

Buffalo  
Bayou  
Park

MASTER PLAN

*Shepherd to Sabine*

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## 5.1 PROTECTING THE INVESTMENT

The Buffalo Bayou Park Project represents the largest single investment made toward improvements to the Houston Park System—ever. With such an historic opportunity, there come historic responsibilities to protect the improvements made possible by this investment and to better protect the historic parkland itself. There are five major strategies for protecting the improved parkland:

### Development Hiatus

This green space already is experiencing change with the Rosemont Bridge Project, Plensa Artwork, Buffalo Bayou Hike & Bike Trail Project and planned Police Memorial improvements. While the Project is being planned, designed and built on a very ambitious schedule, the City should not authorize any further changes or projects, including volunteer work, except work sponsored by BBP and HPARD. In addition, no more special events should be scheduled beyond mid-2012 when major construction begins.

### Park Dedication

Only Eleanor Tinsley Park, from Sabine Street to Taft Street on the south side of the bayou and comprising less than 10% of the total Project Area, is dedicated parkland. The majority of the Project Area was dedicated for flood control, utility and public works purposes in the 1930's and for recreation (with the Sandy Reed Memorial Trail) in the early 1980's. The entire area deserves the protection that park dedication affords, with the only exception being the City of Houston Public Works & Engineering Department (PW&E) Water Reservoir Property.

### Master Plan Status

With regard to the Project Area (but not the Water Reservoir Property and Area-wide Improvements described in Chapter 3), future changes and proposals should be required to conform to and be limited by this Master Plan, which seeks to balance nature with improvements and recreational activity with an ability to “get away from the city”. Public safety, public utility work and emergency work would not be subject to this rule. Some ambitious ideas for Unfunded Projects to Buffalo Bayou Park are included in Chapter 4 that already are a part of the Master Plan. And other ideas could be accepted through a review and approval process involving the City and BBP. But it would make no sense to open such a carefully improved area to otherwise unplanned changes (outside of important utility and public safety initiatives)—a prospect that will become more attractive to some as Buffalo Bayou Park grows in popularity.

### Operating Restrictions

Buffalo Bayou Park is going to become ever more popular once it is improved, and its attractiveness for events and festivals will grow as well. While events can be accommodated, their size, intensity, duration and frequency must be governed by a set of rules that places the highest priority on the horticultural health of the park and on minimizing negative impacts on surrounding communities.

### Maintenance

As stated previously, this historic investment in park improvements cannot be allowed to deteriorate over time due to lack of maintenance. A detailed *Preliminary Maintenance Plan* has been prepared, and it is summarized in this chapter. It provides the strategy, guidelines and initial cost estimates, which in final form, must be incorporated into an Owner's Manual that will govern the ongoing work of the City, HCFCD and BBP.

## 5.2 PARK OPERATIONS OVERVIEW

Buffalo Bayou Park will continue to be a City of Houston park, but new players will be involved. The Harris County Flood Control District (HCFCD) and Buffalo Bayou Partnership (BBP) will join the City of Houston in maintaining the park and bayou channel. The following roles, responsibilities and coordination among the entities will be governed by an Owner's Manual that will be prepared during the Development Phase (design and engineering):

### Park Management

- **General Operations:** Park Rules and other general management issues.
- **Security:** Scheduling of Park Rangers and coordination with HPD concerning general security.
- **Communications:** General public relations and communications with the general public.
- **Water Quality:** Coordination with PW&E about pollution sources affecting the quality of water in the bayou and its tributaries.
- **Maintenance:** Monitoring of any maintenance contracts.

### Channel Maintenance

- **Vegetation Management:** Seasonal clearing of vines and invasive plants along the channel.
- **Sediment Removal:** Periodic removal of sediment along the channel and other locations designated for sediment removal.
- **Bank Stability:** Stability of banks to minimize rotational failures and collapses.

### Park Maintenance

- **Horticultural Maintenance:** Daily and seasonal work to promote healthy lawns, trees and plant materials.
- **De-littering:** Daily and weekly de-littering and cleaning of facilities.
- **Facility Maintenance:** Longer-term work to maintain systems and facilities.
- **Sediment Removal:** Post-flood sediment removal from trails and as needed from lawns and other planting areas.
- **Behavior Monitoring:** Monitoring the park for damaging behavior and vandalism.
- **Water Quality:** Coordination with its other crews to remove "floatables" from the waterway.
- **Capital and Maintenance Reserves:** Manage reserve funds for major non-annual expenses and long-term capital work.

