

# McDermott Park Redevelopment

Fond Du Lac, WI

Author

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A SENIOR CAPSTONE PROPOSAL

Submitted in partial fulfillment of the requirements for the degree  
Bachelor of Science in Landscape Architecture

Department of **Landscape Architecture**  
College of Agricultural and Life Sciences

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A special thanks goes to Nancy Sondergard for being a wonderful and supportive client and always giving me great advice.

I would also like to thank the University of Wisconsin-Madison Landscape Architecture Department. The knowledge of the profession that I have gained along with the individuals I have had the opportunity to get to know have encouraged me to look at the world in a different light. They have also inspired me to teach others about the profession.

Finally, I'd like to give a big thanks to:

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## ABSTRACT

McDermott Park is the largest park in the northeast region of Fond du Lac, WI with 14.7 acres. With the most recent unsuccessful plan to redevelop the park into an athletic field complex, it remains a public park with few amenities for the community. Being located in a floodplain, there has been little development within the park to ensure the risk of flooding remains as it currently is. However, the park's large open spaces provide opportunities for recreation, education, and community-held events.

This project seeks to redevelop McDermott Park as a public park with more amenities to increase and encourage the community's use of the park throughout the year. This will be achieved by analyzing the region, community, and site to better understand the impact of the park's relationship to such areas. With the influence of these analyses, a design proposal will be produced. This project will explore approaches to educate and encourage the improvement of the environmental and public health of the community.

Figure 1.00 - Fond Du Lac Lighthouse



Figure 1.01

## THE AUTHOR

Xue is pursuing a degree in Landscape Architecture. She enjoys cooking, traveling, photography, and playing soccer and tennis. She also has a wide range of interests within landscape architecture including stormwater management, urban agriculture, and streetscape designs. One of her main goals is to become a licensed professional working at a firm with an international scope.

Xue Xiong  
Department of Landscape Architecture

May 2016



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# INTRODUCTION

To fulfill the requirements of the Senior Capstone Program in the Department of Landscape Architecture at the University of Wisconsin-Madison I will investigate how ideas of public health may inform the design of an urban park redevelopment. This investigation will be given context and focus by the concerns and goals of Friends of McDermott Park, which include public participation. McDermott Park of Fond Du Lac, Wisconsin will be the site for this study.

## RESEARCH TOPIC: PUBLIC HEALTH

The topic of public health will be explored to understand how landscapes can promote and provide resources to encourage awareness and benefit the health and well-being of its users and the surrounding community. One of the main factors affecting the health and well-being of a person is the physical environment they are in. Cecily Maller, Mardie Townsend, Anita Pryor, Peter Brown, and Lawrence St Leger's research concludes that nature is a vital role in human health and well-being and is accessible by parks and nature reserves. Landscapes that promote daily exercise and provide clean natural resources give way to opportunities for learning and development to help overcome health inequalities that can also heal physical and mental health conditions.

## TYPE OF PROJECT: URBAN PARK DESIGN

McDermott Park, as one of the three district parks of Fond du Lac, has become an underutilized park over the past years. There have been unsuccessful attempts to redevelop this park to a water treatment center as well as an athletic field complex. Redeveloping McDermott Park as an urban park will continue to serve and benefit the entire community for the current and future generations. Integrating a variety of outdoor rooms and activities throughout the park will allow users of all ages to observe, engage, and enjoy it throughout the year.

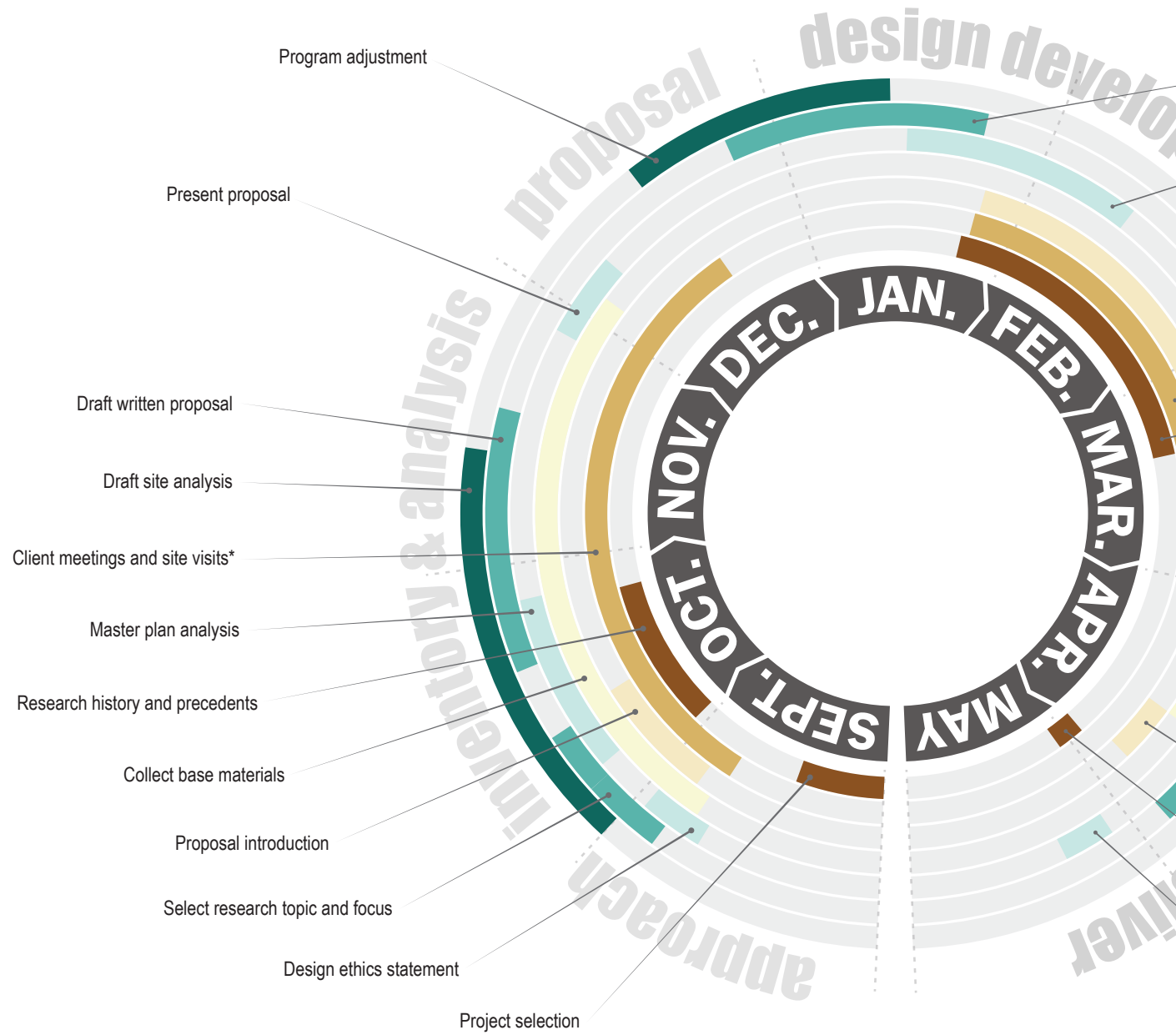


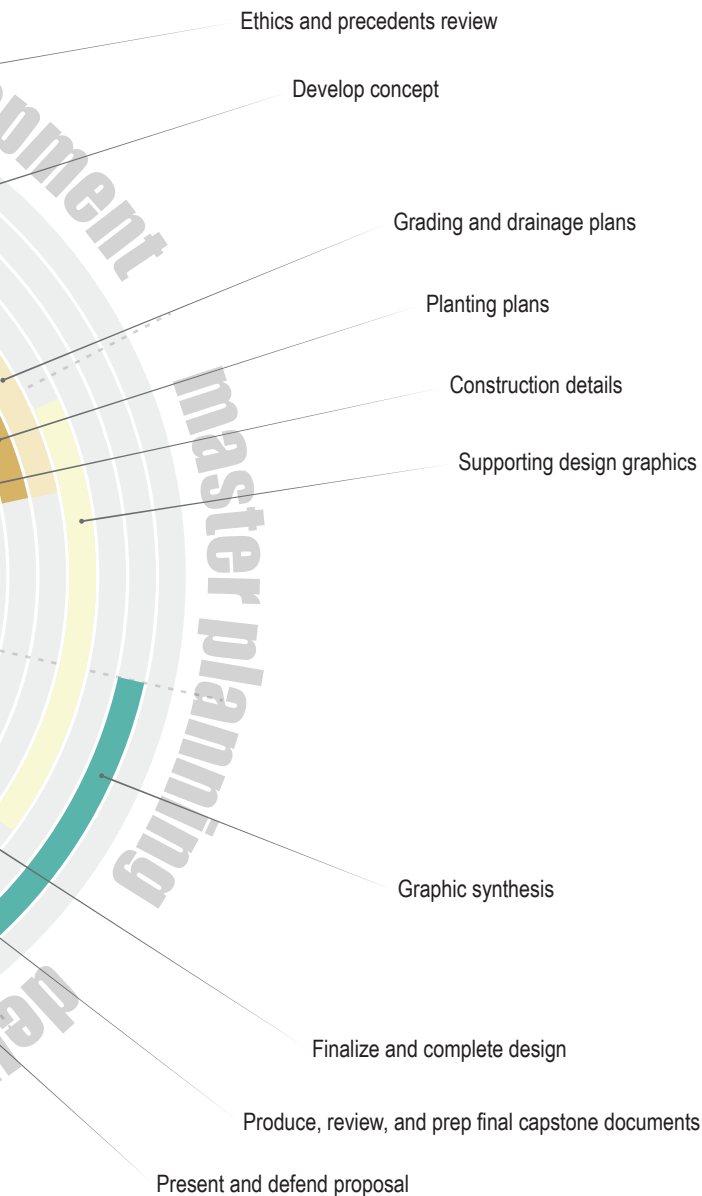
Figure 1.02 - Softball Diamond

## PROFESSIONAL FOCUS: PUBLIC PARTICIPATION

Public participation will promote awareness and influence the design of the park. It will also create a stronger sense of community and connection through the encouragement and practice of stewardship to create and maintain this public space. Meetings with the client and surveys are the main types of communication that will be used to gain a better understanding of the community's concerns and goals for the site. This mutual relationship will create a strong and feasible redevelopment plan for the site.

The products of this capstone will include a set of design documents and recommendations for McDermott Park, which will be submitted to Friends of McDermott Park, and a capstone document, which will be submitted to the Department of Landscape Architecture in partial fulfillment of the degree of Bachelor of Science in Landscape Architecture.





## **\*CLIENT MEETINGS & SITE VISITS:**

### **[09.24.15] Client**

- Introduction
- Site overview
- Goals

### **[10.01.15] Client & Parks & Rec Department**

- Site overview
- Site questions/ concerns
- Site analysis

Figure 1.03 - Workflow Diagram

## **PROJECT WORKFLOW**

This workflow diagram illustrates a general timeline in completing the entire year of the capstone project.

The first semester consists of mainly research and analysis of the site. Some steps span over a longer period of time than others as they may require more research. These steps require more feedback from the clients, peers, and instructors. Feedback is very important in all of these steps as it is continuously considered and integrated to complete capstone.

The second semester is the design portion where plans, renderings, and supporting graphics will be produced to convey a solution. Feedback is critical throughout this period as well.

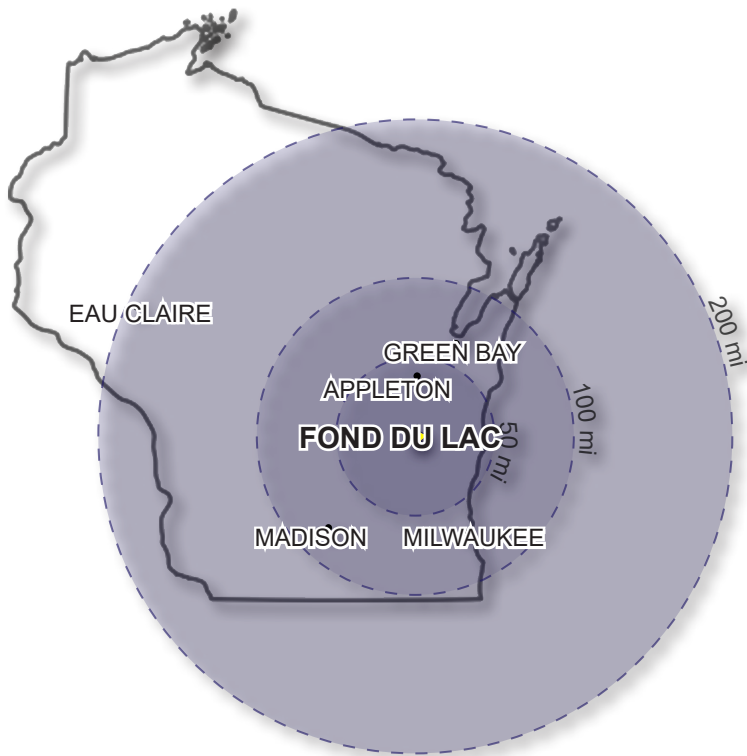


Figure 1.04 - Wisconsin Cities Relationship

## CONTEXT AND BACKGROUND

McDermott Park is located in Fond du Lac, Wisconsin. Fond du Lac is an 1.5 hour drive from Madison, 1 hour drive from Milwaukee and Green Bay, WI, 45 minute drive from Appleton, and about a 3.5 hour drive from Eau Claire, WI.

In the early 19th century, Fond du Lac County was part of the Winnebago Indian nation. By the 1840's with the resource of water as a mode of transportation, villages were established along Lake Winnebago. Water was more than just a mode of transportation; it was a source of power which established more villages in the Fond du Lac county along the Fox River.

The city of Fond du Lac rapidly grew in the mid 1840's as Yankees arrived to rebuild homes, farms, and similar communities of those back in New England, New York, and Pennsylvania. By 1870, it became the second largest city in the state with great numbers of German, Dutch, Irish, Welsh, and Scottish immigrants settling there. It had a major railroad hub and specialized in wheat production.

Today, with a population of over 43,021 people (2010 Census), it is made up mainly of single-family residential districts and industrial districts along the southwest region. It is home to 3 colleges and one hospital which serves the greater Fond du Lac area. Fond du Lac has become a great attraction for outdoor enthusiasts, local and broad, as it is located at the southern tip of Wisconsin's largest inland lake: Lake Winnebago. It is also home to the world headquarters of Mercury Marine, a producer of outboard motors.

## HISTORY

McDermott Park was given as a gift to the city of Fond du Lac from a real estate agent, William McDermott, in 1922. With the purpose of the park to serve the city and its residents, it has remained a park ever since. It was the largest park in the northeast region of the city. As the city grew outward from the Fond du Lac River and Lake Winnebago, the surrounding area became mainly residential homes.

In 2005, the city found too much radium within their water and proposed a \$32 million remediation plan. This plan consisted of a water treatment plant to be constructed in the Park. Because of the utilities running alongside of McDermott Park and the Winnebago Lutheran Academy Highschool, the academy went forward to ask for a 31- year lease to take on this easement of an acre of the land and was granted that lease. A meeting with the community a week later had put an end to the proposal and McDermott park remained along with the lease.

Three years later, the city was hit with a flood from the Rock River. With DeNeveu Creek along the western edge of the park, water rose and flowed out into the floodplain, saving neighbors across the creek much damage.





In 2015, WLA decided to renew their lease from 2005 and extend the amount of 1 acre into 75% of the park to develop an athletic field complex that would hold 2 ball diamonds and a soccer field. In addition to the complex, a parking lot

would be installed south of the tennis courts. A few months later, WLA decided not to go through with their plan because of the fact that the park was located in a floodplain.





Figure 1.06 - Park Bench

## PROJECT GOALS AND CONCERNS

### STAKEHOLDERS:

The primary stakeholders invested in this project are the members of Friends of McDermott Park and ParkWatch. The main stakeholder is:

Nancy Sondergard  
*Friends of McDermott Park*

### VISION:

The stated vision of the Friends of McDermott Park is to

"Maintain full-time, year round, public access to McDermott Park in its entirety for the enjoyment, enrichment and long-term sustainable use of all citizens and future generations."

### MISSION:

The stated mission of the Friends of McDermott Park is to

"Initiate a sustainable and effective process to ensure any/all proposed park improvements are rigorously examined, analyzed, assessed and found to be in alignment with environmental considerations, best practice land usage and citizen support."

### REQUEST:

The production of a comprehensive community park development plan for McDermott Park.

### PRIMARY GOAL:

"Ensure that McDermott Park remains a valuable asset and benefit for the entire community for today and all future generations to come."



## CLIENT GOALS:

1. Improve this public park by creating a variety of multi-seasonal activities and multi-purpose spaces
2. Connect park to existing city-wide trail network (FDL LOOP)
3. Create an ADA accessible design for all users to enjoy
4. Provide spaces which encourage and promote community environmental education awareness and community stewardship
5. Produce an economically feasible and sustainable plan

## PERSONAL GOALS:

1. Maintain a professional relationship with consistent communication with the client
2. Address the client's goals into the site design
3. Design to reflect historical background and value of the project site
4. Propose decisions that are well supported by researched information and precedents
5. Integrate knowledge and skills learned throughout the undergraduate curriculum to develop an economically feasible and sustainable plan



Figure 1.07 - East Side Screening

# RESEARCH TOPIC

## PUBLIC HEALTH: LITERATURE REVIEW

Designing and creating spaces to encourage and enable a daily healthy lifestyle has many benefits physically and mentally. Living organisms share, help create, and maintain these environments. From these articles, there are many different aspects such as aesthetics, flexible spaces to provide a variety of activities, paths as connections, and safety to take into consideration to design and create such an environment. These elements such as trails, plants, and flexible spaces can help redevelop McDermott Park into a park to provide these opportunities for users of all ages and different social and economic backgrounds.

