

Seabrook Hike and Bike Trails Master Plan



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EXECUTIVE SUMMARY

Since construction of the first segments of Seabrook's network of hike and bike trails in the early 1990s, the trails have gained widespread popularity and use. Three community surveys in the past 12 years have revealed community wishes for expansion of the trail system to serve more residents with access points close to their homes. Multiple studies have underscored the positive impact of trails on home values and on community health. The goals of this plan are to:

- connect all city parks via trails
- create a "Figure 8"-shaped overall network with spur trails for neighborhood access
- provide multiple safe hike/bike crossing points along Highway 146
- add 25 miles of hike/bike trails to the present network of 10 miles
- encourage healthy outdoor recreation for residents
- improve property values across the city through trail availability
- connect Seabrook trails with other regional trails

The Seabrook trails network is most fully developed in the more rural northeastern portion of the city. Specific needs identified in surveys include additional trails in the neighborhoods west of Highway 146, trail connections crossing it, and segments serving the southernmost part of the city better.

This master plan presents recommendations to widen the network so that northern and southern loops meet in the middle, like the number 8. Loosely characterized, the bottom of the 8 is at the Seabrook/Kemah Bridge; the top is at Red Bluff Road; and the center is at or near Repsdorff/East Meyer roads. Highway 146 crossings at these three points would enable connection of all neighborhoods and city parks to the trail system. More detailed recommendations are in section 4 of the plan, and trail design parameters and maintenance guidelines are in the appendices.

Uncertainties of several kinds complicate planning but also present opportunities. Major changes are pending with redevelopment of the Highway 146 north-south axis through the heart of the city. Port, rail and industrial district plans along the city's northern edge include trail agreements and options. In the south, storm recovery, road work, Waterfront District plans, and the proposed Habitat Island offer potential. A period of significant changes and new construction in several parts of the city is an obvious time to incorporate trail development.

The cost of the proposed trails network is estimated at \$4 million, as laid out in section 5.8 of the plan. Implementation strategies, also in section 5, range from local funding to partnering with county and state agencies that are conducting transportation projects; federal grants for recreational programs; corporate and foundation grants; and referendum options. The suggested priority sequence is:

- Central crossing first (Repsdorff/Meyer area), serving the most residents soonest
- South end second (Seabrook/Kemah Bridge area), adding trails to an existing undercrossing
- North end third (Red Bluff), as northeastern residents already have good trail access

Establishing the central crossing first would anchor the proposed "Figure 8"-shaped network well. Having trails connecting all of Seabrook's parks has been a longstanding goal. Residents want to have trail access on foot close to their homes, and this plan outlines the way there.

1. INTRODUCTION

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## 1.1 Overview

Trails are popular in Seabrook. They receive heavy use by residents for walking, dog walking, jogging, and biking, especially where trail access is closest to homes. Residents and City officials are in widespread accord about wanting expansion of the trail system to provide fuller coverage of the city’s land area and closer trail access for more residents, avoiding the need for people to drive to trailheads.

Beyond the routine pressures of ongoing population growth, Seabrook is poised for upgrades on Highway 146, the city’s major arterial route, and for rail and other development serving the Bayport Container Terminal immediately to the north. These three forces intensify the need for trail expansion as the city’s face is changing.

## 1.2 Vision

The Seabrook Hike and Bike Trails Master Plan makes recommendations for a community-wide network of multipurpose trails and pathways. The network is envisioned as a continuous set of developed trails, footpaths, bridges, and sidewalk segments that connect neighborhoods, parks, significant natural features and business districts. Routes are to be developed in consultation with neighborhood associations and businesses to provide facilities that are safe and convenient for users and neighbors.



Figure 1. Deer coexist with people in Seabrook

### **1.2.1 What a Community-Wide Trails Network Means**

In opinion surveys, trails have repeatedly scored as the top community asset identified; they have also repeatedly been selected as the top priority in provision of further amenities. Parks, trails and natural areas are valued highly in the local community as a key aspect of quality of life in the city.

The purpose of the present plan is to extend the trails network for fairer distribution of access points across the city, in the process also making a positive contribution to public health and fitness, locally available recreation, and property values. Elements of a comprehensive vision for the trail system include access, quality community growth, strengthening property values, and widening transport options.

### **1.2.2 Ease of Access to Outdoor Recreation**

Seabrook includes natural lands and extended stretches of lake and bay waterfront, close to where people live and work. Such resources are popular for low-impact recreation such as walking and for more strenuous fitness activities such as jogging and cycling. Access is often the critical missing link. Establishing hike and bike corridors all through the city will enable both residents and visitors to enjoy local parks, Clear Lake and Galveston Bay.

The nation's most popular form of outdoor recreation is walking for fitness and health. Bicycling and mountain biking are growing sports. Birding is a notable component of Seabrook's public profile because of the city's combination of bayshore, bayou, wetland and woodland habitat. Demand for safe and pleasing places to walk, jog, cycle and go birding is on the increase.

### **1.2.3 Quality of Life as the Community Grows**

Results of a recent Master Plan Commission survey showed "small town charm" (or a sense of community) as the third most valued community asset, after parks and trails in first place and proximity to the waterfront in second place (Seabrook Master Plan Commission 2009).

Quality of life is a multifaceted force, dependent upon economic strength, good schools, friendly neighbors, low taxes, a clean and healthy environment, and access to natural areas and outdoor recreation, among many other things. Offering easy access to outdoor amenities and open space for walking/cycling can help guide Seabrook toward a future in which its well-loved atmosphere is maintained.

Greenways and trails conserve open space, can benefit local air and water quality, and can provide educational opportunities for both residents and visitors. A trail is an "outdoor classroom" where people tune in to the rhythms of the natural systems where they live. Trails also have an impact on civility, producing interaction among people who live near one another and have a common interest in fitness and the outdoors.

A trend toward pedestrian and bicycle-friendly communities is evident in real estate development throughout the United States. According to a 1995 poll commissioned by the National Homebuilders Association, 88% of the new homebuyers surveyed preferred to live in neighborhoods and communities that offer access to outdoor resources and safe places to walk and ride bicycles. Progressive practices in neighborhood development aim to offer services and destinations within a 20-minute walk. In this sense a trail system is one component of a new model for the future.

#### **1.2.4 Trails Boost the Local Economy**

Homebuyers favor trailside property because it gives them easy access to individual outdoor recreational opportunities. Living near parks and trails is a preference clearly declared in multiple real estate surveys; in short, proximity of these amenities raises home values. Developers typically sell homes on or near greenways for more money than comparable homes farther from these amenities.

Tourism is a second economic benefit, and is a sustainable way to foster new businesses and diversify the Seabrook economy. Tourism revenues generated by off-road trails have been documented for communities across the country. A 1992 National Park Service study found that three Florida, Iowa and California trails generated over \$3.5 million a year in tourism revenue. Trails can also spur establishment of restaurants and visitor accommodation.

#### **1.2.5 Transport Options Expand**

A desirable place to live and work includes walking and bicycling among the options for ways to get to work and other destinations. A 1990 U.S. Department of Transportation survey on personal transportation showed that 42% of auto trips were made for “personal business,” such as to/from a store, doctor, or school, and 25% were recreational or social, such as to/from friends, parks, or church. Thus it is realistic to assume that easy access to alternative modes would get more people out of the cars and onto their feet or bikes.

### **1.3 Background and Related Plans**

In concert with development of the recent Master Plan for the Drusilla Carothers Coastal Gardens (2009), the Seabrook Master Plan (forthcoming, early 2010), and the Seabrook Parks and Open Space Master Plan (forthcoming, late 2010), this Hike and Bike Trails Master Plan updates comprehensive City planning to provide for projected population growth and ongoing recovery from impacts of Hurricane Ike.

By request of City Council, work on the trails plan was accelerated to make it available ahead of the fuller Seabrook Parks and Open Space Master Plan, also being developed by the Open Space, Beautification and Preservation Committee during 2010. The plans for the trails, parks, and Carothers Gardens are thus three components in the same round of open space and parks planning.

In addition, the *South Seabrook Marine District Waterfront Development Plan* (JJR 2006), and the *Seabrook Habitat Island Feasibility Study* (AECOM 2009) have bearing, guiding development in lower Seabrook and including trail, boardwalk and viewing platform proposals.

### **1.4 Scope and Public Process**

The present plan covers only proposed trails. Substantial public input regarding hike and bike trails is available from opinion surveys in 1998, 2004, and 2009. The Open Space Committee used the ideas and community wishes expressed in these surveys as a basis for this plan; see *Seabrook Parks, Recreation and Open Space Master Plan* (1998), *Seabrook Community Survey* (2004), and *Seabrook Master Plan Commission* (2009). Seabrook City Council adopted a draft of this plan in February 2010. Full public review of the overall parks and trails plan is scheduled for September and October 2010, as follows:

- Posting online for public review
- Mail survey (all Seabrook households)
- Circulation to selected parks and trails professionals for review
- Circulation to selected City officials and volunteers
- Public meeting (all households invited by mail)

## 2. GOALS

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A citywide trails network can improve quality of life for residents by giving them easier access to healthy outdoor recreation, linking people with destinations and favored natural attractions, and shaping community growth in positive ways in the long term. Open Space Committee members, City officials, and interested residents jointly developed seven goals for this plan, based on the track record of existing trails and the results of opinion surveys since 1998.

**Goal 1:** Connect the people of Seabrook via a citywide trail system that ties neighborhoods to one another and to natural areas for recreation.

**Goal 2:** Focus trail expansion on Highway 146 crossings and fuller trail development in the western and southwestern parts of the city least well served by existing trails.

**Goal 3:** Create spurs that improve residents' access to the network directly from their homes without needing to drive.

**Goal 4:** Encourage the inclusion of a park land dedication requirement in the subdivision regulations to facilitate the development of trails to and through future neighborhoods.