### Operating Restrictions

Operating restrictions will be in place to help prevent any of the above parties or outside entities from conducting or allowing activities that could result in damage to the park. Areas of special concern include vehicular access into the park and the size, location, duration, type and frequency of events, festivals and concerts.

## Buffalo Bayou Park: Total Maintenance and Task Hours

TASK	QTY	UNIT	UNIT (min)	ONCE (min)	ONCE (hours)	ANNUAL FREQ.	TOTAL HOURS	TOTAL HOURS	In-House Staff	Contracted Services	Non-Salaried Services	COMMENTS
<b>Parkland</b>								<b>25,845</b>	<b>11,347</b>	<b>5,477</b>	<b>8,615</b>	<b>Annual Hours/ 131 acres</b>
Empty trashcans	58	can	5	290	5	365	1,764		588		1,176	Daily & twice a day for 1/3 of the year
Trashcan maintenance	58	can	30	1,740	29	12	348		116		232	Wash down, repaint, routine checkups
Remove litter	196	msf	2	393	6.5	365	2,388		796		1,592	10% of an acre, Parkland
Remove litter	36	msf	15	544	9	52	472		157		315	5% of an acre, Riparian Edge
Remove litter	76	msf	2	152	2.5	180	455		152		303	5% of an acre, Woodlands
Remove litter	59	msf	2	118	2.0	180	355		118		236	25% of an acre, Tall Grass/ Meadows
Remove litter	19	msf	2	39	0.6	180	117		39		78	30% of an acre, South Perennial Gardens
Remove litter	40	msf	2	81	1.3	365	491		164		328	10% of an acre, Paved Area/ Trails
Remove litter	13	msf	2	26	0.4	180	79		26		53	10% of an acre, Structure Areas
Remove litter	2	msf	2	4	0.1	180	12		4		8	10% of an acre, Dog Park
Blow debris w/backpack blower	237	msf	5	1,183	19.7	104	2,051	2,051				10% of paved areas
Powerwashing	22	msf	15	336	6	24	134					
Clean catchbasins	98	basin	30	2,944	49	6	294		294			Assume 2 basins/acre
Mow turf (open area)	1,815	msf	1	1,815	30	38	1,150		115	1,035		Toro Groundmaster, 85% of an acre
Mow walking/trim	343	msf	9	3,091	52	38	1,958		196	1,762		20" push mower, 15% of an acre
Top dress soil and/or mulch	1,669	msf	30	50,058	834	1	834		834			75% of an acre
Seasonal turf renovation	196	msf	30	5,888	98	1	98		98			10% of an acre, aerate, seed, fertilize
Weed control	261	msf	15	3,920	65	12	784		261		523	Monthly, 10% of an acre
Temporary fence	98	mif	10	981	16.4	24	393		393			Install/maintain temporary fencing, assume 2,000 lf/acre
Tree maintenance	330	tree	45	14,855	248	1	248			248		With aerial truck
Shrub bed maintenance	343	msf	30	10,304	172	12	2,061		687		1,374	Weeding, spot watering, assume 15% of an acre
Fall leaf removal	540	msf	15	8,096	135	3	405		135		270	25% of an acre
Vine management	160	msf	60	9,581	160	2	319		106		213	25% of an acre
Scheduled Inspection	102	msf	20	2,032	34	12	406					15% of an acre
Invasive control/removal	102	msf	10	1,016	17	52	881		294		587	15% of an acre
Natural resource Management	493	msf	15	7,390	123	12	1,478		1,256		222	Weeding, cleaning, trimming, invasive species removal, etc., assume 30% of an acre
Seasonal cleanup and prep	163	msf	60	9,750	163	1	163		54		108	25% of an acre, Tall Grass/ Meadows
Seasonal cleanup and prep	49	msf	60	2,963	49	2	99		33		66	75% of an acre, Southern Perennial Gardens
Annual Cutback	488	msf	15	7,313	122	1	122				81	75% of an acre
Plant replacement	6	msf	60	359	6	3	18		18			10% of an acre
Garden maintenance	19	msf	60	1,167	19	24	467		156		311	Weeding, spot watering, fertilizing, dead heading, pruning, 30% of an acre
Install/maintain fencing	379	cif	5	1,895	32	24	758		253		505	1,000 lf/acre
Temporary sign	137	signs	10	1,367	23	10	228		194		34	
Benches	74	each	10	740	12	12	148		67		81	Repair & paint
Rodent/ Pest control	235	traps	3	589	9.8	52	510		510			3 traps/acre
Graffiti removal		allow					295		98		196	Painting & chemical removal
Sign maintenance	51	each	10	510	9	12	102		34		68	Repair & paint
Sign maintenance		allow					152		51		101	Temporary and permanent signage maintenance, Woodlands
Light maintenance	130	each	15	1,950	33	12	390		195		195	General light maintenance, spot painting, remove stickers, light bulb replacement
Trail maintenance	40	msf	30	1,212	20	12	242		81		162	10% of an acre
Railing and retaining wall		allow					120		60		60	Basic maintenance, repair, and routine checkups
Structure maintenance		allow					49		49			
Site furnishing maintenance	59	each	10	590	10	12	118		53		65	Wash down, repaint, routine checkups
Clean Drinking Fountains	12	each	10	120	2	35	70		32		39	Weekly April - Oct
Maintain drinking fountains	12	each	45	540	9	12	108		49		59	
Fence maintenance	20	cif	20	400	6.7	12	80		80			
Irrigation maintenance		allow					1,019		611		407	
Repair/Replace Quick Couplers		allow					264		264			
Pond maintenance		allow					350		175		175	
							<b>25,845</b>	<b>11,347</b>	<b>5,477</b>		<b>8,615</b>	