### Healthy Places: Exploring the Evidence

Author: Howard Frumkin

Streets and sidewalks, parks and cafes, theaters and sports facilities can be known and considered as "third places" and are usually many of the best places compared to home and work. Public places are important scenes for a wide variety of activities such as social interactions and physical activity and can bring more well-being.

Research on park use suggests that several design features play a role, including amount and type of vegetation; presence of interesting, meandering pathways; quiet areas for sitting and reading; recreational amenities; adequate information and signage; and perceived level of safety. Moreover, features that promote physical activity in park design include proximity, accessibility, attractive scenery, good lighting, toilets and drinking water, and well-designed and well-maintained paths.

### Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations

Author: Cecily Maller, Mardie Townsend, Anita Pryor, Peter Brown, and Lawrence St Leger

There are many factors which affect the health and well-being of a person, and one of the main factors is a person's physical environment. Cecily Maller, Mardie Townsend, Anita Pryor, Peter Brown, and Lawrence St Leger's research concludes "that nature plays a vital role in human health and well-being, and that parks and nature reserves play a significant role by providing access to nature for individuals." Landscapes that promote daily exercise, provide clean natural resources, and give way to opportunities for learning and development to help overcome health inequalities that can also heal physical and mental health conditions.

Contact with nature comes in many forms ranging from viewing nature, participating in environmental conservation work, recreational activities, nature-based therapy programs, to observing plants and animals with a variety of results. From a study of recovery rates of patients, patients with views of nature recovered quicker and spent less time in the hospital. Nature is believed to help lower levels of job stress. Community gardens create opportunities for community members to come together to learn from each other creating and strengthening community cohesion. Contact with nature provided many benefits such as an increased sense of identity and ownership, sense of integration, relief from daily struggles, empowerment, and encouraged community stewardship.

## **Biophilia, Health, and Well-being**

Author: Judith Heerwagen

Biophilia, according to the Merriam-Webster Dictionary, is "a hypothetical human tendency to interact or be closely associated with other forms of life in nature." It is through human experiences with the natural environment in which individuals grow to value, respect, and care for the environment creating more sustainable communities. Some qualities of biophilic design are spaces that are multi-sensory and transformable. Spaces with multiple uses allow for users of all ages to enjoy.

The results from a Netherlands project found that residents closer to green spaces had better profiles than those who were further from these spaces. Contact with nature through the human sensory systems provide benefits such as reduction in stress and improved moods.

## **Parks and Health: How Public Parks and Recreation Contribute to a Healthy Lifestyle**

Author: Barbara McCann

Obesity and physical inactivity is an arising problem in America. Children who are overweight has tripled in recent decades. It is a concern because being overweight leads to serious diseases and conditions. Public parks can give millions of Americans opportunities to be active by providing ball fields, basketball programs, walking trails, and other amenities.

Recent research shows that moderate activity, such as walking for 30 minutes a day, provides significant health benefits. Providing places to walk is important. From the research, "43 percent of people who reported having safe places to walk within 10 minutes of their home met the U.S. surgeon general's recommended activity level, versus only 27 percent of those without safe places to walk near their home."

Having access to places to get active is one of the most important factors linked to whether people will be active. Studies have shown that parks and trails are positively associated with physical activity and the closer people live to a park or trail, the stronger the effect.

## **Beyond Toxicity: Human Health and the Natural Environment**

Author: Howard Frumkin

Environmental exposures may actually have positive health effects, although, teachings and research in environmental health often revolve around the hazardous effects of some environmental exposures, such as toxic chemicals, radiation, and biological and physical agents. Research have hypothesized that humans are naturally attracted to other living organisms and also suggest that humans generally have an inborn bond with nature more. This all implies that having certain contact with the natural world in some way is beneficial to our health.

As Frumkin writes of the results of the 1989 National Gardening Survey of more than 2000 randomly selected households, plants have had a great and positive impact upon many individuals.

*"50.1 % of respondents agreed with the statement, "The flowers and plants at theme parks, historic sites, golf courses, and restaurants are important to my enjoyment of visiting there," and 40.0% agreed with the statement, "Being around plants makes me feel calmer and more relaxed." Among residents of retirement communities, 99% indicate that "living within pleasant landscaped grounds" is either essential or important, and 95% indicate that windows facing green, landscaped grounds are either essential or important."*

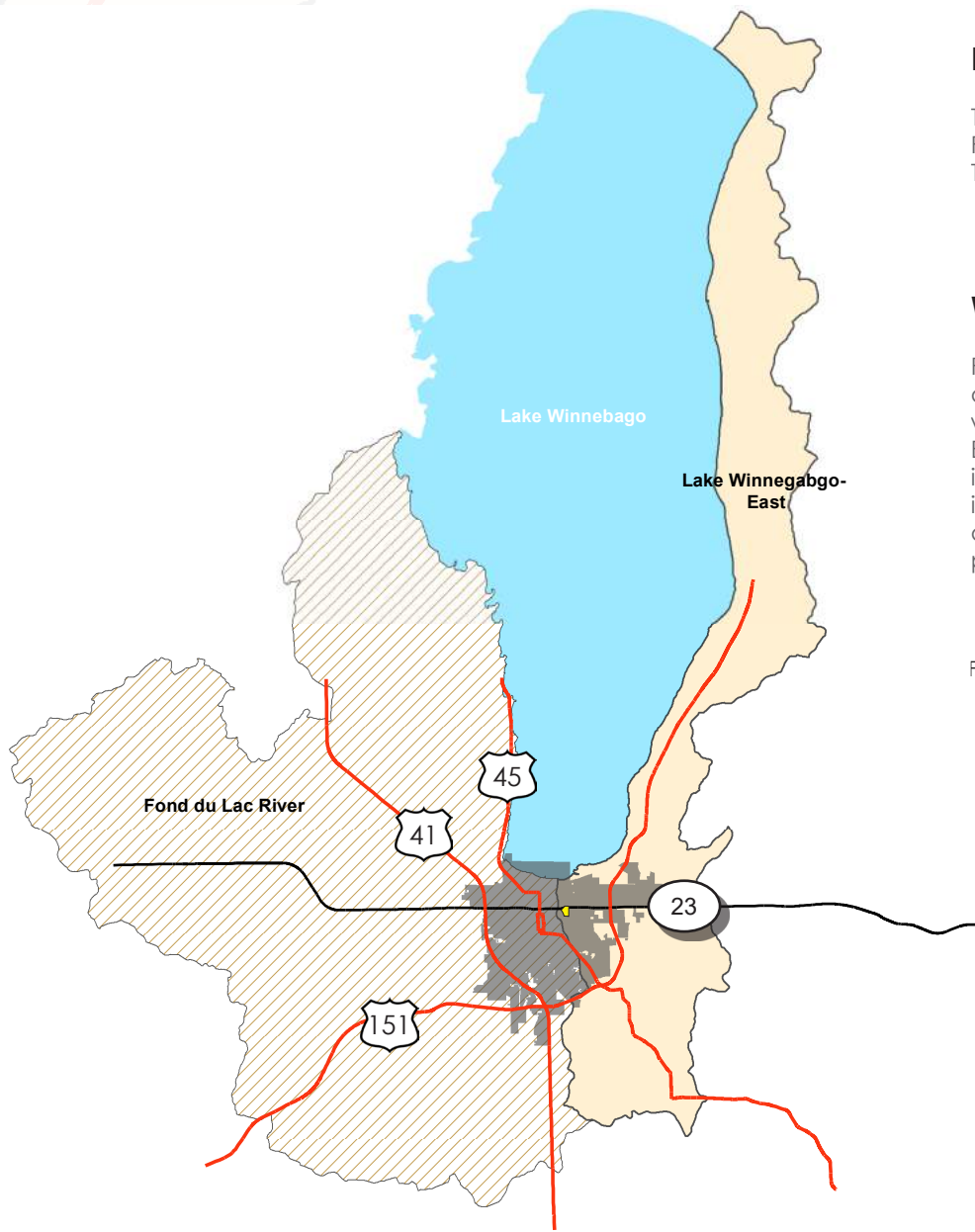
Plants have an important role in mental health and the physical environment. Plants remove toxins from the air, ground, and water and create a safer and more welcoming environment for living organisms.

# THE REGION

Fond du Lac River







## HIGHWAYS

There are four major highways that encompass the city of Fond du Lac. McDermott Park is located off of highway 23. This provides simple and direct access to the park.

## WATERSHEDS

Fond du Lac city is made up of two watersheds: the Fond du Lac River watershed and the Lake Winnebago- East watershed. McDermott Park lies in the Lake Winnebago- East watershed and is bordered by DeNeveu Creek along its western edge which flows into Lake Winnebago. All of the impact upon McDermott Park drains into Lake Winnebago and needs to be taken into account when constructing program elements as well as re-grading the site.

Figure 2.00 - Regional Watershed Map

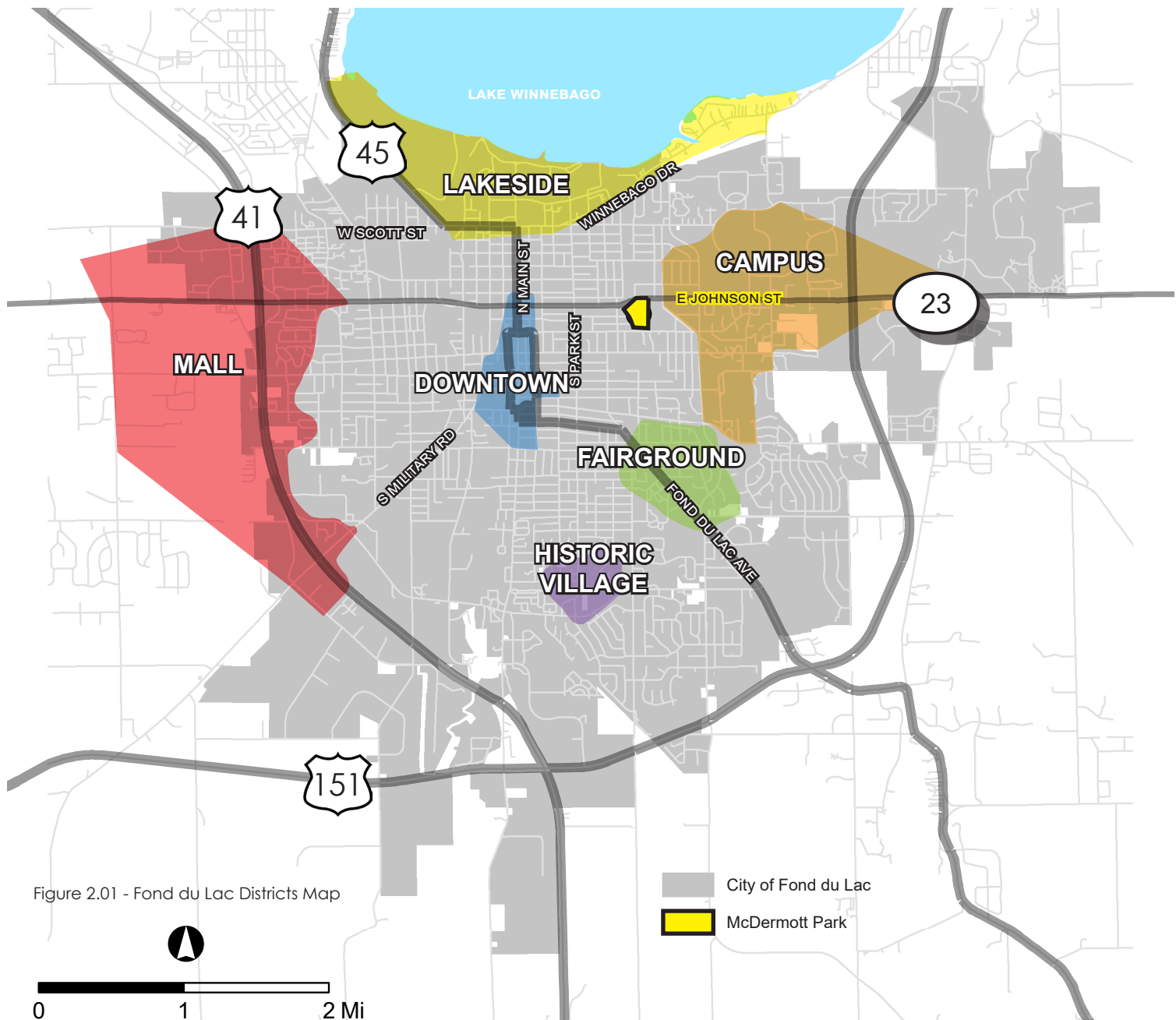


Figure 2.01 - Fond du Lac Districts Map

## DISTRICTS

Currently, there are six districts within Fond du Lac city. Each district, all with a different character, provides many activities for residents as well as visitors. Along highway 23, McDermott Park lies between the Campus District and the Downtown District but shares recreational qualities similar to those in the Lakeside District.

These three districts surrounding McDermott Park display unique features. The Downtown District is lively with its businesses and community events, while the Lakeside District holds many recreational and leisure activities, and the Campus District exhibits and provides educational opportunities

### Regional Recommendations

- Create a transitional space/ corridor between the Campus and Downtown Districts while integrating characteristics of the Lakeside District



Figure 2.02 - Fondue Fest



Figure 2.03 - Snow Sailing

Figure 2.04 - Gottfried Prairie and Arboretum





## FOND DU LAC (FDL) LOOP PATHWAY

This 15.4 mile bicycle and pedestrian pathway allows community members to explore the city and acts as an alternative system of transportation. Made up of different trails, there are a variety of sights to see and terrain to experience. There is no direct access to this pathway from McDermott Park but surrounding streets help connect the two destinations to each other.

### Regional Recommendations

- Create a bike trail along DeNeveu Creek to the north to connect to the FDL Loop

