



MULTI-USE PARK FACILITIES

A GUIDE TO APPLYING MITIGATION IN PARKS

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RECREATIONAL DETENTION ON PARK SITES

Memorial Park



- Collaboration between City Departments to solve flooding challenges
- Multi-Use = Recreation and Detention
- Opportunity to improve recreation amenities



Inwood Forest Regional Detention Plan



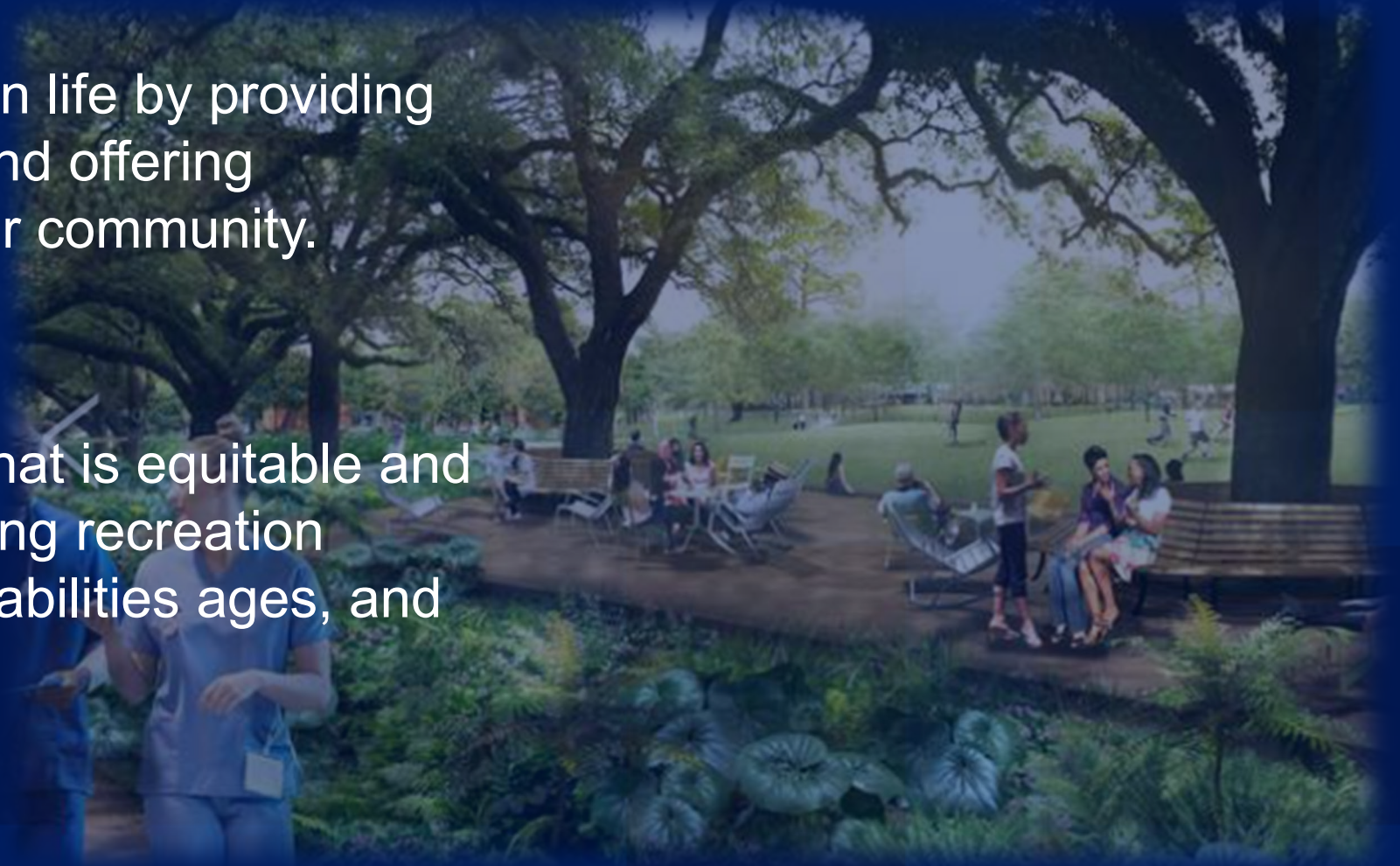
Conceptual of Hackberry Park

MISSION:

