

**H-GAC 2040 REGIONAL  
PEDESTRIAN & BICYCLE PLAN**





HOUSTON-GALVESTON  
AREA COUNCIL

H-GAC serves as the Metropolitan Planning Organization (MPO) for the eight-county Houston-Galveston area. As the MPO, H-GAC is responsible for developing and maintaining the Regional Pedestrian and Bicycle Plan, an action plan to guide investments and encourage mobility through active transportation means.

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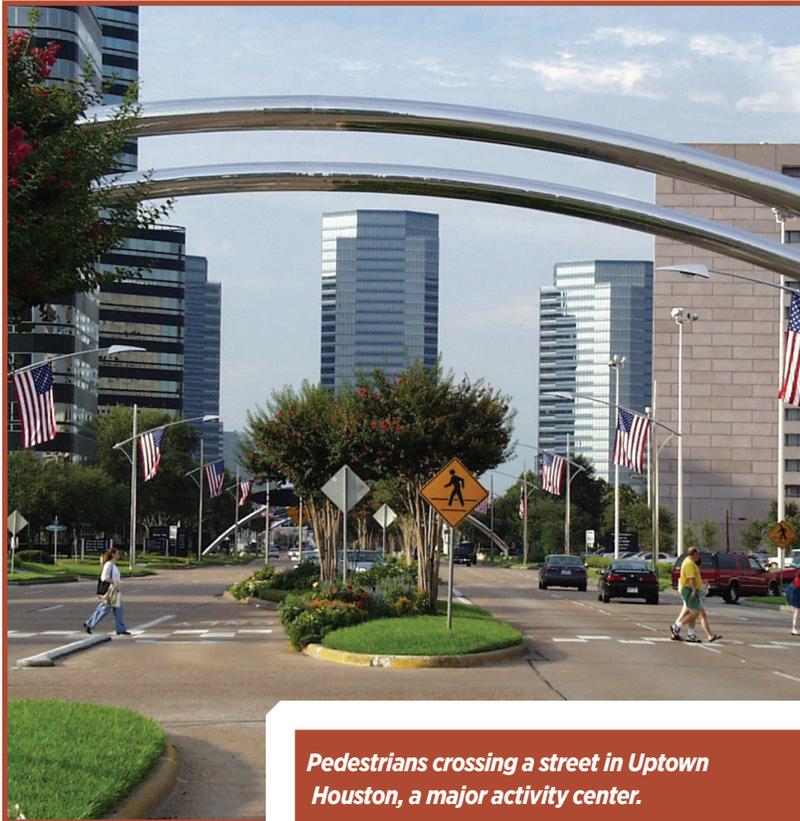
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# Introduction



## What is the Regional Pedestrian and Bicycle Plan?

The Regional Pedestrian and Bicycle Plan is a long-range planning document that describes our region’s vision for enhancing pedestrian and bicycle infrastructure within the eight-county Transportation Management Area (TMA). The Regional Pedestrian and Bicycle Plan supports the 2040 Regional Transportation Plan (RTP), a long-range, multi-modal transportation plan that guides investment in all types of transportation infrastructure throughout the Houston-Galveston area.



*Pedestrians crossing a street in Uptown Houston, a major activity center.*

## Why do we need the Regional Pedestrian and Bicycle Plan?

Our region is home to more than six million people, who live in rural towns, suburban communities, and dense urban centers. By 2040, our region is expected to have 3.2 million more residents.<sup>1</sup> As our region grows, greater demand will be placed on our transportation system. Enhancing our region’s pedestrian and bicycle network will provide greater transportation options for people of all ages and abilities, while improving public health and creating new economic development opportunities.

Almost 2% of people in our region walk or bike to get to work.<sup>2</sup> Many local efforts aim to make walking and biking a safe and convenient mode of transportation. The Regional Pedestrian and Bicycle Plan does not replace any local plans, but provides a comprehensive approach to planning for pedestrians and bicyclists across jurisdictional boundaries. As a regional planning document, it is intended to:

- **Guide Public Investment**  
Establish a framework the Transportation Policy Council (TPC) can use when investing in pedestrian and bicycle infrastructure and supportive policies and programs.
- **Promote Interjurisdictional Coordination**  
Create an overall vision of how the regional pedestrian and bicycle network should function.
- **Identify Best Practices**  
Identify tools public and private entities can utilize to improve the safety, comfort and convenience of walking and biking throughout our region.

## Growing Interest in Active Transportation

For a variety of reasons, people nationwide are walking and biking more frequently:

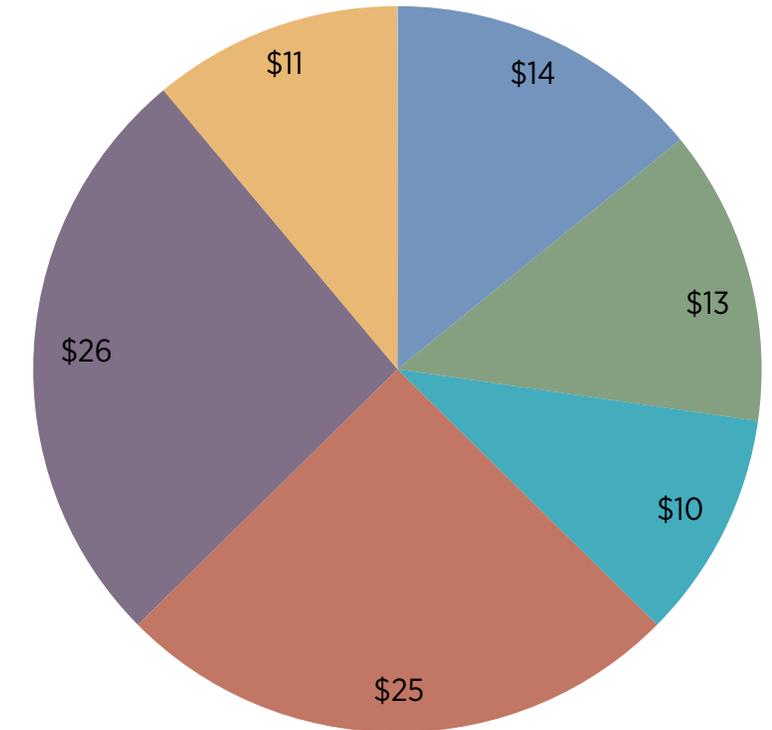
- An increasing number of Americans are interested in living in a walkable community, where they can access shopping, dining, and other amenities without having to use a car.<sup>3</sup>
- Young Americans are waiting longer to obtain driver’s licenses and are utilizing transportation alternatives more frequently.<sup>4</sup>
- Concern for the environment has inspired many people to choose walking and bicycling as a clean and “green” transportation option.<sup>5</sup>
- Increasing costs associated with buying and maintaining an automobile have made walking and biking an attractive, economical alternative.<sup>6</sup>

Our region’s residents have indicated support for investing in pedestrian and bicycle infrastructure. In 2012, Houstonians approved a major bond referendum providing \$100 million to support Bayou Greenways 2020, an initiative to create a network of open space and shared-use paths along local waterways.<sup>7</sup> Businesses and communities throughout our region (including Houston and The Woodlands) have received recognition from the League of American Cyclists for being “bicycle friendly.”

### Federal Requirements for Pedestrian and Bicycle Planning

Per federal law, H-GAC and other metropolitan planning organizations (MPOs) must address bicycle and pedestrian issues in regional transportation plans. The needs of non-motorized users must also be considered when constructing and reconstructing roads and other transportation facilities.

**Figure 1:**  
How Our Region’s Residents Would Spend \$100 Improving Our Transportation Network



- Building New Roads and Highways
- Fixing Existing Roads and Highways
- Improving Design and Safety
- Public Transportation
- Sidewalks and Bikeways
- Planning and Coordination

Source: H-GAC THINK 2040 Survey (2012)



## Benefits of Active Transportation

Walking and bicycling provide a variety of social, economic, and environmental benefits:

- **Provides more transportation options**  
 In many parts of our region, the automobile is the only feasible transportation option, hampering mobility for those without access to a car. Safe and convenient pedestrian and bicycle facilities provide residents with an affordable means of travel.
- **Reduces air pollution**  
 Replacing automobile trips with walking and biking reduces greenhouse gas emissions from private vehicles, improving air quality.<sup>8</sup>
- **Improves public health**  
 Safe and convenient pedestrian and bicycle accommodations encourage and allow residents to incorporate physical activity into their daily routines, reducing obesity and improving overall health.
- **Increases property values**  
 Many residents want sidewalks, trails, and other amenities supportive of walking and biking near their homes. Improving access to these facilities may increase a neighborhood's desirability and property values.<sup>9</sup>
- **Creates recreational opportunities**  
 Biking is one of the most popular recreational activities in the U.S. Safe and attractive pedestrian and bicycle facilities allow residents to walk and bike for enjoyment and utility.
- **Supports economic development**  
 Creating an extensive active transportation network will attract bicyclists and other visitors from throughout our region and beyond, who will patronize local businesses during their trips.

### A Century of Bicycling in Houston



Houstonians have been bicycling for utilitarian and recreational purposes since the late nineteenth century. In the 1890s, Houston was home to the largest cycling organization in the South, Lord's Cycle Club. People from throughout the city flocked downtown to watch the group's bicycle races.

*Source:*  
 Chapman, Betty T. "Bicycle Racing Meant Business as Popular Spectator Sport in 1892." *Houston Business Journal*. *Houston Business Journal*, 22 Oct. 2010. Web. 1 Feb. 2014.

## Plan Development

The Regional Pedestrian and Bicycle Plan was created after extensive research and consultation with stakeholders throughout our region. It builds off of previous regional planning efforts, including the *2035 Regional Bikeway Plan* and *Our Great Region 2040*.

<b>Inventory</b>	H-GAC worked with the Pedestrian and Bicyclist Subcommittee and local stakeholders to: <ul style="list-style-type: none"> <li>• Map existing bicycle infrastructure; and</li> <li>• Identify existing programs and policies intended to make walking and biking safer and more convenient.</li> </ul>
<b>Needs Assessment</b>	Stakeholders throughout our region helped identify areas where new or improved bicycle and pedestrian facilities are needed.
<b>Regional Vision</b>	The Pedestrian and Bicyclist Subcommittee developed the plan’s vision, goals and objectives.
<b>Concept Development</b>	Stakeholders helped develop the plan’s content, providing feedback at group meetings and workshops.

### Economic Impacts of Bicycling

Many communities are not only interested in the transportation benefits of bicycling, but the economic impacts as well. Bicycling is one of the top 10 most popular recreational activities in the country, with participants pumping an estimated \$133 billion annually into the U.S. economy. The local impacts of bicycling have been studied in several communities:

- The Bayou Greenways Initiative, which aims to create 300 miles of shared-use paths along Houston-area waterways, is estimated to provide \$117.1 million worth of economic, environmental, and health benefits each year.
- Local and state agencies in North Carolina’s Outer Banks spent \$6.7 million on infrastructure to support bicycle tourism. This investment has generated an estimated \$60 million in economic activity each year.
- Three multi-use trails in Orange County, Florida have an estimated economic impact of \$42.6 million annually and support 516 jobs, with the average trail user spending \$20 per visit at nearby businesses.

Several organizations host bicycling events in our region that attract thousands of people each year, many of whom patronize local businesses.

For example:

- More than 1,000 people participate in [Bike Around the Bay](#), a two-day, 180-mile ride benefiting the Galveston Bay Foundation.
- About 13,000 people participate in the [BP MS 150](#), a two-day, 180-mile ride between Houston and Austin organized by the National MS Society: Lone Star.

Our region could build upon the success of these events to improve bicycle infrastructure and market our region as a destination for bicyclists.

Sources:

*Crompton, John. Benefits Analysis: Bayou Greenways - A Key to a Healthy Houston. Rep. Houston, TX: Houston Parks Board, 2011 (p. 1).*

*Lawrie, Judson, John Guenther, Thomas Cook, Mary Paul Meletioui, and Sarah Worth O'Brien. Pathways to Prosperity: The Economic Impact of Investment in Bicycle Facilities. Rep. Raleigh, NC: North Carolina Department of Transportation: Division of Bicycle and Pedestrian Transportation, 2004 (p. vi).*

*Economic Impact Analysis of Orange County Trails. Rep. Altamonte Springs, FL: East Central Florida Regional Planning Council, 2011 (p. i - ii).*

*"More than 1000 Riders Join GBF for Bike Around the Bay 2013!" Galveston Bay Foundation: More News. Galveston Bay Foundation, 13 Oct. 2013. Web. 24 Mar. 2014.*

*National Multiple Sclerosis Society. Cyclists Shift into High Gear for the 29th Annual BP MS 150. MS150.org. National Multiple Sclerosis Society, 13 Feb. 2013. Web. 1 Feb. 2014.*



## Health Impacts of Bicycling and Walking

Communities that invest in pedestrian- and bicycle-friendly infrastructure enjoy multiple benefits, such as decreased air pollution, improved mobility for non-drivers, and increased rates of physical activity. Physical activity can prevent weight gain, reduce the risk of developing chronic diseases, and prevent premature death.

Several studies have demonstrated these benefits:

- Residents living near trails are 50 percent more likely to meet physical activity guidelines and up to 80 percent more likely to bicycle.
- Building shared-use paths can lead to short- and long-term increases in walking and bicycling, especially in urban areas and along facilities that connect population centers with major destinations, such as downtowns.
- Studies have shown that providing on-street bicycle lanes can generate marginal increases in bicycle commuters.

Sources:

Rodriguez, Daniel A. *Active Transportation: Making the Link from Transportation to Physical Activity and Obesity. Issue brief. San Diego, CA: Active Living Research, 2009 (p. 4 - 5).*



**Pedestrians and bicyclists utilize pathways along Buffalo Bayou in Houston.**

### Key Terms

- **Active Transportation**  
Walking, biking, and other forms of non-motorized, human-powered transportation.
- **Bicyclist**  
A person riding a human-powered, pedal-driven vehicle.
- **Bicycle Facilities**  
Improvements made to accommodate or encourage bicycling, such as bicycle lanes, shared-use paths, and bicycle racks.
- **Network**  
Connected facilities that form a cohesive system.
- **Pedestrian**  
A person traveling by foot or in a wheelchair.
- **Pedestrian and Bicyclist Subcommittee**  
An H-GAC committee of experts that advises regional decision-makers on issues related to pedestrian and bicyclist travel. Members represent local governments, transportation agencies, and non-profits.
- **Pedestrian Facilities**  
Improvements made to accommodate walking, such as sidewalks and crosswalks.
- **Regional Transportation Plan (RTP)**  
The long-range transportation plan that identifies roadway, transit and other transportation projects needed to improve mobility in our region.
- **Transportation Management Area (TMA)**  
An area that includes Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties where regional transportation policies are coordinated through H-GAC.
- **Transportation Policy Council (TPC)**  
The 28-member board responsible for development and approval of regional transportation plans and programs within the TMA. Members of the TPC include local elected officials and heads of transportation agencies.

# Creating a Vision



## Creating a Vision

Members of H-GAC’s Pedestrian and Bicyclist Subcommittee worked together to create a unified vision of what our pedestrian and bicycle network should look like in 2040, based on input from local governments, citizens and other stakeholders. Goals that will help achieve that vision were identified.

### VISION:

The vision describes what the pedestrian and bicycle network will be like in 2040.

### GOALS:

Goals describe the general aspirations for the regional pedestrian and bicycle network. The goals support different components of the vision.

### OBJECTIVES:

Objectives are different initiatives that, if implemented, will help realize the vision and goals for our region’s pedestrian and bicycle network.



*Public and private entities have built shared-use paths near Downtown Houston.*

## The Vision

Pedestrians and bicyclists of all abilities can travel safely, conveniently and comfortably throughout our region using an interconnected, well-maintained network of pedestrian pathways and on- and off-street bicycle facilities.



### REGIONAL NETWORK

**Goal 1** Provide a comprehensive regional bikeway and pedestrian network that creates clear connections to destinations and other modes.

**Objective:** Develop a comprehensive regional bikeway plan that connects major activity centers, neighborhoods, schools, transit routes, recreation areas, and community destinations.

**Objective:** Develop an inventory of pedestrian and bicycle infrastructure for our region.

**Objective:** Eliminate gaps in the existing pedestrian and bicycle network.

**Objective:** Provide safe and convenient routes across barriers, such as freeways, tollways, railroads and waterways.

**Objective:** Encourage bicycle and pedestrian accommodations to be considered in the planning and design of all roadways, bridges, transit projects and other transportation projects.

**Objective:** Encourage funding and implementation of pedestrian and bicycle projects that have been identified in a planning study, such as an H-GAC Special District Study, an H-GAC Livable Centers Study, or other local or regionally-developed study or plan.

**Objective:** Account for the full range of benefits associated with pedestrian and bicycle facilities when prioritizing transportation project funding.<sup>10</sup>



**SAFETY**

**Goal 2** Ensure our region’s pedestrian and bicyclist infrastructure is safe, accessible and comfortable for all users.

- Objective:* Identify safety-related pedestrian and bicyclist needs by tracking crash hotspots, trends, and identifying causes of pedestrian and bicycle crashes.
- Objective:* Develop a pedestrian and bicycle safety action plan.
- Objective:* Educate and raise public awareness about pedestrian and bicyclist safety.
- Objective:* Encourage the use of the Walk Friendly Community Assessment Tool to recognize pedestrian-friendly communities and create more walkable communities.
- Objective:* Increase human comfort (including shade, lighting, and design) along key pedestrian and bicycle routes.
- Objective:* Improve overall maintenance of bikeways and sidewalks for both on- and off-street facilities.
- Objective:* Improve and ensure quality temporary cyclist and pedestrian accommodations or detours are provided within construction zones.
- Objective:* Encourage the creation of end-of-trip facilities along key regional pedestrian and bicycle routes.



**POLICIES**

**Goal 3** Help local entities access the tools needed to implement policies and projects that provide high-quality options for pedestrians and bicyclists.

- Objective:* Promote the adoption of complete streets ordinances and policies.
- Objective:* Identify a variety of funding sources for local entities to encourage the provision of pedestrian and bicycle infrastructure.
- Objective:* Promote more pedestrian and bicycling projects that are leveraged with other projects.
- Objective:* Promote collaboration amongst local entities on planning and implementation of projects.
- Objective:* Provide more educational opportunities for local entities on planning, design, implementation, and maintenance of projects.



**HEALTHY LIVABLE COMMUNITIES**

**Goal 4** Use our region’s pedestrian and bikeway network to help create healthier and more livable communities.

- Objective:* Promote the use of high-quality bikeway and pedestrian facilities as economic development tools.
- Objective:* Increase the use of alternative modes for work and non-work trips.
- Objective:* Improve public health by encouraging a certain amount of daily physical activity along existing pedestrian and bicycle pathways.
- Objective:* Encourage implementation of recommendations described within an H-GAC Special Districts Study, an H-GAC Livable Centers Study, or other multi-jurisdictional or local plan.





*Well-designed pedestrian accommodations make walking an attractive transportation option.*

# Existing Conditions



## Existing Pedestrian and Bicycle Network

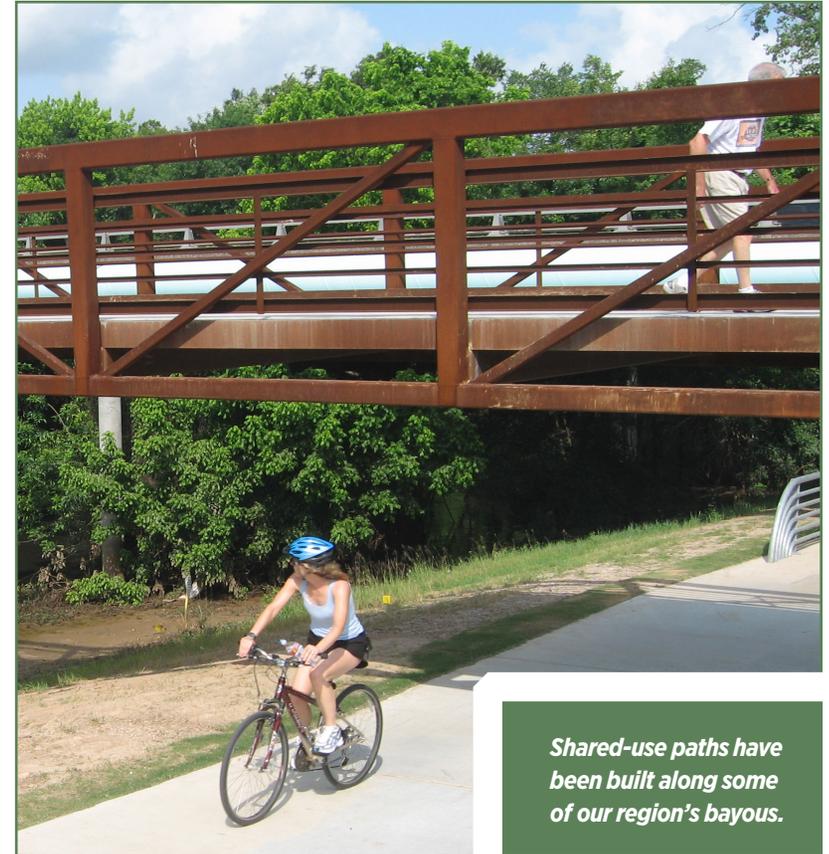
The types of pedestrian and bicycle facilities available differ from community to community, and their conditions vary:

- In *urban areas*, there are shared-use paths, bicycle lanes, and signed bicycle routes, with a few signed shared roadways. The presence of sidewalks varies, depending on the density of the surrounding area and when it was developed (or redeveloped).
- In *suburban areas*, shared-use paths are the most common type of bicycle infrastructure. Extensive networks of off-road bicycle facilities exist within The Woodlands, Sugar Land, Cinco Ranch, and Kingwood. Some suburban areas have sidewalks and/or walking trails, but others do not.
- In *rural areas*, signed shoulder bicycle routes and share-the-road signs can be found along some roadways (particularly in Montgomery County). There are a few areas, such as rural downtowns, with sidewalks or other pedestrian facilities.

Additional facilities are proposed in the Regional Transportation Plan (RTP), Transportation Improvement Program (TIP), and local plans.

Facility Type	Miles
Bicycle Lane	149
Shared Use Path/Trail	688
Signed Shared Roadway	127
Signed Shoulder Bike Route	251
Total	1,215

Source: H-GAC (February 2014)



*Shared-use paths have been built along some of our region's bayous.*

**Our region's roadway network included 68,899 lane miles in 2012.**  
H-GAC 2013 Mobility Report

## Walking and Biking in Our Region

Pedestrian and bicycle infrastructure is used by people for a variety of different purposes. Some people walk or bike for utilitarian trips, such as traveling to work or school, while others do so for recreation. Despite the presence of these facilities, walking and biking do not constitute a large share of overall trips. 1.8% of people in our region walk or bike to work, compared to 3.3% nationwide (Table 3).

**Table 3: Comparison of Mode Share Amongst Peer Regions**

	Houston	Atlanta	Dallas/ Fort Worth	Denver	Miami	San Antonio	San Diego	Texas	U.S.
<b>Drove Alone</b>	78.5%	77.4%	80.6%	74.5%	78.0%	78.9%	75.3%	79.1%	76.0%
<b>Carpooled</b>	12.3%	10.6%	10.9%	9.7%	9.6%	11.8%	10.6%	11.9%	10.4%
<b>Public Transportation</b>	2.5%	3.5%	1.5%	4.8%	4.2%	2.1%	3.3%	1.6%	4.9%
<b>Bicycle</b>	0.3%	0.2%	0.2%	1.1%	0.6%	0.1%	0.6%	0.2%	0.5%
<b>Walked</b>	1.5%	1.3%	1.3%	2.4%	1.9%	2.1%	2.9%	1.8%	2.8%
<b>Other Means</b>	1.6%	1.5%	1.3%	1.2%	1.6%	1.5%	1.2%	1.6%	1.2%
<b>Worked at Home</b>	3.3%	5.5%	4.2%	6.3%	4.0%	3.4%	6.1%	3.8%	4.1%

Source: 2006 – 2010 ACS. Regions correspond with the boundaries of each COG for the selected cities.

### Types of Bicyclists

Bicyclists have varying abilities and comfort levels, and have different reasons for making bicycle trips. The American Association of State

Highway and Transportation Officials (AASHTO) categorizes bicyclists into two groups: Experienced/Confident Riders and Casual/Less Confident Riders. Each group has different preferences that must be considered when designing roadways and bicycle facilities (Table 4).

**Table 4: Different Types of Bicyclists**

Experienced/Confident Riders	Casual/Less Confident Riders
Generally comfortable riding in the street with automobile traffic	Prefer utilizing shared-use paths, bicycle boulevards, or bicycle lanes on low-volume, low-speed roadways
Prefer taking a direct route between destinations	May take a less direct route to avoid busy streets with fast-moving traffic
Avoid utilizing sidewalks and travel with the flow of automobile traffic	May utilize sidewalks in areas without on-street facilities
May reach speeds of up to 25 miles per hour on flat topography (higher descending hills)	Travel at speeds around 8 – 12 miles per hour



## Current Plans, Programs, and Policies

Communities throughout our region are improving the safety and convenience of their pedestrian and bicycle networks. In many places, public entities, non-profits, and developers are working to build new pedestrian and bicycle infrastructure, improve existing facilities, and promote active transportation options. These efforts not only involve physical changes to our region’s infrastructure, but educational programs and policies intended to improve the safety, convenience, and attractiveness of walking and biking. While some of these projects require significant financial investments, others are inexpensive strategies that could make our region more walkable and bikeable.

### FEDERAL EFFORTS

Local and regional initiatives are guided by federal policies, which have become more supportive of pedestrians and bicyclists in recent years. Per federal law, the needs of pedestrians and bicyclists must be considered when planning new transportation facilities or reconstructing existing ones (unless walking and biking are prohibited). Metropolitan planning organizations must include accommodations for pedestrians and bicyclists within their transportation plans (including the Regional Transportation Plan and Transportation Improvement Program).<sup>11</sup>



Federal funding for active transportation improvements has been undergoing changes. MAP-21 (Moving Ahead for Progress in the 21st Century Act) was signed into law in July 2012, and is the first long-term surface transportation authorization since 2005. The legislation aims to create a more efficient performance-based transportation program, while building upon the successes of past programs and policies. Several programs used to support alternative modes of transportation, including Transportation Enhancements (TE), Recreational Trails, and Safe Routes to School, were combined into a single funding source, the [Transportation Alternatives Program \(TAP\)](#).<sup>12</sup>

### STATE EFFORTS

In accordance with federal law, the Texas Department of Transportation (TxDOT) has a state bicycle coordinator, who works with other state agencies and local governments to ensure the needs of pedestrians and bicyclists are considered as part of transportation projects. The agency’s Bicycle Advisory Committee has a similar role, encouraging policymakers and engineers to consider bicyclists’ preferences when developing projects and policies.<sup>13</sup>

### REGIONAL EFFORTS

H-GAC and other entities are working collaboratively to provide greater transportation options for our region’s residents, improving overall mobility.

#### Plans

##### Special Districts

Parts of our region are more conducive to walking and biking than others. As part of its [Special Districts Program](#), H-GAC identified areas where there are significant opportunities to replace vehicle trips with pedestrian or bicycle travel. Local governments in these areas (or special districts) have an opportunity to partner with H-GAC to complete detailed pedestrian and bicycle plans, which provide specific recommendations that can be implemented with funds from the Transportation Improvement Program (TIP) and other sources. Areas targeted for study were identified in the 2004 Special Districts Study, which was updated in 2010. Nine studies have been completed (Table 5).

