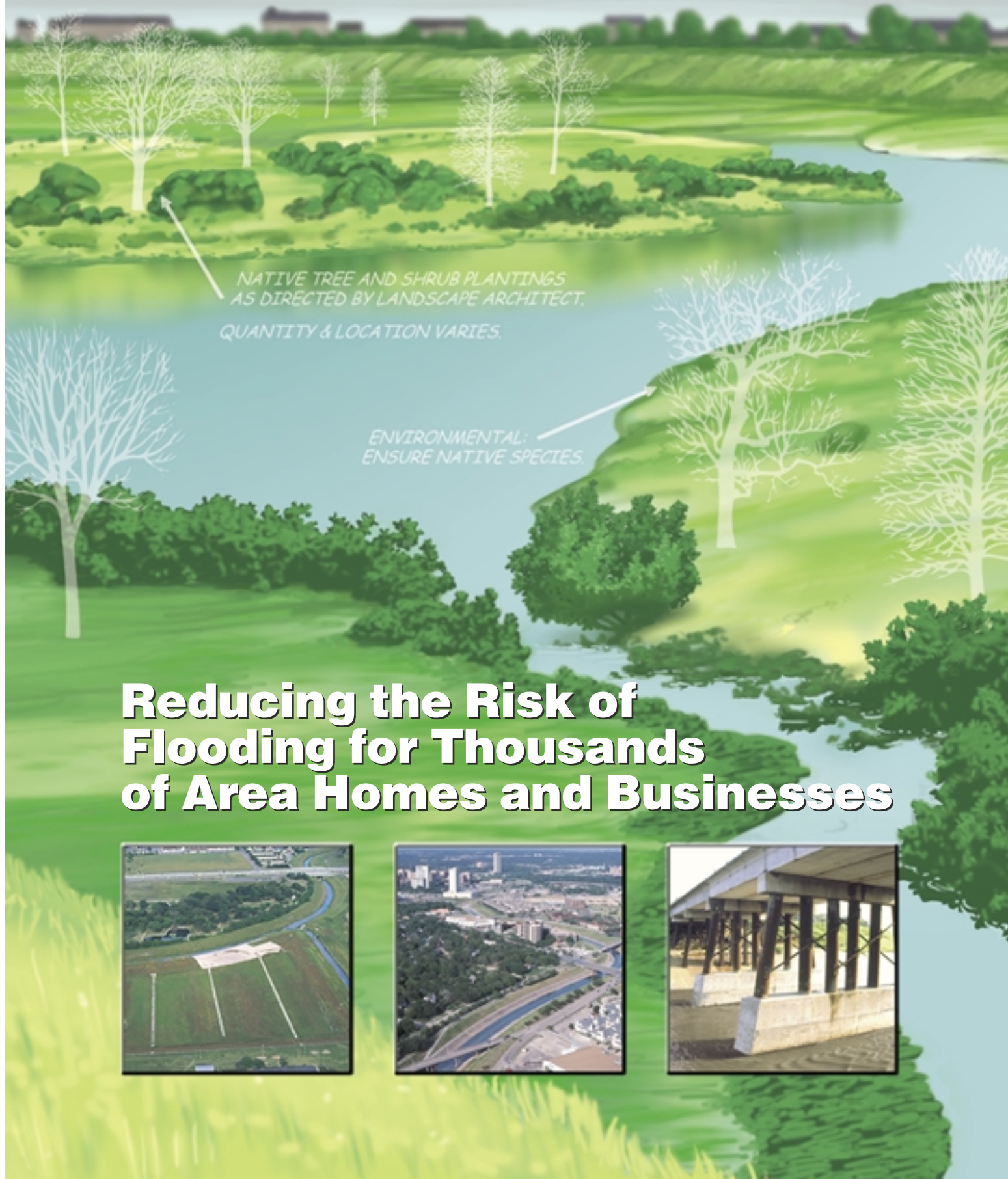


BRAYS BAYOU

THE BRAYS BAYOU FLOOD DAMAGE REDUCTION PROJECT



NATIVE TREE AND SHRUB PLANTINGS
AS DIRECTED BY LANDSCAPE ARCHITECT.
QUANTITY & LOCATION VARIES.