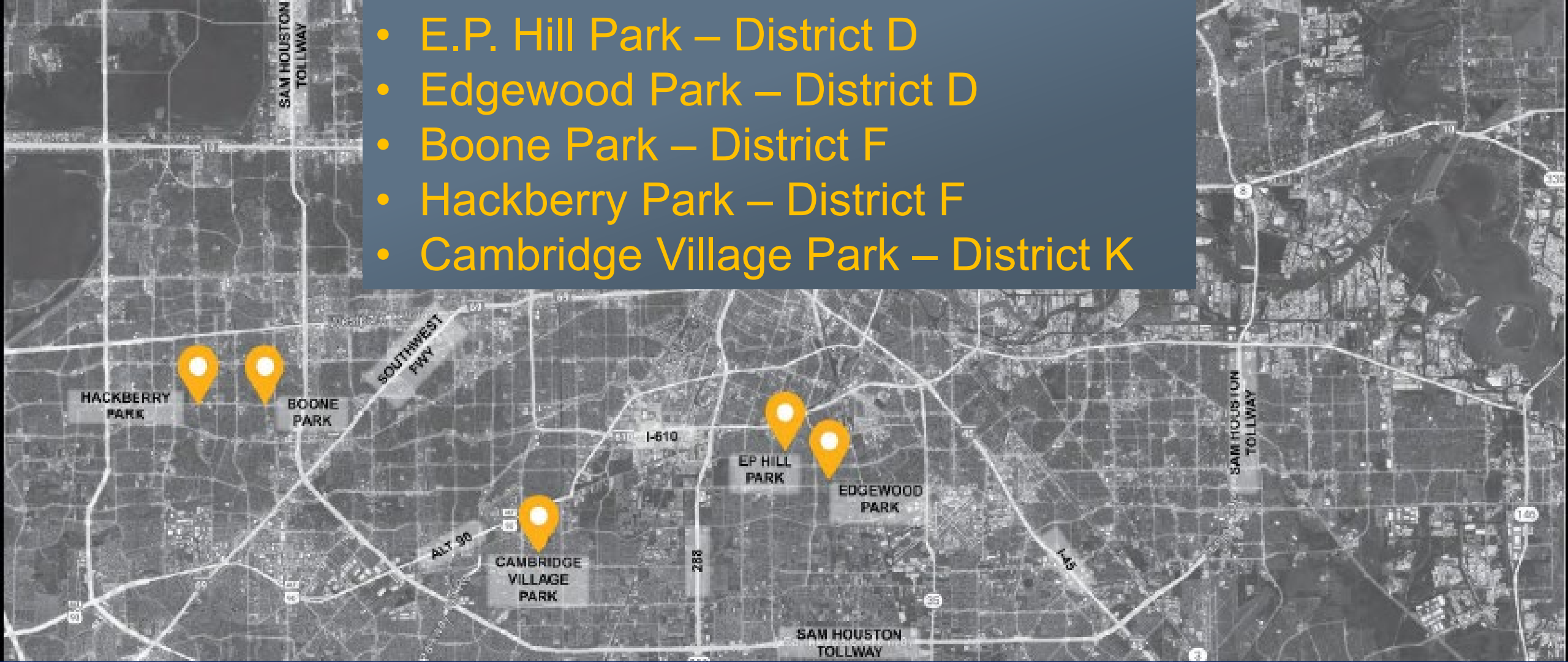
To enhance the quality of urban life by providing safe, well-maintained parks, and offering affordable programming for our community.

VISION:

The pursuit of a park system that is equitable and balanced and provides engaging recreation programming for people of all abilities ages, and socio-economic levels.



