

ULI Case Studies

Buffalo Bayou Park



SVA GROUP

The renewed Buffalo Bayou Park is a critical urban green space extending upstream of downtown Houston along Buffalo Bayou.

PROJECT SUMMARY

Buffalo Bayou Park is a 160-acre linear park stretching for 2.3 miles west of downtown Houston, along the region's primary river. A \$58 million capital campaign transformed the park from a neglected drainage ditch into a citywide showpiece. Its ten acres of trails wind past seven major public art installations, three gardens of native flora, and over four pedestrian bridges; two festival lawns, a dog park, a skate park, a nature play area, a restaurant, and an art exhibit hall draw visitors from afar. Structures were carefully sited above the path of potential floods, while park elements within the valley were designed and built to be submerged during future floods—requiring cleanup, rather than reconstruction, after the inevitable floods.

The nonprofit Buffalo Bayou Partnership orchestrated a joint effort between public sector partners and private donors: private donors funded the park, in tandem with public sector improvements to the river channel and adjacent streets, and with a plan for ongoing maintenance. The park's completion was a milestone that launched a broader effort to reimagine the possibilities of streams across the region.

QUICK FACTS

City

Houston

State/Province

TX

Country

USA

Metro Area

Houston

Project type

District/Corridor/Community

Land Uses

Connected Regional Bicycle Paths, Event Space, Open space, Restaurant, Visitor Center, Water Uses/Amenities, Wetland

Site size

160 acres

Keywords

Adaptive reuse, Amphitheater, Dog park, Flash flood area, Linear park, Park, Park system, Playground, Public art, Public-private partnership, Resilient design, Restaurants, Stormwater management, Trails, ULI Global Awards for Excellence 2017 Winner, Visitor center, Waterways

Location type

Central City

Website

<https://buffalobayou.org/visit/>

Master plans

<https://issuu.com/buffalobayou>

Address

105 Sabine St
Houston, Texas 77007
Fourth Ward

Owners

Buffalo Bayou Partnership
City of Houston

Introduction

After Hurricane Harvey dropped 27 trillion gallons of rain onto metropolitan Houston, Buffalo Bayou Park in the city's west end was a complete mess. Roiling floodwaters filled the steep channel for weeks after the storm, even as the rest of the city slowly dried out. Lawns, paths, and picnic shelters that had cost tens of millions of dollars just a few years earlier had disappeared beneath the waves. Mountains of silt, looking like desert sand dunes, covered just about everything else.

Some onlookers wondered whether the money and work that had gone into beautifying the city's keystone river had all been for naught. "No, it's not a mistake," counters Guy Hagstette, project manager of Buffalo Bayou Park. "It comes with the territory."

Sure enough, just days later joggers were back on the trails. Even before the rains broke, the park's restaurant was back in business, with avocado toast proceeds donated to a relief fund. One week after the rains, park work crews were out in force to clean off silt and pick up trash and fallen trees, and bike rentals had resumed.

Site and Idea

Both Houston and Texas were born along the banks of Buffalo Bayou in 1836, when the Allen brothers laid out a townsite where Buffalo and White Oak bayous meet.