ENVIRONMENTAL:
ENSURE NATIVE SPECIES.

Reducing the Risk of Flooding for Thousands of Area Homes and Businesses



WORKING HARD TO
Reduce



SCENES LIKE
These



Harris County
Flood Control District

1937



"WILD RIVER"
 A
 PICTORIAL PETITION
 PRESENTED TO THE
 STATE AFFAIRS COMMITTEES
 of the
 45th LEGISLATURE
 in 1937 (session commencing
 at Austin, Texas, March 4th, 1937,
 URGING FAVORABLE CONSIDERATION OF
 Senate Bill Number 174, and
 House Bill Number 284.

The District is Created

Shortly after the Allen brothers chose to establish Houston at the confluence of Buffalo and White Oak Bayous, virtually every structure in the new settlement flooded. Although it was quickly realized that our area is naturally flood prone, it took the devastating floods of 1929 and 1935 to bring about serious action for major flood relief.

The Harris County Flood Control District was created by the Texas Legislature in 1937, and originally served as the local partner for the U.S. Army Corps of Engineers for flood control projects. Over the last 60 years, we have successfully partnered with the Corps on many projects, and through this time our role and capabilities have grown significantly.



Harris County
Flood Control District

The Harris County Flood Control District

Who we are. What we do.

Our bayous and waterways are an integral part of the local landscape. Houston is widely known as the Bayou City, and the rest of Harris County is much the same. In many places throughout the county, our bayous offer distinctive vistas, whether in their original pristine condition, or sculpted by modernization. But, when nature sends the heavy rains that come with our climate, and as flood waters overwhelm the capacities of Harris County's channels, they can become sights that none may wish to see.

The price of major flooding is paid not only in dollars, but in distress in the lives of families and business owners. At the Harris County Flood Control District, our job is to help reduce the risk of that kind of disaster.

Created by the Texas Legislature in 1937, the District was given the responsibility of overseeing rivers, streams, tributaries and flood waters "for domestic, municipal, flood control, irrigation and other useful purposes." Although our primary function was to serve as the local partner for the U.S. Army Corps of Engineers, the District gradually took on a much more complex role. As the population of Harris County doubled to 600,000 by mid-century, and the number of plants and

factories tripled, managing the problems of flooding became even more urgent. Costly floods were almost an annual event. More homes and businesses were built in improvident locations, prior to establishing the standard of the 1% (100-year) flood and prior to our current level of understanding of flood-prone areas. Still, managing the flooding as efficiently as possible was essential.

Every year, new flood damage reduction projects were proposed and others were completed. Major projects, such as the enlargement of a 25.4-mile stretch of Brays Bayou in 1968, and 10.7 miles of White Oak Bayou in 1971, were big steps. Despite the progress, however, flooding problems continued, with 21 damaging storms from 1950-1980. It became apparent that additional flood control "tools" were needed. The concept of stormwater detention facilities began to figure prominently in project planning and new development projects. These facilities hold storm water until the peak passes and release it slowly as flood waters recede. The District now has more than 40 regional detention sites, covering over 7,100 acres, with many more in the planning stages.

New technologies have also influenced the evolution of flood damage reduction, benefiting channel flow with new structural and non-structural solutions. Additionally, floodplain regulations and stringent environmental codes have played an increasingly important role. Efficiency of District operations has also improved through the years: a streamlining of the organization in the 1990s reduced the staff by two-thirds, while engineering, construction and maintenance duties were privatized. The District now performs capital projects under a "pay-as-you-go" funding program that makes your tax dollars go farther by avoiding the extra cost of borrowing (selling bonds).

Although our operations have become more complex through the years, our mission remains simple: Devise the flood damage reduction plan, implement the plan and maintain the infrastructure... with appropriate regard to community and natural values.

Whether it's multi-million dollar project management, the maintenance of area channels or detailed attention to improving the local environment, we will continue to hold true to our mission.

Practically speaking, preventing all flooding in Harris County is virtually impossible, given the area's terrain, climate and storm patterns. But every project helps the community cope with flooding by helping reduce the risk and frequency of damages.

DID YOU KNOW? Flooding in this area has been a problem even before the earliest settlers built homes here. The Harris County Flood Control District works hard to reduce the impact of flooding, but cannot control all floods.

