

# **WATER WORKS MASTER PLAN REPORT**

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Prepared for:  
Des Moines Water Works

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## **CHAPTER 1 – MASTER PLAN INTRODUCTION AND PROCESS**

### **Introduction**

Water – its abundance, its absence, and its quality – is a significant issue today across all scales: global, national, regional, and local. In just the last decade, Water Works Park has seen numerous flood events, one of the most significant droughts in US history, and unprecedented technical challenges to providing clean water due to record high nitrate pollution in both the Des Moines and Raccoon Rivers. As the place where Des Moines' drinking water is harvested, Water Works Park provides a unique opportunity to illuminate these issues and influence the mindset of the region's next generation of stewards.

To this end, Water Works launched a master plan in 2013 to create a long lasting vision for the future of this important 1,500-acre urban park. The mission of the park master plan transcends any of its single uses – recreation, operation, conservation – in isolation. By combining these functions with an educational mission, the master plan for Water Works Park seeks to transform, through the experience of the landscape, the way we, as a culture and society, think about water. The guiding principles of the master plan are the following.

- Respect and reveal the power of water in the Des Moines region
- Celebrate a place of outdoor adventure within the city limits
- Capitalize on every educational and learning opportunity within the park with a focus on water
- Create spaces for community gathering and civic events in the active zones
- Respect and restore the wild parts of the park
- Strengthen connections to existing trail networks and neighboring parks
- Safeguard and enhance the water resource

At the confluence of the Raccoon and Des Moines Rivers, the downhill end of a 10,000 square mile watershed and a fast emerging greenway system, Water Works Park offers critical habitat for many species of the Raccoon River Valley. The vision for the park celebrates the ecological value of this great landscape, and provides opportunities to explore this community resource. This document summarizes the process, recommendations, and potential paths to implementation for the master plan to achieve this vision and guide decisions for the park's future.

### **Planning in Context**

Almost twice the size of Central Park, Water Works Park affords the Des Moines region a powerful opportunity to continue the metro's renaissance and build on the exceptional popularity of neighboring Gray's Lake, commonly known as the area's crown jewel of city parks.

Water Works Park already offers much to Central Iowa – 1,500 acres with ample woodlands and wildlife, a river, and multiple trails that converge at its heart.

The founders of Water Works Park set the landscape aside to protect Greater Des Moines' primary drinking water supply, and its function as a utility must serve as the foundation for all planning. With that function at its core, this master plan has evolved to an ambitious vision thanks to the leadership of Des Moines Water Works – recognizing the park's potential to encourage all in Central Iowa to embrace an outdoor culture; promote public health, learning, and adventure; connect to our natural resources in meaningful ways; make a critical difference in improving water quality for the region; and set the Des Moines Metro apart from any other city of its size and scale in the Midwest.

The timing for this plan couldn't be better. It follows on the heels of the Capital Crossroads Initiatives launched by the Greater Des Moines Partnership and the Healthiest State Initiative, and the region's governmental municipalities supportive response to that effort – The Tomorrow Plan, the metro's first sustainable development plan. That plan specifies the need to develop a natural resources network throughout the metro as the basis for habitat protection, stormwater management and flood mitigation, public health promotion, outdoor recreation, and water quality

improvement. The plan calls for the development of greenways, primarily in association with the Des Moines and Raccoon Rivers, and points directly to the Water Works Park project as the linchpin for that greenway development.

In short, plans throughout the metro are calling for this master plan to launch a host of critical green infrastructure projects for Greater Des Moines, beginning here, starting now.

### **Master Planning Process**

As previously described, Des Moines Water Works wants to expand its role not only in the Raccoon River watershed but also in the public matrix of the city's riverfront. In response to this need, Water Works launched an international design competition in the summer of 2011 to solicit ideas about the future of the park. The goals of that competition included "look[ing] at the park and river not only as a public open space, but ... also knit[ting] together the ecological function of water and fluvial systems with the metropolitan community and contribut[ing] to the social, economic, and environmental success of the urban park." The two-phase competition led to the selection of the Sasaki/RDG/AES team in early 2012 (*see Appendix 1 – Competition Entry*).

Over the next 18 months following that selection, the design team worked closely with Water Works leadership to formulate a master planning process. This period included various stakeholder presentations throughout the Greater Des Moines region to gauge interest and gather support for the more formal process to come. Also during this time, the team created two distinct committees to help oversee the process – the Steering Committee and the Technical Committee. The prior represents a diverse array of regional leaders who share an interest in Des Moines' natural and cultural heritage, each of whom expressed interest in being advocates for the future of Water Works Park. The latter are experts from a variety of relevant agencies and organizations who provided needed technical oversight to ensure the master plan's feasibility.

#### Steering Committee

- Joe Bechen
- Angela Connolly
- Mayor Franklin Cownie
- David Carlson
- Ted Corrigan
- Johnny Danos
- Charlotte Hubbell
- Mike Hubbell
- Dylan Huey
- Doug Reichardt
- Janis Ruan
- Bill Stowe
- Zac Voss
- Connie Wimer

#### Technical Committee

- Scott Atzen, Water Works
- Ted Corrigan, Water Works
- Nate Hoogeveen, Iowa Department of Natural Resources

- Ben Page, Des Moines Parks and Recreation
- Dennis Parker, Polk County Conservation
- Carl Rogers, Iowa State University
- Gary Scott, West Des Moines Parks and Recreation

In July 2013, the master planning process formally began with a kick-off meeting and site tour at Water Works (see *Appendix 2 – Project Kick-off Presentation*). These meetings allowed the team to become acquainted with each other and with the 1,500-acre park site. Workshops with both the Steering and Technical Committees focused on discussion of the winning competition entry. Committee members provided feedback on the three Cs – areas of consensus, concern, and clarification – which aided the design team in focusing further communication and design exploration. Additionally, the team brainstormed goals for the master planning process.

In September 2013, the design team launched a major public meeting and event in the park (see *Appendix 3 – September 2013 Steering Committee Presentation*). The open house, held on Tuesday, September 10, was a celebratory social event with two goals: to build a strong sense of community through fun activities in the park, and to generate excitement and input for the master plan effort and future of the park. The event featured multiple stations outlining initial master plan design ideas and goals (see Chapter 3 for a discussion of the Site Analysis and Design Options). It also included food and drink, family-friendly art activities, an opportunity to try paddleboarding – a proposed program in the park, and an ecology bike tour led by Kim Chapman, the design team’s ecologist. Approximately 400 people attended, representing a broad spectrum of Des Moines citizens – young families, senior citizens, professionals, political leaders, entrepreneurs, recreation enthusiasts, and everyone in between.

In November 2013, the design team presented a draft master plan to the Steering and Technical Committees (see *Appendix 4 – Draft Master Plan Presentation*). The draft master plan included a summary of the feedback from the September event, park-wide system diagrams, and concept plans for a series of potential interventions. The team also presented concept design alternatives to address connectivity between Gray’s Lake and Water Works Park, asking the committees to evaluate a potential overpass or underpass to help overcome the barrier of Fleur Drive. At these meetings, the team discussed priorities for a first phase of implementation as well as potential for a new foundation to oversee future phases. Feedback from this milestone work session helped to form the final recommendations in this master plan report and its accompanying Executive Summary (see *Appendix 5 – Executive Summary Report*).

In addition to these milestone meetings and events, the following focus and small group discussions occurred over the course of this master planning process.

- US Army Corps of Engineers and City of Des Moines Engineering
- Meredith Foundation, Gray’s Lake Committee
- Central Iowa City-County Trails Committee
- Downtown Business Small Group Discussion (recruited as part of the design competition preparation)
- Business Neighbors Focus Group
- Des Moines Water Works Park Users Group
- Residential Neighbors Focus Group
- Audubon Discussion Group
- Conservation Discussion Group
- Theater Arts Discussion Group (Iowa Shakespeare Festival and associates)
- Transportation Discussion Group
- Individual interviews related to specific user interests: theater, mountain biking, commuter cycling, equestrian, and Des Moines Disc Golf
- Disability Rights of Iowa
- Jasper Winery
- Young Professionals Discussion Group\*

\*This group has evolved to serve as the seed group to form a 501(c)(3) non-profit foundation to assist Des Moines Water Works in the management of the park. As the 501(c)(3) foundation forms to help guide this work in the future, these foundation members increasingly provide input on the master planning process as well.

### **Community Engagement Outcomes**

Unless focused on a particular master plan issue (stage development, cycling elements, aerial adventure course, Gray's Lake connection, or natural resources protection), most groups spoke to similar basic expectations moving forward for Water Works Park. Respondents discussed the importance of welcoming newcomers to the park, maintaining its wild features, crafting important links to Gray's Lake, developing meaningful community attractors, and providing critical, effective education messages on water quality and the impacts of flooding. The following provides more detail on themes (broad-based and specific) emerging from the public engagement strategies.

#### **Welcome the public**

At the outset, respondents brought up Water Works' hidden – if not intimidating – entryway. People spoke of knowing the area only as a utility site – not a park to welcome the public. While the Arie den Boer Arboretum is beautiful, its density, coupled with security practices that limit access, make the park unwelcoming to many.