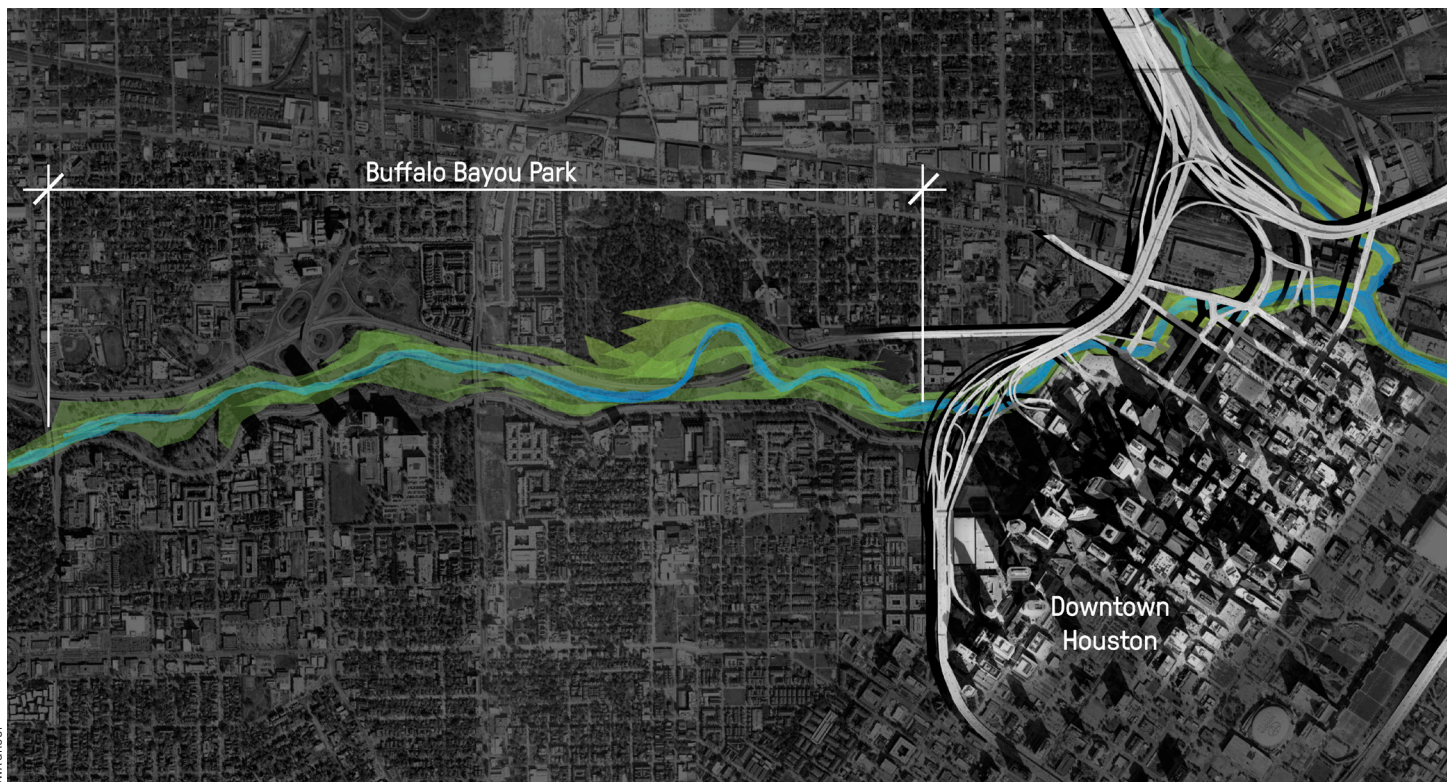
The genius behind their settling well inland of the Gulf of Mexico did not become truly apparent until after 1900, when a hurricane flattened the booming downriver city of Galveston. Port traffic relocated up the San Jacinto river, toward Houston, just as the first oil boom brought unprecedented wealth to southeast Texas. The city grew in every direction, and in 1913 commissioned its first city plan from Boston-based landscape architect Arthur Comey, who wrote that "the backbone of a park system for Houston will naturally be its bayou or creek valleys." Voters subsequently passed a bond to purchase parkland, including the bayou valleys and an army training camp to the west, which became Memorial Park.

The new city was hardly immune to disasters of its own: in 1935, days of relentless rain swept down Buffalo Bayou, killing seven and inundating downtown Houston buildings with five feet of water. The Harris County Flood Control District (HCFCD) was quickly assembled and put on a

fast track; by 1938, the federal government had appropriated funds to dam the bayou's tributaries and to straighten long stretches of the bayou's channel. Plans for the linear parks went down the drain.

Between 1953 and 1958, the bayou was straightened through the core of what is now Buffalo Bayou Park—west of downtown, between Sabine Street and Shepherd Drive. HCFCD drew up plans to encase the channel in concrete, to further speed floodwaters toward the ocean. But in a rare triumph for conservation, local activist Terry Hershey, longtime ULI member George Mitchell, and their Buffalo Bayou Preservation Association convinced local congressman George H.W. Bush to turn down a federal appropriation for the pavement.

Even as the leafy neighborhoods along the bayou blossomed into some of the city's most prosperous, the bayou itself lay neglected. Memorial Drive and Allen Parkway, the roads lining the bayou, were widened into forbidding expressways that completely sealed off the park. Within the valley were the bayou's often-turbulent waters, which claimed the grim title of Texas's most polluted waterway, plus "an asphalt trail that had withered away, no park benches, oil barrel trash



Buffalo Bayou Park spans over 2.3 miles (3.7 km), creating over 160 acres of linear open space along Buffalo Bayou just west of downtown Houston.

SITE PLAN



The design of the park reestablishes Buffalo Bayou as a central component of the city's cultural infrastructure. A series of gardens, event venues, and public art installations offer visitors opportunities to gather and engage within Houston's natural landscape.

receptacles, no lighting, no amenities," says Anne Olson, president of Buffalo Bayou Partnership. A few sculptures and memorials were dropped here and there, facing the highways, but the park gained a generally unsavory reputation.

The Buffalo Bayou Partnership (BBP) was founded in 1986 as part of Central Houston Inc., a civic organization dedicated to downtown, as part of an upwelling of civic pride coinciding with the city's 150th anniversary. From the start, Olson describes BBP as "very capital project driven, not an environmental or membership group," as it sought funds and coordinated improvements. BBP's first capital project was Sesquicentennial Park, a 22-acre park and riverwalk through the downtown theater district (see ULI Case Study, Bayou Place). It opened in 1989 and was expanded in 1998—and inspired work on a visionary plan for the entire corridor, convened by BBP and cosponsored by the city, county, and HCFCO. There was an implicit division of labor from the start, with BBP charged with fundraising for incremental capital improvements.

