VILLAGE			\$3,500,000		\$3,500,000
CITY OF SUGAR LAND			\$1		\$1
FORT BEND COUNTY			\$0		\$0
GREATER EAST END MANAGEMENT DISTRICT				\$4,500,000	\$4,500,000
GREATER GREENSPOINT MANAGEMENT DISTRICT		\$3,184,541	\$2,900,000	\$20,000,000	\$26,084,541
GREATER SOUTHEAST MANAGEMENT DISTRICT		\$1,109,000		\$10,000,000	\$11,109,000
HARRIS COUNTY		\$14,706,849		\$24,156,773	\$38,863,622
H-GAC		\$3,750,000	\$12,000,000	\$18,000,000	\$33,750,000
METRO		\$1,500,000			\$1,500,000
SOUTHWEST HOUSTON REDEVELOPMENT AUTHORITY		\$40,000			\$40,000
TIMBER LANE UTILITY DISTRICT			\$3,290,000		\$3,290,000
TXDOT HOUSTON DISTRICT		\$1,000,000	\$5,223,742		\$6,223,742
<b><i>Grand Total:</i></b>					<b>\$280,367,511</b>

***Pedestrian and Bicyclist Projects in the Regional Transportation Plan***

*Sorted By Sponsor, Street then Limits*

<b>MPO ID</b> <b>Key Map</b> <b>Proj Status</b> <b>Sponsor</b>	<b>CSJ #</b> <b>Sponsor ID</b>	<b>Street</b> <b>From Limit</b> <b>To Limit</b>	<b>Project Description</b>	<b>Length</b> <b>Let Date</b> <b>Total Cost</b>
7061	0912-31-121	MUSTANG TRAIL SYSTEM IN ALVIN	MUSTANG TRAIL SYSTEM	0.001 10/01/2007 \$840,000
TIP CITY OF ALVIN				
13854 696N		TOM BLAKELY JR HIKE & BIKE TRAIL EXT NATIONAL OAK PARK	CONSTRUCT TOM BLAKELY JR. HIKE & BIKE TRAIL EXTENSION	0.000 \$89,550
SHORT CITY OF ALVIN				
5053	0912-71-697	GOOSE CREEK TRAIL GOOSE CREEK PARK GARTH RD	CONSTRUCT PEDESTRIAN PATH ALONG GOOSE CREEK	5.030 06/01/2006 \$1,361,919
TIP CITY OF BAYTOWN				
9954	0912-71-698	GOOSE CREEK TRAIL S OF MARKET ST W OF TEXAS AVE	CONSTRUCT HIKE/BIKE TRAIL	0.682 09/01/2004 \$1,406,250
LET CITY OF BAYTOWN				
7064 774M	0912-73-082	CS IN GALVESTON	CONSTRUCT RAILROAD PEDESTRIAN WALKWAY	0.001 09/01/2006 \$220,000
TIP CITY OF GALVESTON				
2929 411T - 451H	0912-71-545 N-0420-24-2	WEST WHITE OAK BAYOU TRAIL EXT S. PINEMONT	WEST WHITE OAK BAYOU TRAIL EXTENSION	2.980 11/01/2007 \$3,971,375
TIP CITY OF HOUSTON				
2930	0912-71-544 N-0420-22-2	COLUMBIA TAP RAIL TO TRAIL DIXIE DR POLK ST	CONSTRUCT COLUMBIA TAP RAIL TO TRAIL BIKEWAY	3.107 02/01/2007 \$3,024,869
LET CITY OF HOUSTON				
2931		SIMS BAYOU TRAIL POST OAK IH 45	CONSTRUCT SIMS BAYOU TRAIL	14.000 10/01/2008 \$9,500,000
SHORT CITY OF HOUSTON				
3064 493L	0912-71-503 N-0420-18-2	BUFFALO BAYOU TRAIL SHEPHERD DR SABINE	BIKE TRAIL ON BUFFALO BAYOU PARALLEL TO MEMORIAL DR & ALLEN PKWY	2.216 09/01/2007 \$5,220,751
TIP CITY OF HOUSTON				
3066	0912-71-505 N-0420-16-2	HOUSTON HERITAGE CORRIDOR BAYOU TRAIL WEST SEGMENT 1 HOUSTON HERITAGE CORR-RR TRESTLE JOHNNY GOYEN PK ALONG WHITE OAK BAYOU HIKE & BIKE TRAIL	HIKE AND BIKE TRAIL (HOUSTON HERITAGE CORRIDOR BAYOU TRAILS WEST, SEGMENT 1)	5.600 12/01/2007 \$3,891,560
TIP CITY OF HOUSTON				