**Table 5: Completed Special District Studies**

Airline Improvement District	Galveston	Montrose*
Clear Lake*	Gulfton*	Sugar Land Town Center
Fifth Ward*	Missouri City	Third Ward*

\* Within the City of Houston



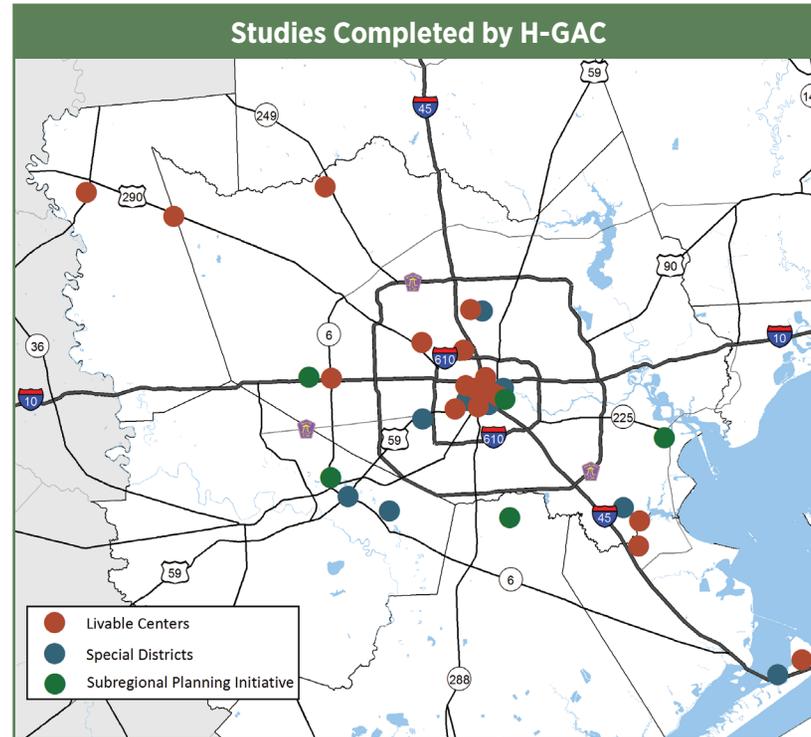
**Livable Centers**

As part of its **Livable Centers Program**, H-GAC prepares planning studies aimed at creating walkable, mixed-use places that offer a variety of transportation options. The program is based on the premise that locating housing near jobs and services in a pedestrian-friendly, transit-oriented environment will provide residents with more opportunities to walk, bike, and/or use transit, thereby reducing vehicle miles traveled and improving air quality. These planning studies include recommendations for improving sidewalks and streetscapes, providing better bicycle accommodations, and increasing access to transit. They also address related “outside-the-curb” issues, such as policies and programs that promote pedestrian-friendly urban design, mixed-use development, and affordable housing. Since 2008, 18 planning studies have been completed, with additional studies beginning in 2015 (Table 6).

Airline Improvement District	Galveston	Near Northwest
Cypress Creek Greenway	Hempstead	Northside
Downtown/EaDo	Independence Heights	Tomball
East End	League City	Upper Kirby
Energy Corridor	Midtown	Waller
Fourth Ward	NASA Area Management District	Washington Avenue

**Subregional Planning Initiative**

The Subregional Planning Initiative (SPI), managed by H-GAC, promotes inter-jurisdictional cooperation and planning to address our region’s transportation needs. H-GAC works with local governments to identify multi-modal transportation projects and land use policies that reflect locally-supported goals. Many of these studies list policies and improvements intended to make communities more pedestrian- and bicycle-friendly (Table 7).



East End Mobility Study*	METRO Bike and Ride Access and Implementation Plan
East Port Transportation-Land Use Vision Plan and Implementation Program	Northern Brazoria County/Pearland Subregional Planning Initiative
Fort Bend Subregional Plan	Greater West Houston Subregional Planning Initiative*

*\*These studies were completed in partnership with the City of Houston as part of its City Mobility Planning Process.*



**Our Great Region 2040**

In 2014, H-GAC completed [Our Great Region 2040](#), a high-level regional plan aimed at enhancing our region’s quality of life. As part of an associated [case study](#), H-GAC identified ways stakeholders can work together to complete the Cypress Creek Greenway, a continuous network of shared-use paths and parkland in northern Harris County. *Our Great Region 2040* also includes several



implementation strategies intended to improve the regional bicycle and pedestrian network and provide residents with greater transportation choices.

**Sam Houston Greenbelt**

Several organizations (led by [Houston Wilderness](#)) are working together to create a ribbon of protected land surrounding urbanized parts of our region, linking existing parks, refuges, and waterways. The [Sam Houston Greenbelt Network](#) will not only protect valuable environmental assets, but provide opportunities for hiking, biking, paddling, and other activities.

**Local Perspectives**

**Airline Improvement District**  
*Implementing Special Districts and Livable Centers Studies in Unincorporated Areas*

The Airline Improvement District (the District) spans four square miles in unincorporated Harris County. Over the years, the community has experienced economic decline and social change. Much of the area lacks sidewalks, and deep ditches along roadways make walking difficult. Well-worn footpaths line many streets, demonstrating the need for pedestrian facilities. Compounding the need is the fact that a significant number of households do not have cars.

The District is working proactively to make walking and biking safe, convenient, and comfortable. H-GAC worked with the District to complete the Airline Improvement District Pedestrian and Bicyclist Special District Study and the Airline Improvement District Livable Centers Study, which identified strategies for improving the local pedestrian and bicycle network. By participating in these planning processes, the District has been able to secure funding for infrastructure improvements that it would not have been able to access otherwise. Construction began in 2014 on pedestrian-friendly improvements along Airline Drive, one of the corridors with the most pedestrian and automobile traffic. Nearby entities are also building sidewalks along Airline Drive, helping create an interconnected pedestrian network that connects different communities.



**“As seniors give up their licenses, it is critical to have pedestrian amenities to use to remain mobile.”**

**Teri Koerth: Executive Director  
Airline Improvement District**

**Programs and Initiatives**

**Regional Transportation Policy**

H-GAC works with local officials, residents, and other stakeholders to identify regionally-significant transportation needs and projects. The agency’s [Pedestrian-Bicyclist Program](#) works with public and private entities to improve the mobility and safety of pedestrians and bicyclists. As part of this program, the [Pedestrian and Bicyclist Subcommittee](#) (appointed by the Technical Advisory Committee) advises regional decision-makers on issues related to pedestrian and bicyclist travel, and serves as an information-sharing forum for communities interested in promoting walking and biking.

**Promoting Active Transportation**

H-GAC’s [Commute Solutions](#) program provides information on different commuting options available in our region. Pedestrian and bicycle travel are among several alternative commuting strategies promoted to reduce congestion and improve air quality.

[NuRide](#), which is part of the Commute Solutions programs, rewards residents who walk, bike, or use transit. Approximately 26,000 residents participate in the program, receiving discounts and special offers from supporting businesses.

**Mapping**

The [Regional Bikeway Viewer](#), created by H-GAC, is an interactive mapping tool that allows users to view existing and planned bikeways throughout our region. The [City of Houston](#) has created a similar mapping system that shows bikeways within its jurisdiction.

**Counting Pedestrians and Bicyclists**

There is limited data on the number of pedestrians and bicyclists using our region’s active transportation infrastructure. To help decision-makers better understand how pedestrian and bicycle facilities are being used, H-GAC installed two permanent pedestrian/bicyclist counters along White Oak Trail in Houston. Upon request, H-GAC also loans temporary pedestrian/bicyclist counters to local governments.

**LOCAL EFFORTS**

**Plans**

Several communities have articulated a vision for their pedestrian and bicycle networks in long-range planning documents, guiding investment in sidewalks, trails, and other facilities. Proposed network improvements and initiatives may be described in comprehensive plans, parks plans, or a local pedestrian/bicycle plan (Table 8). While most of these planning efforts have been undertaken by public entities, non-profit organizations are developing similar plans.

**Table 8: Examples of Local Long-Range Pedestrian and Bicycle Planning Documents**

City of Lake Jackson: Pedestrian and Bicycle Master Plan	City of Pearland: Trail Master Plan	City of Seabrook: Hike and Bike Trails Master Plan	Energy Corridor District: West Houston Trails Master Plan
City of La Porte: Bicycle-Pedestrian Trail Master Plan	City of Rosenberg: Transit and Pedestrian Study	City of Sugar Land: Pedestrian and Bicycle Master Plan	Fort Bend Green: Brazos River Corridor Master Plan
City of Missouri City: Bicycle and Pedestrian Mobility Plan	City of League City: Trails & Open Space Master Plan	Energy Corridor District Bicycle Master Plan	Greens Bayou Corridor Coalition: Parks & Trails Master Plan



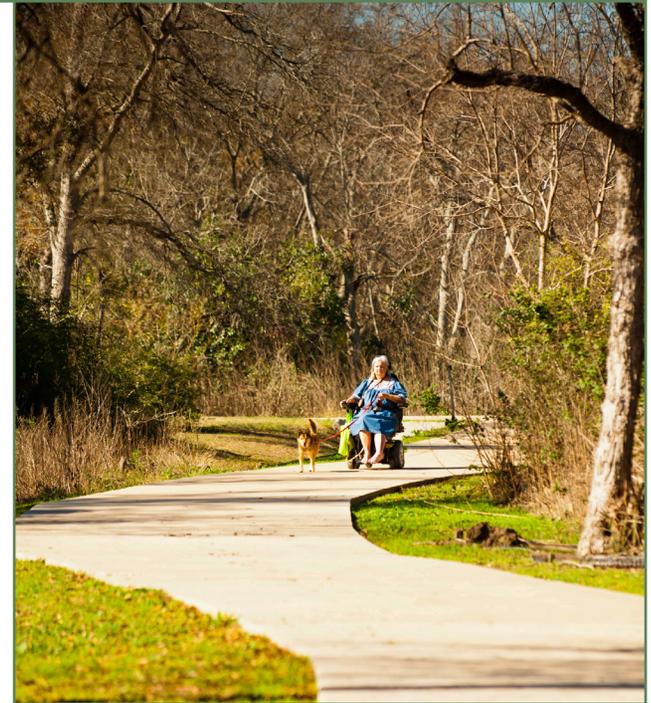
# Local Perspectives

## City of La Porte *Implementing Local Plans*

La Porte (pop. 33,800) lies 25 miles east of Downtown Houston, on the upper reaches of Galveston Bay. Due to its proximity to the Houston Ship Channel, the area is a major industrial center. In recent years, the city has been developing a well-connected active transportation network, providing residents with greater transportation options and recreational opportunities.

The community’s vision for its active transportation network was established in 2003, when City Council adopted the Pedestrian-Bicycle Master Plan. Since that time, more than 16 miles of bicycle facilities have been built throughout La Porte, connecting neighborhoods to nearby schools, parks, major employment centers, and other points of interest. Most of this infrastructure is separated from automobile traffic, making biking safe and convenient for people of all ages and abilities. Multi-use trails are used for recreational trips, and when traveling to work and school.

Not only can residents (and visitors) safely travel throughout La Porte by bike, they can also visit nearby communities. The city’s paths connect to bicycle facilities in Pasadena, Morgan’s Point, and Shoreacres, allowing bicyclists to travel throughout eastern Harris County on facilities designed specifically for their use. These accommodations improve residents’ quality of life, and they may attract bicyclists from throughout the region looking for safe, interesting places to ride.



**“Our trail system is not only recreational. Some people ride their bikes to work now, whereas before that was not as safe an option.”**

***Tim Tietjens: Director of Planning  
City of La Porte***

**Programs and Initiatives**

**Building Shared-Use Paths**

Many communities are planning and constructing shared-use paths, which are able to accommodate both bicyclists and pedestrians. The largest of these efforts is the [Bayou Greenways Initiative](#), a multi-organizational effort to create a continuous network of open space with shared-use paths along our region’s famous bayous. Several segments have been completed or are underway. Once complete, there will be at least 300 miles of interconnected trails along Houston-area waterways.

Several local governments are investing in similar efforts to improve bicycle and pedestrian facilities. Examples include:

- The City of Pearland is constructing shared-use paths in accordance with its [Trail Master Plan \(2007\)](#), and is working with developers to complete new segments as subdivisions are constructed.
- The City of La Porte has been constructing several trail connections to fulfill the vision described in its [Bicycle-Pedestrian Trail Master Plan](#), which was approved in 2003.
- In 2014, the City of Houston entered into an [agreement](#) with CenterPoint Energy allowing construction of shared-use paths within the company’s transmission corridors. These corridors will be utilized to improve connectivity between existing pedestrian and bicycle facilities along the city’s bayous.

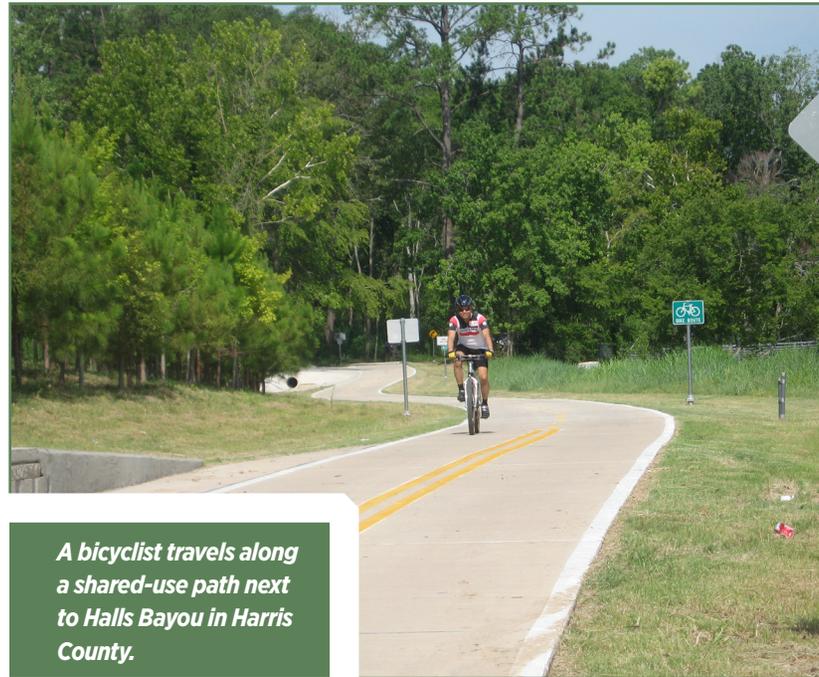
Developers throughout our region are building shared-use paths within their projects, often linking residential areas with parks, shopping, and other amenities. Extensive developer-built trail networks exist in Cinco Ranch, Kingwood, and The Woodlands.

**Multi-Modal Accommodations**

To compliment these off-road facilities, many are interested in making our region’s street network more conducive to walking and biking. Several organizations are promoting the concept of complete streets, which are

transportation corridors that include safe, comfortable accommodations for pedestrians, bicyclists, transit users, and motorists. The [Houston Coalition for Complete Streets](#), which is made up of 33 local organizations, is encouraging localities to adopt complete street policies, which would guide the design of transportation projects. In November 2013, Mayor Annise Parker (City of Houston) signed an [executive order](#) that called for the incorporation of complete street principles into municipal planning efforts and transportation projects. The [City of Sugar Land: Master Thoroughfare Plan](#), adopted in June 2012, reflects complete streets principles, and calls for the adoption of a specific complete streets policy.

Organizations in our region have completed projects demonstrating how an automobile-oriented street can be redesigned to accommodate multiple modes of transportation. For example, [Better Block Houston](#) has held events in several Houston neighborhoods, working with residents to temporarily retrofit streets with pedestrian and bicycle facilities.



*A bicyclist travels along a shared-use path next to Halls Bayou in Harris County.*



**Intermodal Connectivity**

Walking and bicycling trips can link with other modes of transportation. METRO, our region’s largest transit provider, allows cyclists to bring [bicycles on buses](#), making it easier for riders to utilize multiple modes on their trips (Figure 2). Local buses are equipped with bike racks, which can accommodate two bicycles at a time. On some buses that provide park-and-ride service, bicycles can be stored in designated baggage compartments. During certain times, bicycles can even be brought onto trains that are part of the agency’s light rail system. METRO worked with H-GAC to create the [METRO Bike and Ride Access and Implementation Plan](#), which identifies projects that can provide even better connections between our region’s bicycle network and public transit.

Smaller transit providers are also improving accommodations for bicyclists. [Fort Bend County](#) plans to install bicycle racks on its buses by the end of 2014. Commuters can store bicycles on buses serving [park-and-ride lots](#) operated by the Brazos Transit District in southern Montgomery County.

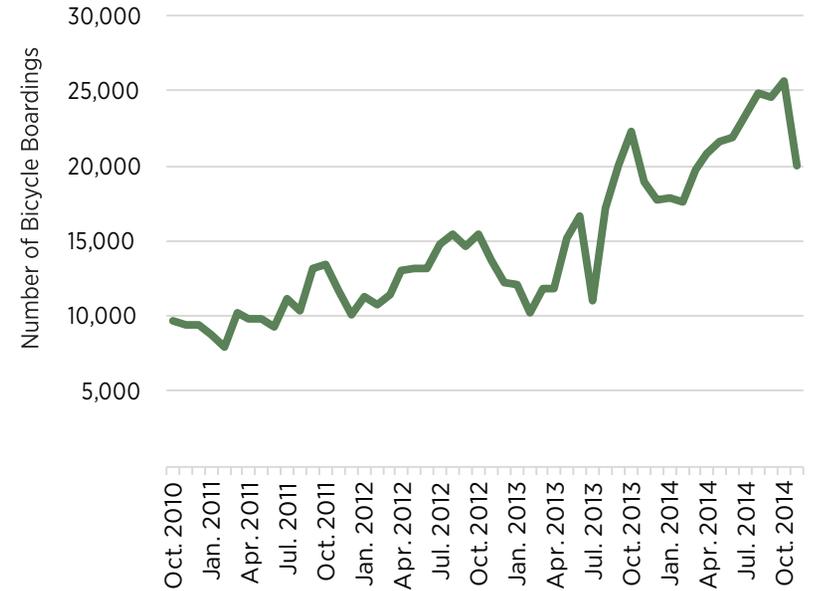
**Bike Sharing**

[Houston B-cycle](#), a bike-sharing program that operates in central Houston, encourages bicycle use for short trips, allowing users (for a small fee) to check out a bicycle at their point of origin and return it at their destination. The program began in Spring 2012, with the installation of three bike-share stations in the downtown area. As of early 2015, there are 29 stations inside Interstate 610. Several public and private entities provide financial support to the program through sponsorships.<sup>14</sup>

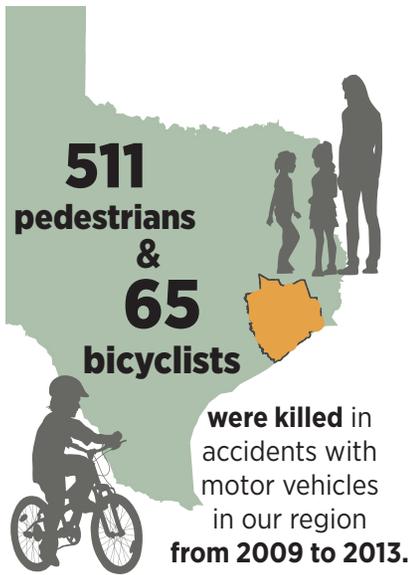
**Bicycle Friendly Communities**

The League of American Bicyclists’ [Bicycle Friendly Community](#) program recognizes communities that provide safe routes for bicyclists and encourage residents to bike for transportation and recreational purposes. Two communities in our region have been certified as Bicycle Friendly Communities: Houston (Bronze) and The Woodlands (Bronze).

**Figure 2:**  
**Monthly Bicycle Boardings on METRO Buses**  
October 2010 - November 2014



*Many METRO buses are equipped with bike racks.*



Source: Texas Department of Transportation

**Safety**

Communities are recognizing that people will not walk or bike if they feel unsafe. High-speed automobile traffic and inattentive motorists can endanger non-motorized users. In May 2013, the City of Houston adopted a [safe passing ordinance](#), requiring motorists to keep a certain distance from pedestrians, bicyclists, and other non-motorized road users. Several organizations offer educational programs that teach bicyclists how to travel safely along roadways.

Managed by Harris County Public Health & Environmental Services (HCPHES), the [Healthy Living Matters \(HLM\)](#) initiative aims to curb childhood obesity through policy and environmental change. The initiative began in 2011, with financial support from the Houston Endowment. A diverse group of stakeholders engaged in a two-year effort to develop a [Community Action Plan](#), which describes policies aimed at addressing issues that impact childhood obesity, including the form of the built environment. The plan recommends that a “Safe Neighborhoods” policy be adopted. This policy recommendation includes improving streets and sidewalks and supports the ongoing development of trails and parks, providing greater opportunities for families to engage in physical activity.

[Sunday Streets Houston](#) provides Houstonians with a unique opportunity to explore different neighborhoods in a car-free environment. Selected streets are closed to motorized vehicles, allowing people to walk, bike or exercise without having to contend with automobile traffic. The first three events were held in Spring 2014, with some drawing more than 20,000 people.<sup>17</sup> This program is part of [Go Healthy Houston](#), an initiative launched by Mayor Annise Parker (City of Houston) that encourages residents to eat healthy foods and exercise regularly.<sup>18</sup>

**Active Transportation & Health**

With childhood obesity a growing national and local problem, many communities are working to make walking and biking a safe option for children traveling to and from school. Nationally, the percentage of children who commute to school by walking or bicycling decreased 68 percent between 1969 and 2001.<sup>15</sup> To reverse this trend, municipalities and school districts throughout our region have received federal Safe Routes to School grants, including the cities of Clute and Rosenberg, along with Channelview Independent School District (ISD), Crosby ISD, Cypress-Fairbanks ISD, Galena Park ISD, Houston ISD, Sheldon ISD, and Waller ISD.<sup>16</sup> Participating entities receive federal funds to improve pedestrian and bicycle connections between schools and the surrounding community.



## Challenges and Opportunities

Building a well-connected pedestrian and bicycle network provides many benefits, but it also presents significant challenges. Our region can work together to overcome these challenges, while taking advantage of unique opportunities created by our natural, cultural, and economic resources.

Challenges	Opportunities
<ul style="list-style-type: none"> <li> <p><b>• Funding</b> Federal initiatives that support active transportation, such as the Transportation Alternatives Program (which includes many projects eligible under the former Transportation Enhancements Program), have limited funding and the project selection process is highly competitive.</p> </li> <li> <p><b>• Automobile-Oriented Culture</b> Separated land uses, vast parking lots, wide streets and limited connectivity sometimes make automobiles the only practical way to get around. Many residents believe walking and biking are dangerous and do not know basic bicycle safety techniques.</p> </li> <li> <p><b>• Development Standards</b> Regulatory tools influence the character and quality of pedestrian and bicycle facilities. Many infrastructure design manuals and subdivision ordinances encourage and/or require road networks to facilitate high-speed automobile movement at the expense of pedestrian and bicyclist comfort and safety. Accommodations for walking and biking are not always required, and street interconnectivity may be discouraged, forcing pedestrians and bicyclists to travel longer distances to reach relatively-close destinations.</p> </li> <li> <p><b>• Coordination</b> Creating a continuous pedestrian and bicycle network with a consistent high-quality design can be difficult in areas where multiple agencies have jurisdiction. Private developers constructing adjacent projects do not always coordinate with one another, creating a disjointed system.</p> </li> <li> <p><b>• Heat and Humidity</b> Heat and humidity can make walking and biking uncomfortable in the warmer months.</p> </li> </ul>	<ul style="list-style-type: none"> <li> <p><b>• Recent Investments in Pedestrian/Bicycle Infrastructure</b> Despite funding challenges, public and private entities are making significant investments in pedestrian and bicycle infrastructure. Localities are increasingly interested in accommodating pedestrian and bicycle infrastructure as part of construction and reconstruction projects, with some pursuing Complete Street policies. Developers are incorporating sidewalks, shared-use paths and other pedestrian and bicycle facilities into their projects. Our region can build off this momentum to continue developing an interconnected pedestrian and bicycle network.</p> </li> <li> <p><b>• Changing Demographics</b> As interest in urban living grows, the core of our region’s cities will continue to redevelop. Communities can take advantage of redevelopment opportunities to create mixed-use activity centers where walking and biking are safe and convenient.</p> </li> <li> <p><b>• Natural Features</b> Our region’s gentle topography makes walking and biking easy for people of all ages and abilities.</p> </li> <li> <p><b>• Capitalizing on Tourism</b> A well-developed active transportation network linking cultural sites and natural areas could attract recreational users from within our region and beyond.</p> </li> <li> <p><b>• Temperate Cooler Months</b> Mild winters, along with comfortable spring and fall temperatures, make walking and biking attractive for several months of the year.</p> </li> </ul>



# Regional Needs



## Regional Needs

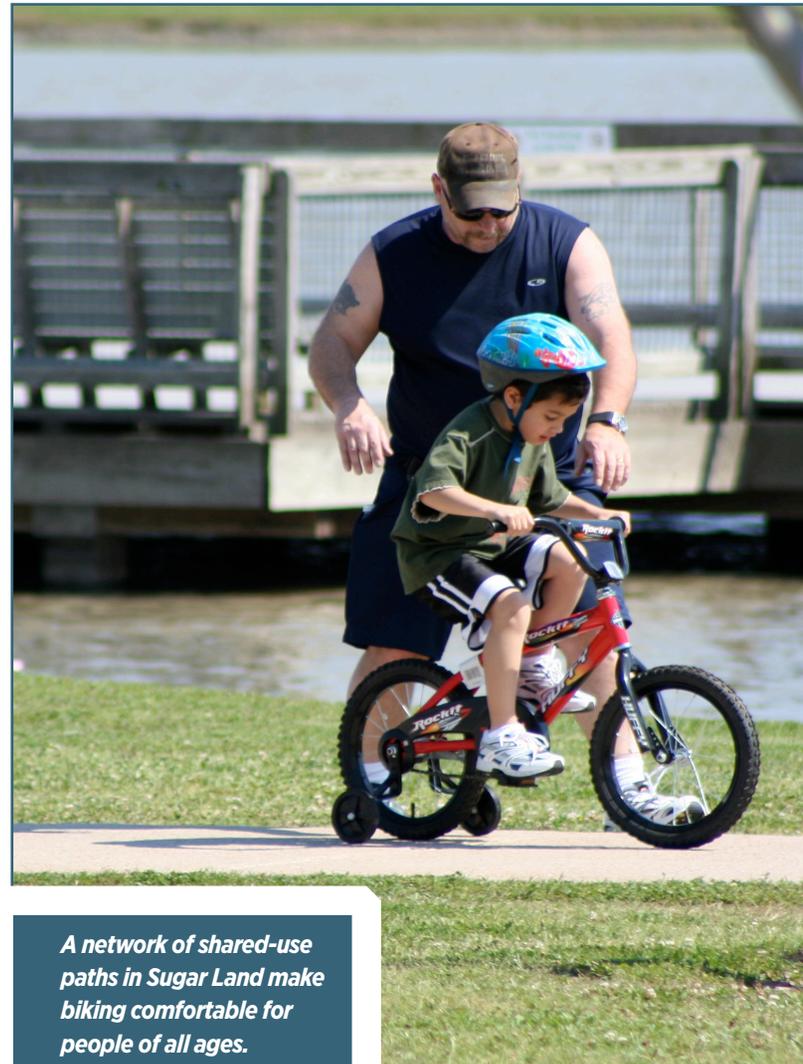
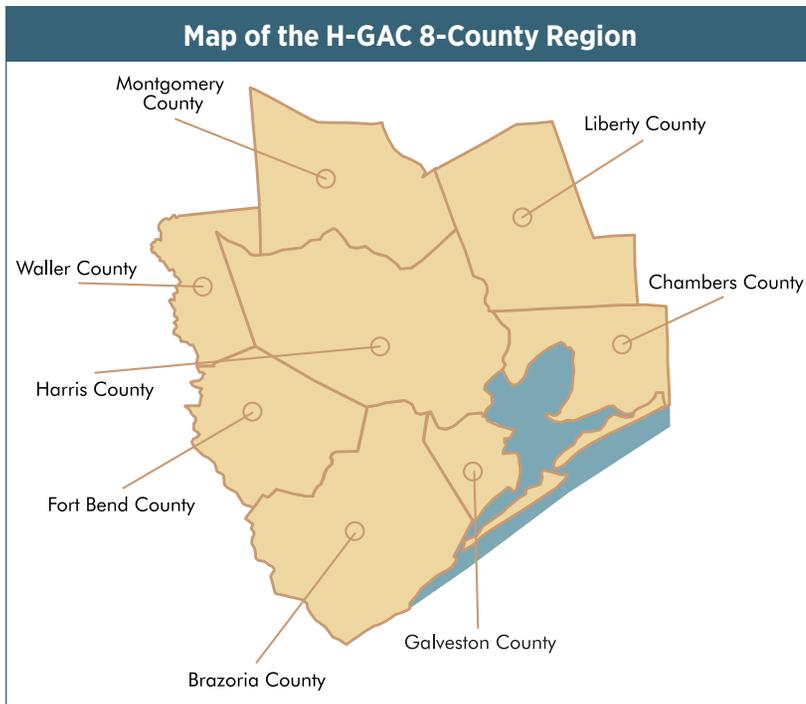
Based on input received from the Pedestrian and Bicyclist Subcommittee, local officials, and other stakeholders, H-GAC identified policies, programs, and investments needed to make walking and biking an attractive transportation option. Goals, objectives, and policy recommendations were developed to address these needs.