The first two segments were completed downtown, whetting the appetite for a broader undertaking. In 2000, BBP, with the backing of local governments, commissioned a "Buffalo Bayou

and Beyond" plan from a group of consultants led by Thompson Design Group and EcoPlan. When completed in 2002, it outlined a vision to rehabilitate the bayou's ecology, expand its drainage capacity, improve its value in terms of scenery and recreation, and revitalize adjacent neighborhoods.

The plan's centerpiece was a ten-mile, 2,500-acre linear park to be completed by 2022, stretching from Memorial Park in the west, through downtown, to the Houston Ship Channel Turning Basin on the east. Flood control was a key rationale for the plan's promise of a "place that manages the impacts of flooding, protecting its people and assets from random acts of nature." One of its key selling points was that better drainage could reduce flood risk and enable development along downtown's neglected north edge, with the bayou waterfront as a centerpiece.

The plan was released at a time of blossoming public interest in Houston's parks. When a large parking lot next to downtown's convention center came up for sale in 2004, a group of philanthropists convinced the mayor to join a public/private partnership to create a signature urban park, which opened in 2008 as Discovery Green Park. Meanwhile, progress on Buffalo Bayou slowly continued upstream; in 2006, the Sabine

Promenade opened, threading the riverwalks beneath the tangle of highway ramps at downtown's western edge, creating public access to the water's edge and creating a transition from the urbane downtown riverwalk to the wilder upstream park.

The Sabine Promenade caught the attention of the Kinder Foundation, which had been instrumental in convening the Discovery Green partnership. Rich and Nancy Kinder, who have focused their giving on green space, education, and quality of life in the Houston area, were initially drawn to the idea of improving water quality. They soon recognized the broader potential of extending the Sabine Promenade upriver, activating a network of green spaces across the city's west side, and began discussing a major gift.

The \$30 million gift that resulted made it possible for BBP not only to raise \$23.5 million in matching funds for the park, but also to secure public support for the project's construction and ongoing maintenance. With the funds in hand, the 2002 plan needed to be refined into detailed designs. SWA Group was the natural choice for this job, having designed the Sabine Promenade and even some of BBP's 1980s plans. Kevin Shanley, then principal of SWA Group, a global landscape

architecture and planning firm with a practice in Houston, had long been known around town as “Mr. Bayou” for decades of experience with ecology and flood control along the bayous.

Planning and Design

Buffalo Bayou Park stretches for over two miles along the bayou from Sabine Street at its eastern end, upriver to Shepherd Drive. Just downriver is downtown Houston, and upriver is the prestigious River Oaks area, developed in the 1920s as a mixed-use suburb by ULI pioneer Hugh Potter. It is mostly bounded on the north by Memorial Drive and on the south by Allen Parkway, both six-lane limited-access roads; the park is also spanned by Waugh Drive and Montrose Boulevard, both busy north–south arterial roads. Most of the surrounding land is multifamily, with some large offices such as the Federal Reserve Bank.

A pair of paved upland trails bracket the bayou for the length of the park, connecting to the downtown riverwalks to the east as well as to the popular hiking and bridle trails in Memorial Park, half a mile from the Shepherd Drive entrance. The trails offer multiple options for loops of varying lengths when combined with four new

pedestrian bridges spanning the bayou and adjacent streets—two built by BBP, plus the city’s Rosemont Bridge (a pedestrian span adjacent to the Montrose Avenue bridge) and a second level of the Shepherd Drive Bridge, which was built by the state.

The new bridges, along with extensive traffic-calming measures, help improve connectivity from the park to the densely populated adjacent areas: 44,000 households live within a ten-minute walk of the park. Allen Parkway was reconfigured with elements like stoplights, at-grade crossings, and parking-lined service drives, so that the upland trail users no longer confront relentless highway traffic.

Highly visited attractions and structures are clustered into the park’s only two large upland areas: the Water Works on Sabine Street and Lost Lake toward the west end. These recreational elements, along with the more elaborate perennial gardens, are set toward the park’s outer edges, high above the water line and closer to adjacent neighborhoods. Even the bridge spans were calculated to clear the base flood elevation.

The Water Works is built atop and around a decommissioned two-acre enclosed drinking water reservoir, now called the Cistern. Facili-

ties at the Water Works include a visitor center and shop, a bike rental facility, and a festival lawn atop the cistern, adjacent to a skate park (built ten years prior) and a play area with nature-themed equipment. Upstream, a smaller visitor center, boathouse, and restaurant overlook Lost Lake, a tributary pond that was “lost” when its dam broke in the 1970s.

Eleanor Tinsley Park is another highly trafficked area, with a broad amphitheater used for large events that draw tens of thousands, like pop concerts and the city’s Independence Day festivities. It also has the park’s only sports field, a sand volleyball court; additional playing fields are available in nearby parks.