**Pedestrian and Bicyclist Projects in the Regional Transportation Plan**

*Sorted By Sponsor, Street then Limits*

MPO ID Key Map Proj Status Sponsor	CSJ # Sponsor ID	Street From Limit To Limit	Project Description	Length Let Date Total Cost
3072	0912-71-433	DIXIE BRIDGE NEAR HERMAN PARK MASON PARK AT TIPPS ST	ON-STREET BIKEWAY IMPROVEMENTS	1.200 01/01/2008 \$4,889,000
TIP CITY OF HOUSTON				
5050		WHITE OAK/KATY TRAIL 14TH ST MAIN ST	BIKE TRAIL/LANE ON ROADS & RR ROW	6.200 02/01/2007 \$2,136,000
SHORT CITY OF HOUSTON				
6085	0912-71-655 N-0420-19A-2	VA VA VA	WEST HOUSTON ON-STREET BIKEWAY NETWORK PHASE 2	1.650 12/01/2005 \$800,000
TIP CITY OF HOUSTON				
7067	0912-71-700 N-0420-30-2	MKT/SP RAILS TO TRAILS SHEPARD HOUSTON AVE	CONSTRUCT MKT/SP RAILROAD (HIKE AND BIKE) TRAIL	0.001 09/01/2006 \$4,368,000
TIP CITY OF HOUSTON				
7544		W BRAYS BAYOU TRAIL DAIRY ASHFORD BARKER RESERVOIR	CONSTRUCT BIKE/HIKE TRAIL	01/01/2023 \$850,000
LONG CITY OF HOUSTON				
9351	0912-71-631 N-0420-5-2	KEEGANS BAYOU TRAIL GESSNER CITY LIMITS NEAR SYNOTT	CONSTRUCT HIKE & BIKE TRAIL	4.000 11/01/2005 \$5,027,858
TIP CITY OF HOUSTON				
9841 496F	0912-71-591 N-0420-15A-2	HERMAN BROWN PARK TRAIL WITHIN HERMAN BROWN PARK AUTUMNWOOD DR	BIKE & HIKE TRAIL THROUGH HERMAN BROWN PARK (PHASE 2)	0.811 07/01/2007 \$1,806,148
TIP CITY OF HOUSTON				
10093		VA VARIOUS	SUPER NEIGHBORHOOD ACTION PLAN VARIOUS PROJECTS	01/01/2023 \$10,000,000
LONG CITY OF HOUSTON				
10348	0912-71-799	BAKER ST N YORK ST ON N BANK OF BUFFALO BAYOU	12' WIDE CONCRETE SHARED USE PATH: BUFFALO HERITAGE CORRIDOR SHARED USE TRAIL IN HOUSTON	2.000 03/01/2008 \$3,761,261
TIP CITY OF HOUSTON				
10349	0912-71-800 N-0420-36-2	LITTLE WHITE OAK BAYOU CAVALCADE SYLVESTER ST	12' WIDE CONCRETE SHARED USE PATH: PHASE I SHARED USE PATH - TREES IN CITY OF HOUSTON	0.500 06/01/2007 \$1,026,729
TIP CITY OF HOUSTON				
10350	0912-71-801 N-0420-37-2	COLUMBIA TAP-UNION STATION TRAIL POLK ST TO WALKER ST & BASTROP ST TO TEXAS AVE ON MOPAC RR	12' WIDE CONCRETE SHARED USE PATH WITH 5' BIKE LANE	1.070 11/01/2007 \$795,405
TIP CITY OF HOUSTON				