Regional Network	Safety
<ul style="list-style-type: none"> <li>• <b>Gap Elimination</b> Investments are needed to eliminate major gaps in the regional pedestrian and bicycle network, such as freeways, tollways, railroads, and waterways.</li> <li>• <b>Improved Connectivity</b> Better connectivity is needed between localized networks.</li> <li>• <b>Data Collection</b> Data on the number of pedestrians and bicyclists using existing facilities is needed to help communities determine demand for active transportation infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Improved Awareness</b> Programs are needed to encourage motorists to watch for pedestrians and bicyclists on our region's roadways.</li> <li>• <b>Safety Education</b> Efforts promoting safe travel techniques for pedestrians and bicyclists need to be accessible to all communities.</li> </ul>
Policies	Healthy Livable Communities
<ul style="list-style-type: none"> <li>• <b>Multi-Modal Transportation Planning</b> Local and regional policies should be reviewed to ensure they allow and encourage the provision of pedestrian and bicycle facilities when roadways are constructed or improved.</li> <li>• <b>Additional Funding Sources</b> New, innovative funding sources are needed to build and maintain our region's active transportation network.</li> <li>• <b>Interjurisdictional and Intermodal Coordination</b> To maximize the impact of public investment on regional mobility, governmental entities need to work together during the planning, design and construction of pedestrian, bicycle and other regionally significant transportation projects.</li> <li>• <b>Capacity Building</b> Many communities need assistance developing policies, programs, and projects supportive of walking and biking.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Improved Access</b> While our region has made significant investments in pedestrian and bicycle infrastructure, some residents still do not have access to these facilities. Safe and convenient pedestrian and bicycle infrastructure is needed in many parts of our region, especially in areas where the automobile is the only viable means of transportation.</li> <li>• <b>Connections to Cultural and Natural Assets</b> To create new recreational and economic development opportunities, better connections are needed between communities and our region's cultural sites and natural areas</li> </ul>

## County Profiles

Communities will confront different obstacles when developing bicycle facilities. Some of the challenges each county in our region may face, along with opportunities they can capitalize on, are described on the following pages. In addition, facility needs are also summarized.

Accompanying maps show the location of existing and proposed bicycle facilities. Proposed facilities are planned projects local governments and transportation agencies are actively pursuing, as reported by project sponsors and members of the Pedestrian and Bicycle Subcommittee.



*A network of shared-use paths in Sugar Land make biking comfortable for people of all ages.*



# Brazoria County

Population (2010)	Estimated Population (2040)	Land Area (mi <sup>2</sup> )	Population Density (2010) (per mi <sup>2</sup> )	Largest City	County Seat
313,166	636,524	1,357.70	230.66	Pearland	Angleton

## Opportunities

- Concentrated Growth**  
 Most of the county's population growth is occurring in its northern communities, creating vibrant areas that contain different types of destinations (schools, parks, shops, restaurants, etc.) within close proximity. The Brazosport area in southern Brazoria County is a cluster of eight cities and is a major employment center, home to one of the largest chemical complexes in the world.
- Proactive Planning Efforts**  
 Pearland, Lake Jackson, and other communities have adopted long-term planning documents that describe where pedestrian and bicycle facilities should be constructed.
- Existing Pedestrian and Bicycle Facilities**  
 Several communities have existing pedestrian and bicycle facilities, or are working towards developing local active transportation networks. For example, Pearland and Lake Jackson have several miles of shared-use paths, while Alvin has a network of bicycle lanes.
- Scenic Corridors and Protected Landscapes**  
 Pedestrian and bicycle facilities could be constructed along waterways that criss-cross the area, creating direct connections separated from vehicular traffic. Two national wildlife refuges ([Brazoria](#) and [San Bernard](#)) protect thousands of acres of coastal habitat, providing an attractive, low-traffic area for bicyclists to ride.
- Favorable Topography**  
 Flat topography makes walking and biking easy for people of all ages and abilities.

## Challenges

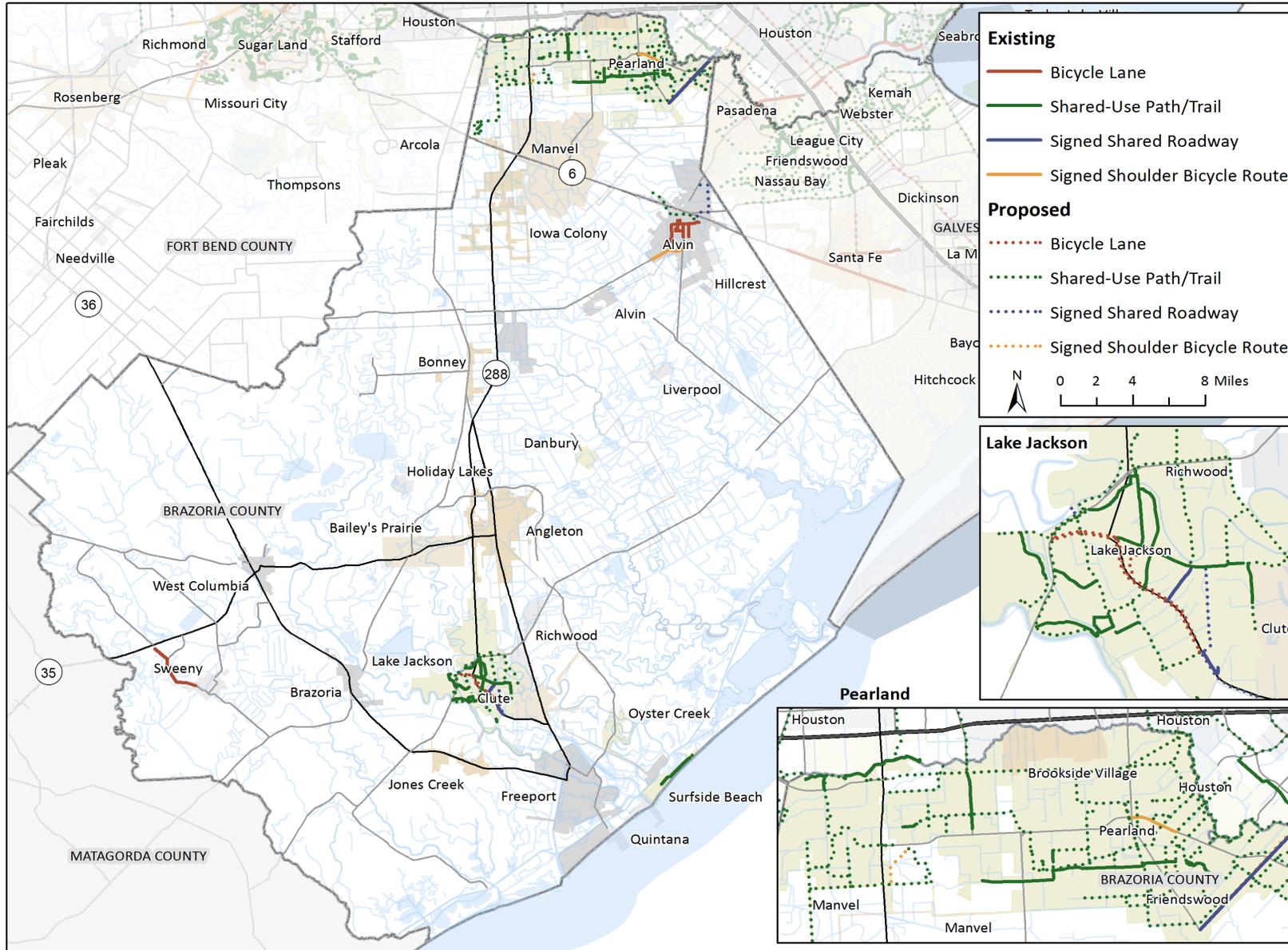
- Natural Barriers**  
 Coastal wetlands and waterways limit connectivity between mainland communities and barrier islands. State highways, which are not always comfortable for bicyclists, provide the only access to island communities.

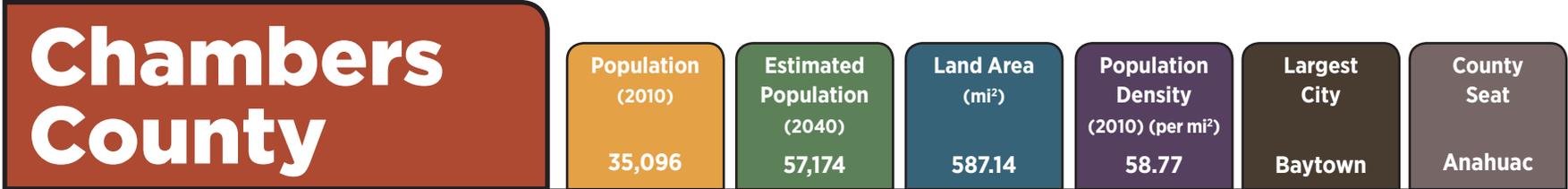
## Needs

- Connecting Communities**  
 Additional bikeways are needed to connect localized systems in Alvin, Pearland, and Lake Jackson with the rest of the county.
- Low-Volume, Low-Speed Alternative Routes**  
 Some bicyclists prefer riding on less-traveled roadways, especially those with scenic views. Bicycle facilities could be developed parallel to busier highways, providing bicyclists with safe (but direct) routing options.



# Bikeway Facilities in Brazoria County





**Opportunities**

- Scenic Corridors and Protected Landscapes**  
 The county’s roadways provide expansive views of coastal prairies, marshes, and farmland. Several roads run near Trinity Bay, a scenic arm of Galveston Bay. [Anahuac National Wildlife Refuge](#) spans 34,000 acres and attracts birders from throughout the country.
- Well-Developed Rural Highway System**  
 In the eastern part of the county, there is a well-developed network of state highways, farm-to-market roads, and county roads connecting small towns and destinations, providing bicyclists with several different routes to reach the places they want to go.
- Favorable Topography**  
 Gentle topography makes walking and biking easy for people of all ages and abilities. Flat prairies and straight roadways increase the visibility of bicyclists, improving safety.

**Challenges**

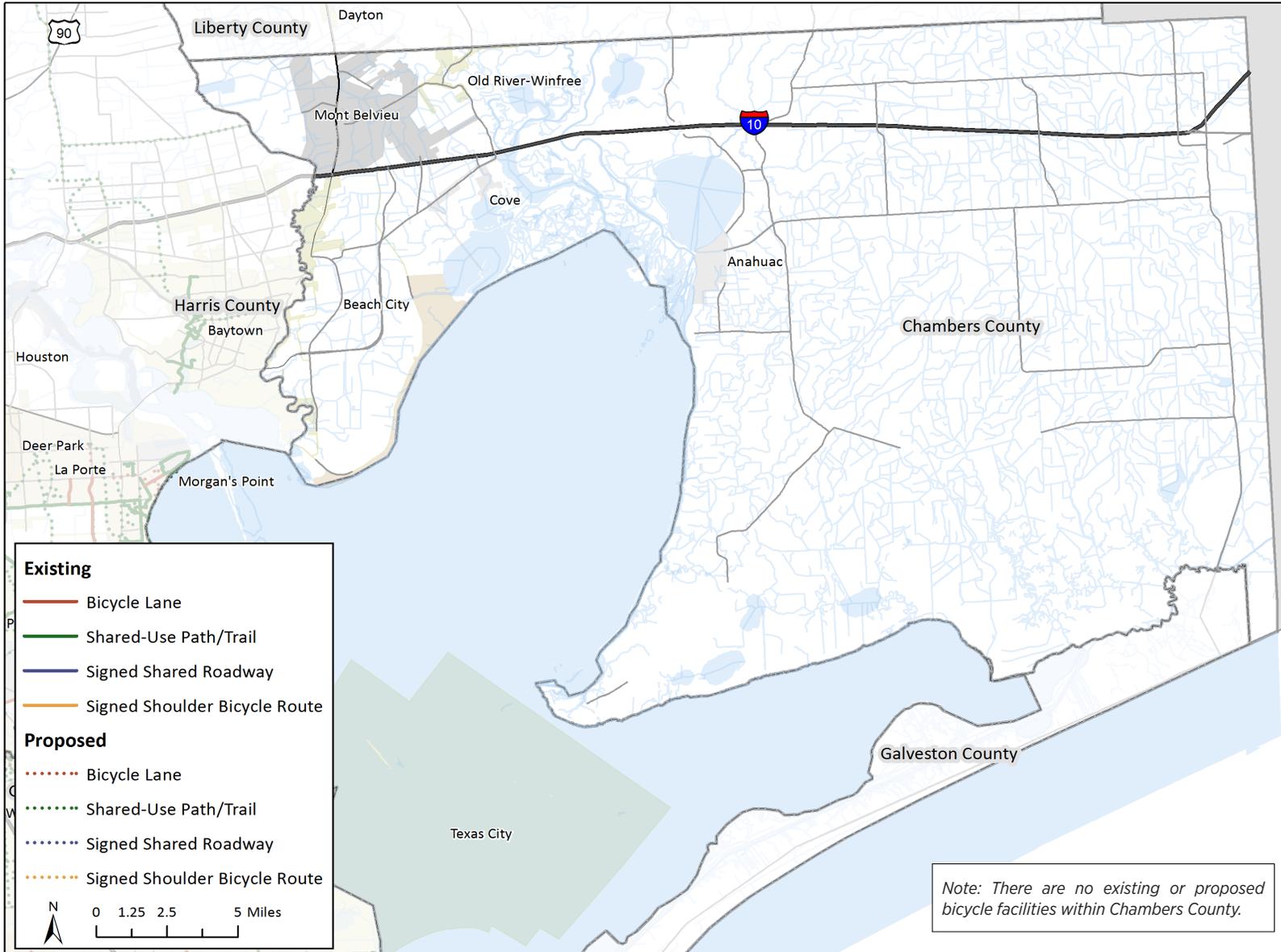
- Natural Barriers**  
 The Trinity River divides the county. The only vehicular crossing is the Interstate 10 bridge, which does not include pedestrian and bicycle facilities.
- Limited Access to Existing Facilities**  
 Few areas have existing pedestrian and bicycle facilities.

**Needs**

- Connecting Communities**  
 Bicycle facilities are needed to connect the county’s cities and towns with Anahuac National Wildlife Refuge. Existing roadways, such as state highways and farm-to-market roads, could be retrofitted to better accommodate cyclists of varying abilities.
- Trinity River Crossing**  
 A pedestrian- and bicyclist-friendly option for traversing the Trinity River is needed. The existing Interstate 10 bridge could be retrofitted with pedestrian and bicycle accommodations separated from vehicular traffic. Any improvements must be elevated, so they do not hinder navigability of the river.



# Bikeway Facilities in Chambers County



# Fort Bend County

Population (2010)	Estimated Population (2040)	Land Area (mi <sup>2</sup> )	Population Density (2010) (per mi <sup>2</sup> )	Largest City	County Seat
585,375	1,152,034	861.48	679.50	Sugar Land	Richmond

## Opportunities

- Existing Pedestrian and Bicycle Facilities**  
 Several communities in Fort Bend County have well-developed pedestrian and bicyclist networks. Many developers are building shared-use paths within their projects, often linking residential areas with parks, shopping, and other amenities. Some communities also have walkable town centers, which provide opportunities for residents to walk and bike to different destinations.
- Proactive Planning Efforts**  
 Missouri City, Sugar Land and Rosenberg have adopted long-term plans for developing pedestrian and bicycle facilities.
- Scenic Corridors**  
 The Brazos River bisects the county, flowing past rural farmland, residential neighborhoods, and [Brazos Bend State Park](#). Local non-profit Fort Bend Green created the [Recreation Master Plan for the Brazos River Corridor](#), which identifies opportunities for recreation and conservation.
- Well-Maintained Rural Highway System**  
 Much of the county west of the Brazos River remains largely undeveloped. A well-maintained, interconnected highway system links rural towns, offering bicyclists several low-traffic routes to different destinations.
- Favorable Topography**  
 The flat terrain and openness of the coastal prairie offers good visibility for motorists and cyclists, which is especially important when using on-street bicycle facilities.

## Challenges

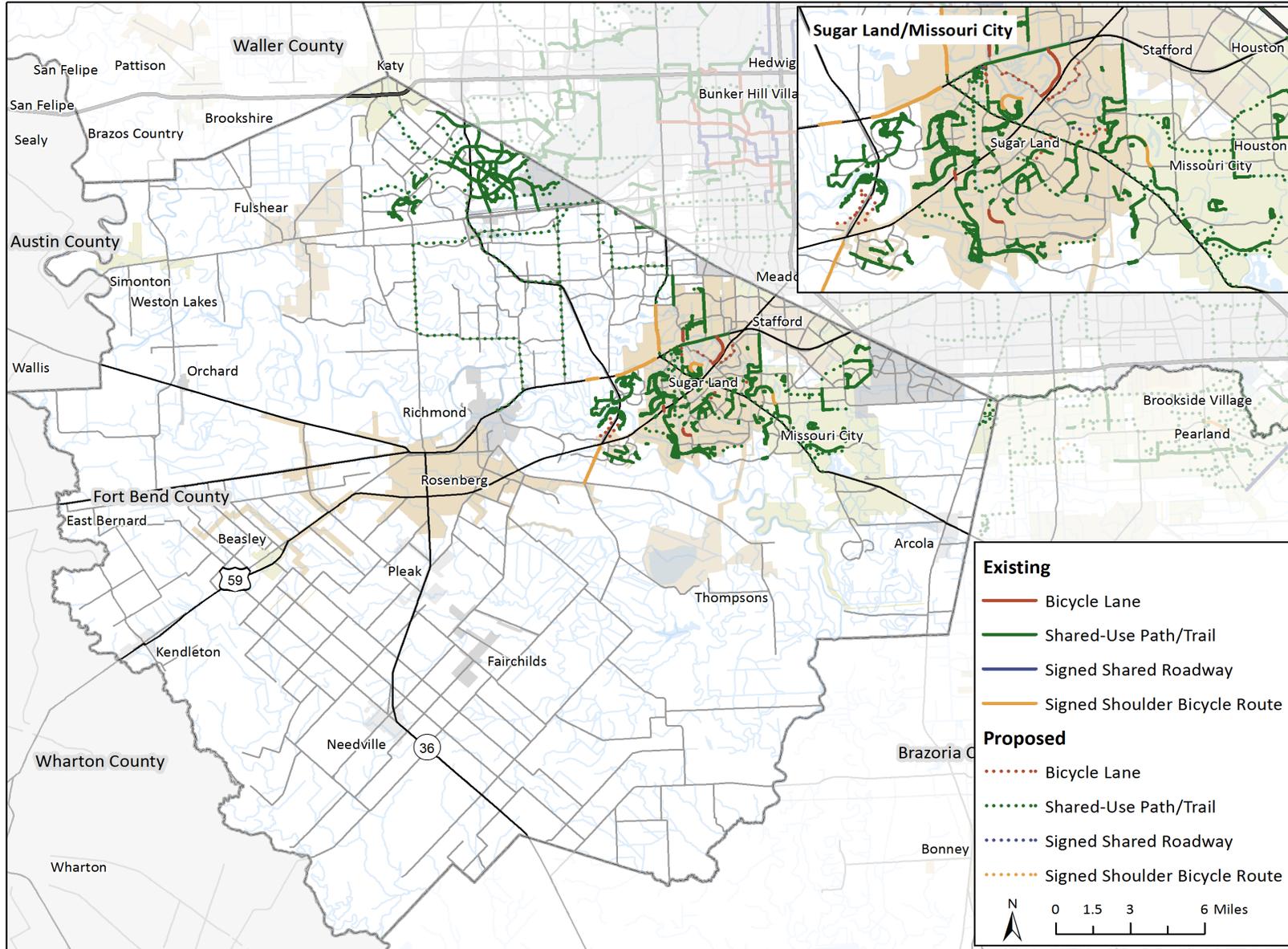
- Natural Barriers**  
 While the Brazos River presents opportunities for recreation, it also limits connectivity between suburban communities in eastern Fort Bend County and rural areas to the south and west. Most existing bridges carry busy highways across the river, and may not be safe or comfortable for pedestrians and bicyclists.

## Needs

- Connect Rural Communities**  
 Bicycle-friendly improvements along existing rural highways could create a well-connected network in western Fort Bend County, providing cyclists with safer access to small towns and Brazos Bend State Park.
- Connect Existing Systems in Suburban Areas**  
 Sugar Land and Missouri City have existing pedestrian and bicycle networks, but they do not connect with other communities. Communities could work together to create new bikeways that link these networks with existing and proposed facilities in Southwest Houston, Pearland, and Cinco Ranch.



# Bikeway Facilities in Fort Bend County



# Galveston County

Population (2010)	Estimated Population (2040)	Land Area (mi <sup>2</sup> )	Population Density (2010) (per mi <sup>2</sup> )	Largest City	County Seat
291,309	571,116	378.36	769.93	League City	Galveston

## Opportunities

### • Existing Pedestrian and Bicycle Facilities

League City, Texas City, and other communities have existing and planned bikeways that provide good connectivity between local destinations. Some developers are building shared-use paths within their projects, providing opportunities for walking and biking.

### • Proactive Planning Efforts

Some communities have developed long-range planning documents that identify places where pedestrian and bicyclist improvements should be made. The City of Galveston partnered with H-GAC to complete the [Galveston Special Districts Study](#) (2006) and the [Galveston Livable Centers Study](#) (2012), which described ways to improve walkability on the island's East End and in the historic core. The [League City Parks & Open Space Master Plan](#) (2006) identifies miles of future on- and off-street trails needed to connect parks, schools, and other destinations, while the [Main Street Implementation Plan: A Livable Centers Study](#) (2012) provided recommendations on how to make the city's historic downtown more walkable and bikeable.

### • Scenic Corridors

Several communities sit alongside Clear Lake, Galveston Bay, the Gulf of Mexico, and other coastal waters. Roadways along the shoreline provide bicyclists with scenic views across open water and marshland. Shared-use paths are proposed along bayous in northern parts of the county.

### • Historic Communities

Historic downtowns, such as those in Galveston, League City, and Texas City, can be attractive destinations for pedestrians and bicyclists, since they often have an interconnected street network, interesting architecture, mature landscaping, and a mix of uses.

### • Favorable Topography

Flat topography makes walking and biking easy for people of all ages and abilities.

## Challenges

### • Natural Barriers

Coastal bays separate Galveston Island and the Bolivar Peninsula from the mainland, making biking between these destinations difficult.

### • Over-Reliance on High-Speed, High-Volume Connections

High-speed, high-volume roadways limit bicyclist and pedestrian movement, as many residents feel uncomfortable biking and walking along (or across) these routes. Interstate 45 is a major barrier to walkers and bikers; most roadways that cross the highway carry high volumes of automobile traffic, making them inhospitable to pedestrians and bicyclists. State Highway 146 provides one of the only connections between communities along Galveston Bay.

## Needs

### • Safe Pedestrian and Bicyclist Accommodations Along Major Highways

In some instances, high-volume, high-speed roadways provide the only connection between communities. Safe bicycle accommodations are needed along these busy corridors, because feasible alternatives do not exist. For example, State Highway 6 is the only roadway linking communities in southwestern Galveston County, so appropriate bicycle facilities along this route could provide cyclists with safer access to Santa Fe.

### • Alternative Parallel Routes

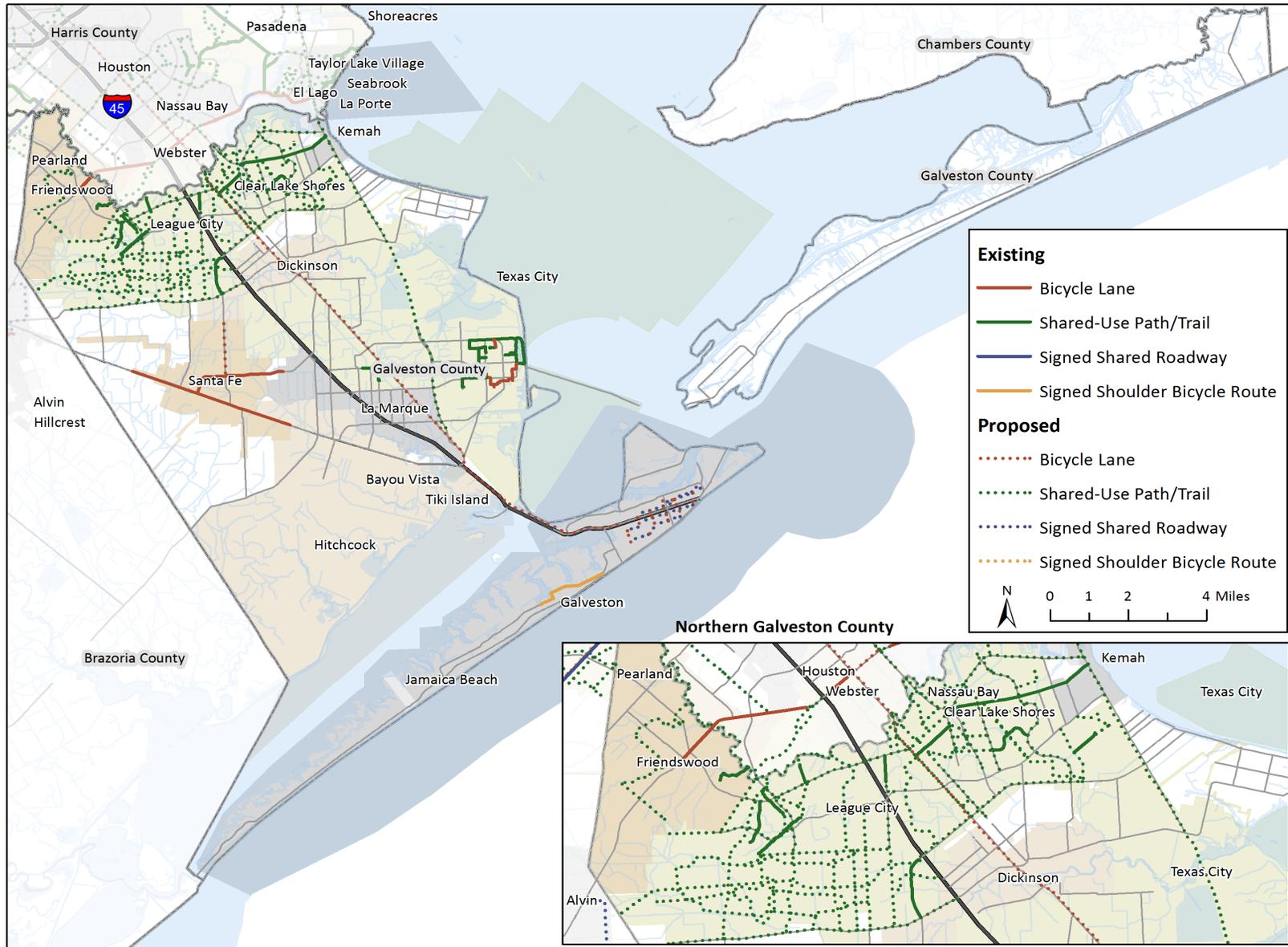
Where possible, less-traveled routes that parallel major thoroughfares should be retrofitted to accommodate bicyclists. For example, Nicholas Street in Dickinson provides a safer alternative than biking on State Highway 3 or Interstate 45.

