

## ABSTRACT

Title of Thesis: CHOREOGRAPHING A GREENWAY:  
EXPLORING EXPERIENTIAL DIVERSITY  
THROUGH CHOREOGRAPHIC DANCE  
PRINCIPLES

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Successful parks provide a rich assortment of experiences that stimulate the body, senses, and emotions. Another way to describe this quality is the term experiential diversity. While experiential diversity is rarely addressed explicitly in typical greenway designs, its implementation is vitally important in order to increase engagement and activate space. The Anacostia riverfront in Washington, D.C. suffers from a severe lack of experiential diversity and is redesigned in this thesis to explore how experiential diversity can enhance greenway design using choreographic dance principles. Many dance principles can be applied to design. By approaching park design as a choreographer of dance, a designer can focus on the human experiences – how materiality and the environment influence movement, senses, and emotions. This thesis demonstrates how dance can be successfully translated into the landscape, and how choreographic dance principles are helpful tools for creating a diverse and engaging landscape composition.

CHOREOGRAPHING A GREENWAY: EXPLORING  
EXPERIENTIAL DIVERSITY THROUGH CHOREOGRAPHIC  
DANCE PRINCIPLES

by

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# Chapter 1: Introduction

## *1.0 Opening Statement*

Successful waterfront parks provide a wide variety of activities supported by diverse environments and well-designed spaces. These parks provide a rich assortment of experiences for various users, different levels of passive and active spaces, as well as different atmospheres. Another way to describe this condition is the term “experiential diversity.” This is a new term that I define as a variety of experiences that stimulate movement, senses, and emotions. It is important for a park to have this diversity because this condition activates space and engages all types of users. Despite its importance, there seems to be a lack of techniques that help enhance experiential diversity.

One location in need of experiential diversity is located in Washington, D.C. along the Anacostia riverfront. All along a two-mile stretch between 11<sup>th</sup> Street Bridge and East Capitol St. SE is a monotony of experience. The majority of the site is comprised of large areas of mowed lawn, a few trees, and a paved path that runs parallel with the river. The Anacostia riverfront also suffers from a number of issues including water quality and accessibility. Designing a greenway park along the Anacostia River will address the need to redesign the waterfront for an area that is growing, for a river whose ecological conditions were long-time neglected, and for a neighborhood whose access to the river was severed by a freeway.

As an alternative to designing this greenway park through the typical lenses of ecological and social benefits alone, this thesis explores how experiential diversity

can enhance greenway design by using choreographic dance principles. Using dance principles can be a helpful tool to create experiential diversity because many choreographic principles can apply to design. Similar to a designer, a choreographer must also create contrast and variety while paying particular attention to the body, senses, and emotion. Lawrence Halprin, an influential landscape architect who also worked on the master plan of the Anacostia Riverfront in the 1960s, provides significant precedent for combining dance and design. In order to translate dance into landscape design and apply them to the Anacostia riverfront, this thesis project:

1. Analyzes the Anacostia riverfront site conditions as normally conducted in the design process.
2. Describes existing literature on greenway design, but adds to this the principles of dance choreography and techniques landscape architect Lawrence Halprin used to incorporate choreography into his designs.
3. Develops a methodology that translates choreographic dance principles into landscape design at multiple scales.
4. Implements the methodology to enhance experiential diversity along Anacostia waterfront.

### 1.1 Greenways Literature Review

#### *Definition*

Greenways are bands of landscape that possess natural and recreational resources. They can border waterways, traverse ridgelines, and can range from

narrow urban trail corridors to wide expansive floodplains. Primarily, the key characteristic of a greenway is its network of linear lands (Hellmund & Smith, 2006).

#### *Greenway Opportunities and Benefits*

Greenway projects tend to be initiated because of landscape problems such as flooding, decline of greenspace, or polluted environments (Hellmund & Smith, 2006). Landscapes everywhere are experiencing habitat loss, fragmentation, and isolation due to development. In a fifteen-year period from 1982-1997, the total amount of developed land in the United States increased by more than 25 million acres (Hellmund & Smith, 2006).

Increased fragmentation and fewer acres of undeveloped land reduces habitat and diversity of wildlife including birds, mammals, reptiles, fish, and plants. Fragmented habitat landscape patches can decrease the productivity and quality of the patches. Isolated patches can prevent seeds from reaching other suitable habitat or spread apart predators and prey (Hellmund & Smith, 2006). Currently, there are over 1,300 species of plants and animals listed as threatened or endangered (EPA, 2018).

Development also erode soils, generating excess nutrients and toxic chemicals that reduce water quality in wetlands, streams, and aquifers. The impermeable surfaces of development such as buildings and roads prohibit stormwater infiltration and subsequently increase surface runoff that can alter hydrology of nearby streams and rivers (Sabbion & Perini, 2016; Hellmund & Smith, 2006).

Greenways support diverse landscape functions and preserve connectivity. From an ecological standpoint, greenways can keep areas clear of most development, providing habitat for plants and animals and wildlife corridors that are essential for

wide-ranging species (Shen, 2017). Greenways bordering stream corridors can help reduce flood damage by infiltrating excess stormwater. They filter excess nutrients in the ground water, provide habitats for aquatic species, and create shade that lowers water temperatures (Sabbion & Perini, 2016; Hellmund & Smith, 2006).

Greenways also provide social benefits for a community. Greenways can reconnect people to nature in their daily lives and provide active and passive recreational opportunities such as jogging, walking, biking, and fishing. They also have the potential to promote social justice and quality. Because of their linear shape, greenways tend to connect diverse neighborhoods, further increasing public access (Keith et al., 2018). Greenways also tie communities together by linking parks, historic sites, residential areas, and shopping districts allowing people to travel between them car-free. However at the same time, greenways also can contribute to neighborhood gentrification, raising land prices and increasing spatial segregation of different income groups. For example, in Boulder, Colorado, the housing prices rose dramatically in the 1990s when the greenbelt greenway was implemented. As a result, many residents who could not afford these houses had to leave the city, creating sprawl (Hellmund & Smith, 2006). Thus, it is important for agencies to work together when planning a greenway.

A less definable but equally important benefit of greenways is their aesthetic appeal. Greenways often follow a physiographic corridor such as a stream or ridgeline that have can provide scenic views. Greenways also facilitate historic preservation. For example, landowners may make small gains when an abandoned right-of-way of a railroad is divided up and returned to adjacent landowners.

However, when the corridor stays intact and becomes a designated greenway, something unique is preserved for the community. In the last thirty-five years, the Rails-to-Trails Conservancy estimates that 12,650 miles of abandoned railroad tracks have been converted to rail-trail greenways in the United States, serving approximately 100 million users per year (Hellmund & Smith, 2006)

The environmental, social, and economic benefits of greenways have been widely studied (Keith et al., 2018, Hellmund & Smith, 2006, Linehan et al., 1995, Gobster, 1995). However, there seems to be a lack of discussion about creating experiential diversity for people on the greenway. Most greenway designs simply add biking and walk trails but there other ways to stimulate human activity along a greenway that are discussed in this thesis.

## 1.2 River Restoration Principles

### *Restoring Riverfronts for the Public*

Riverfront designs should consider the needs of its users from all neighborhoods, ages, and cultures (Otto et al., 2004). Successful riverfront projects increase public use through the design of parks, trails, docks, and special events such as concerts and festivals. The designs should allow the community to experience the river up close so that people can touch and interact with the river through activities such as wading, boating, fishing, or simply sitting by the riverbank. Lively and diverse places are created as a result of this physical and visual access, fostering a sense of community and appreciation for nature (Otto et al., 2004).

The Connecticut River once was severed from downtown Hartford, Connecticut by the Interstate 91 highway. In 2001, a \$22-million Riverfront Plaza was constructed over the highway, creating a seamless connection from downtown to the waterfront (Otto et al., 2004). Now, the plaza creates versatile gathering spaces and has become a popular venue for concerts, boating, and fishing and attracting 850,000 visitors and generating \$17 million in 2001.

Another example of restoring riverfronts for the public lies in the nation's capital. In Washington D.C., a series of new biker-pedestrian bridges was built along the Anacostia River to provide visitors an intimate, yet low-impact experience with the river and its marshes (Otto et al., 2004).

Connecting the public to the river is vital for long-term sustainability. Connections through recreational activity, restoration projects, and educational programming can increase public support for river restoration and its protection (Otto et al., 2004; Middleton, 2001). Communities can participate in the restoration process by identifying sites in need of restoration and performing stream monitoring and maintenance. On-site educational opportunities can also increase a sense of attachment to the river and foster a sense of stewardship and environmental consciousness (Louv 2006, 2008).

### *Restoration Design Principles*

According to Otto et al., there are several design principles to river restoration.

1. *Preserve natural river features and functions.* Avoid structural engineered approaches such as dams, pipes, and channelization that can alter natural flows and equilibriums of the water and sediment supply.

2. *Buffer sensitive natural areas.* Buffering along the river protects water quality, wildlife habitats, and fragile areas around the stream such as steep slopes and wetlands. If filtering pollutants is the goal, stream buffer widths should be a minimum of 100 feet and the first 25 feet of the buffer should always be kept free of development, preferably with canopy trees and aquatic vegetation. Trail lookouts and bike paths can be placed in the first 25 feet closest to the river, while athletic fields, lawns, and playground should be placed farther away.
3. *Restore riparian and in-stream habitats.* Successful habitat restoration projects replant native species and enforce no-mow zones in riparian buffers. A rebuilt channel should have a natural shape with boulders, gravel, and logs to create riffles, pool, and other natural river features. Daylighting a stream is another restoration approach that involves excavating a stream that has been trapped in an underground pipe. Once the stream is daylighted, it has the capacity to clean runoff and absorb high velocity flows during storm events.
4. *Reduce hardscapes* by minimizing pavement on roads and in parking lots. If removing hardscape is improbable, alternative paving materials such as permeable paving can be used to better infiltrate stormwater.
5. *Manage stormwater on site* and use non-structural approaches such as bioretention ponds and bioswales.
6. *Balance recreational and public access goals with river protection.* Greenways and river trails are both adept solutions to this balance. They enhance both access and the environment by protecting the floodplain,

buffering rivers as well as providing recreational access. Water trails are also becoming increasingly popular. A water trail is “a stretch of river, shoreline, or ocean that has been designated to provide educational, scenic, and challenging nature-based experiences to recreational boaters” (Otto et al., 2004, 91). A water trail can inspire users, unify communities, and serve as an outdoor classroom by providing hands-on experience.

7. *Celebrate the river’s unique environmental and cultural history.* Incorporate information about the river into the design of riverfront features, public art, and interpretive signs. The public is more likely to support efforts to improve and protect their river if they are informed about river ecology (Otto et al., 2004). They can also use the river more safely if they know about water quality issues and hazards.

### *Marsh Restoration*

Fundamental requirements to achieving a successful marsh restoration are “understanding the function (of the marsh), giving the system time to restore, and allowing for the self-designing capacity of nature” (Mitsch & Wilson, 1996, 77). In ecological-engineered design, it is important to lightly manage self-organization (Weinstein et al., 2001). Instead of specifying exact organisms and plants, human intervention should be minimized to allow nature to take over. Many species can first be introduced, but after the initial period of competitive colonization, the prevailing species should control the spatial diversity and population regulation (Odum, 1989). The aesthetics of a restoration project is important for public acceptance, however an overly-managed and manicured restoration can be detrimental. A good balance



between aesthetics and ecological functions facilitate a durable restoration (Weinstein et al., 2001).

Another principle when restoring a marsh is to increase edge –the interface between the marsh plain and tidal creeks. More edges increase the exchange of marsh products (Weinstein et al., 2001) and the overall productivity. Edge can be increased by creating different elevations and with different hydroperiods. Another way of creating more edge and more complexity is through a subtidal channel or tidal creek. These channels provide refuge for aquatic organisms at low tide but also act as passages between the estuary and marsh plain where primary production that takes place (Weinstein, 1981; Deegan, 1993).

Freshwater marshes can take 15-20 years to fully recover (Mitsch & Wilson, 1996). According to a twenty-year study of the tidal marsh restoration program along the Connecticut coast, the rapid recovery of vegetation tend to occur in lower elevations where the soil water tables are high and the hydroperiods are long (Warren et al., 2002). The recovery of other biota do not necessarily depend on the vegetation. The high marsh snail *Melampus biantatus* took twenty years to reestablish while the typical fish species were found in the restored area within five years. The herons, egrets, and other shorebirds returned once marsh and its ecological functions were fully restored. (Warren et al., 2002).