**Goal 5:** Preserve easements and rights-of-way to maintain views and future trail opportunities.

**Goal 6:** Promote trail design and maintenance standards aimed at providing safe and secure ways for users to enjoy local natural areas.

**Goal 7:** Extend City trails to connect them with regional trails, notably to Armand Bayou Nature Center and along the Red Bluff Road corridor.

The layout of the current trails system is briefly described in section 3 of this plan. Section 4 presents recommendations for expansion of routes to address the goals identified, and implementation strategies and funding sources are outlined in section 5.

### 3. EXISTING TRAILS NETWORK



Most of Seabrook’s trails network lies in the eastern/northeastern parts of the city (see map 1). Developed trails already connect eight parks, from Miramar Park in the heart of the city to Pine Gully Park near its northern edge, as shown on map 1. Seabrook has 10 miles of granite-surfaced hike/bike trails, and dirt spur trails or footpaths expand the network at the Seabrook Wildlife Refuge and in Pine Gully and Hester Garden Parks.

Of the city’s total of 18 park properties (appendix A, map 2), the largest that are not connected to the trails network are Friendship Park (10 acres, Red Bluff Road); Drusilla Carothers Coastal Gardens (8.5 acres, Pine Gully Road); and Brummerhop Park (7 acres, Repsdorph Road). Friendship Park has an internal developed trail.



Figure 2. White ibis juvenile; birding while exercising is part of the appeal of Seabrook’s trails

Map 1. Seabrook Trails Network



Park properties of smaller size and not currently connected to the trails network but featuring key attractions are McHale Park with its pelican viewing observation deck and bay view (lower Todville Road); the nearby Second Street Park on the Seabrook Slough, with water views on both sides; and also nearby, the Boat Ramp at the Kemah Channel (map 1). Note that McHale Park is included on the Great Texas Coastal Birding Trail. Facilities other than trails in each park are covered in the city's overall parks master plan.

### 3.1 Pine Gully Park

This park is on the Great Texas Coastal Birding Trail. A granite-surfaced trail starting near the pier in Pine Gully Park traverses the length of the park to Todville Road, with several short spur trails and a boardwalk over a small bayou. West of the park the trail crosses Todville Road and follows Pine Gully, then turning south toward Robinson Park.

### 3.2 Robinson Park and Seabrook Wildlife Refuge

The trail along upper Pine Gully divides, one side of the fork leading to the Robinson Park gazebo and the other leading to the Seabrook Wildlife Refuge. A developed trail parallels Todville Road south from the Robinson Park gazebo.

### 3.3 Baybrook and Hester Parks

Baybrook Park has tennis courts alongside Todville Road, and the trail passes southward to and through the heavily wooded Hester Garden Park with its butterfly garden and views of the Hester Gully bayou.

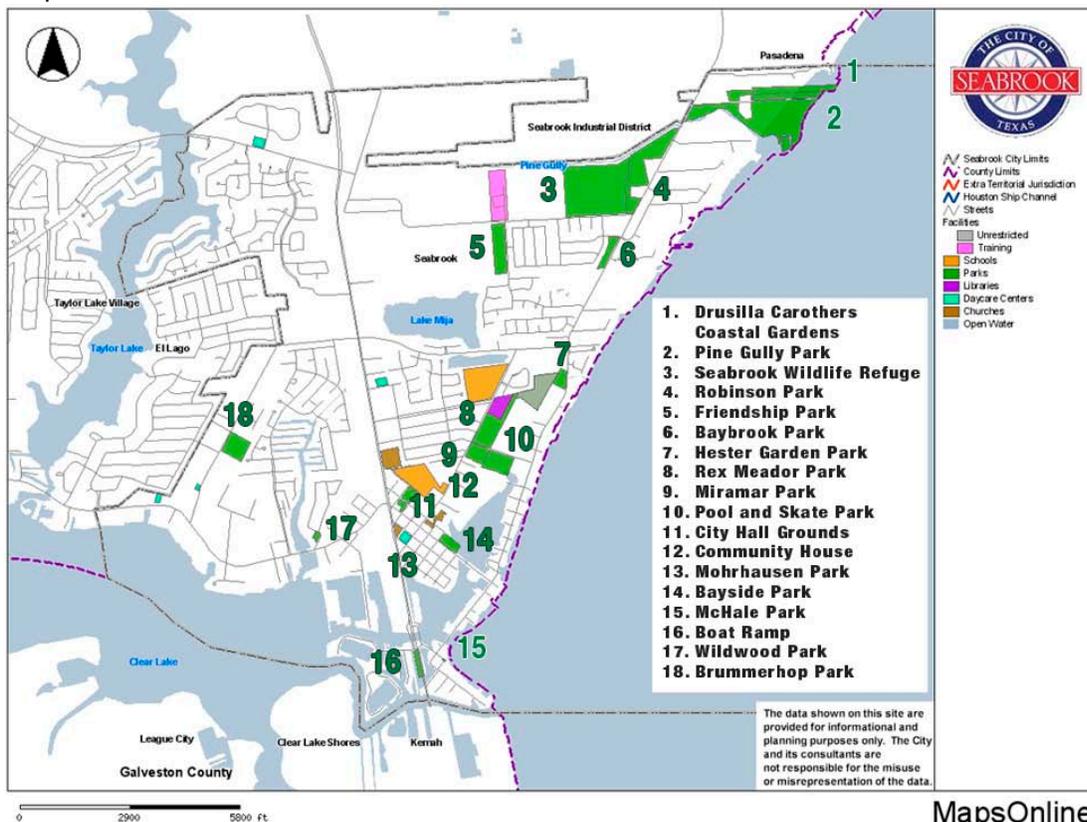
### 3.4 Meador and Miramar Parks and Disc Golf Course

Trails in the large Meador and Miramar Parks are mainly wide open but some trail sections are wooded and shady; others serve the city pool, playground and skate park. These parks and the Disc Golf Course are all adjacent properties, providing a large area of natural landscapes in the very heart of Seabrook.

### 3.5 Non-City-Owned Trails

Lakeside Drive between Repsdorph Road and NASA Parkway is flanked by sidewalks and serves as neighborhood trail. El Mar Road through the Miramar subdivision has bridged central drainage and serves a similar function between North Meyer and Bahama (near the Kroger grocery store). Other such pedestrian corridors exist in the city as well.

Map 2. Seabrook Parks



### **3.6 Dirt Tracks/Footpaths**

A dirt track flanks the north and west sides of the Seabrook Wildlife Refuge, connecting to the developed trail along upper Pine Gully. Pine Gully Park and Hester Garden Park also have short sections of dirt footpaths.

### **3.7 Places Not Served**

From map 1 and the foregoing brief descriptions of existing trail segments, it is clear that despite its excellent reputation, the trails network does not yet serve most parts of Seabrook well. The shortfall is noted in 1998 and 2004 surveys of parks needs. As earlier indicated, Friendship Park, Drusilla Carothers Coastal Gardens, and Brummerhop Park are the largest parks not connected to the trails.

To use the trails, everyone living west of Hwy 146, and many even on the east side of the highway must get into their cars and drive to an east-side park to start walking or jogging a trail. City-owned trails are entirely absent west of Highway 146 and in the southern parts of the city—Old Seabrook and the Point.

## 4. RECOMMENDATIONS

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Figure 3. Yellow-crowned night-herons feast on crawfish in Seabrook’s ditches

The first seven of nine recommendations provided here directly address the seven goals outlined in section 2 of this plan; thus these two parts of the plan should be read together. Two further recommendations address maintaining natural conditions and suggest a sequence of priority for trail development. Proposed new trails are illustrated in map 3 and described in section 4.10. As each route involves particular legal and contractual circumstances that are beyond the scope of this master plan, the proposed routes are indicated broadly, to identify which points can most usefully be connected and to show desirable routing for more refined investigation by City staff.

#### **4.1 Recommendation 1: Create a comprehensive Figure 8 citywide trail and path network.**

A trails network designed as a Figure 8 would allow trails to connect all City-owned park properties, dramatically improving the range of local destinations accessible on foot or by bike for residents using the trails (map 3). People would have a much wider variety of options for viewing wildlife, for varying the length of their walks and runs, and for exploring additional parts of the city.

For most effective creation of continuously connected trails, fully developed hike/bike trails, sidewalks and low-impact footpaths should all be considered as potential trail segments. All sections of the trails network do not have to be equal.

#### **4.2 Recommendation 2: Develop northwest, southwest and southeast trail loops to balance the existing northeast loop, and establish new central and northern Highway 146 hike/bike crossings so as to connect all four loops.**

Four loops or corridors crossing Highway 146 in three places constitute the proposed Figure 8 configuration:

- Pine Gully loop (northeast)
- Taylor Lake loop (northwest)
- Old Seabrook loop (southeast)
- Lakewood loop (southwest)

The Pine Gully trail is largely already in place (map 1). A fifth loop in the heart of Seabrook is also largely in place. Thus completing the Figure 8 requires primary focus on establishing trails in and to the Taylor Lake, Old Seabrook and Lakewood areas. Note that trail names used in the route descriptions that follow have been developed for convenience in the present plan and do not necessarily constitute final trail names, for which community input is likely advisable.

Map 3 shows nine proposed new trail segments. Those indicated in red are trails to be developed in conjunction with projected roadway work (trails 1-4), while those marked in blue (trails 5-9) connect city parks, serve large numbers of residents, and answer expressed public wishes. The proposed new trails are:

- |                                |                                               |
|--------------------------------|-----------------------------------------------|
| 1 North Trail                  | (Pine Gully to Armand Bayou crossing Hwy 146) |
| 2 Red Bluff-NASA Parkway Trail | (north-south axis serving west side)          |
| 3 East Meyer Trail             | (central Hwy 146 crossing)                    |
| 4 South Trail                  | (serves existing southern Hwy 146 crossing)   |
| 5 Second to Meyer Connector    | (adds lower Todville to system)               |
| 6 City Hall Connector          | (ties in several city facilities)             |
| 7 Hwy 146 Crossover Connector  | (serves maximum number of residents)          |
| 8 Friendship Park Connector    | (tie large parks together)                    |
| 9 Wildlife Refuge Trail        | (answers demand for natural areas)            |

Fuller descriptions of these proposed trail segments are provided in section 4.10. Note that the proposed North Trail provides the opportunity to connect Seabrook's trails to Armand Bayou Nature Center and the regional trail network serving it.