### • Coastal Routes

Bikeways along the county's barrier islands could draw tourists to the area, attracting those interested in biking in a scenic coastal setting. Bicycle facilities could be placed along FM 3005 on Galveston Island and State Highway 87 on the Bolivar Peninsula.



# Bikeway Facilities in Galveston County



# Harris County

Population (2010)	Estimated Population (2040)	Land Area (mi <sup>2</sup> )	Population Density (2010) (per mi <sup>2</sup> )	Largest City	County Seat
4,092,459	5,840,678	1,703.48	2,402.41	Houston	Houston

## Opportunities

### • Existing Pedestrian and Bicycle Facilities

Some communities have well-developed local pedestrian and bicycle networks, including Houston and La Porte. Miles of shared-use paths follow the county's bayous, and many more will be developed as part of the [Bayou Greenways Initiative](#), creating new opportunities for walking and biking in several cities and unincorporated areas.

### • Well-Developed Thoroughfare System

A well-developed thoroughfare system provides bicyclists with a variety of different routes when traveling long distances.

### • Dense Population Centers

Major population centers often have a variety of destinations people may be interested in walking and biking to. Many of these areas already have some pedestrian and bicyclist accommodations, as well as access to transit. The [Urban Houston Framework](#) identifies tools that can be used to encourage the development of mixed-use, walkable activity centers in appropriate locations.

### • Proactive Planning Efforts

[La Porte](#), [Seabrook](#), the [Energy Corridor](#) (part of the City of Houston), and other communities have developed long-range planning documents that identify places where pedestrian and bicyclist improvements should be made. Through partnership with H-GAC, communities have completed [multiple mobility studies](#), which often include recommendations on how to make transportation corridors more hospitable to pedestrian and bicyclists. Some cities, including Houston, have a pedestrian-bicyclist coordinator (or similar position) on-staff, who ensures public policies and programs consider the needs of active transportation users. In November 2013, Mayor Annise Parker (City of Houston) signed an [executive order](#) calling for the incorporation of complete street principles into municipal planning efforts and transportation projects. Advocacy groups, such as [BikeHouston](#), work to make biking a safer, more convenient transportation option.

### • Favorable Topography

Flat topography makes walking and biking easy for people of all ages and abilities.



**Challenges**

• **Natural Barriers**

Major bayous and waterways, such as the San Jacinto River and Lake Houston, limit pedestrian and bicyclist movement. Few bridges span these features, and they may not have adequate pedestrian and/or bicyclist accommodations.

• **Manmade Barriers**

Freeways, tollways, railroads and other infrastructure can impede pedestrian and bicycle circulation. In some areas, bridges and underpasses may not have adequate pedestrian and/or bicyclist accommodations.

• **Land Availability**

Much of Harris County is highly developed, making it difficult to obtain the right-of-way needed to construct pedestrian and bicyclist facilities.

• **Over-Reliance on High-Speed, High-Volume Connections**

Heavily-traveled thoroughfares create formidable barriers to pedestrians and bicyclists. High traffic volumes and fast-moving traffic make these multi-lane roadways difficult to cross for those not in an automobile. Development along these corridors makes the construction of pedestrian and bicycle facilities difficult.

**Needs**

• **Connections to Existing Local Networks**

Well-developed localized active transportation networks are scattered throughout Harris County, but they are not all connected to one another. Additional facilities are needed to link these isolated system. New connections could follow existing roadways, bayous, detention facilities, and/or utility easements.

• **Connections Across Major Waterways**

Bicycle-friendly water crossings are needed throughout Harris County, especially in eastern areas along the San Jacinto River and Buffalo Bayou. Existing bridges could be retrofitted to better accommodate pedestrians and bicyclists, or these features could be incorporated into the design of replacement facilities.

• **Connections Across Manmade Barriers**

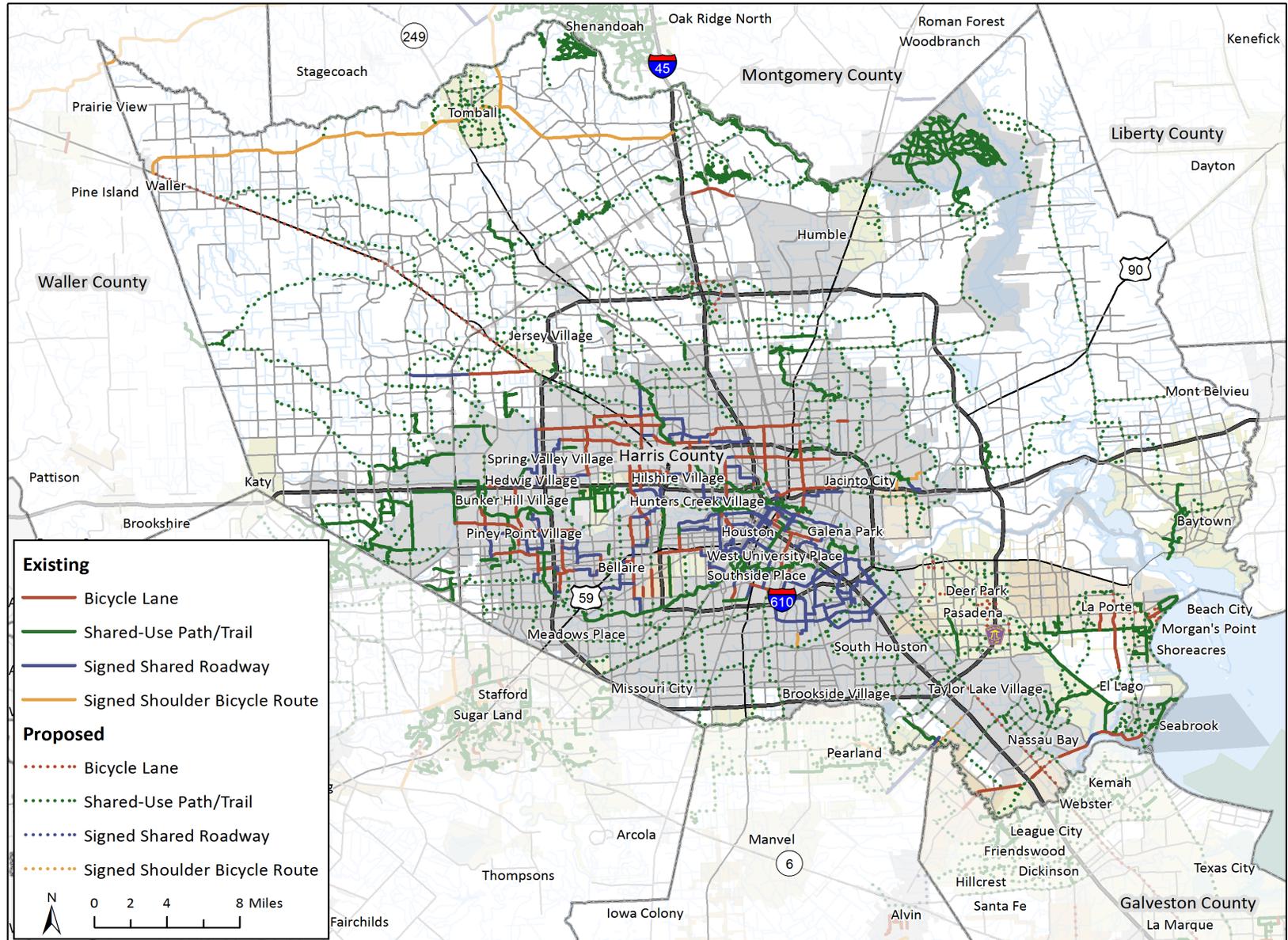
Safe and convenient pedestrian- and bicycle-friendly crossings that traverse freeways (and other high-speed, high-volume roadways), railroads and other infrastructure are needed to eliminate gaps in the active transportation network.

• **Safe Pedestrian and Bicycle Accommodations Along Major Highways**

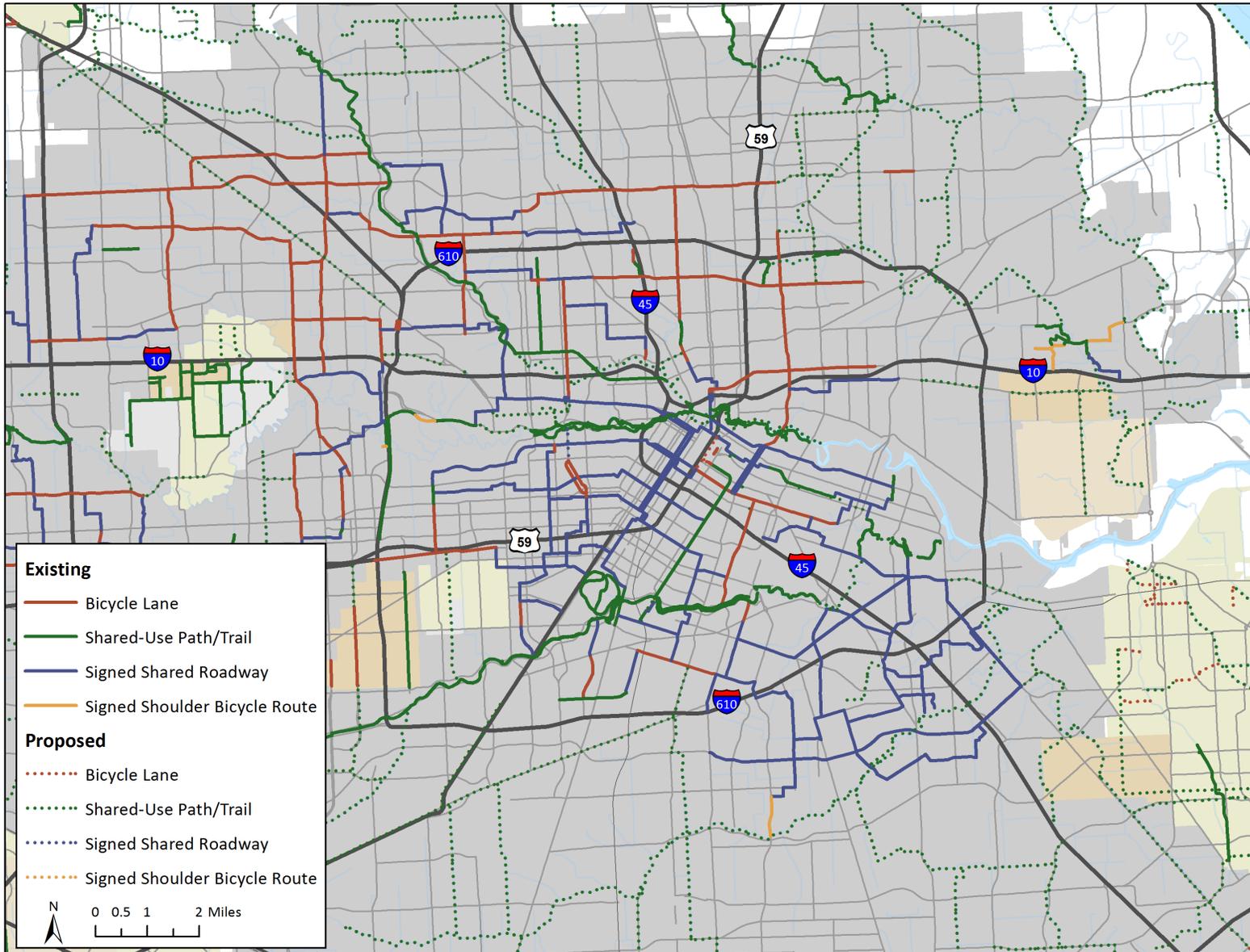
In some instances, high-volume, high-speed roadways provide the only connection between communities. Safe pedestrian and bicycle accommodations are needed along these busy corridors, because feasible alternatives do not exist.



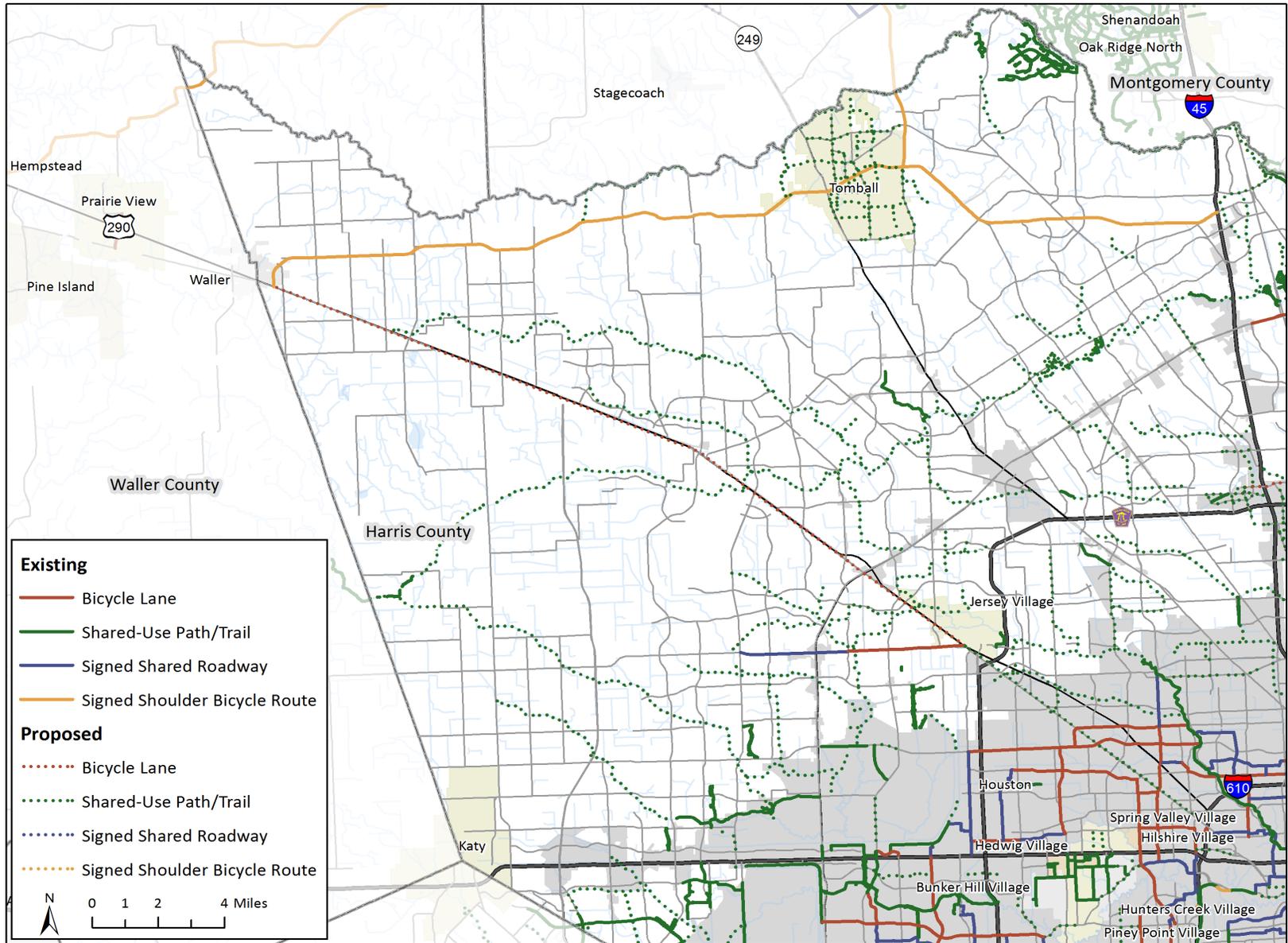
# Bikeway Facilities in Harris County



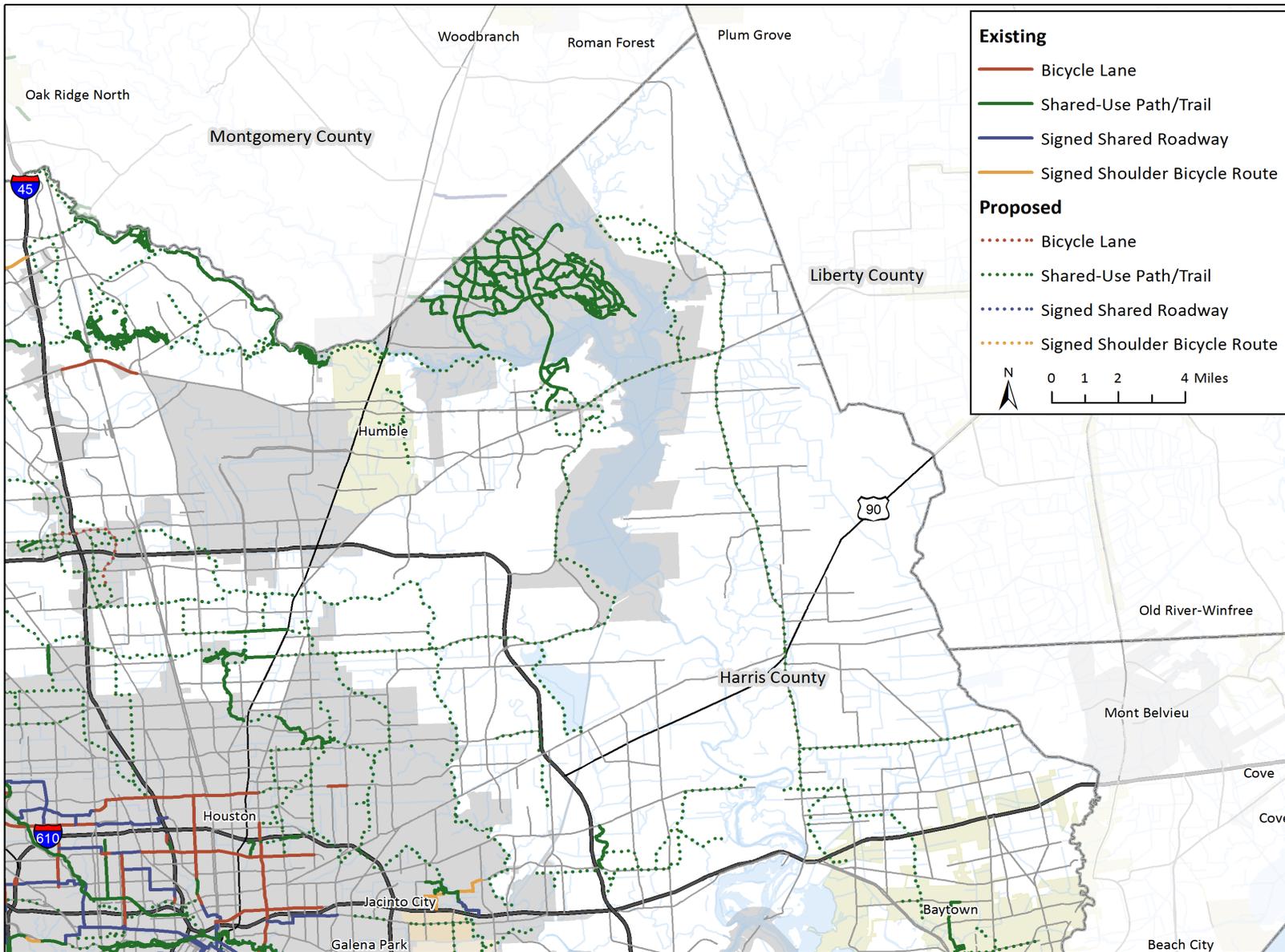
# Bikeway Facilities in the City of Houston



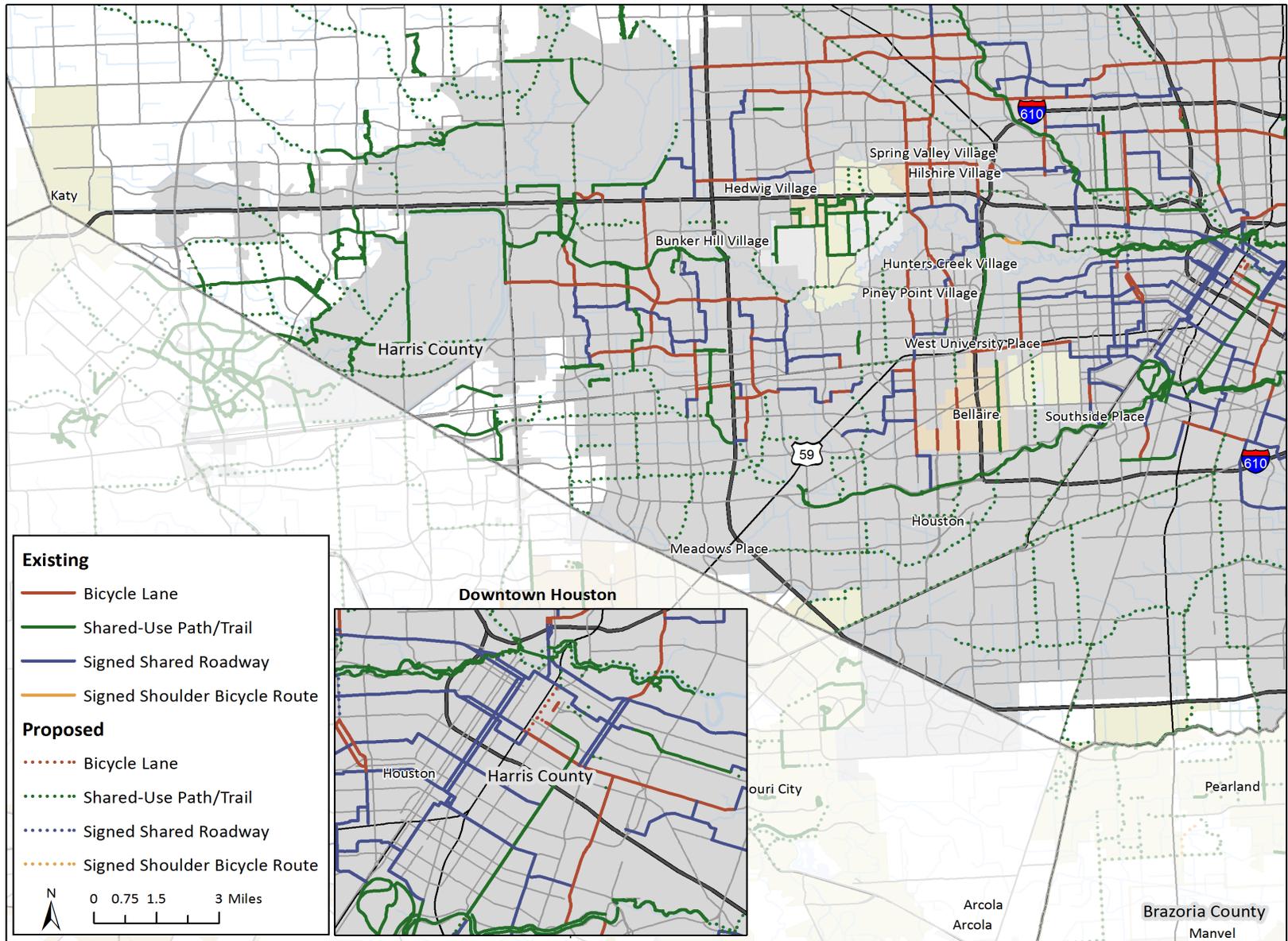
# Bikeway Facilities in Northwest Harris County



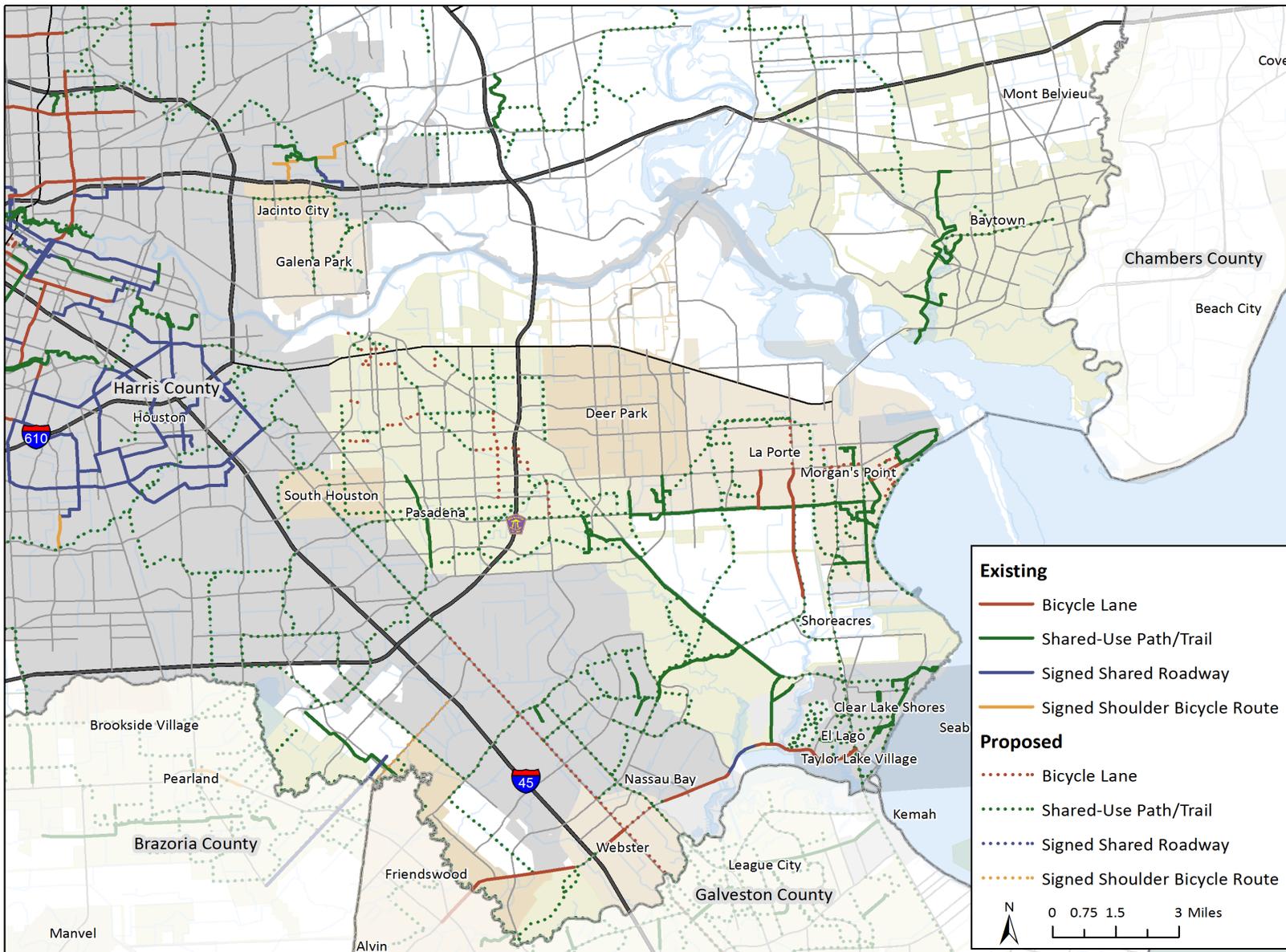
# Bikeway Facilities in Northeast Harris County



# Bikeway Facilities in Southwest Harris County



# Bikeway Facilities in Southeast Harris County



# Liberty County

Population (2010)	Estimated Population (2040)	Land Area (mi <sup>2</sup> )	Population Density (2010) (per mi <sup>2</sup> )	Largest City	County Seat
75,643	76,685	1,158.42	65.30	Liberty	Liberty

## Opportunities

- Protected Landscapes**  
 The 25,000-acre [Trinity River National Wildlife Refuge](#) protects bottomland forests along its namesake river and is home to more than 275 species of birds.
- Historic Communities**  
 Historic downtowns, such as those in Liberty, Dayton, and Cleveland, can be attractive destinations for pedestrians and bicyclists, since they often have an interconnected street network and a mix of uses.  
  