Cover Illustration: Brays Bayou regional detention basin near West Sam Houston Parkway and Beechnut
 Cover Photos (L-R): Aerial view of Brays Bayou regional detention basin (Arthur Storey Park), aerial view of Brays Bayou west of Medical Center, RR bridge replacement on Brays Bayou
 Cover Photos (Top to Bottom): Area scenes from recent floods, © Houston Chronicle

DID YOU KNOW?

Without a flood damage reduction plan, a 1% (or 100-year) flood event on the main channel of Brays Bayou alone could result in the flooding of 28,000 homes and 700 businesses, causing extensive damage.

Brays Bayou Putting the Flood Damage Reduction Plan Into Action

With input from dedicated people whose homes and livelihoods are affected by area flooding, as well as extensive engineering and environmental research, a study to identify a flood damage reduction plan for Brays Bayou is complete. The plan consists of an upstream element and a downstream element. The upstream element is currently under construction, and we have recently completed a planning study for the downstream element. On June 13, Harris County Commissioners Court adopted the Brays Bayou Flood Damage Reduction Plan, which incorporates the recommendations for the upstream and downstream elements.

The upstream element includes channel enlargement and a series of detention basins between the Sam Houston Parkway and State Highway 6. Construction began on this part of the project in the mid-1990s, and some completed features have already reduced the threat of flooding along the bayou. Upstream work should continue through 2008.

One of the major factors in seeking federal funding for a flood reduction project is the cost of the project compared to the expected losses if the project were not constructed. This comparison is expressed as a benefit-to-cost (b/c) ratio. To secure federal funding, the b/c ratio must be greater than one, i.e., benefits must outweigh the costs of the project. Total costs for the upstream element are estimated to be \$195 million dollars. The federal government will pay for \$131 million of that total. On an annualized basis, the cost would be approximately \$12.5 million. Figures show that a reduction

of \$41.5 million of flood losses will be expected in any given year. The b/c (\$41.5 million compared to \$12.5 million) ratio is 3.3, far exceeding the federal government's criteria for participation.

Downstream, planning is finalized for the area from the mouth of Brays Bayou upstream to the Sam Houston Parkway. This plan is the culmination of two years of detailed study and will include a combination of measures: the 17.5-mile enlargement of the current bayou channel from the mouth of Brays Bayou at the Ship Channel upstream to Fondren Road; a large detention basin along Willow Waterhole (a tributary to Brays Bayou), located on over 250 acres of land; and the replacement/raising of fourteen bridges, as well as the extension of seventeen bridges, all spanning Brays Bayou. The bridge work is being planned in coordination with other governmental agencies.



The project for the downstream element will cost approximately \$253 million, with about \$132 million coming from the federal government. On an annualized basis, the cost of constructing the project will be approximately \$24.7 million.

Estimated annual flood damages will be reduced from \$72.5 million to \$15.0 million. The ratio of benefit (\$57.5 million) to cost (\$24.7 million) of 2.3 qualifies the project for federal funding.

Combining the upstream and downstream elements, the total Brays Bayou project will cost approximately \$448 million. Of that amount, approximately \$263 million will come from the federal government. The project will reduce estimated annual flood damages by \$99 million each year, at an overall b/c ratio of 2.7. This equates to a rate of return of 20 percent per year.