#### **Leverage opportunity**

Respondents said this park shows amazing potential to deliver rare experiences for Central Iowa and beyond, but it is currently underused. According to respondents, this is due in part to its lack of public welcome and promotion, but also to the lack of amenities. While an aerial adventure course starts the park down a distinctive path, respondents see the proposed circuit (an intertwined canal course for beginning to advanced paddleboarders) as another essential element in creating iconic experiences. Respondents also spoke of the value of public art, their interest in the convergence of cycling opportunities, the importance of the park's connection to Gray's Lake, and the intersection of recreation and education around water quality as a resounding theme that can also set this park apart.

#### **Provide refreshments**

Some respondents spoke of the importance of introducing quality food and drink to the park – and even maintained the right food experience could provide another key point of distinction for the park. Three potential locations emerged. Some respondents suggested offering refreshments at the East Activity Node of the park, which they expect will function as a Gray's Lake extension and provide a high traffic location for vendors. A celebratory hub (see below) near the current in-park trail bridge over the Raccoon is another, and the proposed events lawn amenities also should include refreshments, according to respondents (see below).

#### **Create something special to cross Fleur**

The link to Gray's Lake held strong interest for most respondents – for many, it's the most important element in this plan. Gray's Lake enjoys high levels of use (more than a million visits annually) and is indeed a jewel in the urban park crown. But Gray's Lake faces space limits and lacks some of the open-lawn activity sites and expanded parking immediately available at neighboring Water Works – if only a convenient crossing for Fleur Drive could be established. At this master plan's September 2013 public event and in subsequent smaller group meetings, the public rejected improvements to the current at-grade crossing, instead asking for an overpass or underpass. Most cited the overpass as the more potentially iconic connector, and the underpass as the more likely accessible and convenient crossing for the day-to-day user. No consensus has emerged, although the Connectivity Subcommittee expressed an underpass connection preference.

#### **Keep the wild-like wild**

Birders, hikers, walkers, strollers, cyclists, equestrians, runners, and more all highlighted the value of the urban oasis aspects of this park – its ability to immerse the park user in nature with downtown right next door. While many who spoke to this value also welcome park improvements, they want this work done with a great deal of sensitivity to preserving the park's irreplaceable nature features.

### **Celebrate cycling**

Converging at Water Works are four trails – with the American Discovery Trail overlaying all. Today, the in-park bridge crossing, with its limited adjacent parking, serves as an informal trails hub. But the cycling community says more can and should be done here. Cycling enthusiasts and others see this park as a prime opportunity to celebrate the Central Iowa Trails system – a system on its way to achieving its goal of world-class quality, and value an improved bridge crossing. Some want the bridge replaced and others want it restored to preserve its history. Most see improving the bridge as an additional opportunity to create a true hub or trailhead, reflective of this location's importance to the Central Iowa Trails system. Others want to see cycling celebrated by the addition of an active-biking component to the park, beyond the existing trails and improved connections. They look to a built obstacle course as a key adventure attractor for young adults and families, expressing some interest in locating this active biking site at or near the East Activity Node since they see this as an emerging site for family activity.

### **Access the river**

While community members value the Circuit – the proposed water trail, for its adventure, instructional opportunities, and iconic appeal, they still want the river to play a meaningful role in the park user's experience. They want access. They propose the possibility of linking the river and the Circuit – perhaps in a loop available to the more skilled paddlers.

### **Go big – and small – with events**

Early in the process, it became obvious that many community members and leaders seek support for mega-events in the metro. While these events typically occur at Water Works Park, they leave significant maintenance problems for Water Works staff and potentially damage the resource. Furthermore, the park offers few amenities for event organizers. Many respondents expressed strong interest in enhancing the events lawn to create a truly valuable venue for significant events.

### **Heed flooding**

No matter what improvements occur at the park, virtually all respondents have a high level of expectation that those improvements will be flood resilient to the greatest degree, and they do not seem concerned about the possibility of portable amenities which are easily moved in and out to respond to flood threats.

### **Educate, educate, educate**

Perhaps due to flooding and ongoing news about Iowa's poor source-water quality, respondents share Water Works' intent to use this site for educating the public about watersheds, water quality, flood mitigation, and the Water Works utility. They share Water Works' goal of public education underpinning all of this park's future features and programs.

### **Aerial Adventure leads the way**

Most respondents see real promise in the proposed aerial adventure course, in part due to its ability to engender excitement and repeat visits (as compared to the one-shot zipline originally conceived for the park). The minimal up-front costs required to start the course are also appealing. The vendor builds the course with vendor investment and largely absorbs all liability risk, while providing, based on past history, a reasonable rental fee to Water Works, which would help fund other park initiatives. Many see this project as a lead-off project for the master plan.

## **CHAPTER 2 – SITE ANALYSIS AND DESIGN STUDIES**

This chapter summarizes a series of design explorations and the public feedback related to each study. Building on the project's kick-off and the areas of consensus, concern, and clarification expressed by the Steering and Technical Committees, the design team devised three priority topics: Connectivity, Learning through Recreation, and Civic Life in the Park. Within each of these topics, the design team presented an analysis of existing park systems, potential best practices from other great urban parks, and design case studies to dig deeper into particularly important issues.

### **Connectivity**

Connectivity is a term used in urban design and planning to describe the number and capacity of connections in a circulation network. Higher levels of connectivity, in theory, decrease travel distances and time, increase user route choice, and promote alternative transportation methods. Important to connectivity is the degree to which available circulation options connect people to their intended destinations, and also the degree to which the experience is pleasant and comfortable. Implicitly, excellent connectivity can discourage car use by making walking or bicycling enjoyable and easy.

Throughout the master planning process, connectivity emerged as a key issue and design driver. Within this theme, the design team presented an analysis of existing park circulation systems, best practices from other great parks, and two series of design alternatives for public evaluation. The first design alternative related to the park's road system and its relationship to other park features. The second looked at ways of improving connections between Gray's Lake and Water Works.

### **Existing Conditions**

Currently, vehicular traffic is prohibited north of the river, with access points to the north sections of the park largely confined to the trails hub parking access at Ashworth Pool in Greenwood Park, to some limited access via the mountain biking network at the northwest corner of the park, and to largely limited pedestrian or equestrian traffic near 31st Street. Vehicular traffic from the south enters via park roads and the parallel George Flagg Parkway running between Fleur Drive and Park Avenue. With mention of the George Flagg Parkway and the parallel park roads, note the potential redundancy of these park and public road systems. In the southeast quadrant of the park, the trails system also covers territory similar to these roads.

Four multiuse paved trails also nearly converge at the park. The Walnut Creek Trail enters from the northwest and the Bill Riley Trail enters directly from the north via Greenwood Park, with both trails converging and heading east to Meredith Trail and Gray's Lake. At the same time, the Great Western Trail, linked by park road, heads south out of the park and ends at Martensdale, Iowa, in Warren County. Polk County Conservation maintains this trail as it enters Water Works Park from Park Avenue to the south.

The park also hosts a number of relatively single-use trail systems. A network of mountain bike trails occupies the northwest corner of Water Works Park. Access to these trails is limited and outside the boundaries of the park. A series of equestrian trails parallel the paved trails at many points and also take riders into the park's woodlands – but in the park all equestrian trails have been limited to the north side of the Raccoon River. Similarly, a series of hiking trails traverse the park, but with little to no accompanying signage and limited public awareness.

### **Precedents**

Given the challenges and opportunities of the existing park circulation systems, the design team showed three best practices to improve user experience and choice. First, great park road examples include streets that integrated innovative stormwater management (Portland, Oregon) and great multi-modal street sections (Gray's Lake). Second, great parks often have attractive and clear wayfinding and signage systems, including recognition of project donors (Council Bluffs), interpretive signage (National Mall, Washington D.C.), and pedestrian-scaled signage (Gray's Lake). Lastly, great parks often have iconic moments or hubs related to pedestrian and bicycle systems (High Trestle Trail and Kruidenier Pedestrian Bridge).

### **Case Study 1: The Park Road**

While the park road network currently allows access to many parts of the park, it can create conflicts with bicycles and pedestrians. Further, with the introduction of the Circuit – a water trail that roughly follows the park road – new challenges of vertical circulation and separation require consideration. For example, near the intersection of George Flagg Parkway and 31st Street – where the river, the park road, the Circuit, and the parkway converge – not enough space exists to accommodate all four lanes. The design team presented three options for evaluation, from the least change and investment to the most.

The BETTERING THE ROAD scheme maintains the existing road geometries, but like Gray's Lake today, this scheme improves the road cross-section to provide dedicated vehicular, pedestrian, and bicycle spaces. The Circuit in this scheme is shorter and non-continuous. The road has one major Circuit crossing located at the existing park bridge.

The PARK AND WALK scheme adjusts George Flagg Parkway only at the pinch-point (east of the bridge, where river, road, and trail nearly converge). The existing bridge is replaced and rebuilt as a signature park icon and serves as a pedestrian bridge only, except for Water Works service vehicles. The bridge extends over the Circuit and creates a new gateway and parking opportunity on George Flagg Parkway. This scheme has no vehicular crossing of the Circuit, and the Gallery Walk becomes a multi-modal trail with no vehicular conflicts.

The TWO LOOPS scheme proposes relocating George Flagg Parkway to expand the connected park space and make more room for a continuous Circuit. A series of new iconic gateways are located along George Flagg Parkway, providing entrance into a two-way park drive. This change also separates operations and park traffic and enables minimal vehicular Circuit crossings.