 Trinity River National Wildlife Refuge is working with the City of Liberty and other organizations to better connect local destinations with public lands. As part of this project (called Crosswalks to Boardwalks), a network of signed bicycle routes will link trailheads with neighborhoods, municipal parks, and other points of interest.
- Favorable Topography**  
 Flat topography makes walking and biking easy for people of all ages and abilities. In the southern part of the county, the coastal prairie provides expansive views and increases the visibility of cyclists along rural highways.

## Challenges

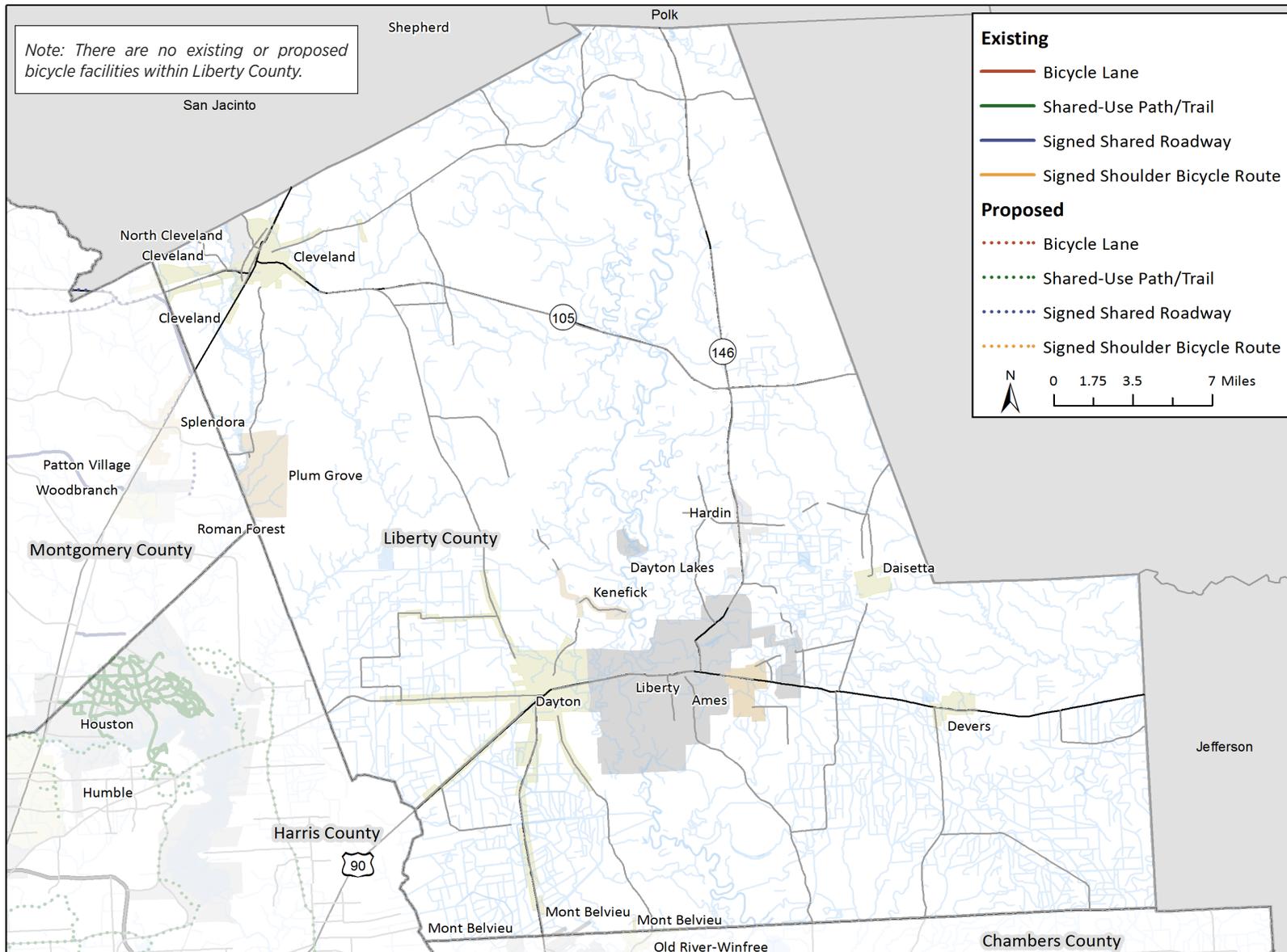
- Natural Barriers**  
 The Trinity River divides the county in half, limiting east-west movement. Bayous in the western part of the county (Luce and Tarkington) limit connectivity with Harris and Montgomery counties.
- Limited Access to Existing Facilities**  
 Few areas have existing pedestrian and bicycle facilities.

## Needs

- Trinity River Crossing**  
 Existing river crossings (FM 787, State Highway 105, U.S. 90) could be retrofitted to accommodate pedestrians and bicyclists, improving connectivity between eastern and western parts of the county.
- Connecting Rural Communities**  
 Improved bicycle facilities along existing rural highways could connect small cities and towns.



# Bikeway Facilities in Liberty County



# Montgomery County

Population (2010)	Estimated Population (2040)	Land Area (mi <sup>2</sup> )	Population Density (2010) (per mi <sup>2</sup> )	Largest City	County Seat
455,746	1,150,541	1,041.74	437.49	Conroe	Conroe

## Opportunities

- **Existing Pedestrian and Bicycle Facilities**

The Woodlands has an extensive active transportation network, with shared-use paths, sidewalks, and other facilities connecting neighborhoods with parks, schools, and shopping. [The Woodlands Cycling Club](#) has worked with local officials and TxDOT to post “Share the Road” signs along rural and suburban highways used by area cyclists.

- **Protected Landscapes**

Sam Houston National Forest spans thousands of acres in northern Montgomery County, providing bicyclists with miles of scenic, low-volume roadways to travel along. [Lake Houston Wilderness Park](#) and [W.G. Jones State Forest](#) offer opportunities for hiking and biking. Trails are being constructed through protected lands along Spring Creek.

- **Favorable Topography**

Most of Montgomery County is flat, making walking and biking easy for people of all ages and abilities. The area’s iconic pine trees provide shade, making these activities more pleasant.

## Challenges

- **Natural Barriers**

Lake Conroe and the West Fork of the San Jacinto River limit east-west movement, as there are few crossings with adequate pedestrian and bicycle facilities.

- **High-Traffic, High-Volume Roadways Create Barriers**

High-speed, high-volume roadways limit pedestrian and bicyclist movement, as residents may feel uncomfortable walking or biking along (or across) these routes. Interstate 45 is a major barrier to walkers and bikers; many roadways crossing the highway carry high volumes of automobile traffic, making them inhospitable to pedestrians and bicyclists. Congested roads in fast-growing suburban and exurban areas may also be unsafe and unappealing to walkers and bikers. Development along these corridors makes constructing new pedestrian and bicycle facilities difficult.

## Needs

- **Utilize Waterways as Active Transportation Corridors**

Shared-use paths along bayous and other waterways can provide long-distance connections between communities. Paths have been already built along Spring Creek. Additional facilities could be built along the West Fork of the San Jacinto River and some sections of Spring Creek and its tributaries (including Mill Creek and Sulfur Branch).

- **Alternative Parallel Routes**

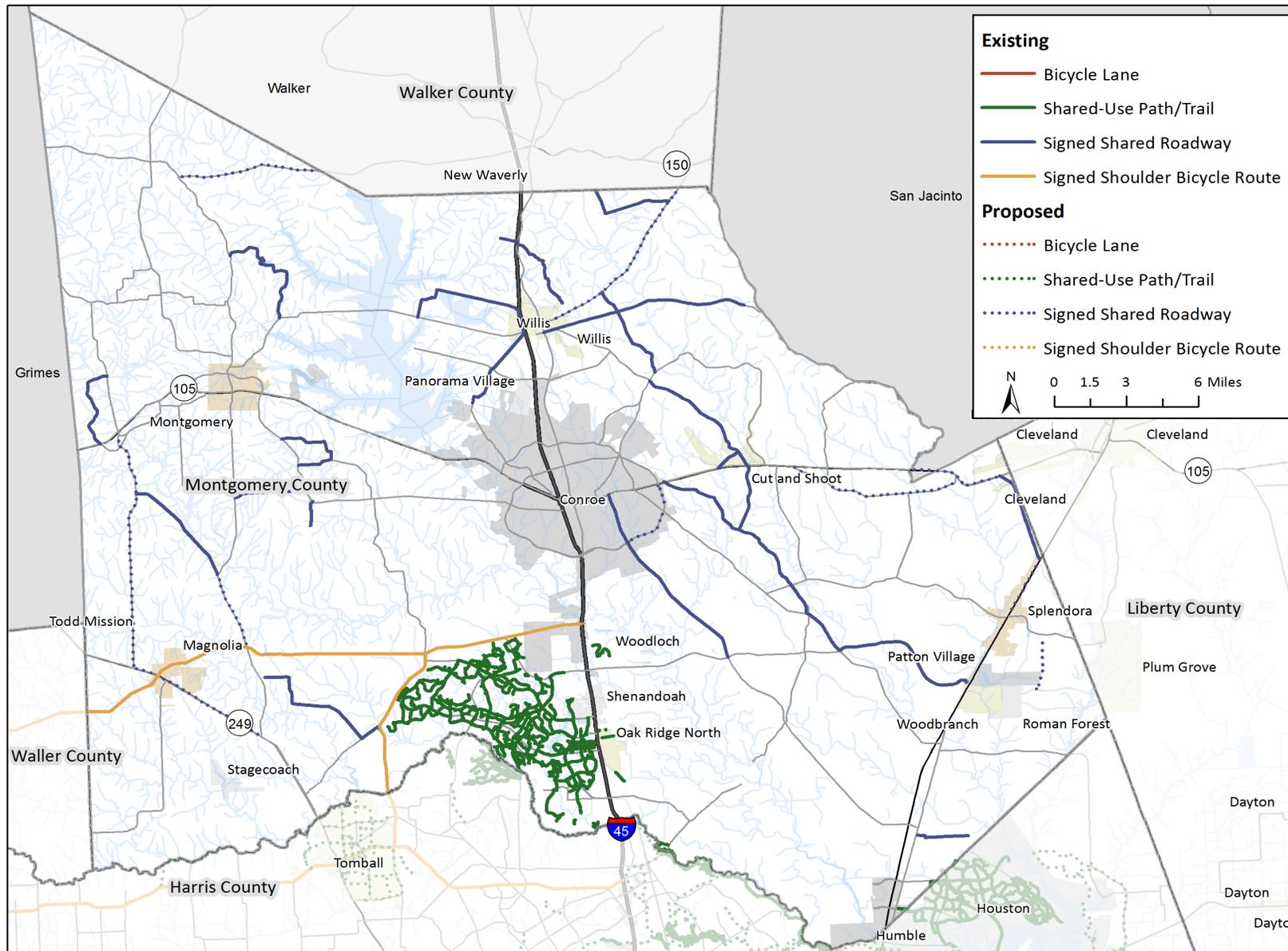
Bicyclists need safe routes separated from high-speed, high-volume roadways. To facilitate travel along the Interstate 45 corridor, bicycle facilities could be provided along an existing railroad that runs just east of the highway.

- **Crossing the West Fork of the San Jacinto River**

There are few bicycle-friendly routes crossing the West Fork of the San Jacinto River. As new thoroughfares are built across the waterway and existing bridges are upgraded, accommodations for pedestrians and bicyclists should be provided.



# Bikeway Facilities in Montgomery County



# Waller County

Population (2010)	Estimated Population (2040)	Land Area (mi <sup>2</sup> )	Population Density (2010) (per mi <sup>2</sup> )	Largest City	County Seat
43,205	72,691	513.42	84.15	Hempstead	Hempstead

## Opportunities

- Historic Downtowns**  
 Several communities have walkable downtown areas, which can serve as a destination for bicyclists and pedestrians. Hempstead and Waller partnered with H-GAC to complete [Livable Centers studies](#), which identified policies, programs, and improvements to support walking, biking, and transit in their historic cores.
- Scenic Corridors**  
 The Brazos River forms the county’s western boundary, providing opportunities for recreation and ecotourism. The [Katy Prairie Conservancy](#) and other entities have worked together to protect thousands of acres of open space in central Waller County, much of which is accessible to the public.
- Favorable Topography**  
 Waller County’s flat, open prairies make walking and biking easy, and improve the visibility of pedestrians and bicyclists traveling along roadways.

## Challenges

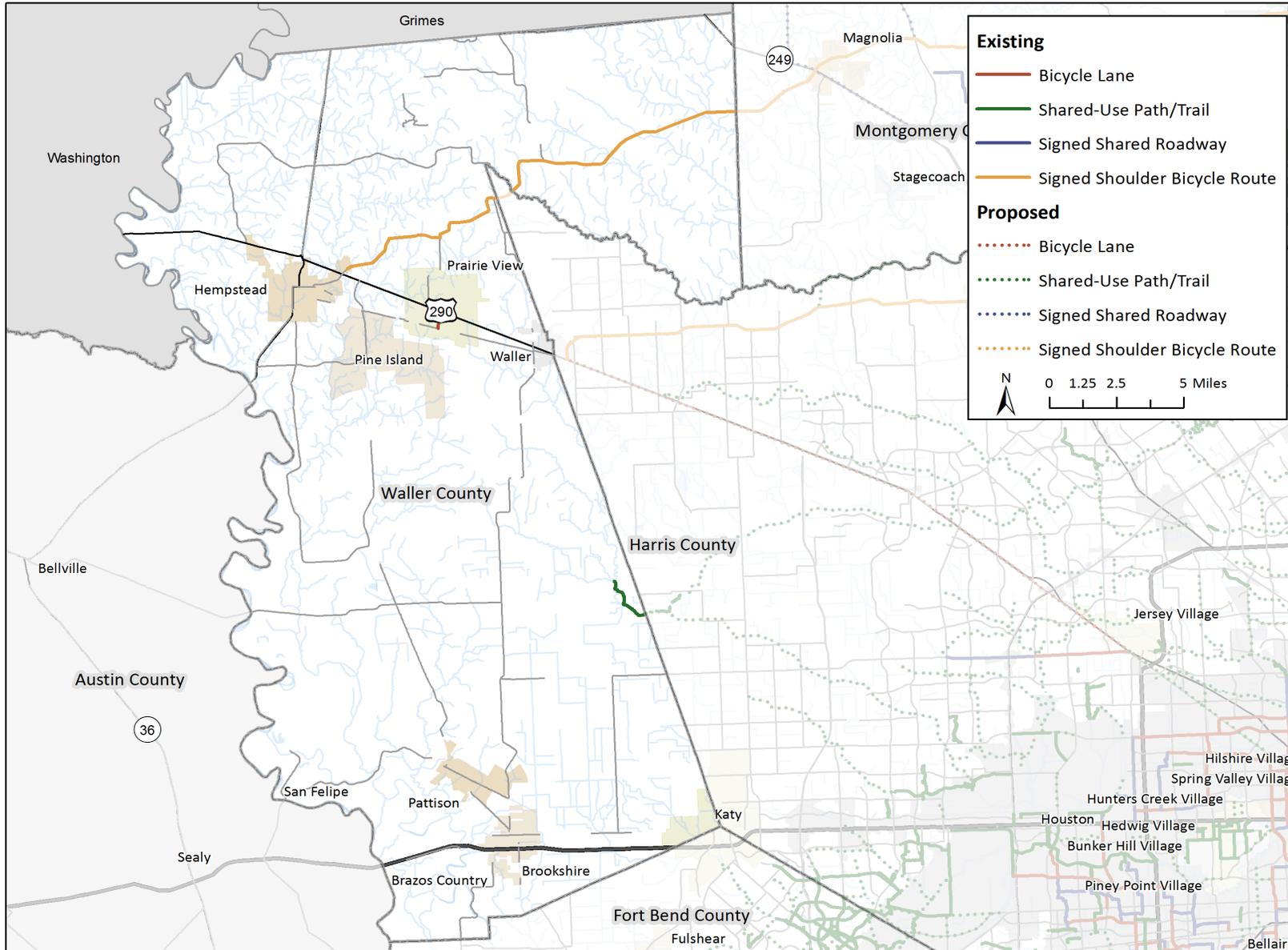
- Limited Access to Existing Facilities**  
 Few areas have existing pedestrian and bicycle facilities.

## Needs

- Parallel Routes**  
 Major inter-regional transportation corridors run through Waller County, linking Houston with other parts of the state. Interstate 10 and U.S. Route 290 provide direct routes to other cities, but high-speed traffic makes them inhospitable to bicyclists. Pedestrian and bicycle facilities could be provided along lower-volume roads that parallel these routes. For example, Old Houston Highway parallels U.S. Route 290 between Hempstead and Waller, but has lower posted speeds and carries less traffic than nearby thoroughfares. In southern Waller County, U.S. Route 90 provides an alternative route to Interstate 10.
- Connecting Rural Towns**  
 Bicycle facilities along existing rural highways could connect towns along U.S. Route 290 with those in southern Waller County.
- Brazos River Trail**  
 Bicycle facilities along the Brazos River, between U.S. 290 and Fort Bend County, could draw tourists interested in recreational rides.



# Bikeway Facilities Waller County



# Local Perspectives

## City of Hempstead *Demand for Pedestrian and Bicycle Improvements in Small Towns*

Hempstead (pop. 5,770), the seat of Waller County, is located 50 miles northwest of Downtown Houston. Incorporated in 1858, the city has long been a center of activity for the surrounding area. Much of the city is organized around a traditional street grid, with interconnected streets providing pedestrians and bicyclists with several routes to get where they want to go.

Recognizing the benefits of walking and biking, officials have been working to make improvements throughout the city. Many residents walk and bike, and they want more sidewalks, bicycle lanes, and other active transportation infrastructure. There are existing sidewalks in the historic downtown area, and the city is pursuing projects to provide pedestrian facilities elsewhere (including connections to local parks and recreational facilities). Some of these planned projects were identified in the Hempstead Livable Centers Study (2012), which the city completed in partnership with H-GAC. These improvements are intended to improve safety and make Hempstead an even better place to live, work, and play.



**“Sidewalks and other improvements are very much needed, and the citizens would love to have these types of facilities.”**

*Michael S. Wolfe: Mayor  
City of Hempstead*

# Building a Regional Network



## Building a Regional Network

Parts of our region have well-developed pedestrian and bicycle networks, but there are few routes between these localized systems. Working together, representatives from different communities helped identify where bikeways could link major destinations and activity centers.

Creating a regional bikeway network will take time, but will provide new opportunities for residents, businesses, and visitors. Through incremental

investment, inter-jurisdictional coordination, and creative partnerships, our region can build a world-class active transportation system in a fiscally responsible way.

### Priority Actions

As regional entities create new policies and invest in infrastructure improvements, they can **accelerate**, **facilitate** and **coordinate** development of our region’s pedestrian and bicycle network.

**Table 9: Priority Actions Supportive of Building a Regional Pedestrian and Bicycle Network**

	Action	Description
Facilitate	Create a System Vision	Work with stakeholders to create a long-term vision for what our region’s pedestrian and bicycle network should be like, and review that vision regularly (updating as necessary).
	Build Capacity	<ul style="list-style-type: none"> <li>• Provide communities with tools they can use to become more pedestrian- and bicycle-friendly, such as model policies and information on best practices.</li> <li>• Help communities develop pedestrian and bicycle projects of regional interest that can successfully compete for funding from federal, state, and local sources, and can be delivered on time</li> </ul>
	Collect Data	Collect data that will help communities: <ul style="list-style-type: none"> <li>• Determine the need for new and/or improved pedestrian and bicycle infrastructure (e.g. Pedestrian/Bicycle Counts, Infrastructure Inventory, etc.).</li> <li>• Evaluate the impact investments in pedestrian and bicycle infrastructure have on mobility.</li> </ul>
	Improve Cultural Awareness	<ul style="list-style-type: none"> <li>• Assist regional and local entities in developing and maintaining programs that raise public awareness of the benefits of walking and biking.</li> <li>• Promote safe travel techniques for pedestrians and bicyclists.</li> <li>• Encourage motorists to be aware of pedestrians and bicyclists traveling throughout the region.</li> </ul>
Accelerate	Reward Local Planning and Investment	Prioritize investment within jurisdictions that have: <ul style="list-style-type: none"> <li>• Developed a local pedestrian and/or bicycle plan;</li> <li>• Implemented pedestrian- and bicycle-friendly policies and programs; and/or</li> <li>• Used non-federal funding sources to complete local pedestrian and bicycle projects.</li> </ul>
	Invest in Pilot Projects	Provide financial and technical support to innovative pedestrian and bicycle projects that will spur local investment in underserved communities and/or serve as demonstration projects.



**Table 9: Priority Actions Supportive of Building a Regional Pedestrian and Bicycle Network**

	Action	Description
Coordinate	Promote Interjurisdictional and Intermodal Coordination	<ul style="list-style-type: none"> <li>• Help communities and agencies work together during the planning, design, and construction of interjurisdictional pedestrian and bicycle projects.</li> <li>• Continue to integrate pedestrian and bicycle improvements into subregional plans, access management studies, and other regional planning efforts.</li> </ul>
	Connect Facilities	Prioritize investment in projects that eliminate major gaps in the regional pedestrian and bicycle network and/or connect localized networks.
	Institutionalize Active Transportation Planning	<ul style="list-style-type: none"> <li>• Establish a framework that promotes collaboration amongst federal, state, regional, and local entities during the planning, design, and construction of all transportation projects.</li> <li>• Develop regional policy describing how the needs of pedestrians, bicyclists, motorists, and transit users should be integrated into the planning and design of different types of transportation projects.</li> <li>• Work with federal and state agencies to reduce the regulatory burdens associated with utilizing federal funds to complete pedestrian and bicycle projects of regional interest.</li> </ul>

To maximize the impact of public dollars, our region should direct federal transportation funding to pedestrian and bicycle construction projects that will have the greatest impact on regional mobility. Table 10 describes characteristics of pedestrian and bicycle projects that are of regional interest.

**Table 10: Defining Pedestrian and Bicycle Investments of Regional Interest**

Pedestrian and bicycle construction projects seeking inclusion within the Transportation Improvement Program (TIP) should achieve at least two (2) of the following goals:	
<i>Eliminate a Major Barrier</i>	Provide safe and convenient routes across barriers, such as freeways, tollways, railroads, and waterways. Close gaps in the existing bicycle network that align with regional bikeways shown on the <i>Regional Bikeway Concept Map</i> .
<i>Connect to Transit</i>	Provide connections to regional and local transit systems.
<i>Connect to Activity Centers</i>	Provide connections to, or within, activity centers.*
<i>Realize Recommendations in Regional and Local Plans/Studies</i>	Implement recommendations described within an H-GAC Special Districts Study, an H-GAC Livable Centers Study, or other multi-jurisdictional or local plan.
<i>Accommodate Multiple Modes of Transportation</i>	Support construction or rehabilitation projects along major thoroughfares that include safe accommodations for pedestrians, bicyclists, motorists, and transit users (within existing or planned service areas).

\*Density thresholds for different types of activity centers are defined within the Livable Centers Benefits Calculator, which is available online at [www.h-gac.com/community/livablecenters/tools.aspx](http://www.h-gac.com/community/livablecenters/tools.aspx).



## Regional Bikeway Concept Map

The Regional Bikeway Concept Map establishes an overarching vision of how our region’s active transportation network could develop over the next 20 to 30 years. It shows major destinations and activity centers and how they could be connected with bicycle infrastructure.

### Regional Bikeways

Regional bikeways are the “freeways” of the regional bikeway network, facilitating long-distance biking between activity centers and areas with significant cultural and/or natural resources. Public agencies, non-profits, and developers can work together to build these connections by constructing new facilities or adding appropriate bicycle infrastructure when reconstructing (or repaving) existing roadways.

Regional bikeways do not follow a specific route, but show general linkages that could be made between destinations. Exact routing would be based on local support and feasibility. Some bikeways can extend to the boundaries of the eight-county region, allowing the network to connect to the rest of the state.

69 regional bikeways have been identified as critical to creating a safe, convenient, well-connected bicycle network (Table 11). These routes are intended to:

- **Facilitate Safe and Continuous Travel Between Regional Destinations**  
In recent years, there has been significant investment in bicyclist infrastructure, yet gaps remain that limit regional connectivity. Strategic connections will facilitate bicycle travel between destinations in urban, suburban, and rural areas.
- **Overcome Locally-Identified Physical Barriers and System Gaps**  
Local stakeholders identified routes needed to improve safety and make biking more convenient. The regional bikeways proposed align with many of these routes.
- **Be Equitability Distributed**  
With these connections, the regional bikeway network would extend to cities, suburban areas, and small towns in all eight counties that are part of the TMA.

- **Connect to State and National Bicycle Networks**

Where appropriate, regional bikeways align with existing or proposed state and national bikeways, accommodating inter-regional travel (and the economic opportunities associated with bicycling tourists).

- **Create Economic Development Opportunities**

Bicycling is a multi-billion dollar industry nationwide. Creating a well-connected bikeway network linking noteworthy cultural and natural resources will attract bicyclists from across our region and beyond, increasing tourism.

### How was the *Regional Bikeway Concept Map* Developed?

Local officials identified bicycle routes needed to improve connectivity within their communities. Routes were delineated, but the types of facilities (shared-use path, bicycle lanes, etc.) were not determined.



H-GAC mapped the identified needs and existing facilities, highlighting localized pedestrian and bicycle networks and areas that could become more walkable and bikeable.