- E.P. Hill Park – District D
- Edgewood Park – District D
- Boone Park – District F
- Hackberry Park – District F
- Cambridge Village Park – District K



FUTURE PARK DESIGNS

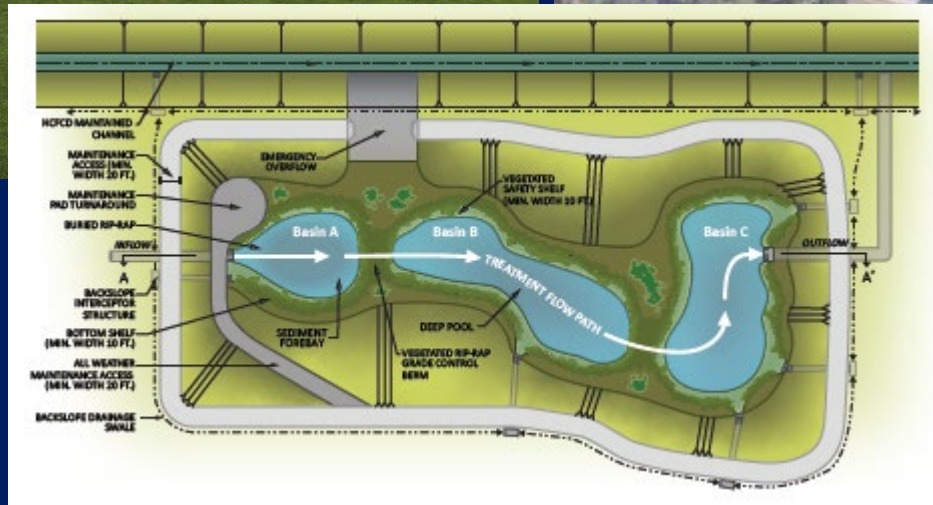
DETENTION AND RECREATION



Conceptual of Cambridge Village Park



The Commons at Herman Park



Conceptual Wetlands

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SPECIAL CONSIDERATIONS AND REGULATIONS FOR COH PARKS

4.1 | PROPERTY DEED RESEARCH

When considering incorporating stormwater detention into parks for mitigation purposes, it is important to research the property deed for each park individually. The property deed will verify parkland ownership and identify how the park was deeded to the City. Any deed restrictions and/or reverters on the park will need to be identified early in the park planning process. Deed restrictions limit the use or activities that may take place on a property. Reverters stipulate that the land will be returned to the property owner according to some condition. Generally, legal counsel will need to be involved in the deed research to ensure that stormwater detention can be legally implemented in the parkland. This information is important to gather at the beginning of the project, as it determines whether the project can move forward.



4.2 | COMMUNITY ENGAGEMENT

When considering incorporating stormwater detention into parks, it is critical to involve the public throughout the entire process. The HPARD Master Plan (2015) is available from the HPARD website (<https://www.houston.tx.gov/parks/masterplan.html>) and includes analysis of the parks and amenities available in each of 21 park sectors throughout Houston as well as recommendations for future park plans. The HPARD Master Plan provides useful information about the future of each park sector. In addition to this information, a public engagement process needs to be in place to involve the community throughout the entire process from park selection to conceptual design alternatives planning, to ensure that the proposed plan is desirable to the community and meets their needs.

4.3 | CHAPTER 26 RESTRICTIONS

The Texas Parks and Wildlife Code, Title 3 - Parks; Chapter 26 - Protection of Public Parks and Recreational Lands (*Appendix 2: Chapter 26*), protects the use of public parkland. An entity may not approve any program or project that requires the use or taking of any public land designated and used prior to the arrangement of the program or project as a park, recreation area, scientific area, wildlife refuge, or historic site unless (i) "there is no feasible and prudent alternative" or (ii) "the program or project includes all reasonable planning to minimize harm to the land, as a park, recreation area, scientific area, wildlife refuge, or historic site, resulting from the use or taking." If incorporating stormwater detention in a park includes mitigation for areas that are outside of the park (such as the nearby community), Chapter 26 procedures will need to be followed to gain approval for the project. This typically involves a public hearing at a City Council meeting with at least 30 days' notice. Consideration of the timelines and cost to receive approval for Chapter 26 procedures should be considered during the feasibility analysis of the proposed detention.