More tranquil, reflective spaces along the trails were created around wetland plantings, or seven public art installations. Some complement existing landscape features or sculptures, like the ceremonial grove of trees planted around the Houston Police Officers’ Memorial, or the semicircle of trees and shade structures around the Wortham Fountain. Other artwork was added to the new landscape, like the glowing “Tolerance” statues at the foot of the Rosemont Bridge and the “Monumental Moments” word sculptures that appear in glades along the lower footpath.



New bridges and pathways were added to the park to provide access to Texas’s longest paddling trail. The added green infrastructure along the trails offers flood protection and other recreational benefits.

Others are nature reserves, surrounded by lush landscapes of 14,000 native trees and 12 acres of prairies—selected and planted in partnership with volunteers and established local conservation organizations like Trees for Houston and the Katy Prairie Conservancy. Half the park’s lawns were replaced with native plants.

From the beginning, park elements were designed with water in mind—both floods and droughts. Just after the Buffalo Bayou and Beyond planning process had begun in 2001, Tropical Storm Allison hit the region and submerged many blocks along the bayou. By the time construction on the park began in 2012, the state had just seen its worst-ever year of drought.

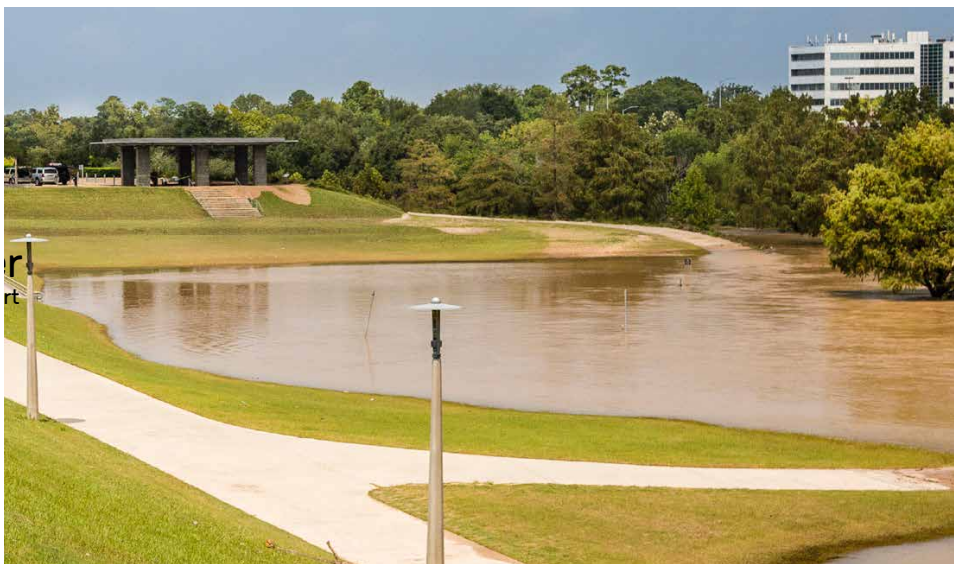
The water course was redesigned in order to reverse much of the streamlining that had been made in the 1950s, following intensive study of the bayou’s “fluvial geomorphology.” Meanders were restored with “flood benches,” like speed humps where fast-moving floodwater can spread out and drop silt and debris. After high water events, cleanup crews can focus their attention on these few locations.

Sunken areas that had been oxbows were restored as wetlands, and small tributaries lost to urbanization were restored as pumped-flow waterfalls, both providing additional habitat and flood capacity. Steep slopes were regraded, improving conveyance and capacity while also opening up views into the valley.

The park’s structures are designed to withstand not only inundation, but also impacts from whatever debris and detritus might wash through. They show off their heavy-duty construction through the use of hardy and submersible materials—like stout rectilinear shade pavilions of board-formed concrete, precast concrete light poles, oversized handrails, and concrete-filled galvanized steel bridge abutments that poke above the 100-year-flood height. These stronger specifications added 15-20 percent to the upfront cost. Everything built into the park, even the trash cans, has foundations anchored far below the surface to prevent them from washing away. Rounded corners, and surfaces tapered into the flow of future floodwaters, protect everything from bridge columns to walkways from erosion. Retaining walls slope downward to allow silt to slough off. Most of the park’s larger structures have ground floors intended to flood: water came up to the doors of the restaurant, which sits above a boat rental facility that was designed so that water could flow through.



SVA GROUP



BUFFALO BAYOU PARTNERSHIP



BUFFALO BAYOU PARTNERSHIP

As part of the park updates, the slopes of the bayou banks were laid back to create both additional capacity for flood water movement and recreational space. The pictures above show Eleanor Tinsley Volleyball Court before hurricane Harvey (top), one week after (middle), and three weeks after (bottom).