## 5.3 PARKLAND MAINTENANCE

As one of Houston's unique destination parks, Buffalo Bayou Park must receive a level of maintenance commensurate with its role in the Houston Park System. Visitation and usage are already high and will grow as facilities are improved and the natural environment grows richer. Increased usage means increased impacts on lawns, gardens and other natural areas, and a growing burden to de-litter and maintain safe conditions. The park's strengths are its weaknesses from a maintenance perspective. Its rolling terrain creates difficulties for mowing; the bayou generates floods that must be addressed and bisects the park into smaller areas; its long, narrow site stretches crew strengths; and there are many places to hide for those who choose to do harm.

The Preliminary Maintenance Plan by ETM Associates was developed in tandem with the design master plan by SWA Group, and each planning team informed the work of the other. Examples include a reduction in garden areas and mowed lawns as the costs for properly maintaining these areas were calculated. In addition, the distribution of picnic facilities and other areas of more intense use was modified as impacts on maintenance routines were assessed. This section summarizes the *Preliminary Maintenance Plan*, which is available for review in a separate report.

### Methodology

Based on the overall landscape, planting and facility plans produced by SWA Group, ETM Associates identified five different landscape areas and developed specific maintenance tasks for each landscape area that were used to estimate the number of man-hours per year per acre for each area (lawns, natural grasses, woodlands, riparian edges and gardens/ornamental grasses), and also for water features, trails and facilities (including picnic shelters, overlooks and restrooms). In addition, unusual conditions were analyzed, such as post-flood clean-up of debris and removal of sediment from trails and landscape areas. The list of tasks and resulting man-hours assume HCFC

work on a seasonal and multi-year basis along the bayou's riparian corridor, but along with this HCFCD work, park crews will need to enter this area daily to remove litter, cut back fast-growing vines, and fill in areas with native plant materials between HCFCD seasonal sweeps. Refer to the summary table on the facing page for the on-site tasks and man-hours, including allocation of man-hours to in-house, contracted and unpaid labor (see Manpower Deployment).

In addition to work "on the ground", other maintenance functions are required as well—horticultural and mechanical expertise, outsourced work contract compliance, and unpaid labor supervision to name a few.