4.4 | STORMWATER QUALITY

When incorporating stormwater detention into recreational parkland, it is important to analyze the source of the incoming stormwater to identify and address potential contamination issues. The trajectory of overland surface flow that is planned to be mitigated in the park can be identified and simulated via localized sheetflow modeling (see Section 5.4). Potential pollutants along the stormwater's path can then be determined. In the case that the park is mitigating water from the local storm sewer system, the COH's Municipal Separate Storm Sewer System (MS4) regulates the stormwater to acceptable levels of stormwater quality. The discharged stormwater from the surrounding areas is anticipated to have been flushed to reduce pollutants at its entry points to the storm sewer system. Stormwater quality management and mitigation features may be included in the park if necessary and/or desired. See the *Storm Water Quality Management Guidance Manual* (2001) for further details on stormwater quality and management in the City of Houston.

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CHAPTER 26 – TEXAS PARKS & WILDLIFE CODE

- Protection of Public Parks & Recreational Lands
- Governs non-park use of park land

CHAPTER 26 PROCESS

- Hold public hearing
- There is no feasible or prudent alternative
- Hold public hearing
- There is no feasible or prudent alternative
- Minimize harm to the park
- Approve the finding
- Minimize harm to the park
- Approve the finding

PURPOSE

together we create a strong foundation
for Houston to thrive



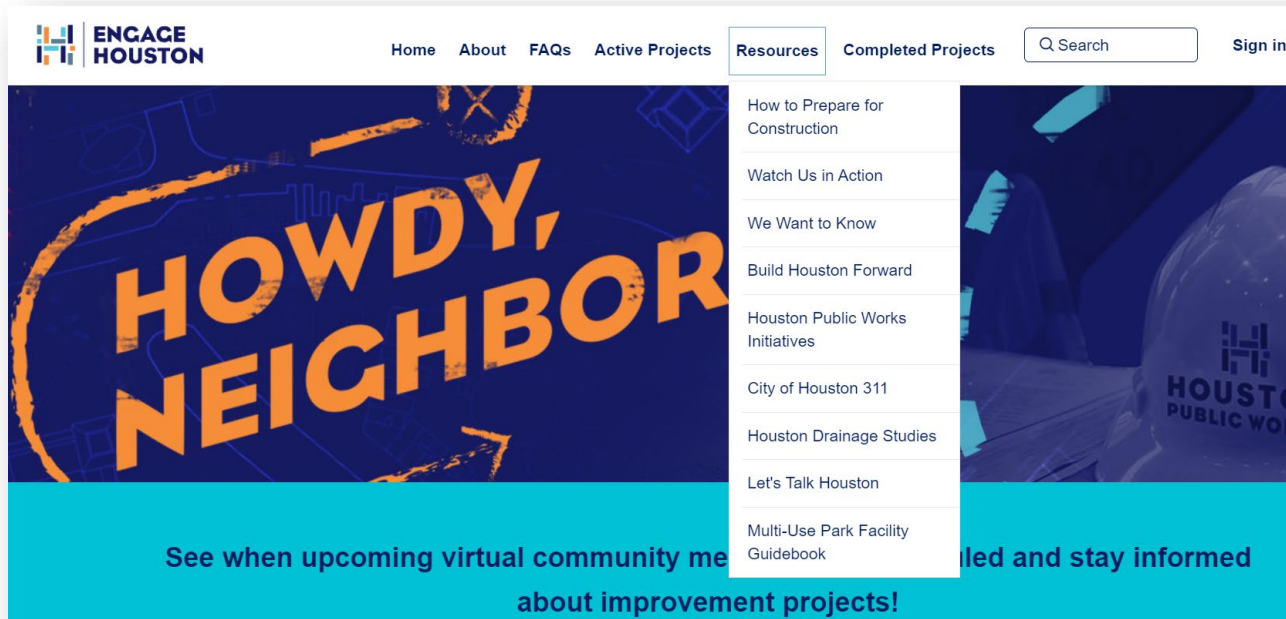
5 TO THRIVE VALUES

integrity | teamwork | ownership | communication | respect

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GUIDEBOOK PUBLISHED



INTRODUCTION

1.1 | DOCUMENT GOAL AND IMPETUS

As our climate continues to change and severe weather events become more common, the City of Houston's (COH) residents, economy, and ecosystems will face increasing risks from flood and storm events, erosion, and aging infrastructure.

Mitigating these risks through innovative, implementable, adaptable, and cost-effective strategies is critical to the City's long-term resilience and growth.

Traditionally, open land has been used for stormwater management via the installation of dedicated stormwater detention basins. But as society becomes increasingly urban, open land that can be dedicated to stormwater detention is increasingly difficult to find. By using proven, innovative strategies that combine park amenities with stormwater detention methods, the open space in parkland can be enhanced to provide recreational features for residents and wildlife habitats while also mitigating excess stormwater – ultimately protecting the community from flooding risks.