Approvals, Finance, Construction

A complex set of improvements involving a waterway on government-owned land required intensive collaboration between numerous partners. At the table were the partners from the 2002 plan—BBP, the city, the county, and the HCFCF—plus the Kinder Foundation, the Downtown Redevelopment Authority, the state’s department of transportation (since the trail improvements had decades-old federal bike/pedestrian funding), and the U.S. Army Corps of Engineers to sign off on changes to tributaries and wetlands.

During early negotiations on the leadership gift, the Kinders wanted assurances that their gift would not just wash away—that both the HCFCF and the city would coordinate their own share of improvements and support the park’s long-term maintenance. A term sheet was drawn up and circulated not only to determine the project’s overall scope, but also to set maintenance agreements out to the year 2096.

An integral part of that process was understanding just how big of a job the city was signing up for. “We had to get an owner’s manual in place” for the park, says Hagstette, setting out “how often the trash would be picked up, so that we could define the costs, then identify a number that the city could commit to.” That led to hiring ETM Associates, a park maintenance consultancy led by a former operations director for Central Park, who builds up maintenance cost estimates from adding up thousands of line items and through extensive interviews with previous maintenance staff about the park’s needs. ETM has since returned to advise BBP on cost-effective maintenance, such as balancing in-house and contracted services.

The result of these negotiations was two sets of agreements that set the terms for the public/private partnership: a “tri-party agreement” outlined the basic framework for the design phase, and a later construction, operating, and maintenance agreement (COMA). BBP would build, operate, and maintain the park; the city, state, and HCFCF would build and maintain their own concurrent improvements; and the TIRZ would provide ongoing revenues for maintenance.

HCFCF built and maintains several features within the waterway that mitigate flood impacts. Its \$7.2 million Channel Conveyance Restoration at Buffalo Bayou Park project along BBP was administratively deemed to be “maintenance” of its 50-year-old works, in order to thin the regulatory burden.



JOHNNY SINGLETON, SWA GROUP

A trail system over 10 miles long structures the park, offering separate facilities for bikes and pedestrian-only paths through the implementation of bridges and underpasses. The trail system provides uninterrupted movement through the entire stretch of the park, never requiring visitors to stop for vehicular traffic.



SWA GROUP

The Buffalo Bayou Partnership restored and repurposed the Cistern into a public space to house art installations, tours, and meditation sessions.

At the same time, the park does not shy away from engaging with the sometimes-turbulent waters. A soft-surface path for walking and jogging threads close to (but at least 12 feet above) the water’s edge, which at times dives 30 feet below the busy streets. Its lower elevation, tree canopy, and white noise from the flowing water result in a setting entirely removed from the city noise above.

One of the few low-lying recreational areas is an expansive dog park, which had been informally established decades earlier and was deemed too important to move. Its water features are fil-

tered through a recirculating system intended to incorporate a nearby manmade wetland.

Designers tackled numerous challenges intrinsic to working within a waterway. Even though the site was now in the middle of the city, utilities had never really been extended into the park; this proved problematic when siting lights, drinking fountains, and other accommodations. The mucky soils underlying the park are ill-suited for structures; the airy footbridges sit on concrete pilings drilled up to 70 feet into the earth.

The city of Houston owns the underlying land and roadways; it contributed concurrent improvements—mostly access improvements such as re-designing Allen Parkway and pedestrian improvements along road bridges, but also improvements within the park such as a notable Jaume Plensa sculpture and the nearby Rosemont Bridge. Mayor Annise Parker's leadership was also an instrumental force in advancing the project through multiple agencies.

The Downtown Redevelopment Authority, which manages a tax increment finance district (a TIRZ, in Texas parlance) spanning about 80 blocks of downtown as well as the park, provides an annual \$2 million payment for ongoing maintenance. Its borders were enlarged to encompass the entire park, which required de-annexing part of the park from a different TIRZ. In addition, all funds from concession and rental revenue within the park are dedicated to a capital expenditure fund—e.g., the restaurant, event spaces, volleyball court, group fitness classes, commercial photography fees, and recreational equipment rentals; this reserve fund was around \$500,000 through 2016.

The Kinder Foundation's leadership gift was explicitly for site-wide earthwork, general landscaping, trails, and lighting. This allowed BBP to begin planning and construction immediately, while still fundraising around specific amenities (such as fountains, buildings, and artwork) that could be added onto the project scope later.

Public involvement for the 2010 master plan revealed three camps of public opinion among residents. Many recognized that the trails were in bad shape and primarily wanted incremental improvements, like restrooms. Some wanted a park resembling the highly urbanized San Antonio Riverwalk, and others wanted zero change—hardly the most “natural” option, given that both the waterway's shape and the invasive species along it were artificial. Education about the ecological value of the proposed changes helped smooth that process along.

Construction

Coordinating a project with landscape, building, and waterway components, and doing so on the tight timetable required by the Kinder Foundation, was always going to be a challenge, and BBP was prepared to have to juggle multiple general contractors sharing the site. Luckily, as a private entity they could select contractors based on experience. A single general contractor, Millis



Because the park is built in a floodway, water will rise up to 20 feet several times a year during Houston's sporadic torrential rainfalls, inundating and submerging everything in the park. At the right is the Water Works.