### Manpower Deployment

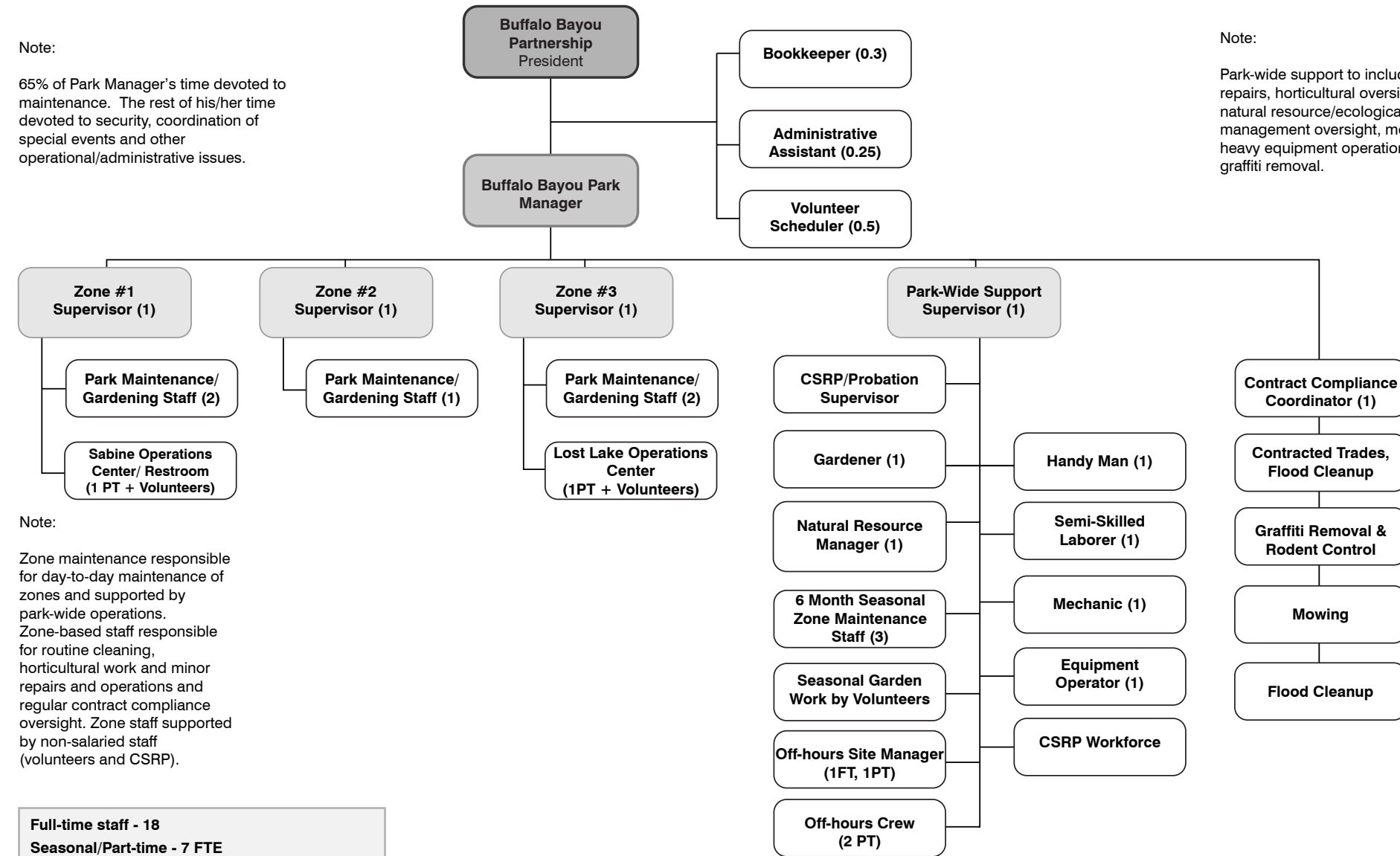
Determining the number of man-hours required for proper on-site maintenance is Step 1. Step 2 focuses on the best strategies to deploy that manpower. The relative merits of in-house versus contracted services were assessed. For those tasks determined to best be provided by in-house crews, how to deploy crews was considered as well as use of part-time seasonal crews versus full-time employees. "Park-wide" versus "zone" crew deployments were assessed with the former allowing more flexibility in use of crews and the latter resulting in more effective oversight of areas, monitoring of park use and general quality of care. Finally, some tasks were identified as candidates for non-salaried labor, such as large-scale de-littering sweeps by probationers, inmates and CSRP workers and large-scale seasonal gardening tasks by volunteers teams. The resulting manpower plan is a blend of each of these strategies:

- **In-House Zone-based Crews:** These teams of crews can be deployed in three zones (see facing page) where they will conduct daily horticultural, park maintenance and targeted de-littering while also growing familiar with "their turf." Two zones include restrooms that must be monitored. The Park Manager and zone-based supervisors will oversee this work.