Respondents tended to prefer change, with the highest number of positive comments for the PARK AND WALK and TWO LOOPS options. Though road geometry changes resonated, concerns included also increasing the quality of the experiences – better entrances, signage, and surfaces – and maintaining vehicular connections to key experiences in the park.

### **Case Study 2: Gray's Lake Connections**

Fleur Drive provides one of the most frequented and significant north-south transportation corridors in the Metro area, linking residents to the airport, the Blank Park Zoo, and a number of businesses, attractions, and residences. With the popularity of Gray's Lake, pedestrian activity along and in the vicinity of Fleur Drive continues to grow along with interest in additional pedestrian and trail facilities and connections. Along this busy drive, heavy vegetation intermittently lines Water Works Park, blocking the public's ability to see the park or feel welcome.

At Gray's Lake, visibility is more open. Fleur Drive gives Water Works Park its primary vehicle access, and is the only vehicle access for Gray's Lake. Currently, the most direct pedestrian access between Gray's Lake and Water Works Park occurs at Fleur Drive. Other access points for walkers and bikers are located along trails. Due to increasing storm events and intensity, flooding might happen more often at Fleur Drive. Fleur Drive connects the south side of Des Moines to downtown.

The public consistently expressed interest in a seamless pedestrian connection between Water Works Park and Gray's Lake. The design team presented three options for evaluation.

The BELOW-GRADE SOLUTION welcomes Gray's Lake users to Water Works Park by way of a skylit, artful passageway – the Portal – leading to a dynamic, flood-resilient garden space encircling a destination amphitheater.

The ABOVE-GRADE SOLUTION explores an elevated green corridor – the Oxbow – with its own distinct viewpoint of the urban landscape and a relatively seamless experience when moving from park to park.

The AT-GRADE SOLUTION suggests a series of enhancements to improve both the function and aesthetic appeal of this at-grade crossing. Stormwater management, native landscaping, and improved alignment for safety create a greater sense of ease when moving between these two outstanding parks.

The at-grade crossing improvements have not resonated with the Steering or Technical Committees or the public. For many respondents, it appears knowing more about costs and fully understanding the viability of each option matters to their preference (How much of Gray's Lake will be consumed by ramping to an overpass? How can an underpass feel safe? How do costs compare for these options?). Some simply wish we could provide both the iconic overpass and the convenient underpass. However, the Connectivity Subcommittee expressed a preference with the underpass option as a first phase connection between Water Works Parks and Gray's Lake. The subcommittee expressed a desire for a well-designed, wide, and bright tunnel, ensuring the passage felt safe and welcoming for pedestrian crossing. The committee also expressed that care should be taken to minimize impacts, visual or physical, to Gray's Lake.

Therefore, the master plan preferred direction is the underpass option. The overpass can be explored in the future for its iconic value.

Chart One: Matrix of Evaluation Criteria for Underpass and Overpass

		UNDER	OVER
<b>CRITERIA</b>	<b>Experience &amp; Views</b>	- wide tunnel with skylights - lighting will be critical - no view	- climbing up and over - views of both parks, potential views of floodway during flood events - rich landscape experience connects parks
	<b>Identity Potential</b>	- nodes on both grey's lake and WW sides of tunnel create sense of place for pedestrians - not visible if driving along Fleur	- bridge doubles as gateway along Fleur, signage, etc - link structure to Gray's Lake ped bridge to create common language/identity
	<b>User Comfort/Accessibility</b>	- ease of use because of at-grade connection on Gray's Lake side - width, height, lighting, paintings, entry and finishes all critical to creating a positive experience	- requires climbing up +/-15 feet, long ramp - open air crossing feels safe
	<b>Ecological Context</b>	Minimal ecological effects. When Raccoon River floods, water enters Water Works from Gray's Lake side of Fleur Drive. Sediment may accumulate where floodwaters pond or slow down.	Minimal ecological effects. Sediment may accumulate behind bridge piers where floodwaters slow down.
	<b>Flood Resiliency</b>	- Impact of lowering the grade on storm drainage should be studied - Tunnel in flood way likely to have significant impact on HECRAS model - Cladding materials, lighting, paving and planting should be capable of withstanding inundation	- Majority of structure raised out of flood plain - Structure designed to withstand impact of floating debris - Fill in flood plain to impact HECRAS model
	<b>Permitting</b>	- Joint USACE/IDNR Application and Local Permits required - Structures in flood plain to impact HECRAS model - Work within Flood Way	- Joint USACE/IDNR Application and Local Permits required - Work within Flood Plain - Structure on levee will require USACE coordination
	<b>Construction Feasibility</b>	- Significant lane closures or total closure of Fleur Drive required for installation of tunnel - Any existing utilities in Fleur Drive will need to be temporarily routed or shored for construction	- Temporary lane closures of Fleur Drive required
	<b>Cost</b>	Based on concept estimate, approximately 2.3M.	Based on concept estimate, approximately 2.6M.
<b>LEGEND</b>	Positive      Neutral      Negative		

### Learning through Recreation

A primary goal of this park master plan and its recommendations for improvements is to promote a greater sense of stewardship and understanding of water through an educational and interpretive experience of the landscape. This happens already in Water Works Park. From the mountain bikers to the campers to the kayakers, the stunning contrast of this forested landscape to its urban surroundings inspires contemplation of and connection to nature.

The master plan seeks to enhance and expand opportunities for engagement with and understanding of the park's natural and operational systems. This was described as Learning through Recreation and included many forms of programming potentials – expanded bicycle trails, an adventure course in the woods, educational playgrounds, and, most importantly, a proposed new water trail.

## **Existing Conditions**

Water Works Park exists to protect the gallery, a three-mile long pipe 20 feet underground that provides clean drinking water to Des Moines residents. The gallery works by gathering up relatively clean groundwater under pressure from the Raccoon River. This water is forced into the gallery, a perforated pipe within the river's sand aquifer, and is directed to the Water Works plant for final cleansing.

Over the years Water Works discovered that ponds excavated next to the gallery increased the amount of groundwater in the gallery. They also noticed that the ponds removed nitrogen, reducing the need for additional intensive treatment; the ponds and wetland edges shelter natural bacteria that treat nitrogen for free. These ponds are currently used for fishing and other forms of recreation.

## **Precedents**

At the community outreach sessions, the design team presented a series of precedents related to great water trails to illustrate the potentials of the Circuit. First, great water trails provide a great variety of waterside and watersheet programming, from fishing to kayaking to standing paddleboarding. Second, great water trails provide appropriate accommodations, including parking, storage, concessions, and rentals. Lastly, great water trails provide easy and attractive access points, whether through structured portage locations, boat ramps, or waterside docks.

## **Case Study 3: The Circuit**

With respect to water trails, an upstream and a downstream access point in Polk County along the Raccoon River provide some paddling potential today, but less experienced paddlers are concerned that the downstream exit is simply too close to the river dam. They find this intimidating and are reluctant to use the river. The design team proposed combining the ecosystem benefits of water cleansing with recreational and educational opportunities by connecting the operational ponds into a continuous, safe water trail – dubbed the Circuit.

THE SHORT CIRCUIT scheme maintains the existing road alignments, creating a short and segmented Circuit. The major proposed change connects the two existing basins with a recreational Circuit canal parallel to the Raccoon River and George Flagg Parkway.

The LONG AND CONNECTED CIRCUIT scheme unites a series of existing ponds with a single channel to create one continuous recreational and utilitarian Circuit. The course varies from narrow channel to open pond, providing diverse paddling experiences and better habitat for fishing. From a water quality perspective, this option provides high value to Water Works by increasing water surface area and generating more clean drinking water.

THE BRAIDED CIRCUIT scheme provides the most choice for the community by creating a variety of water channels for paddleboarding and other water activities. From a water quality perspective, this option provides high value to Water Works by increasing water surface area and providing more clean drinking water.

Respondents were clear – they have a strong preference for the BRAIDED CIRCUIT scheme. This scheme affords more opportunities to accommodate various skill levels and create ever-changing experiences, and thereby, improved learning.

## **Civic Life in the Park**

Urban parks are increasingly the settings for the lives of a wide range of users. These spaces are the places to play, eat, rest, contemplate, learn, and, perhaps most importantly, feel the greatest sense of connectedness with our neighbors. Beyond the basic necessities of safety, user comfort, and visual delight, urban parks provide a wide range of program – from the daily uses of exercise, connection, and relaxation to the occasional large-scale event.

The Civic Life in the Park theme explored the existing and potential uses at Water Works Park, with a particular focus on the event lawn. Within this theme, the design team presented an analysis of existing events, best practices from other event landscapes, and design alternatives for public evaluation.

## **Existing Conditions**

Today, Water Works Park hosts a great range of events that serve Des Moines and the region. Many of these are reliant on Water Works' natural assets – such as the HyVee Fishing Derby that utilizes the existing ponds. Some rely on the park's circulation systems – such as the Make-a-Wish Jolly Lights Festival that lines the park's roads. Many utilize the existing event lawn at the west entrance to the park – such as summertime concerts and recent the visit of 10,000 campers during RAGBRAI.