### 1.3 Principles of Choreography

Instead of solely addressing greenway design through the typical social and ecological lenses, this thesis strived to advance principles of greenway design by enhancing experiential diversity through choreographic dance principles. In order to

understand these principles and translate them into the landscape, the following principles were identified.

### *Definitions*

Choreography is the “art of planning and arranging dance movements into a meaningful whole; the process of building a composition” (School Curriculum and Standards Authority, 2012). A dance is made up of choreographic phrases. Each choreographic phrase is a sequence of movements that convey a feeling, a part of a story, or a style (Blom & Chaplin, 1982, 30). The link between phrases is called a transition. Transitions must be seamless so that the dance will appear cohesive. Rather than abruptly changing from a fast-paced phrase to a slow-paced one, the choreographer might have the dancers “slowly melt” between phrases (Ambrosio, 1999).

### *Form*

Choreographic form allows a choreographer to arrange dance phrases together. There are two major structures.

1. AB, ABA, Rondo:

In an AB form, Part A and Part B are two contrasting phrases that can differ in energy, movement, and style (Minton, 2007). For example, Part A can be high in energy with rigid movement while Part B can be low in energy with graceful movement. ABA is similar to the AB structure however the two contrasting parts are developed followed by a return the first phrase. A rondo (ABACAD) is based on one leading theme (A) that is combined with other

phrases. Having a principal theme adds unity to the piece even as new phrases are introduced.

## 2. Rhapsodic/Narrative

This type of dance form is composed of emotions or moods. Movements can be created to express pure feelings or “rhapsodies.” Along those lines, a dance can become a narrative that tells a story (Minton, 2007). For example, *Sleeping Beauty* is a notable classical ballet that tells the story of a fairy tale. The general structure of a narrative includes an introduction of characters, development, climax, and then resolution (Blom & Chaplin, 1982).

### *Movement and Music*

Movement and music are key components of dance. “Movement is the source of dance and music is a related art that is used to help achieve the choreographic intent” (Blom & Chaplin, 1982, 162). There are various methods where dance and music can be choreographed together. Music can be background while the dance is the main focus. Or if a musical piece has several instruments, each instrument can be represented by a dancer whose movements imitate the instrument’s music. For example, if the instrument goes up in scale, the dancer rises higher in space. Another method to combine dance and music is that the movement is dictated by how the dancer or choreographer sees or feels the music (Blom & Chaplin, 1982, 162-164).

### *Choreographic Dance Elements*

While there are many different styles of dance, all choreographers manipulate space, time, and energy of a dance to enhance the overall composition (Minton, 2007).

#### 1. Space

“Movements mold the spatial aspects of dance” (Minton, 2007, 22). Elements of space include shape, level, and floor patterns. Shape is the configuration of body parts and contours the body creates. The body can create many different shapes including curved, linear, symmetrical, asymmetrical, twisted, flat, small, and large. Level is the dancer’s height in relation to place (Minton, 2007). High levels involve airwork where a dancer might jump or leap into the air. Middle levels involve a standing or bent leg position and low levels involve a kneeling or lying down position. A dance can become more interesting when a choreographer changes levels in a dance. The use of levels also helps create meaning in a dance. For example, themes of joy or floating in the clouds might require movements at a high level. In contrast, themes of sadness might require movements at a low level (Minton, 2007). Floor patterns are another spatial element of dance in which the choreographer moves dancers around the stage. The use of floor patterns “enhance the visual appeal” of a dance (Minton, 2007). Patterns can include a zig-zag shapes, staggered lines, circular formations and each depicting different meanings. For example, to depict flowing water, a choreographer might move dancer along a meandering pattern similar to a meandering stream.

## 2. Time

Unlike other art forms such as painting and sculpture, dance happens within a given time frame. A specific mood or feeling can be created with a “combination of timing elements” (Minton, 2007, 30). During a dance, a choreographer can change the tempo and rhythm. The tempo is the speed of the music. The rhythm is a combination of short and long beats and can be regular, irregular, simple or complex (Minton, 2007).

## 3. Energy

During a dance, a dancer can exert different amounts of energy to accomplish a movement. The amount of energy determines “the duration, intensity and speed of each movement” (Minton, 2007, 32). Sustained movement occurs when the dancer performs a movement very slowly. The release of energy is constant and slow (Minton, 2007). On the other hand, percussive movement is when there are sharp bursts of energy.

### *Variety and Contrast*

Variety is essential to a good dance composition (Minton, 2007). In order to keep the audience engaged and excited, a variety of contrasting movements and techniques can be implemented. Contrasting elements include angular and curvilinear body shapes, gentle and strong movements, slow and fast tempos, orderly or chaotic floor patterns (Powers, 2011). Changing elements of space, time, and energy can also add variety and enhance experiential diversity.

#### 1.4 Lawrence Halprin's Choreographic Process

##### *Scores and the "Motation" Method*

Translating dance into the landscape is not a novel idea. Lawrence Halprin, an influential landscape architect in the 1960s, used dance throughout his design process. In the visual and performing arts field during the 1960s, "a progressive liberation from the observer to the active participant occurred" (Hirsch, 2014, 2). Lawrence Halprin's wife, Anna, an avant-garde dancer and choreographer, was directly involved in this movement and her work "soon infiltrated her husband's work" (Hirsch, 2014, 2). In her dance workshops, Anna organized interactive events where the performance involved the audience and the resulting performance was left open-ended. Lawrence Halprin implemented these performance theories of "open score" to his work by "designing public spaces as scores" (Hirsch, 2014, 2) in order to encourage participation and activate his projects.

Another way Halprin used dance in his designs was through his method of "Motation" in which people's movement was visualized and recorded. This method was heavily influenced by Labanotation, a common notational system for dance choreography. Halprin choreographed how different users would move over time. He noted their speed, what part of the body might be moving, the level of the surrounding sounds, and stage position (Figure 1). Only after the movement was visualized and choreographed through motation did Halprin begin to design the landscape. Halprin explains, "the environment exists for the purpose of movement" (Hirsch, 2014, 13). While Halprin never used motation for his actual designs, his

[illegible]

*interesting patterns of terraces and paths, varying its texture of paving underfoot, and its foliage backgrounds, and fences, all rhythmically united, then it can influence people's movement patterns through its spaces taking on the fine sense of a dance.*” (Halprin, 1949 as cited in Hirsch, 2014, 46).

Lawrence Halprin's work demonstrated his interest in “designing environments that stimulated the body, senses, and emotions” (Hirsch, 2014, 51). According to Halprin, plants can be used in a dramatic manner to spotlight notable features. Including a “trickle of water, bird songs, tinkle of glass bells...bring music to the garden stage” and adding “fountains, the flight of birds, or an open fire at night...bring action” (Sunset, 1947, 44-45 as cited in Hirsch, 2014, 279). Halprin also paid close attention to “textures, transitions and sequences, directing views” (Hirsch, 2014, 51) often creating “processional schemes to be experienced as unfolding of shifting opportunities” (Hirsch, 2014, 52). In another article appearing in *Progressive Architecture* in 1958, Halprin explains one of his processional sequences of the Kentfield property in Marin County:

*“This entrance garden is a space confined on three sides...but the space explodes outward to the view on the down side...There, sequences directed the visitor to different outlooks, steps and other climbing features would entice movement up or down”* (Halprin, 1958 as cited in Hirsch, 2014, 48)

#### *Application*

Lawrence Halprin's many strategies of incorporating dance into design are useful tools that integrate artistic movement and participation with the design of



spaces. His process pays close attention to sequential experiences that stimulate movement, sense, and emotions that can enhance experiential diversity.

## Chapter 2: Site Inventory and Analysis

### 2.0 Site Selection

The Anacostia waterfront is the perfect location to implement a greenway and explore experiential diversity techniques because both components can alleviate many of problems that burden the Anacostia riverfront. The Anacostia riverfront deals with water quality issues, lack of accessibility, and social justice issues. The site was chosen for three primary reasons.

#### *Reason 1 – Water Quality Issues*

##### History of the Anacostia River

The Anacostia River is approximately 8.5 miles long, beginning at Bladensburg, Maryland and ending at the Potomac River confluence (Figure 2). The river's watershed spans 176 square miles incorporating lands within the District, Prince George's and Montgomery counties.

In the early 17<sup>th</sup> century, an estimated 10,000 Nanchotank Native American Indians lived on the river. Migratory and resident fish such as American shad, rockfish, sturgeon, and herring provided the Nanchotank Indians with bountiful food sources. In 1608, Captain John Smith, an English explorer, visited the Anacostia River basin while surveying navigable waters in the region. Captain Smith's visit opened the door for subsequent European settlement that led to dramatic changes to the watershed's land use (Wennersten, 2008).

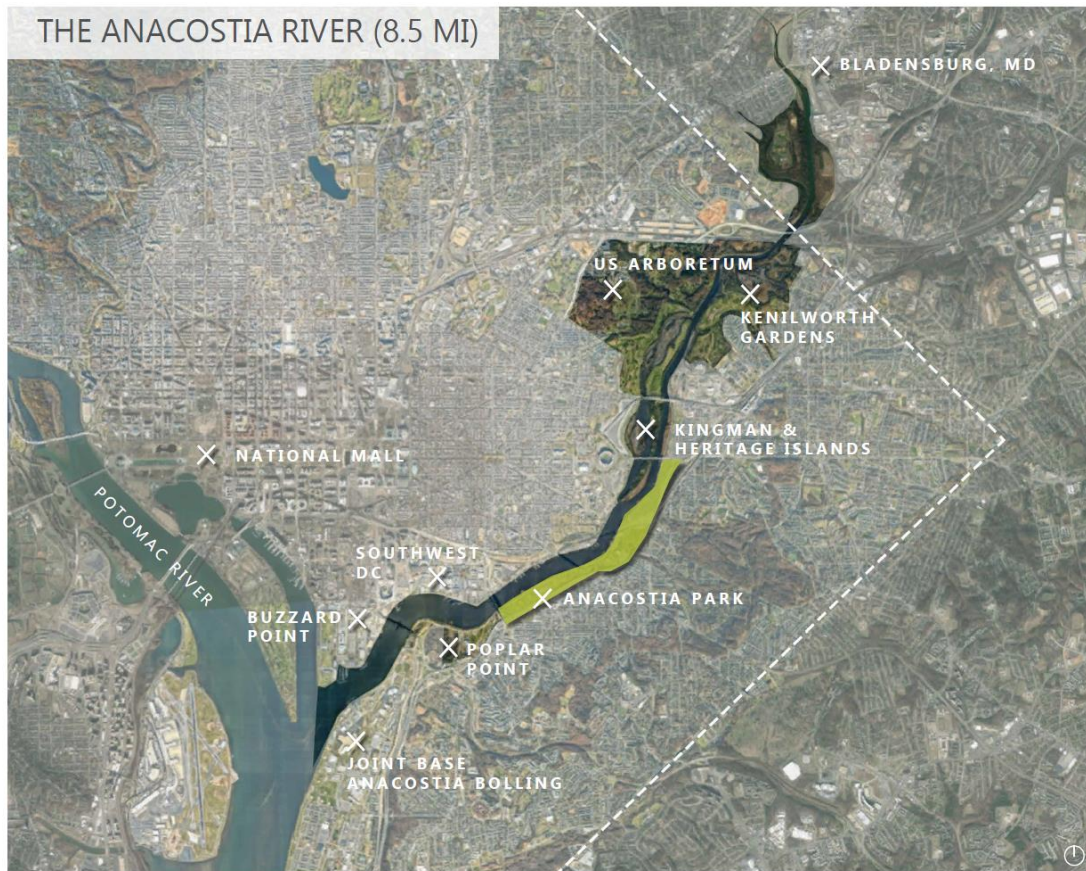


Figure 2: Anacostia River (Ren)

English settlers began to clear the forest in the watershed to grow tobacco, corn, and grain. These crops were loaded onto sea-faring ships in Bladensburg, the primary seaport for Washington, D.C back then. By 1860, these well-developed agricultural fields accelerated sedimentation and created extensive mud-flats along the banks of the Anacostia, crippling the Bladensburg seaport. During the Civil War, in order to defend the Capital, massive deforestation efforts were taken to create lookouts and clear views. This clearing of trees in the watershed hastened land erosion and the building of guns and gunboats at the Navy Yard filled the river with even more silt. By 1875, the Anacostia water depth had shrunk from 44-feet deep to a mere 8-feet deep (Williams, 2001). To make matters worse, eight outfalls dumped ten million gallons of raw sewage into the river daily. When the tide fell

during the summer time, sewage stifled the aquatic grasses and malarial mosquitoes thrived. Consequently, there were several malaria outbreaks and other diseases in D.C (Wennersten, 2008).