Map 3. Proposed Trails

Red = trails to be developed in conjunction with projected roadway and related work.

Blue = trails tying in more parks, serving a maximum of residents, and reflecting public wishes.

“Loose ends” at upper right are where new trails connect to existing trails.

#### 4.3 Recommendation 3: Add spur trails to serve city parks, underserved neighborhoods, and parks operated by homeowners’ associations.

City park properties needing trail connection are the Boat Ramp, Brummerhop Park, City Hall grounds, Community House, Drusilla Carothers Coastal Gardens, Friendship Park, McHale Park, Mohrhausen Park, and Wildwood Park (map 3). If these are not directly on the Figure 8 routing eventually selected, they should have spur trails for access to the network.

Subdivisions typically include at least some sections of roadway with sidewalks that can serve as connectors to trail segments. Spur trails should tie to such points. Homeowner association-operated parks exist in the Lake Cove, Lake Pointe Forest and Seabrook Island subdivisions; a trail spur to the neighborhood as a whole may be sufficient, or these parks may warrant spurs of their own.

#### **4.4 Recommendation 4: Enact a trails development ordinance.**

Trails development ordinances have been enacted in Allen and Southlake, Texas, and have proven successful in helping to get trails constructed (*Building a Legacy* 2009). Hence this recommendation in the Seabrook Hike and Bike Trails Master Plan. The required trails often replace sidewalks, meaning they may not add significantly to the cost of a residential or commercial development.

Some developers plan to add trails anyway, given their popularity among homebuyers, and a mandatory trail development ordinance may thus serve only to create a level playing field where all are required to do so. Credits can be given for trail construction and landscaping or other infrastructure elements.

Such an ordinance could also address the question of ditches. Seabrook has long had a network of roadside drainage ditches. These attract and support some appealing wildlife species that use small-scale shallow wetland pockets, such as native turtles, herons, and egrets. Ditches and other patches of periodic standing water support crawfish, for example—a key food source for several wildlife species. Modern construction is typically without ditches, but to encourage the long-term presence of desired wildlife species, some ditches or equivalent habitats are needed.

In new developments, preservation of trail corridors could be required in conjunction with open space created under the City Code. Right-of-way reservations for pedestrian paths, bikeways, and multiple use trails are examples. The City Code could also provide developers with incentives to encourage implementation of the Hike and Bike Trails Master Plan (e.g., fee waivers, or flexibility in required off-street parking and internal project circulation layout, justified on the basis of lands used in support of the recreational trail network).

#### **4.5 Recommendation 5: Assess all rights-of-way in the city for their potential for future trail development.**

A railroad right-of-way running north-south through the city may offer significant trail development options, or at least options for an undeveloped footpath (see [www.railstotrails.org](http://www.railstotrails.org)), and various other categories of easement also warrant investigation.

A special local characteristic created by land subsidence is street rights-of-way dead-ending at the Clear Lake, Seabrook Slough or Galveston Bay waterfront. Some of these may have potential for trail development or spur trails because of the water views they provide. As indicated elsewhere in this plan, the waterfront is publicly regarded as a key community asset and a key aspect of Seabrook's appeal. Locations that offer pedestrians waterfront views while walking or jogging are highly valued by residents.

#### **4.6 Recommendation 6: Develop Seabrook-appropriate design standards for trail development and maintenance protocols for preservation and enhancement of natural resources.**

Trail design is an increasingly specialized field, responding to issues of security, safe trail use, ease of maintenance, and noninterference with wildlife. Some aspects of design standards are outlined in appendix B, and there are many more. Accepted design standards are needed for use by parks staff and developers for fully developed hike/bike trails, sidewalks, low-impact footpaths where trails are not feasible, and for road crossings and bridges, among other facilities.

Trail maintenance can be controversial. Since the first trails were created in Seabrook, parks personnel have been caught between diverging views in the community regarding how much clearing and mowing are appropriate along trail routes. Public complaints typically lead to extensive vegetation clearing—which then results in a round of complaints from others concerned to retain wildlife-sheltering undergrowth beside the trails. Maintenance staff need clear, standard, agreed-upon maintenance guidelines and schedules to follow (see examples in appendix C).

**4.7 Recommendation 7: Begin planning a more ambitious follow-up phase of trail development.**

Linking with the regional trail system is feasible with Highway 146 crossings, extending routes accessible from Seabrook by many miles and encouraging other trail users into Seabrook. Armand Bayou Nature Center is an attractive nearby destination, with 12 miles of trail already in place beyond it along Red Bluff Road. Regionwide, multi-city trails in place or planned include the existing Great Texas Coastal Birding Trail and new initiatives by the Houston-Galveston Area Council and Houston Wilderness.

Opening trail parameters to include planning for special custom trail segments can add a series of new dimensions to the city’s network. Possible options include:

- Lighted trail segments for use at night
- Consideration of potential for formal greenway designation
- Trail development for the wheelchair-bound and people with disabilities
- Special trail offerings for youth, equestrians, and boaters

**4.8 Recommendation 8: Keep conditions as natural as possible.**

Seabrook residents have repeatedly indicated a preference for conserving natural areas within the city park system and along the trails, starting with a major citywide opinion survey on parks in 1998. It concluded: “A random survey of the citizens of Seabrook concluded that 72% of those surveyed support additional parks and recreational facilities. The greatest priorities based on the surveys were trails and natural areas” (*Seabrook Parks, Recreation and Open Space Master Plan*, 1998). Complete results of that survey are available within the 1998 parks master plan.

In 2004 the city’s community development director surveyed 500 Seabrook voters by mail on a wide range of topics (*City of Seabrook Community Survey*, 2004). The 325 responses constituted a 65% response rate. Answers regarding property tax (items 43-53) and resource preservation (items 65-70) were illuminating about parks and open space. On resource preservation, large majorities of respondents showed a high preference for natural qualities in the city and for waterfront access:

| Item                                                                | Agree | Disagree/ No opinion |
|---------------------------------------------------------------------|-------|----------------------|
| Wildlife habitat along the shoreline and bayous should be preserved | 292   | 24                   |
| Open (natural) space in the city should be preserved                | 260   | 51                   |
| The City should provide access to bodies of water to the public     | 234   | 82                   |

On property tax (“I would be willing to have my property taxes increased in order to . . .”), a majority of respondents opposed a tax increase for eight out of ten items. But a majority supported a tax increase to hire fire fighters (184 yes; 83 no; 39 no opinion) and “to preserve environmentally sensitive areas” (153 yes; 108 no; 48 no opinion; see *City of Seabrook Community Survey, 2004*).

The most recent data available are from a 2009 survey sent to all households on the Seabrook water billing list (Master Plan Commission, 2009). Respondents were asked to identify key city assets. The top three community assets identified were parks and trails, waterfront access, and sense of community or small town charm.

Thus the recent survey mirrors and underscores the results of earlier opinion gathering. It is abundantly clear that parks, trails, the waterfront, and natural areas are high on the list of best-loved aspects of the city and are prime reasons why people choose Seabrook. Maintaining natural conditions along trails is also advisable from the standpoints of vandalism and storm damage (see sections 5.9.2, 5.9.3).

#### **4.9 Recommendation 9: Focus first on trail segments serving the most residents.**

The suggested priority sequence for trail development is based on the objective of delivering easy trail access to the greatest number of residents in the shortest time frame.

**First priority: Create a central crossing.** The center of the Figure 8, at or near Repsdorph and East Meyer, is in the center of the city and would serve the most residents in the shortest time with the least investment in trail spurs to a Highway 146 trail crossing point. This would give people in neighborhoods west of Hwy 146 quick access to rural trails east of the highway.

**Second priority: Add trails in the south.** Seabrook already has a safe Hwy 146 crossing for pedestrians and cyclists underneath the Seabrook/Kemah Bridge, but no trails yet serve this crossing point. Because of the waterfront and boat ramp water access, the area is a uniquely appealing destination. The nearest existing pedestrian corridors are about one mile to the northeast (Second Street Park), and about one mile to the west (Lakeside Drive), already available to walkers because it has sidewalks. Thus modest new trail segments could greatly extend the continuous walking route very quickly.

**Third priority: Cross Hwy 146 in the north.** Residents in the northeastern sector of Seabrook are best served by existing trails already. Extending those trails to Hwy 146 and establishing a safe crossing require building relatively long trail segments. Routing agreements are already partly in place, and berm construction has begun along what will be much of the trail route. This crossing would add the greatest distance and bring the Seabrook trails much closer to connection with the regional trails network.

**Fourth priority: Complete the additional spur trails required.** Connecting parks and neighborhoods to the network mainly involves short spurs, some portions of which already exist in the form of sidewalks.

### **4.10 Proposed New Trails**

#### **4.10.1 North Trail**

The prime existing trail through natural landscapes is the Pine Gully trail loop, which starts at the wooded Hester Garden Park (8.6 acres) on Hester Bayou, runs north up Todville Road via Baybrook and Robinson parks to end at the bayou, bay and pier in Pine Gully Park (52 acres). The North Trail connects

this loop it all the way from Pine Gully to Armand Bayou Nature Center, tying to the regional trail system, with a Hwy 146 crossing at Red Bluff Road. Components:

*\* Berm trail paralleling Red Bluff Road from Robinson Park to Hwy 146 north crossing, and on alongside Red Bluff toward Armand Bayou*

Notes: From Robinson Park to Hwy 146 the North Trail runs along southern base of a wooded east-west “sight and sound barrier berm” under construction as a buffer for new railroad development serving Bayport Container Terminal. Trail routing is largely governed by berm routing, parallel to Red Bluff and upper Todville roads (see trail 1, map 3). Along much of its length the berm is beside the upper course of Pine Gully. A hiking trail bridge crossing Hwy 146 can be included in redevelopment of the Red Bluff intersection. One additional roadway crossing will be needed on this trail segment if the proposed Cruise Terminal Road is built.