Though this incredible range of events can be accommodated in the park, the events also pose challenges. Water Works staff – small given national standards for parks of this acreage – often carry the burden of event setup and cleanup. Much of the basic infrastructure – such as electrical service, sound, and parking – required for these events is relatively ad-hoc, expanding the need for pre-event and post-event labor. Lastly, the event lawn – the epicenter of many of the larger events – is nearly 67-acres, much of it mown. This is significantly larger than necessary, at four times the size of Central Park's Great Lawn (16 acres) or the Main Ring of the Iowa State Fair Grounds (14 acres).

## **Precedents**

To illustrate the potentials of the Event Lawn, the design team presented a series of precedents related to great civic event spaces at the community outreach sessions. First, great event spaces have carefully orchestrated sequences of arrival and adequate parking, including clear signage and wayfinding systems. Second, great civic event spaces provide concessions – temporary vendors, food trucks, fixed concession pavilions, or a combination of these – as well as amenities such as restrooms. Lastly, great civic event spaces are designed to provide flexibility, easy access to infrastructure (power, water, and sound), and human comfort (shade, views, and microclimate).

## **Case Study 4: The Event Lawn**

The design team presented three Event Lawn alternatives for public feedback. Each option increased in complexity and potential investment.

The MEADOW scheme maintains a mixed-use event space in the center of the current field. The event space is defined by an ecologically vibrant meadow and outer ring of canopy trees. The stage in this option is temporary, brought in and installed when needed for events. Parking is strategically placed along the road.

The TWO SPACES scheme has a fixed stage in the middle of two mown fields, providing a flexible and dynamic space for the Des Moines community. The two mown fields—one large and one small—provide space for a variety of event sizes. A public path leads from the parking to a new boat launch and dock. Parking is placed within the canopy trees.

The MOAT scheme provides a large central field with a fixed stage, separated from the parking and road by a treatment wetland that acts as a security buffer by limiting event lawn access to three specific points and also helps clean water before it enters the Circuit. The stage is cantilevered over Basin 17, providing a great backdrop for concerts and easy access to the Circuit.

The latter two options resonated with the public. The TWO SPACES scheme allows for flexibility and different scaled events. The MOAT scheme offers an educational opportunity as well as a secure perimeter. Few preferred the MEADOW scheme. A challenge with the TWO SPACES scheme is designing to allow for successful co-programming or distinct separate programming of the two venues.

## **CHAPTER 3 – MASTER PLAN: PARK SYSTEMS**

The master planning process resulted in the need to create two layers of recommendations – those related to park systems and those related to specific potential project implementation. This chapter summarizes the prior recommendations related to park systems. Where the next chapter tackles a few specific design opportunities that could result from major capital fundraising campaigns, this chapter creates a framework for everyday decision-making regarding the distribution of emergent program opportunities, the management of the park's diverse ecosystems, the use of plant materials, and the refinement of the park's circulation systems.

### **System 1: Program**

Today, most of the park's more active uses exist near vehicular access, specifically at the east entrance near the Arie den Boer Arboretum and at the western end near the Event Lawn. In addition, a series of sport-field landscapes occur at the southern edge of the park along existing road systems. Areas north of the river and west of the Event Lawn are primarily passive in use if used at all, largely due to their limited vehicular access.

This system, though largely unintentional, utilizes the river as a natural barrier to active use and enables the preservation and protection of the park's most valuable and contiguous habitat. For this reason, it should serve as a framework for decision-making about the expansion of existing uses or the introduction of new program elements.

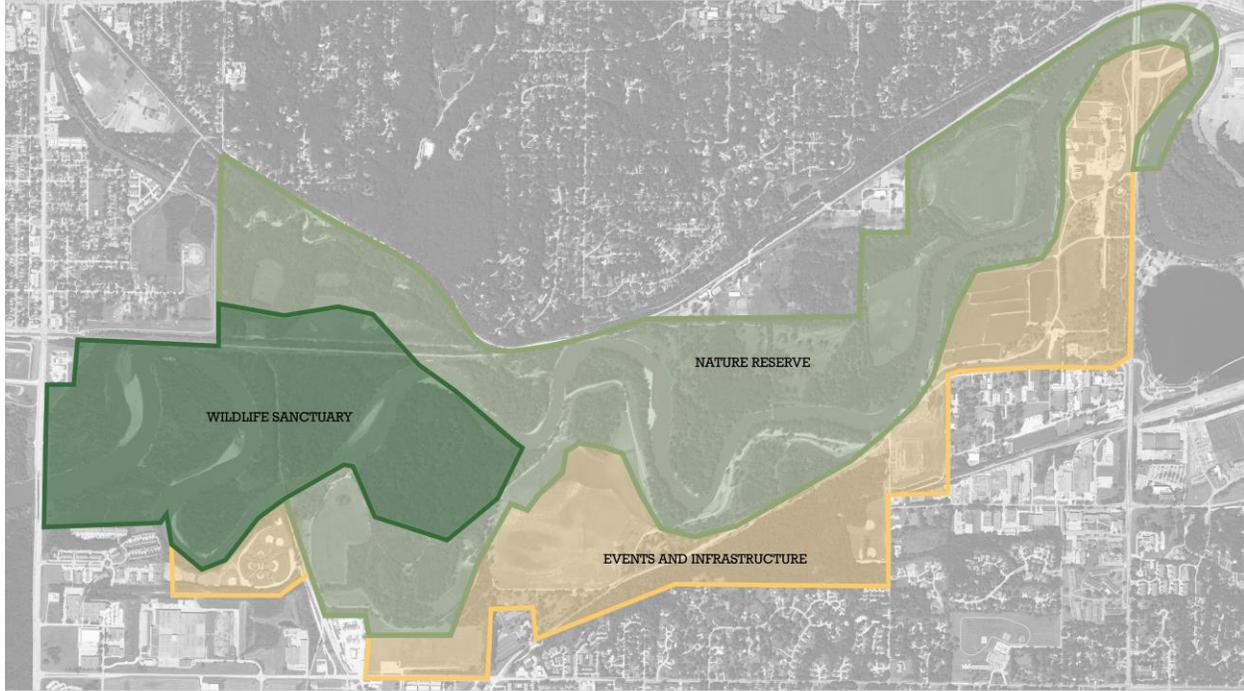
The types of activities that occur in the sensitive northern and western edges of the park should be those that can reasonably coexist with species that are less tolerant of human activity. Because of the lack of vehicular access, uses should be highly flood-tolerant, minimal in terms of infrastructure need, and low-maintenance. Examples of appropriate programming include fixed passive activities, such as hiking, riding, biking, and bird watching.

The types of activities that occur in the more active areas of the park should be publicly accessible and designed to foster human use and enjoyment. In contrast to their less accessible counterpoint spaces, the active spaces can be more highly-programmed, strongly connected to the city streets, and inspired by the engineered forms and hidden infrastructure of the working water landscape. The active landscape is described here as the space from the Arboretum to the east, along the Circuit, to the Event Lawn.

Importantly, through this master planning process, a new understanding of the active landscape emerged – an East Activity Node, a West Activity Node, and the Circuit. Building on the energy and population of Gray's Lake, the Eastern Activity Node, including the Arboretum, the Great Lawn, and the East Ponds, is seen as a highly active node with plenty of fixed or permanent program. Learning from the influx of events, the Western Activity Node, including the Event Lawn and Basin 17, is seen as a place for temporary program. The Circuit is the connective thread between these two important nodes.

A good test case for utilizing this program framework is the existing Ultimate Frisbee fields at the westernmost end of the park's roadway system. These fields attract a number of Frisbee players because of their scale and flexibility. There is, however, limited access to organized infrastructure or amenities (water, restrooms, parking) and it exists within the highly sensitive western edge of the park. For these reasons, the Ultimate Frisbee fields are more appropriately relocated to the vibrant East Activity Node, with the former site reverted to habitat via prairie restoration and reforestation.

Chart Two: Ecological Management Zones



## System 2: Ecological Management Zones

Today, Water Works Park staff have, generally, two park management zones – one maintained frequently (the active landscape described above) and one maintained very infrequently (the passive landscape described above). Though responsive to existing use patterns, this maintenance regime creates a sharp contrast between the cared for and not cared for areas, minimizing the potentials for greater water quality, habitat, and biodiversity.

The master plan recommends the creation of a new management strategy for the park – three distinct ecological management zones, each with its own management plan.

### Wildlife Sanctuary

The proposed Wildlife Sanctuary is at the western edge of the park. This landscape is largely composed of floodplain forest and has great connectivity to large adjacent patches of open space. For these reasons, it provides some of the highest quality habitat on site. The Wildlife Sanctuary should be maintained using the following key principles.

- Protect wildlife habitat for species most sensitive to people and their activities
- Prohibit hard or permanent infrastructure
- Allow only low-key, non-wheeled human activity
- Focus on restoration of damaged natural resources

### Nature Reserve

The proposed Nature Reserve is mostly along the northernmost border of the park, with a small patch west of the Event Lawn. This landscape is diverse, including floodplain forest, rare patches of upland forest, the site's only savanna landscape, and some prairie. The Nature Reserve contains some consistent human use, such as the equestrian trails to the north and the mountain biking trails in the northwest. The Nature Reserve should be maintained using the following key principles.