Figure 2.05 - Biking along the FDL Loop



Figure 2.06 - Trails on streets



Figure 2.07 - Snow-shoeing



Figure 2.08 - Rollerblading



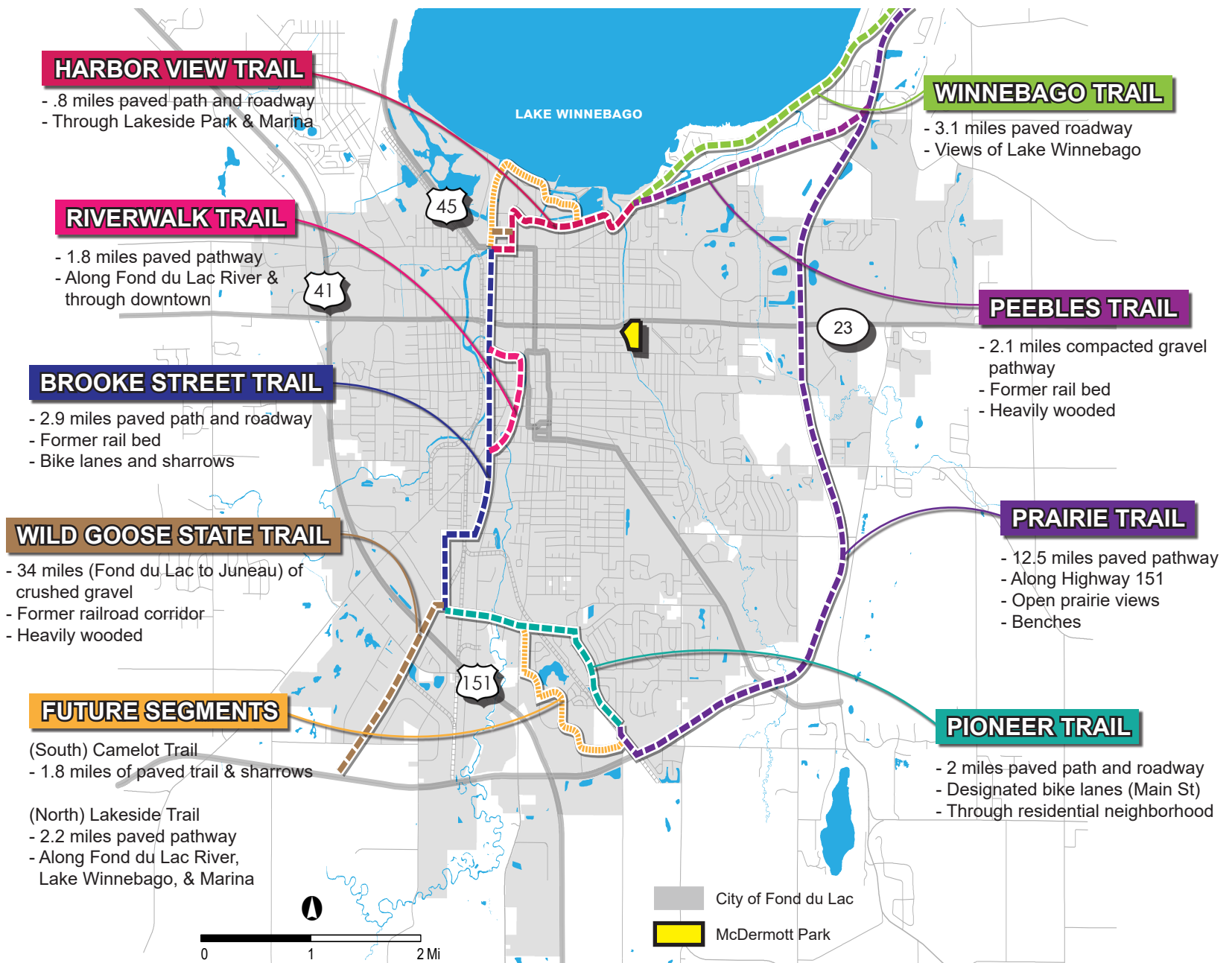


Figure 2.09 - FDL Loop Trail Map

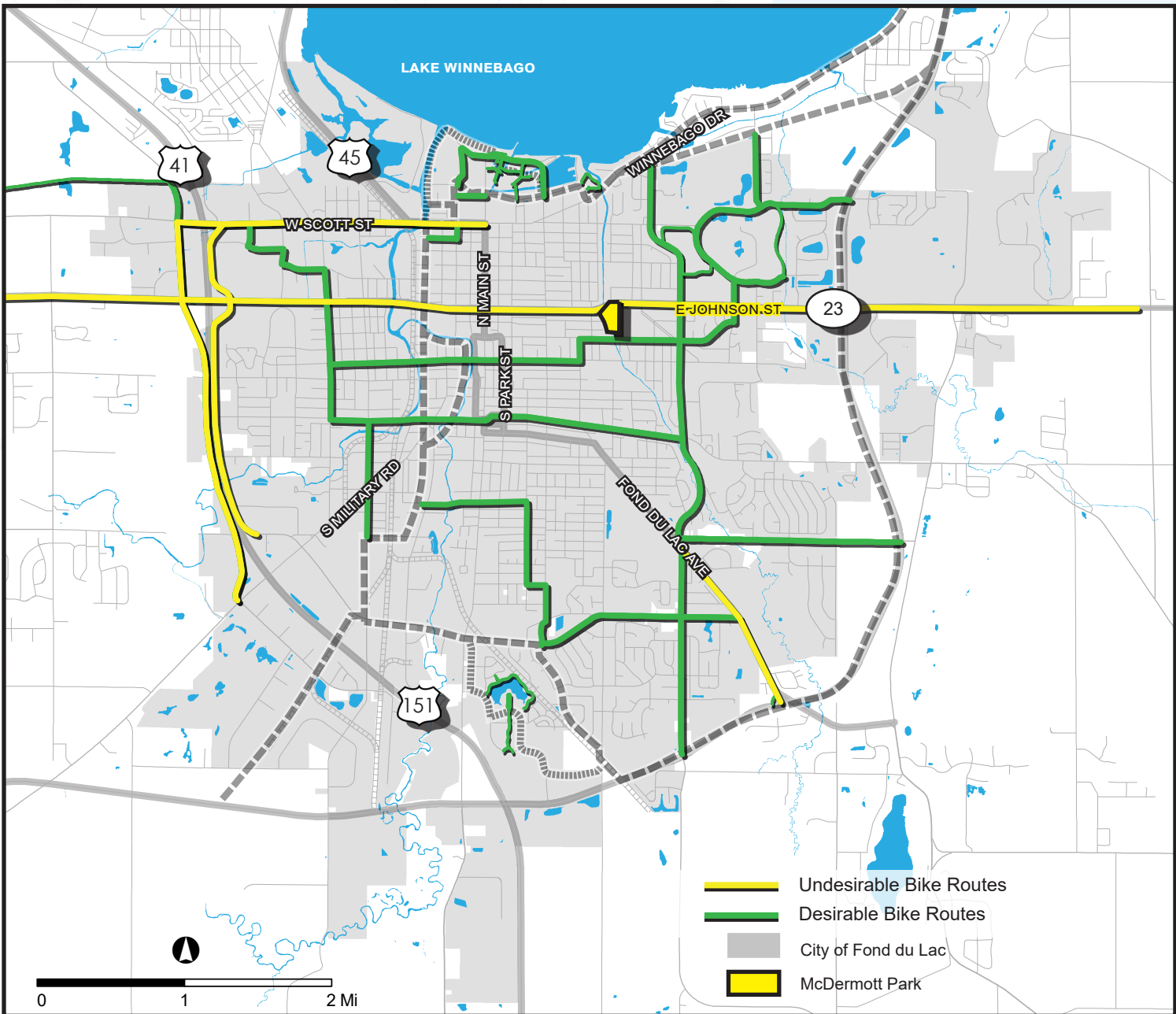


Figure 2.10 - Bike Routes Map

Figure 2.11 - E. Johnson Street View

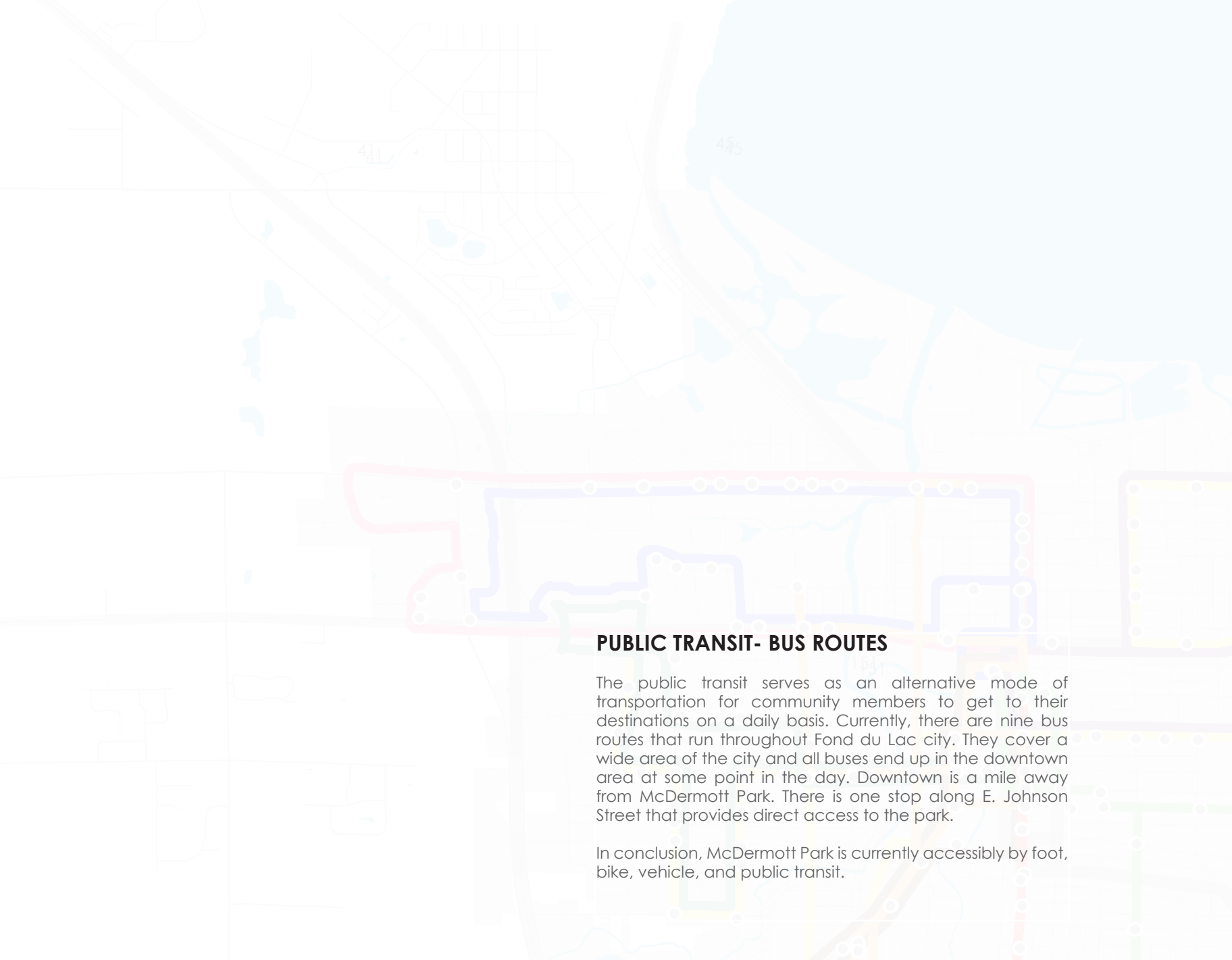


## EXISTING BIKE ROUTES

There is a strong network of bike routes within the city of Fond du Lac. Many of these are sharrows which connect to the FDL Loop, providing more access to different parts of the pathway from the McDermott Park. Green routes indicate desirable routes while yellow indicates undesirable routes. Such routes are undesirable because they may be located in the main arterials with heavy traffic, have lanes that are too narrow, or have no lanes designated for bikers. E. Johnson Street is among the undesirable bike routes as it is one of the main arterials with heavy traffic and does not have a designated bike lane.

## Regional Recommendations

- Redesign E. Johnson Street to provide a designated bike lane with access to McDermott Park



## **PUBLIC TRANSIT- BUS ROUTES**

The public transit serves as an alternative mode of transportation for community members to get to their destinations on a daily basis. Currently, there are nine bus routes that run throughout Fond du Lac city. They cover a wide area of the city and all buses end up in the downtown area at some point in the day. Downtown is a mile away from McDermott Park. There is one stop along E. Johnson Street that provides direct access to the park.

In conclusion, McDermott Park is currently accessible by foot, bike, vehicle, and public transit.

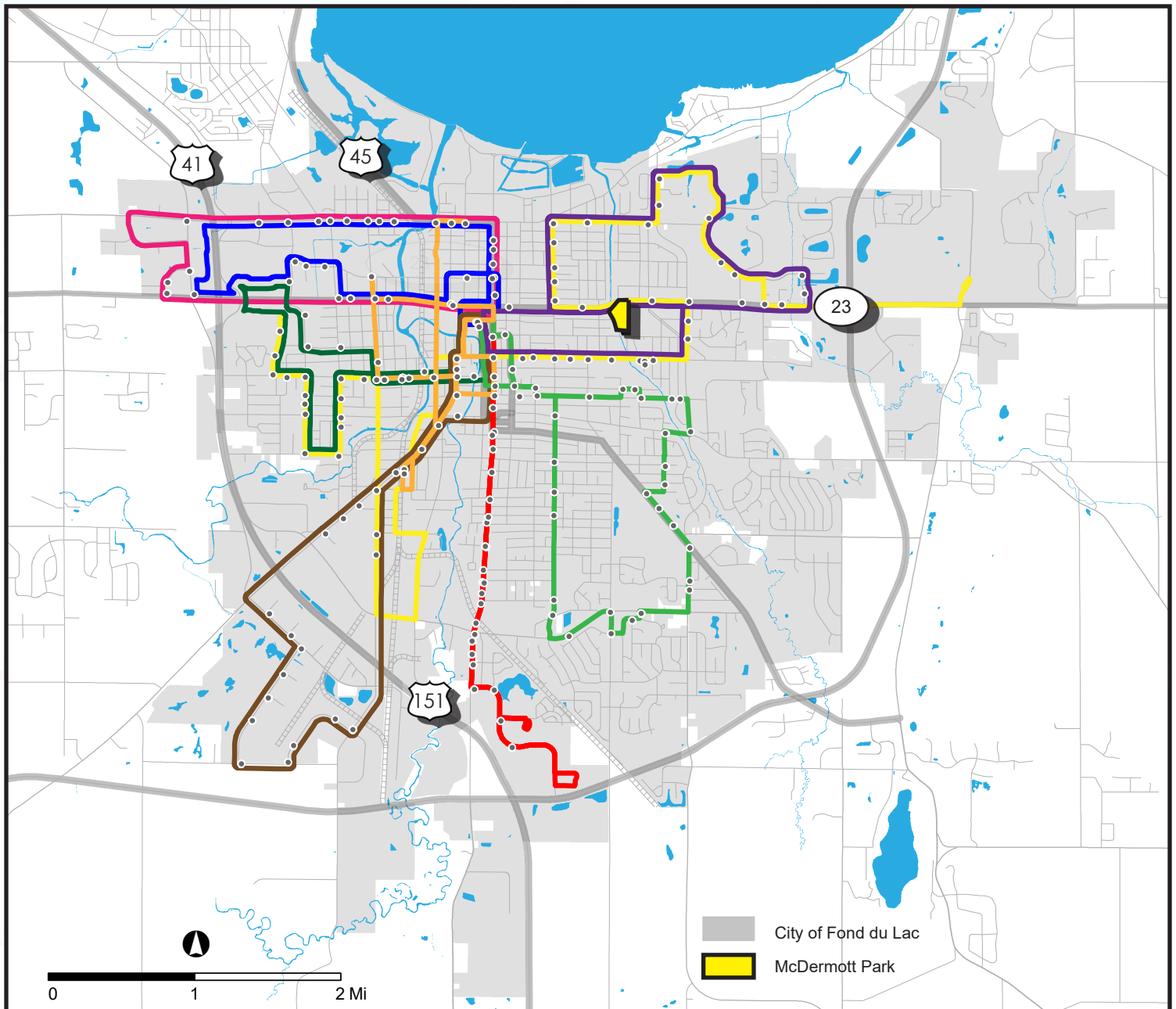
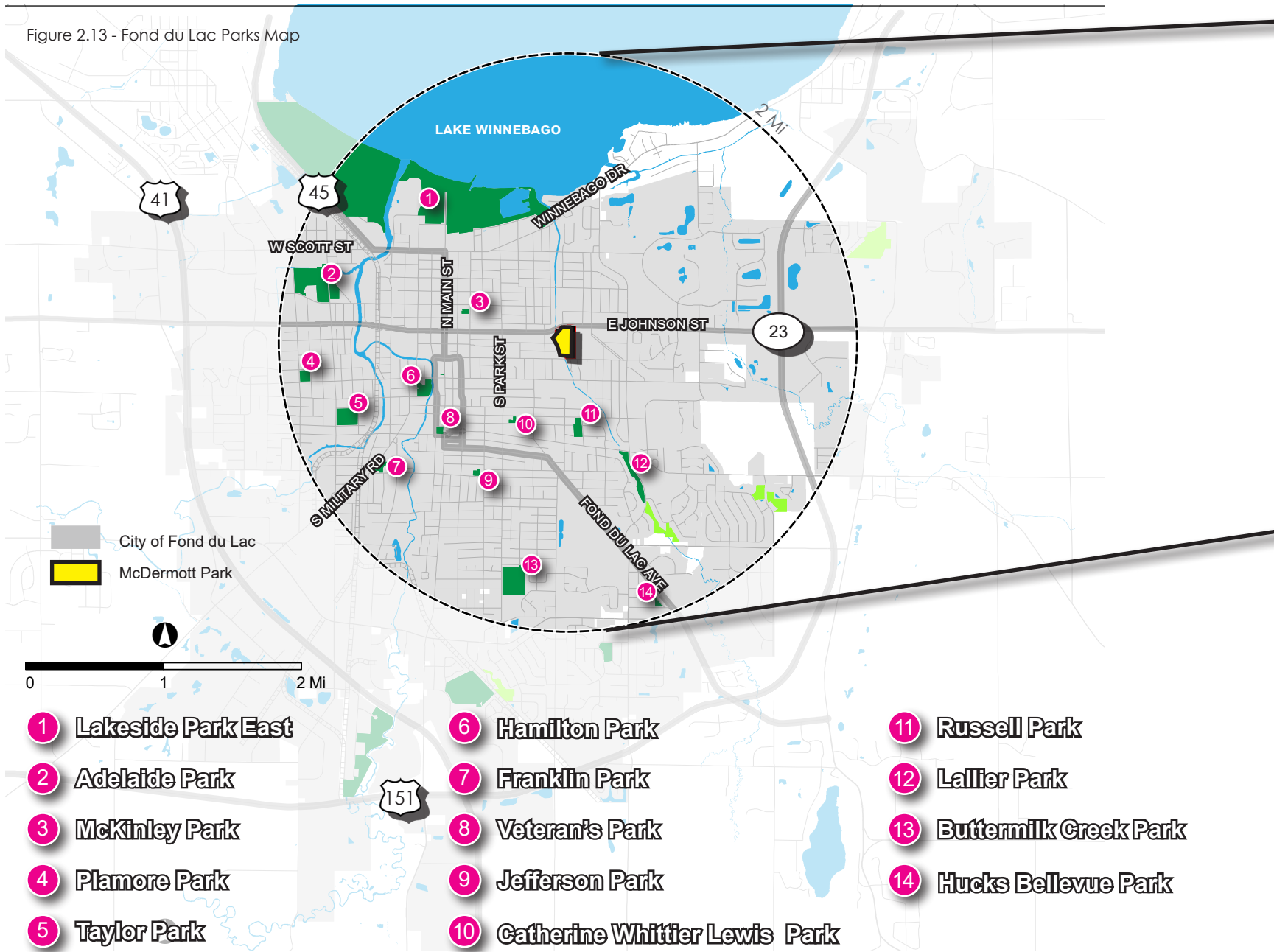
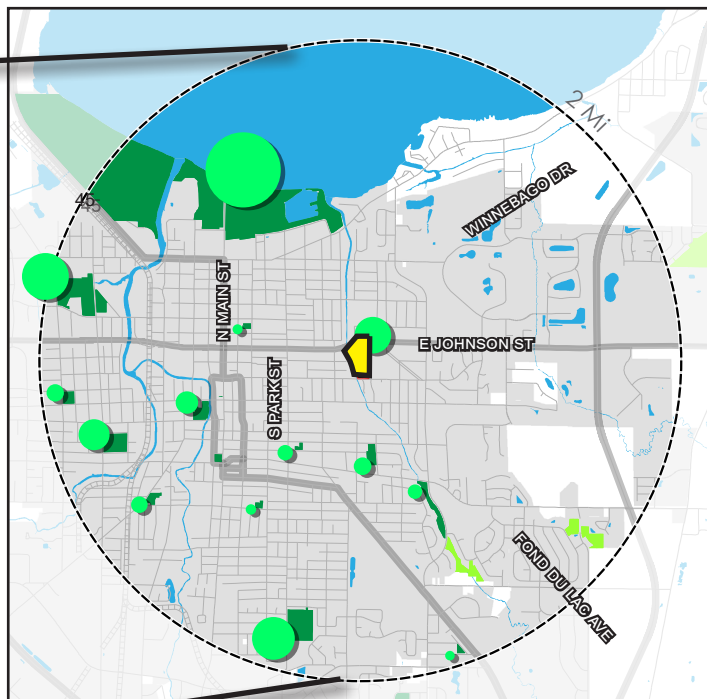


Figure 2.12 - Bus Routes Map



Figure 2.13 - Fond du Lac Parks Map





## EXISTING PARKS

There are three type of parks in the Fond du Lac. The largest, large urban parks, serve the entire community. The second largest, district parks, serves neighborhoods within a radius of 1- 2 miles. The last, neighborhood parks, serve neighborhoods within a radius of less than 1 mile of the park. McDermott Park, a district park, is 14.7 acres in size. The inset map (left) shows the relative sizes of these 14 parks which ranges from over 140 acres (Lakeside Park East) to 1.1 acres (McKinley Park). McDermott Park is the largest park in the northeast quadrant of the city.