# Maintenance Organization Chart

Note:

65% of Park Manager's time devoted to maintenance. The rest of his/her time devoted to security, coordination of special events and other operational/administrative issues.



Note:

Park-wide support to include repairs, horticultural oversight, natural resource/ecological management oversight, mowing, heavy equipment operation, and graffiti removal.

Note:

Zone maintenance responsible for day-to-day maintenance of zones and supported by park-wide operations. Zone-based staff responsible for routine cleaning, horticultural work and minor repairs and operations and regular contract compliance oversight. Zone staff supported by non-salaried staff (volunteers and CSRP).

Full-time staff - 18
Seasonal/Part-time - 7 FTE
Contract Services - 5,477 hrs
Non-Salaried Staff - 8,615 hrs
Operation Center Volunteers - 4,368 hrs

# 5.3

- In-House Park-wide Crews:** A Head Gardener and Natural Resource Manager can guide zone-based crews in sensitive natural areas while a two-man "handyman team" can repair benches and replace lamps. Seasonal crews will provide support during the busy spring and summer seasons. A Mechanic is needed to keep equipment in working order. And an off-hours crew is needed to monitor behavior, prevent vandalism and address other issues when the regular hours crews are not on site. The Park Manager and Park-wide Supervisor will oversee this work.
- Outsourced Work:** Large-scale mowing, graffiti removal, pest control, post-flood sediment removal, and specialized maintenance of plumbing, mechanical and electrical systems are best handled by contractors. Limited use of off-duty police officers also will be required to manage behavior and address vandalism. The Park Manager will oversee this work, assisted by a Contract Compliance Assistant.
- Basic De-littering and Seasonal Gardening:** Based on successful experience along Buffalo Bayou and in other parks, large-scale de-littering can be provided by inmates, probationers and CSRP workers while volunteer teams can provide the work force needed for large-scale seasonal gardening tasks. Individual volunteers could supplement paid workers monitoring restrooms and information desks. An on-site supervisor will manage deployment of these work forces.
- Support:** Non-salaried crew scheduling, bookkeeping, and general administrative activities all are important for an effective maintenance program. These functions are best handled at the BBP office headquarters.

### Materials and Services

Proper maintenance of the park requires more than just manpower. Materials must be purchased and tools replaced. Electrical power and waste hauling must be procured, and specialized equipment must be rented. And because the bayou's riparian corridor will be impacted on a regular basis by flooding and its aftermaths, replacement plants will be required. At this time, annual maintenance costs assume the same billing arrangement for water and sewer as other parks operated by HPARD.

### Support

In addition to the support positions described above, other support functions must be included. Payroll taxes and benefits must be paid. Commercial general liability insurance is needed to insure against accidents and other claims, and property insurance (for built facilities only, not landscapes) is needed to protect the investment.

### Initial Equipment

BBP already performs maintenance functions along Buffalo Bayou through its "Clean and Green" program and its "Might Tidy" trash collection boat and is ready to support maintenance of *Buffalo Bayou Park*; however, there is a need to procure large equipment (trucks, bobcat, utility carts, etc.), small tools, and an initial round of tools and supplies to begin the maintenance program.

## Maintenance Zones



## 5.3

### Preliminary Estimate of Annual Maintenance Costs

The Preliminary Maintenance Plan is based upon SWA Group's general site plans that establish overall acreages of plant materials and locations and general sizes of site facilities. But no specific designs have been established nor have any specific plant materials been selected. And importantly, the delineation of the channel maintenance corridor only has been estimated. At this time, an overall approach and strategy for maintenance can be established, but it is too early to calculate exact maintenance costs.