- Balance human use with wildlife protection and restoration of natural resources
- Buffer Wildlife Sanctuary and expand wildlife habitat in park
- Minimize impact on natural resources

- Ensure infrastructure is flood resilient
- Allow play in the wild through high-key, wheeled, and similar intensity recreation
- Provide only self-sustaining activities that educate users about water
- Guide activity development and promote ecological restoration using a natural resource management plan

### **Events and Infrastructure Zone**

The proposed Events and Infrastructure Zone is mostly along the southern and eastern borders of the park. This landscape is a relative monoculture of landscaped areas with some small patches of floodplain forest. The Events and Infrastructure Zone contains consistent human use and extensive vehicular access. The Events and Infrastructure Zone should be maintained using the following key principles.

- Provide facilities and venues for large crowds and significant events
- Minimize impact on natural resources by designing with nature and using green infrastructure principles
- Develop a natural resource management plan for natural areas within this zone

The quality of the natural lands is always improved with a management plan, with leadership and volunteers to implement it, and with a monitoring program. The management plan describes the issues and lists the actions needed to improve the condition of plant communities. The leadership and volunteers guide and carry out tasks according to a schedule and within a budget. The response of plant life and wildlife to management and restoration tells whether the plan is correct or not. If species that indicate better ecological conditions don't thrive, then something may be wrong with the plan or the actions being taken to implement the plan.

### **System 3: Plant Communities**

Using information from pre-European settlement vegetation, existing plant communities, and proposed park uses, the design team developed target plant communities for Des Moines Water Works Park. A target plant community is a preferred future condition for an area of vegetation given its history, current condition, and intended use. Plant community refers to the vegetation itself, while land cover refers to mappable areas of any kind. A plant community – floodplain forest, for example – can be mapped as a land cover type. A shopping mall can also be mapped as a land cover type, but is not a plant community.

Target plant communities are described below. Each includes a list of key restoration and management tasks. Completing these tasks will improve vegetation structure and animal habitat quality while increasing species diversity and the plant community's resilience to disturbance and environmental change. Positive outcomes to creating high-quality plant communities include the following.

- Visually-pleasing vegetation and environment
- Resistance to and more rapid recover from damage due to disturbance and environmental change
- Lower maintenance costs over the long term
- Greater variety of plants and animals

### **Upland Forest**

Description: Healthy upland forests in the Des Moines region have showy displays of spring wildflowers.

Species: Eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), black walnut (*Juglans nigra*), green ash (*Fraxinus pennsylvanica*), honey locust (*Gleditsia triacanthos*), box-elder (*Acer negundo*), and sometimes bur oak (*Quercus macrocarpa*)

Park Condition: Few, small, and scattered areas on upland soil above the Raccoon River floodplain are considered upland forest. The site quality is moderate due to past logging and grazing. The recent influx of Tartarian honeysuckle (*Lonicera tatarica*) and other introduced plants has reduced the groundcover due to the dense shade.

### **Key Restoration and Management Tasks**

- Maintain a continuous tree canopy

- Remove invasive shrubs in openings and at the edges of the forest
- In old fields, densely plant oaks (swamp white, bur), walnut, gray dogwood, and other trees and shrubs

### **Floodplain Forest**

Description: The river overflows its banks annually, sometimes several times, dropping sediment when the flood recedes.

Species: Similar to upland forest in its trees but lacks oaks; Black willow (*Salix nigra*) is common in wet areas

Park Condition: Most natural vegetation in the park's river floodplain is considered floodplain forest. Regular flooding keeps the shrubs sparse. Groundcover can be dense with wood nettle (*Laportea canadensis*), or sparse due to flooding.

#### Key Restoration and Management Tasks

- Maintain continuous tree canopy
- Remove invasive shrubs from the edges of roads and areas of fill
- Where needed, plant silver maple, hackberry, and other floodplain trees

### **Savanna**

Description: Savannas have clumps of trees or scattered trees in a matrix of grasses, sedges, and wildflowers – forbs. One hundred fifty years ago, savanna was one of the most common plant communities in Iowa, but today it is one of the rarest. To remain vibrant, savannas need frequent fires, grazing, or mowing to prevent trees and shrubs from taking over. In savannas, shrubs typically grow near trees.

Park Condition: The park contains no natural savanna, but regular mowing has created the look of savanna north of the old bridge across the Raccoon River. This will be retained and enhanced.

#### Key Restoration and Management Tasks

- Maintain 50 percent tree canopy cover
- Remove invasive trees, shrubs, and forbs
- Plant native trees, such as oaks, and shrubs

### **Prairie**

Description: Prairies are diverse plant communities of grasses, sedges, and forbs. Prairie evolved with frequent or intense fires and grazing, and had few woody species.

Condition: Prairie does not currently exist in the park, but if planted in open fields could reduce mowing.

#### Key Restoration and Management Tasks

- Remove weeds [perennial rye (*Lolium perenne*), orchard grass (*Dactylis glomerata*), alfalfa (*Medicago sativa*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*)]
- Seed with a diverse mix of native prairie plants that tolerate moist and wet soil
- Manage seeding for three years using mowing and spot-herbicide
- Begin prescribed burning on a three-year cycle

### **Treatment Wetland**

Description: This vegetation filters water, takes up nutrients, and provides leaf surfaces for microbial activity.

Species: Common plants are sedges (e.g., *Carex lacustris*, *C. trichocarpa*), prairie cordgrass (*Spartina pectinata*), arrowhead (*Sagittaria latifolia*), softstem and river bulrush (*Schoenoplectus tabernaemontani*, *S. fluviatilis*), and yellow water lily (*Nuphar lutea*)

Park Condition: This pertains to the treatment wetland in the Event Lawn. Similar areas exist as marshes and shoreline edges.

#### Key Restoration and Management Tasks

- For existing wetlands, avoid disturbing the native vegetation

- Create a variety of water depths in new wetland basins
- Seed or plant with typical wetland plants adapted to sunny conditions
- Remove dominating, invasive plants such as hybrid and narrow-leaved cattail (*Typha x glauca*, *T. angustifolia*), giant reed (*Phragmites australis*) and purple loosestrife (*Lythrum salicaria*)
- Begin prescribed burning on a three-year cycle

**Open Water**

The park’s existing ponds and wetlands with open water support aquatic and emergent plants, including several species listed above. Most of the park’s open water has only low to moderate native plant diversity. The aggressive reed canary grass (*Phalaris arundinacea*), narrow-leaf and hybrid cattail, and giant reed are abundant in places.

**Key Restoration and Management Tasks**

- Create or maintain gently-sloped and densely-vegetated shorelines
- Plant or protect native trees and shrubs
- Provide access such as limestone blocks at water’s edge, and docks, and special habitat features such as turtle logs, nest boxes and platforms, and perches

**Perpetual Stewardship**

After a plant community is restored, generally requiring three to five years, it needs ongoing management to remain in good ecological health, deliver ecosystem services, and respond positively to disturbance and environmental change. The schedule below assumes that the park will use prescribed burning as a restoration and management technique. If not, haying is required to remove plant litter that builds up and alters the plant community’s function and plant life.

Chart Two: Maintenance Regimes

Task Frequency (once every X years)				
Plant Community	Detailed Inspection & Tasks for Next Year	Weed Control (Spot Herbicide)	Seeding & Planting of Disturbed Ground	Prescribed Burning
Upland Forest	1	3-4	3	-
Floodplain Forest	1	2-3	3	-
Savanna	1	2-3	2-3	-
Prairie	1	1-2	3-5	3
Treatment Wetland	1	1-2	3-5	3-4
Open Water	1	-	-	-

Beyond the site’s natural plant communities (listed above), there are a number of landscapes described here as cultural land cover types. These are landscapes heavily impacted and maintained by people. They serve a series of recreational, operational, and cultural uses, but no longer resemble the natural plant community that preceded it.

**Landscaped Area**

The park’s existing landscaped areas are primarily mowed turf grass (Kentucky bluegrass, *Poa pratensis*) with scattered shade trees and ornamental shrubs. Landscaping trees and shrubs include American elm (the blight-resistant Liberty variety of *Ulmus americana*), river birch (*Betula nigra*), Kentucky coffee-tree (*Gymnocladus dioica*), Eastern redbud (*Cercis canadensis*), and blue spruce (*Picea pungens*). Many ornamental crabapples (*Malus* spp) and hawthorns (*Crataegus* spp) are planted in the Arboretum.

**Developed**

The park's existing developed areas are primarily buildings and parking areas surrounded by landscaped areas. The park's developed areas will remain developed.

### Lime Basin

The lime basin, north of the Raccoon River near the Water Works facility, is used to dispose of lime, a byproduct generated by the nitrogen-filtering process. Vegetation in this area is mostly floodplain forest trees and shrubs, reed canary-grass, and giant reed. Water Works will continue to use this area for lime disposal and no active restoration is proposed.

### Invasive Species

The design team recommends avoiding use of invasive ornamentals in the park. The following is a list of some invasive species. It is illegal to plant any species cataloged as noxious in state or federal listings. Contact the County Weed Inspector or visit <http://plants.usda.gov/java/noxious?rptType=State&statefips=19> or <http://plants.usda.gov/java/noxious?rptType=Federal>.