(Figure \*\*\*\*\*) Within a mile radius of McDermott Park, there are five other parks. These parks will influence the decision of which existing programs to keep or remove from McDermott Park and influence the type of connection between the two parks as trails, materials, or programmatic spaces shown in Figure\*\*\*\*.

Figure 2.14 - Existing Programs & Amenities Chart

	McDermott Park	Lakeside Park East	McKinley Park	Catherine Whittier Lewis Park	Russell Park	Lalier Park
Baseball/ Softball Fields	X	X	X	X		
Basketball Courts			X	X		
Birdwatching	X					
Boat Access	X					
Biking						
BMX Track						
Camping						
Cross-Country Skiing						
Disc Golf						
Fishing	X					
Hiking						
Hunting						
Picnic Area	X	X		X	X	
Playground	X	X	X		X	
Restrooms	X	X		X		
Shelter/ Pavilion	X	X				
Sledding						
Snowshoeing						
Soccer	X					
Swimming						
Tennis Courts	X					
Volleyball	X	X				
Walking path/ Trail	X					

## Regional Recommendations

- Remove one existing ball diamond from McDermott Park

# THE COMMUNITY

## COMMUNITY ANALYSIS AND DESIGN STRATEGY

### ZONING

McDermott Park is located within a heavy residential zone-single family residential homes. With an office district to the south, education districts to the north and east, program elements within the site should serve all of these community members to promote public health.

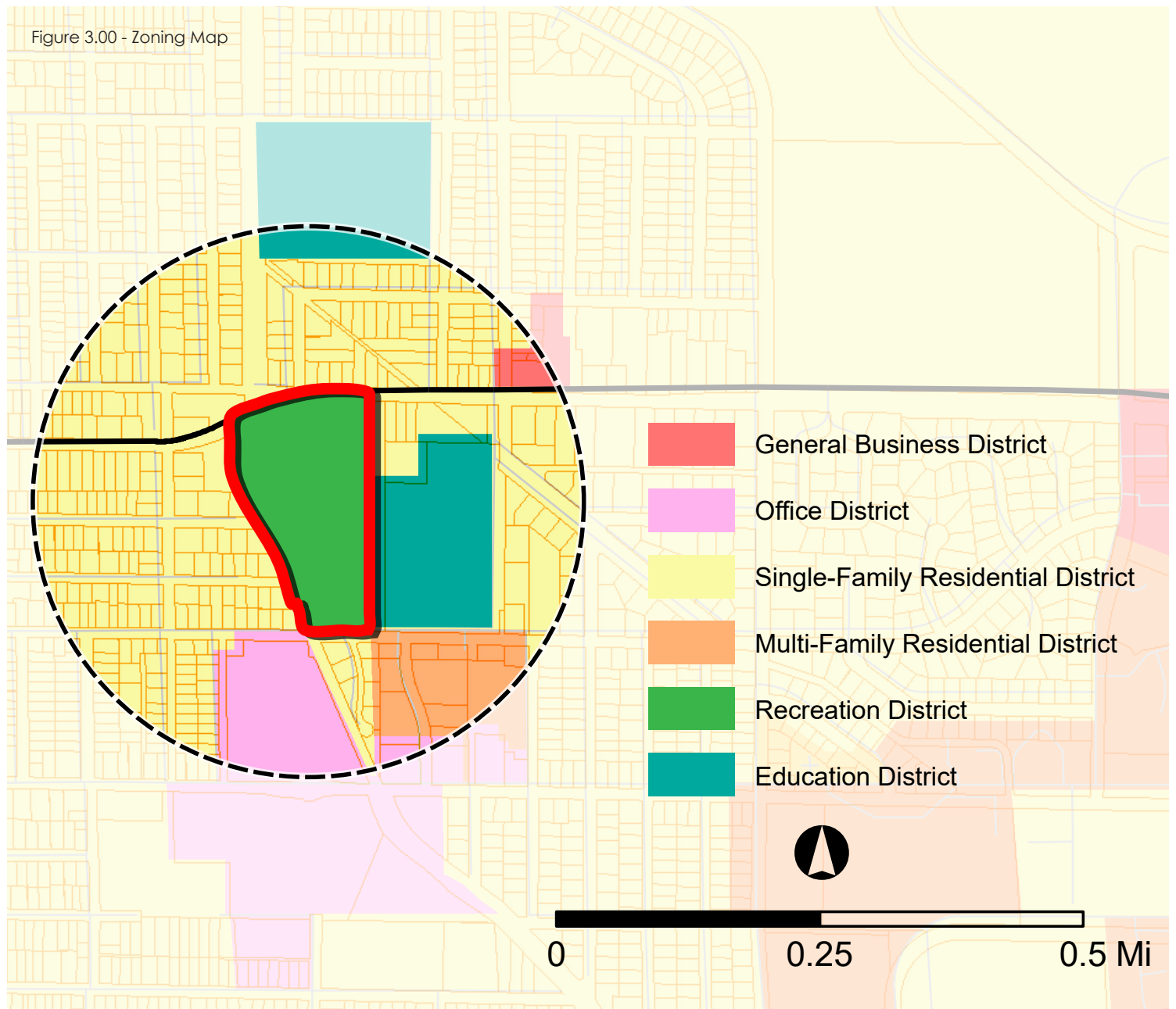
Redeveloping the park will help increase the value of these properties and can provide jobs for the area as well. Connections made between the businesses and schools to the park will encourage users to travel between the two by non motorized transportation.

### Community Recommendations

- Design multi-functional spaces with year-round interest within the park for a variety of users



Figure 3.00 - Zoning Map





## EXISTING LAND USE

The community scale examines the context within a quarter-mile walking radius- a comfortable walking distance of about five minutes. With its proximity to the existing buildings, McDermott Park can become a great asset to the area.

Rosenow Elementary School is located two blocks north of the site with its own athletic complex that is an open field. A connection between the park to the school provides the opportunity to have classes or events at the park with a direct path between the two.

With one business further down E. Johnson Street, McDermott Park can be redeveloped to provide outdoor spaces for a break from work, classes, and be a daily routine for exercise.

The only hospital in Fond du Lac is located two blocks south of McDermott Park. Patients, family members of patients, as well as workers can use the trails and spaces within the park to their advantage to benefit physically and mentally.

The Winnebago Lutheran Academy High School, east of the site, has an athletic complex with a track and a baseball diamond. Being adjacent to the site allows the WLA many opportunities to host events, programs, and classes for the community.

### Community Recommendations

- Connect McDermott Park to surrounding businesses and institutes through a system of trails
- Create a community center

Figure 3.01 - Existing Land Use Map



## VEHICULAR CIRCULATION

E. Johnson Street is a main arterial in Fond Du Lac and is also known as highway 23. This north side of McDermott Park is the most dangerous with the heavy traffic and is the only access into the park for cars and bikes. The speed changes from 45 miles per hour to 35 miles. It currently has two lanes of traffic going both ways. There are no designated bike lanes and is not inviting for bikers. This type of traffic creates and encourages the perception that it is not safe to travel by bike here.

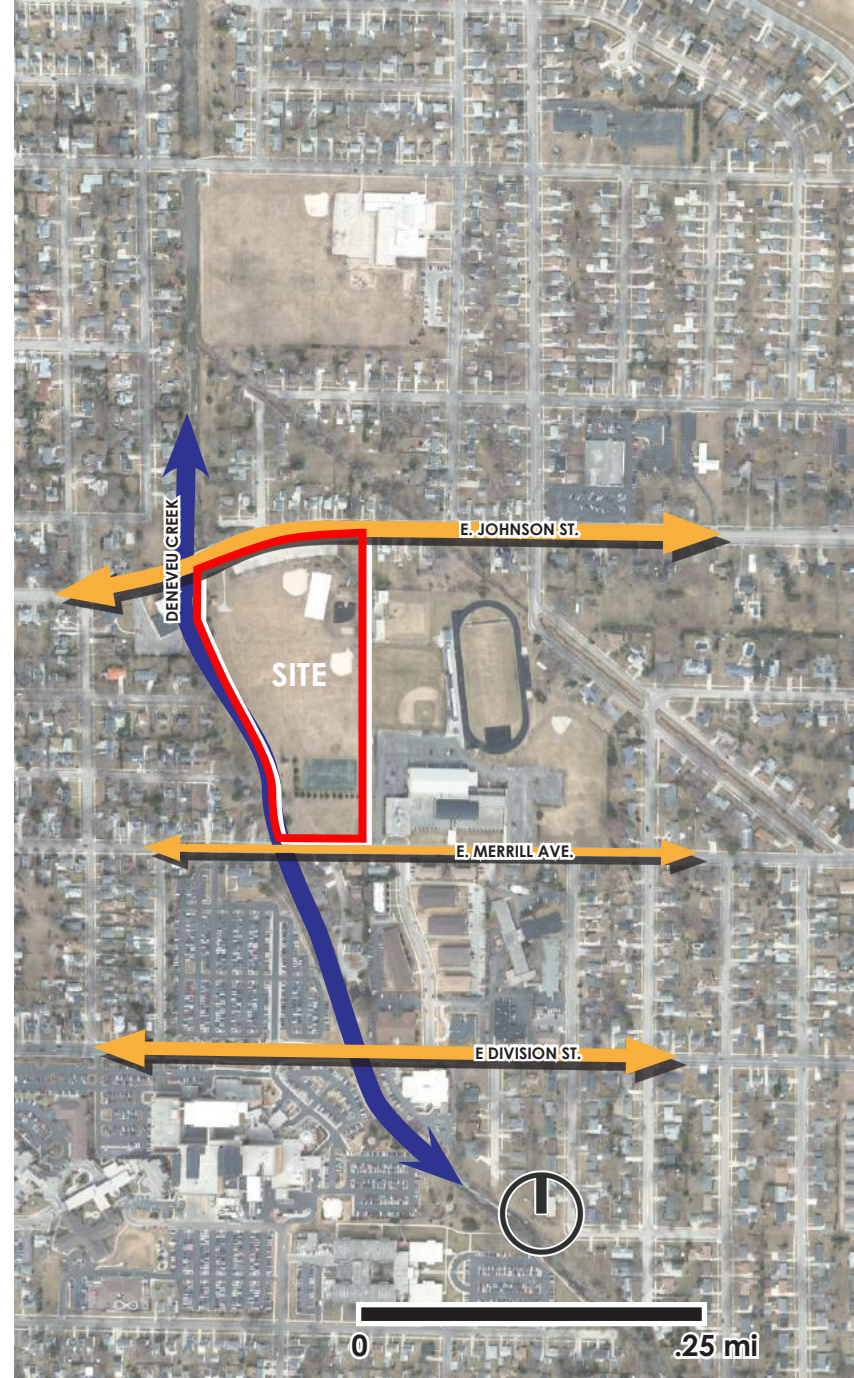
E. Merrill Avenue borders the southern edge of the park with less traffic. This two-way street is currently used as a bike route and can be enhanced to encourage more bikers to travel through and access the park safer.

E. Division Street is slightly busier than E. Merrill Avenue as it leads to the St. Agnes Hospital. There is an existing trail along creek from E. Merrill Avenue south towards and beyond E. Division street.

### Community Recommendations

- Enhance bike route along E. Merrill Avenue to encourage access to park from the south
- Connect trail system to existing trail southwest of McDermott park

Figure 3.02 - Vehicular Circulation Map



# THE SITE

## EXISTING TOPOGRAPHY

The park is relatively flat throughout. The steeper areas border DeNeveu Creek. There are many views into and out of the park from almost anywhere in the park because it is relatively flat. The elevation moves from high to low beginning at the southwest end of the park moving throughout and across to the northeast end. This is the typical flow of water as it moves through the site.

There are no distinct high or low spots which provides users views of the entire park.

### Site Recommendations

- Create outdoor rooms by building up or down throughout the park
- Re-direct the flow of water to harvest and re-use on site
- Create views of specific features of the park with elevated points
- Use topography to create different experiences throughout the park

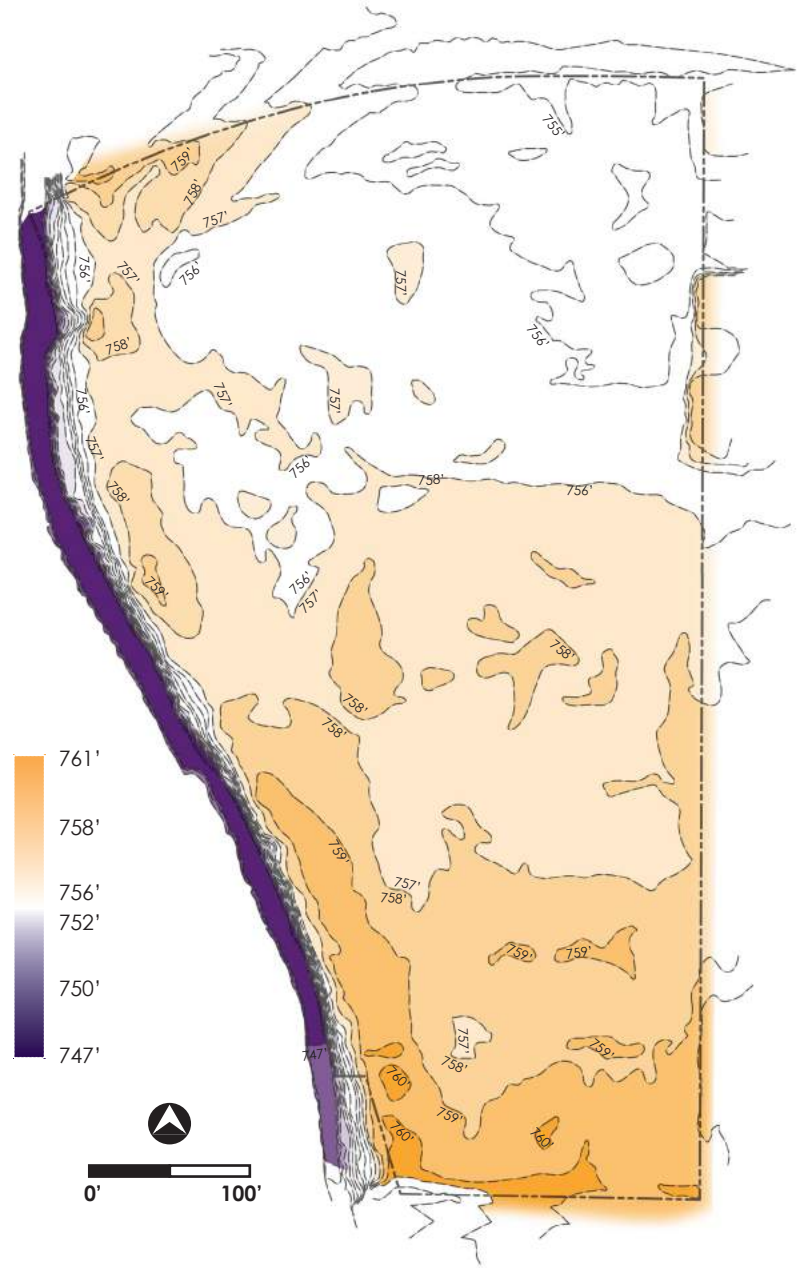


Figure 4.00 - Existing Topography Map



## EXISTING PROGRAMS & AMENITIES

There is a parking lot that holds 78 cars located in the north edge along E. Johnson Street. This parking lot is in good condition with and has a few paths, the only paths in the park, leading to the pavilion, shelter, and stormwater pump station.

Recreational activities include 4 tennis courts near the south end of the park, 2 ball diamonds in the center of the park that are underutilized, and a sand volleyball court in the northeast region. Adjacent to the volleyball court is a children's playground with one bench.