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10351 TIP CITY OF HOUSTON	0912-71-803 N-0420-34-2	WESTCHASE TRAIL N DEARWOOD TO WESTHEIMER E OF HCFC DITCH W 157 TO S BANK OF HCFC DITCH D 124	12' WIDE CONCRETE SHARED USE PATH: WESTCHASE DISTRICT TRAIL - NORTH-CITY OF HOUSTON & WESTCHASE MGT DISTRICT IN HOUSTON	2.700 01/01/2007 \$4,410,979
10352 533A TIP CITY OF HOUSTON	0912-71-805 F-0550-01-2	HERMANN PARK GOLF COURSE PERIMETER PATH CONNECTIONS	8' TO 16' WIDE SHARED USE PATH: HERMANN PARK TRAIL IMPROVE-FRIENDS OF HERMANN PARK	2.500 12/01/2007 \$2,249,370
10576 TIP CITY OF HOUSTON	0912-71-900	MAIN ST BUFFALO BAYOU ASTRODOME COMPLEX AT LOOP IH 610	COORDINATING TRANSPORTATION, LAND DEVELOPMENT & COMMUNITY SYSTEMS	0.001 09/01/2005 \$625,000
10930 TIP CITY OF HOUSTON	0912-71-822 N-0420-17A-2	HOUSTON HERITAGE CORRIDOR BAYOU TRAIL EAST SEGMENT 1 HOUSTON HERITAGE CORRIDOR-RR TRESTLE MCKEE ST	HIKE AND BIKE TRAIL (HOUSTON HERITAGE CORRIDOR BAYOU TRAILS EAST, SEGMENT 1)	0.377 12/01/2008 \$2,081,761
10932 TIP CITY OF HOUSTON	0912-71-824 N-0420-17C-2	HOUSTON HERITAGE CORRIDOR BAYOU TRAILS EAST SEG3 WEST ROW OFNORTH YORK EAST ROW OF LOCKWOOD ALONG BUFFALO BAYOU	HIKE AND BIKE TRAIL (HOUSTON HERITAGE CORRIDOR BAYOU TRAILS EAST SEGMENT 3)	2.940 12/01/2008 \$876,891
11860 TIP CITY OF HOUSTON	0912-72-066	MAIN ST CORRIDOR	CONSTRUCT/REHAB PEDESTRIAN WALKWAY	0.001 08/01/2008 \$2,250,000
11888 493LMQR SHORT CITY OF HOUSTON	N-0781	VA VARIOUS	IMPROVING DOWNTOWN SIDEWALKS, ROADWAYS, PUBLIC UTILITIES IN HISTORIC NORTH END	06/01/2005 \$19,849,000
13525 TIP CITY OF HOUSTON	0912-72-068	GELHORN HIKE & BIKE TRAIL	TIE HIKE & BIKE INTO GELHORN DRIVE PROJECT, PROVIDING AN IMPROVED MULTI-MODAL TRANSPORTATION FACILITY	0.001 08/01/2008 \$1,000,000
13526 573F TIP CITY OF HOUSTON	0912-72-067 F-0630-01-2	SUNNYSIDE AREA HIKE & BIKE TRAIL IN SCOTTCREST PARK	CONSTRUCT PEDESTRIAN/BICYCLE TRAIL	0.001 08/01/2008 \$937,500
13562 TIP CITY OF HOUSTON	0912-72-123	MKT/SP RAILS TO TRAILS SHEPERD HOUSTON AVE	ADJUST UTILITIES	0.001 12/01/2006 \$17,300