Chart Three: Invasive Species to Avoid

TREES AND SHRUBS	
Common Name	Scientific Name
Amur Maple	<i>Acer ginnala</i>
Norway Maple	<i>Acer platanoides</i>
Barberry	<i>Berberis thunbergii</i> and related species
Siberian Peashrub	<i>Caragana arborescens</i>
Russian Olive	<i>Eleagnus angustifolia</i>
Bittersweet	<i>Euonymus</i> spp or <i>Celastrus</i> spp, except <i>E. atropurpurea</i> and <i>C. scandens</i>
Non-native Honeysuckles	<i>Lonicera tatarica</i> , <i>L. x bella</i> , <i>L. morrowii</i> , <i>L. xylosteum</i>
White or European Poplar	<i>Populus alba</i>
Common, Glossy Buckthorn	<i>Rhamnus cathartica</i> , <i>R. frangula</i>
Black Locust	<i>Robinia pseudo-acacia</i>
Multiflora Rose	<i>Rosa multiflora</i>
Siberian Elm	<i>Ulmus pumila</i>
HERBACEOUS PLANTS	
Common Name	Scientific Name
Smooth Brome	<i>Bromus inermis</i>
Flowering Rush	<i>Butomus umbellatus</i>
Crown Vetch	<i>Coronilla varia</i>
Queen Anne's Lace	<i>Daucus carota</i>
Leafy Spurge	<i>Euphorbia esula</i>
Common St. John's Wort	<i>Hypericum perforatum</i>
Yellow Water Iris	<i>Iris pseudacorus</i>
Bird's-foot Trefoil	<i>Lotus corniculatus</i>

Purple Loosestrife	<i>Lythrum salicaria</i>
White, Yellow Sweet Clover	<i>Melilotus alba, M. officinalis</i>
Silver or Banner Grass	<i>Miscanthus</i> species
Reed Canary Grass	<i>Phalaris arundinacea</i>
Giant Reed Grass	<i>Phragmites australis</i>
Japanese Knotweed	<i>Polygonum cuspidatum</i>
Ornamental water lilies	Various species
Mullein	<i>Verbascum Thapsus</i>
Cow, Hairy Vetch	<i>Vicia cracca, V. villosa</i>

### Recommended Species

There are hundreds of beautiful native trees, shrubs, wildflowers, and grasses that can create aesthetically pleasing landscapes that grow easily without a great deal of maintenance. Some recommended native trees and shrubs, and innocuous non-native trees and shrubs, are documented below. These native woody plants are indigenous to Des Moines and the surrounding ecological region. They are adapted to local conditions of soils, climate, diseases, and competition. While some of these species may not have existed historically at Water Works Park, they are suitable for landscape plantings with the goal of visual screening, ecological buffering, and wildlife habitat enhancement.

Certain species are recommended because they have a high wildlife value as food (oak, serviceberry, aspen) or as nesting sites (conifers). These and other species are also attractive or have natural history interest because they are used by people or have interesting physical properties.

As a precaution, wild genetic stock within a 200-mile radius of the project area is preferred over cultivars and more distant genetic strains. Some research suggests wild strains benefit wildlife to a greater extent than cultivated strains of the same species. Some research also suggests that local genetic strains of certain species are better able to survive local soil, climate, disease, and competitive conditions than more distant genetic strains. Additionally, note that a few species are not indigenous to the area but are innocuous in landscape plantings, and fulfill particular landscape design needs.

Chart Four: Native Woody Plant Recommendations for Native Landscaping

NATIVE CANOPY TREES	
Common Name	Scientific Name
Black Maple	<i>Acer nigrum</i>
Red Maple	<i>Acer rubrum</i>
Sugar Maple	<i>Acer saccharum</i>
River Birch	<i>Betula nigra</i>
Hackberry	<i>Celtis occidentalis</i>
Kentucky Coffeetree	<i>Gymnocladus dioica</i>
Black Walnut	<i>Juglans nigra</i>

Eastern Red Cedar	<i>Juniperus virginiana</i>
White Spruce	<i>Picea glauca</i>
Eastern White Pine	<i>Pinus strobus</i>
Big-toothed Aspen	<i>Populus grandidentata</i>
Quaking Aspen	<i>Populus tremuloides</i>
Black Cherry	<i>Prunus serotina</i>
Swamp White Oak	<i>Quercus bicolor</i>
Northern Pin Oak	<i>Quercus ellipsoidalis (coccinea)</i>
Bur Oak	<i>Quercus macrocarpa</i>
Red Oak	<i>Quercus rubra</i>
Eastern White Cedar	<i>Thuja occidentalis</i>
Basswood	<i>Tilia Americana</i>
<b>NATIVE TREES AND SHRUBS OF THE UNDERSTORY</b>	
<b>Common Name</b>	<b>Scientific Name</b>
<b>Short Trees</b>	
Smooth Serviceberry	<i>Amelanchier laevis</i>
Fireberry Hawthorn	<i>Crataegus chrysoarpa</i>
Large-thorned Hawthorn	<i>Crataegus macroantha</i>
Ironwood	<i>Ostrya virginiana</i>
<b>Shrubs</b>	
Low Serviceberry	<i>Amelanchier humilis</i>
Black Chokeberry	<i>Aronia melanocarpa</i>
Pagoda Dogwood	<i>Cornus alternifolia</i>
Gray Dogwood	<i>Cornus racemosa</i>
Red-twig Dogwood	<i>Cornus sericea</i>
American Hazelnut	<i>Corylus Americana</i>
Bush Honeysuckle	<i>Diervilla lonicera</i>
Witch Hazel	<i>Hamamelis virginiana</i>
Winterberry	<i>Ilex verticillata</i>
Ninebark	<i>Physocarpus opulifolius</i>
Wild Plum	<i>Prunus Americana</i>
Chokecherry	<i>Prunus virginiana</i>
Smooth Sumac	<i>Rhus glabra</i>
Smooth Rose	<i>Rosa blanda</i>
Prairie Willow	<i>Salix humilis</i>

Red Alder	<i>Sambucus pubens</i>
Southern Arrowroot	<i>Viburnum dentatum</i>
Nannyberry	<i>Viburnum lentago</i>
Highbush Cranberry	<i>Viburnum opulus var. americanum (trilobum)</i>
<b>Vines</b>	
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Riverbank Grape	<i>Vitis riparia</i>

#### **System 4: Circulation**

Park circulation is functional today, but many participants throughout the process spoke of the importance of a connected circulation network as key to success. Changes to the circulation system are to meet a series of goals. First, key circulation improvements, such as park gateways, will help make Water Works Park more visible and welcoming. Second, trail improvements can help elevate Water Works Park’s stature as a significant mobility hub in the city. Lastly, roadway improvements can provide continuity of the park’s future feature, the Circuit, and help to make circulating through Water Works more safe and enjoyable.

#### **Park Entrances**

Currently, vehicular traffic is prohibited north of the river, with access points to the north sections of the park largely confined to the trails hub parking access at Ashworth Pool in Greenwood Park, to partially limited access via the mountain biking network at the northwest corner of the park, and to largely limited pedestrian or equestrian traffic near 31st Street. Vehicular traffic from the south enters via park roads and the parallel George Flagg Parkway running between Fleur Drive and Park Avenue. With mention of the George Flagg Parkway and the parallel park roads, we note the potential redundancy of these park and public road systems. In the southeast quadrant of the park, the trails system also covers territory similar to these roads.

Vehicular-scaled signage, specific gateway names, and other beautification (planting, lighting, and pedestrian amenity) will improve park entrances at each of these existing locations. Changes to the roadway system enable a series of new iconic gateways located along George Flagg Parkway. These could serve as significant new identity moments and points of arrival. Throughout the park, a contemporary and uniform system of signage and wayfinding (regulatory, identity, and interpretive) should be planned, designed, and implemented.

#### **Trail Systems**

Four multiuse paved trails also nearly converge at the park. The Walnut Creek Trail enters from the northwest and Bill Riley Trail enters directly from the north (via Greenwood Park), with both trails converging and heading east to Meredith Trail and Gray’s Lake. At the same time, the Great Western Trail, linked by park road, heads south out of the park and ends at Martensdale, Iowa, in Warren County. Polk County Conservation maintains this trail as it enters Water Works Park from Park Avenue to the south.

The master plan proposes routing the Great Western Trail to the north and east from its southern entry point and linking it to the trails network in the vicinity of the proposed celebratory, historic, and functional trailhead at the revamped bridge location. Additionally, this master plan recommends exploring fixes for trail low points that flood frequently and addressing the well-known trouble spot as the paved trail crosses under the railroad bridge northwest of the river bridge.

### **Road System**

While the park road network currently allows access to many parts of the park, it can create conflicts with bicycles and pedestrians. Further, with the introduction of the Circuit – a water trail that roughly follows the park road – new challenges of vertical circulation and separation require consideration. For example, near the intersection of George Flagg Parkway and 31st Street – where the river, the park road, the Circuit and the parkway converge – not enough space exists to accommodate all four lanes.

The master plan proposes to minimize road redundancy and provide room for the braided circuit by shifting George Flagg Parkway in the southeast quadrant of the park to connect directly to Bell Avenue to the east. This change also separates operations and park traffic and enables minimal vehicular Circuit crossings. Service access throughout the park, and the occasional vehicular-only event, can be accommodated using the park's extensive multiuse trail system. This concept will require additional, focused public engagement with affected landowners.