It was not until 1902 that Congress approved funding for the U.S. Army Corps of Engineers to dredge portions of the tidal Anacostia. The construction of Kingman Island was a result of the Corps dredged sediment project. Meanwhile, industry continued to expand and soon the Anacostia River became a dumping ground for sanitary sewage. Overflow from the city's trash transfer station, runoff from the Metrobus maintenance yard, and weapons waste at Navy Yard also contributed to the pollution of the river. Figure 3 shows a graphic representation of the history of the Anacostia River broken up into categories of people, products, and land use.

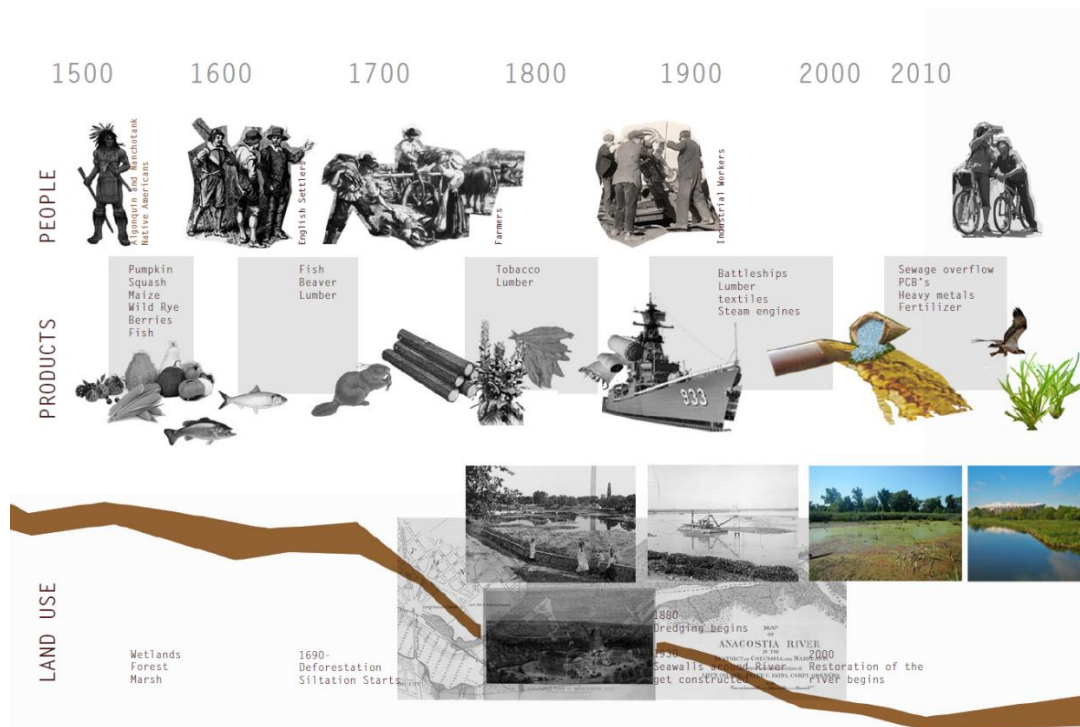


Figure 3: Anacostia River History (Ren)

## Current State of the River

Today, the Environmental Protection Agency estimates that less than 10 percent of the Anacostia watershed's original forests and wetlands remain. By the late 1980s, the Anacostia River lost 98 percent of its tidal wetlands and 75 percent of its freshwater wetlands (Chesapeake Quarterly, 2010).

With less vegetation, increasing populations, and old infrastructure, water issues in the District have become inescapable. Stormwater runoff is responsible for 75%-90% of the Anacostia's current pollution (Turrentine, 2016). One inch of rain can produce 1,000 to 1,500 gallons of runoff from a 1,500 square-foot roof (Simpson, 2011). In D.C., most stormwater runoff is not able to infiltrate into the ground because of impermeable surfaces such as rooftops, parking lots, and roadways. During storm events, this rapid runoff can only flow into storm drains, straining the holding capacity of these drains and causing erosion problems near the outflows.

Problems with water quality also arise from the old drainage systems in D.C. One-third of the District still uses a 19<sup>th</sup>-century combined sewer system (CSS) that conveys both sanitary sewage and stormwater in the same pipeline (Figure 4).

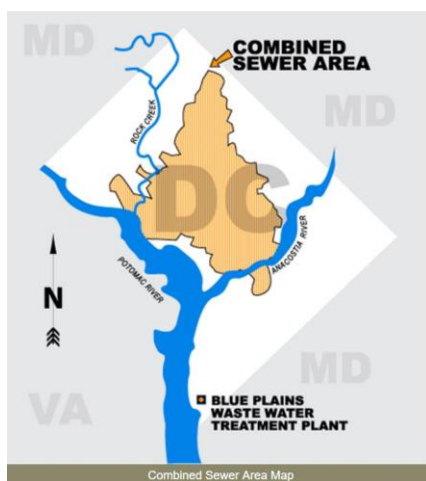


Figure 4: Combined Sewer Area in D.C. (D.C. Water)

During periods of significant rainfall, the capacity of the CSS is exceeded and excess flow of stormwater and sewage is discharged through 17 points directly into the Potomac River, Anacostia River, and Rock Creek (Turrentine, 2016; DC Water, 2016). Each year, about 2.5 billion gallons of raw sewage mixed with stormwater are dumped into the District's waterways. As a result, the Anacostia and Potomac Rivers are severely polluted by sediment, nutrients, and toxins (Turrentine, 2016). High nutrients concentrations in the rivers cause algae blooms which block sunlight from reaching plants below the water's surface. When these submerged plants die, wildlife dependent on them for food and habitat are also harmed. When algae blooms die off, they also deplete oxygen levels which cause fish kills (DOEE, 2017). In the Anacostia, biodiversity on the river bottom is low because the turbidity of the water blocks sunlight from penetrating through and supporting submerged aquatic vegetation.

To remedy the situation, D.C. Water initiated the Clean Waters Project –a massive infrastructure program comprised of an extensive tunnel system. These tunnels, some 23 feet in diameter, will run parallel to both the Anacostia and Potomac Rivers and have to capacity to capture up to 157 million gallons of combined sewer overflow (CSO) (DC Water, 2017a). This system is projected to reduce CSO's by 96 percent annually. The Anacostia River Tunnel Project is one of the four tunnels being built that will divert CSO from the RFK Stadium CSO outfall in Southeast, D.C. down to Poplar Point in southeast D.C. The Anacostia River Tunnel recently opened on March 22, 2018. (DC Water, 2017b).



## Anacostia Watershed Initiative

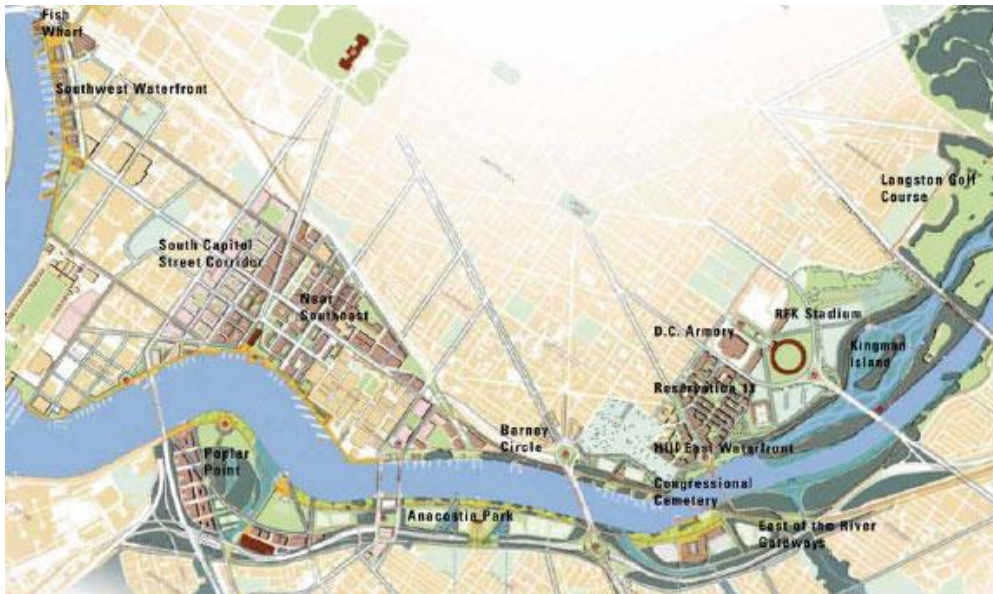


Figure 5: Anacostia Waterfront Initiative Map (Anacostia Waterfront Initiative)

In light of the state of the District's waterways, District government and private business are coming together to fund more initiatives. One major project is the Anacostia Waterfront Initiative (AWI). The AWI is a \$10 billion, 30-year-long project led by the District of Columbia government and embraced by 19 regional and federal partners. The AWI area borders the Anacostia River and spans from the Tidal Basin to the District's northeast border with Maryland (Figure 5). Initiated in 2000, AWI strives for "a clean river environment, new parks and other recreational facilities, more job-creating commercial centers, revitalized residential neighborhoods, and multi-modal transportation options" (Government of the District of Columbia, 2010). Since the initiative began, D.C. Water has reduced combined sewer overflow by 36% and the District has achieved an approximate 50% decrease in nitrogen and sulfur concentrations that lead to acidification of water bodies (Government of the District of Columbia, 2010). With regards to parks, over \$100 million in public investment has been made to create parks including Yards

Waterfront Park, Canal Park, Marvin Gaye Park. Neighborhoods have been revitalized with a 40% increase in the total population (Government of the District of Columbia, 2010). In the next ten years, the AWI will continue to undertake more projects to accomplish the ultimate goal: transform the D.C. waterfront into “a vibrant mix of natural and neighborhood assets along a clean Anacostia River” (Government of the District of Columbia, 2010).

### Restoration Projects

Stream restoration and marsh restoration projects are also taking place all along the Anacostia River. Since 2002, the Anacostia Watershed Society (AWS), a nonprofit organization devoted to protecting and healing the Anacostia River watershed, has revegetated over 12 acres of tidal wetlands in the Anacostia River. In 2014, over 20% of the Anacostia tidal wetlands have been restored (Anacostia Watershed Society, 2018b). In 2007, the AWS initiated the Anacostia Riparian Meadow Restoration project that replaces non-native plant species with native plants and grasses to create special habitats for native wildlife. Currently these meadow restoration projects are implemented on Kingman Island, at the confluence of the river in Bladensburg, MD, and in the Northwest Branch of the Anacostia near 38<sup>th</sup> Avenue Bridge in Hyattsville, MD (Anacostia Watershed Society 2018a). The D.C. Mayor also invested \$4.7 million dollars to fund Kingman and Heritage Island located in the Anacostia River near East Capitol St. NE (Chason, 2018). The Anacostia River is gaining more attention which makes the Anacostia riverfront a prime location to place more initiatives.



## *Reason 2 – Lack of Accessibility*

Historically, rivers and waterfronts were used as essential transportation corridors, necessary for trade and defense. Waterfronts were developed for “ports, warehouses, manufacturing facilities and military installations” (Lewis, 2001). With the introduction of railroads in the 1800s, rail infrastructure and warehouses expanded along the waterfront and the social, retail, and city’s downtown moved away from the river. In the late 1950s, technological changes also triggered profound shifts in waterfront land use. International travel methods shifted from passenger ships to jet aircrafts and local commuting shifted from ferries and streetcars to private automobiles (Otto et al., 2004). In the D.C. region by 1988, there were 2.8 million registered vehicles (African American Environmentalists Association/Friends of the Earth, 1998). Tanker and freight sizes increased dramatically which required deep-water ports and larger land areas by the waterfront (Urban Land Institute, 2003). In D.C., the harbors that thrived during colonial times were made irrelevant by railroads and the deep-water ports in Baltimore. By the 1960s, highways built along the waterfront, heavy industry, and military installations cut off water access for most of D.C. (Huslin, 2007). Closed-off waterfronts are a typical problem of former industrial waterfronts. The underutilized parcels are “separated from the physical, social, and economic activity of rest of the city...and more often than not, they leave us with a tragic legacy of toxic contamination” (Marshall, 2004).