The leased segment indicated with the yellow outline is currently leased to WLA, adjacent to the park and is currently a strip of green grass with the top half fenced off as part of their ball diamond.

### *Site Recommendations*

- Remove one ball diamond to allow for multi-functional outdoor spaces and activities
- Increase seating amenities within the park to allow for users to observe, engage, and enjoy the park

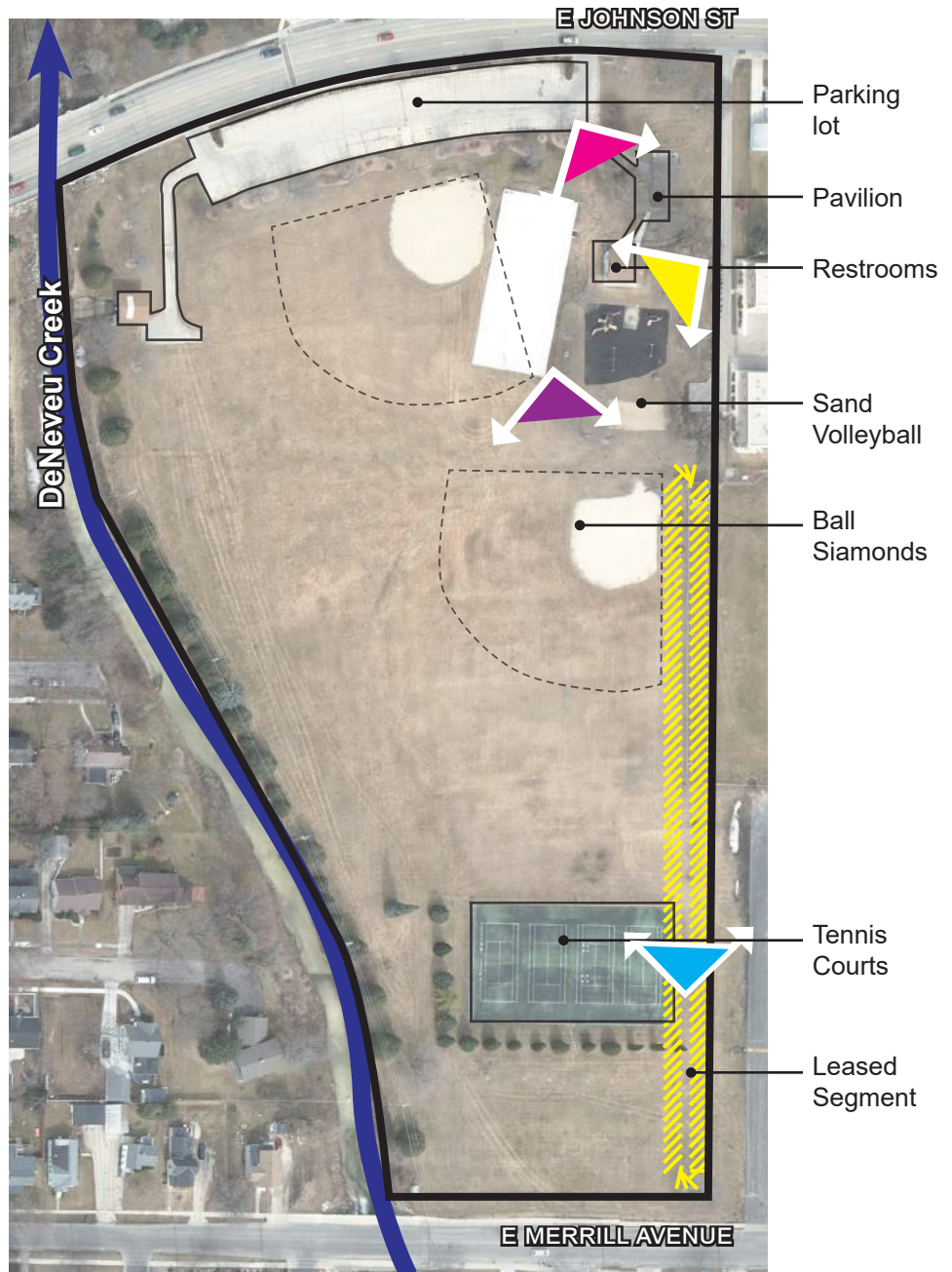


Figure 4.01 - Existing Programs & Amenities 1





Figure 4.02 - Pavilion



Figure 4.03 - Leased Segment to WLA



Figure 4.04 - Playground



Figure 4.05 - Softball Diamond 2



Figure 4.07 - Great Open Lawn



Figure 4.06 - Stormwater Pumping Station



Figure 4.08 - E. Johnson Street Bridge



Figure 4.09 - South Entrance





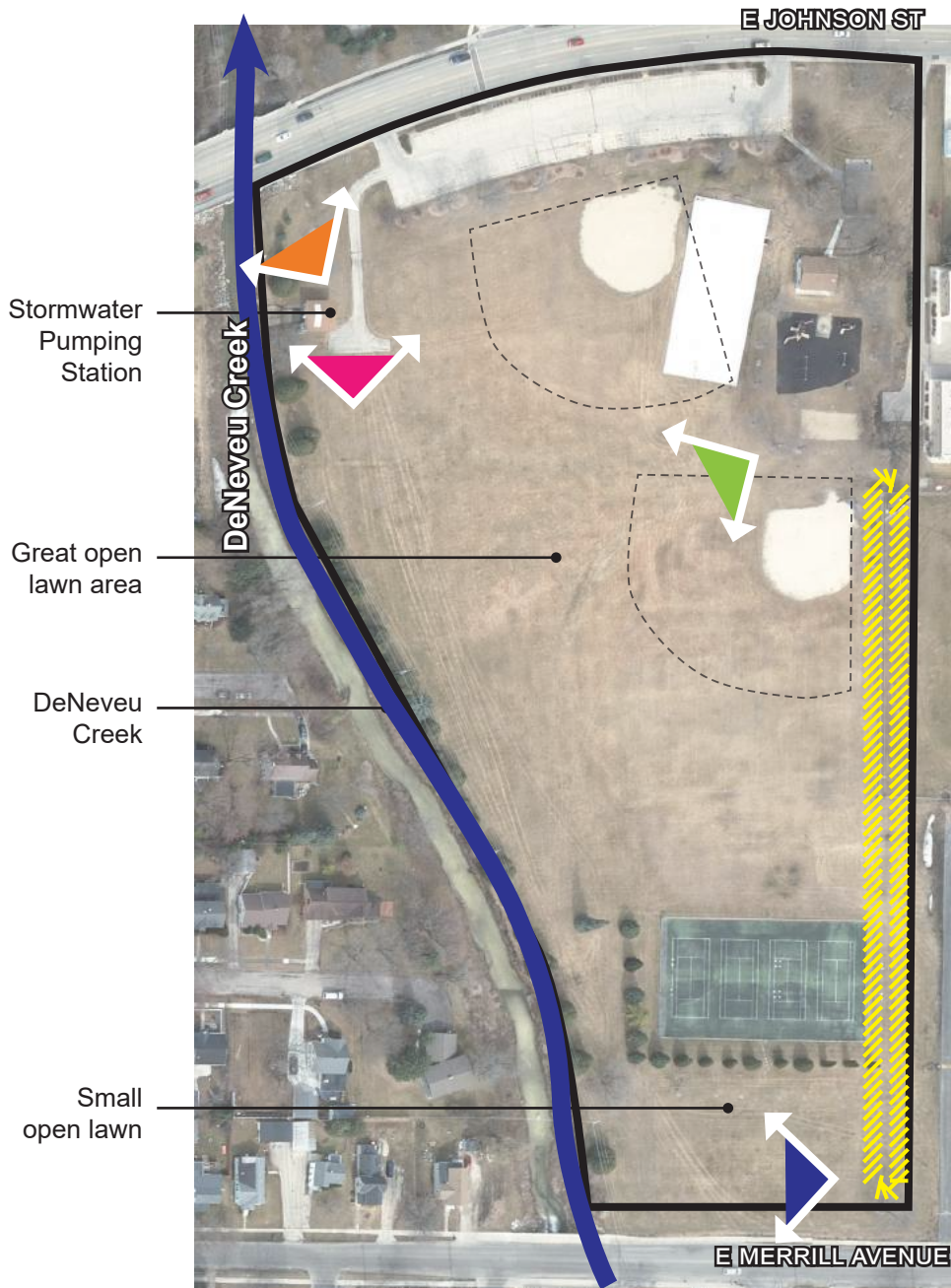


Figure 4.10 - Existing Programs & Amenities 2

## EXISTING PROGRAMS & AMENITIES

A stormwater pump station is located in the northwest region of the park with a service road.

The great open lawn is relatively flat with few dips and scattered manholes.

DeNeveu Creek runs along the entire west edge of McDermott Park. It is classified as body of water with the lowest water quality level. The biodiversity is limited here because of the water quality as well as the size of the creek.

A small open lawn area located south of the tennis courts is underutilized and does not have any amenities. There is a sign with the park hours and another indicating that no dogs are allowed within the park.

### Site Recommendations

- Enhance and restore the water quality of DeNeveu Creek to allow for biodiversity
- Redesign the small open lawn into a covert space



# CIRCULATION & NODES

Current vehicular circulation is along the north and south side of the site. E. Johnson Street is the only street with access into the park. These entrances are the main entrances to the park.

This site lacks walkway paths which makes navigation throughout the park difficult. Pedestrian circulation is along the edges of the park.

## Site Recommendations

- Create entrances along E. Merrill Avenue into the park
- Create walking paths throughout the park
- Create educational and fitness nodes along DeNeveu Creek
- Create a bike trail along DeNeveu Creek connecting E. Merrill Avenue to E. Johnson Street to the FDL Loop
- Create a winter trail throughout the park

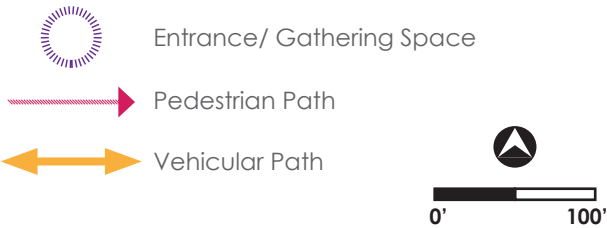
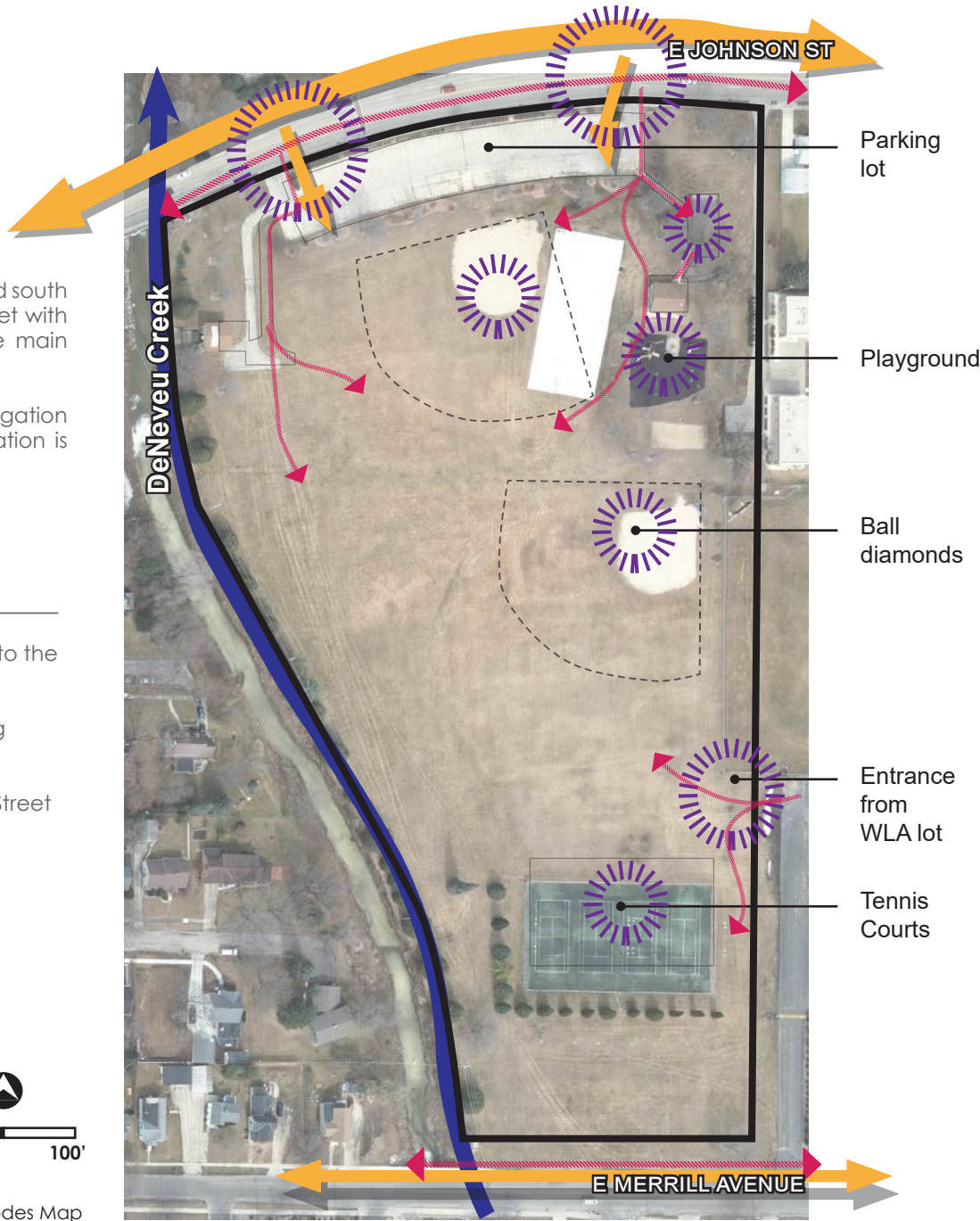
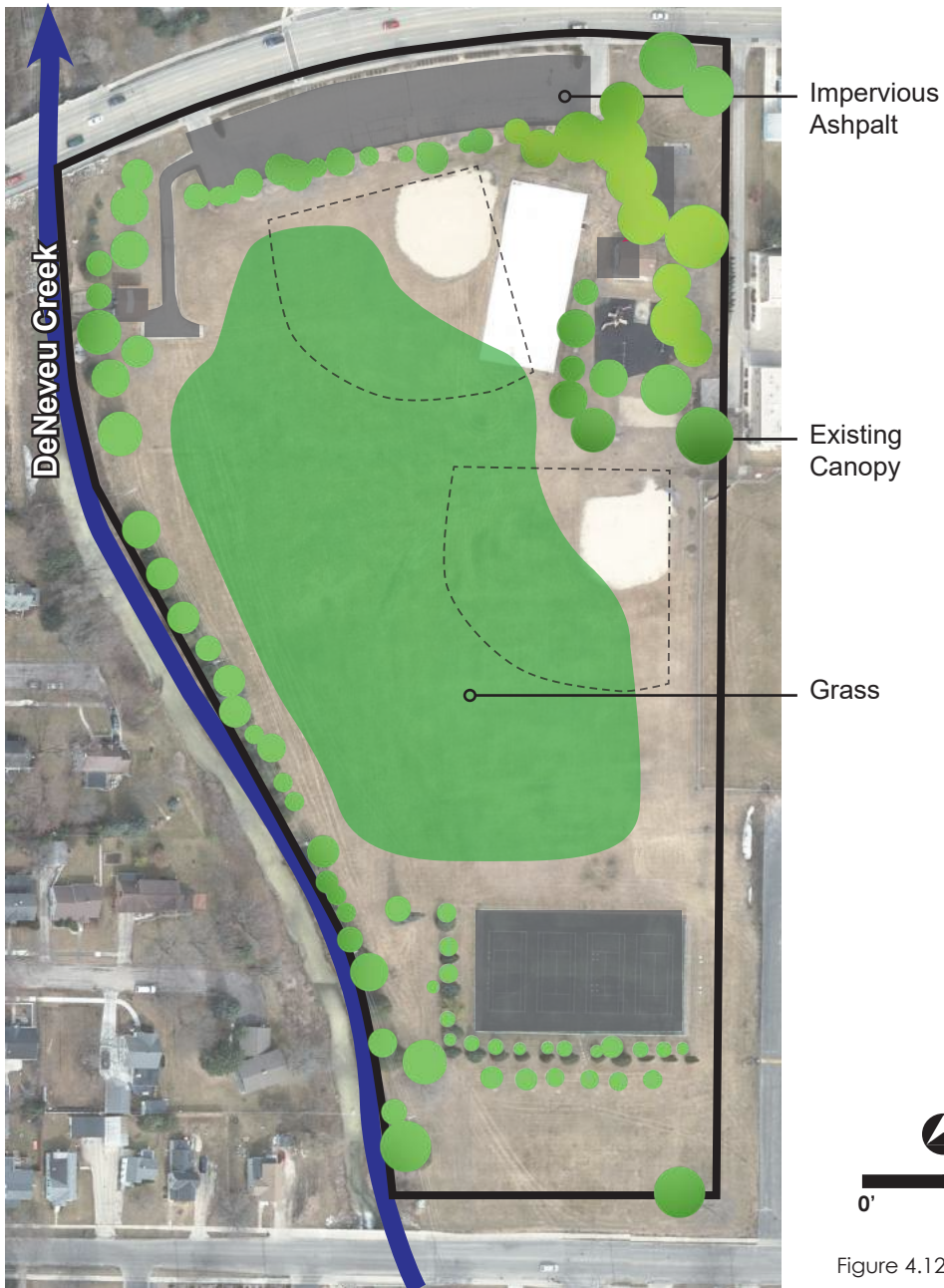


Figure 4.11 - Circulation & Nodes Map







## SURFACES

The different types of surfaces help direct users of the park and define spaces. On this site, the different types of surfaces greatly impact water runoff and its quality and will be an important aspect to consider while designing.