As the City, HCFCD and BBP enter into an agreement for the Development Phase (primarily design and engineering), the parties should have a general idea of the likely obligations each party will be expected to assume. As designs are developed in more detail, it will be possible to prepare an Owner's Manual that will provide a greater level of detail for all three parties, and through this process, establish more accurate projections of maintenance costs to be approved by the parties prior to construction. At this time, the annual maintenance costs (in calendar year 2010 dollars and excluding channel maintenance) is estimated to be approximately \$2,000,000, with the final total dependent upon many variables including the specific delegation of responsibilities among the parties. In addition, there will be an estimated initial outlay for equipment and initial supplies of \$581,000. In both cases, the City will not begin incurring these costs until about FY2014, and the full annual costs will not be incurred until FY2016. As a result, these estimates must be adjusted for inflation before they are incurred and then on an annual basis.

### Non-Annual Costs

Two additional types of costs must be covered over the longer-term:

- **Extraordinary Expenses:** Buffalo Bayou Park is subject to flooding and other impacts from weather events. The more frequent events have been built into the annual maintenance

cost estimate. But larger events like Tropical Storm Alison and Hurricane Ike must be anticipated, also. The Preliminary Maintenance Plan calls for funds that BBP has not spent in any fiscal year to be placed in a maintenance sinking fund to cover these unpredictable and potentially major expenses. Hopefully, savings from years with fewer storms will build to the point where they can fund expenses resulting from major weather events. Major vandalism is another unpredictable expense that could be covered by this fund. While BBP will deploy crews to minimize damage from vandalism, it is not possible to completely protect a park environment from all vandalism. Note that BBP will procure property insurance to cover facilities, but insurers will not cover landscape features and plantings. BBP should report the status of the maintenance sinking fund to the City on an annual basis.

- **Depreciation:** Over the anticipated life of the agreements governing the project, various systems are going to depreciate and require replacement. Major rolling stock, roofing, water pumps/filters (for ponds and water features), and building air conditioning/lighting/plumbing systems are prime examples of facilities that must be replaced at some point in the future after somewhat predictable usable life-spans. Hopefully, major repairs to park facilities in the Project Area built prior to the Project could be funded as well. In order to build a capital replacement reserve to fund these expenses, all revenues from concessions managed by BBP will flow into this reserve fund. Over the 10+ years during which little of this type of outlay should be required, BBP must diligently build up this reserve fund. BBP should report the status of the capital reserve fund to the City on an annual basis.



## 5.4 EVENTS AND SPECIAL USES

Special events have special impacts on parks, and these must be considered as part of any overall maintenance plan. As part of its overall operational responsibilities for Buffalo Bayou Park, the City will continue to schedule, contract for, and help produce a wide range of concerts, festivals and other events in and around the park. However, these special activities also will be governed by the Owners Manual, which will establish the number, type, size, frequency and location of special events. And contracting requirements must protect the park and ensure that outside event producers respect this high-quality natural environment while conducting their events. The Master Plan and the Preliminary Maintenance Plan assume the following range of special events:

- **Festival Concerts:** Eleanor Tinsley Park will continue to be the home for several city-wide festival concerts, such as the *Freedom Over Texas*, *Houston's Official Fourth of July Celebration*, and the site plan and park infrastructure included in the Project's scope should reduce the impact that these events have on the park. If Area-wide Improvements and Management Recommendations also are implemented (see Chapter 3), impacts will be reduced even further. The Master Plan also assumes that the number and size of these events will not grow substantially beyond those that already are occurring here.
- **Smaller Entertainment Events:** Water Music Place is being designed to accommodate more-regularly-scheduled events at the Sky Lawn. These smaller events could include outdoor movies, small concerts and special-occasion events for groups wanting to book the space. The Sky Lawn Pavilion can be the focus for these events, but it is important to note that specialized event infrastructure (sound, lighting, etc.) is not in the Project's scope. The Sky Lawn itself will be able to accommodate several thousand people.

- **Fun Runs and Walks:** While fun runs and walks typically use the roadways surrounding the park, most stage a mini-festival before and after. The availability of thousands of parking spaces in downtown make Sam Houston Park the better option for these kinds of events, but some could occur in the park with proper event planning, protection of park facilities, and planning to reduce impacts on adjacent neighborhoods.
- **Cross Country Meets:** Buffalo Bayou Park is a popular location for cross country meets because of its length and varied topography. The route used by runners will be factored into the plans for lawns and trails so these occasional events can be accommodated without damage to the horticultural quality of the park.