## Early Urban Waterfront Development Efforts

As early as the late 1960s, cities such as San Francisco and San Antonio began to redevelop their waterfront for public recreation, open space, housing, office and retail (Breen & Rigby, 1994). By the 1970s, cities started realizing that their downtown riverfront had fallen into disuse as water-dependent industries such as commercial fishing, shipping ports, and railroad systems declined or moved away. Cities worked to reclaim their community's unique heritage by transforming the local waterfront into a new destination for residents and tourists that would reconnect with the waterfront, the location where the root of the city was typically founded. In addition to economic drivers, the urban riverfront redevelopment effort was prompted by several key environmental factors including water quality improvements, desire for more park space, and a growing appreciation for “green infrastructure” benefits.

Washington D.C. is one city in the process of transforming its waterfront along the Potomac and Anacostia rivers. As previously mentioned, the Anacostia Waterfront Initiative is making stronger connections to the waterfront and revitalizing the area with natural parks and new development. While there has been great progress including the Anacostia Riverwalk trail, some areas, particularly the east side of the Anacostia, still need better connections and accessibility. The seven-lane wide 295-freeway still visually and physically blocks the Anacostia neighborhood from accessing the river conveniently. There needs to be more direct entry points from the Anacostia neighborhood to waterfront.

### *Reason 3 – Social Justice Issue*

#### Anacostia River as a Socio-economic Barrier

During the 1950s, Washington's civil rights movement launched new initiatives against the Jim Crow laws that segregated blacks and demoted them to blue collar jobs in the District and Federal government. To demobilize this urban civil rights movement, the District Commissioners, beholden to "moneyed elite and southern conservatives in Congress" (Williams, 2001, 422), mobilized the power of the state for a massive relocation of African Americans out of Washington's central core to east of the Anacostia River.

Thus, the Anacostia River became a "literal barrier" between west side of the river that symbolized culture, politics, and wealth, and the east side of the river that became a dumping ground for the lower class and pollution (Williams, 2001). As the river grew more polluted and the displaced residents had the predictable problem of finding work as outsiders stereotyped them as the under-class. City maps and books about the city's history even omit the east side of the Anacostia (Williams, 2001; Cary, 1996; Gillette, 1995). This disparity is still apparent today. From 2002-2013, households with incomes less than \$40k dominate the east side of the river (Figure 6).

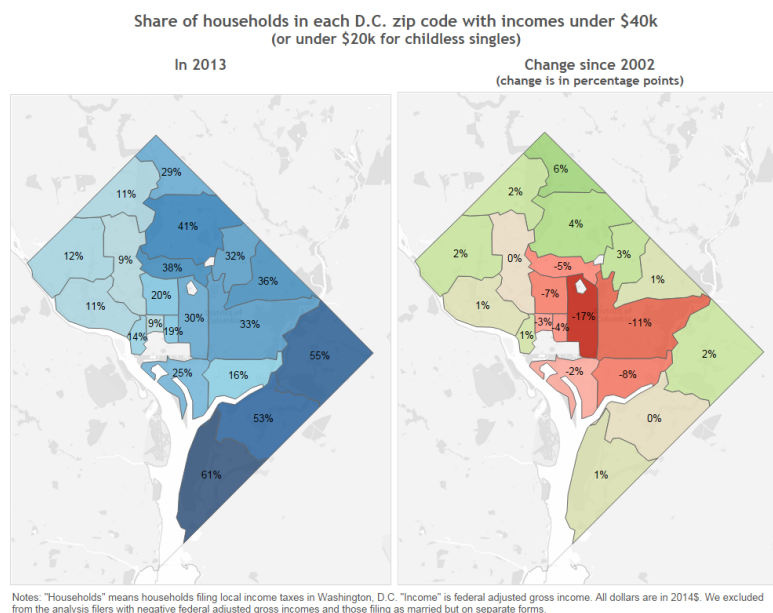


Figure 6: Income Disparities between the East and West Side of the Anacostia River (Urbanscrawldc.com)

Nevertheless, “the Anacostia River was still inexplicably precious to people who live along its shores” (Williams, 2001, 424). On the east side of the river, residents remember swimming in the Anacostia when the swimming pools were closed off to African Americans. They remember “selling catfish to the whites on the other side” (Williams, 2001, 424). People would go to fish, to be alone, or to play with their children. The Anacostia Park situated at the southern portion of the river, was the space that gave the community an escape from city life. One community member reflected, “some days it’s so peaceful you wouldn’t give it for anything ... When I get mad, when I need a place to think, this is where I go (Williams, 2001, 424).”

The Anacostia Park is a neighborhood park for the community and remains a fairly simple park with sport fields and boating access. It is important to note in the redesign process that some parts of the park should still remain for the neighborhood. There will be places of high activity but also quiet places to fish and relax.

## Lawrence Halprin's Redesign of the Anacostia

In October 1966, Lady Bird Johnson led a campaign to beautify Washington D.C. She believed “Beauty is a human right that should be accessible to all, and its power to improve lives should be deployed in the neighborhoods that need it most” (Haffner, 2017, 147). The principal theory behind this campaign was that “transforming ecology and aesthetics in city neighborhoods could improve individual lives and lessen racial tensions and crime” (Haffner, 2017, 149). Recreation was believed to relieve social problems including juvenile delinquency and race riots (Haffner, 2017, 152).

Lawrence Halprin was the landscape architect assigned to redesign the Anacostia riverfront. “Washington’s second river” was “highly polluted and surrounded by the city’s poorest and most disenfranchised residents” (Haffner, 2017, 147). Halprin envisioned a “unified inner-city park” where the National Arboretum, RFK Stadium, and Kenilworth Aquatic Gardens were connected as one park system (Figure 7). On Anacostia’s western bank Halprin proposed “300 acres of trails, parkland, sports fields, picnic areas...and a sandy beach with 100 acres of swimmable water.” Where Kingman Island is currently situated, Halprin proposed Kingman Lake Park (Figure 8), which would offer large amusement opportunities including “a roller coaster, pleasure garden, beer garden, dance pavilions, art galleries, bandstands, theaters, boards, and restaurants” (Haffner 2017, 148).

Although Halprin’s plans never came to fruition due to the end of the Johnson administration, the project shows an important moment in waterfront development where water is a “central element in urban redevelopment, social and economic

justice, and civic identity” (Haffner, 2017, 148). Halprin’s design also exhibited the great potential for the Anacostia riverfront and Anacostia Park.

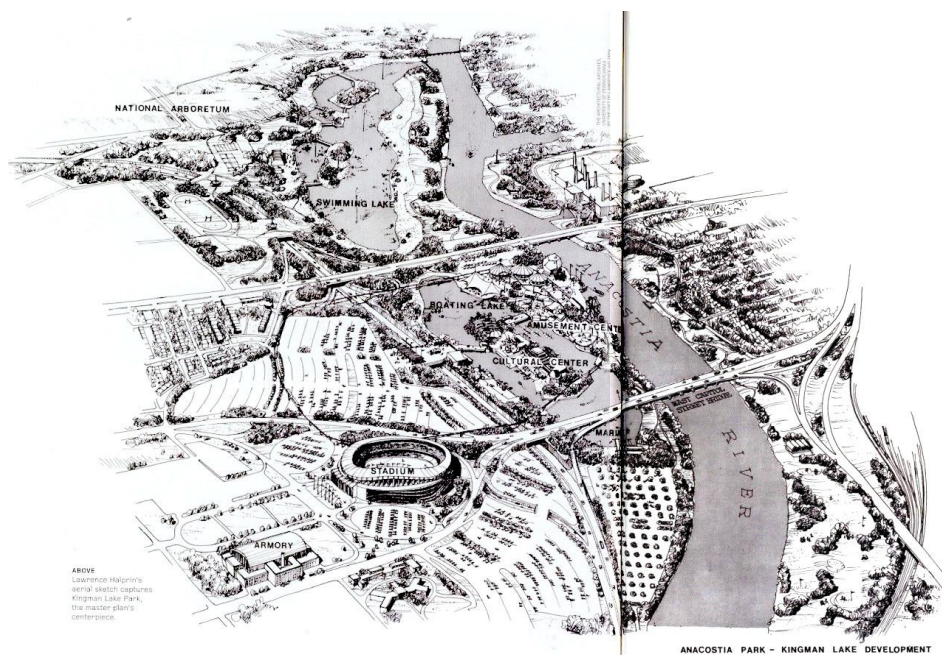


Figure 7: Lawrence Halprin Master Plan (Reprinted with permission from The Architectural Archives, University of Pennsylvania by the Gift of Lawrence Halprin)

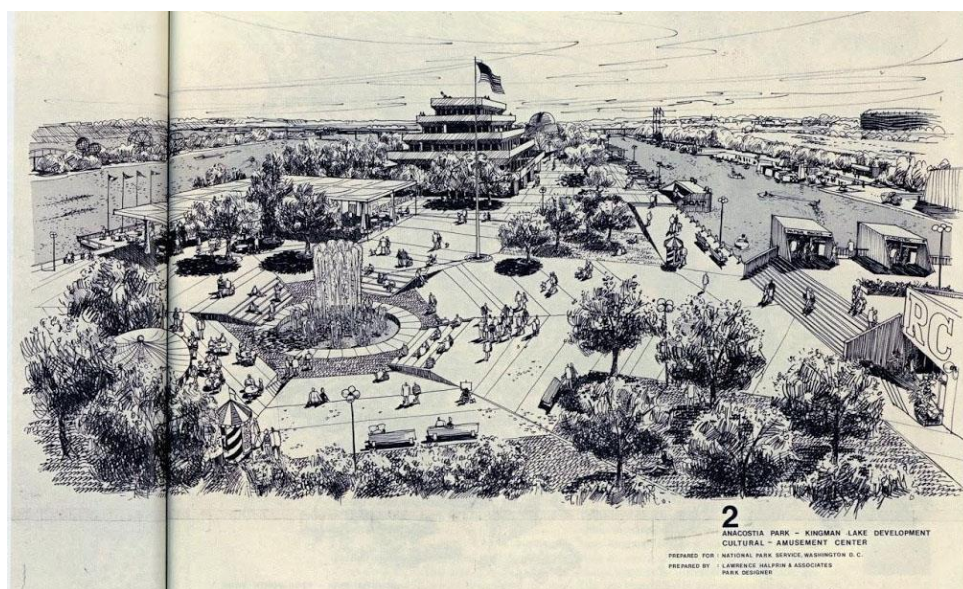


Figure 8: Lawrence Halprin Anacostia Park (Reprinted with permission from The Architectural Archives, University of Pennsylvania by the Gift of Lawrence Halprin)



## 2.1 Site Inventory and Analysis: Master Planning Scale

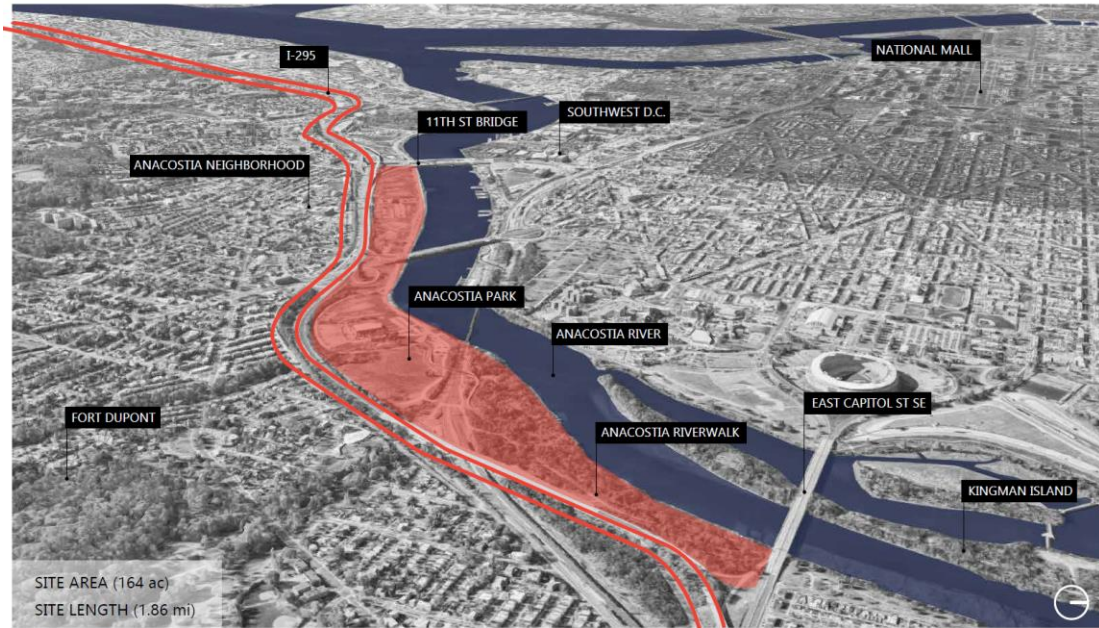


Figure 9: Site Area (Ren)

Continuing Lawrence Halprin's vision, the design intervention presented in this thesis takes place at sections of the Anacostia Park and a forested section located between 11<sup>th</sup> Street Bridge and East Capitol St. (Figure 9). The Anacostia Riverwalk trail currently runs through the site parallel to the Anacostia River. A new greenway park will alleviate many of the issues plaguing the Anacostia riverfront. To improve water quality, the greenway park can help reduce flood damage by infiltrating excess stormwater. It can protect habitats and provide shade that lowers water temperatures (Hellmund & Smith, 2006). To increase accessibility, the greenway park can tie the Anacostia neighborhood communities together by linking neighboring parks and increasing access (Hellmund & Smith, 2006). Lastly in terms of social justice, the greenway park can connect diverse neighborhoods and increase public access so that

everyone would be able to connect with nature in their daily lives (Hellmund & Smith, 2006).