**Pedestrian and Bicyclist Projects in the Regional Transportation Plan**

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13636		MASON PARK	CONSTRUCT PEDESTRIAN BRIDGE OVER BRAYS BAYOU AND CONNECT TO EXISTING OFF-ROAD SHARED USE PATHS ON BAYOU GREENWAY LINKING THREE OF THE TOP 12 DISTRICT AREAS OF THE H-GAC PEDESTRIAN AND BICYCLE SPECIAL DISTRICTS STUDY	0.170 02/28/2010 \$2,231,000
535A	F-0616	TIPS ST @ EVERGREEN DR 75TH ST		
SHORT				
CITY OF HOUSTON				
13638		MEMORIAL PARK	CONSTRUCT NEW 300 FT BRIDGE AND 500 FT OF SHARED USE PATH CROSSING MEMORIAL DRIVE	03/31/2010
491H		SOUTH SIDE OF MEMORIAL PARK		
SHORT		NORTH SIDE OF MEMORIAL PARK		\$1,796,000
CITY OF HOUSTON				
13649		GULFTON	GULFTON SPECIAL DISTRICT PEDESTRIAN & BICYCLIST IMPROVEMENTS	
SHORT				\$1,400,000
CITY OF HOUSTON				
13666		KEEGANS BAYOU TRAIL	CONSTRUCT PEDESTRIAN/BIKE TRAIL CONNECTING TO KIRKWOOD CROSSING UNDER DAIRY ASHFORD CONNECTING MULTIPLE COMMUNITIES	2.000 06/01/2008 \$2,860,403
528U - 529W		KIRKWOOD		
SHORT		HUNTINGTON ESTATES		
CITY OF HOUSTON				
13667		MKT/SP SPUR	ACQUISITION OF ABANDONED MKT/SP RAILWAY SPUR CURRENTLY OWNED BY TXDOT FROM IH 610 ALONG 7TH ST TO IH 45 ALONG SPRING CONNECTS TO EXISTING BIKEWAYS AND PRESERVES THE CORRIDOR FOR PEDESTRIAN AND CYCLISTS USE	6.500 \$2,776,100
491D - 492A		IH 610 ALONG 7TH ST		
SHORT		IH 45 ALONG SPRING ST		
CITY OF HOUSTON				
13668		SPRING BRANCH CREEK TRAIL	CONSTRUCT SPRING BRANCH CREEK TRAIL	1.000 06/01/2008 \$1,592,749
450Z - 451W		CAMPBELL		
SHORT		WESTVIEW		
CITY OF HOUSTON				
13669		CITY OF HOUSTON	CITY OF HOUSTON EDUCATION AND AWARENESS CAMPAIGN TO INCREASE SAFE USE OF THE BICYCLE TRANSPORTATION NETWORK BY USERS AND MOTORISTS	12/01/2007 \$124,976
VARIOUS		VARIOUS		
SHORT				
CITY OF HOUSTON				
13670		WHITE OAK BAYOU	TRAIL ALONG WHITE OAK BAYOU CONNECTING MKT/SP RAIL TO TRAIL VIA AN EXISTING ABANDONED RAIL BRIDGE	2.200 06/01/2008 \$4,237,176
492 CGH		T C JESTER		
SHORT		I-10		
CITY OF HOUSTON				
12860	0912-73-111	MAGNOLIA AVE	INSTALL SIDEWALK AND ADA RAMPS (SAFE ROUTES TO SCHOOLS)	0.236 09/01/2006 \$46,205
		HIGHLANDS ELEMENTARY		
TIP		BAYOU RD IN LA MARQUE		
CITY OF LA MARQUE				
7632		CITY OF LA PORTE BIKE TRAIL	COMPREHENSIVE BIKE/PED TRAIL SYSTEM FOR CITY OF LA PORTE (PHASE I): PASADENA CONNECTOR	5.200 01/01/2009 \$1,825,200
		VARIOUS LOCATIONS		
SHORT				
CITY OF LA PORTE				
7633		CITY OF LA PORTE BIKE TRAIL	COMPREHENSIVE BIKE/PED TRAIL SYSTEM FOR CITY OF LA PORTE	21.000 01/01/2023 \$8,724,800
		VARIOUS LOCATIONS		
LONG				
CITY OF LA PORTE				

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3033	0912-31-143	OYSTER CREEK TRAIL N. DIXIE DR SH 332	CONSTRUCT HIKE & BIKE TRAIL	1.976 02/01/2006 \$1,286,040
CITY OF LAKE JACKSON				
2221		BRITTANY BAY BLVD IH 45	CONSTRUCT HIKE & BIKE	2.548 01/01/2010
658		BAY AREA BLVD		\$324,000
CITY OF LEAGUE CITY				
2222		BRITTANY BAY BLVD BAY AREA BLVD	CONSTRUCT HIKE & BIKE	4.730 01/01/2013
657		FM 528		\$600,000
CITY OF LEAGUE CITY				
2223		BAY AREA BLVD BRITTANY BAY BLVD	CONSTRUCT HIKE & BIKE	1.683 01/01/2012
		CLEAR CREEK		\$300,000
CITY OF LEAGUE CITY				
5056	0976-07-006	SH 96 0.26 MI E OF IH 45	CONSTRUCT HIKE/BIKE TRAIL ALONG SH 96	4.750 01/01/2007
659		FM 1266		\$757,500
CITY OF LEAGUE CITY				
5057		FM 518 PERKINS ILLINOIS	CONSTRUCT PEDESTRIAN SIDEWALK ALONG FM 518	0.600 01/01/2008 \$425,000
CITY OF LEAGUE CITY				
7084	0912-73-085	SH 96 FM 1266 SH 146	PEDESTRIAN AND BICYCLE TRAIL PHASE 2	0.001 01/01/2008 \$265,579
CITY OF LEAGUE CITY				
2270		FM 2234 VARIOUS	RESTRIPE ROADWAY FOR ON-STREET BIKE LANE	3.400 09/01/2006 \$23,200
CITY OF MISSOURI CITY				
5054		HIKE/BIKE TRAIL CITY HALL/CIVIC CENTER COMMUNITY PARK	CONSTRUCT HIKE/BIKE TRAIL (SEG 1)	4.750 09/01/2011 \$2,795,600
CITY OF MISSOURI CITY				
5055		HIKE/BIKE TRAIL FONDREN PARK CITY HALL/CIVIC CNTR	CONSTRUCT HIKE/BIKE TRAIL (SEG 3)	5.030 09/01/2012 \$3,004,400
CITY OF MISSOURI CITY				
6078		VA VARIOUS	MISSOURI CITY BIKE/PEDESTRIAN PROJECTS	38.010 09/01/2007 \$7,285,000
CITY OF MISSOURI CITY				