STRATEGIES TO BE EVALUATED INCLUDE:



Aboveground
Storage



Underground
Storage



Green Stormwater
Infrastructure (GSI)

The strategies presented in this guidebook can help maximize the environmental, economic, and social benefits of Houston parks while increasing the City's resiliency in the post-Hurricane Harvey environment. In particular, the following Resilient Houston Actions are advanced by this initiative (see the Resilient Houston 2020 publication for more details):

25. Make Room for Water

28. Respect Bayous and Natural Floodplains as an Integral Part of Houston's Urban Nature

34. Integrate Green Stormwater Infrastructure into Houston's Built Environment

By building strong partnerships between agencies such as Houston Public Works (HPW) and the Houston Parks and Recreation Department (HPARD), and investing equitably in parks and stormwater infrastructure, the City can improve parklands, better manage flooding and stormwater, adapt to changing weather, and provide consistency for all parklands – ensuring environmental equality for all of the City's residents.

GUIDEBOOK GOAL

- Strategies to combine **detention facilities** in a park space.
- Enhancements to parks and renovations
- Protect the community from flooding risks
- Build strong partnerships between agencies

GUIDEBOOK GOAL

STANDARD DETENTION BASIN:

- Concrete pilot channels
- 3:1 slopes
- Fairly ridged



Bellaire West Detention @ Cook Rd and D-122



**CITY OF HOUSTON
HOUSTON PUBLIC WORKS**

**INFRASTRUCTURE
DESIGN MANUAL**



**Wet Bottom Detention
Basins with
Water Quality
Features**

**HARRIS COUNTY
FLOOD CONTROL
DISTRICT**



**Policy
Criteria
Procedures**

**HARRIS COUNTY
FLOOD CONTROL
DISTRICT**

GUIDEBOOK GOAL

Compile and coordinate applicable detention requirement from different review agencies between City and County. Capture the **relevant information** for implementing detention storage in parkland

This guidebook is **NOT** for implementing a **standard HCFCD detention pond** – see relevant HCFCD manual for relevant design criteria

Potential Park Mitigation & Recreation Strategies

ABOUT THIS SECTION

The potential park mitigation and recreation strategies described in this section are twofold in their ability to improve the quality of life of residents by providing additional recreational space that can also be utilized as stormwater detention to make our city more resilient and mitigate the impact of future flooding events.

This section will describe, guide, and illustrate some of the potential park mitigation and recreation strategies highlighting the importance of leveraging existing natural features to mitigate the effects of flooding. To facilitate this effort, we will describe these strategies in the three categories shown below.