### *Larger Ecological Context*

Surrounding the site is an array of habitat cores and parkland that a greenway park would help connect (Figure 10). The U.S. Arboretum, Kenilworth Aquatic Gardens, and Kingman Island are three major habitat cores located along the northern parts of the Anacostia River. Fort Dupont Park is a major park located east of the site and Pope Branch and the riparian habitat around it meet at the middle of the site. These have the potential to be connected together in a network of habitats that serve as healthy urban recreation areas for the residents of Anacostia.

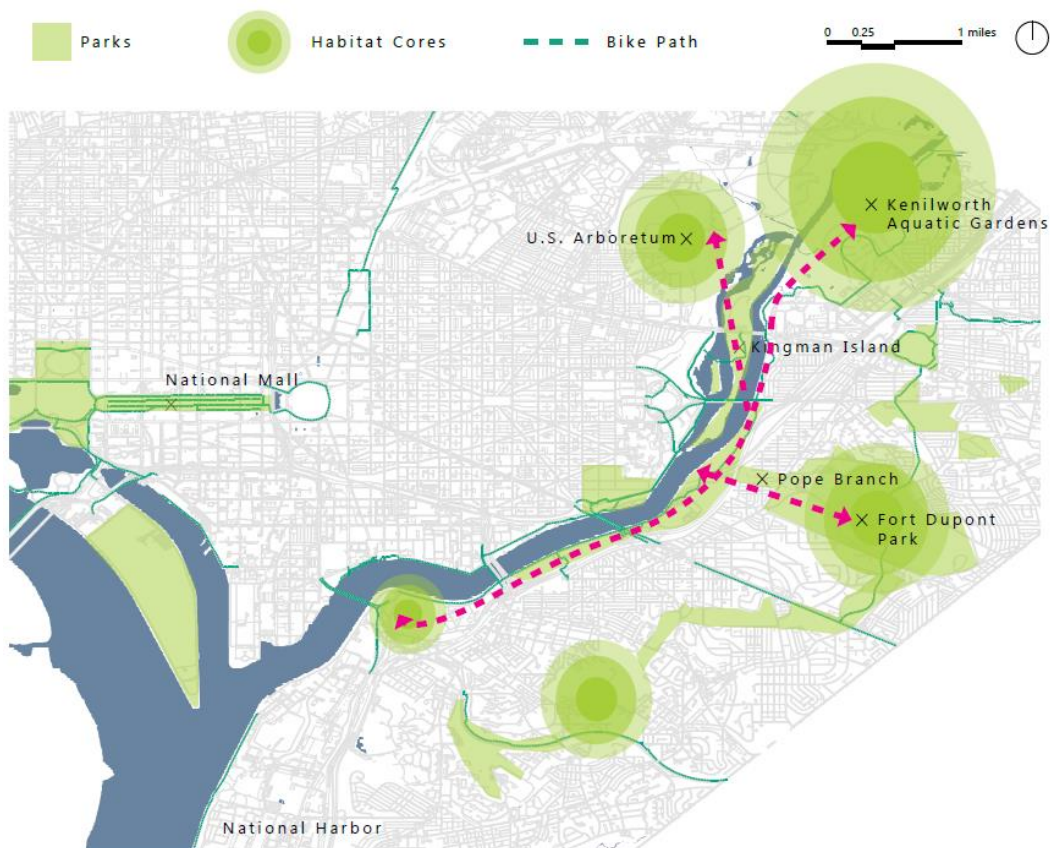


Figure 10: Habitat Cores and Larger Context (Ren)



## Circulation

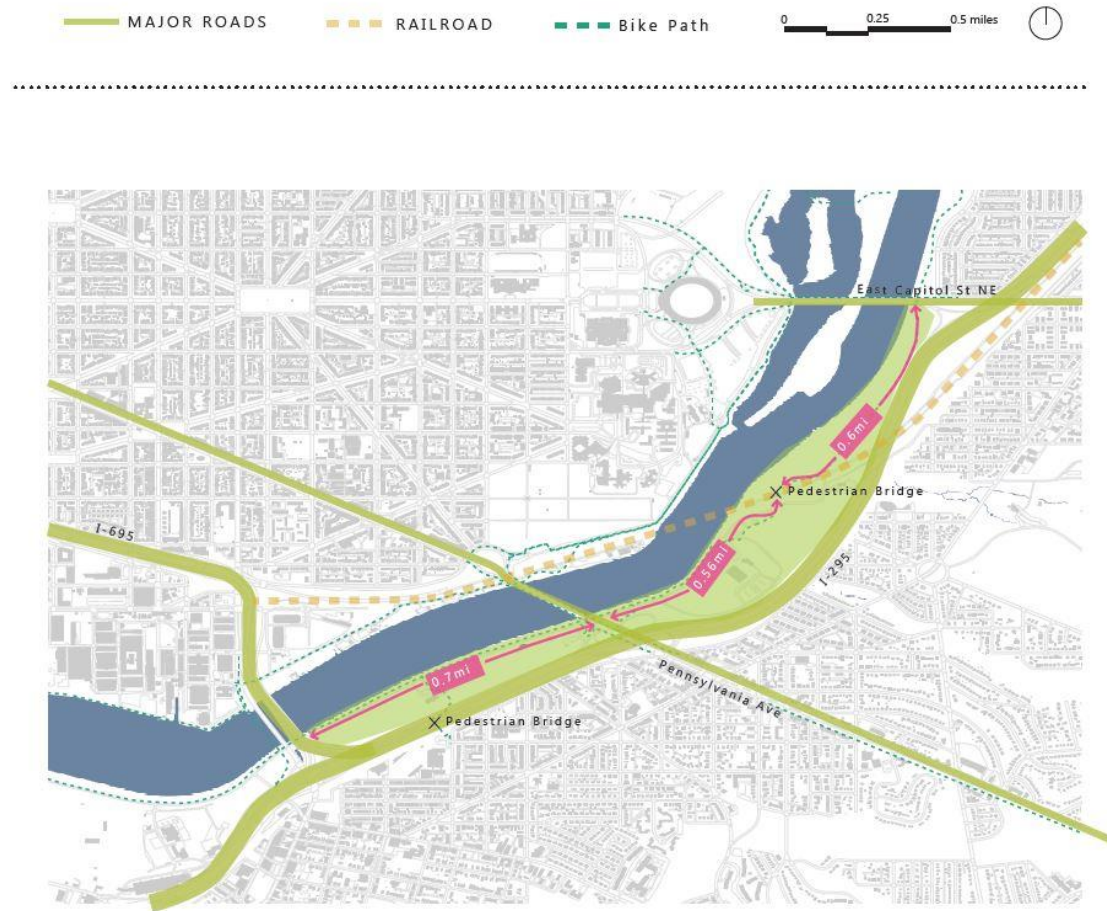


Figure 11: Circulation and Dimensions (Ren)

There are five bridges that cross the Anacostia River near Anacostia Park. Martin Luther King Jr Ave, 11<sup>th</sup> Street Bridge along I-695, John Phillip Sousa Bridge along Pennsylvania Ave, a railroad bridge, and Whitney Young Memorial Bridge along East Capitol St. SE (Figure 11). Anacostia River and I-295, a major freeway, bound the site. The seven-lane freeway blocks many of the residents living adjacent to the park. Even though these residents are 0.5 miles from the park, the only ways to access the park are from Good Hope Rd SE and Nicholson St. SE, both streets that travel below the major freeway. One pedestrian bridge connects Anacostia High School to the park.

Anacostia Park needs more access directly across the freeway. A pedestrian bridge on the north section of the park over the I-295 freeway would give residents convenient and direct access to the park. This pedestrian bridge would also provide greater connections to the future Pope Branch trail, Fort Dupont Park, and neighborhoods northeast of the park. Accessibility can also be improved with better marked entrances. There are no eye-catching signs as visitors enter from Good Hope Rd SE and Nicholson St. SE. Entrances into the park should be celebrated with plazas and information kiosks.

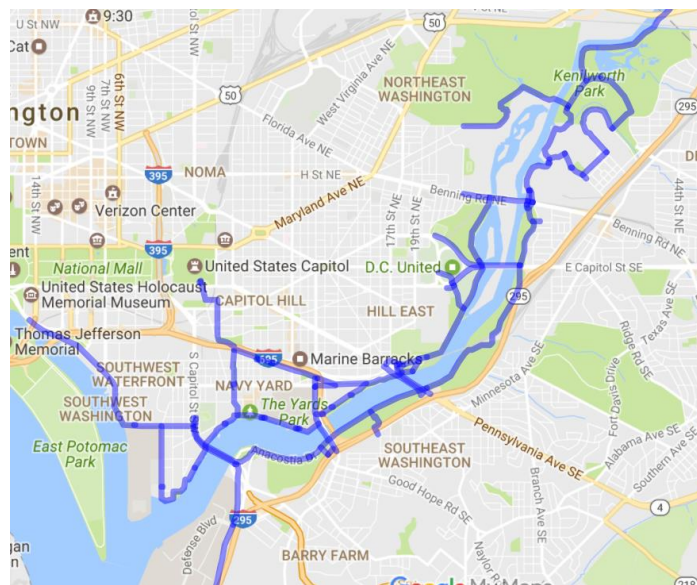


Figure 12: Anacostia Riverwalk Trail (Anacostia Watershed Initiative)

The Anacostia Riverwalk Trail (Figure 12) is one project within the AWI that serves to connect residents and visitors to the river and to commercial and recreational destinations. The trail is a total of 28 miles long and extends from the National Mall at the Tidal Basin to Bladensburg Marina Park in Maryland. The trail provides scenic travel for pedestrians and bicyclists along the Anacostia waterfront and connects users to destinations such as the Fish Market, Nationals Park, and

Kingman Island. The Anacostia Riverwalk also trail runs through the site. Adjacent to Anacostia Drive is a shared-used path that bikers and pedestrians use. Other segments of the trail are currently being constructed. The Kenilworth Aquatic Gardens segment was completed fall of 2016.

### *Zoning*

Starting at the end of the river, the Anacostia River is bounded by two federal military bases, Fort McNair and Joint Base- Anacostia-Bolling. Moving north along the river, there are portions of mixed-use, commercial, and residential areas. East of the river is bounded by green space owned by the National Park Service with moderate to low-density housing adjacent to that. The river bottom itself is also property under the management of the NPS-National Capital Parks East office. West of the river is bounded by mixed-use housing, green space, and production, distribution, and repair areas. As new development encroaches around the site, Anacostia Park becomes valuable green space that will need to serve diverse users in the mixed-use, residential, and commercial areas.