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13569 610 - F,K,P SHORT CITY OF MISSOURI CITY		MUSTANG BAYOU TRAIL TURTLE CREEK DR PALM HARBOUR DR	CONSTRUCT HIKE AND BIKE TRAIL ALONG MUSTANG BAYOU AND LEVEE; TRAIL WILL CONNECT NORTH AND SOUTH ENDS OF TOWN AND PROVIDE ACCESS TO HISTORICAL LANDMARK LOCATED IN KITTY HOLLOW PARK	2.000 08/31/2011 \$2,050,500
13570 609-B, 569-X SHORT CITY OF MISSOURI CITY		OYSTER CREEK TRAIL PHASE II DULLES AVE CARTWRIGHT RD	COMPLETE A BIKING AND WALKING PATH ALONG OYSTER CREEK FROM THE EXISTING TRAIL AT CARTWRIGHT RD TO SUGAR LAND'S TRAIL AT DULLES AVE INCLUDING LIGHTING AND BRIDGES	2.000 08/31/2011 \$1,249,500
13640 609K - 609R SHORT CITY OF MISSOURI CITY	PK-9604	FIRST COLONY HIKE & BIKE TRAIL S END OF DETENTION DITCH SH 6 S OF LAKE OLYMPIA BLVD	CONSTRUCT BIKE/PEDESTRIAN TRAIL	2.000 09/01/2010 \$1,742,400
10346 TIP CITY OF PASADENA	0912-71-793 R031	VINCE BAYOU TRAIL BURKE/CRENSHAW PARK STRAWBERRY PARK ON VINCE BAYOU	VINCE BAYOU PEDESTRIAN AND BICYCLE TRAIL IN PASADENA	2.700 03/01/2006 \$1,762,998
13042 536G TIP CITY OF PASADENA	0912-71-866	VINCE BAYOU IN MEMORIAL PARK S OF S IN PASADENA	INSTALL SIDEWALKS AND PEDESTRIAN/BICYCLE BRIDGE	0.001 04/01/2006 \$189,200
9087 490 L SHORT CITY OF PINEY POINT VILLAGE		BLALOCK TAYLORCREST MEMORIAL DR	CREATE AN ACCESSIBLE ROUTE TO INCREASE PEDESTRIAN SAFETY. RECONSTRUCT & REPAVE 2-LANE OPEN DITCH ASPHALT ROADWAY TO ALLOW FOR THE CONSTRUCTION OF THE SIDEWALKS.	1.700 01/01/2011 \$3,500,000
13621 568X - 568U SHORT CITY OF SUGAR LAND	TR0705	SUGAR LAND TOWN CENTER VA VA	SUGAR LAND TOWN CENTER PEDESTRIAN-BICYLIST SPECIAL DISTRICT STUDY TO IDENTIFY AND IMPLEMENT NEO-TRADITIONAL DEVELOPMENT AND ADDRESS MAN-MADE BARRIERS OF US 59 AND SH 6	0.001 06/01/2007 \$1
13833 SHORT FORT BEND COUNTY		RED GULLEY TRAIL W AIRPORT RD OLD RICHMOND RD	CONSTRUCTION OF A BIKE AND PEDESTRIAN TRAIL ALONG RED GULLY CONNECTING THREE SCHOOLS WITH LOCAL SUBDIVISIONS TO REDUCE VEHICLAR TRAFFIC TO AND FROM THE SCHOOLS AND PARKS.	3.500 10/01/2008 \$0
13710 454J - 454N LONG GREATER EAST END MANAGEMENT DISTRICT		NAVIGATION BLVD FRANKLIN ST RR UNDERPASS BUFFALO BAYOU	CREATE SAFE ROUTE/CONNECTOR FOR PEDESTRIAN/CYCLISTS TO MOVE FROM BUFFALO BAYOU TO DOWNTOWN VIA NAVIGATION & RUNNELS & JENSEN & CONTINUE EAST END ECONOMIC DEVELOPEMENT	0.500 10/01/2033 \$4,500,000
7127 372, 373 SHORT GREATER GREENSPPOINT MANAGEMENT DISTRICT		GREENS BAYOU TRAIL SEG 2 IH 45 N BRADFIELD	CONSTRUCT SEG. 2 OF 12' WIDE CONCRETE HIKE & BIKE TRAIL , ASSOCIATED PED BRIDGES, SEATING AND LANDSCAPING.	1.400 01/01/2004 \$1,450,000
7647 372, 373 LONG GREATER GREENSPPOINT MANAGEMENT DISTRICT		VA THRU GREENSPPOINT	HIKE & BIKE TRAIL SYSTEM PACKAGE OF PROJECTS ON AND OFF STREET TRAILS	0.001 01/01/2023 \$20,000,000