OVERVIEW OF THE STRATEGIES

The primary benefit of strategies 1 and 2 is their ability to serve as stormwater detention while maintaining recreational space. Strategy 3 benefits less from detention and instead focuses on a holistic approach to stormwater management, including infiltration into the soil, stormwater quality (SWQ), and peak rate reduction. Additionally, environmental co-benefits from GSI include urban heat island reduction, carbon capture, wildlife and habitat preservation, among others. Also, note that a combination of the three strategies is preferable in park sites. These strategies are to be designed in a way that the park will drain first and not be negatively impacted by stormwater from typical storm events.

Additionally, strategies 1 and 2 have the potential to be easily employed in existing parks with ample open space or ball fields. While strategies 1 and 2 can also be implemented in parks without open space, they are more challenging to fit in the park footprint without removing some of the existing habitat or park features, which is generally discouraged, not cost-effective, and in some cases, prohibited. Some of the features from strategy 3 have a smaller footprint and can thus be utilized in parks with less available space. Furthermore, many of the GSI features can be incorporated into designs of strategies 1 and 2, which allows for additional stormwater detention and SWQ treatment.

CHAPTER 6 POTENTIAL PARK MITIGATION & RECREATION STRATEGIES

- Utilizing a combination of strategies for stormwater detention is possible and desirable
- Use where the strategies enhance the park's aesthetic appeal as well as stormwater storage and treatment, and are in line with the park's goals

CHAPTER 6 POTENTIAL PARK MITIGATION & RECREATION STRATEGIES

MULTI-USE DRY DETENTION STRATEGY

- Depressed open space or sports field

WET DETENTION STRATEGY

- Wet amenity pond and wetland features



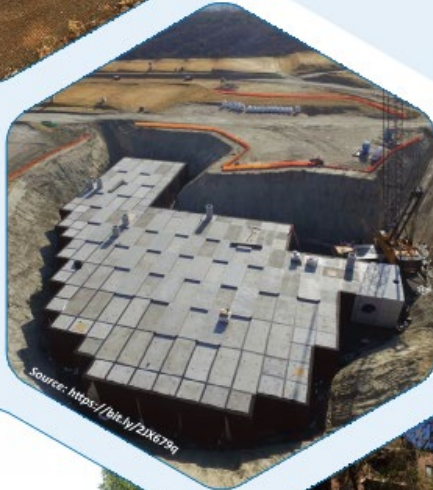
Section 6.1

Aboveground Storage





Section 6.2
Underground Storage



CHAPTER 6 POTENTIAL PARK MITIGATION & RECREATION STRATEGIES

ADVANTAGES

- Stormwater detention occurs below the ground surface
- Not intrusive to park layout
- Accommodate amenities such as:
 - high use sports fields
 - splash pads
 - playgrounds
 - parking lot

