

# Executive Summary

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The City of Houston has embarked on a program which has established a Comprehensive Bikeway Plan for the entire City and will ultimately lead to implementation of an extensive system of bikeways. The primary focus for development of this plan is to facilitate bicycle commuting in order to respond to increasing auto congestion, air quality issues, and mandates from the federal government to reduce reliance on the single occupant automobile.

The Comprehensive Bikeway Plan for the City of Houston has been developed using logical planning techniques which identified and analyzed opportunities and constraints for bikeway development. Through this process a bikeway system master plan has been developed jointly with the Mayor's Task Force on Bicycle Safety and Mobility and interested citizens from across the City. In addition to development of the bikeway system master plan, this plan identifies design guidelines for recommended bikeway classes and provides a plan for implementation.

## Project Goal

The Mayor's Task Force on Bicycle Safety and Mobility established the following goal for this project:

*"Develop a plan for a comprehensive system of bikeways, support facilities, and programs that can be used to promote bicycling as a mode of transportation and to provide safe and convenient travel for commuting, utilitarian, and recreational purposes."*

The purpose of this goal statement is to provide overall direction for the development of the bikeway plan. The Task Force also identified several specific objectives or areas of emphasis to focus and guide development of the bikeway plan. These objectives include the following areas:

- Accessibility;
- Safety;
- Design Considerations;
- Maintenance and Operation;
- Funding;
- Interagency Coordination and Policies; and,
- Education.

Each of these areas have related objectives associated with the development of the Comprehensive Bikeway Plan. Chapter 2 outlines each area of emphasis and specific objectives related to development and implementation of this plan.

**Assessment of Existing Conditions**

Initiating a comprehensive development plan for bikeways in the City of Houston required an inventory and assessment of existing conditions. There are many existing segments of bikeways, trails, and roadways in Houston which cyclists use on a regular basis. Additionally, there are limited support facilities for use by cyclists, such as bicycle parking facilities. Chapter 3 contains a summary of the characteristics of existing bikeway facilities, including both on and off-road facilities, and identify the potential bikeway corridors for use by cyclists.

**Identification of Needs and Opportunities**

Chapter 4 describes the process of identifying the needs of bicyclists and the opportunities for bicycle system development that are available in Houston. The chapter begins with a discussion of the "design bicyclist" for the system, which shall include both experienced and less experienced cyclists. Activity centers and other major destinations for bicyclists are identified and incorporated into the base of data to be considered when locating bikeways. These destinations included hospitals, universities, shopping centers, major office employment centers, public schools, park and recreation facilities, and METRO transit centers and park and ride facilities.

**Integration With Other Plans** - Plans or proposals for bikeway development have previously been prepared for various areas within Houston by City, METRO, area associations, civic clubs, and citizen organizations. These proposals were identified and considered during the development of this Comprehensive Bikeway Plan. All of the proposed routes were considered as part of the alternatives evaluated, and many of the proposals were incorporated into this Bikeway Plan. Proposals that were found to be consistent with the plan objectives and evaluation criteria were adopted as part of the plan, while others were modified or replaced by other alternatives that were found to be more consistent with the objectives and criteria. The plan proposals gathered for consideration include the following:

- Citizens Environmental Coalition Recreational Trails Plan;
- METRO Hike and Bike Trails Proposal;
- Buffalo Bayou Master Plan;
- Buffalo Bayou East Sector Redevelopment Plan;
- White Oak Bayou Bikeway Plan;
- U.S. Army Corps of Engineers Sims Bayou Recreational Development Plan;
- West Houston Association Green Ribbons; and,
- City of Houston Neighborhoods to Standard Information Program.

**Initial Network Development** - An initial concept of the proposed network of bikeways was developed in preparation for discussion at public focus group meetings. The framework of the bikeway plan network was devised by compiling the skeleton of off-road facilities along major bayous and abandoned rail corridors, as previously conceived by others, and augmenting that with a network of on-road bikeways that would cross barriers and connect neighborhoods with potential bicycle destinations. These potential destinations included the off-road trail, other neighborhoods, retail, and employment centers

#### **Bikeway User Needs and Comments**

A series of eight public meetings was conducted throughout the city to expose the bikeway network concept to potential users. The gathering of interested citizens also afforded the opportunity to conduct a survey of citizen needs and concerns regarding bicycling. A summary of the responses received from over 200 citizens attending the meetings is presented in **Appendix B** along with the survey used to collect this data.