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9355 372, 373 SHORT		GREENS BAYOU TRAIL ELLA BLVD IH 45 N	CONSTRUCT SEG. 1 OF 12' CONCRETE HIKE & BIKE TRAIL W/ ASSOCIATED PED BRIDGES, SEATING AND LANDSCAPING	1.400 01/01/2004 \$1,450,000
GREATER GREENSPPOINT MANAGEMENT DISTRICT				
10347	0912-71-797	GREENS BAYOU TRAIL SYSTEM GEARS RD	12' WIDE CONCRETE SHARED USE PATH IN GREATER GREENSPPOINT MANAGEMENT DISTRICT	2.500 11/01/2007
TIP		BRADFIELD PARK		\$3,184,541
GREATER GREENSPPOINT MANAGEMENT DISTRICT				
11972	0912-72-953	HOLMAN DELANO	PEDESTRIAN IMPROVEMENTS	0.113 09/01/2008
TIP		ENNIS		\$135,000
GREATER SOUTHEAST MANAGEMENT DISTRICT				
11973	0912-72-951	ELGIN, ENNIS, ALABAMA IN THIRD WARD	PEDESTRIAN IMPROVEMENTS	0.189 09/01/2008
TIP				\$224,000
GREATER SOUTHEAST MANAGEMENT DISTRICT				
13524	0912-72-069	THIRD WARD HIKE & BIKE TRAIL	CONSTRUCT PEDESTRIAN/BICYCLE TRAIL	0.001 08/01/2008
TIP				\$750,000
GREATER SOUTHEAST MANAGEMENT DISTRICT				
13827 493		GREATER SOUTHEAST MANAGEMENT DISTRICT DOWLING, BLODGETT, SCOTT	CONSTRUCT 5-PHASE PEDESTRIAN STREETScape IMPROVEMENTS (ADA RAMPS, SIDEWALKS, SHELTERS, LANDSCAPING, LIGHTING)	02/01/2033 \$10,000,000
LONG		MCGOWEN, SOUTHMORE, WHEELER, ELGIN, ENNIS, DELANO		
GREATER SOUTHEAST MANAGEMENT DISTRICT				
2934	0912-71-548	NORTH CHANNEL HIKE & BIKE TRL WOODFOREST BLVD (SOUTH)	CONSTRUCT HIKE & BIKE TRL	1.988 09/01/2006
TIP		WALLISVILLE RD (NORTH)		\$984,269
HARRIS COUNTY				
7068 488M	0912-71-701	TERRY HERSHEY PARK TRAIL AT TERRY HERSHEY PARK IN HOUSTON	CONSTRUCT BIKE/PEDESTRIAN TIE-IN AT TERRY HERSHEY PARK IN HOUSTON	0.001 11/01/2007
TIP				\$2,255,628
HARRIS COUNTY				
7634		CLEAR CREEK BIKE TRAIL TOM BASS PK & EL FRANCO LEE PK	CONSTRUCT CLEAR CREEK BICYCLE TRAIL	1.000 09/01/2014
LONG		S BELT HIKE & BIKE TRAIL		\$1,000,000
HARRIS COUNTY				
7637		MOUNT HOUSTON RD KEITH WEISS PARK	CONSTRUCT 4'-WIDE CONCRETE PEDESTRIAN WALKWAY	0.750 01/01/2023
LONG		US 59		\$1,320,479
HARRIS COUNTY				