### **Path System**

The park also hosts a number of relatively single-use trail systems. A network of mountain bike trails occupies the northwest corner of Water Works Park. Access to these trails is limited and outside the boundaries of the park. A series of equestrian trails parallel the paved trails at many points and also take riders into the park's woodlands – but in the park all equestrian trails have been limited to the north side of the Raccoon River. Similarly, a series of nature/hiking trails traverse the park, but with little to no accompanying signage and limited public awareness.

In partnership with birders and equestrians, this plan proposes to provide some limited additional trails and/or improved nature trail routes, developed in a manner that does not interfere with current wilderness experiences.

## **CHAPTER 4 – MASTER PLAN: IMPLEMENTATION**

This chapter summarizes the master plan recommendations for potential implementable projects. Where the previous chapter creates a framework for everyday decision-making based on overall park systems, this chapter tackles a few specific design opportunities that could result from major capital fundraising campaigns. Program elements, benefits, phasing considerations, conceptual costs, and potential partners are included for each of the three catalyst projects.

### **East Activity Node**

The master plan proposes an enhanced public activity node at the eastern end of Water Works Park. Program in this area will attract the community and provide complementary uses to the existing offerings at nearby Gray's Lake. New connections will provide strong and direct access between these two parks. Activities will include a great lawn for a variety of active and passive recreational uses, multiple children's play zones, seating, concessions, equipment rental, and access to the proposed Circuit landscape for fun recreational water activities. Shaded parking is provided in key locations to allow for accessible and easy entry.

### **Park Entrance and Circulation**

Despite serving as the primary entrance to Water Works Park for the great majority of visitors, the park entrance at Fleur Drive is challenged by many competing factors. Some of these include the significant scale of Fleur Drive (six lanes in places), the lack of visibility (views to Gray's Lake are relatively open compared to the dense, low planting of the Arboretum), a lack of planting consistency along Fleur Drive (higher cottonwoods grace the banks along Gray's Lake with a mix of evergreens and crabapples along Water Works) and landscape elements with an understated aesthetic (the split wood character of the Arboretum's signage and fencing). Additionally, once entering the park, visitors lack the wayfinding and signage to differentiate park uses from Water Works operational infrastructure. Parking similarly lacks structure or clarity.

Improvements to the arrival sequence at this important node focus on creating a more cohesive landscape treatment, clarifying circulation systems, and improving orientation to park destinations. The master plan recommends the following.

- Develop a planting, fencing, and grading approach to the edge of Fleur Drive that complements the Gray's Lake edge and promotes visibility into Water Works
- Improve the gateway experience by enlarging the opening, integrating new signage that announces Water Works, improving plantings, introducing special lighting elements, and integrating higher quality wall and paving materials
- Minimize the number of decision points on the entrance drive by eliminating the central service drive and creating better signage at key locations
- Integrate a new portage to the Raccoon River at the end of the entrance drive
- Concentrate new screening planting along the northwest edge of the Arboretum, helping to screen necessary Water Works operational material stockpiles

### **Arie den Boer Arboretum**

Established in 1930, the Arie den Boer Arboretum is one of the world's largest collections of flowering crabapple trees. Named for collector and horticulturist Arie den Boer, the collection holds over 300 species. Water Works staff has cared for the trees over the years, growing the collection through a popular memorial tree planting program. Today, the Arboretum faces challenges from overcrowding in places as well as an unclear scientific mission. Where the Arboretum once was a curated collection of diverse species of scientific value, today the Arboretum is maintained more as a garden – for ornamental and cultural purposes. Further, the Arboretum is susceptible to frequent flooding, which compromises tree health and burdens the Water Works staff members who maintain the Arboretum's signature water feature.

These challenges also present opportunities to clarify and strengthen the purpose of the Arboretum while also improving some of the park's visibility and identity issues. To this end, the master plan recommends the following.

- Consult with an independent arborist to document the existing condition of the trees, including their ecological, aesthetic, and scientific value, overall health, and likelihood of surviving transplantation
- Using the arborist's findings, create a map that prioritizes trees to be preserved, transplanted, or removed; this map can serve as a guide for decision-making related to gateway and visibility improvements
- Replace memorial tree program with a park-wide ecological restoration memorial program; this could include options for the use of the memorial donations (woodland, savannah, wetland, and prairie restoration) with shared recognition spaces (donor walls or plazas) in each landscape
- Consider removal of the Denman Fountain, replacing it with a more flood-resilient landscape treatment (preserving the garden context) and reinterpreting the memorial narrative near the new Circuit hub
- Remove the old rail bed alignment

### **Connections to Gray's Lake**

Fleur Drive provides one of the most frequented and significant north-south transportation corridors in the Metro area. With the popularity of Gray's Lake, pedestrian activity along and in the vicinity of Fleur Drive continues to grow along with interest in additional pedestrian and trail facilities and connections. Currently, the most direct pedestrian access between Gray's Lake and Water Works Park occurs at Fleur Drive. Other access points for walkers and bikers are along trails. The public consistently expressed interest in a seamless pedestrian connection between Water Works Park and Gray's Lake. The design team presented three options for evaluation.

The design team evaluated two potential alternatives to provide access from Water Works Park to Gray's Lake – an overpass called the Oxbow and an underpass called the Portal. These options were vetted with a number of stakeholders and various agencies, taking into consideration aesthetics, experience, durability, feasibility, and cost. Both were found to have merits and challenges. The master plan preferred direction is the underpass option. The overpass can be explored in the future for its iconic value. The underpass concept design should be developed, including real survey information, an engaged discussion with governing jurisdictional entities, and further public outreach. It is important to note the Connectivity Subcommittee expressed a preference for the underpass option as a first phase to connect the two parks. For future further studies, the underpass concept design should pursue the following design principles.

- Limit the impact to Gray's Lake
- Maintain panoramic views from Fleur Drive to Gray's Lake
- Connect Gray's Lake nodes (north and south) to the Water Works Circuit hub in a pedestrian friendly way
- Create a safe, convenient, and attractive entry portal to Water Works Park
- Improve connectivity and functionality of special events in a seamless way between Gray's Lake and Water Works Park
- Remove conflict points along Fleur Drive
- Improve and expand events or pre/post events

### **The Great Lawn (the Big Green)**

A great mown lawn space exists between the Arboretum and the East Ponds. It is framed by large canopy trees and elevated prospects at the roadway and levee edges. The lawn has potential to become a much more active contributor to this Eastern Activity Node as a flexible multiuse space capable of hosting active recreation, festivals, youth activities, and event overflow for Gray's Lake. This would require modest enhancements.

- Maintain the open flexibility of the lawn space
- Integrate viewing and seating spaces along the western and southern edge – potentially by using topographic change for terracing and integrating seating
- Grade the lawn and reinforce it to encourage durability, usefulness, and positive drainage
- Provide a clear accessible path to the Gray's Lake connection and the Arboretum

## **The Circuit Hub**

The master planning process included a strong cry for more fixed amenities and concession, and the resulting programming overlay places those elements at the East Activity Node. The master plan recommends a new node of clustered amenities at the key southern location, between the East Ponds, the levee, the Water Works Administration building, its maintenance barns, and the Great Lawn. This would become the primary hub of Water Works Park. Improvements could include the following.

- Repurpose the maintenance facilities for active park uses
- Dredge the east ponds and reconfigure walkways to enable natural water-cleansing function and greater recreational use
- Create access to the ponds (a dock or pier) that enables the beginning of the Circuit experience
- Integrate concessions (food, coffee, restrooms), perhaps with temporary and mobile vendor locations that become more permanent with time
- Create an elevated urban terrace along the pond's eastern edge with seating and views
- Integrate a rental location or facility to provide watercraft such as kayaks and paddleboards
- Introduce meadow and low-mow grasses to minimize maintenance outside of the Great Lawn
- Create a series of educational, adventure-based play spaces for various ages structured on water-based ideas and themes
- Integrate a significant new shaded parking lot with convenient access to the hub

## **Phasing Considerations**

- Permitting associated with grading, wetland impacts, and interaction with the levee and roadways
- Potential to dovetail and leverage funding with upcoming Water Works East Pond improvements as a match

## **Conceptual Cost Range**

East Activity Node Base Park Improvements: \$9-10 million

Additional Special Features

- Concession Building: \$2-2.2 million
- Overpass or Underpass: \$2.6-2.9 million
- Educational Playgrounds: \$900,000-1 million
- Levee Amphitheater: \$500,000-600,000

## **Potential Partners**

- City of Des Moines
- City Parks Department
- Recreation and Athletic Leagues
- Conservation/Education Partners
- Central Iowa Trails
- Metropolitan Planning Organization
- Polk County Conservation Board
- Convention and Visitors Bureau
- Raccoon River Watershed Agencies
- Greenbelt Committee
- Central Iowa Paddlers Iowa Department of Transportation
- Iowa Department of Natural Resources
- Iowa Department of Tourism
- US Army Corps of Engineers
- National Endowment for the Arts
- Arts/Theater Partners
- US Fish and Wildlife Service
- Des Moines Water Works
- Private Sector (naming rights)

## **West Activity Node**

The master plan proposes a more robust event framework at the western end of Water Works Park. Program in this area will take advantage of the site's scale and flexibility and, consistent with the park program diagram, could largely be temporary in nature. New connections will provide strong and direct access between the Circuit's west end and the Raccoon River. Roadway systems will provide access to all West Activity Node destinations, but will be removed in key locations to allow for Circuit continuity. Structured parking will allow for overflow. The elements of the node include an improved event lawn, a new aerial adventure course, a celebratory new wetland system, and strategic circulation improvements.