*\* Spurs to Seabrook Wildlife Refuge, Friendship Park, and Drusilla Carothers Coastal Gardens*

Notes: These are all short-distance segments.

*Friendship Park* (10 acres) already has a perimeter trail and parking; tying it to the North Trail would add variety for users and make Friendship Park a trailhead point where existing parking can serve the whole northeastern loop (see trail 8, map 3).

*Seabrook Wildlife Refuge* (53 acres) is the largest parcel in the park system that remains in a largely natural condition. Publicly expressed wishes for natural areas in the park system suggest perimeter-only trails are for this park (see trail 9, map 3).

*Drusilla Carothers Coastal Gardens* (8.5 acres) stretches from wooded frontage on a small bayou at the west end through an established garden to the bay shore. A gravel driveway to the bay is serviceable as a walking/jogging path in its present form. Routing a trail spur from the west end can provide hiking access and place the “panhandle” portion of the land in use, while also preserving security for the structures by avoiding hiker access from the main high-use parking lot at the Pine Gully Park gate.

*\* Maintaining woodland*

Naturalness is the hallmark of trails in the northeast. Much of the land along all North Trail routes and spurs is well wooded at present. Maintaining maximum wooded qualities and native vegetation will enhance trail appeal, serve as a sound damper for rail noise, provide visual screening for trail users, and conserve coastal woodland habitat for migrant and resident birds and other wildlife.

#### **4.10.2 Red Bluff-NASA Parkway Trail**

Redevelopment of Repsdorph Road creates the opportunity to establish a new north-south trail axis serving the whole west side of the city, answering a long-expressed need. This trail supplies all residents west of Hwy 146 with network access relatively close to their homes. Walkers and joggers currently using sidewalks can then access granite-surfaced hike/bike trails in other parts of the city after Hwy 146 crossings are in place. Components:

*\* Main north-south route on Lakeside and Repsdorph*

Notes: The Red Bluff to NASA Parkway Trail route is along Lakeside in the north, where sidewalks are in place, and along Repsdorph in the south, where trail creation is projected as part of roadway redevelopment (see trail 2, map 3). This trail connects Brummerhop Park (7 acres) on Repsdorph to the network.

Distance from Red Bluff-Hwy 146 to Lakeside is about a quarter mile, and thus a quarter mile of trail development can readily connect Lake Pointe Forest and Seabrook Island residents to the proposed North Trail and thus to the full trails network once the northern trail crossing of the highway is in place.

*\* Spurs to three neighborhood parks*

*Notes:* Neighborhood parks exist in Lake Pointe Forest, Seabrook Island, and Lake Cove, offering green space, trails and water views. Little trail construction is required to add these neighborhood parks to the network, as the neighborhoods are well served by sidewalks. However, little of their land area is natural, and connection to the wider network therefore has significant value for these residents.

#### **4.10.3 East Meyer Trail**

The East Meyer Trail provides the central Hwy 146 crossing. It will give residents on the west side of Seabrook pedestrian access to the city's major suite of parks and recreation facilities as well as to its central nexus of granite-surfaced hike/bike trails. Together, these trails and the proposed central highway crossing anchor the overall Figure 8-shaped design of the proposed system. Components:

*\* East Meyer to Hwy 146 past Lake Mija and sandpit lake*

*Notes:* This proposed trail leaves the existing Pine Gully trail near the North Meyer-East Meyer bend and runs along East Meyer between the sandpit lake and Lake Mija, past Harbor Cove and the Fire Station to the Hwy 146 (trail 3, map 3). The lakes are scenic components and birding attractions. The 34-acre contiguous central park area has open and wooded trails, some with water views. Adjoining facilities are Rex Meador Park (21 acres), Miramar Park (5 acres), the Disc Golf Course (8.1 acres), playground, swimming pool, skate park, library, and Seabrook Intermediate School. Students use trails extensively for supervised training and would benefit; and school parking provides a de facto after-hours trailhead.

*\* Hwy 146 crossing and west along Repsdorff to meet the Red Bluff-NASA Parkway Trail*

*Notes:* Intersection redevelopment and the planned circle at the realigned Repsdorff-Lakeside provide the opportunity to add a pedestrian bridge crossing Hwy 146 and connect to the north-south (Red Bluff to NASA Parkway) trail at or near the circle. Most of the east-west portion of Repsdorff flanking Lake Cove (trail 3, map 3) will become a potential trail route.

#### **4.10.4 South Trail**

At the south end of Seabrook is the only existing safe pedestrian crossing of Hwy 146, at the Boat Ramp underneath the Seabrook/Kemah Bridge—but no trails serve this crossing point (see trail 4, map 3). The area is a key aspect of the city's public profile: boats, open water, pelicans, and marshland are all closely associated with Seabrook. A wish expressed in opinion surveys is for a trail in the south. The waterfront, boats, fish markets, and narrow streets are inviting, but the area lacks pedestrian access. A trail provides a low-cost and low-impact way for many more residents to enjoy it than can do so at present.

Components:

*\* NASA Parkway to Wildwood Park, Hwy 146, and south to the Kemah Bridge/boat ramp*

*Notes:* The scenic qualities of the area are high, although space is at a premium. This trail connects Wildwood Park to the network. Sidewalks along NASA Parkway, a powerline/railroad right-of-way, and small streets near Lakewood Yacht Club (e.g., Fifth, Lidstone, extension of Anders) provide trail route options for foot traffic. At Lakeside and NASA Parkway is a controlled pedestrian crossing, and the Mud Lake road bridge beside Wildwood Park has a pedestrian lane. The railroad right-of-way is accessible from the boat ramp, where there is extensive parking. Pending roadway and bridge work create uncertainties for trail routing.

*\* Boat Ramp to the Point, McHale Park and Second Street*

Notes: The lower section of Todville Road and the Point have long been a trademark of Seabrook, with shrimp boats and flocks of wild pelicans, both resident and migratory, and both white and brown. A combination of narrow footpaths, overwater boardwalks, and/or higher “catwalks” will likely be needed in this zone, as land is limited and water is everywhere. The bridge on lower Todville has a pedestrian strip.

This trail connects the McHale Park pelican-viewing platform and Second Street Park to the network. McHale has parking, as do both the Boat Ramp and Second Street Park. The Habitat Island planned at the Point as part of Seabrook Waterfront District will provide a new wildlife-rich visual attraction, and an elevated viewing deck near this island calls for a trail spur.

**4.10.5 Second Street to Meyer and the heart of Seabrook**

Notes: Alongside the Seabrook Slough, both Second Street and Todville Road offer water views along either side of the roadway. Residents have frequently expressed the wish for a trail along Todville near the bay so as to be able to enjoy more of this area way on foot, instead of being limited to passing through by a car. At the landward end of Second Street Park, minor trail expansion can tie three additional city properties to the network (trail 5, map 3). Second Street also feeds directly into Old Seabrook. Components:

*\* Second Street north along Todville and upper Slough to Meyer*

Notes: Space for trails is limited along county-owned Todville Road. A combination of boardwalks and stub road right-of-way trail segments will likely be needed. Should GLO regulations prevent permanent structures, removable floating walkways offer a potential solution that can be towed or stowed when storms threaten.

*\* Second Street east to Mohrhausen Park, Community House and City Hall grounds*

Notes: Existing footpaths already connect City Hall, the Community House, Mohrhausen Park and Pelican Path display of painted pelicans, all very near one another. A trail spur of about 1,000 feet westward from Second Street Park can tie all three facilities into the southern loop. Old Seabrook is directly on the loop as well. Pending removal of the sewer plant presents opportunity for an additional short trail segment at the east end of Second Street Park.

**4.10.6 City Hall connector**

From the north, the trail in Miramar Park crosses Meyer and proceeds south past the baseball fields and old police station site, reaching very close to City Hall. City-owned land provides a greenway route behind the old police station for a short new trail to connect the major central park acreage to City Hall and other city properties (trail 6, map 3). In the process, Bay Elementary School would also get a trail link to Miramar Park; school parking provides a de facto after-hours trail head.

**4.10.7 Hwy 146 crossover connector**

Trail 7 on map 3 is an alternative that may be the quickest, easiest, and least expensive way to provide the greatest number of residents with easy trail access, on both sides of Hwy 146. Components:

*\*Meador Park along El Mar to Hwy 146*

Notes: From the central multi-park complex to Hwy 146, sidewalks line both sides of El Mar through Miramar subdivision, flanking a central open drainage with pedestrian bridges. This means that a pedestrian corridor from Hwy 146 to the trails in these parks already exists (trail 7, map 3).

*\* Hwy 146 crossing and trail/sidewalk/drainage easement connection to Brummerhop Park*

Notes: A pedestrian bridge over the highway at this point does not have the complications of a major intersection or elevated portion of the highway. Sidewalks are present in Lake Cove subdivision a short distance west of Hwy 146. West of Lakeside, projected improvements to the drainage easement running north of Sawyer Drive provide a trail route reaching Brummerhop Park (trail 7, map 3).

#### **4.10.8 Other spurs, crossings, and connections**

*\* Friendship Park and the Seabrook Wildlife Refuge*

See 4.10.1 for proposed spurs serving these large parks (trails 8 and 9, map 3).

*\*Robinson Park loop*

A southern connection back to Robinson Park from the Seabrook Wildlife Refuge has been requested by trail users so that they can walk in a loop.

*\*Hester Gully bridge*

A pedestrian bridge over Hester Gully in Hester Garden Park has been requested by trail users so that they can proceed southward without having to get onto Todville Road to cross the bayou.

*\* Spurs for bay viewing*

Multiple road rights-of-way ending at the bay offer this opportunity in Old Seabrook and along lower Todville Road.