The parking lot, tennis courts, and sidewalks are made up of asphalt. Other ground surfaces are grass (great open lawn) and sand around the ball diamonds and volleyball court.

Existing vegetation include mature green ash trees in the northeast region along with honey locust trees. Along the creek, there are american arborvitae, a few blue spruce trees, and much buckthorn beneath the arborvitae. Younger trees are planted south of the tennis court and will give a sense of privacy when mature.

### Site Recommendations

- Manage and reduce the amount of invasive species along the shoreline
- Use native species throughout the park to encourage biodiversity and to help aid in stormwater management
- Increase tree canopy in the open lawn area to create rooms
- Create trails with materials that will minimize water runoff and be economically feasible

Figure 4.12 - Surfaces Map

# DESIGN STRATEGIES

## PRECEDENT: CANAL PARK (2012)

**DESIGNER:** OLIN

**LOCATION:** Washington, DC

**PROJECT TYPE:** Courtyard/ Plaza/ Park/ Stormwater management facility

**FORMER LAND USE:** Brownfield

**SIZE:** 3 acres

**BUDGET:** \$20 Million

This former parking lot for district school buses was redeveloped and completed in 2012 into a three-block urban park. The park features a restaurant, a seasonal ice rink, two interactive water features, and moveable tables with chairs and umbrellas. It is utilized by residents, workers, and attracts almost 28,000 visitors of all ages and social and economic backgrounds throughout the year with its special events and spaces. The park was designed with many sustainable features such as rain gardens, bioretention tree pits, an accessible vegetated green roof, renewable energy products, and a stormwater management system. Water runoff captured is filtered, directed into underground cisterns, and is treated and reused to irrigate the open green spaces, water features, and supply the ice rink.

Canal Park, about one-third the size of McDermott Park, is a great example of how water runoff can be captured, treated, and reused throughout the site. This idea can be used within McDermott Park to increase the water quality as well as provide for more year-round activities in the park. Renewable energy features such as lighting elements can help lower the costs in the long run for the park as well.

Figure 5.00 - Canal Park: Before & After





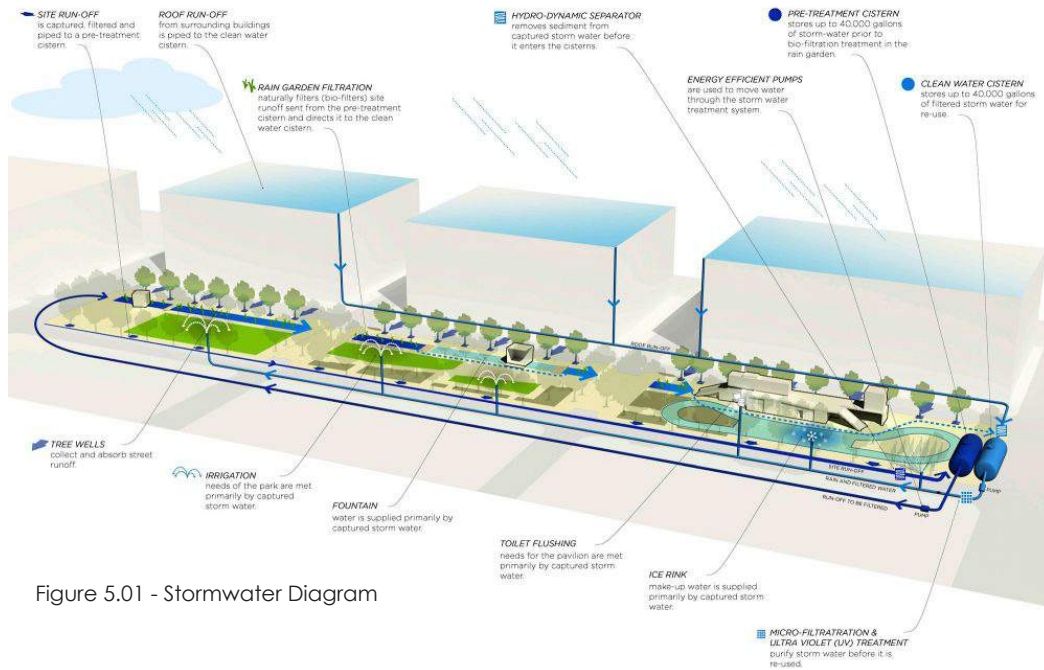


Figure 5.01 - Stormwater Diagram

Figure 5.04 - Master Plan



Figure 5.02 - Benches



Figure 5.03 - Rain Garden

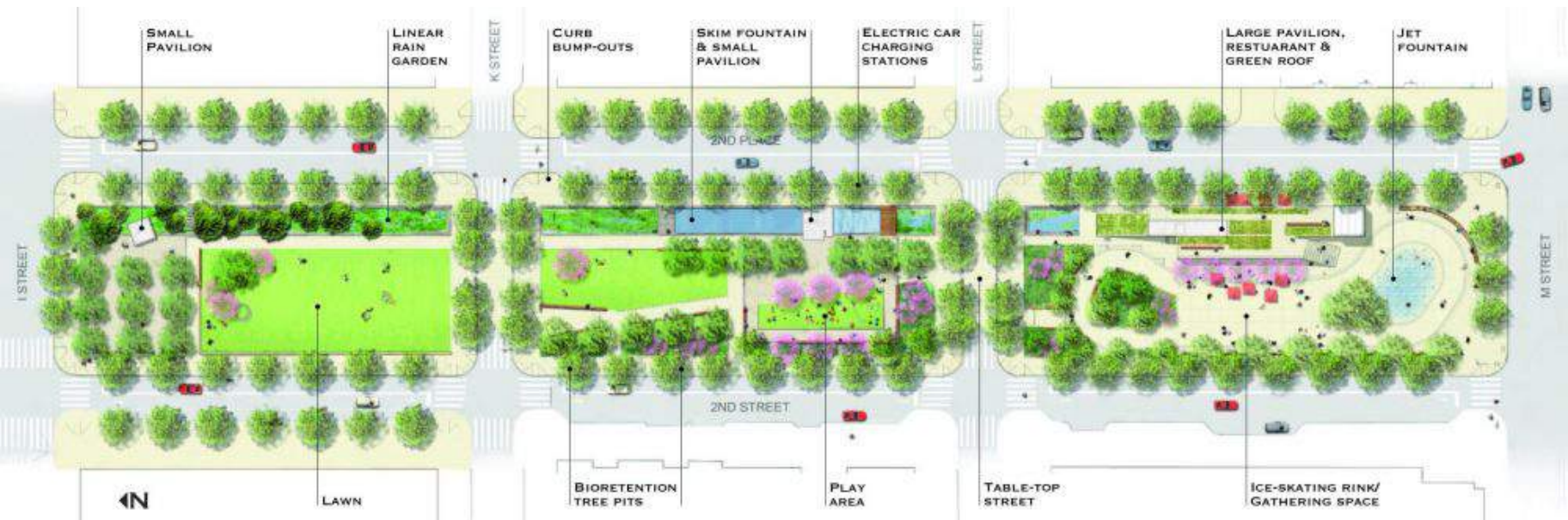




Figure 5.05 - Cumberland Park: Before



Figure 5.06 - Cumberland Park: After



## PRECEDENT: CUMBERLAND PARK (2012)

**DESIGNER:** Hargreaves Associates

**LOCATION:** Nashville, TN

**PROJECT TYPE:** Park

**FORMER LAND USE:** Brownfield

**SIZE:** 6.5 acres

**BUDGET:** \$9.5 Million

Cumberland Park, once industrial and commercial land, is an adventure park for many families. It features many interactive spaces and focuses on brownfield remediation, floodplain preservation, stormwater harvesting, and improved biodiversity. This first phase of the Riverfront Revitalization Plan was designed to bring back visitors and residents to the river and downtown region. Some of these features include a splash pad (Hollow Sprayground), mounds (Hollow Washboards), and a rock climbing wall for people to interact with. The urban park creates different experiences for its users as it allows its users to use their imagination to explore and navigate throughout the area. The redevelopment of the riverfront into an active and vibrant public space promotes health, diversity, and sustainability.



Figure 5.07 - Slide, Gorge Wall, & Explorer Trail

Cumberland Park has many features that can positively influence and redevelop McDermott Park to provide, promote, and highly encourage a daily healthy lifestyle for users of all ages. This precedent is located within a floodplain and successfully preserves its function by neither increasing the flood elevations or decreasing the flood storage. The ideas of promoting equitable site use and access, strong community participation, sustainability awareness and education through play can help turn McDermott Park into a similar park.





Figure 5.08 - Master Plan





Figure 5.09 - Promenade



Figure 5.10 - Water Play Feature



Figure 5.11 - Botanical Garden

## PRECEDENT: KLYDE WARREN PARK (2012)

**DESIGNER:** The Office of James Burnett

**LOCATION:** Dallas, TX

**PROJECT TYPE:** Park/ Open Space

**FORMER LAND USE:** Transportation

**SIZE:** 5.2 acres

**BUDGET:** \$110 Million

As the world's largest suspended infrastructure that holds a park, it features a pedestrian promenade, great lawn, interactive water features, dog park, botanical garden, as well as other garden and plaza spaces. Klyde Warren Park programs free daily events ranging from yoga classes to family activities, concerts, and an outdoor theater.

One of the main ideas to take from this precedent is the funding for the park. Private fundraising allowed the opportunity for donors, interested in particular types of park spaces, to express their interest and be incorporated throughout the early design phase. With this in mind, funding to make a plan happen and maintain it can be costly but donations of any kind will surely help and create a strong sense of community and connection to the park.



Figure 5.13 - Master Plan





Figure 5.12 - Aerial





## DESIGN CONCEPT

With the slightly flat topography and large open space of McDermott Park, the design concept behind the site plan is to create defined rooms throughout the park by altering the landscape. Designing around the existing vegetation and proposing new vegetation can help refine and define these spaces. The idea of unprogrammed spaces located at the highest and lowest elevations of the site can create many different experiences and allows visitors to interact with the space to make it more meaningful to them.

The two different colors represent the active and passive activities. Each space is created to support both activities to make the most of the site and endless opportunities.

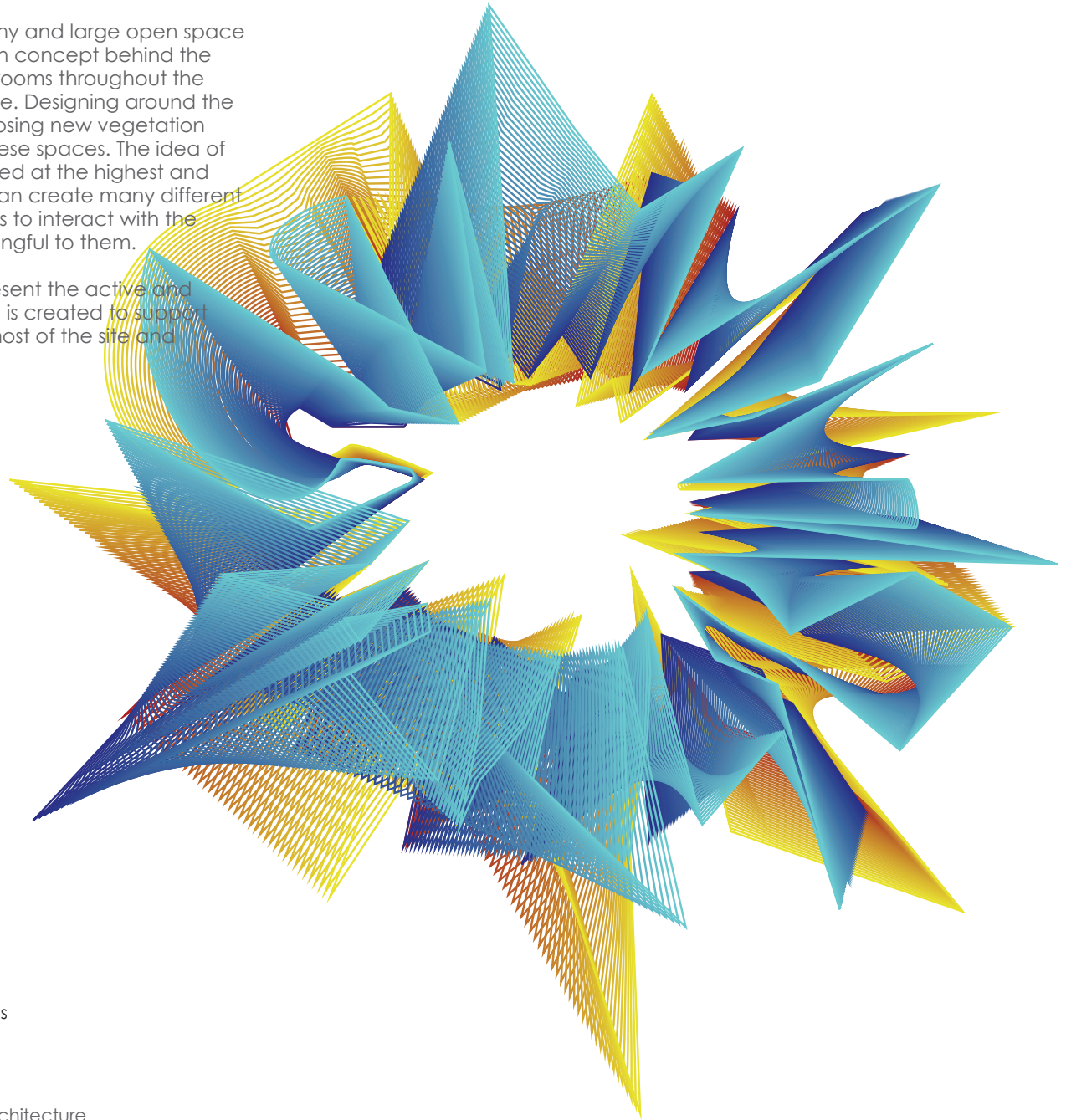


Figure 5.14 - Endless Opportunities

## PROGRAM ELEMENTS

To fulfill the project goals, the programmatic elements listed were decided upon to best serve the community. These elements reflect spaces and activities which allow for users of all ages, from individuals to groups, to observe, engage in, and enjoy. Creating these elements as transformable spaces will allow easier adaptation to the changing community and seasons, and keep the park utilized throughout the year.

### TRAILS:

#### ***Multi-purpose Trail:***

Recreational trail connecting McDermott Park to the Fond du Lac Loop as well as parks nearby to encourage physical activity to and throughout the park and city

#### ***Winter Trail:***

Seasonal trail for users to enjoy winter activities such as cross country skiing and snowshoeing throughout the park

### MULTI-FUNCTIONAL NODES:

#### ***Educational:***

Small spaces to encourage and provide learning opportunities of the biodiversity within the park and outdoor classrooms

#### ***Passive:***

Covert spaces offering a more relaxed atmosphere, less active, and opportunities to observe other activities in the park

#### ***Active & Fitness:***

Overt spaces encouraging user engagement with the park's amenities which promote mental and physical exercise and social interaction among other users

### SPECIFIC GATHERING SPACES:

#### ***Small Amphitheater:***

As the main feature of the park, this gathering space allows for individuals and groups to relax, enjoy, and celebrate events such as weddings, movies, classes, and more

Figure 5.15 - Bike Trail Example







Figure 5.16 - Cumberland Park: Canopy Lawn

## PROFESSIONAL DESIGN ETHICS

My design ethics for creating a successful design focuses on three aspects: a sense of community, functionality, and sustainability influences to design for the future. People have stronger and more meaningful connections to these places in which they help create through the use of local materials, community organizations, and the activities they partake in. Functionality offers many experiences for people of all ages throughout the year and contributes to a stronger identity for the design. Sustainability influences the ecological value and overall aesthetics of a place. Together, these aspects help create a variety of interactions between people and places which remain meaningful.

### ECOLOGICAL:

Reduce environmental impact on DeNeveu Creek and promote biodiversity throughout the park.

### ECONOMIC:

Provide cost effective solutions that preserve scarce resources and use local resources to create multi-use spaces.

### SOCIAL:

Provide equitable access to park, encourage diversity, and promote social connections for users of all ages.

## EVALUATION CRITERIA

### ECOLOGICAL:

- Increase tree canopy throughout the area
- Increase legibility of the site boundary
- Maintain existing habitats along DeNeveu Creek
- Increase ecological diversity along DeNeveu Creek
- Improve and increase water infiltration and reuse

### ECONOMIC:

- Design to allow for variable funding opportunities and community contributions
- Design to reflect historical background and value of the project site
- Create a stronger sense of community with focus on and the use of local materials and native plants

### SOCIAL:

- Design project area to be accessible by users of all ages and abilities
- Provide informal and formal open space for activities
- Provide spaces for educational opportunities throughout the project area
- Provide multi-seasonal interests and activities
- Connect McDermott Park to the Fond Du Lac Loop by bike and pedestrian accessibility
- ADA compliant

### OVERALL:

- Decisions are well supported by researched information and precedents
- Maintain a professional relationship and consistent communication with the client
- Respect and evaluate clients' ideas to appropriately implement and best represent the neighborhood

### METRICS:

- Locate and create trails within a 1/4 mile radius of McDermott Park to surrounding existing businesses and facilities
- Increase stormwater storage capacity
- Increase tree canopy by 200%



# MASTER PLAN



## MASTER PLAN

The proposed master plan is made up of McDermott Park and the land adjacent (East) of it. There are two phases of this plan to redevelop. The first phase focuses on McDermott Park and is designed to be implemented within five years. The second phase focuses on the land adjacent to McDermott Park and is designed to be implemented after ten years if the land can be acquired by then to create a site to be used by visitors and community members of all ages.