Development & Construction, which had pertinent experience on both buildings and parks, was the initial low bidder for bridges and site work. Millis was then able to oversee the entire project as buildings were added to the project scope.

SWA was retained through the construction process, as well. “In order to hang on to the design intent, there's a real benefit to have the design firm continue with construction administration services,” says Hagstette. Tim Peterson of SWA adds that BBP was “considering having a separate construction management

team—but this is specialty work that big construction companies don't do [themselves]. We thought that level would drive up costs. Instead, we selected a team of contractors who could build this work.”

A key early challenge was that the site had never been adequately surveyed; indeed, many old plat maps had used the ever-shifting bayou as a boundary. Even though the site was 98 percent owned by the city of Houston, nobody had ever cleared up which department was responsible for what part—and where the bayou boundaries were for two 19th-century cemeteries that owned



The park was designed to facilitate many different types of engagement with nature through cycling, jogging, paddling, and exploration. A nature play area provides intimate contact with natural and organic features for children.

the other 2 percent of the land. Luckily, everyone was prepared to put aside potential differences: the city accepted a new map in lieu of a traditional survey to proceed with building permits, and the cemeteries readily granted trail easements in exchange for site and access improvements.

The city's park director required that construction proceed in stages, so that parts of the park were always open to the public. This also has given some areas' plantings a head start on growing in, an effect that will average out over time. A bimonthly project newsletter and public construction tours helped keep the public excited about the project's progress.

The dual-span Rosemont Pedestrian Bridge, the first major feature to open, proved to be a feat of engineering. One span crosses between the two bayou trails, while another span leaps over Memorial Drive to connect to a rail-trail and a park to its north. The span's overlapping cantilevers and double curvature seemed like an impossible feat, but Millis recommended King Fabrication, a local metal fabricator whose prior work on pipelines suited the task.

Performance

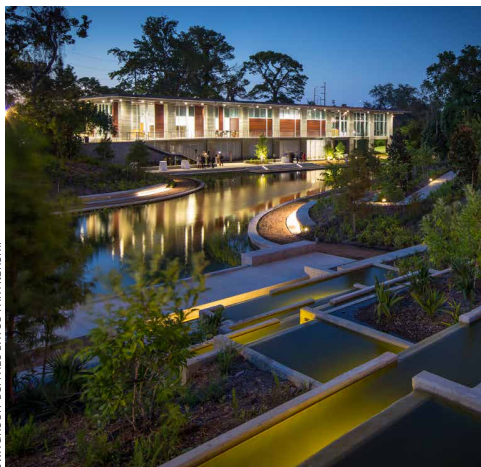
The park's tremendous popularity has surpassed all expectations, instantly creating a regional amenity out of what had been little more

than a drainage ditch. During the first year, the two visitor centers welcomed 14,000 patrons; a trail user counter recorded nearly 150,000 visitors in one month. The park's bridges, with greenery in the foreground and the city skyline just beyond, have become the iconic photo opportunity in downtown Houston. Linking downtown to a park network that stretches up to Memorial Park has increased park visitation all along the corridor, and created a common ground between the divergent neighborhoods on either side of the bayou.

Event spaces have proved particularly popular, in line with the broader trend toward experiential places. A light-and-sound installation in the cistern drew 30,000 people in 2017, despite limited visitor capacity inside the structure. The jewel-box restaurant, which offers a one-of-a-kind "lost in the woods" setting, is booked far in advance for evening special events—helping to sustain a more accessibly priced all-day menu for park visitors.

The restaurant is the largest commercial tenant within the park; food trucks also fill parking courts on weekends and during special events. "We hired a broker to find us a couple of vendors," says Olson. The selected vendor "had wanted to do a full-service restaurant, but came back and changed it to breakfast, lunch, and special events" in the evening, when park foot traffic is lower. BBP collects a base rent plus a percentage of gross sales.

The park's completion has been a boon to properties near the park. One early development that sought to take advantage of the new park, the seven-story Riva at the Park condo-



During Hurricane Harvey, the Boat House at Lost Lake flooded up to its second story, which houses a restaurant. After the floodwaters receded, the landscape and infrastructure show no sign that they were underwater two weeks before.



ALBERT VEERNA/REXTO

The interior of the new restaurant and event space building at Lost Lake rests above the 100-year flood elevation. Here, visitors dine with a panoramic view of the bayou environs, experiencing the contrast of the wildness of the bayou landscape and the luxuriousness of the building's interior.

minium, proved so popular during pre-sales that it was redesigned as a ten-story building. An examination of 2015 tax assessment data shows that single-family houses within a ten-minute walk of Buffalo Bayou (both the park and the wilder upriver stretches) were worth 16 percent more than houses within a 20-minute walk.