*\* Capri crossing*

Uncertainties surrounding Hwy 146 redevelopment timing make it prudent to consider all options for possible crossings, including temporary options.

*\*Lakeside circle*

The section of Lakeside under construction includes a circle linking it with Repsdorph Road. Lakeside has sidewalks and may provide trail opportunities near this new circle.

*\* Regional trails network*

Distance from Lakeside to Armand Bayou Nature Center, the nearest point on the regional network of trails, is about four miles. The nature center's four internal trails and the extended 12-mile trail to it along the Red Bluff corridor present a substantial opportunity for the regional system to be tied to Seabrook's network, linking the regional system to the bay. Partnering with TxDOT, Harris County, Taylor Lake Village, and/or Pasadena can provide benefits for all. The section of this connecting spur that is within the Seabrook city limits is about three-quarters of a mile.

#### **4.10.9 Rails to trails (or Rails *with* trails)**

The proposed Figure 8-shaped trails network includes a southern segment potentially on the railroad bed and two points farther north where trails would cross the old rail route. An obvious additional option is a linear trail all along the rail bed/utility corridor route from the Boat Ramp to Red Bluff. The disused rail bed and pipeline/powerline rights-of-way could provide a north-south pedestrian corridor right through the very center of the city. Such a rail bed trail would intersect all four loops in the Seabrook trails network.

## 5. IMPLEMENTATION AND COSTS

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Most trails are funded through partnerships between the public and private sectors, leveraging local government money as a match for federal, state and private funding sources. Sources of funding are provided in this section, along with successful strategies used elsewhere. Publicly organized trail development is typically focused on the supply-side economics of building costs, but partnerships can greatly reduce the costs to the initiating entity (Land Plan Consultants 1997).

Local funding options are presented first, followed by potential sources of support at the county, state and federal level. Much large-scale funding comes via transportation projects. Table 1 shows state-level grant programs specifically focused on outdoor recreation, and broad cost estimates for Seabrook are provided in table 2.

Trails in Harris County as a whole are on the increase, with major greenway additions especially in the north. In the southeastern part of the county a major recent addition to the regional trail system brings it very close to Seabrook. Pending work on two arterial highways suggests significant opportunities for connecting the regional and Seabrook networks, bringing trail users all the way to Galveston Bay.



Figure 4. Hike/bike trail along Pine Gully

5.1 Local Funding

Examples below are funding sources that have been pursued by other communities for trail development.

- **Transportation Improvement Work:** Trail projects need to be considered during transportation improvement projects, as they can often be incorporated into work for roadway widening, bridge replacement, or resurfacing if trail routes are identified early in the design phase.
- **Impact Fees:** The impact fees levied by local government on new development can help to finance trail facilities outside the specific development concerned.
- **Local Capital Improvements:** A capital improvements program can provide a yearly appropriation for the Parks and Recreation Department for trail development and maintenance.
- **Bond Referendums:** Across the nation communities have successfully placed propositions on local ballots to fund trail development. Seabrook ventured into similar terrain with a 2007 bond vote for park acquisition. School bonds can help develop trail facilities on and around school property, and local general obligations bonds can also be a source of funds.
- **Penny Sales Tax:** Such a tax can be levied for a designated time only or to raise a specified amount. Voters are more willing to support sales taxes with built-in limitations and for special purposes they favor.
- **Private-Sector Funds:** Local industries and businesses may agree to provide support for development of selected trails through cash donations and reductions in the cost of materials that support trail facility development.
- **Trail Sponsors:** Modest donations from individuals and businesses can sponsor trail amenities for meeting project design standards, such as benches, trash cans, and signage.
- **“Buy-a-Foot”:** In some communities people are encouraged to “buy” one linear foot of greenway by donating the cost of construction. The High Point Greenway in North Carolina is an example; greenway “feet” were sold at a cost of \$25 per foot, raising over \$5,000 (Land Plan Consultants 1997).

5.2 County Funding

Very close to Seabrook at Red Bluff Road and Bay Area Boulevard is the 2,500-acre Armand Bayou Nature Center, a prime natural attraction, on land owned by Harris County. The nature center has four internal hiking trails and is the main destination on Pasadena’s 12-mile Armand Bayou Trail, the longest hike/bike trail in the region.

An obvious link waiting to be made along the Red Bluff corridor is to connect the long Armand Bayou Trail, already reaching as far as the nature center, with the established hike and bike trails in the northern end of Seabrook. Such a link would provide greatly extended hiking and biking opportunity for the users of both networks. The regional trail system of Harris County would be dramatically expanded by adding Galveston Bay as a cycling and hiking destination, and Seabrook trail users could then reach the nature center and beyond.

5.3 State Funding

5.3.1 TPWD Grants

The Texas Parks and Wildlife Department administers a suite of grants designed for outdoor recreation and community trail development activity. This grants program provides 50% matching grant funds to municipalities, counties, MUDs and other local units of government with a population less than 500,000 *to acquire and develop parkland or to renovate existing public recreation areas*. There are two funding cycles per year, and projects must be completed within three years of approval.

The maximum grant award is \$500,000, with lower limits for specified types of projects (table 1). Eligible sponsors include cities, and the master plan submission deadline is 60 days prior to the application deadline.

Table 1. Texas Parks and Wildlife Department Outdoor Recreation Grants

Grant Type	Award Limit
Outdoor Recreation	\$500,000
Small Community	75,000
Urban Outdoor Recreation	1,000,000
Urban Indoor Recreation	1,000,000
CO-OP	50,000
Recreation Trail	200,000
Boating Access	\$500,000

Source: Texas Parks and Wildlife Department website, <http://www.tpwd.state.tx.us/business/grants/trpa>

5.3.2 TxDOT and Federal Transportation Dollars

Federal funds allocated for transportation enhancements are administered by the Texas Department of Transportation have lead to the creation of more than 100 miles of trails throughout Texas over the past 10 years (*Building a Legacy* 2009). Projects must conform to federal safety and construction procurement guidelines, and the required local match is a minimum of 20%. Communities may overmatch to improve their competitive position.

5.3.3 Regional Surface Transportation Program

This RSTP block grant program makes money available statewide for roads, bridges, transit capital, bicycle and pedestrian projects (*Building a Legacy* 2009): “Metropolitan Transporting Organizations (MPOs) can transfer monies from other federal transportation funding sources to the RSTP program if they want more flexibility in how they allocate their

funds. SAFETEA requires states to set aside 10% of the RSTP funds for safety construction activities and another 10% for the Transportation Enhancement Activities (TEA) Program.” Applicants eligible for RSTP funds include cities and counties.

5.3.4 Safe Routes to School Program

The overall purpose of this program is to improve safety in and around school areas. TxDOT’s Safe Routes to School Program implemented by HB 2204 became effective in 2002 and chiefly addresses safety construction improvements. Projects can be on or off the state highway system but must be on public property and within a two-mile radius of a school; federal funds requested are limited to \$500,000, and a local funding match of 20% is required unless the project is located on the state highway system (in which case TxDOT will provide the match).

Six categories of work are eligible: sidewalk improvements; pedestrian/bicycle crossing improvements; on-street bicycle facilities; traffic diversion improvements; off-street bicycle and pedestrian facilities; and traffic calming measures for off-system roads (*Building a Legacy* 2009). This is a potential source of funding for pedestrian bridges crossing Highway 146.

5.4 Federal Funding

Federal programs offer financial aid for projects that aim to improve community infrastructure, transportation, and recreation programs. The National Recreational Trails Fund Act was part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The National Highway System Designation Act of 1995 amended ISTEA. As indicated in the preceding section about state funding potential for trails, portions of these federal funds are administered via the states.

Federal programs that can be used to support trail are listed in the sections that follow, and appendix D provides links to much further detail on this topic.

5.4.1 ISTEA

A primary source of federal funding for greenways is through the Intermodal Surface Transportation Efficiency Act (ISTEA), several sections of which support the development of bicycle and pedestrian transportation corridors. Those sections that apply to trail systems include:

- Symms National Recreational Trails Fund Act (NRTFA), using funds paid into the Highway Trust Fund from fees on non-highway recreation fuel used by off-road vehicles and camping equipment.
- Congestion Mitigation and Air Quality Improvement (CMAQ) Program, created to reduce congestion on local streets and improve air quality, making funds are available to air quality “nonattainment” areas.
- National Highway System (NHS), for bicycle facilities on land adjacent to highways; trails can be constructed as part of and at the same time as a larger project. Walkways, crosswalks, and other pedestrian amenities have also been created with such funds in Seattle (Land Plan Consultants 1997).
- Surface Transportation Program (STP) funds can be used for bicycle and pedestrian facility construction or related projects such as brochures and route maps.

5.4.2 National Scenic Byways Program

This component of ISTEA is designed to protect and enhance designated scenic roads. Money is available for planning, safety improvements, historic resource protection, and tourism signage. Some states with Scenic Byways programs have developed trail facilities in conjunction with this initiative.

5.4.3 Community Development Block Grants

The U.S. Department of Housing and Urban Development (HUD) offers financial grants to communities for neighborhood revitalization, economic development, and improvements to community facilities and services, especially in low and moderate-income areas. Several communities have used HUD funds to develop greenways.

5.4.4 Land and Water Conservation Fund (LWCF) Grants

Established in 1965 to provide parks and recreation opportunities close to people's homes, this program is dedicated to recreation. It employs funds from sale or lease of nonrenewable resources, primarily federal offshore oil and gas leases and surplus federal land sales. Communities can use LWCF grants for trails and greenways provided they match LWCF grants with 50 percent of the project costs (in cash or services).

5.4.5 Grants for Small Watersheds

The USDA Natural Resource Conservation Service (NRCS) provides funding to state and local agencies or nonprofits to carry out watershed improvements involving less than 250,000 acres. NRCS provides financial and technical assistance to eligible projects to improve watershed protection, flood prevention, sedimentation control, public water-based fish and wildlife enhancements, and recreation planning. The NRCS requires a 50 percent local match for public recreation, and fish and wildlife projects.