Figure 6.00 - Proposed Master Plan



Figure 6.01 - Existing Plan



Figure 6.02 - Proposed Master Plan



Figure 6.03 - Master Plan





# SITE DESIGN

Figure 7.00 -- Site Plan







Figure 7.01 - Central Wharf Plaza

## PROGRAM ELEMENTS

### 1 E. JOHNSON STREET UNDERPASS

This will link the proposed multi-purpose trail within McDermott Park to the FDL Loop from the north and provide a safe option for users to get to the park by avoiding vehicular traffic along E. Johnson Street.

### 2 OVERLOOK DECK

An outdoor space with terraced seating allows for individuals and groups to gather for educational and passive recreational purposes.

### 3 BIOSWALES

These features collect, slow down, and infiltrate stormwater into the ground. Plants are selected to remove toxins to increase the air and water quality throughout the park.

### 4 OPEN LAWN

Unprogrammed space provides a variety of activities for users of all ages to enjoy throughout the year. This space can be used as a softball field, ice rink, and or host events. A cistern is constructed along its east side which allows for water to be captured and stored and pumped to supply for irrigation uses as well as for the ice rink.

### 5 OAK GROVE PLAZA

The plaza with mature oaks create a year-round space for users to enjoy with scattered seating options and views across the park.

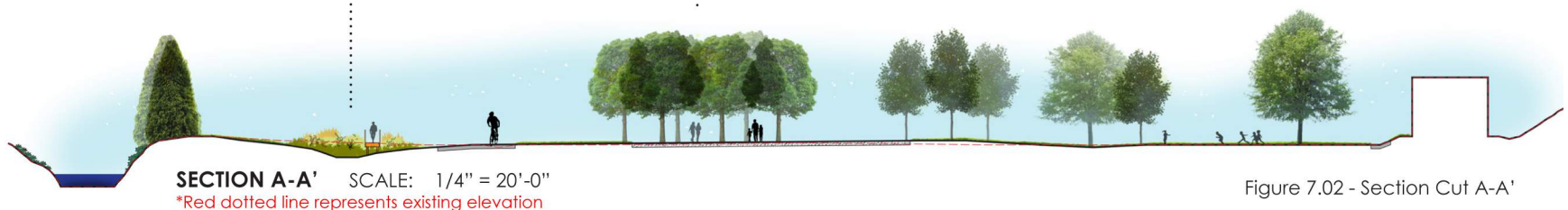


Figure 7.02 - Section Cut A-A'

## PROGRAM ELEMENTS

### 6 AMPHITHEATER

A gathering space for public events, group events and classes, classrooms, and or passive recreation. It is also a stormwater management mechanism with a level spreader constructed below to slowly infiltrate water runoff from the surrounding sites before reaching the creek. This space is ADA accessible and can hold up to 40 individuals.

### 7 LEISURE GARDEN

Located at the highest elevation of the park, this passive space is planted with select plants to provide year-round interest as well as an ecosystem hub to attract pollinators, birds, and butterflies into the area. There are multiple benches located throughout the garden to allow visitors to relax with different views of the entire park. This garden can resemble a botanical garden by including signage to educate visitors of the plants in this site.

### 8 EDUCATIONAL NODES

These signage elements display information of the park's history and wildlife habitats for visitors. These smaller passive spaces are located throughout the park.

### 9 MULTI-PURPOSE TRAIL

An 8 to 10 feet wide trail designed to link McDermott Park to its neighboring businesses, parks, and existing trails. This allows for users to walk, jog, bike, roller-blade, or use a non-motorized mode of transportation to navigate through the park although it can be used by emergency service vehicles as well as vehicles to transport equipment for events.

### 10 PASSIVE NODES

Similar to the educational nodes, these smaller spaces allow users to relax while on breaks or a quick walk in the park.



**SECTION B-B'** SCALE: 1/4" = 10'-0"

\*Red dotted line represents existing elevation

Figure 7.04 - Section Cut B-B'

PROPOSED TOPOGRAPHY

The proposed topography creates a series of rooms throughout the park for different experiences through raised mounds and lowered gathering spaces such as the Amphitheater. The creek region remains the lowest in elevation while the center becomes a high spot in the park.

The Leisure Garden is located in this area shown in the dark orange in Figure \*\*\*. It is designed to capture and treat water runoff from here that will flow onto the surrounding areas. This high spot also provides many different views of the park from that spot.

The lower spots in the park include the Amphitheater and places for bioswales. These areas are designed to remove toxins in the water before reaching the creek to improve its overall water quality.

Figure 7.05 - Proposed Topography Map

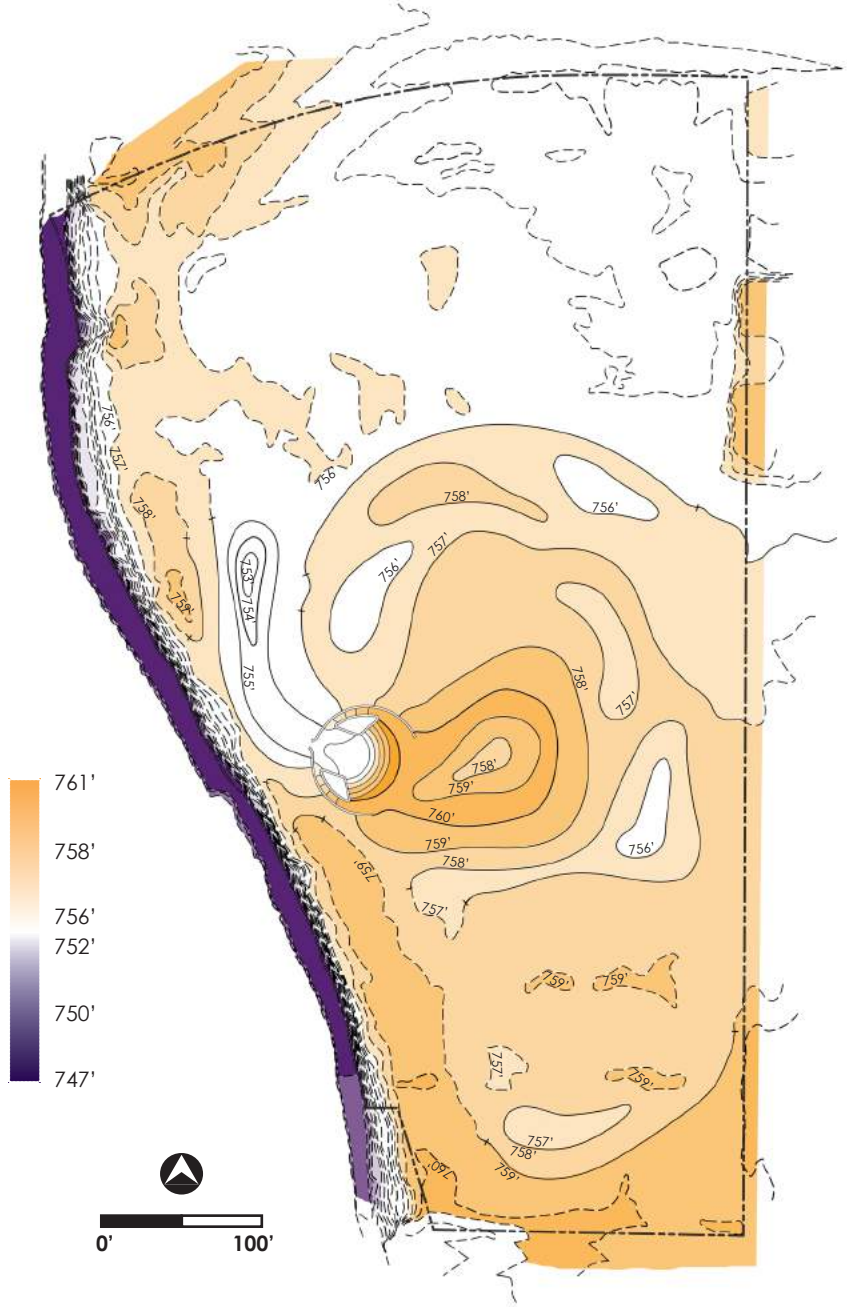
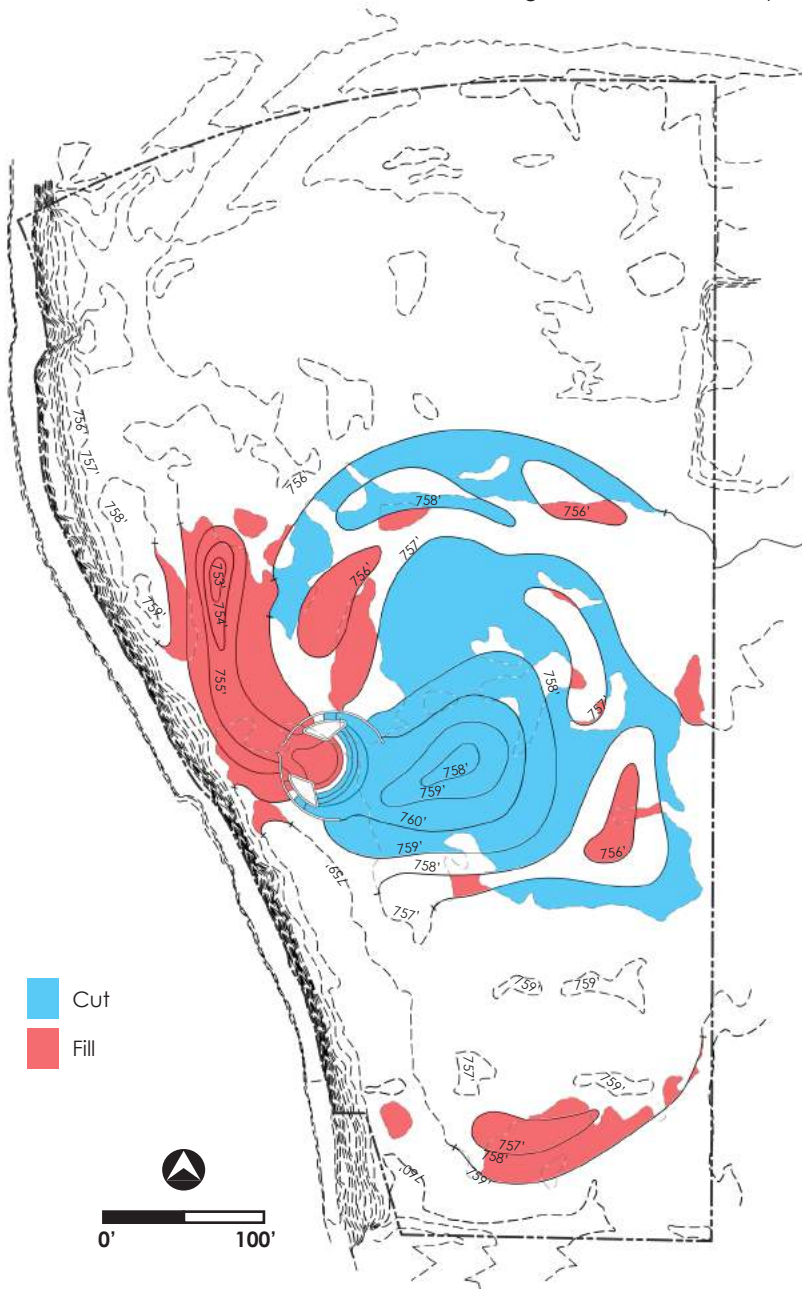




Figure 7.06 - Cut &amp; Fill Map



## GRADING AND DRAINAGE

### Cut

Area	Elevation Change (ft.)	Total Cut (cubic ft.)
36,562.50	1	36,562.50
9,687.50	2	19,375.00
6,671.88	3	11,015.63
546.88	4	2,187.50

**Total:** 69,140.63

**Total (cubic yds.):** 2,560.76

**Compaction Factor: 1.25 Total:** 2,048.61

### Fill

Area	Elevation Change (ft.)	Total Cut (cubic ft.)
64,375	1	64,375
18,750	2	37,500
9,687.50	3	29,062.50

**Total:** 130,937.50

**Total (Cubic yds.):** 4,849.53

**Compaction Factor: 1.25 Total:** 6,061.91

**Total Difference (Cubic yds):** -4,013.91

Figure 7.07 - Cut &amp; Fill Calculations

The negative difference means that there will be more fill than cut, requiring new soil to be added onto the site. The new soil can help to create spaces to capture, direct, and treat water runoff before it reaches Lake Winnebago through DeNeveu Creek.

STORMWATER MANAGEMENT: PRE-Q

Figure 7.09 - Calculatred Pre-Q Values

Pre- Q Values					
Surface Type	Coefficient	Total Area (sq. ft.)	Intensity	Convert to cfs	Q- Value (cfs)
Vegetation	0.35	2,875.01	2.5	/43,560	0.05775
Building	0.95	4900.42	2.5	/43,560	0.26718
Sand	0.85	1646.13	2.5	/43,560	0.0803
Rubber	0.35	5,743.69	2.5	/43,560	0.11537
Clay	0.75	17,115.82	2.5	/43,560	0.73673
Grass	0.35	516,721.05	2.5	/43,560	10.37949
Concrete/ Asphalt	0.9	30,584	2.5	/43,560	1.57974
Total:					13.21656

Figure 7.08 - Pre-Q Values

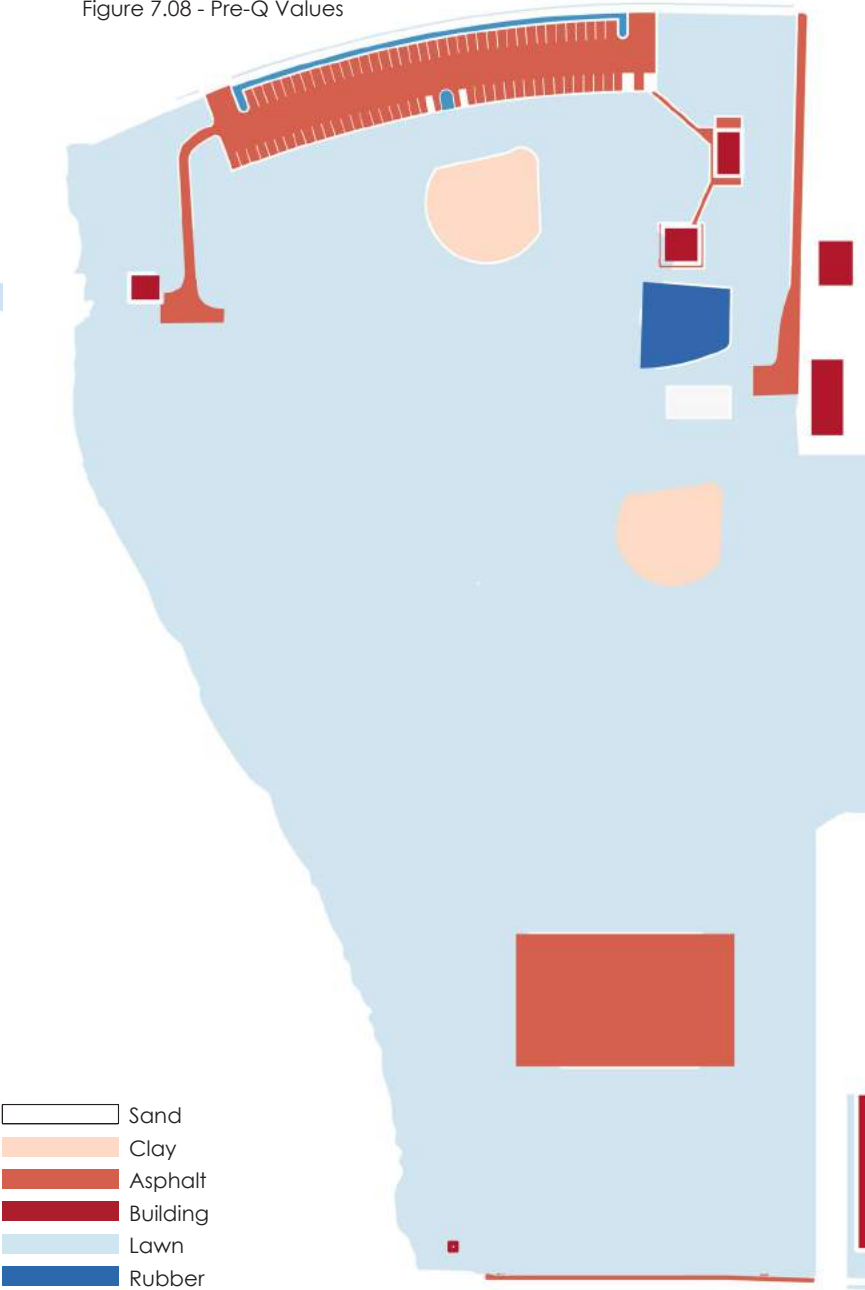
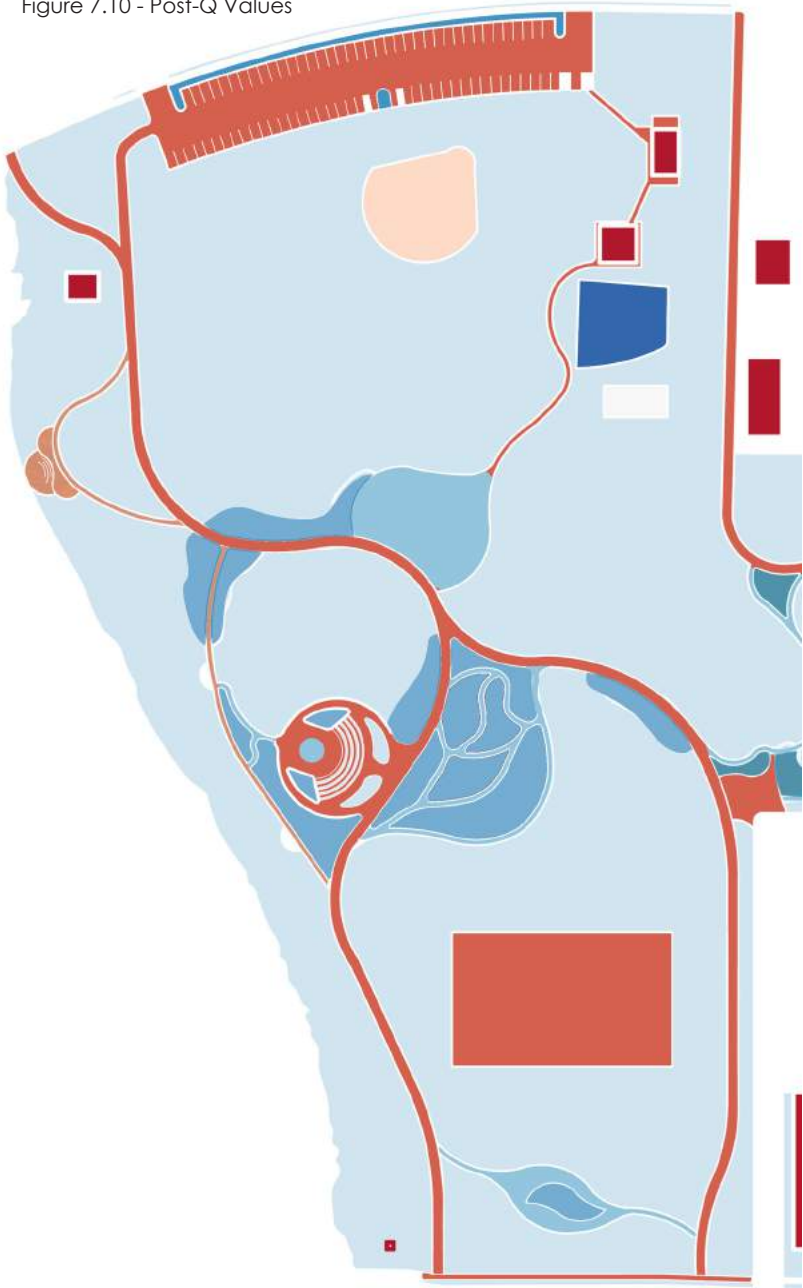