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7638		BIG GULCH TRAIL	CONSTRUCT BIG GULCH BICYCLE TRAIL	2.000
		GREENS BAYOU		01/01/2023
LONG		SAN JACINTO COLLEGE		\$0
HARRIS COUNTY				
7640		MAYDE CREEK BIKE FACILITY	PEDESTRIAN & BICYCLE FACILITY	1.500
447J - 447S		CULLEN PARK		01/01/2023
LONG		APPLETREE HILL LN		\$636,426
HARRIS COUNTY				
7641		TERRY HERSHEY PARK	BICYCLE TIE IN FACILITY	0.001
		MAYDE CREEK UNDER IH-10		01/01/2023
LONG		ADDICKS RESERVOIR LEVEE SYSTEM		\$1,255,628
HARRIS COUNTY				
7642		SPRING CREEK TRAIL	HIKE & BIKE	0.001
		FOXWOOD FOREST DR		01/01/2023
LONG		DEERBROOK MALL		\$0
HARRIS COUNTY				
7643		KINGWOOD TRAIL	HIKE & BIKE	0.001
		KINGWOOD DRIVE LOOP 494		01/01/2023
LONG		TOWNSEN BLVD BRIDGE		\$0
HARRIS COUNTY				
7645		CHAMPION FOREST DR	PEDESTRIAN WALKWAY	0.500
330P - 330T		LANDAU PARK LN		01/01/2023
LONG		HERTS DR		\$74,040
HARRIS COUNTY				
7646		OLD TOWN SPRING	PEDESTRIAN WALKWAY	0.001
		SPRING CYPRESS/MAIN		01/01/2023
LONG		MIDWAY /GENTRY		\$1,419,000
HARRIS COUNTY				
7768		ELDRIDGE PKWY N	HIKE & BIKE TRAIL	0.001
		PATTERSON		01/01/2023
LONG		CULLEN PARK TRAIL		\$3,348,000
HARRIS COUNTY				
7769		BARKER-CLODINE TRAIL	HIKE & BIKE TRAIL	0.001
		SH 6		01/01/2023
LONG		BARKER RESEVOIR LEVEE DAM		\$2,976,000
HARRIS COUNTY				
7770		CARPENTER BAYOU TRAIL	HIKE & BIKE TRAIL	0.001
		N OF WALLISVILLE		01/01/2023
LONG		NEW P&R FACILITY		\$1,264,800
HARRIS COUNTY				
7771		BIG GULCH TRAIL	CONNECTS WOODFOREST & PINE TRAILS	0.001
		NORMANDY	SUBDIVISIONS W/ COUNTY COURT, ADMIN FACILITIES	01/01/2023
LONG		SAN JACINTO COLLEGE N CAMPUS	& COLLEGE	\$1,302,000
HARRIS COUNTY				

***Pedestrian and Bicyclist Projects in the Regional Transportation Plan***

*Sorted By Sponsor, Street then Limits*

<b>MPO ID</b> <b>Key Map</b> <b>Proj Status</b> <b>Sponsor</b>	<b>CSJ #</b> <b>Sponsor ID</b>	<b>Street</b> <b>From Limit</b> <b>To Limit</b>	<b>Project Description</b>	<b>Length</b> <b>Let Date</b> <b>Total Cost</b>
7772 LONG HARRIS COUNTY		HALLS BAYOU I WEST LITTLE YORK JENSEN DR	HIKE & BIKE TRAIL	1.300 01/01/2023 \$1,190,400
7773 LONG HARRIS COUNTY		HALLS BAYOU III EASTWARD FROM TIDWELL PARK THE MESA TRANSIT CENTER AND BROCK PARK	HIKE & BIKE TRAIL	0.001 01/01/2023 \$2,418,000
7774 LONG HARRIS COUNTY		HALLS BAYOU II HALLS BAYOU, EASTWARD US 59, ALONG HALLS BAYOU TO TIDWELL PARK	HIKE & BIKE TRAILS	2.000 01/01/2023 \$1,488,000
7777 LONG HARRIS COUNTY		CYPRESS CREEK GRANT RD JARVIS RD	HIKE & BIKE TRAIL	0.001 01/01/2023 \$1,488,000
7779 LONG HARRIS COUNTY		CYPRESS CREEK GRANT RD CYPRESS CREEK	HIKE & BIKE TRAIL	0.001 01/01/2023 \$1,488,000
7814 LONG HARRIS COUNTY		SPRING CREEK US 59 TOWNSEN	HIKE & BIKE TRAIL	01/01/2023 \$1,488,000
7870 LONG HARRIS COUNTY		HALLS BAYOU TRAIL WEST LITTLE YORK BROCK PARK	CURB LANE ON TIDWELL HIKE & BIKE	01/01/2023 \$0
9902 530V - 531S TIP HARRIS COUNTY	0912-71-432 N-0420-05-2	WEST BRAYS BAYOU BIKE TRAIL WEST AT THE JEWISH COMMUNITY CENTER AT FONDREN MIDDLE SCHOOL	CONSTRUCT BIKE TRAIL - WEST BRAYS BAYOU TRAIL	4.550 10/01/2007 \$5,775,000
10354 446U - 446V TIP HARRIS COUNTY	0912-71-808	SOUTH MAYDE CREEK PED/BIKE FACILITY ARMARANTH RD 0.2 MI E OF GREENHOUSE ON MAYDE CREEK	12' WIDE SHARED USE PATH: SOUTH MAYDE CREEK PED/BIKE FACILITY - HARRIS CO PRECINCT 3	2.000 11/01/2006 \$2,437,233
10355 493M TIP HARRIS COUNTY	0912-71-809	SAN JACINTO ST, FRANKLIN ST, AUSTIN ST, CONGRESS ST (AN ENTIRE BLOCK IN DOWNTOWN HOUSTON)	HARRIS COUNTY TRANSPORTATION PLAZA-HARRIS COUNTY INFRASTRUCTURE (SEGMENT 1)	0.001 09/01/2007 \$3,801,322