5.4.6 Urban and Community Forestry Assistance Program

The USDA provides small grants of up to \$10,000 to communities for the purchase of trees to plant along city streets and for greenways and parks. To qualify for this program, a community must pledge to develop a street-tree inventory, municipal tree ordinance, tree commission, and urban forestry plan.

5.4.7 Small Business Tree Planting Program

The Small Business Administration provides small grants of up to \$10,000 to purchase trees for planting along streets and within parks or greenways. Grants are used to develop contracts with local businesses for the plantings.

5.5 Private Foundations and Corporate Grants

The Foundation Directory and Foundation Grants Index at www.fdncenter.org identify organizations that assist in direct funding for trail projects. "*Grants for Greenways*" is a national listing with links to groups providing technical and financial support for greenway interests. And grants from or partnerships with utility companies can often be established for proposed utility and pipeline easement trails.

5.6 Volunteer Work

Community volunteers may help with trail construction and maintenance work parties. Potential sources of volunteer labor include such entities as Rotary and the Boy Scouts. Cheyenne, Wyoming, has seen major community volunteer investment of work in its greenway system. A manual guides their activity, and through an “Adopt-a-Spot” program participants take charge of periodic trash pick-up, landscaping, pruning trailside vegetation, and developing wildlife enhancement projects (Land Plan Consultants 1997).

5.7 Range of Additional Options Available

Trails funding potential shifts among foundations and corporations over time, especially for grants of \$10,000 or less. Small-scale grants can be used for activities such as mapping and surveying, ecological assessments, and interpretive displays and brochures. For example, the Conservation Fund's American Greenways Program has teamed with the DuPont Corporation and the National Geographic Society to award small grants (\$250 to \$2,000) to stimulate the planning, design and development of greenways. Awards are intended to develop action-oriented greenway projects and leverage other money for greenway development. Grant recipients are selected according to criteria including demonstrated community support.

Similarly, at times funds have been made available by *Walking Magazine* through its Trail Restoration Fund, aimed at walking clubs; Coors Brewing Company through its Coors Pure Water 2000 grants for projects including greenway river cleanups; the World Wildlife Fund's Innovative Grants program, supporting projects that establish and sustain protected natural areas such as greenways; and REI (Recreational Equipment Incorporated) Environmental grants awards to organizations protecting and enhancing natural resources for outdoor recreation.

5.8 Estimated Cost of Seabrook's Figure 8 Trails Network

Estimates presented here are broad. Details of trail routing may affect these projections either upward or downward, depending on trail segment construction methods selected, precise routes, contractual agreements with partners, and timing of trail development.

5.8.1 Trail Beds

Current trail construction costs for geotextile/crumbled granite trail beds in uncomplicated settings are about \$37,000 per mile. For the purposes of this plan, assuming construction will occur over a span of several years, a cost of \$40,000 per mile is projected. Use of the geotextile/granite medium would create trails that match seamlessly with those already in place.

Where space and drainage issues create the need for culverts, this cost can multiply as much as fourfold for some portions of trail beds. The estimated cost used in this plan is \$120,000 per mile for trail segments requiring culverts at intervals.

Costs of sidewalk segments are not included, as sidewalks are either already in place or envisioned as part of new residential/transportation development and thus covered by funding from other sources. Costs of footpath segments also are not included, being extremely low.

Table 2. Estimated Costs of Figure 8 Trail Development in Seabrook

Developed trails	20 miles @ \$40,000/mile	\$ 800,000
Trails needing culverts	5 miles @ \$120,000/mile	600,000
Small bridges (ditches)	10 bridges @ \$1,000/ea	10,000
Central Hwy 146 crossing		1,000,000
Red Bluff Hwy 146 crossing		1,500,000
Ground-level signage		40,000
Trail literature (\$2,500/year, 10 years)		25,000
Total		\$ 3,975,000

Note: All “community connector” spur trails to neighborhoods and their parks are included. Connection to the regional trail network at its Armand Bayou Nature Center trailhead is not included.

5.8.2 Road Crossings

Beyond addition of small trail bridges to cross roadside drainage ditches in some parts of the city, special measures for pedestrians are not required at most Seabrook road crossings. Streets are mainly modest in scale, and traffic is not intense.

The great exception is the wide, fast arterial Highway 146, where the plan calls for hike/bike bridges at two points on the proposed Figure 8 trail. The only existing safe pedestrian crossing of Highway 146 is at the south end of town, below the Seabrook/Kemah bridge. New pedestrian bridges will be needed across Highway 146 in the center of Seabrook (Repsdorff/Meyer area) and at the north end (Red Bluff).

Options include:

- Install the center crossing first, over Highway 146 in its present form and at a non-intersection point, to avoid the complications presented by a major intersection. Ideally this would involve a modular bridging method that can be adjusted during or after the construction work upgrades the highway. Work on Highway 146 through the heart of Seabrook is scheduled to cover five years, but at this writing it has not been funded, and thus its starting date remains unclear. *Main advantage: This would create a crossing quickly and to serve the greatest number of residents the soonest.*

- Install the pedestrian crossing over Highway 146 at Red Bluff first, since construction work for elevation of the roadway at that intersection has already begun. It is scheduled to be complete in three years, and uncertainties in that setting will then be over. Building this crossing first would allow lessons learned there to be applied in central Seabrook when roadway work occurs there at a later date. *Main advantage: Work at the Red Bluff intersection is already in progress, and pedestrian bridge planning can begin immediately.*
- Install low-cost (“industrial grade”) temporary crossing structures near both the central and Red Bluff intersection points as soon as possible, so as to reflect City commitment to connection of trails, complete the tying together of trail segments quickly, and serve until more pleasing and permanent installations are possible. Crossing near (but not at) intersections may be less compromised by the highway construction phase. *Main advantage: Cheaper temporary crossings would allow evaluation of use patterns, needs, and best long-term options for permanent bridging structures.*
- Install the center crossing later, bridging Highway 146 at the planned new Repsdorph/Meyer intersection when that intersection is being built.

Given uncertainties in the timing and exact nature of the Highway 146 upgrade, it is possible that temporary bridges could be in proud service for several years.

5.8.3 Large-Span Pedestrian Bridges

Recent bridge projects comparable to what is envisioned for Seabrook have cost in the range of \$1.5 to \$2 million (see sources following). Modular options are available, and bridges vary widely in size and aesthetic appeal. Temporary bridging may need to be considered, given ongoing uncertainty in roadway development plans for the area. Fuller engineering research is needed to refine which options may serve Seabrook best. Following are links to organizations worth investigating.

Older-style bridges warrant consideration for possible match with the Old Seabrook look. Boston’s Truman Highway pedestrian bridge was built in 1906 to span a river and railroad (see http://www.boston-online.com/cityviews/truman_highway_pedestrian_bridge.html).

A wide range of bridge designs can be seen in the Continental Bridge photo gallery (www.contech-cpi.com/bridges/products/truss/continental_bridges/continentalphotogallery/552).

The Safe Routes to School program gives further examples (www.saferoutesinfo.org/guide/engineering/pedestrian_and_bicycle_bridges_and_tunnels.cfm)

A modular bridge was installed in 2009 at a New Braunfels middle school for safe crossing of a drainage. (http://texas.construction.com/texas_construction_news/2009/0901_HansonInstallsModularBridge.asp)

The City of Santa Rosa, California, is planning a pedestrian/bike bridges across of a major highway. <http://ci.santa-rosa.ca.us/departments/publicworks/projects/BikePedBridge/Pages/default.aspx>

Two companies that specialize in pedestrian bridges are Gator Bridge and Rail (www.bridgeandrail.com/pedestrian-bridges.php), working in aluminum, and Nature Bridges, www.naturebridges.com, working in various materials.

See also http://www.mdacomposites.org/mda/PSGbridge_pedestrian_intro.html, Prefabricated Bridges, www.4specs.com/s/32/32-3400.html, and Truss bridges, www.pioneerbridges.com.

5.9 Caveats and Considerations

Uncertainties surrounding development of Hwy 146 are the main complicating factor in detailed planning for trail development. Changes coming in the north are well advanced contractually and thus easier to foresee; it would seem most pragmatic to focus trail expansion in that zone. Yet that is in the northeastern section of Seabrook that already has fine trails, and the need for more trails is greater in other parts of town.

5.9.1 Priorities

Making a central Hwy 146 crossing the priority carries risks. Highway plans may change, and delays may confound trail effort. Yet this is the zone where a highway crossing can most quickly make the greatest improvement in trail access for the most residents. Lake Pointe Forest residents, for example, could get to the bay on foot after the Repsdorph-East Meyer trail is completed or a crossing is established near El Mar (see trails 3 and 7, map 3). Only modest actual trail construction would be required. Similarly, adding trails in the south, where there is already a safe highway undercrossing, could greatly extend continuous trail routing through addition of only modest stretches of trail.

5.9.2 Nuisances

Vandalism presents a range of design and maintenance issues, frustrations, and expenses. However, some of these frustrations can be minimized with thoughtful planning. Notably, vandalism is mainly focused on structures—benches, picnic tables, signage, bathrooms, other buildings and shade structures, lighting, trash cans, fences, gates, etc. Where structures are kept to a minimum, vandalism tends to be at a minimum as well. If there is no fence, no one can cut the fence.

Thus it would appear to make sense to aim for a minimum of built structures along the trails, apart from a few benches as resting points. Ground-level directional signage presents vandals with less temptation than solitary signs posted on poles, and trail guides downloadable from the Web can reduce the need for vulnerable informational signage. Moreover, signs and structures work against the natural qualities of trails and views to some degree, providing a second reason to aim to keep them at a minimum.

Abuse of trails and natural areas occasionally arises in such forms as four-wheelers roaring along trails, youngsters using wooded areas for paintball fights, and unauthorized “campers.” The best medicine for preventing abuses of these kinds consists of extensive use of the trails by law-abiding citizens. Many carry cell phones and can quickly call 911 when anything untoward is noted; their presence itself discourages nuisance activity.