### **Event Lawn**

The proposed event lawn landscape combines the Steering Committee and community's favorite schemes, Two Spaces and the Moat, into one preferred option. The preferred event lawn option has a fixed stage in the middle of two mown fields, providing a flexible and dynamic space for the Des Moines community. The two mown fields—one large and one small—provide space for different size events. Other improvements include the following.

- Integrate a public path from the parking to a new boat launch and dock cantilevered over Basin 17
- Create parking in strategic locations within the canopy trees and separated from the gathering space by the treatment wetland
- Allow for overflow parking in clearings along the edge of the roadway
- Create service access to the event space via a break in the treatment wetland; this could be paved or created using grass pavers or another reinforcement technique

### **Water System**

As the upstream side of the proposed Circuit feature, the West Activity Node has a significant role to play in the creation of the Circuit feature. It is here water will be captured from the Raccoon River and directed into Basin 17 to begin the Circuit flow. To allow human interaction with this water, a sediment bay and a treatment train are necessary to help clean the water before it enters into the Circuit. This new wetland feature can provide multiple benefits beyond water cleaning. These include acting as a security buffer or moat by limiting event lawn access to specific points of entry, providing an educational opportunity for park visitors to learn about treatment wetlands, and helping to scale down the massive size of the existing event lawn. The elements of this system include the following.

- Pump river water into the beginning of the treatment train
- Create a sediment forebay to allow for the deposition of sediments
- Dredge a water course and restore edges with appropriate wetland species with biofiltration capacity

### **Aerial Adventure Course**

Given the shortage of maintenance and operations staff for the size of Water Works Park, the master planning process included conversations about how to introduce program through third-party vendors. At the same time, the programming overlay suggests the potential for more adventure-based programming in the sensitive and remote areas of the park. A third-party-led adventure course, including ziplines, ropes courses, and/or climbing walls, could be an excellent demonstration of these principles. One such vendor toured the site during the process and identified a key location, just west of the Event Lawn. Key considerations include the following.

- Engage a vendor with the capacity to deliver a sustainable product, including promoting tree health, building with an eye toward flood resilience, minimizing soil compaction, and providing education integration
- Allow for the public to participate and view activity for free
- Develop a lease/cost model that benefits the Water Works Park maintenance and operations budget
- Create the necessary parking to incent this development

## **Circulation**

Today, there are two large vehicular loops at the west end, each circling a large lawn/meadow space. Bicycle access is along roadways. Parking happens along roadway verges in a relatively unstructured way. Circulation at the west end of the park is reasonably functional today. Changes to circulation are to support new park programming and to extend existing systems.

- Remove sections of roadway that will conflict with the future Circuit, enabling a system of circulation around the Event Lawn that terminates in a turnaround
- Use the turnaround as a new portage and limited parking location for connectivity between the river and the Circuit
- Convert abandoned roadway sections into multiuse trails
- Extend existing bicycle trails to connect to other regional trail systems
- Allow for overflow parking in clearings along the edge of the roadway
- Create service access to the event space via a break in the treatment wetland; this could be paved or created using grass pavers or another reinforcement technique

## **Phasing Considerations**

- Permitting associated with grading, wetland impacts, and interaction with the levee and roadways
- Potential for a quick win with Aerial Adventure Course third-party vendor

## **Conceptual Cost Range**

West Activity Node Base Park Improvements: \$8-9 million

Additional Special Features

- Fixed Stage: \$1-1.5 million
- Circuit Dock: \$1-1.5 million
- Educational Playgrounds: \$900,000-1 million
- Levee Amphitheater: \$500,000-600,000

## **Potential Partners**

- City of Des Moines
- City Parks Department
- Recreation and Athletic Leagues
- Conservation/Education Partners
- Central Iowa Trails
- Metropolitan Planning Organization
- Polk County Conservation Board
- Convention and Visitors Bureau
- Raccoon River Watershed Agencies
- Greenbelt Committee
- Central Iowa Paddlers
- Iowa Department of Transportation
- Iowa Department of Natural Resources
- Iowa Department of Tourism
- US Army Corps of Engineers
- National Endowment for the Arts
- Arts/Theater Partners
- US Fish and Wildlife Service
- Des Moines Water Works
- Private Sector (naming rights)

- Suburban Community Partners
- County Conservation Boards
- K-12 and Higher Education Ecology Programs
- Tree NGO

### **The Circuit**

Along with increasing the production of clean drinking water, the Circuit will create a new, dynamic recreational amenity for the citizens of the region. The Circuit is divided into four different experiential zones: the Treatment Train, the Braided Forest, The Raceway, and the East Ponds. The East Ponds and the Treatment Train improvements were discussed previously in the East and West Activity Nodes, respectively. Each of these landscapes will provide a unique experience for the users. Additionally, as the water moves through the Circuit, pollutants are cleaned and removed from the water. The following described features in the central section of the Circuit.

### **Braided Forest**

The second phase of the Circuit is the Braided Forest. The community preferred the braided design option for its potential to provide variety of spaces and an intimate experience, in contrast to the fast-moving Raccoon River or the large open Gray's Lake. This central experience of the braided stream falls within a dense floodplain forest. Suggested improvements include the following.

- Carve a series of narrow channels through this forested landscape, taking care to design the channels to promote access and minimize special maintenance equipment
- Integrate places for rest along the channels, including docks, seating, and interpretive moments
- Plant the edges of the channel with wetland species capable of providing biofiltration benefits
- Create a new bicycle hub at the intersection of the pedestrian bridge and the new multiuse trail
- Extend the pedestrian bridge to span the multiuse trail and the Circuit
- Create a new park entrance and parking lot on axis with the pedestrian bridge and within the forest

### **The Raceway**

The third phase of the Circuit is the Raceway. This experience is created at an existing pinch-point, where the river, the gallery, the existing park road, and George Flagg Parkway come together in a limited area. This shortage of space drives the design expression, with the Circuit tightened into an urban, canal-like form. Suggested improvements include the following.

- Remove sections of George Flagg Parkway and the park roadway to create space for the Raceway alignment
- Realign George Flagg Parkway to direct traffic into the existing Bell Avenue corridor
- Integrate places for rest along the Raceway, including docks, seating, and interpretive moments
- Restore the eroded banks of the Raccoon River via sustainable bank stabilization methods (willow terracing)

### **The Gallery Walk**

The Gallery Walk is a new multiuse trail that traces Water Work's unique water harvesting feature called the gallery. Buried 20 feet below ground, the gallery pipe is invisible to the public. The Gallery Walk creates an experience of the pipe at the ground level. In many areas, it is repurposed from large sections of the existing park road to be abandoned in the future. The Gallery Walk includes improvements, including the following.

- Integrate educational signage, art, and interpretive elements
- Repurpose the roadway, where applicable, into a new multiuse pathway
- Include pedestrian and bicycle friendly amenities, such as seating, lighting, and trash receptacles

## **Phasing**

- Required partnership and consensus with city and regional transportation agencies for roadway relocations and improvements
- Permitting associated with grading, wetland impacts, and interaction with the levee and roadways
- Potential to collaborate with the city on the bridge improvements, slated for replacement within the next five years
- Please note, for watercraft recreation, consult local experts to obtain information on safe boating conditions

## **Conceptual Cost Range**

The Circuit Base Park Improvements: \$5-6 million

Additional Special Features

- New Bridge: \$3.2-3.6 million

## **Potential Partners**

- Conservation/Education Partners
- Central Iowa Trails
- Metropolitan Planning Organization
- Polk County Conservation Board
- Convention and Visitors Bureau
- Raccoon River Watershed Agencies
- Greenbelt Committee
- Central Iowa Paddlers
- Iowa Department of Transportation
- Iowa Department of Natural Resources
- Iowa Department of Tourism
- Des Moines Water Works
- Private Sector (naming rights)

## **The Water Works Foundation**

An eye toward long-term sustainability includes understanding that improvements to Water Works Park are consistent with the mission of park ownership, but also that the park can be operated and maintained over time. Throughout the master planning process, the discussion of park maintenance and operations was central. To address this key aspect of implementation, the Steering Committee spearheaded a discussion about potential organizational management opportunities moving forward.

Within this discussion, Board of Trustees Chairman, Graham Gillette, stated "the Des Moines Water Works must meet its vital mission of producing clean, affordable water. No matter how excited we may be about the recreational, educational, and other uses of the park, as board members we felt it would be inappropriate to divert utility customers' money and resources to park revitalization."

To this end, Des Moines Water Works is working to create a not-for-profit foundation to manage development of Water Works Park. Water Works will still own the land, but transformation of the park to a destination spot will be managed by the foundation. The new foundation will be led by Steering Committee members and other key emerging professionals within the greater Des Moines community.

The master plan report and executive summary are designed to provide the newly formed foundation with recommendations to help guide future park decisions. Emphasis should be given to the continued engagement of the Steering Committee and Technical Committee on foundation development and park consideration.