Figure 7.10 - Post-Q Values



STORMWATER MANAGEMENT: POST-Q

Figure 7.11 - Calculatred Post-Q Values

Post- Q Values					
Surface Type	Coefficient	Total Area (sq. ft.)	Intensity	Convert to cfs	Q- Value (cfs)
Vegetation	0.35	32097.16	2.5	/43,560	0.64474
Building	0.98	4900.42	2.5	/43,560	0.27562
Sand	0.5	1646.13	2.5	/43,560	0.04723
Rubber	0.35	5743.69	2.5	/43,560	0.11537
Clay	0.75	8557.91	2.5	/43,560	0.36836
Pervious Concrete	0.65	14771.44	2.5	/43,560	0.55104
Grass	0.35	446026.18	2.5	/43,560	8.95943
Wood	0.4	4956.3	2.5	/43,560	0.11378
Concrete/ Asphalt	0.9	60886.82	2.5	/43,560	3.14498
Total:					14.22055
Post Q - Pre Q =					1.00399

- Sand
- Clay
- Asphalt
- Building
- Lawn
- Pervious Concrete
- Vegetation
- Rubber



## LEISURE GARDEN: PLANTING PLAN

The Leisure Garden is a passive gathering space planted with both native and non-native plants. Plants with year-round interest will help create an identity for this space and different experiences for visitors throughout the year.

This planting plan focuses on the native plants along the outer edges of the garden which are commonly planted within bioswales and gardens lining the multi-purpose trail throughout the entire site. Native plants integrate the Campus District's aspect of educational outreach and can reflect environments found at the Arboretum.

The preferred plants are native and have biophytoremediation qualities to remove toxins in the air, water, and soils to create a healthy environment for visitors. Many of these plants can and will also attract and increase wildlife habitats into the area for butterflies, birds, and pollinators.

One of the main goals is to ensure diversity. Following the concept of the Urban Forest Guidelines can help achieve this goal to reduce the risk of major losses of plants due to pests.

Selecting a variety of plants with different heights will create different rooms within this garden. Plants with a quick growth rate are also preferred to establish a strong base and provide an aesthetically pleasing atmosphere with the first phase of the Master Plan.

Figure 7.12 - Site Plan: Leisure Garden



KEY	Scientific Name	Common Name
<b>TREES</b>		
CC	<i>Carpinus caroliniana</i>	American Hornbeam
QB	<i>Quercus bicolor</i>	Swamp White Oak
CJ	<i>Cercidiphyllum japonicum</i>	Katsura Tree
<b>SHRUBS</b>		
Hv	<i>Hamamelis virginiana</i>	Common Witchazel
Cs	<i>Cornus sericea</i>	Redosier Dogwood
<b>GRASSES</b>		
sh	<i>Sporobolus heterolepis</i>	Prairie Dropseed
bc	<i>Bouteloua curtipendula</i>	Sideoats Grama
ss	<i>Schizachyrium scoparium</i> 'The Blues'	The Blues' little bluestem
ec	<i>Elymus canadensis</i>	Canada Wild Rye
<b>FLOWERS</b>		
ep	<i>Echinacea purpurea</i>	Purple Coneflower
af	<i>Agastache foeniculum</i>	Lavender Hyssop
ai	<i>Asclepias incarnata</i>	Red Milkweed
hh	<i>Heliopsis helianthoides</i>	Ox Eye Sunflower
ls	<i>Lobelia siphilitica</i>	Great Blue Lobelia
bl	<i>Baptisia lactea</i>	White False Indigo

Figure 7.13 - Planting Schedule



Figure 7.14 - Different heights of plants creating different experiences and spaces for everyone

Figure 7.15 - Leisure Garden: Planting Plan





## CONSTRUCTION DETAIL: GABION BENCH

Scale: 1/2" = 1'-0"

7- 2"x4" CEDAR WOOD,  
CONSTRUCTION COMMON, #2  
OR BETTER, ALL KNOTS TIGHT,  
ACQ TREATED, ATTACH TO  
3"x3"x2" CEDAR WOOD WITH 2  
#8 x 2" DECK SCREWS, CERAMIC  
COATED, 'GRK' FASTENERS

PERVIOUS PAVEMENT,  
SEE DETAIL

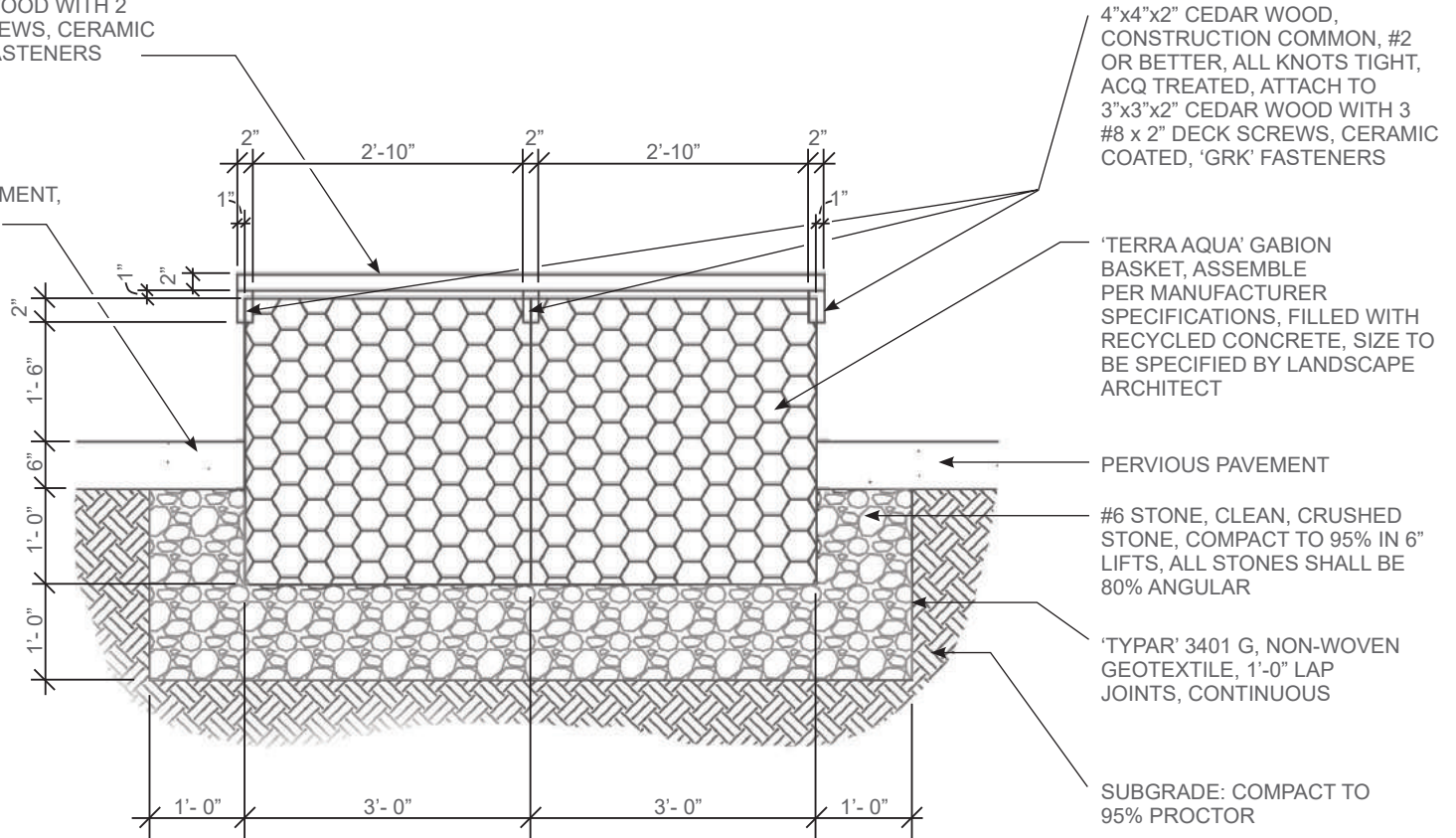


Figure 7.16 - Gabion Bench Detail

# CONCLUSION

## REFLECTION

### Content:

The information I gathered during the semester is accurate. With data that seemed to be out dated, I researched more to find the most up-to-date information. Some data sets were not complete but I used resources within the University as well as resources from the city of Fond du Lac and my clients to find data sets that were more complete.

### Process:

The process portion was one of the most difficult parts of Capstone for me. I became very confused about the scale for the analyses but later realized that everything was interconnected and helped create a stronger proposal plan. I reevaluated the site many times over to see how to create the best presentation for my proposal. There were more maps and analyses I should have created to better understand my site before I made my proposed design.

### Premise:

The proposed program elements and goals of my client's were very appropriate. I admired their idea of redeveloping the site in phases with the first phase to be opened to the public as a celebration of the park. I believe the design topic I chose to investigate for this project was appropriate. The idea of bringing people of all ages into this park by encouraging and promoting a daily healthy lifestyle is one that benefits many people and the park itself. My client helped me see a different view on what was important for community members of many ages.

### Self reflection:

Overall, I thought the capstone project was a very well thought out and intense project. I did not quite understand how my relationship with my client would be but after talking

with my client, she made it very easy for me to approach her with questions and thoughts to go through this project. I wanted the best proposal for my client because I tried to apply this project to be what I thought would be similar that in a real firm but I realized that I should have not thought of it like that. This project acts like an internship itself and although I wanted the best for my client, this project was the first of its kind for me as a big learning experience that has taught me the things I enjoyed and did not enjoy and how to approach these instances later on in future projects.

# APPENDIX

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All pictures of Cumberland Park found at <http://www.lan-dezine.com/index.php/2013/04/cumberland-park-by-hargreaves-associate/>

Figure 5.05 - Cumberland Park: Before, Hargreaves Associates  
Figure 5.06 - Cumberland Park: After, Aerial Innovations TN Inc.

Figure 5.07 - Slide, Gorge Wall, & Explorer Trail, Hargreaves Associates



Figure 5.08 - Master Plan, Hargreaves Associates

All pictures of Klyde Warren Park found at <http://www.lan-dezine.com/index.php/2014/11/klyde-warren-park-by-the-office-of-james-burnett/>

Figure 5.09 - Promenade, Mei-Chun Jau

Figure 5.10 - Water Play Feature, Mei-Chun Jau

Figure 5.11 - Botanical Garden, Dillon Diers Photography

Figure 5.13 - Master Plan, The Office of James Burnett

Figure 5.14 - Endless Opportunities,

Figure 5.15 - Bike Trail Example, Google.com

Figure 5.16 - Cumberland Park: Canopy Lawn, Nashville Metro Parks

Figure 6.00 - Proposed Master Plan,

Figure 6.01 - Existing Plan,

Figure 6.02 - Proposed Master Plan,

Figure 6.03 - Master Plan,

Figure 6.04 - Example of Bioswale with gabions, <http://lid.ok-state.edu/images/Osorb-Bioswale-0113-de.jpg/image>

Figure 6.05 - Examples of Community Garden Plots,

<http://www.cityfarmer.info/wp-content/uploads/2009/09/scotts.jpg>,

[http://3.bp.blogspot.com/\\_MKNJiMpG2y4/TNGaztFxeqI/AAAAAAAAAD8/uQl1u8xdef4/s1600/AerialGardens2.JPG](http://3.bp.blogspot.com/_MKNJiMpG2y4/TNGaztFxeqI/AAAAAAAAAD8/uQl1u8xdef4/s1600/AerialGardens2.JPG),

[http://cowichangreencommunity.org/wp-content/uploads/2014/09/IMG\\_0236-e1409877896339.jpg](http://cowichangreencommunity.org/wp-content/uploads/2014/09/IMG_0236-e1409877896339.jpg)

Figure 7.00 - Site Plan,

Figure 7.01 - Central Wharf Plaza, <https://www.asla.org/2011awards/230.html>

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Figure 7.14 - Different heights of plants creating different experiences and spaces for everyone,

Figure 7.15 - Leisure Garden: Planting Plan,

Figure 7.16 - Gabion Bench Detail,

## LITERATURE REFERENCES

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### Grading Calculations:

Cut			
Area	Elevation Change (ft.)	Total Cut (cubic ft.)	
	36,562.50	1	36,562.50
	9,687.50	2	19,375.00
	6,671.88	3	11,015.63
	546.88	4	2,187.50
Total:			69,140.63
Total (cubic yds.):			2,560.76

Compaction Factor: 1.25      Total:      2,048.61

Fill			
Area	Elevation Change (ft.)	Total Cut (cubic ft.)	
	64,375	1	64,375
	18,750	2	37,500
	9,687.50	3	29,062.50
Total:			130,937.50
Total (Cubic yds.):			4,849.53

Compaction Factor: 1.25      Total:      6,061.91

Total Difference (Cubic yds):      -4,013.91

### Stormwater Calculations:

#### Pre- Q Values

Surface Type	Coefficient	Total Area (sq. ft.)	Intensity	Convert to cfs	Q- Value (cfs)
Vegetation	0.35	2,875.01	2.5	/43,560	0.05775
Building	0.95	4900.42	2.5	/43,560	0.26718
Sand	0.85	1646.13	2.5	/43,560	0.0803
Rubber	0.35	5,743.69	2.5	/43,560	0.11537
Clay	0.75	17,115.82	2.5	/43,560	0.73673
Grass	0.35	516,721.05	2.5	/43,560	10.37949
Concrete/ Asphalt	0.9	30,584	2.5	/43,560	1.57974

Total:      13.21656

#### Post- Q Values

Surface Type	Coefficient	Total Area (sq. ft.)	Intensity	Convert to cfs	Q- Value (cfs)
Vegetation	0.35	32097.16	2.5	/43,560	0.64474
Building	0.98	4900.42	2.5	/43,560	0.27562
Sand	0.5	1646.13	2.5	/43,560	0.04723
Rubber	0.35	5743.69	2.5	/43,560	0.11537
Clay	0.75	8557.91	2.5	/43,560	0.36836
Pervious Concrete	0.65	14771.44	2.5	/43,560	0.55104
Grass	0.35	446026.18	2.5	/43,560	8.95943
Wood	0.4	4956.3	2.5	/43,560	0.11378
Concrete/ Asphalt	0.9	60886.82	2.5	/43,560	3.14498

Total:      14.22055

Post Q - Pre Q =      1.00399