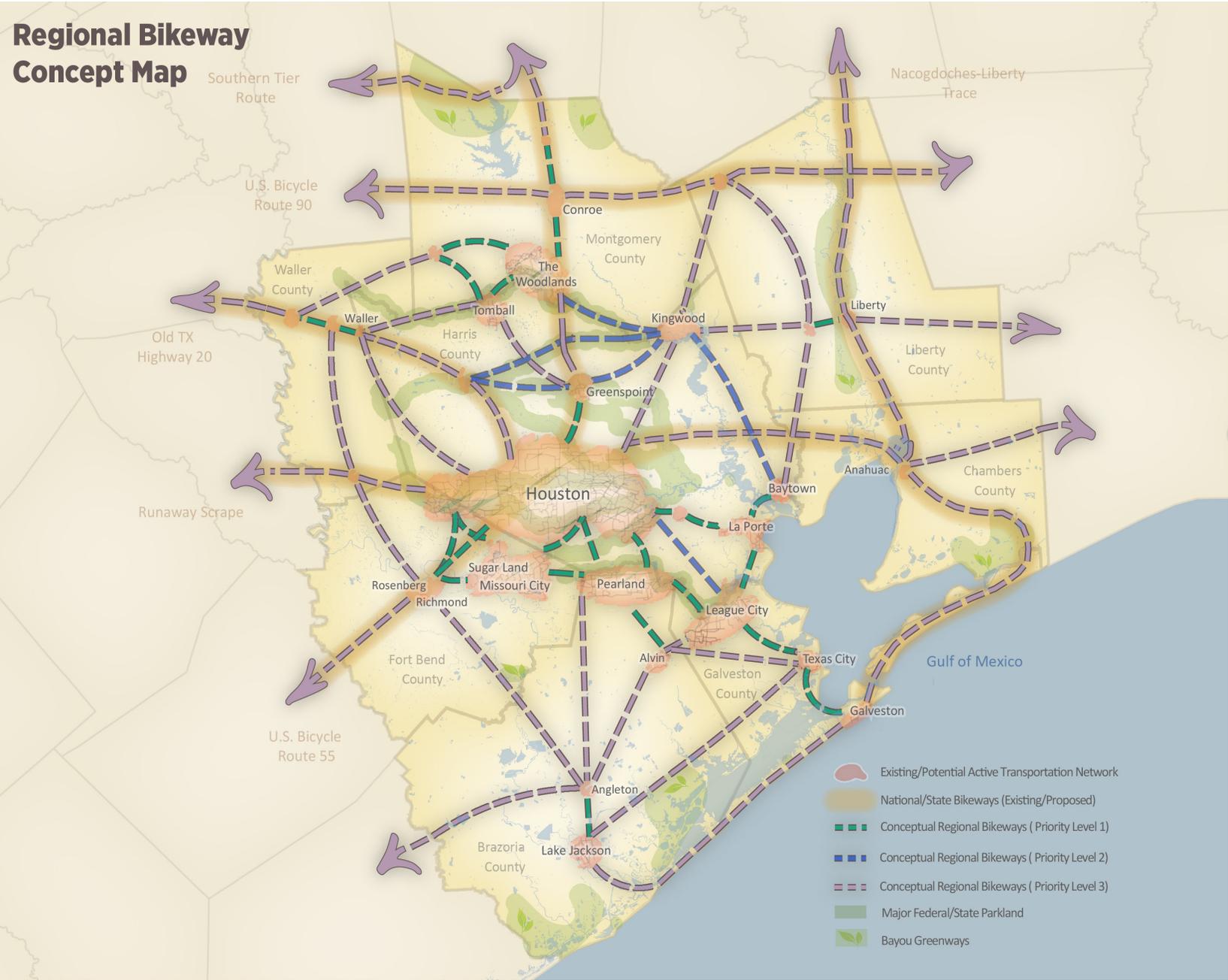
H-GAC proposed possible connections between existing and potential localized networks.



Stakeholders discussed and evaluated the conceptual routes shown on the *Regional Bikeway Concept Map*.



# Regional Bikeway Concept Map



In addition to the regional bikeways described, several other features are shown:

**Existing/Potential Active Transportation Networks**

*Existing/Potential Active Transportation Networks* are hubs of the regional bikeway network, serving as the origin or destination for many bicycle trips. These places include:

- Areas with an existing or planned interconnected bicycle network;
- Areas with an existing interconnected street network that could support walking and biking;
- Existing or emerging population and employment centers;
- Historic community centers;
- Areas near significant cultural and/or natural resources; and
- Areas included within an H-GAC Livable Centers Study.

**National and State Bikeways (Existing/Proposed)**

National Bikeways include existing or proposed multi-state bicycle routes promoted by the Adventure Cycling Association and/or designated by the American Association of State Highway and Transportation Officials (AASHTO). Some of the national bikeways are conceptual. They do not follow a specific route, but delineate the general area where a route may be developed; communities can determine the exact location of these routes, based on local conditions.

State Bikeways include routes promoted by Bike Texas (a bicycle advocacy group) and other groups as “heritage cycling routes.” These routes generally follow historically-significant roads. Many do not follow an officially-recognized route.

**Major Federal/State Parkland**

Thousands of acres of land in our region are managed by federal and state agencies for public use, providing residents and visitors with numerous recreational opportunities. These destinations include Sam Houston National Forest, national wildlife refuges, state parks, state recreation areas, and state historic sites.

**Relationship between Regional Bikeways and Localized Active Transportation Networks**

The regional bikeways and existing/potential active transportation networks shown on the Regional Bikeway Concept Map are both integral parts of our region’s pedestrian and bicycle network. While regional bikeways would provide inter-jurisdictional connections and facilitate long-distance travel, investments in localized networks provides greater opportunities for walking and biking to everyday destinations. As regional bikeways are constructed, enhancement of these localized networks will improve the connectivity and safety of the overall network. To improve localized networks, communities can pursue transportation projects that:

- Connect activity centers, neighborhoods, schools, transit routes, recreation areas, and community destinations with pedestrian and bicycle infrastructure;
- Eliminate gaps in the existing pedestrian and bicycle network;
- Provide safe and convenient routes across barriers, such as freeways, tollways, railroads and waterways; and
- Create end-of-trip facilities along key pedestrian and bicycle routes.

Different types of pedestrian and bicycle infrastructure would be employed in each component of the regional network, depending on the context of the surrounding community and characteristics of nearby roadways. See *Programs and Strategies* to learn more about the different types of pedestrian and bicycle infrastructure.



Table 11: Regional Bikeways

Connection	Distance (Miles)	Estimated Cost*
Alvin-Angleton	17.4	\$7,314,670
Anahuac-East Houston	41.1	\$17,264,275
Anahuac-Galveston	53.2	\$22,365,510
Anahuac-Jefferson County Line	19.0	\$7,974,955
Angleton-Lake Jackson	5.6	\$2,352,364
Angleton-Matagorda County Line	22.3	\$9,362,341
Baytown-La Porte	4.0	\$1,677,736
Brookshire-Austin County Line	4.8	\$2,033,374
Brookshire-Richmond/Rosenberg	16.5	\$6,913,925
Cleveland-Conroe	20.6	\$8,668,322
Cleveland-Hardin County Line	23.0	\$9,660,710
Cleveland-Kingwood	17.7	\$7,423,957
Cleveland-Liberty	23.6	\$9,904,385
Conroe-Grimes County Line	19.6	\$8,227,593
Conroe-The Woodlands	5.7	\$2,382,351
Cypress-Northwest Houston	11.1	\$4,643,253
Cypress-Waller	14.2	\$5,963,310
Dayton-Baytown	19.9	\$8,355,054
Dayton-Kingwood	14.5	\$6,073,939
Galveston-Lake Jackson	43.9	\$18,456,720
Hempstead-Washington County Line	5.0	\$2,094,586
Houston Greenspoint-Cypress	13.6	\$5,723,244
Houston Greenspoint-North Central Houston	5.8	\$2,441,963
Kingwood-Baytown	22.6	\$9,501,668
Kingwood-Cypress	27.4	\$11,502,028
Kingwood-Houston	17.3	\$7,258,822
Kingwood-Houston Greenspoint	11.9	\$5,011,679
Kingwood-The Woodlands	14.9	\$6,242,093
La Porte-League City/Nassau Bay	5.7	\$2,382,325
La Porte-Pasadena	5.2	\$2,169,656
League City-Alvin	2.1	\$864,392

Table 11: Regional Bikeways

Connection	Distance (Miles)	Estimated Cost*
League City-Texas City	9.1	\$3,806,514
Liberty-Anahuac	21.3	\$8,952,053
Liberty-Dayton	4.3	\$1,817,849
Liberty-Jefferson County	20.4	\$8,571,363
Liberty-Polk County Line	28.6	\$12,008,511
Magnolia-Hempstead	19.6	\$8,240,765
Magnolia-Tomball	8.2	\$3,462,078
North Montgomery County/Lake Conroe	12.0	\$5,051,059
Pasadena-East Houston	2.3	\$960,121
Pearland-Alvin	8.1	\$3,387,872
Pearland-Angleton	25.2	\$10,568,344
Pearland-League City	5.3	\$2,225,606
Pearland-Missouri City	4.2	\$1,747,152
Prairie View-Brookshire	19.1	\$8,039,772
Prairie View-Hempstead	3.7	\$1,543,215
Richmond/Rosenberg-Angleton	32.8	\$13,790,808
Richmond/Rosenberg-Southwest Houston	9.2	\$3,873,484
Richmond/Rosenberg-West Houston	7.9	\$3,330,813
Richmond/Rosenberg-Wharton Cty. Line	12.7	\$5,338,922
Southeast Houston-League City	13.7	\$5,762,646
Southeast Houston-Pearland East	4.3	\$1,801,711
Southwest Houston-Missouri City	7.1	\$2,992,444
Southwest Houston-Pearland West	6.7	\$2,831,678
Sugar Land-Richmond	2.9	\$1,227,996
Sugar Land-West Houston	5.7	\$2,410,142
Texas City-Alvin	17.7	\$7,444,914
Texas City-Galveston	9.1	\$3,826,310
Texas City-Lake Jackson	36.5	\$15,333,864



Connection	Distance (Miles)	Estimated Cost*
The Woodlands-Houston Greenspoint	11.3	\$4,760,694
The Woodlands-Magnolia	9.1	\$3,840,533
The Woodlands-Tomball	3.6	\$1,503,842
Tomball-Houston Greenspoint	13.0	\$5,464,642
Tomball-Waller	16.0	\$6,731,353

Connection	Distance (Miles)	Estimated Cost*
Waller-Prairie View	3.0	\$1,256,383
Waller-West Houston	23.4	\$9,836,169
West Houston-Brookshire	9.3	\$3,913,829
Willis-Conroe	5.2	\$2,198,458
Willis-Walker County Line	5.1	\$2,147,834
<b>Total</b>	<b>986.0</b>	<b>\$414,212,941</b>

\*Estimated costs are based on constructing different facility types in the same proportion as they currently exist (Bicycle Lane: 12%, Shared-Use Path/Trail: 57%, Signed Shared Roadway: 10%, and Signed Shoulder Bike Route: 21%). The following estimates were used:

- Bicycle Lane: \$40,000/mile
- Shared-Use Path/Trail: \$725,000/mile
- Signed Shared Roadway: \$13,750/mile
- Signed Shoulder Bike Route: \$3,200/mile (if there is an existing shoulder)

These estimates should be used for planning purposes only, and do not consider the presence of existing or proposed facilities. Actual costs vary, depending on topography, available right-of-way, and other site-specific conditions.



# Prioritizing Regional Bikeways

The conceptual regional bikeways will develop over time, as funding becomes available. To maximize the impact on regional mobility, investment in regional bikeways will be prioritized as follows:

Priority	Level 1: Complete Shorter Segments (≤ 10 miles) between Localized Networks	
Rationale	Prioritize implementation of regional bikeways less than ten (10) miles in length that connect nearby localized pedestrian/bicycle networks. Completion of these facilities could have the greatest impact on regional mobility; they will connect two or more localized pedestrian/bicycle networks at a relatively low cost, allowing residents to bike longer distances. Most of these bikeways are located in developed parts of our region, providing benefits to existing rural, suburban, and urban communities. Short segments that extend to the edge of our region and do not link localized networks were excluded.	
Number of Segments	28	
Length (miles)	162.41	
Estimated Cost	\$68,228,818	
Applicable Bikeways	Angleton-Lake Jackson Baytown-La Porte Conroe-The Woodlands Houston-Greenspoint-North Central Houston La Porte-League City/Nassau Bay La Porte-Pasadena League City-Alvin League City-Texas City Liberty-Dayton Magnolia-Tomball Pasadena-East Houston Pearland-Alvin Pearland-League City Pearland-Missouri City	Prairie View-Hempstead Richmond/Rosenberg-Southwest Houston Richmond/Rosenberg-West Houston Southwest Houston-Missouri City Southeast Houston-Pearland East Southwest Houston-Pearland West Sugar Land-Richmond Sugar Land-West Houston Texas City-Galveston The Woodlands-Magnolia The Woodlands-Tomball Waller-Prairie View West Houston-Brookshire Willis-Conroe

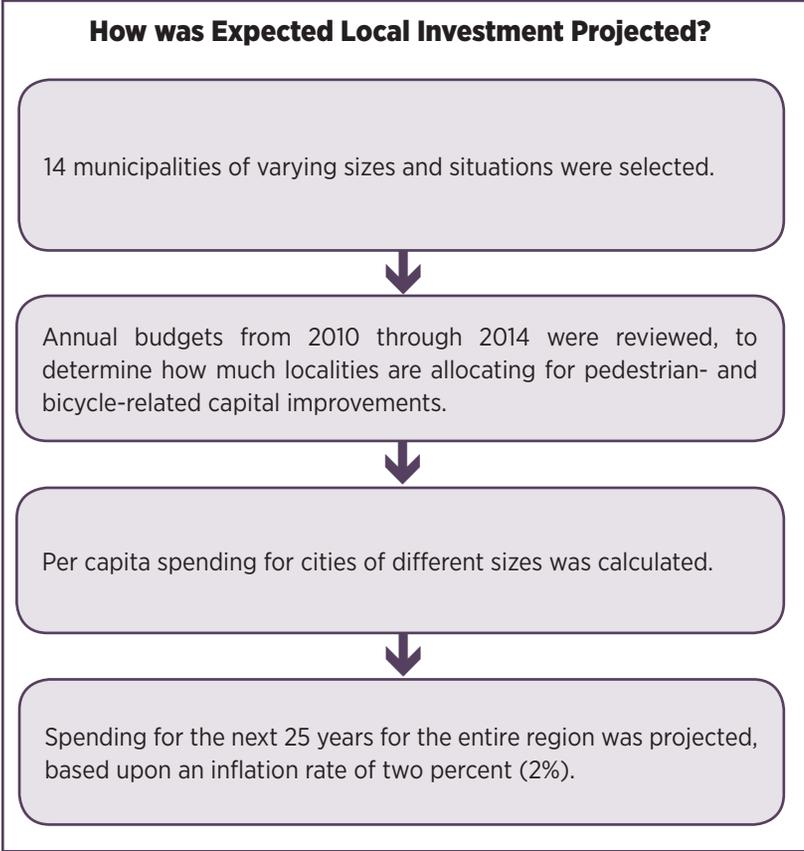


Priority	Level 2: Complete Longer Segments (>10 miles) where Local Investment is Planned or Underway	
Rationale	Some of the proposed regional bikeways align with existing or planned on- and off-road bicycle facilities. Completed or planned investments along these routes demonstrate a local commitment to improving the area's active transportation network.	
Number of Segments	5	
Length (miles)	92.20	
Estimated Cost	\$38,731,678	
Applicable Bikeways	Kingwood-Baytown Kingwood-Cypress Kingwood-The Woodlands	Southeast Houston-League City Houston Greenspoint-Cypress

Priority	Level 3: Complete Longer Segments (>10 miles) with Limited Local Investment Planned or Underway	
Rationale	Some of the proposed regional bikeways span long distances (greater than 10 miles). These bikeways not only connect distant localized networks, but improve access to federal/state parkland and accommodate inter-regional travel. Many of these proposed bikeways would not only serve a transportation function, but could create new economic development opportunities for surrounding communities. These bikeways should be funded primarily using non-federal funding sources.	
Number of Segments	36	
Length (miles)	731.38	
Estimated Cost	\$307,252,444	
Applicable Bikeways	Galveston-Lake Jackson Hempstead-Washington County Line Kingwood-Houston Kingwood-Houston Greenspoint Liberty-Anahuac Liberty-Jefferson County Liberty-Polk County Line Magnolia-Hempstead North Montgomery County/Lake Conroe Pearland/Angleton	Prairie View-Brookshire Richmond/Rosenberg-Angleton Richmond/Rosenberg-Wharton County Line Texas City-Alvin Texas City-Lake Jackson The Woodlands-Houston Greenspoint Tomball-Houston Greenspoint Tomball-Waller Waller-West Houston Willis-Walker County Line

# Expected Local Investment in Pedestrian and Bicycle Infrastructure

Developing a well-connected regional pedestrian and bicycle network will require significant investment. Many communities are already dedicating funds to build new sidewalks and bicycle facilities and improve existing infrastructure. If cities throughout the region continue to invest in pedestrian and bicycle infrastructure at current levels, they are projected to spend approximately \$1.36 billion over the next 25 years (2015 - 2040)



# Local Perspectives

## Houston Downtown Management District *Enhancing Existing Active Transportation Networks*

Since Houston’s founding in 1836, Downtown has been a major activity center. More than 140,000 employees work in the area, and hundreds of thousands of visitors attend conferences and other events at local venues. Although pedestrian and bicycle facilities already exist, several entities are working together to make walking and biking more appealing to residents, workers, and tourists.

Downtown Houston has one of the most well-developed pedestrian networks in our region. Generous sidewalks, short block lengths, gridded streets, and a mix of uses make walking convenient. Several streetscape improvement projects are planned or underway, which will further enhance pedestrians’ experiences. With several bus routes, light rail stations, and bikeshare facilities in the area, pedestrians have easy access to other modes of transportation.

Designated bicycle routes cross Downtown Houston. Those following signed bicycle routes must ride in the street with automobile traffic, which is unappealing to novice bicyclists. Stakeholders and city leadership are focused on providing bicycle facilities that will better connect nearby shared-use paths with Downtown destinations. In late 2014, city officials announced plans for installing a two-way cycletrack along Lamar Street.

Balancing the needs of all network users with the expectations of adjacent property owners can be difficult in an urban environment. Despite the challenges, pedestrian- and bicycle-friendly projects can provide significant economic returns. Trail projects currently under construction near Allen’s Landing and at Buffalo Bayou Park, plus the Sabine-to-Bagby Promenade and Sesquicentennial Park, are already popular destinations for residents and visitors. Continued investment in pedestrian and bicycle infrastructure will make Downtown Houston an even better place to live, visit, and do business.



**“Downtown has been and will continue to be Houston’s core for business, civic and cultural activity. Along with surrounding central city neighborhoods, continued growth and development makes Downtown a highly sustainable community primed for all modes of transportation with great connections to the entire region.”**

***Lonnie Hoogeboom:  
Director of Planning, Design & Development  
Houston Downtown Management District***

# Programs and Strategies



## Program and Strategies

Different policies, programs, and design techniques can be used to maximize the impact public and private investments have on long-term pedestrian and bicyclist mobility. These strategies can be implemented on a regional scale through partnerships, or locally by public and private entities. Communities can choose whether or not to adopt the recommended policies, programs and initiatives, which can be tailored to meet local needs and preferences.

Implementing these strategies requires coordinated efforts between land use and transportation planners, traffic engineers, public works employees, and parks personnel, often with the involvement of other public and private organizations. The broad support of community members, local staff, elected officials, and other partners is needed to ensure that our region’s active transportation infrastructure is maintained and the network is expanded.

Policies			
Policy	Description	Implementers	Benefits
Development Regulations/ Incentives	<p>Local governments are equipped with a range of regulatory tools to incentivize or mandate the provision of pedestrian and bicycle facilities. These tools may be used to not only improve infrastructure, but address building design and placement, which influences the safety and appeal of walking and biking. For example:</p> <ul style="list-style-type: none"> <li>• <i>Subdivision ordinances</i> can encourage or require sidewalks in new developments; shorter blocks; narrower, pedestrian-friendly streets; and an interconnected road network.</li> <li>• <i>Zoning regulations</i> can offer density bonuses to developers that provide exceptional pedestrian or bicycle improvements, or allow for reduced setbacks and the use of architectural treatments that make walking and biking more appealing.</li> <li>• <i>Parking regulations</i> can encourage or require that on-site bicycle parking be provided, and that parking lots be located behind buildings to create a pedestrian-friendly streetscape.</li> <li>• <i>Road design manuals</i> can encourage adherence to complete street principles and allow for narrower residential streets that slow traffic, making walking and biking safer.</li> </ul>	<ul style="list-style-type: none"> <li>• Local Governments</li> </ul>	<ul style="list-style-type: none"> <li>• Improves safety</li> <li>• Improves comfort for pedestrians and bicyclists</li> <li>• Increases community desirability and livability</li> <li>• Reduces vehicular trips</li> <li>• Provides greater transportation options</li> </ul>

Policies			
Policy	Description	Implementers	Benefits
Complete Streets	<i>Complete Streets</i> is a movement to ensure that roadways improve the mobility and safety of all travelers (pedestrians, bicyclists, motorists, transit users, etc.) using context-sensitive designs that reflect the character of the surrounding community. For example, a suburban street built to these standards may have sidewalks, bicycle lanes, and highly-visible pedestrian crossings, in addition to lanes for vehicular traffic. Localities nationwide have committed to building complete streets through legislation, internal policy, and revised design manuals.	<ul style="list-style-type: none"> <li>Local Governments</li> <li>Developers</li> </ul>	<ul style="list-style-type: none"> <li>Improves safety</li> <li>Improves comfort for pedestrians and bicyclists</li> <li>Increases community desirability and livability</li> <li>Provides greater transportation options</li> </ul>
Siting of Public Buildings	Communities can promote walking and biking by locating schools, libraries, social support services, and other public buildings in higher-density areas with good pedestrian and bicycle infrastructure.	<ul style="list-style-type: none"> <li>Local Governments</li> </ul>	<ul style="list-style-type: none"> <li>Improves accessibility of government services</li> <li>Reduces vehicular trips</li> </ul>
Full Cost/Benefits Analysis	Transportation planning in our region has historically emphasized improving highway congestion and air quality, but other considerations must be weighed in prioritizations to ensure a balanced transportation system. Possible prioritization measures could include safety, economic development, social equity, public health, and community identity.	<ul style="list-style-type: none"> <li>State Agencies</li> <li>Metropolitan Planning Organizations</li> <li>Local Governments</li> </ul>	<ul style="list-style-type: none"> <li>Provides greater transportation options</li> <li>Make the distribution of transportation funding more equitable</li> </ul>



<b>Programs</b>			
<b>Policy</b>	<b>Description</b>	<b>Implementers</b>	<b>Benefits</b>
Safe Routes to School Programs	The Federal Safe Routes to School Program (now funded as part of the <a href="#">MAP-21 Transportation Alternatives Program</a> ) provides funding to communities interested in making walking and biking safe for children traveling to and from school. Local governments and school districts can adopt similar programs, using local funding to make infrastructure improvements and provide educational programs aimed at promoting walking and biking amongst school-aged children.	<ul style="list-style-type: none"> <li>Local Governments</li> <li>School Districts</li> </ul>	<ul style="list-style-type: none"> <li>Improves safety</li> <li>Improves comfort for pedestrians and bicyclists</li> <li>Increases community desirability and livability</li> <li>Provides greater transportation options</li> <li>Reduces vehicular trips</li> <li>Promotes physical activity, improving overall health</li> </ul>
Bike-to-Work Days	Many employers are organizing bike-to-work days, encouraging their workers to try commuting by bicycle.	<ul style="list-style-type: none"> <li>Local Governments</li> <li>School Districts</li> <li>Businesses</li> <li>Non-Profits</li> </ul>	<ul style="list-style-type: none"> <li>Promotes bicycling as a viable transportation option</li> <li>Demonstrates local support for alternative transportation options</li> </ul>
Employee Incentives for Walking/Biking	Public and private employers can offer incentives to workers who choose to walk or bike to work. For example, participating employers can provide free bicycle tune-ups, loaner bicycles, secure bicycle parking, locker rooms, cash incentives, and/or a free ride home in case of a family emergency.	<ul style="list-style-type: none"> <li>Local Governments</li> <li>School Districts</li> <li>Businesses</li> </ul>	<ul style="list-style-type: none"> <li>Reduces employers' parking and healthcare costs</li> <li>Promotes walking and bicycling as viable transportation options</li> </ul>
Bikeshare Programs	Bikeshare is a system that makes bicycles available for short-term rental. Users can rent a bicycle from one of several hubs, and return it within a few hours to any station in the system. The program is most successful in bikeable areas that have a variety of destinations within close proximity.	<ul style="list-style-type: none"> <li>Local Governments</li> <li>School Districts</li> <li>Non-Profits</li> </ul>	<ul style="list-style-type: none"> <li>Provides greater transportation options</li> </ul>
Scenic Bikeways Programs	Scenic bikeways are bicycle-friendly routes that connect unique natural, historic, and/or cultural attractions, particularly those located in rural areas. These routes are marked with directional signage and identified on maps and other marketing materials.	<ul style="list-style-type: none"> <li>Federal Agencies</li> <li>State Agencies</li> <li>Local Governments</li> <li>Non-Profits</li> </ul>	<ul style="list-style-type: none"> <li>Promotes tourism</li> </ul>

<b>Maintenance/Operations</b>			
<b>Policy</b>	<b>Description</b>	<b>Implementers</b>	<b>Benefits</b>
Pedestrian/ Bicyclist Counts	Different tools can be used to count the number of pedestrians and/or bicyclists traveling along an identified route or facility, including infrared detectors and computer visioning technology. Information collected is often used to help prioritize transportation improvements.	<ul style="list-style-type: none"> <li>• Local Governments</li> <li>• Non-Profits</li> </ul>	<ul style="list-style-type: none"> <li>• Helps identify areas with high pedestrian and bicyclist activity</li> <li>• Helps determine where infrastructure improvements are needed</li> <li>• Helps prioritize transportation improvements</li> </ul>
Facility Inventory	A facility inventory identifies the location and condition of pedestrian and/or bicycle infrastructure in a specific area. Information collected is maintained in an easy-to-understand database.	<ul style="list-style-type: none"> <li>• Local Governments</li> <li>• Non-Profits</li> </ul>	<ul style="list-style-type: none"> <li>• Helps determine where existing infrastructure is and where improvements are needed</li> <li>• Helps active transportation users navigate the community</li> </ul>
Maintenance Plans	A maintenance plan prioritizes and schedules maintenance and upgrades for pedestrian and bicycle infrastructure, helping ensure these facilities remain in adequate condition.	<ul style="list-style-type: none"> <li>• Local Governments</li> </ul>	<ul style="list-style-type: none"> <li>• Helps communities work proactively to maintain infrastructure</li> </ul>
Adopt-a-Path Programs	As part of adopt-a-path programs, citizens, non-profits, and businesses help maintain publicly-owned pedestrian and bicycle facilities by providing financial support and/or volunteering to complete maintenance activities.	<ul style="list-style-type: none"> <li>• Local Governments</li> <li>• Non-Profits</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces maintenance costs</li> <li>• Prevents deterioration of pedestrian and bicycle facilities</li> </ul>



<b>Safety</b>			
<b>Policy</b>	<b>Description</b>	<b>Implementers</b>	<b>Benefits</b>
Safety Education Courses	Safety education courses teach people of all ages and abilities how to walk and bike safely in a variety of environments. Pedestrian- and bicycle-friendly curriculum can be taught at schools, in after-school programs, at workshops, or through online courses.	<ul style="list-style-type: none"> <li>Local Governments</li> <li>School Districts</li> <li>Non-Profits</li> </ul>	<ul style="list-style-type: none"> <li>Improves safety</li> <li>Improves comfort for pedestrians and bicyclists</li> <li>Promotes bicycling as a viable transportation option</li> </ul>
Walking Buses	Walking (and biking) school buses are groups of students that walk or ride together to school, usually under adult supervision. Many school districts work with volunteers to plan and organize walking buses.	<ul style="list-style-type: none"> <li>Local Governments</li> <li>School Districts</li> <li>Individuals</li> </ul>	<ul style="list-style-type: none"> <li>Improves safety</li> <li>Reduces vehicular trips</li> <li>Promotes physical activity, improving overall health</li> </ul>
Safe Passing Ordinances	Safe Passing Ordinances define a minimal clearance motorists must heed when passing vulnerable road users, such as pedestrians and bicyclists.	<ul style="list-style-type: none"> <li>Local Governments</li> </ul>	<ul style="list-style-type: none"> <li>Improves safety</li> <li>Improves comfort for pedestrians and bicyclists</li> </ul>
Strengthening Enforcement	Communities can use a variety of different tactics to ensure that laws related to pedestrian and bicyclist safety are adhered to, such as assigning bicycle officers to areas with high amounts of pedestrian and bicyclist traffic or using undercover “pedestrian” police officers to enforce applicable laws.	<ul style="list-style-type: none"> <li>Local Governments</li> </ul>	<ul style="list-style-type: none"> <li>Improves safety</li> </ul>

## Design

A variety of facility types can be used to safely accommodate pedestrians and bicyclists. When choosing which facility types to utilize, it is important to consider roadway design, traffic speed and volume, expected pedestrian and bicyclist activity, and surrounding land uses. A combination of facility types can be employed along a single stretch of roadway, creating an environment that supports multiple modes of travel.