DISADVANTAGES

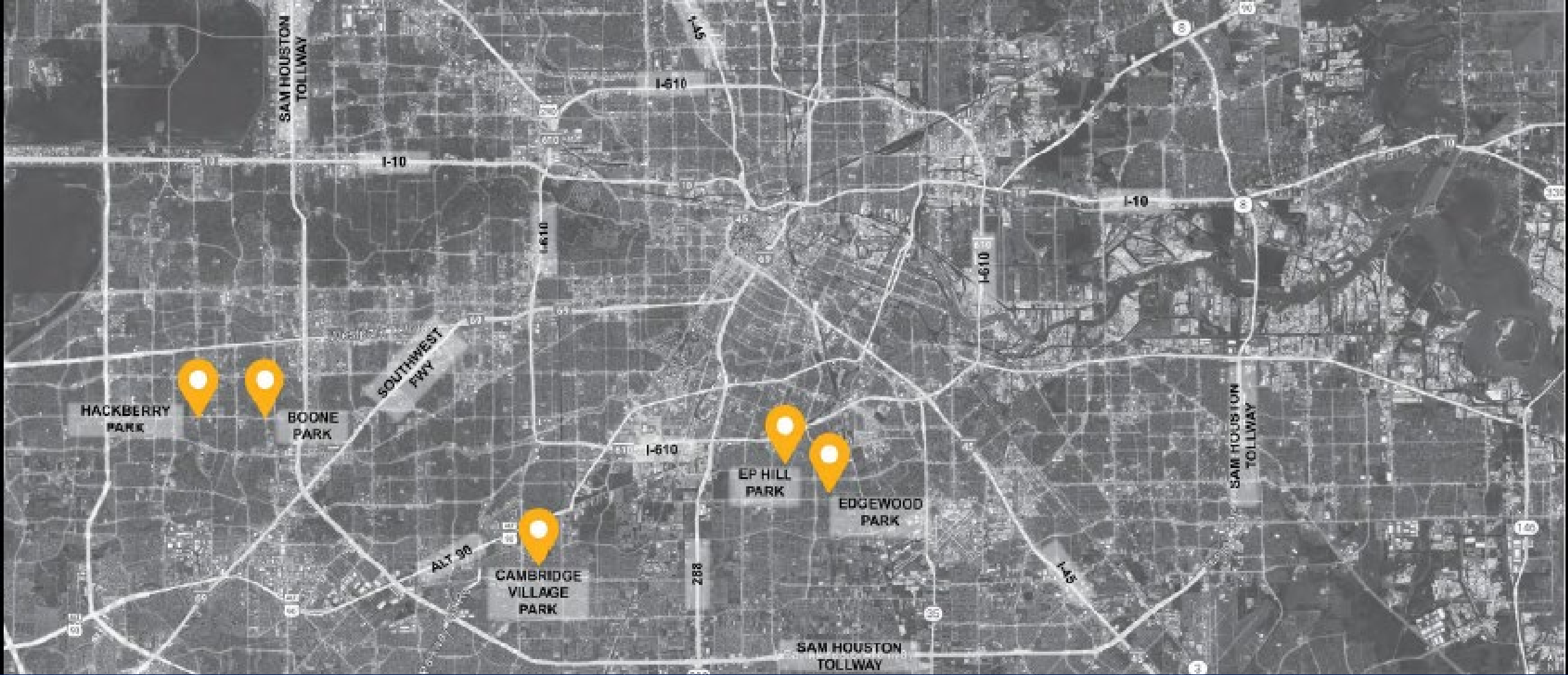
- Higher construction cost

CHAPTER 6 POTENTIAL PARK MITIGATION & RECREATION STRATEGIES

ADVANTAGES

- Uses or mimics natural processes to prevent, capture, and filter stormwater runoff
- Stormwater quality benefits
- Can be incorporated around park amenities due to generally smaller footprint





FUTURE PARK DESIGNS



EDGEWOOD PARK

EDGEWOOD PARK

CONCEPTUAL LAYOUT

- Followed master plan for park
- Upgraded trail
- New football field
- Underground storage for future parking lot





EDGEWOOD PARK



EDGEWOOD PARK



18TH ST / GLORY LAND

COTTAGE GROVE LIVING

COFFEE ST

TREE PRESERVATION ZONE

PICNIC AREA

TRAIL

OPEN SPACE

PLAYGROUND

TRAIL

PICNIC AREA

3

DRAINAGE CHANNEL

BASKETBALL

EP HILL PARK

EP HILL PARK

CONCEPTUAL LAYOUT

- Expanded trail
- Upgraded gazebo & basketball court
- New parking area





EP HILL PARK



EP HILL PARK



CAMBRIDGE PARK

CAMBRIDGE PARK

CONCEPTUAL LAYOUT

- Expanded trail
- Lowered soccer field
- New benches & playground canopy



CALLOUT NOTES

1. DRY DETENTION BASIN / IRRIGATED FIELD
2. ADA RAMP/LANDING INTO DETENTION FOR SOCCER FIELD
3. PICNIC PAVILION WITH PERIMETER TREE ALLEE AND PICNIC TABLES
4. DRY DETENTION BASIN
5. EXPAND PLAYGROUND WITH CLIMBING STRUCTURE AND SHADE SAILS
6. PROPOSED TREE MITIGATION
7. NEW TRAIL
8. PICNIC AREA/ W PROPOSED SHADE TREES
9. PROPOSED BENCHES
10. PROPOSED EXERCISE STATION W/ SHADE STRUCTURE
11. STONE CLAD 2WAY GSI FEATURE



JC JONES | CARTER



CAMBRIDGE VILLAGE PARK



CAMBRIDGE VILLAGE PARK



DRAINAGE CHANNEL

HPARD PROPOSED RIPARIAN ZONE

HPARD PROPOSED RIPARIAN ZONE

SOCCER FIELD

SOCCER FIELD

TRAIL

SAND VB.