**Pedestrian and Bicyclist Projects in the Regional Transportation Plan**

Sorted By Sponsor, Street then Limits

MPO ID Key Map Proj Status Sponsor	CSJ # Sponsor ID	Street From Limit To Limit	Project Description	Length Let Date Total Cost
11194 N/A SHORT H-GAC		VA VARIOUS PROJECTS IN HARRIS & GALVESTON COUNTIES	STRATEGIC INVESTMENT TO ENHANCE PEDESTRIAN & BICYCLE SAFETY WITHIN HIGH-ACTIVITY AREAS, STRATEGIC PLACEMENT OF SIDEWALKS, CROSSWALKS	0.001 02/01/2014 \$18,000,000
11195 N/A SHORT H-GAC		VARIOUS VARIOUS PROJECTS REGIONWIDE	STRATEGIC INVESTMENT TO ENHANCE PEDESTRIAN & BICYCLE SAFETY WITHIN HIGH-ACTIVITY AREAS, STRATEGIC PLACEMENT OF SIDEWALKS, CROSSWALKS, ETC.	0.001 08/01/2010 \$12,000,000
11975 TIP H-GAC	0912-00-945	VA VARIOUS	HGAC SPECIAL DISTRICT STUDIES/IMPLEMENTATION FOR FUTURE BIKE AND PEDESTRIAN IMPROVEMENT	0.303 09/01/2008 \$3,750,000
7120 TIP METRO	0912-00-215	VA VARIOUS	FY 2000 BIKE RACKS ON METRO BUSES	0.000 08/01/2006 \$1,500,000
11974 TIP SOUTHWEST HOUSTON REDEVELOPMENT AUTHORITY	0912-72-133	MARINETTE ST CLAREWOOD BELLAIRE BLVD	MARINETTE ON-STREET BIKE PATH	0.303 09/01/2008 \$40,000
12873 TIP TXDOT HOUSTON DISTRICT	0912-73-106	VA VARIOUS LOCATIONS IN GALVESTON COUNTY	ADA COMPLIANCE	0.001 05/01/2006 \$1,000,000
13613 493-494 SHORT TXDOT HOUSTON DISTRICT	0912-71-901	Parallel to Runnels Street (GH&H RR ROW - southside) MCKEE ST (ABANDONED GH&HRR) TXDOTS RR BRIDGE ON BUFFALO BAYOU (Strauss Trunion Bascule)	CONSTRUCT GH&H SHARED USE PATH TO BRIDGE THE GAP BETWEEN THE HERITAGE CORRIDOR AND EXISTING OFF-ROAD SHARED USE PATHS ON THE NORTHERN BANKS OF BUFFALO BAYOU	0.750 05/01/2011 \$456,458
13850 618Y - 659B SHORT TXDOT HOUSTON DISTRICT	3312-01-008	FM 270 NASA RD 1 FM 518	PEDESTRIAN AND BICYCLE IMPROVEMENTS PROPOSED EITHER ON-STREET OR WITHIN THE EXISTING ROW ON FM 270	3.200 10/15/2008 \$3,272,262
13851 494J SHORT TXDOT HOUSTON DISTRICT	0177-11-149	STRAUSS TRUNION BASCULE BRIDGE AT US 59 AND BUFFALO BAYOU IN HOUSTON	RESTORATION OF AN EXISTING RAILROAD BRIDGE TO MAKE IT BICYCLE ACCESSIBLE AND TO PROVIDE CONNECTIONS TO EXISTING BICYCLE FACILITIES. BRIDGE HAS BEEN DAMAGED BY FIRE AND IS IMPASSABLE BY PEDESTRIANS.	0.500 10/01/2008 \$1,495,022
13600 333E SHORT TIMBER LANE UTILITY DISTRICT		CYPRESS CREEK RAMBLING BROOK DR TIMBER LANE PARK	SHARED-USE PATH WITH BENCHES LIGHTING AND TWO BRIDGES	2.100 01/01/2008 \$3,290,000

**Grand Total: \$280,367,511**