Since the bikeway plan framework had been so thoroughly examined for presentation at the public meetings, it was easy for citizens to grasp the concept of a continuous network of routes, lanes, and trails that could be followed to access destinations throughout the city. The map that had been prepared was in such detail that a resident could find his home location and desired destinations and see where a bikeway had been planned in the vicinity. Overall, the bikeway system plan was well received by the citizens attending. Many comments and valuable insights were collected by the Consultant Team members, who conducted all of the meetings and were available, as were task force members, to discuss the plan with citizens.

**Bikeway Network**

The network of proposed bikeways is presented in **Appendix C**. The total program of improvements includes approximately 1,305.0 miles of bikeway facilities. The total cost for all facilities is approximately \$94,422,000. The detailed breakdown of facility type, length of facility type and cost is as follows:

<u>Facility Type</u>	<u>Miles</u>	<u>(%)</u>	<u>Estimated Cost</u>	<u>(%)</u>	<u>Net Cost/Mile</u>
Bike route with no special treatments* (includes signal installations)	322.1	(31.1)	\$7,855,000	(8.0)	24,387
Bike route with wide outside lane	286.2	(27.7)	5,439,000	(5.7)	19,004
Bike lanes	83.2	(8.0)	3,737,000	(4.0)	44,916
Shoulder lanes	65.6	(6.3)	7,790,000	(8.3)	118,750
Bike Trails	<u>276.7</u>	(26.7)	<u>69,401,000</u>	(73.0)	250,817
<b>TOTAL</b>	<u>1,035.0</u>	(100.0)	<u>\$94,422,000</u>	(100.0)	<u>\$91,229</u>

The costs of each segment are detailed in **Appendix D**.

**Staged Implementation Plan** - A comprehensive bicycle system for the city of Houston must be developed in stages, as the bikeway system plan would bring the bikeway inventory from approximately 50 miles to over 1,000 miles. Timing for overall implementation will depend upon the availability of funds and the demand for bicycle facilities in various parts of the city, as well as future growth and development.

In the prioritization of the Comprehensive City of Houston Bikeway Plan, the projects were prioritized into four groups as follows:

- Priority 1 - Implementation for year 1 and 2;
- Priority 2 - Implementation for year 3 to 5,
- Priority 3 - Implementation for year 5 to 10; and,
- Priority 4 - Implementation for year 10 and beyond.

The program for implementation in years one and two include \$19,798,000 for implementation of 383.2 miles of bikeways. For Priority 2 projects being implemented in three to five years, approximately 423.8 miles of bikeways are proposed for implementation for a cost of \$30,411,000. Approximately 126.8 miles of bikeways are proposed for Priority 3 projects (five to ten year implementation) for a cost of approximately \$20,407,000. For projects identified for implementation for year ten and beyond, a total of approximately 95.4 miles of bikeway facilities are proposed at a cost of \$23,621,000. The longer range set of projects includes many of the bike trails on the other side of the bayou from earlier trail projects. The detailed breakout of the bikeway implementation plan and time phased program are presented in Appendix D.

### **Recommendations**

This report contains a series of recommendations for design and implementation of the bikeway system and a proposed bicycle safety and education program. These recommendations include the following:

**Policies** - It is essential that policies be developed to support and guide development of the Bikeway Plan. Policies related to implementation of the Bikeway Plan should include the following:

#### **The City of Houston:**

- Adopt the Comprehensive Bikeway Plan as the official planning document for development of the comprehensive bikeway system;
- Establish coordinated efforts to determine design and implementation tasks along city departments;
- Establish a position for a Bicycle Program Manager who would be responsible for coordinating activities of all Bikeway Plan aspects;
- Establish requirements for providing bicycle parking at employment and retail facilities;
- Encourage provision of showers, lockers, or access to these facilities by employers by providing incentives in development, review or approval processes;
- Establish procedures for coordinating on-going Capital Improvement Projects with expansion or implementation of the Bikeway Plan;

- Define funding resources available to be used not only for initial design and construction but also on-going maintenance and operation;
- Establish coordination of new bikeway development, especially off-road facilities, with City of Houston Police Department to coordinate and facilitate security patrols;
- Establish coordination between City Departments including Capital Projects, Utilities, Parks & Recreation, Planning and Development by establishing a committee with representatives from each Department tasked to coordinate and facilitate bikeway development;
- Establish and adopt a bikeway program for low-level maintenance of facilities and for citizen safety patrols; and
- Establish policy and responsibilities for promoting public education and awareness of bicycling.