Flood Performance

After Harvey, “the new parks and trails along our bayous have come back quickly,” says Hagstette, owing to smart design and budgeting decisions. “Money had to be spent” on flood cleanup, he continues, “but it was built into the plan”—namely, the funds set aside for maintenance and repairs. An outpouring of volunteer support after the flood also came in handy, especially for replanting.

Floodwaters rose 38.7 feet at Buffalo Bayou Park’s western end, but the upper third of the park was not submerged for long. The flood’s height was not entirely unprecedented: it was only five feet above the floods on Memorial Day 2015, four months before the park’s grand opening. Yet the sheer volume of water over the subsequent weeks proved problem-

atic; the unprecedented draining of the overwhelmed Addicks and Barker reservoirs down the bayou drowned trees and grasses in the lower two-thirds of the park, as well as many of the park’s resident bats. When the water finally receded, almost 40,000 cubic yards (4,000 truckloads) of silt and debris were left behind, along with eroded riverbanks.

Park features meant to perform double duty as flood storage, including active recreation fields and passive sculptural elements, were submerged for weeks. Resilient systems and networks meant that backups were available for park users to enjoy: for instance, the lower-level footpath was out of commission for months, but joggers were back on the upper-level paths within days. The one attraction that closed for reconstruction and reconfiguration after Harvey was the dog park, whose location within the valley left it vulnerable to repeated flooding that overwhelmed the water filtration system with silt.

Lighting has proved to be an ongoing design and maintenance challenge. LEDs have been a boon in many regards; BBP has taken full advantage of their artistic possibilities throughout the park with moody lamps that

OTHER PARTICIPANTS

Funding Partners

Buffalo Bayou Partnership
Kinder Foundation
City of Houston
Harris County Flood Control District
Tax Increment Reinvestment Zone #3

DEVELOPMENT TEAM

Prime/ Master Planner/ Lead Designer

SWA Group

Architecture

Page

Horticultural/Specialty Landscape

Architecture

Reed Hilderbrand

General Contractor

Millis Development & Construction, Inc.

Civil Engineering

United Engineers

MEP Engineering

Hunt & Hunt Engineering, Corp.

Geotechnical

Aviles Engineers

Structural Engineers

RDP Engineers

Traffic Engineers

AIA Engineers

Wayfinding

Marek Hill Design

Lighting

L’Observatoire and artist Stephen Kornis

Water Feature

Greenscape Pump Services

Irrigation Design

Sweeney & Associates

Playground Consultants

Natural Learning Initiative. College of Design, NC State University

ADA Consultant

Advanced Design Solutions

Interviewees

Kerri da Silva, associate, SWA Group
Guy Hagstette, director of parks and civic projects, Kinder Foundation; former project manager, Buffalo Bayou Park
Anne Olson, president, Buffalo Bayou Partnership
Tim Peterson, principal, SWA Group
Michael Robinson, associate, SWA Group

Website

Tour: <https://buffalobayou.org/visit/destination/buffalo-bayou-park/>



JONNU SINGLETON, SWA GROUP

One of the most significant improvements is the transformation of the landscape to a more natural and self-sustaining state by reintroducing native landscapes and restoring diversity and balance to the terrain. Over 14,000 native trees were planted in the park over the course of construction.

track the moon cycle, and with the blockbuster art installation inside the cistern. However, LEDs are essentially circuit boards, which inevitably short-circuit when plunged into muddy water—which still happens, despite countermeasures like mounting electrical equipment within water-resistant fixtures atop the poles, and water sensors that cut off electricity during floods. (The need for flood resistance also explains why the site cannot rely on solar panels, which are also circuit boards.) After each flood, park staff disassemble and clean hundreds of lights and replace hundreds more; newer generations of equipment are improving.

Mitigating erosion and stabilizing both the channel and slopes also will require additional engineering work after Harvey. Riprap, gabions filled with recycled concrete, and coir all hold down parts of the channel, but high-stress areas underneath bridges and opposite outfalls have been difficult to stabilize with roots given the frequency and duration of flooding.

Observations Planning for the future

The west end of Buffalo Bayou Park is helping inform similar efforts throughout the region. The east end of Buffalo Bayou is much wider and thus less flood-prone, but runs through an area long characterized by shipping, heavy industry, and the attendant environmental justice concerns. BBP has been purchasing property and easements for parks and trails, and is currently in the midst of a detailed planning process for parks and neighborhoods alongside.

Olson already sees that the park will have a very different character, showcasing its wilder landscape alongside the “cultural and industrial heritage of an area that still has a lot of industry. We own some really cool abandoned industrial artifacts, like an abandoned sewage treatment plant, wharf, and gantries,” and hope to incorporate those into the park. In a nod to erosion that affected trails close to the waterway, easements and setbacks will be wider on the east end.

“Equity is a theme that’s a thread in all of our conversations” about the east end, contin-

ues Olson, adding that BBP has been involved in the High Line Network of urban parks that reuse infrastructure as a catalyst for equitable development. A wider focus also means broader stakeholder engagement, “new ways to reach neighbors instead of standard boring meetings,” Olson says.