PICNIC AREA

PAVILION

PICNIC AREA

OPEN SPACE

PARKING

TRAIL

LOW AREA



BOONE PARK

BOONE PARK

CONCEPTUAL LAYOUT

- Improved soccer field and large swale
- Upgraded volleyball courts
- Replace old pavilion





BOONE PARK



EXISTING NATURAL AREA

BOARDWALK

SECURITY LIGHTING

NO MOW PLANTING

DRY DETENTION OPEN PLAY AREA

BOARDWALK

SLOPE (WOOD)

SLOPE (WOOD)



BOONE PARK



DRAINAGE CHANNEL
 PROPOSED RIPARIAN ZONE

HACKBERRY PARK

HACKBERRY PARK

CONCEPTUAL LAYOUT

- Connected the water feature
- Removed mounds to create more park space
- Add wetland feature with bird habitat



CALLOUT NOTES	
1.	DRY DETENTION BASIN
2.	WET DETENTION POND
3.	FISHING PIER
4.	BOARDWALK
5.	STORM-WATER QUALITY WETLAND
6.	BIRD BLIND
7.	BIRD HABITAT ZONE
8.	RENOVATE EXIST PARKING
9.	NEW TRAIL
10.	NOT USED
11.	WETLAND
12.	PICNIC AREA
13.	REPLACE INVASIVE TREES W/ NATIVE TREES PER CAL. NCH





HACKBERRY PARK



HACKBERRY PARK

GSI in Parks Summary Sheet

When implemented in parkland, most GSI features provide a micro-scale level of stormwater detention and the added advantages of aiding in stormwater quality, wildlife habitat, and environment beautification. Apart from constructed stormwater wetlands (which can be larger-scale), BMPs can be implemented in smaller areas throughout the park. Implementing BMPs in smaller areas will not interfere with recreational park amenities but rather enhance the park

- ✓ Micro-scale temporary stormwater detention storage
- ✓ **Park Amenities:** BMPs can generally be implemented around park amenities due to smaller scale
- ✓ **SWQ Features:** Many of the BMPs treat stormwater



Trash Mitigation

Trash mitigation will be necessary for many of the detention strategies. Trash will likely be picked up in the stormwater and collect in and around the detention area. It is important to account for various trash mitigation devices, such as Stormceptors and trash racks, during the design phase. In some cases, there is not a technological device to aid in trash collection. Therefore, trash collection will need to be accounted for in the maintenance plan for the feature.



Soils

Healthy soils have increased infiltration capabilities when compared to unhealthy, compacted soils, and thus reduce the stormwater runoff during storm events. Additionally, healthy soils allow for better vegetation growth, which slows down water and reduces stormwater runoff. Preserving healthy soils can help with overall park habitat preservation and runoff reduction. Suburban subsoiling and other types of soil amendments can increase the organic matter in soils and increase soil voids, thus providing additional space for stormwater infiltration and penetration. This can be very important when implementing GSI Best Management Practices (BMPs), as soil infiltration is key to their successful implementation. Soil amendments can also be applied to open fields during park renovation in an effort to increase soil health and water infiltration. This topic is discussed further in Section 6.3. Furthermore, it is important to plan for the preservation of healthy soil during the park renovation construction process. Any potential impacts to healthy soil should be planned for and mitigated during the planning process. However, if the soil is impacted negatively during construction (e.g., compaction can occur from heavy equipment), efforts should be made to restore the impacted soil.



thank you