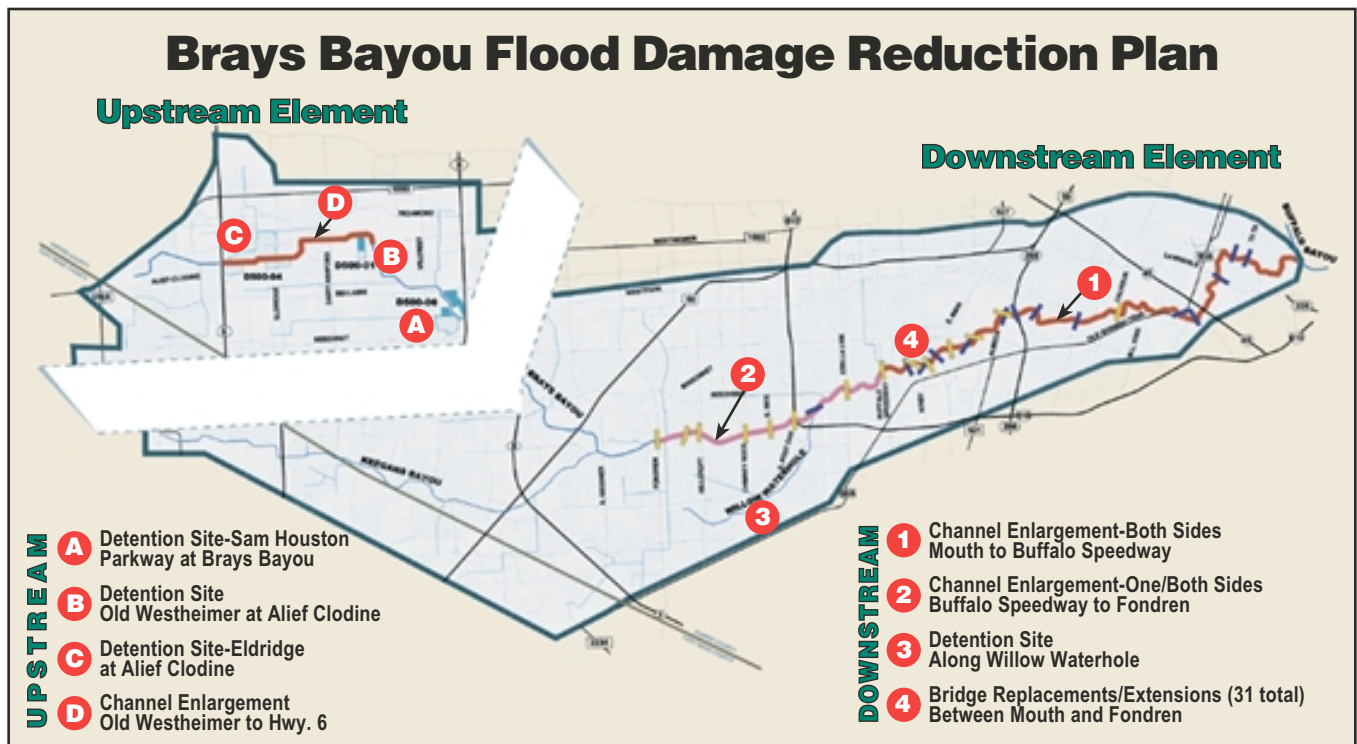
Because the Brays Bayou watershed is highly urbanized, thousands of homes and businesses will benefit from the reduced risk of flooding. Bellaire, Houston, Meadows Place, Southside Place, West University Place and unincorporated areas of Harris County will be helped. AstroWorld, Hermann Park, the Houston Zoo, the Texas Medical Center, Rice University, the University of Houston, the commercial corridor along the West Loop and the Southwest Freeway interchange, as well as many residential subdivisions and retail centers, are all in the area that will benefit from the project.

The Brays Bayou Project study has been greatly concerned with the environmental impact of the planned improvements. Proposed designs for bayou parkways include the preservation or moving of existing trees where possible, and the replanting of additional trees and shrubs when existing trees cannot be saved. In fact, multi-purpose property use has always been important in the development of the plan, so that the land involved may be used for recreational or aesthetic purposes when it is not serving its primary purpose of handling flood water.

A good example of environmental consideration is the detention area along the western edge of the Sam Houston Parkway. Here, a large stand of hardwoods adjacent to the bayou has been preserved, and the area is now a popular Harris County Precinct 3 park known as Arthur Storey Park.

This environmental vision will extend to the downstream element as well. The Willow Waterhole detention basin will provide attractive green areas in that part of the watershed. This detention facility will hold water only during extreme rainfall events. The remainder of the time it will serve as a recreational area, a natural conservation area, a pleasant green space, or any combination of these. All stakeholders, including the City of Houston and local neighborhoods, are taking part in the planning process to develop and implement the best plan for this basin.

When the Project reaches completion, the banks of Brays Bayou will be a place to walk, to bike and to enjoy, with the comforting knowledge that the potential for extreme flooding has been remarkably reduced.