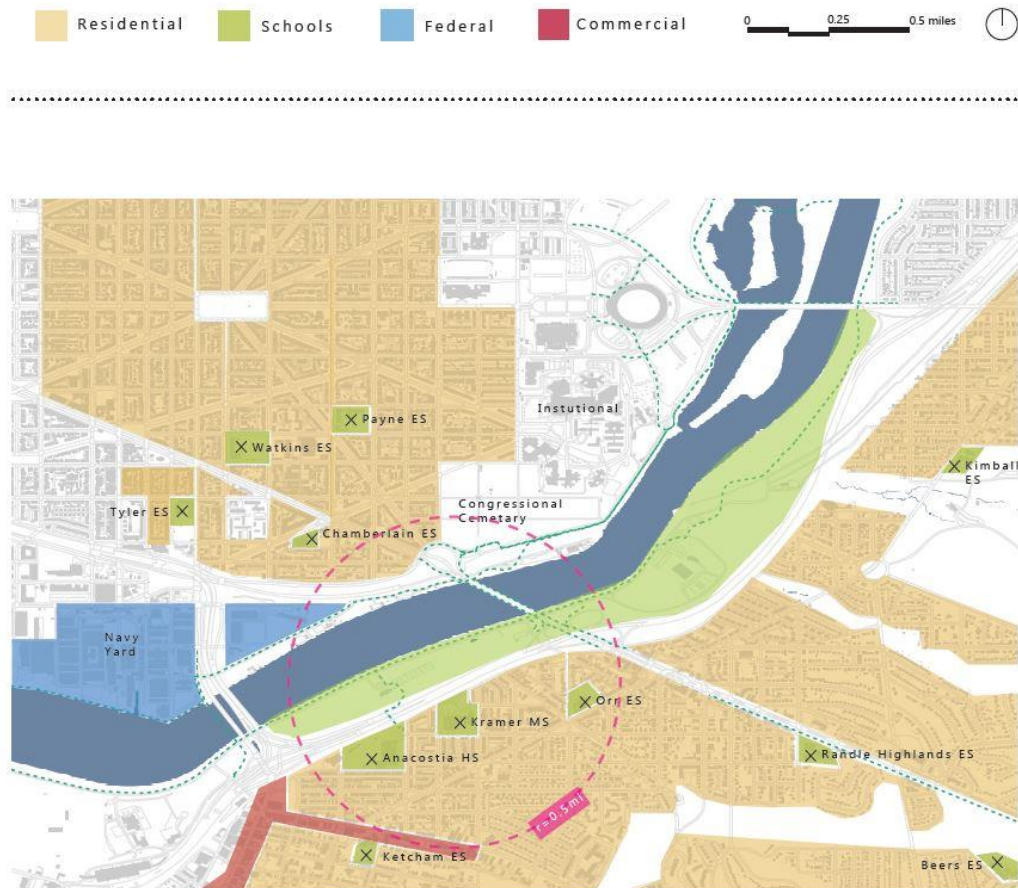


Figure 13: Zoning and Schools (Ren)

### Schools

Directly on the other side of I-295 are three schools within a 0.5 mile radius, Anacostia High School located on 16th St SE, Kramer Middle school located on 17th St SE, and Orr Elementary School on Minnesota Ave SE (Figure 13). Within a 1.0 mile radius, there are several other schools located on the east and west side of the River. All these schools could benefit from the recreational and educational programs provided with the new design. The Anacostia River provides many lessons about hydrology, ecology, restoration, and D.C. history. Schools are also a great place to start increasing community engagement and develop a relationship with the river. The redesign is intended to increase the physical connection to the park by providing safer

paths but also to increase the emotional connection to the river by providing programs for the surrounding school and community.

### *Recent Developments*

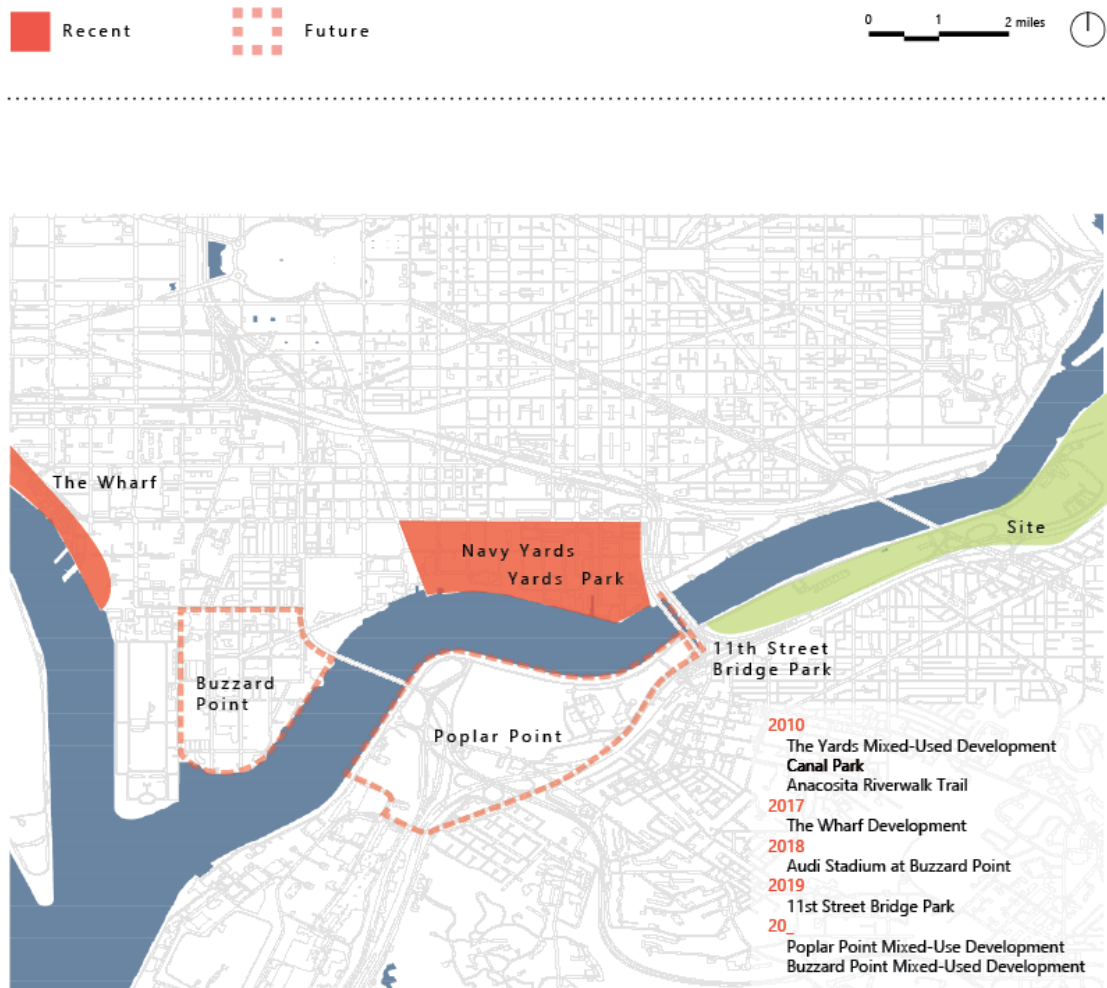


Figure 14: Recent Developments (Ren)

There are several major development projects occurring near the Anacostia (Figure 14). Near the south end of the Anacostia, there is the Buzzard Point development with a new soccer stadium for D.C. United being built there. A new pedestrian bridge park called 11<sup>th</sup> Street Bridge Park is expected to open in 2019 which will provide a popular connection between two sides of the river (11<sup>th</sup> Street

Bridge Park 2017). The bridge park will be D.C.'s first elevated public park that will provide recreation, environmental education, and art activities. Due to the proximity of the bridge park to the site, it is important that activities are not duplicated in the redesign of Anacostia Park. Another popular outdoor attraction is Yards Park located in southwest D.C. that has a splash pad, terraced lawn steps, and a boardwalk.

Toward the north end of the Anacostia River is Kingman and Heritage Islands where designated portions are State Conservation Areas and Critical Wildlife areas. A product of dredging the river, these islands are now home over 100 different species of wildlife and important ecosystems such as vernal pools, freshwater wetlands, and tidal swamps. In January 2018, Mayor Bowser announced a new \$4.7 million investment will be used for educational and recreational improvement for the islands (Chason, 2018). The Kenilworth Aquatic Gardens Riverwalk Trail has just been completed in fall of 2016 which links D.C. to Prince George's County. Most of the attractions are concentrated in the north and south of the site while little more than open lawn and roadway links them together. A more vibrant trail system and green space would help connect attractions in the north and south D.C. area.

#### *Water Trail Amenities*

The Anacostia River Trail provides water recreation activities along the entire stretch of the river. At the north end of the Anacostia River Trail is the major water recreation hub, Bladensburg Waterfront Park, which provides the most activities. At the park there are canoe/kayak launch and rentals, piers, boat ramps, and picnic areas. South of the park are the Kenilworth Aquatic Gardens with picnic areas, National Arboretum with a kayak launch, and Kingman Island with a canoe/kayak launch and



pier. Continuing south, is the Anacostia Community Boathouse, Anacostia Park with an Aquatic Resources Education Center, picnic areas, and a boat ramp. The redesign of Anacostia Park would be a great place to put a rental area because the only other location to rent canoes and kayaks are at Bladensburg Park in the north and Diamond Teague Park located at the southern-most point. Anacostia Park should also provide more water amenities for the east side of the river because besides Bladensburg Park, all water recreation activities including marinas are currently concentrated on the west side of the river.

### *Vegetation and Wildlife*

There is a great variety of habitat types along the Anacostia waterfront including upland forests, forested wetlands, grasslands, and emergent wetlands. In the upland forests, there are trees such as the American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), white oak (*Quercus alba*), and southern red oak (*Quercus falcata*). In the forested wetlands, there is seasonal flooding. Deciduous hardwood species such as black gum (*Nyssa sylvatica*) and red maple (*Acer rubrum*) dominate this area. Alder (*Alnus spp.*) and silky dogwood (*Cornus amomum*) are common shrubs and flood-tolerant swamp species such as arrow arum (*Peltandra virginica*), orange jewelweed (*Impatiens capensis*), and various smartweeds spread throughout the area. In the grasslands and emergent wetlands, there are species including narrow-leaf cattail (*Typha angustifolia*) and river bulrush (*Bolboschoenus fluviatilis*).

Specifically in Anacostia Park, there are cherry trees (*Prunus spp.*), Joe Pye weed (*Eutrochium purpureum*), water lilies (*Nuphar spp.*), button bush (*Cephalanthus*

*occidentalis*), and milkweed (*Asclepias syriaca*) (National Parks Service 2015 “Nature and Science). There are also herbaceous emergent plants such as wild rice (*Zizania aquatica*), arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), softstem bulrush (*Schoenoplectus validus*) and spatterdock (*Nuphar lutea*).

The Anacostia River also provides habitat for many shorebirds and birds of prey. According the National Park Service, in the spring time, many migratory birds pass through the area. In the summer, osprey (*Pandion haliaetus*) fish and nest along the river. During the fall, Caspian terns (*Hydroprogne caspia*) and Forster’s terns (*Sterna forsteri*) can be spotted. In the winter, buffleheads (*Bucephala albeola*), and other ducks can be seen on the open water (National Parks Service 2015). Specifically in the Anacostia Park, deer, foxes, beavers and muskrats can be seen.