Harris County and Harris County Flood Control:

- Establish policy to facilitate interagency cooperation in joint development of bikeway facilities along Harris County Flood Control easements;
- Establish guidelines for development and maintenance responsibilities for agencies which desire to develop along Flood Control easements; and,
- Designate a staff position to coordinate and facilitate bikeway facility development with the City of Houston and other agencies which develop bikeway facilities.

Metropolitan Transit Authority of Harris County:

- Establish a policy and procedures for allowing bicycles on or in the bus;
- Establish coordination of new bikeway development in conjunction with mobility project planning and design; and,
- Provide for the installation of bicycle storage facilities at all park and ride and transit center facilities.

Texas Department of Transportation:

- Continue to support and expand the responsibilities of the Bicycle Coordinator to include assistance in development, planning, design and construction of Bikeway facilities in his jurisdiction; and,
- Establish procedures that will assist in coordinating plans of multiple jurisdictions to avoid conflicts in alignments and ensuring coordinated development.

Houston Independent School District:

- Establish a school based bicycle education and training program, in conjunction with local bicycle organizations and the Texas Department of Public Safety.

**Design** Guidelines are presented in Chapter 6 for the proper design and construction of both on-road and off-road facilities to accommodate bicycling. In general, all facilities should meet the minimum standards recommended by the American Association of State Highway and Transportation Officials (AASHTO) in the publication Guide for the Development of Bicycle Facilities, August 1991, or its most current edition. This publication should be incorporated into the design standards for roadway and bike path projects. Pavement striping, signage, and signals should be in accordance with the most current Texas version of the Manual on Uniform Traffic Control Devices (MUTCD).

Other areas covered in Chapter 6 include geometrics, lane widths and designations, signage, lighting, parking, and maintenance.

**Bicycle Education Program** - Details of a proposed bicycle education program are presented in Chapter 8.

Most of the successful bicycle education programs in the United States have been public-private partnerships. This concept involves the grass-roots bicycle organizations in a pro-active role within established programs conducted by public agencies. A full "life-cycle" program of education might consist of the following elements:

- Kindergarten through Third Grade - pedestrian and bicycling safety education safety training (Florida DOT has developed pilot programs; The Institute for Rehabilitation and Research, TIRR, has produced a bicycle helmet video and is promoting it to area PTO's, Triametic has produced a video entitled "Bicycle Safety Camp");
- Fourth and Fifth Grades - "Basics of Bicycling" curriculum (developed by Bicycle Federation of America);
- Middle School and High School - focus on sports and recreational uses, touring, racing; conducted by volunteer cycling advocates;
- Local Universities - promote cycling at campus, introduce effective cycling as physical education course (similar to racquetball, tennis, etc.);

- Adult Cyclists - a modified version of LAW's Effective Cycling course would serve the public need for cycling education, offered at bike shops and community centers; promotional events such as Bike to Work Day, and Bicycle Houston Week also serve educational needs;
- Motorist Education - emphasize sharing the road techniques and bicycle awareness in Driver's Manual by Department of Motor Vehicles and all state and private Driver Education courses. (State of North Carolina includes Driver's Manual chapter on "Sharing the Road".)
- Public Awareness and Bicycling Encouragement - outreach to non-english speaking adults; helmet promotion campaigns; parents of child cyclists through speakers at Parent-Teacher Organizations

The initial bicycle education programs should concentrate on addressing the most effective intervention opportunities. The recommended programs include the following:

- Institutionalize bicycle education in the public school system;
- Bicycle Law Enforcement;
- "Streetwide Cycling" Safety Seminar for adults;
- Develop Public Awareness and Encouragement of Bicycling, including a variety of programs;
- Bicycle Training for City Staff, and,
- Motorist Education.

### Funding Sources

Funding of bikeway facilities can come from many sources. Traditionally, these facilities have been funded as a part of on-going capital improvement programs. Agencies or departments have funded, for the most part, the development of existing facilities from existing funded programs, whether it is from Capital Projects or Parks and Recreation Departments.

A new perspective on funding will be required as municipal, state and federal funds have become less available and new funding mechanisms are established through ISTEA. A combined and joint effort in funding facilities will be a trend for future development of many new infrastructure projects, especially transportation related projects. Funding issues are discussed in Chapter 7.