Bicycle Facility Types	Pedestrian Facility Types/Improvements	End-of-Trip Facilities
Bicycle Lanes	Sidewalks	Bicycle Parking (Bike Racks, Bike Lids, Enclosed Bike Shelters)
Bicycle Routes	Shared-Use Paths	Showers/Changing Rooms
Bicycle Boulevards	Paved Shoulders	Bicycle Repair Stations
Cycletracks/Sidepaths	Curb Ramps	
Shared-Use Paths	Crosswalks (Striped, Raised, In-Roadway Lighted)	
Shared Lanes/Sharrows	Curb Extensions	
Bike Boxes at Intersections	Median Refuge Islands	
Signed Shoulders	Countdown and Audible Pedestrian Signals	
	Grade-Separated Crossings (Overpasses/Underpasses)	
	Benches/Other Seating	
	Pedestrian Lighting	

Design considerations for pedestrian facilities are described in the [AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities](#), with additional guidance provided in H-GAC's [Pedestrian Pathways](#).

The [AASHTO Guide for the Development of Bicycle Facilities](#) should be consulted when designing, constructing, and maintaining infrastructure for bicyclists, as recommended by [TxDOT](#). Supplemental guidelines are also described in [Building Better Bikeways](#), a publication prepared by H-GAC. See the following pages for more detailed information on the types of bicycle facilities communities across the country are employing:



Signed Bicycle Path	
Description	Navigational signage directs bicyclists to safe routes they can consider using.
Typical Location	Low-volume, low-speed roadways (e.g. neighborhood streets)
Design Considerations	Provide bicycle route signs every ¼ mile and at intersections.
Planning Level Costs	Signs: \$400 per sign and post (every ¼ mile) TOTAL: \$3,200 per mile (both sides of roadway)



Houston, Texas

Shared Lane	
Description	Shared lanes encourage bicyclists and motorists to share the road, especially where a wide outside lane (14 feet or wider) exists. They sometimes utilize shared-lane markings.
Typical Location	Low- or medium-volume streets (e.g. collector streets). Prefer roadways with 4 or more lanes, which ease interactions between cyclists and motorists.
Design Considerations	<ul style="list-style-type: none"> <li>• Provide shared-lane markings every 250 feet, 4 feet from the edge of pavement or door zone of parked cars.</li> <li>• Provide bicycle route signage every ¼ mile and at intersections.</li> </ul>
Planning Level Costs	<ul style="list-style-type: none"> <li>• Signs: \$400 per sign and post (every ¼ mile)</li> <li>• Pavement Markings: \$250 per lane-use marking (every 250 feet)</li> </ul> TOTAL: \$3,200 per mile (both sides of roadway)



Austin, Texas

Bicycle Boulevard	
Description	Bicycle boulevards are roads that prioritize bicycling by employing an assortment of design techniques, especially at intersections. Bicycle boulevards frequently utilize traffic calming tools such as speed humps, chicanes, roundabouts, and neighborhood traffic circles.
Typical Location	Low-volume roadways, preferably those without significant commercial activity. They generally run parallel to a major roadway inhospitable to biking.
Design Considerations	<ul style="list-style-type: none"> <li>• Bicycle boulevards vary in design and cost, depending on the treatments used.</li> <li>• Channelization at intersections is desirable to limit through automobile traffic.</li> <li>• Traffic signals and/or pedestrian beacons are desirable at crossings with major streets.</li> <li>• Signage can be provided for navigation purposes.</li> </ul>
Planning Level Costs	<ul style="list-style-type: none"> <li>• Neighborhood Traffic Circles at Minor Cross Streets: \$20,000 (one every ¼ mile)</li> <li>• Channelization and Signage at Major Cross Streets: \$10,000 (one every ½ mile)</li> </ul> <p>TOTAL: \$100,000 per mile (alternative treatments can result in substantially higher or lower costs)</p>
 <p>Tucson, Arizona</p>	

Bicycle Lane	
Description	Bicycle lanes provide dedicated space in the road for bicyclists. Studies show that both drivers and cyclists behave less erratically when cyclists use bicycle lanes.
Typical Location	Low-, medium- or high-volume roadways, including minor arterials or arterials
Design Considerations	<ul style="list-style-type: none"> <li>• Bicycle lanes should be at least 4 feet wide on roadways with open shoulders, and at least 5 feet wide on roadways with curb and gutter and/or on-street parking.</li> <li>• Pavement markings should appear every ½ mile.</li> <li>• Bicycle lanes incorporated into the design of new roadways typically add a small amount to the total construction cost; however, retrofitting an existing road with additional pavement can have substantial costs.</li> </ul>
Planning Level Costs	<p>Estimate to Convert 4-Lane Undivided Highway to 3 Lanes with a Center Turn Lane (CTL) and bicycle lanes:</p> <ul style="list-style-type: none"> <li>• Pavement Markings (every ½ mile)</li> <li>• Lane Striping (yellow stripes for CTL and white stripes for bicycle lane)</li> <li>• Signs (provided with pavement markings every ½ mile)</li> </ul> <p>TOTAL: \$40,000 per mile (both sides)</p>
 <p>Houston, Texas</p>	



Buffered Bicycle Lane	
Description	Cross-hatching and other roadway markings are used to create a buffer between bicycle lanes and the main travel lanes. This buffer, which can vary in width, encourages automobiles to pass a safe distance from cyclists, increasing the comfort of those using the bicycle lane. If more than paint is used to define the buffer, the facility is generally considered a cycletrack (see below).
Typical Location	<ul style="list-style-type: none"> <li>• Roadways with high traffic volumes and/or speeds.</li> <li>• Roadways with on-street parking with a high turnover rate.</li> </ul>
Design Considerations	<ul style="list-style-type: none"> <li>• Bicycle lanes should be at least 5 feet wide with a striped and cross-hatched buffer separating it from automobile traffic. The buffer should be at least 2½ feet wide.</li> <li>• Bicycle pavement markings should be placed every ½ mile.</li> <li>• Bicycle lane signage may be added for navigation.</li> </ul>
Planning Level Costs	<ul style="list-style-type: none"> <li>• Buffer Striping</li> <li>• Other Roadway Striping</li> <li>• Pavement Markings (every ½ mile)</li> <li>• Signs (provided with pavement markings every ½ mile)</li> </ul> <p>TOTAL: \$56,000 per mile (both sides) (if included in design of new roadway)</p>



Austin, Texas

Cycletrack	
Description	A cycletrack is a one- or two-way bicycle facility that is within a roadway, but is separated from travel lanes (and sidewalks) by a curb, median, or other physical barrier.
Typical Location	Roadways with high traffic volumes and/or speeds.
Design Considerations	<ul style="list-style-type: none"> <li>• Cycletracks should be 8 to 10 feet wide to accommodate two-way traffic, with a buffer 2 feet wide on the side adjacent to the travel lane.</li> <li>• Separation from the travel lane is provided by a mountable curb or a combination of bollards and markings.</li> <li>• Specialized traffic signals should be provided at signalized intersections, especially for cycletracks that accommodate two-way traffic.</li> </ul>
Planning Level Costs	<ul style="list-style-type: none"> <li>• Mountable Curb: \$75,000 per mile</li> <li>• Bike Lane Pavement/Construction: \$160,000 per mile</li> <li>• Signal Modifications: \$75,000 per intersection (one every ¼ mile)</li> </ul> <p>TOTAL: \$535,000 per mile (one side of the roadway, includes curb, raised buffer, and additional roadway pavement)</p>



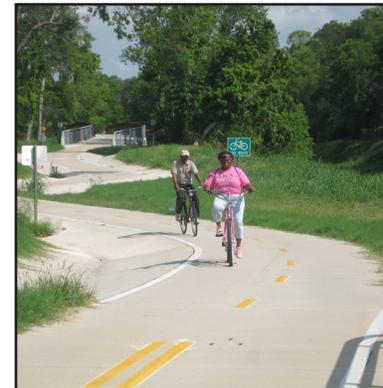
Austin, Texas

Sidepath	
Description	A sidepath is a one- or two-way bicycle facility located next to, but separated from, a roadway.
Typical Location	Adjacent to roadways with high traffic volumes and/or speeds.
Design Considerations	<ul style="list-style-type: none"> <li>• Sidepaths should be at least 10 feet wide to accommodate two-way traffic, with shoulders on either side that are at least 2 feet wide. If the path is only accommodating one-way traffic, the minimum recommended width is 6 feet.</li> <li>• The minimum recommended buffer between the roadway and sidepath is 5 feet.</li> </ul>
Planning Level Costs	<ul style="list-style-type: none"> <li>• Concrete Path (10 feet wide): \$270,000 per mile</li> <li>• Other Costs: \$100,000 (includes signage, driveway modifications, etc.)</li> </ul> <p>TOTAL: \$370,000 per mile</p>



Houston, Texas

Shared-Use Path	
Description	A shared-use path is a dedicated bicycle facility generally located outside of a road's right-of-way. Shared-use paths may also be used by pedestrians, skaters, joggers, and other non-motorized users.
Typical Location	<ul style="list-style-type: none"> <li>• Within an exclusive right-of-way, separated from automobile traffic.</li> <li>• Can be found along utility corridors, waterways and drainage facilities, and within parks.</li> </ul>
Design Considerations	Shared-use paths should be 10 to 14 feet wide to accommodate two-way traffic, with a shoulder 2 feet wide on each side of the facility.
Planning Level Costs	<ul style="list-style-type: none"> <li>• Concrete Path (12' Wide): \$325,000 per mile</li> <li>• Other Costs: \$400,000 per mile (includes wayfinding signage, hybrid pedestrian beacons at roadway intersections, drainage improvements, etc.)</li> </ul> <p>TOTAL: \$725,000 per mile (12' path)</p>



Harris County, Texas

Source: Shared Lane, Bicycle Boulevard, and Buffered Bicycle Lane from National Association of City Transportation Officials, Cycletrack from People for Bikes, All Other Photos by H-GAC

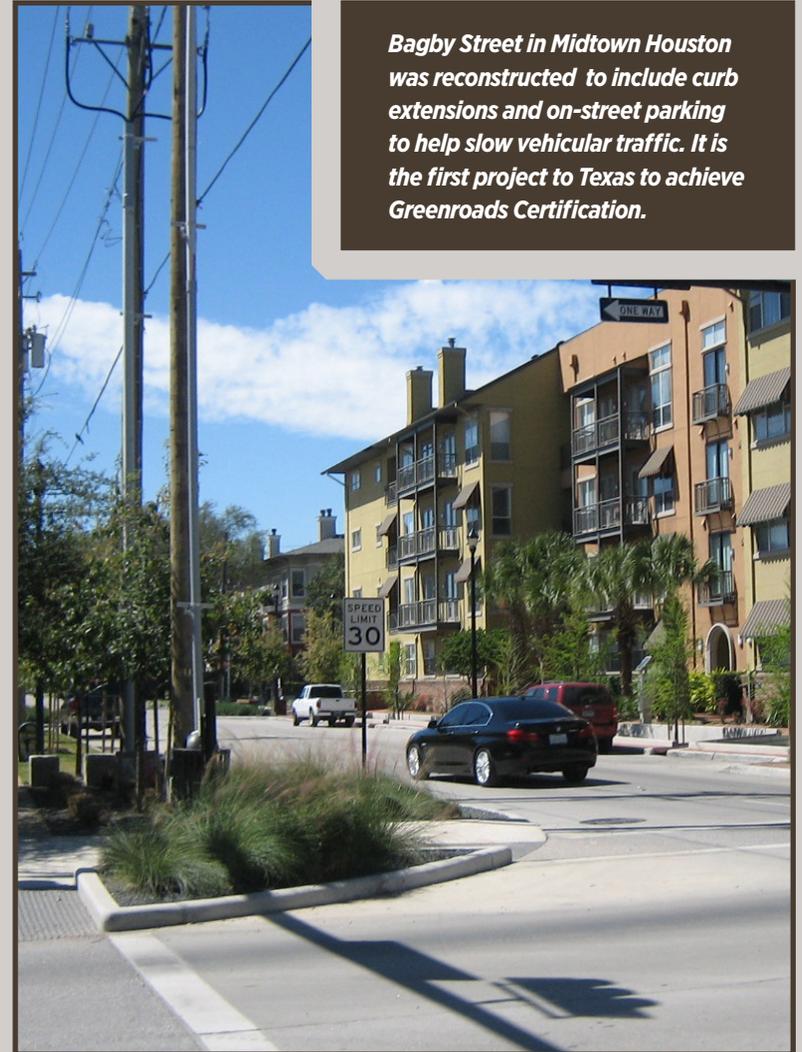


## Road Diets and Traffic Calming

To better accommodate pedestrians and bicyclists along an existing corridor, communities may choose to reduce the number and/or width of travel lanes devoted to automobile traffic. This reduction in lanes is known as a road diet, and can be a relatively inexpensive way to improve the safety and mobility of all travelers. For example, four-lane streets may be reconfigured to include two lanes for vehicular traffic and a shared left-turn lane, with bicycles lanes on either side of the road and pedestrian crossing islands at selected locations. The elements included in a particular road diet are based upon the context of the surrounding community. Roads with Average Daily Traffic (ADT) below 20,000 are considered the best candidates for a road diet.

Reconfiguring travel lanes as part of a road diet provides adequate accommodations for vehicles, bicyclists, and pedestrians, all without having to acquire additional right-of-way. To further improve the cost-effectiveness of these projects, they can be completed as the same time as scheduled resurfacing projects. Reducing vehicular travel lanes often slows traffic, improving safety for all roadway users. If done on appropriate roadways, road diets have been shown to increase foot and bicycle traffic without increasing traffic congestion. Some cities have even seen an increase in business activity along streets that have undergone a road diet.

Like road diets, traffic calming measures aim to make roadways suitable for multiple modes of transportation. Many of these measures aim to decrease vehicular speeds, reducing the risk and severity of traffic accidents. Examples of traffic calming measures include traffic circles, curb extensions, raised crosswalks and intersections, and speed humps. Existing streets can be retrofitted with these features, or they can be incorporated into new roadway designs. Like road diets, traffic calming measures are only appropriate for certain roadways, and the techniques used should reflect the character of the surrounding community.



*Bagby Street in Midtown Houston was reconstructed to include curb extensions and on-street parking to help slow vehicular traffic. It is the first project to Texas to achieve Greenroads Certification.*

## Addressing Infrastructure Needs

Pedestrian and bicycle accommodations can be incorporated into the design of new and reconstructed roadways; some can even be constructed as freestanding facilities. Public and private entities can address our region’s need for new pedestrian and bicycle facilities as they invest in transportation infrastructure (Table 12).

**Table 12: How Public and Private Entities can Address Infrastructure Needs**

Entity	Possible Actions
Metropolitan Planning Organization (MPO)	<ul style="list-style-type: none"> <li>• Prioritize investment in projects that eliminate major gaps in the regional pedestrian and bicycle network and/or connect localized networks.</li> <li>• Prioritize investment within jurisdictions that have:                             <ul style="list-style-type: none"> <li>· Developed a local pedestrian and/or bicycle plan;</li> <li>· Implemented pedestrian- and bicycle-friendly policies and programs; and/or</li> <li>· Used non-federal funding sources to complete local pedestrian and bicycle projects.</li> </ul> </li> <li>• Provide financial and technical support to innovative pedestrian and bicycle projects that will spur local investment in underserved communities and/or serve as demonstration projects.</li> <li>• Help communities develop regionally-significant pedestrian and bicycle projects that can successfully compete for funding from federal, state, and local sources, and can be delivered on time.</li> </ul>
TxDOT	<ul style="list-style-type: none"> <li>• Provide adequate pedestrian and bicycle facilities when constructing or improving roadways.</li> <li>• Provide pedestrian and bicycle facilities along roadways and bridges that intersect existing or proposed active transportation infrastructure.</li> <li>• Maintain existing pedestrian and bicycle facilities that are within the agency’s jurisdiction.</li> </ul>
Counties	<ul style="list-style-type: none"> <li>• Address the needs of pedestrians and bicyclists within county thoroughfare plans.</li> <li>• Provide adequate pedestrian and bicycle accommodations when constructing or improving roadways.</li> <li>• Develop shared-use paths along bayous, utility easements, and railway corridors to connect major destinations.</li> <li>• Create partnerships to help build and maintain active transportation infrastructure.</li> </ul>
Cities	<ul style="list-style-type: none"> <li>• Address the needs of pedestrians and bicyclists within local thoroughfare plans.</li> <li>• Connect regional bikeways with local pedestrian and bicycle facilities.</li> <li>• Create partnerships to help build and maintain active transportation infrastructure.</li> </ul>
Developers	<ul style="list-style-type: none"> <li>• Connect neighborhood trail systems to the regional bikeway network.</li> <li>• Include pedestrian and bicyclist accommodations along streets that connect to regional bikeways.</li> <li>• Provide bicycle parking, pedestrian lighting, street trees, and other features that make walking and biking a safe, convenient transportation alternative.</li> </ul>





*Wide sidewalks, protective awnings, and decorative lighting create a pedestrian-friendly environment in Downtown Rosenberg.*

# Measuring Success



## Measuring Success

Achieving the vision and goals described in this plan will take time. Several metrics can be used to track our progress towards making our region more walkable and bikeable.

Goal	Metric	Benchmark (Current Status)	Source (Date)	
Regional Network	Daily Vehicle Miles Traveled (VMT) Per Capita*	26.7 VMT Per Capita†	H-GAC (July 2014)	
	Mileage of Bicycle Facilities* (Shared-Use Paths/Trails, Bicycle Lanes, Signed Shoulder Bicycle Routes, and Signed Shared Roadways)	Bicycle Lane	149	H-GAC (Feb. 2014)
		Shared-Use Path/Trail	688	
		Signed Shared Roadway	127	
		Signed Shoulder Bicycle Route	251	
		Total	1215	
	Mode Share*	Drove Alone	78.5%	American Community Survey (2006 – 2010)
		Carpooled	12.3%	
		Public Transportation	2.5%	
		Bicycle	0.3%	
Walked		1.5%		
Other Means		1.6%		
Worked at Home		3.3%		
Safety	Crashes Involving Bicyclists per 1,000 Residents (Annual)	0.106	TxDOT and H-GAC (2013)	
	Crashes Involving Pedestrians per 1,000 Residents (Annual)	0.206	TxDOT and H-GAC (2013)	
Policies	Number of Jurisdictions in the Region with a Complete Streets Policy*	1	H-GAC (July 2014)	
Healthy Livable Communities	Number of Bicycles on Buses Annually*	184,983	METRO (2013)	
	Number of People Participating in H-GAC's NuRide Program*	25,828	H-GAC (Dec. 2013)	
	Number of Pedestrian and Bicycle Trips Recorded in H-GAC's NuRide Program Annually*	Pedestrian Trips		H-GAC (2013)
		Bicycle Trips		
	Number of Housing Units within ¼-Mile of a Designated Bicycle Facility	1,074,000	H-GAC (2010) ††	

\*Consistent with metrics used in Our Great Region 2040.

†Average Non-Summer Weekday

††Based on 2010 Census Data.





*About 0.3% of people in our region bike to work, including some employed at the Texas Medical Center (Houston).*



## End Notes

### Chapter 1 - Introduction

1. Houston-Galveston Area Council (2014). H-GAC 2040 Regional Forecast. Houston, TX.
2. United States Census Bureau (2010). American Community Survey: 2006 – 2010. Retrieved January 21, 2014 from <http://www.census.gov/acs/www/>.
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### Chapter 2 - Creating a Vision

10. The social, economic and environmental benefits of walking and bicycling are described on page 3 of this document.

### Chapter 3 - Existing Conditions

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# Appendix A

# Funded Projects



## Pedestrian and Bicycle Projects in the TIP Since 2007

The amount of federal funding allocated to pedestrian and bicycle projects throughout our region varies from year to year, as described in the current TIP. While federal funds cover much of the projects' costs, local governments have pledged millions in matching funds. Most active transportation projects included in recent TIPs are located in Harris County.

Ped/Bike Projects in TIP Since 2007												
County	Sponsor	Street	From Limit	To Limit	Project Descriptions	Fiscal Year	Federal	State	Local	TIP Budget	Funding	Project Status
Harris	City of Houston	Dixie Dr	Dixie Dr	Polk St	Construct Columbia Tap Rail To Trail Bikeway	2007	\$2,379,288	\$-	\$594,822	\$2,974,110	CMAQ, STP-MM, STP-ENH	Complete
Harris	City of Houston	Polk St to Walker St	Polk St to Walker St	Texas Ave on MoPac RR	12' wide concrete shared-use path with 5' bike lane	2007	\$805,124	\$-	\$201,281	\$1,006,405	STP-ENH, CMAQ	Complete
Harris	METRO	NA	NA	NA	Low-interest automobile loans for low-income families for Employment-Related Transportation within the Houston UZA	2007	\$120,000	\$-	\$470,000	\$590,000	5316	Complete
Harris	Harris County	Woodforest Blvd (South)	Woodforest Blvd (South)	Wallisville Rd (North)	Construct Hike & Bike Trail	2007	\$787,415	\$-	\$196,854	\$984,269	STP-ENH	Complete
Fort Bend	City of Sugar Land	NA	NA	NA	Sugar Land Town Center Pedestrian-Bicyclist Special District Study to identify and implement neo-traditional development and address man-made barriers of US 59 and SH 6	2007	\$50,000	\$-	\$50,000	\$100,000	LOCAL	Complete
Harris	Greater Southeast Management District	In Third Ward	In Third Ward		Pedestrian improvements	2008	\$179,200	\$-	\$44,800	\$224,000	CMAQ	Complete
Harris	Greater Southeast Management District	Delano St	Delano St	Ennis St	Pedestrian improvements	2008	\$108,000	\$-	\$27,000	\$135,000	CMAQ	Complete
Harris	City of Houston	Cavalcade	Cavalcade	Sylvester St	12' wide concrete shared-use path: Phase I Shared-use Path - Trees in City of Houston	2008	\$1,183,571	\$67,731	\$228,162	\$1,479,464	STP-ENH, ST DIST DISC	Complete
Harris	METRO	NA	NA	NA	FY 2000 bike racks on METRO buses	2008	\$1,200,000	\$-	\$300,000	\$1,500,000	CMAQ	Complete
Harris	City of Houston	Shephard Dr	Shephard Dr	Houston Ave	Construct MKT/SP Railroad (Aka Nicholson Bikeway/Pedestrian Trail) Hike and Bike Trail	2008	\$3,640,000	\$-	\$910,000	\$4,550,000	STP-ENH	Complete
Harris	City of Houston	Enclave Pkwy	Enclave Pkwy	S of IH 10	West Houston On-Street Bikeway Network: Phase 2	2008	\$984,840	\$-	\$246,210	\$1,231,050	CMAQ	Complete
Harris	Greater Southeast Management District	NA	NA	NA	Construct pedestrian / bicycle trail	2008	\$600,000	\$-	\$180,000	\$780,000	MISC, LOCAL CONT	Complete
Harris	City of Baytown	Goose Creek Park	Goose Creek Park	Garth Rd	Construct pedestrian path along Goose Creek	2009	\$407,756	\$-	\$101,939	\$509,695	CMAQ	Complete
Harris	TxDOT Houston District	NA	NA	NA	Ada Curb Ramp Program FY 07, various locations on SH 35, FM 521 and FM 865	2009	\$1,760,000	\$440,000	\$-	\$2,200,000	MISC	Complete
Harris	City of Houston	In Herman Brown Park	In Herman Brown Park	Autumnwood Dr	Bike & Hike Trail through Herman Brown Park (Phase 2)	2009	\$1,425,158	\$48,000	\$460,687	\$1,933,845	CMAQ, LOCAL CONT	Complete



Ped/Bike Projects in TIP Since 2007												
County	Sponsor	Street	From Limit	To Limit	Project Descriptions	Fiscal Year	Federal	State	Local	TIP Budget	Funding	Project Status
Harris	City of Houston	West Row of North York	West Row of North York	East Row of Lockwood along Buffalo Bayou	Hike And Bike Trail (Houston Heritage Corridor Bayou Trails East Segment 3)	2009	\$773,418	\$-	\$193,354	\$4,462,064	CMAQ, STP-MM, LOCAL CONT	Complete
Harris	Harris County	Harris County Transportation Plaza	Harris County Transportation Plaza		Construct pedestrian tunnel to connect new Harris County Jury Assembly Building (Concurrent Construct) to existing tunnel network and landscaping	2009	\$2,811,600	\$-	\$1,148,400	\$966,772	LOCAL,LOCAL	Complete
Harris	City of Houston	RR Trestle	RR Trestle	McKee St	Hike and Bike Trail (Houston Heritage Corridor Bayou Trails East, Segment 1)	2010	\$1,748,679	\$-	\$524,604	\$3,960,000	STP-ENH, LOCAL CONT	Complete
Harris	City of Pasadena	Strawberry Park	Strawberry Park	Burke/Crenshaw Park on Vince Bayou	Vince Bayou Pedestrian and Bicycle Trail in Pasadena	2010	\$1,383,098	\$-	\$996,422	\$2,273,283	CMAQ, STP-MM, LOCAL CONT	Complete
Harris	City of Houston	S. Pinemont	S. Pinemont	Deep Forest	West White Oak Bayou Trail Extension	2010	\$2,563,919	\$-	\$3,186,081	\$2,379,520	CMAQ, STP-ENH, LOCAL CONT	Complete
Harris	City of Houston	Golf course perimeter	Golf course perimeter	Path connections	8' to 16' wide shared-use path: Hermann Park Trail Improve-Friends of Hermann Park	2011	\$1,999,440	\$-	\$499,860	\$9,442,500	STP-ENH	Complete
Brazoria	City of Alvin	City Pool In Alvin	City Pool In Alvin	South St	Mustang Trail System	2011	\$582,120	\$-	\$173,880	\$5,750,000	STP-ENH, ARRA, CMAQ, LOCAL CONT	Complete
Harris	Harris County	Amaranth Dr	Amaranth Dr	0.2 miles E of Greenhouse Rd on Mayde Creek	10' wide shared-use path: South Mayde Creek Pedestrian and Bicycle Facility - Harris County Precinct 3	2011	\$1,949,786	\$-	\$487,447	\$5,755,878	CMAQ	Complete
Harris	City of Houston	in Scottcrest Park	in Scottcrest Park		Construct pedestrian/bicycle trail	2011	\$600,885	\$-	\$181,507	\$2,499,300	STP-ENH	Complete
Harris	City of Houston	Houston Heritage Corr-RR Trestle	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)	2009	\$3,432,356	\$-	\$1,029,708	\$756,000	STP-ENH	Let
Harris	Upper Kirby District	NA	NA	NA	Upper Kirby ped/transit connection improvements	2010	\$5,000,000	\$-	\$492,165	\$2,437,233	STP-ENH	Let
Harris	Uptown Houston District	NA	NA	NA	Ped/transit connection improvements	2010	\$5,000,000	\$-	\$17,739,821	\$782,392	MISC, LOCAL CONT	Let
Harris	City of Houston	at Bob White Dr, Atwell Dr.,	at Bob White Dr, Atwell Dr.,	Hermann Park, and Tierwester	Construct four ped/bike bridges over Brays Bayou	2010	\$7,554,000	\$-	\$1,888,500	\$5,492,165	LOCAL CONT, ARRA	Let
Harris	City of Houston				Construct pedestrian trail	2011	\$259,655	\$-	\$10,386	\$22,739,821	LOCAL CONT, ARRA	Let
Harris	City of Houston	Shepherd Dr	Shepherd Dr	Sabine St	Bike trail on Buffalo Bayou parallel to Memorial Dr & Allen Pkwy	2011	\$4,604,702	\$-	\$1,151,176	\$270,041	MISC, LOCAL CONT	Let
Multiple	Gulf Coast Center	NA	NA	NA	Purchase of service	2012	\$87,500	\$-	\$-	\$87,500	5310	Let
Harris	City of Houston	Kirkwood Dr	Kirkwood Dr	Gessner Dr	Construct Hike & Bike Trail	2012	\$5,237,703	\$-	\$1,630,235	\$6,867,938	CMAQ, LOCAL CONT	Let
Harris	Harris County	in Houston	in Houston		Construct ped/bike tie-in at Terry Hershey Park in Houston	2012	\$1,975,264	\$-	\$242,690	\$2,217,955	STP-ENH, CMAQ	Let