#### *DOEE Water Improvement Candidate Projects*

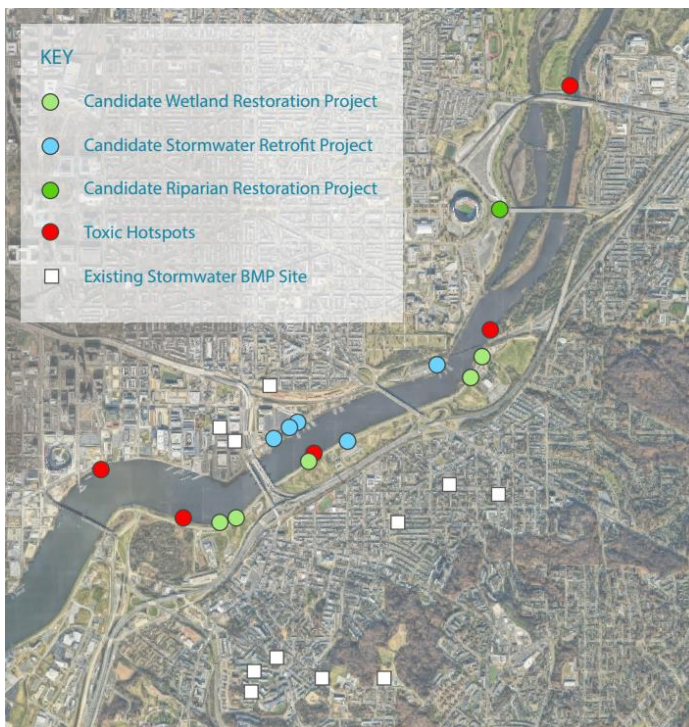
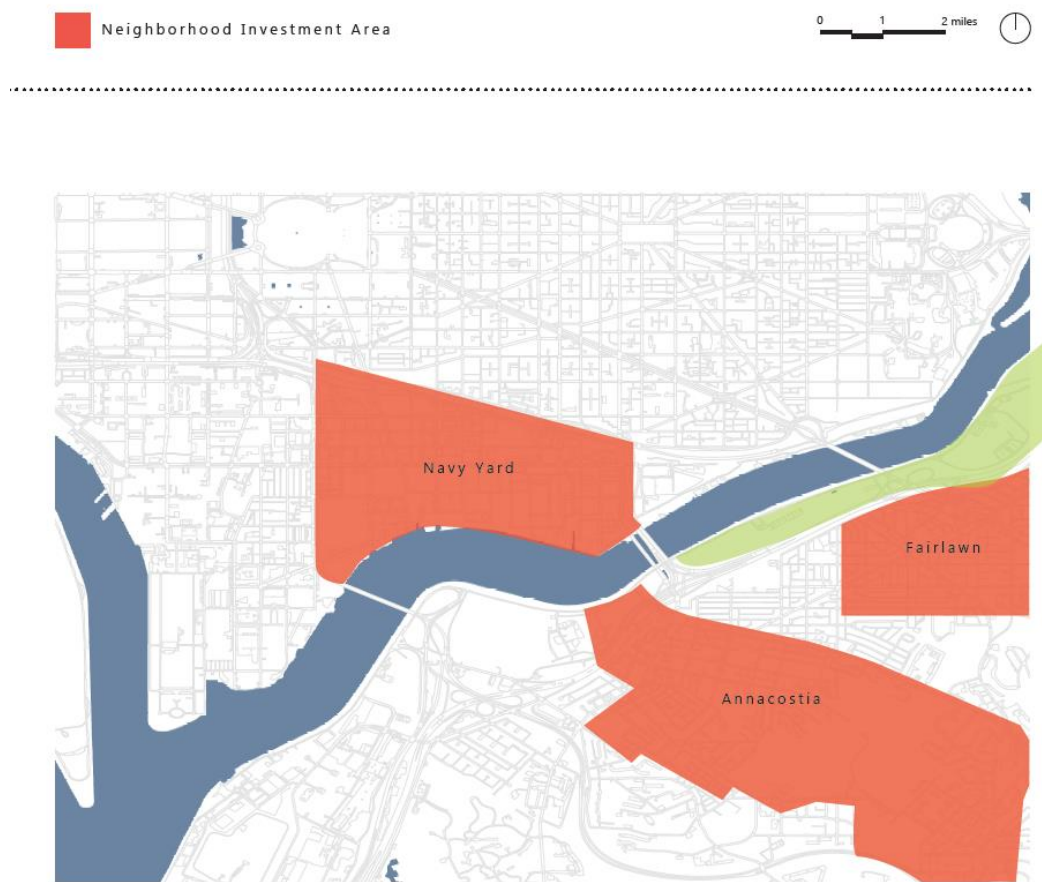


Figure 15: DOEE Water Improvement Candidate Projects (Ren)



In 2009, the DOEE determined several areas for water quality improvement projects for the Anacostia River watershed. Along the east side of the river in Anacostia Park, the DOEE proposed several stormwater retrofits, wetland and riparian restoration projects. A greenway along the site could fulfill these proposals but also connect these new water quality improvements areas with recreational opportunities.

### *Neighborhood Investment Priorities*



*Figure 16: Neighborhood Investment Priorities (Ren)*

Neighborhood investment priority areas are based on a composite of Neighborhood Investment Fund Areas and Strategic Neighborhood Investment

Program (SNIP) areas. The Neighborhood Investment Fund targets twelve areas in the District and is an annual, non-lapsing fund to finance economic development and neighborhood revitalization. The SNIP is a targeted investment policy where priority District neighborhoods receive a series of comprehensive public actions or funds to promote private sector investment. Anacostia, Pennsylvania Ave/Fairlawn, and Southeast/Navy Yard neighborhoods need revitalization (Figure 16). The greenway site is located near these neighborhoods in need. A greenway park could be a good strategy to revitalize these neighborhoods because the park can become an attraction that provides entertainment and recreational opportunities

## 2.2 Site Inventory and Analysis: Site Scale

### *Site Visit*

There was a monotonous experience throughout the site visit. Walking along Anacostia Drive from I-695 up to the railroad bridge, there was generally only one experience—a river view and an immense span of mowed lawn (Figure 17). A pirate ship playground and the Anacostia recreation center provided a small bit of interest but otherwise, there was no other variety in sensory experiences. There were no changes in the pathways, elevation, ground, and the size of spaces until one crossed the pedestrian bridge over the CSX railroad tracks. The monotony of the site reinforced the conclusion that experiential diversity needed to be enhanced.

The shared-use path was completely straight running parallel with the River. There were a couple people biking and walking along the path. A father and daughter

sat on the grass looking out onto the sandbar where some shorebirds had landed. Muffled sounds of construction from the other side of the river could be heard. Having just rained the night before, there were puddles of standing water on the lawns and parking lots. The park was surprisingly quiet even though it was right next to the I-295 freeway. While the park may be uneventful at times, the surrounding neighborhoods still use the park to fish, play recreational sports, and launch their boats. The redesign recognizes that not all the areas should be highly programmed. Some areas should be maintained for the neighborhood and provide shaded, tranquil areas to relax and fish.

Across a new pedestrian bridge that goes over the CSX railroad was a lush forest with a heavily shaded trail. Other than the bridge, there was no change in elevation. Rather than a path that closely follows the river, it might be more interesting to have trails that meander around the waterfront, steering away from fragile wetlands and eroded banks (Otto et al., 2002)





Figure 17: Site Photos (Ren)



## Chapter 3: Translating Dance into the Landscape

In order to redesign Anacostia Park and enhance experiential diversity, a new methodology was created to translate dance principles into the landscape. Lawrence Halprin's many strategies of incorporating dance into design proved to be a useful tool to enhance experiential diversity because he designed with the moving individual in mind. Similarly, this thesis's design process involved encouraging movement and creating sequences of experiences that stimulate the body, senses, and emotions and overall increasing experiential diversity. Throughout the design process, different methods were explored to translate dance into design and ultimately, the exploration resulted in toolkit of theoretical choreographic principles and a synthesized dance palette that can be utilized in design. This translation was applied to both the master planning scale and site plan scale.

### 3.0 Master Planning Scale

At the master planning scale, dance can be translated into the landscape through six choreographic principles. Each principle is illustrated in Figure 18. In order to show the link between dance and design, these principles were developed through a combination of dance principles and Francis Ching's ordering principles of design (Ching, 2007). These theoretical choreographic principles helped create experiential diversity because each of these principles created variation by changing and manipulating the dance elements of space, time, energy (Minton, 2007). Different experiences with space, time, and energy greatly enhance variety. These

choreographic principles also emphasized contrast and when implemented into the landscape, this contrast increased variety.

### MASTER PLANNING SCALE : CHOREOGRAPHIC PRINCIPLES

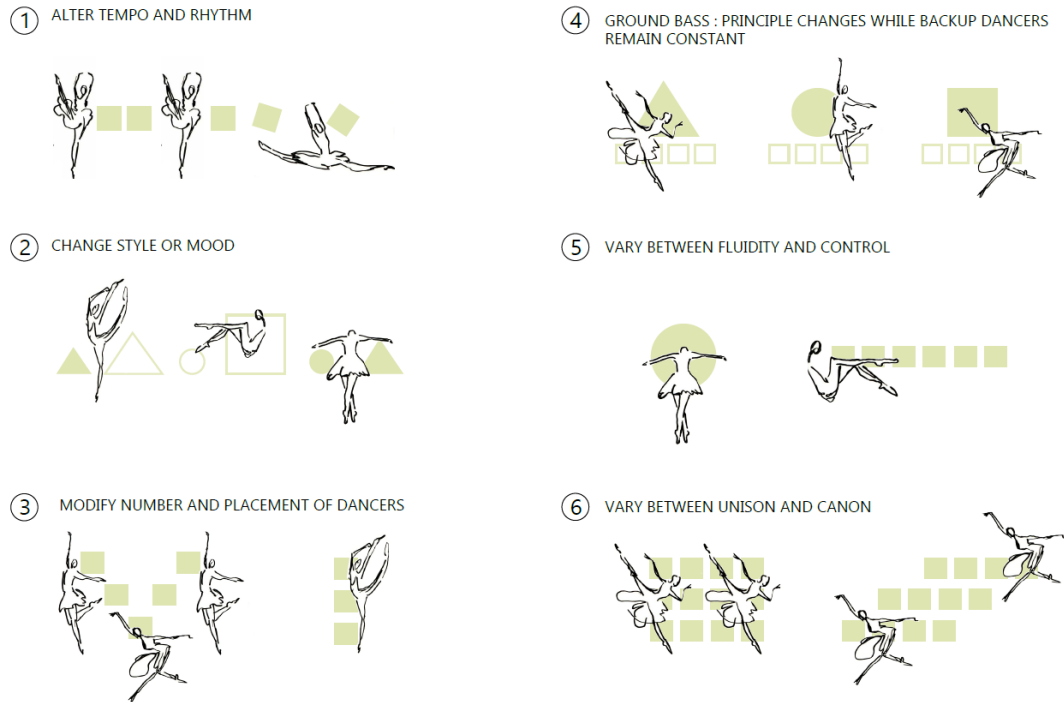


Figure 18. Choreographic Principles at the Master Plan Scale (Ren)

1. In dance, *altering tempo and rhythm* can occur when dancers are moving at varying speeds or patterns. In the landscape, people can also move at different speeds and patterns. They might walk faster down a straight path than a meandering path. An equidistant arrangement of trees can also create a steady rhythm while a change the space between trees can change that rhythm.

2. *Changing style or mood* can occur when dancers wish to convey different meanings. If the dance form is trying to tell a story, the style and mood can change quite often to convey different parts of the story and express different emotions. In

the landscape, different environments can also create different styles or moods for people to experience. Similar to dance styles such as modern, classical ballet, and jazz, there are different aesthetic styles in landscape design including modern, formal, and rustic.

3. On stage, choreographers place dancers in *multiple formations*. They change these formations throughout the dance to create variety (Minton, 2007). In the landscape, space can be manipulated to change dancers' formation. A narrow path could encourage people to form a straight line while an open playground can encourage people to form a cluster.

4. In dance, the *ground bass principle* occurs when principle dancers change while backup dancers (the ground bass) remain constant. This is an important dance principle because although variety and contrast are important in a dance composition, having a balance of variety and continuity is equally imperative (Minton, 2007). In the landscape, a city skyline, a river, a path, or a mountain range are constants in the background, providing unity within a landscape composition.

5. *Altering between fluidity and control* can be seen through a dancer's movement. Fluid movements are graceful and the transition between one dance shape to another is seamless. On the other hand, controlled movements can be more rigid and geometric. Shaping spaces in the landscape can encourage fluid or controlled movements. Large open plazas can encourage fluid movements because there is ample room for dancers to move. In contrast, smaller spaces such as boardwalks or footpaths can encourage controlled movement.



6. *Altering between unison and canon* can be seen in the movement of a group of dancers. Dancers are in unison when a group of dancers repeat one movement phrase together. In contrast, dancing in canon occurs when the repeated movement phrase is performed by different dancers at different time intervals (Minton, 2007). In the landscape, changing circulation paths and the width of paths can encourage this same dance effect. Bike trails that run parallel with roads create unison as bikers and driver move together. In contrast, if different paths are separated and do not run parallel to each other, the users on those paths move in canon.