5.9.3 Resilience of Trails

Storm damage in Seabrook during Hurricane Ike revealed that trails are a sturdy component of the civic infrastructure. Beyond removal of downed trees and repair of washouts, few special measures were needed to restore the trail system to full functioning after that major and very destructive storm. Thus a further bonus in keeping structures to a minimum is to maintain the resilience of the trails network in zones vulnerable to storm damage.

5.9.4 Potential that Warrants Investigation

Looking ahead, several aspects of trail development not specifically addressed in this plan may warrant investigation for their potential benefits to Seabrook.

Opportunity at Old Seabrook and the Point: Having suffered large-scale hurricane damage in 2008, the low-lying portions of the city from Second Street to the Kemah Channel may struggle for some time to attract redevelopment investors. City commitment to such facilities as trail routes, shade trees, and ensuring safe harbor for the city's trademark pelicans will likely be needed to guide future development in directions that complement the historic flavor of Old Seabrook and the Point.

Crossing the Kemah Channel: Dedicated pedestrian or hike/bike facilities on the Seabrook/Kemah Bridge when it is upgraded could be a significant new asset for the Seabrook's trails. View from the bridge are tremendous. League City is developing an ambitious plan for 212 miles of new trails (*League City Trails Master Plan, Draft*, December 2009). Safe crossing at the mouth of Clear Lake could eventually link south shore parks and trails with those on the north side, dramatically increasing trail mileage and variety available to all users.

Short-term measures: In a context of uncertainty surrounding roadway upgrades, temporary footpaths may be appropriate for some trail segments, enabling continuous trail connection to be established at low initial cost through contractual agreement with owners. Drainage corridors may likewise offer potential for short-term connections, with route refinements and full-scale trail bed development to come later (in the same or alternate locations).

Serving disabled people: Encouraging walkability provides opportunities to create facilities also accessible to people who are wheelchair bound, blind, or otherwise disabled.

Wildlife crossings: Development of wildlife crossings is a pioneering venture that suggests itself for Seabrook. These can sometimes be combined with pedestrian trail crossings of larger roadways. Florida and California have built roadway undercrossings for wildlife, including in a freeway interchange setting, and design literature is available (see, e.g., www.wildlifeandroads.org/). Rocky Mountain and upper Midwest states are exploring crossings too. Structures vary from minor culvert alteration to major installations, and they often garner good public support for reasons of vehicle safety and in locales where residents favor maintaining wildlife.

Views are important: A formal inventory of views may be an advisable step for Seabrook. Waterfront views in particular are a distinguishing feature of the cityscape and a favored community asset. They are a large part of the appeal of some existing trails. As waterfront development intensifies, views from public roadways tend to become increasingly masked by built structures, an effect already evident along Seabrook's Clear Lake and Galveston Bay shorelines. The greatest remaining viewshed potential is in Old Seabrook and on the Point. Planning for retention of appealing public views could boost Seabrook's overall property values and enhance its public profile far into the future.

Appendix A. Seabrook Parks and Their Acreage

Seabrook Parks and Facilities	Amenities
Baybrook Park 4221 Todville Rd.	Restrooms, Tennis Courts, Basketball Courts, Picnic tables, Playground
Bayside Park 1000 2nd St.	Waterfront area, Gazebo Benches
Boat Ramp Underneath Seabrook Bridge	Pier, 2 lane boat ramp
Brummerhop Park 2520 Repsdorff	7 acres, Playground equipt., covered picnic shelters, barbeque grills, 2 horseshoe pits, volleyball court, exercise equipt., basketball court, wetlands observation deck, restroom, drinking fountain.
City Hall grounds 1700 First St	Picnic table, 4 benches, granite trails connecting to the Hike & Bike System.
City Pool/Miramar Park 1109 Hammer St. 281-474-3620	Water park with 30' water slide, 2 pools, volleyball, restrooms, showers, concession stand, swim team.
Community House 1210 Anders	Civic Meeting facilities with kitchen and stage area. Historic building, hardwood floors throughout.
Drusilla Carothers Coastal Gardens 502 Pine Gully Road	8.5 acres, bayshore to creekside in length, adjoining Pine Gully Park, with main house and casita for event rental, pleasing gardens, and wooded section
Friendship Park 4622 Park Rd.	10 acres, 5 soccer fields, 3 backstops, playground, picnic tables, BBQ grills, restrooms, concession stand, basketball court, drinking fountains.
Hester Garden Park 3029 Todville Rd.	8.65 acres, wooded area, partial wetland, pond, trails, pay phone. <i>*ON TEXAS PARKS & WILDLIFE BIRDING TRAIL.</i>
McHale Park 400 Todville Rd. & waterfront	Observation deck for bird watching, benches. <i>*ON TEXAS PARKS & WILDLIFE BIRDING TRAIL.</i>
Miramar Park 1900 Meyer Rd.	5 acres, 30' X 30' covered pavilion w/electricity, 6 picnic tables, benches, BBQ, water faucet, playground equipt.
Mohrhausen Park 110 Second St	Covered seating area, table with benches, flowing fountain, flower garden area, granite trails connecting to Hike & Bike System.
Pine Gully Park 605 Pine Gully Rd.	52.27 acres, 1000' fishing pier on Galveston Bay, Karawankawa Indians camp site, wetlands, wooded area, nature trails, restrooms, picnic tables, BBQ grills, playgrounds. Open dawn until dusk. <i>Daily passes available at park or season passes available at City Hall.</i>
Rex Meador Park 2100 Meyer Rd.	21 acres, covered pavilion w/electricity, basketball courts, trails, BBQ grill, sand volleyball court, 2 baseball backstops, aluminum bleachers, restrooms, water fountains. SKATEBOARD PARK. Adjacent to Public Library.
Seabrook Wildlife Refuge & Park 700 Red Bluff Rd.	50+ acres, primitive nature site providing trails for bird watching and observing other wildlife in their natural habitat. Small parking space available. Several benches.
Robinson Park 702 Red Bluff Rd.	19.7 acres, wooded area, hiking trails, foot bridge, wetlands, gazebo, benches, parking. <i>ON THE TEXAS PARKS & WILDLIFE BIRDING TRAIL.</i>
Wildwood Park 2200 Oceanview Drive	.47 acres, open area, bayou, wetlands, picnic tables, BBQ grills, bench, basketball goal, playground.

Appendix B. Some Trail Design Guidelines



These guidelines are based on accepted national standards for trail facilities. For more in-depth information and design development standards, a useful source is Charles A. Flink and Robert Searns, *Trails for the Twenty First Century* (Island Press, 1993).

Pedestrian environments: An individual’s decision to walk hinges heavily on the perceived quality of the experience. Pedestrian facilities should be designed with the following factors in mind: sufficient width for two adults to walk abreast; protection from traffic; trees for shade; continuity; and quality of landscape viewing.

Matching existing trails: A geotextile fabric underlayer and crushed granite trail bed are typical of current Seabrook developed trails. Ideally new trails should match.

Soft surface materials: Crumbled granite is relatively inexpensive to install, compatible with the natural environment, and preferred by runners and mountain bicyclists. This is one of the best surface types for greenway trails because it can be densely compacted and if properly applied, can support bicycle and handicapped-accessible trail development.

Natural surface trails: Trails or footpaths that make use of dirt, rock, soil, or forest litter and may vary from machine-worked surfaces to those worn only by usage. This is the most appropriate surface for ecologically sensitive areas.

Shredded wood fiber: This material is usually composed of mechanically shredded hardwood and softwood pulp, pine bark chips or nuggets, or chipped wood pieces. It decays rapidly but is favored by joggers, equestrians and walkers because it is soft and blends with the natural environment. However, shredded wood fiber needs a flat subgrade.

Wood surfaces: These composed the top layer of bridges, boardwalks and deck. The most commonly used woods for trail surfacing are exposure- and decay- resistant species such as pine, redwood, fir, larch, cedar, hemlock and spruce. Wood is a preferred surface type for special applications because of strength, weight, aesthetic appeal and versatility. However, wood can be slippery when wet.

Lighting: Seabrook residents have requested lighted trail segments for walking and jogging on summer evenings when the air is cooler than by day. Lighting for multi-use trails should be considered on a case-by-case basis, with full consideration of the maintenance commitment lighting requires. A limited loop section of lighted trail in a high-use area is likely to be the best option.

Trash containers: Bins are necessary along all trails and need to be accessible to both trail users and maintenance personnel. At a minimum, trash containers should be located at each entranceway and bench seating point.

Benches: Seating along trails allow users to rest, congregate or contemplate. Trail benches should comfortably accommodate the average adult. They should be located at the primary and secondary entrances to the trail and at regular intervals, and should be set back three feet from the trail edge.

Signage: Signs should give trail users information they need to use the facility. Oversigning should be avoided. Informational and directional signs should orient users and identify routes and mileages, also allowing police, fire, and medical personnel to respond immediately to incidents on the trail. Regulatory and interpretive signs should be at major entry points, and warning signs may be needed to caution about various hazards.

Parking: Adequate parking at trailheads is necessary so that trail users do not park on the road shoulder, but needs in Seabrook are expected to be modest, since the trail network is intended to serve primarily users arriving on foot or by bike, not by car.

Roadway intersections: Crossing should be at logical and visible locations, preferably at existing intersections. Warning to motorists of upcoming crossing may be in order. Maintain visibility is the key to safety.

Highway crossings: For high speed multi-lane arterials and freeways, the only viable solution is a grade-separated crossing. Overpasses are expensive and require long entrance ramps; the two identified in this plan are likely the only two needed.

Restricting motor vehicle access: Unauthorized motor vehicle access can be an issue at trail-roadway intersections. Trail bollards are the most effective method of limiting unwanted motor vehicles. Bollards should be sited 3 feet tall and 30 feet in advance of the intersection, so as not to compromise cyclist concentration at intersections.