Ped/Bike Projects in TIP Since 2007												
County	Sponsor	Street	From Limit	To Limit	Project Descriptions	Fiscal Year	Federal	State	Local	TIP Budget	Funding	Project Status
Harris	Westchase Management District	Deerwood to Westheimer E of HCFC Ditch	Deerwood to Westheimer E of HCFC Ditch	W 157 to south bank of HCFC Ditch D 124	12' wide concrete shared-use path: Westchase District Trail - North	2012	\$3,920,870	\$-	\$980,218	\$4,901,088	STP-ENH	Let
Harris	Airline Improvement District	NA	NA	NA	Airline Improvement District Bicycle/ Pedestrian Improvements	2013	\$2,545,403	\$-	\$636,351	\$3,181,754	CMAQ	Let
Harris	City of Houston	75th St	75th St	Old Spanish Trail	10' wide shared-use path on south bank of Brays Bayou w/ on-street connections, crossings, access to METRO	2013	\$1,970,390	\$-	\$656,797	\$2,627,187	STP-ENH	Let
Harris	City of Houston	Cambridge St	Cambridge St	Mecom Fountain	Landscape with ped/bike improvements adjacent to roadway within medians and ints. bound by TMC, Rice, MFA and Hermann Park	2013	\$2,999,765	\$-	\$749,941	\$3,749,706	STP-ENH	Let
Galveston	City of Texas City	Century Blvd & Fr 14th St	Century Blvd & Fr 14th St	21st St	Landscape and pedestrian improvements with freeway embankments, medians, roadway border widths	2013	\$650,929	\$-	\$162,732	\$813,661	STP-ENH	Let
Multiple	H-GAC	NA	NA	NA	Strategic investment to enhance ped/bike safety within high-activity areas, strategic placement of sidewalks, crosswalks, etc.	2013	\$365,000	\$-	\$91,250	\$456,250	CMAQ	Let
Harris	City of Houston	NA	NA	NA	Montrose neighborhood ped improvements	2013	\$1,600,000	\$-	\$498,000	\$2,098,000	CMAQ, LOCAL CONT	Let
Galveston	City of Galveston	NA	NA	NA	Seawall Blvd Transit/Pedestrian Access Plan FY 2013	2013	\$2,000,000	\$-	\$500,000	\$2,500,000	5309	Let
Harris	City of Houston	NA	NA	NA	City of Houston regional bike/ped connections to transit (TIGER)	2013	\$15,000,000	\$-	\$14,889,881	\$29,889,881	MISC, LOCAL CONT	TIP
Galveston	City of League City	FM 270	FM 270	South Shore Blvd & FM 518	FM 518 Bypass Bikeway: 10' wide shared-use path adj. to Hot Water Canal with a "T" intersection just east of FM 2094 and path to FM 518	2013	\$2,187,386	\$-	\$1,458,257	\$3,645,643	STP-ENH	TIP
Harris	City of Houston	McKee St	McKee St	W of Jensen Dr	12' wide concrete shared-use path: Buffalo Heritage Corridor Shared-use Trail in Houston	2014	\$3,009,009	\$-	\$936,554	\$3,945,563	STP-ENH, LOCAL CONT	TIP
Fort Bend	City of Sugar Land	NA	NA	NA	City of Sugar Land ped/bike improvements	2014	\$2,240,687	\$-	\$697,414	\$2,938,101	CMAQ, LOCAL CONT	TIP
Harris	City of Houston	Fannin St	Fannin St	Hamilton St	Sidewalk improvements in a 33-block area bound by Clay Street, St. Joseph Parkway, Hamilton and Fannin streets	2014	\$1,585,906	\$-	\$396,477	\$1,982,383	STP-ENH	TIP
Harris	Timber Lane Utility District	Rambling Brook Dr	Rambling Brook Dr	Timber Lane Park	Construct hike and bike trail, benches, lighting, bridges	2014	\$3,295,493	\$-	\$823,873	\$4,119,366	CMAQ	TIP
Harris	TxDOT Houston District	Henderson St	Henderson St	Harris C/L	Ped/bike improvements	2014	\$720,087	\$180,022	\$-	\$900,109	CMAQ, ST DIST DISC	TIP
Galveston	TxDOT Houston District	Harris C/L	Harris C/L	S of Hot Water Canal	Ped/bike improvements	2014	\$724,241	\$181,060	\$-	\$905,301	CMAQ, ST DIST DISC	TIP
Harris	TxDOT Houston District	Henderson Rd	Henderson Rd	NASA 1	Preliminary engineering for 10' shared-use path	2014	\$129,617	\$32,404	\$-	\$162,021	STP-MM	TIP
Harris	Greater East End Management District	NA	NA	NA	Design and construct ped/bike improvements including connections between existing shared-use paths, light rail lines, RR crossings	2014	\$312,300	\$-	\$78,075	\$390,375	CMAQ	TIP



**Ped/Bike Projects in TIP Since 2007**

County	Sponsor	Street	From Limit	To Limit	Project Descriptions	Fiscal Year	Federal	State	Local	TIP Budget	Funding	Project Status
Harris	Greater East End Management District	NA	NA	NA	Preliminary engineering for intersection improvements and new sidewalks (East End Livable Center Plan)	2014	\$411,900	\$-	\$102,975	\$514,875	CMAQ	TIP
Harris	Greater Greenspoint Management District	Knobcrest Dr to Greens Rd	Knobcrest Dr to Greens Rd	Imperial Valley Dr to Bradfield Rd	12' wide concrete shared-use path in Greater Greenspoint Management District	2014	\$1,600,000	\$-	\$400,000	\$2,000,000	STP-ENH	TIP
Harris	City of Houston	E of Wilcrest Dr	E of Wilcrest Dr	Dairy Ashford Rd	Construct 10' wide shared-use path with roadway crossings, signage, landscaping	2014	\$1,606,274	\$-	\$401,569	\$2,007,843	STP-ENH	TIP
Harris	City of Houston	Existing MKT Spur Bikeway	Existing MKT Spur Bikeway	Heritage West Trail	MKT Spur Connector Bikeway	2014	\$800,000	\$-	\$200,000	\$1,000,000	MISC	TIP
Fort Bend	City of Sugar Land	Williams Trace Blvd	Williams Trace Blvd	Fort Bend City (Ditch H)	10' wide shared-use path north and south bound within Frtg Road Row with ped/bike crossing improvements	2014	\$1,873,286	\$-	\$1,571,714	\$3,445,000	STP-ENH, LOCAL CONT	TIP
Harris	TxDOT Houston District	NASA Blvd	NASA Blvd	Kobayashi	Preliminary engineering for 6' wide shared-use path	2014	\$150,347	\$37,587	\$-	\$187,934	STP-MM	TIP
Harris	City of Houston	Shenandoah St	Shenandoah St	S MacGregor Way	Construct shared-use trail	2015	\$400,000	\$-	\$100,000	\$500,000	CMAQ	TIP
Harris	City of Houston	Saums Rd at Park View Dr	Saums Rd at Park View Dr	Park Cypress Dr	10' wide shared-use path NW corner of Cullen Park to Barker Cypress Road (west side) crossing under IH 10	2015	\$661,940	\$-	\$165,485	\$827,425	STP-ENH	TIP
Waller	City of Waller	NA	NA	NA	Preliminary engineering for City of Waller LCI (intersection, ped/bike, drainage improvements)	2015	\$319,732	\$-	\$79,933	\$399,665	STP-MM	TIP
Galveston	City of Friendswood	FM 528	FM 528	Hawkill Dr	Construct on-street bikeway (striping, signage, associated improvements)	2015	\$50,324	\$-	\$12,581	\$62,905	STP-ENH	TIP
Harris	City of Webster	Henderson Rd	Henderson Rd	NASA 1	Construct 10' shared-use path	2015	\$739,205	\$-	\$184,801	\$924,006	STP-ENH	TIP
Harris	Greater East End Management District	NA	NA	NA	Construct intersection improvements (3 locations) and new sidewalks to enhance pedestrian safety, mobility, access to transit (East End Livable Center Plan)	2015	\$4,530,900	\$-	\$1,132,725	\$5,663,625	CMAQ	TIP
Brazoria	City of Pearland	NA	NA	NA	Preliminary engineering and row for Green Tee Terrace Bike/Ped Trail	2015	\$432,897	\$-	\$108,224	\$541,121	STP-MM	TIP
Harris	Houston Parks Board	Jensen Dr to Hirsh Rd	Jensen Dr to Hirsh Rd	Bretshire Dr to Tidwell/Wayside Dr	Construct shared-use path	2015	\$3,182,584	\$-	\$795,646	\$3,978,230	CMAQ	TIP
Harris	City of Houston	Almeda Rd	Almeda Rd	Holcombe Blvd	Construct shared-use path connectors/missing segments	2015	\$597,742	\$-	\$149,436	\$747,178	STP-ENH	TIP
Harris	Houston Parks Board	Sayers Rd	Sayers Rd	Hutcheson Park	Construct multi-use path	2015	\$607,430	\$-	\$151,858	\$759,288	STP-ENH	TIP
Harris	City of Webster	NASA Blvd	NASA Blvd	Kobayashi St	Construct 6' wide shared-use path: NASA Blvd to Kobayashi	2015	\$1,160,356	\$-	\$290,089	\$1,450,445	STP-ENH	TIP
Brazoria	City of West Columbia	SH 35	SH 35	17th St	Preliminary engineering for construct sidewalks (new location)	2015	\$36,796	\$-	\$9,199	\$45,995	CMAQ	TIP
Brazoria	City of Pearland	NA	NA	NA	Preliminary engineering and row for Shadow Creek Ranch Bike/Ped Trail	2015	\$248,562	\$-	\$62,141	\$310,703	STP-MM	TIP



**Ped/Bike Projects in TIP Since 2007**

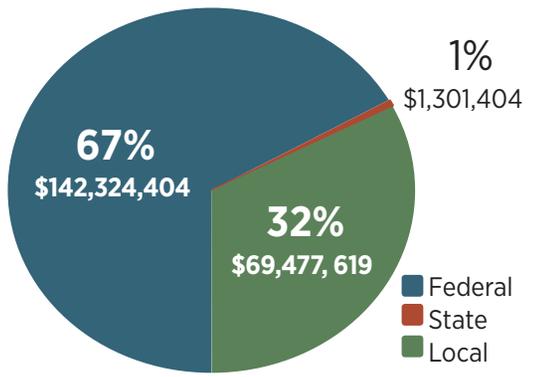
County	Sponsor	Street	From Limit	To Limit	Project Descriptions	Fiscal Year	Federal	State	Local	TIP Budget	Funding	Project Status
Harris	Upper Kirby District	Buffalo Speedway	Buffalo Speedway	Kirby Dr	Transit access improvements and ped enhancements(reconstruct and widen sidewalks with lighting, bus shelters, benches, limited landscaping)	2015	\$2,061,552	\$-	\$515,388	\$2,576,940	CMAQ	TIP
Harris	City of Houston	MacGregor Park	MacGregor Park	University of Houston (Wheeler Ave)	Construct University Connection Bike/Ped Path (shared-use path with bridge over Brays Bayou)	2016	\$1,844,655	\$-	\$1,509,263	\$3,353,918	STP-ENH, LOCAL CONT	TIP
Galveston	City of Clear Lake Shores	Cedar Rd	Cedar Rd	S of Jarboe Bayou	Construct ped/bike bridge over Jarboe Bayou, shared-use path, sidewalks, associated infrastructure	2016	\$999,478	\$-	\$333,159	\$1,332,637	STP-ENH, LOCAL CONT	TIP
Brazoria	City of Pearland	NA	NA	NA	Construct Green Tee Terrace Bike/Ped Trail	2016	\$2,906,253	\$-	\$726,563	\$3,632,816	STP-MM, STP-ENH	TIP
Harris	City of Houston	Tipps St at Evergreen Dr	Tipps St at Evergreen Dr	75th St	Construct ped/bike bridge over Brays Bayou and associated infrastructure	2016	\$3,544,579	\$-	\$886,145	\$4,430,724	STP-ENH	TIP
Harris	TxDOT Houston District	IH 10 W	IH 10 W	Post Oak Rd N	Construct Old Katy Bikeway (shared-use path)	2016	\$1,326,400	\$331,600	\$-	\$1,658,000	STP-ENH	TIP
Brazoria	City of West Columbia	SH 36	SH 36	17th St	Construct sidewalks (new location)	2016	\$479,848	\$-	\$119,962	\$599,810	CMAQ	TIP
Brazoria	City of Pearland	NA	NA	NA	Construct Shadow Creek Ranch Bike/Ped Trail	2016	\$1,299,804	\$-	\$324,952	\$1,624,756	STP-MM, STP-ENH	TIP

**Explanation of Funding Source Acronyms**

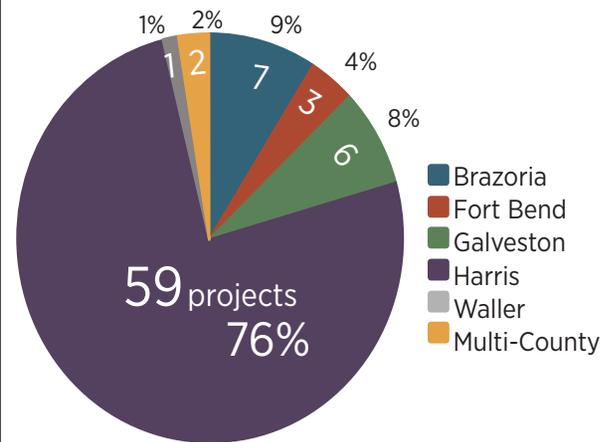
Acronym	Funding Source	Acronym	Funding Source
5309	Section 5309 Funds (Fixed Guideway Capital Investments Program)	LOCAL CONT	Local Contributions (Overmatch)
5310	Section 5310 Funds (Seniors and Individuals with Disabilities Program)	MISC	Funds Distributed from Miscellaneous Federal Programs
5316	Section 5316 Funds (Job Access and Reverse Commute Program)	ST DIST DISC	TxDOT District Discretionary Funds
ARRA	American Recovery and Reinvestment Act (2009)	STP-ENH	Surface Transportation Program – Transportation Enhancements
CMAQ	Congestion Mitigation and Air Quality Program	STP-MM	Surface Transportation Program – Metropolitan Mobility
LOCAL	Locally Funded		



**Funding Sources for Pedestrian and Bicyclist Projects Listed in TIP by Level of Government (2007-2016)**



**Number of Pedestrian and Bicyclist Projects in TIP by County\* (2007-2016)**



\*No TIP projects occurred in Chambers, Liberty, or Montgomery counties.

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Total Number of Pedestrian and Bicyclist Projects Listed in TIP (2007 - 2016)

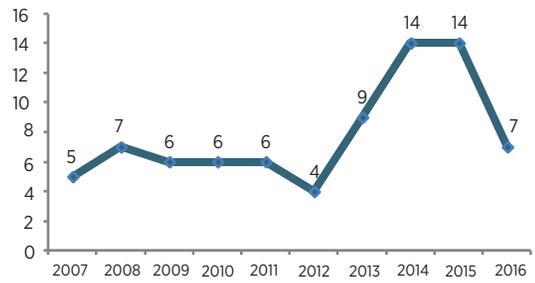
\$213,120,428

Total Funding for Pedestrian and Bicyclist Projects Allocated in TIP (2007 - 2016)

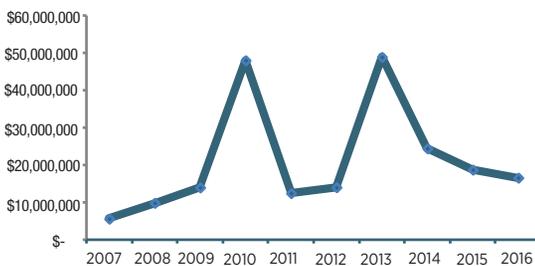
\$2,732,313

Average Project Cost

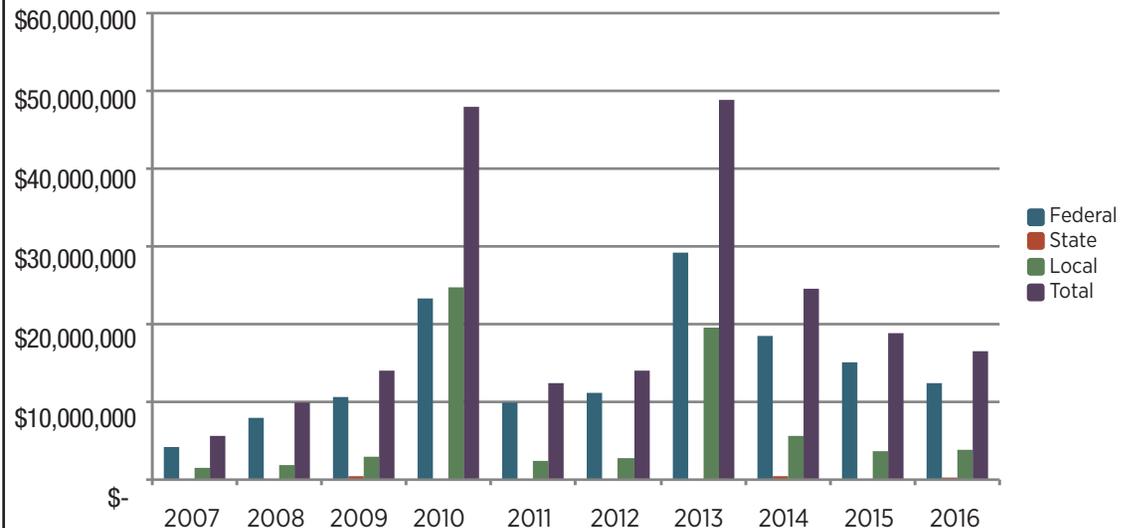
**Number of Pedestrian and Bicyclist Projects by Year of Funding Commitment in TIP (2007-2016)**



**Total Funding in the TIP for Pedestrian and Bicyclist Projects by Year (2007-2016)**



**Funding Sources for Pedestrian and Bicyclist Projects Listed in the in TIP by Level of Government by Year (2007-2016)**





*Biking is a viable transportation option in mixed-use neighborhoods, especially where end-of-trip facilities are provided.*

# Appendix B

# References



## HELPFUL LINKS

Interested in learning more about pedestrian and bicycle planning? Below are helpful links that provide more information on some of the programs, policies, and funding sources being used to promote walking and biking in our region and beyond.

### National Planning Efforts

Adventure Cycling Association/American Association of State Highway and Transportation Officials (AASHTO): U.S. Bicycle Route System

<http://www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/>

League of American Cyclists: Bicycle Friendly America (Includes information on becoming a Bicycle Friendly Community, Business, and University)

<http://www.bikeleague.org/bfa>

### State Planning Efforts

2013 Texas Strategic Highway Safety Plan

<http://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/gov/shsp.pdf>

Texas Department of Transportation: Bicycle Planning

<https://www.txdot.gov/inside-txdot/modes-of-travel/bicycle.html>

Texas Transportation Plan 2040

<https://www.txdot.gov/inside-txdot/division/transportation-planning/statewide-plan.html>

### Regional Planning Efforts

Houston-Galveston Area Council: Commute Solutions

<http://www.mysolutionis.com/>

Houston-Galveston Area Council: Livable Centers Program

<http://www.h-gac.com/livablecenters>

Houston-Galveston Area Council: NuRide

<http://www.nuride.com/>

Houston-Galveston Area Council: Our Great Region 2040

<http://www.ourregion.org/>

Houston-Galveston Area Council: Pedestrian-Bicyclist Program

<http://www.h-gac.com/community/qualityplaces/pedbike/>

Houston-Galveston Area Council: Pedestrian and Bicyclist Subcommittee

<http://www.h-gac.com/community/qualityplaces/pedbike/subcommittee.aspx>

Houston-Galveston Area Council: Regional Transportation Plan

<http://www.h-gac.com/taq/plan/>

Houston-Galveston Area Council: Special District Studies

<http://www.h-gac.com/community/qualityplaces/pedbike/special-districts/>

Houston-Galveston Area Council: Transportation Improvement Program

<http://www.h-gac.com/taq/tip/>

Houston Wilderness: Sam Houston Greenbelt

<http://houstonwilderness.org/greenbelt-network/>

**Local Planning Efforts**

Bayou Greenways Initiative

<http://www.bayougreenways.org/>

Better Block Houston

<http://www.betterblockhouston.org/>

City of Houston: Complete Streets Executive Order

[http://www.houstontx.gov/planning/docs\\_pdfs/Exec\\_Order\\_Complete\\_Streets.pdf](http://www.houstontx.gov/planning/docs_pdfs/Exec_Order_Complete_Streets.pdf)

Healthy Living Matters

<http://healthylivingmatters.net/>

Houston B-cycle

<https://houston.bcycle.com/>

Houston Coalition for Complete Streets

<http://houstoncompletestreets.org/>

METRO Bike and Ride Implementation Plan

[http://www.h-gac.com/taq/sub\\_regional/metro.aspx](http://www.h-gac.com/taq/sub_regional/metro.aspx)

The Woodlands Township: Adopt-a-Path Program

<http://www.thewoodlandstowship-tx.gov/index.aspx?NID=245>

**Examples of Local Long-Range Pedestrian and Bicycle Plans**

Alvin Pedestrian Transit Master Plan

<http://www.thegoodmancorp.com/projects/project-list-2-2/alvin-pedestrian-transit-master-plan/>

City of Lake Jackson: Pedestrian and Bicycle Master Plan

<http://tx-lakejackson.civicplus.com/DocumentCenter/View/467>

City of Rosenberg: Transit and Pedestrian Study

<http://www.rosenbergcodev.com/users/0001/docs/RosenbergTransitandPedPlanCombinedCDVersin.pdf>

Energy Corridor District Bicycle Master Plan

<http://www.energycorridor.org/sites/e cd/media/mobility/bike/2010-11-02%20Energy%20Corridor%20Bicycle%20Master%20Plan.pdf>

Energy Corridor District: West Houston Trails Master Plan

<http://www.energycorridor.org/parks-trails-recreation/west-houston-trails-master-plan>

Greens Bayou Corridor Coalition Parks & Trails Master Plan

<http://greensbayou.org/greens-bayou-2/master-plan/>

League City Parks and Open Space Master Plan

<http://www.leaguecity.com/DocumentCenter/Home/View/2419>

Missouri City Bicycle and Pedestrian Mobility Plan

<http://www.missouricitytx.gov/DocumentCenter/View/3459>

Pearland Trail Master Plan

<http://www.pearlandparks.com/trail%20master-plan.html>

Seabrook Hike and Bike Trails Master Plan (2010)

<http://www.seabrooktx.gov/DocumentCenter/View/324>



**Mapping**

City of Houston: Houston Bikeways GIS

<http://www.gims.houstontx.gov/bikeway/default.aspx>

Houston-Galveston Area Council: Regional Bikeway Viewer

[http://arcgis02.h-gac.com/Bikeway\\_Viewer/](http://arcgis02.h-gac.com/Bikeway_Viewer/)

**Regional Biking Events**

Bike Around the Bay

<http://www.bikearoundthebay.org/>

BP MS 150

[www.ms150.org/](http://www.ms150.org/)

**Technical Guidance**

American Association of State Highway and Transportation Officials (AASHTO): Guide for the Development of Bicycle Facilities

[https://bookstore.transportation.org/item\\_details.aspx?ID=1943](https://bookstore.transportation.org/item_details.aspx?ID=1943)

American Association of State Highway and Transportation Officials (AASHTO): Guide for the Planning, Design, and Operation of Pedestrian Facilities

[https://bookstore.transportation.org/item\\_details.aspx?id=119](https://bookstore.transportation.org/item_details.aspx?id=119)

Houston-Galveston Area Council: Building Better Bikeways

[http://www.h-gac.com/community/qualityplaces/pedbike/publications/building\\_better\\_bikeways.pdf](http://www.h-gac.com/community/qualityplaces/pedbike/publications/building_better_bikeways.pdf)

Houston-Galveston Area Council: Instant Impact Guide

[http://www.h-gac.com/community/livablecenters/publications/Instant\\_Impact\\_Guide.pdf](http://www.h-gac.com/community/livablecenters/publications/Instant_Impact_Guide.pdf)

Houston-Galveston Area Council: Pedestrian Pathways

<http://www.h-gac.com/community/qualityplaces/pedbike/publications/Pedestrian-Pathways.pdf>

**Federal Funding Sources**

MAP-21: Moving Ahead for Progress in the 21st Century Act

<http://www.fhwa.dot.gov/map21/>

Congestion Mitigation and Air Quality (CMAQ)

<http://www.fhwa.dot.gov/map21/factsheets/cmaq.cfm>

Highway Safety Improvements Program (HSIP)

<http://www.fhwa.dot.gov/map21/factsheets/hsip.cfm>

Surface Transportation Program (STP)

<http://www.fhwa.dot.gov/map21/factsheets/stp.cfm>

Transportation Alternatives Program (TAP)

<http://www.fhwa.dot.gov/map21/factsheets/tap.cfm>

Recreational Trails Program (Texas)

<http://www.tpwd.state.tx.us/business/grants/trpa/>

State and Community Highway Safety Grants

<http://safety.fhwa.dot.gov/policy/section402/>

Transportation Investment Generating Economic Recovery (TIGER) Program

<http://www.dot.gov/tiger>

Urbanized Area Formula Program

[http://www.fta.dot.gov/grants/13093\\_3561.html](http://www.fta.dot.gov/grants/13093_3561.html)



**Private Funding Programs**

Advocacy Advance: Rapid Response Grants

<http://www.advocacyadvance.org/grants>

American Hiking Society: National Trails Fund

<http://www.americanhiking.org/national-trails-fund/>

Houston Endowment

<http://www.houstonendowment.org/>

Kinder Foundation

<http://www.kinderfoundation.org/>

PeopleForBikes: Community Grant Program

<http://www.peopleforbikes.org/pages/community-grants>



*Pedestrians enjoy the Tom Blakeney Jr. Hike & Bike Trail in Alvin.*





Approved by the Transportation Policy Council  
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