At a regional scale, the Bayou Greenways 2020 initiative aims to fulfill the century-old promise of a county-wide network of bayou parks by expanding on the network established at Buffalo Bayou Park. It will include 3,000 acres of parkland along 150 miles of waterway, and 80 miles of new trails, bringing 60 percent of Houstonians within 1.5 miles of a greenway park. The \$220 million initiative was also launched with a leadership gift of \$50 million from the Kinder Foundation and voter-approved park bonds.

Lessons Learned

The funding partnership that created Buffalo Bayou Park played to the strengths of each sector: philanthropists’ vision, the public sector’s staying power, and a park conservancy’s flexibility. Strategically, the partnership started with a big vision and a phasing strategy. This planning enabled the leadership gift and political support to catalyze quick action, and impressive results. The Kinder Foundation did not just want a quick ribbon-cutting, they demanded a lasting legacy; their insistence upon understanding, planning for, and sustaining funding for eventual maintenance and repairs has ensured that the park has bounced back after multiple floods.

Designing resilient features into the park was always the intent, but its importance was underscored by flood events that coincided with the park’s planning processes. These decisions have paid dividends not just in the aftermath of frequent floods, but also in dealing with everyday wear and tear: heavy-duty materials and redundant systems help the park manage big crowds, multiple events, and numerous user groups simultaneously. Carefully tending to the vision through construction required careful management by the architects, contractor, and partnership.

PROJECT INFORMATION

Financing sources

Kinder Foundation	\$30,000,000
Additional private grants	\$23,500,000
Additional grants for cistern	\$1,500,000
Subtotal: Buffalo Bayou Partnership	\$60,000,000
Harris County Flood Control District	\$7,200,000
TIRZ #3 for Allen Parkway improvements	\$10,000,000
TIRZ #5 for Rosemont Bridge	\$5,000,000
Texas DOT for trails and Shepherd Bridge	\$6,000,000
Houston Arts Alliance gift of “Tolerance” sculptures	N/A
Subtotal: City of Houston	\$21,000,000

Park amenities

160 acre park	Two visitors centers
10 miles of walking/biking trails	30,000 square foot skate park
Seven public art installations	Nature play area
Four pedestrian bridges	Amphitheater
Two-acre dog park	

Development timeline

The Glenwood Cemetery opens	1871
Arthur Coleman Comey's Planning Report for the Houston Park Commission published as first proposal for Buffalo Bayou improvements	1912
Buffalo Bayou Preservation Association (BBPA) is formed to protect the bayou	1966
Cancellation of the channelization program	1971
Buffalo Bayou Partnership founded under Central Houston	1986
Task force report outlines recommendations for preservation and improvement of the bayou and consists of a re-evaluation of earlier plans	1986
Buffalo Bayou and Beyond 20-year master plan completed	2002
Kinder Foundation awards catalyst \$30 million gift for Buffalo Bayou Park—Shepherd to Sabine	2010
Buffalo Bayou Park Master Plan completed	2011
Buffalo Bayou Park construction begins	2012
Completed construction of Buffalo Bayou Park Phase I	2013
Assumed maintenance and operation of Buffalo Bayou Park Phase I	2014
Completed and assumed full-scale maintenance and operation of Buffalo Bayou Park	2015



About the Urban Land Institute

The Urban Land Institute is a global, member-driven organization comprising more than 40,000 real estate and urban development professionals dedicated to advancing the Institute's mission of providing leadership in the responsible use of land and in creating and sustaining thriving communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 76 countries.

The extraordinary impact that ULI makes on land use decision making is based on its members sharing expertise on a variety of factors affecting the built environment, including urbanization, demographic and population changes, new economic drivers, technology advancements, and environmental concerns.

More information is available at uli.org. Follow ULI on Twitter, Facebook, LinkedIn, and Instagram.

ULI CASE STUDIES

The ULI Case Studies program highlights and showcases innovative approaches and best practices in real estate and urban development. Each case study provides detailed information regarding the ideas, plans, process, performance, and lessons learned for the development project. Each also includes project facts, timelines, financial data, site plans, photos, location maps, and online videos. The new ULI Case Studies program is the revitalization of a program begun in 1971. For more information, visit the ULI Case Studies website at casestudies.uli.org.

ULI STAFF

Billy Grayson

Executive Director
Center for Sustainability and Economic Performance

Katharine Burgess

Senior Director
Urban Resilience

Payton Chung

Director
Case Studies and Publications
Principal Author

David Kim

Executive Director
ULI Houston

Misty Loocke

Senior Manager
ULI Houston

James A. Mulligan

Senior Editor

David Rose

Copy Editor

Erica T. Ellis

Graduate Student Intern/ Graphic Designer

Funding for this case study was provided by:

THE KRESGE FOUNDATION

© 2018 Urban Land Institute
2001 L Street, NW
Suite 200
Washington, DC 20036