This reference map of the Brays Bayou Flood Damage Reduction Plan illustrates the various project features. The upstream portion is already under construction, with several regional detention basins currently in place. Careful attention to the environment means strong promotion of trees and plants, as well as construction of multi-purpose areas for public use that will also provide flood damage reduction for the area.



WRDA: A word that means relief for 28,000 homeowners

The Federal Water Resources Development Act (WRDA), signed into law in 1996, authorized non-federal interests, such as the Harris County Flood Control District, to undertake major flood damage reduction projects with federal funding assistance through reimbursements. We view this as an enormous increase in the capability of our partnership with the U.S. Army Corps of Engineers that allows the strengths of both agencies to bring about faster implementation of flood damage reduction facilities. In addition to Brays Bayou, two other projects are under development through this new law: Hunting Bayou and White Oak Bayou. For the Brays Bayou Flood Damage Reduction Project alone, this plan means that 28,000 homes will more quickly have a substantially reduced risk of flooding.

Partnerships Lead the Way

Willow Waterhole Bayou Interlocal Agreement Benefits Entire Community

As part of the Brays Bayou Flood Damage Reduction Project, the Harris County Flood Control District will implement a 250-acre regional detention basin along Willow Waterhole Bayou. In April 2000, the Houston Parks and Recreation Department and the Harris County Flood Control District embarked on a partnership to capitalize on a unique opportunity for both agencies, which will offer tremendous recreational and multi-use benefits within this regional detention basin. The partnership resulted in a \$750,000 grant to the City from the Texas Parks and Wildlife Department to develop the Phase 1 multi-use facilities, known as the Willow Waterhole Greenway Project.

Phase 1 of this project will be a 60-acre, multi-use facility within the detention basin. It is only the first piece of a much larger, planned regional green space and an example of a long-term relationship between the City and the District to develop recreational joint-use projects on District properties. Phase 1 acquisition and construction is estimated at \$8 million and will take approximately three years to complete.

Input from the public is integral to the development of the Willow Waterhole Greenway Project. With community involvement, amenities can be included that ensure the highest utilization of the Greenway for the surrounding community. Partnerships like this benefit the community by providing additional greenspace for use by the public – a necessity in our rapidly developing community.

Flood Insurance: Who Needs It?

EVERYONE!

Just because your home is not mapped within the 100-year flood plain does not mean that you are safe from potential floods. Many homes flood because excess storm water cannot drain fast enough to prevent local ponding from reaching the inside of a home. Nationally, one-third of flood loss claims are from property located outside of the mapped 100-year flood plains. The National Flood Insurance Program (NFIP), administered by FEMA, is available to any resident of Harris County and incorporated cities within the county. Remember that flood insurance is not included on your standard homeowner's policy. You must provide for it separately, but the cost is relatively inexpensive. It is sold through private insurance companies and is financially backed by the federal government. Contact your insurance agent for more information.

**It doesn't matter
where you live...**



**You could flood
at ANY time!**

DID YOU KNOW?

The Harris County Flood Control District was created by the State Legislature in 1937 as a special purpose district that is governed by the Harris County Commissioners Court.

BRAYS BAYOU PROJECT AT A GLANCE

Upstream Element

THROUGH 2003

Construction of Sam Houston Parkway Basin
Start construction at the Eldridge Road Basin

2002-2008

Design and construction of detention basins and channel enlargements

Downstream Element

JUNE 2000

Presentation of study to Commissioners' Court
Begin acquisition of right-of-way

DECEMBER 2000 - JULY 2001

Federal review

2001-2011

Design and construction

community input

Please express your views at any time.
You may send your comments and questions to:

ATTN: Program Management Department
Harris County Flood Control District
9900 Northwest Freeway
Houston, TX 77092

Or call: 713-684-4040



Harris County
Flood Control District

Harris County Commissioner's Court

Robert Eckels
County Judge

El Franco Lee
Commissioner, Precinct One

Jim Fonteno
Commissioner, Precinct Two

Steve Radack
Commissioner, Precinct Three

Jerry Eversole
Commissioner, Precinct Four

Harris County Public Infrastructure Dept.

Arthur L. Storey, P.E.
Executive Director

Harris County Flood Control District

Michael D. Talbott, P.E.
Director