Bridge design: Design load refers to predictable forces and weights that affect the bridge (dead load = weight of bridge, live load = weight the bridge is designed to support). Minimum design load is the combination of forces and weights that would place the most stress on the bridge structure; AASHTO Standards for Highway Bridges should be consulted. Foundations options are footings or piers; piers are preferable for multi-span bridges. Decking surfaces may be wood, concrete, or fill such as stone or soil. Railings are required for all trail bridges, except where the height of the bridge is less than 30 inches. Handrails, must be installed at a minimum height of 3 6" above the surface of the bridge decking. If bicycles will be using the trail bridge, railing must be installed at a minimum of 54 inches above the surface of the deck.

High-bridge approach: An often neglected element of bridge design is the approach, which can be extended if the bridge is high. Several different types of bridges can be constructed for multi-use trails: footbridges, constructed-in-place bridges, prefabricated bridges, low-water bridges and suspension bridges. Regardless of the type of bridge selected, a structural engineer must assist in its proper design and construction.

Appendix C. Trail Maintenance Guidelines



Success and safety depend on effective trail maintenance. This includes trail resurfacing, vegetation pruning, facility upkeep, sign replacement, mowing, and litter removal. A successful maintenance program also requires continuity and predictability. The guidelines that follow are drawn from *Building a Legacy* (2009).

Safety and Public Profile

- Good maintenance deters vandalism and littering.
- A high standard of maintenance is an effective advertisement promoting the trail as a local and regional recreational resource.
- Good maintenance helps preserve positive public relations with the adjacent land owners.
- Consistent maintenance makes enforcement of regulations on the trail more efficient.
- A proactive maintenance policy helps improve safety along the trail.
- Litter receptacles should be placed at access points such as trailheads.
- Illegal dumping should be controlled by vehicle barriers.

Surface and Longevity

- Routine maintenance prolongs the life of the trail.
- Checks for erosion along the trail should be made during the wet season and after flooding.
- Where drainage problems exist, drainage structures need to be kept clear of debris to maintain flow.
- Trail surfaces should be kept free of debris such as branches.

Vegetation

- Where understory trailside vegetation is natural, desirable, and part of the habitat required for wildlife, it should not be cleared.
- In areas of wildlife emphasis, mowing should be judicious to preserve sheltering vegetation.
- Trail segments vary in how much restraint of vegetation is needed: a wide open feeling is desirable on some but not all trails.
- More enclosed conditions are appropriate in wooded settings.
- Vegetation control should be accomplished by mechanical means rather than herbicides.
- Bi-annual mowing along trails protects the trail investment; suggested times are fall and spring.
- Understory vegetation should be cut before reaching 36 inches.
- Vertical clearance of 8 feet should be maintained.
- Written policies are needed to educate users about the importance of wildlife shelter.

Appendix D. More about Federal Funding Programs for Trails

The listing that follows is a set of links to background information about funding and building hike and bike trails. It is excerpted from the National Trails Training Partnership, "Resources and Library: Federal Funding Programs," hosted by AmericanTrails.org, as of January 2010, at www.americantrails.org/resources/fedfund/index.html.

Recreational Trails

Recreational Trails Program (RTP) funds are administered by the Federal Highway Administration from federal fuel tax. Each state receives an apportionment each year and provides grants for recreational trail projects. For FY2006 states shared in \$60 million, increasing to \$85 million by FY2009. The Coalition for Recreational Trails, a federation of national and regional trail-related groups, presents its annual Achievement Awards to trail projects for outstanding use of Recreational Trails Program funds. Articles:

- June 18 "blueprint" for new transportation bill from House Committee on Transportation and Infrastructure includes Recreational Trails, Enhancements, Safe Routes to School, and more programs
- Nationwide trails community works for reauthorization of the Recreational Trails Program
- Apportionments of Recreational Trails Program Funds to States for FY 2009
- Changes in RTP state funding for 2009 based on fuel use estimates
- Overview of the Recreational Trails Program (2007)
- Funding provisions for Recreational Trails Program FY05-09
- Recreational Trails Program Legislation
- State contacts for the Recreational Trails Program
- FHWA guidance to help States and project sponsors meet RTP requirements and provide best practices for trail design, construction, and maintenance
- Typical RTP projects: Alaska Recreational Trail Grants Awarded for 2006
- Typical State RTP selection rules: CT DEP State Parks Division Guidance for Recreational Trail Grants
- Recreational Trails Program: Report on State Trail Projects, accomplishments from 1993-2001
- FHWA funding improves 3,990 trails across America
- Recreational Program Trails Database of projects funded under RTP
- Report on State Trail Project: funding through the Recreational Trails Program, 1992-1999
- Making The Recreation Trails Program Work For You: How States Solicit And Select Projects
- Use of funds from the Recreational Trails Program
- Recreational Trails Program Apportionments to the States: 1993-2004
- How the Recreational Trails Program Works
- Detailed discussion of state RTP programs from 1996

Transportation

The "Safe, Accountable, Efficient Transportation Equity Act— a Legacy for Users" (SAFETEA-LU) authorizes spending for fiscal years 2005-09 and replaces TEA 21.

- **NEW:** Secretary of Transportation: "people want the opportunity to leave their cars behind"

- Conservation Corps and Transportation: Making the Connection funding and policy guide
- TIGER grants can benefit trail and greenway projects under ARRA
- Program Information Resources: American Recovery and Reinvestment Act
- Safe Routes to School funding available for states for FY05-09
- Surface Transportation Reauthorization for current Transportation Enhancements information
- Transportation Enhancements: Summary of Nationwide Spending as of FY 2008
- Federal Highway Administration's Guidance for Transportation Enhancement (TE) Activities
- How Can Transportation Enhancements Benefit Wildlife? (pdf 3.5 mb)
- Three articles about the new federal transportation funding bill (Aug. 2003)
- Federal Transportation Reauthorization: The State Perspective (pdf 315 mb) (Sept. 2003)
- American Trails Action Alert: Transportation Enhancements
- Reauthorization of TEA eyed by trails coalition
- SAFETEA bill includes provisions affecting trails and greenways
- Secretary of Transportation comments on SAFETEA: reauthorization of transportation funding
- A Guide to Metropolitan Transportation Planning Under ISTEA
- Success Stories in Transportation Enhancements, from The Nature Conservancy
- Transportation Enhancements fund Katy Trail
- Top Ten hints for ISTEA trail projects
- Why Provide Bicycle and Pedestrian Facilities? ISTEA transportation planning in Georgia

Land & Water Cons

The Land and Water Conservation Fund (LWCF) provides funding nationwide for federal land acquisition and state outdoor recreation grants.

- Land and Water Conservation Fund Stateside Assistance fact sheet from NRPA
- 2008 LWCF Annual Report, LWCF Grants Manual, and Project Lists
- LWCF State Assistance Receives \$30 Million for FY2006
- The Land and Water Conservation Fund: Vital to the Future of U.S. Public Parks and Recreation (April 2005)
- LWCF: Responding to a Need for Outdoor Recreation
- FY 2004 Federal LWCF projects by state and estimated funding by state
- \$94 Million For 2003 State Recreation Grants From Land and Water Conservation Fund
- Funding announced for 2001 Land and Water Conservation Fund projects across America
- Summary of proposals for support of Land and Water Conservation Fund, March 1999

Other agencies

- Federal health grants can fund bike/ped programs
- National Recreation Trails program recognizes exceptional trails and greenways
- 2006 budget of \$10.8 billion proposed for the Department of the Interior
- A Trail Advocate's Guide to the Federal Budget Cycle (FY 2003) from the American Hiking Society
- Grants.gov tracks grant opportunities from all Federal grant-making agencies
- Public Lands Highways Discretionary Funds: program guidelines and eligibility

Grant programs

For more on current grants and funding opportunities see the What's Hot area

- Advocacy Advance Grants for organizations and innovative campaigns to increase biking and walking

- Greater Outdoors Project provides grants for environmental projects
- Distribution of "Safe Routes to School" funds to states
- American Canoe Association and L.L. Bean offer water trail Stewardship Grants
- Bikes Belong awards grants for trails and bicycle facilities
- Breyer Animal Creations provides equestrian trail preservation grant
- Nature Valley launches Save the Trails Grant Program, in support of American Hiking Society's National Trails Fund
- Polaris announces 2008 T.R.A.I.L.S. ATV grants program
- Polaris announces T.R.A.I.L.S. grants program for ATV projects
- Funding For Wisconsin Trails (pdf 596 kb): typical State trails, OHV, and snowmobile grant program
- New York Trail Funding Guide (pdf 52 kb)
- National Scenic Byways Grants list for 2006
- The social and economic benefits of Transportation Enhancements (pdf 680 kb)
- Funding Trails Training with State Resources
- Funding sources for bicycle and pedestrian facilities and programs from Baltimore Regional Transportation Board
- 25 community projects given grants to promote Active Living
- Tread Lightly! distributes grants to member clubs
- Kodak American Greenways Awards program from the Conservation Fund
- PowerBar's D.I.R.T. grants program funds outdoor recreation projects nationwide
- Conservation Alliance Grants
- Hudson River Valley Greenway Communities Council provides planning grants for the Hudson River Valley

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Chainguard, www.geopages.com/CapitalHill/1399/

Greenways, www.greenways.com.

Institute of Transportation Engineers, www.io.com/~itehq/index.htm

National Trails Training Partnership, www.americantrails.org/resources/fedfund/index.html

Prefabricated Bridges, www.4specs.com/s/32/32-3400.html

Rails-to-Trails Conservancy, www.railstotrails.org

Roadway crossings for wildlife, www.wildlifeandroads.org

Texas Parks and Wildlife Department, www.tpwd.state.tx.us

Texas Trails Network, www.texasrtrails.org

Transportation Research Board, www.nas.edu/trb.html

USDOT Bureau of Transportation Statistics, www.bts.gov.