### 3.1 Site Scale

#### Dance Equation



Figure 19: Dance Equation (Ren)

At the site scale, the translation of dance into landscape design becomes more detailed. Since dance is composed of a dancer's movement and music while landscape is composed of people's movement and the environment, combining dance within the landscape results in two components: movement and music. Movement in

the landscape is influenced by the ground material, space, and elevation while music in the landscape is influenced by the atmosphere, plant material, and sounds (Figure 19). Overall, the environment is the all-encompassing element that defines movement and music.

#### Movement Component: Movement and Mood

Movement is the first component of dance in the landscape. Choreographers arrange a dancer's movement to convey different moods. Similarly, in the landscape, different types of spaces can manipulate people's movement to convey those different moods. Various elevations, spaces, paths, and ground environment can influence how dancers move through space. Changing the elevation, size of the space, shape of a path, and ground material can alter a dancer's elevation, shape, timing, and energy which consequently express different moods. Figure 20 illustrates how changes in the environment can influence a dancer's movement and encourage different moods.

## MOVEMENT COMPONENT: MOVEMENT & MOOD

*dance = movement + music*

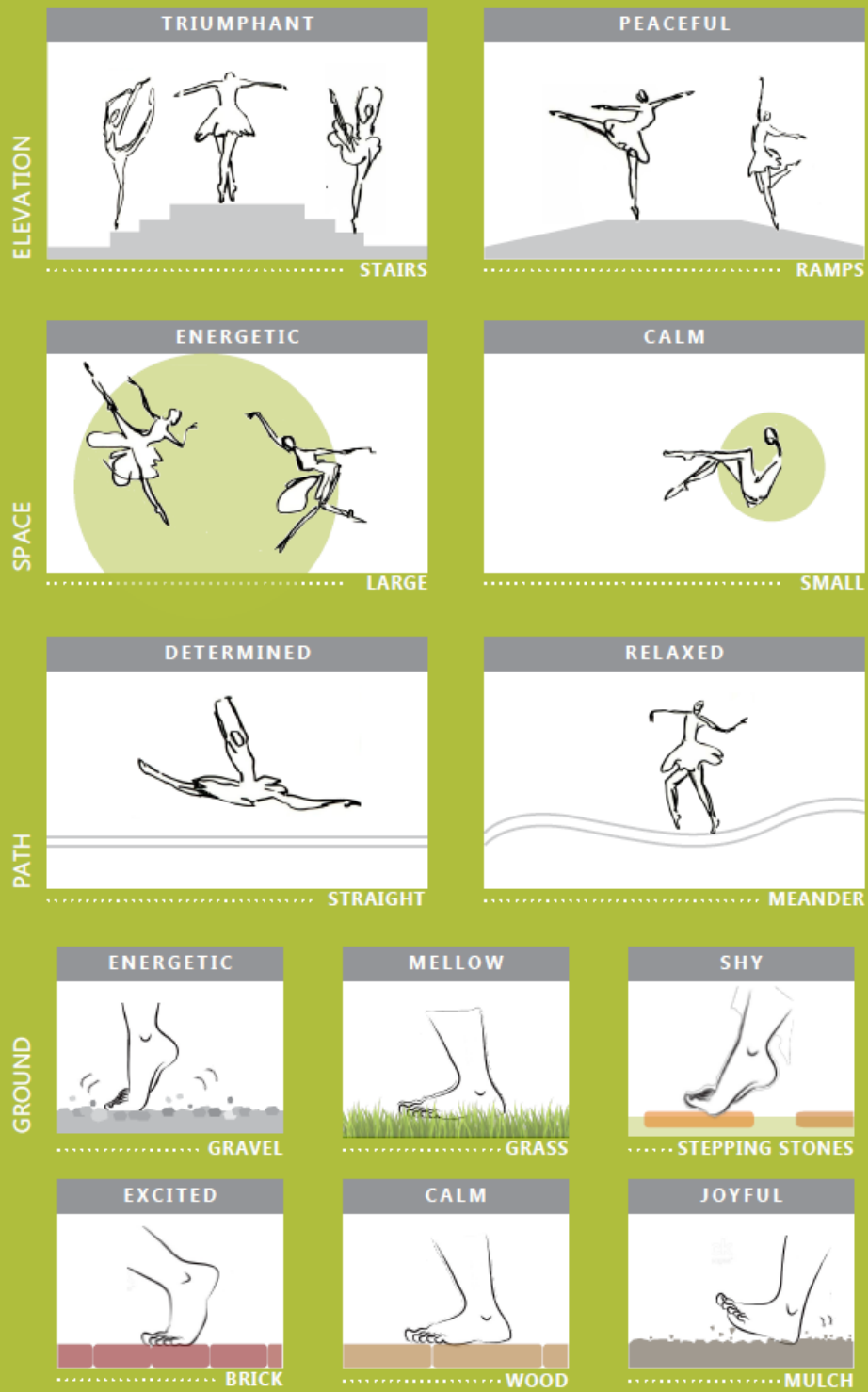


Figure 20: Movement and Mood (Ren)

## Music Component: Music of Plants

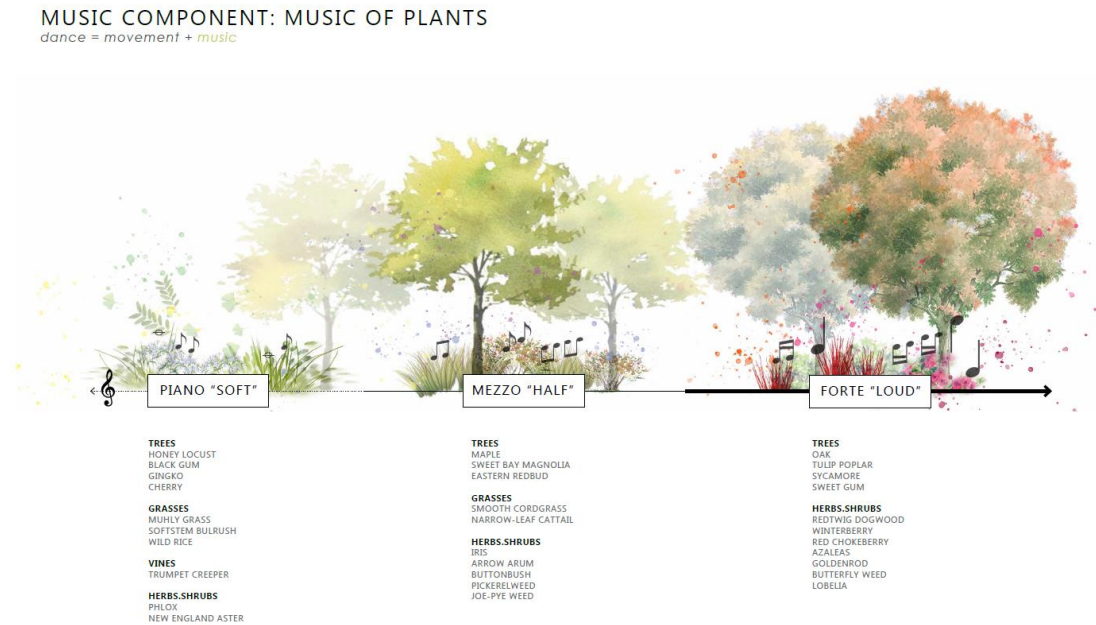


Figure 21: Music of Plants (Ren)

Music is the second component to dance in the landscape. Plants contribute to the idea of music in the landscape. In garden theory, there are background plants and accent plants. Accent plants are striking in shape, color, size. They provide a focal point that adds interest to a landscape (Lifestyle, 2013). Background plants are less striking and attract less attention. This theory can be related to music in terms of music dynamics which is the variation of loudness between notes or phrases. The two main music dynamics are piano meaning soft and forte meaning loud (Lumen Learning, 2017).

Figure 21 illustrates the plant palette for the Anacostia riverfront in relation to music. These plants were chosen because they are native to Maryland floodplain environments and some are currently located on site. Piano plants are soft and low in volume because they have small delicate leaves, soft textures, and pastel colored and

short in height. These plants are typically background plants in garden design. On the other hand, forte plants are loud in volume because they have large leaves, rough textures, bright colors, and are tall in height. These plants are typically accent plants in garden design. Between piano and forte is mezzo, meaning half. The music of these plants are in between piano and forte.

### Synthesized Dance Palette

The two components of movement and music can be synthesized into one concise dance palette (Figure 22). Different dances require different materials. Along a scale of soft/graceful/peaceful to loud/energetic/triumphant, different conditions in the “stage” or ground, movement, and plants can be used. A soft, graceful, peaceful dance can be created with smooth paving, soft grass, stepping stones, and wood planks. The small, graceful movements for this type of dance can be manipulated by narrow paths, meandering paths, graceful ramps, and small spaces. The plants for this type of dance are piano and soft. On the other hand, a loud, energetic, triumphant dance can be created with coarse materials such as cobble, brick or coarse gravel. The large, energetic movements for this type of dance can be manipulated with wide paths, straight paths, stairs and large spaces. The plants for this type of dance are forte and loud. This synthesized palette will be used to design at the site scale.

SYNTHESIZED DANCE PALETTE



Figure 22: Synthesized Dance Palette (Ren)

## Chapter 4: Design with Choreography

### 4.0 Design Goals and Objectives

#### **Goal 1: Advance principles of greenway design**

- Objective 1: Create a wildlife corridor by providing habitat for plants and animals
- Objective 2: Improve recreational opportunities for all ages and abilities
- Objective 3: Preserve scenic views and natural landscape
- Objective 4: Enhance experiential diversity

#### **Goal 2: Explore experiential diversity in design through choreographic principles**

- Objective 1: Create experiential diversity at the master planning scale by creating contrast and variety with theoretical principles
- Objective 2: Create experiential diversity at the site scale by stimulating movement, senses, and emotions with synthesized dance palette

#### **Goal 3: Address Anacostia River's water quality issues and increase accessibility to the Anacostia Park**

- Objective 1: Make stronger connections to the neighborhood and across the Anacostia River
- Objective 2: Treat stormwater and restore habitat
- Objective 3: Increase activity and diversity of activity

### 4.1 Choreography at the Master Planning Scale

#### *Master Plan*

The master plan (Figure 23) is divided into three sections based on the streets and railroad that intersect the site. The southern section is located between 11<sup>th</sup> Street Bridge and Pennsylvania Ave. The middle section is located between Pennsylvania Ave. and the CSX railroad bridge. The northern section is located between the CSX railroad bridge and East Capitol St. These sections are named after musical tempos that describe the type of programming occurring within each section.





Figure 23: Master Plan (Ren)

- a. The first section is called Allegro meaning fast and bright (Figure 24).

Located where the most visitors will enter, this section is highly programmed with an entry plaza, floating theater, picnic areas, nature playground, and a dog park. Visitors entering from the 11st Bridge Park and future developments at Poplar Point and Southwest D.C. are welcomed at the entry plaza. The existing pedestrian bridge that runs across the freeway allows residents from the Anacostia neighborhood to enter the park. Visitors can have variety in their experiences as they stroll through gardens, picnic on open lawns, jump through the playground, meander through marsh plantings, and walk along boardwalk overlooking the Anacostia River.

In terms of improving water quality (Figure 27), there are 21.7 acres of marsh restoration. In order to increase marsh edge and overall marsh productivity



(Weinstein et al., 2001), there are high and low marshes within restoration area. A tidal channel runs through the park, providing safe habitat for aquatic wildlife and increasing people's visual interaction with the water.

- b. The middle section is called Andante meaning at a walking pace (Figure 25).

This section is programmed more for the residents living directly on across the 295 freeway. Instead of walking 0.75 miles to Nicholson St SE, the closest street that runs below the freeway, residents can walk directly across a new pedestrian bridge (Figure 28) that connects the park and a new proposed trail by Pope Branch. As Pope Branch flows into the site, it is daylighted out of the existing storm pipe that filters through a new wetland park (Figure 27).

Visitors can have a variety of experiences as they play in the sports fields, meander through the wetland park, stroll along the river boardwalk, or rent a kayak to paddle along the Anacostia River Trail.

- c. The third section is called Adagio meaning slow with great expression (Figure 26). This forested section provides a quiet nature retreat with the existing nature trail that is part of the Anacostia Riverwalk Trail. Following Otto et al.'s restoration design principles, sensitive natural areas remain buffered with vegetation. The buffer ranges from 300-1,200 feet. Branching off the trail is a bird lookout tower that provides direct views across the river to Kingman Island where the osprey and other birds of prey nest.

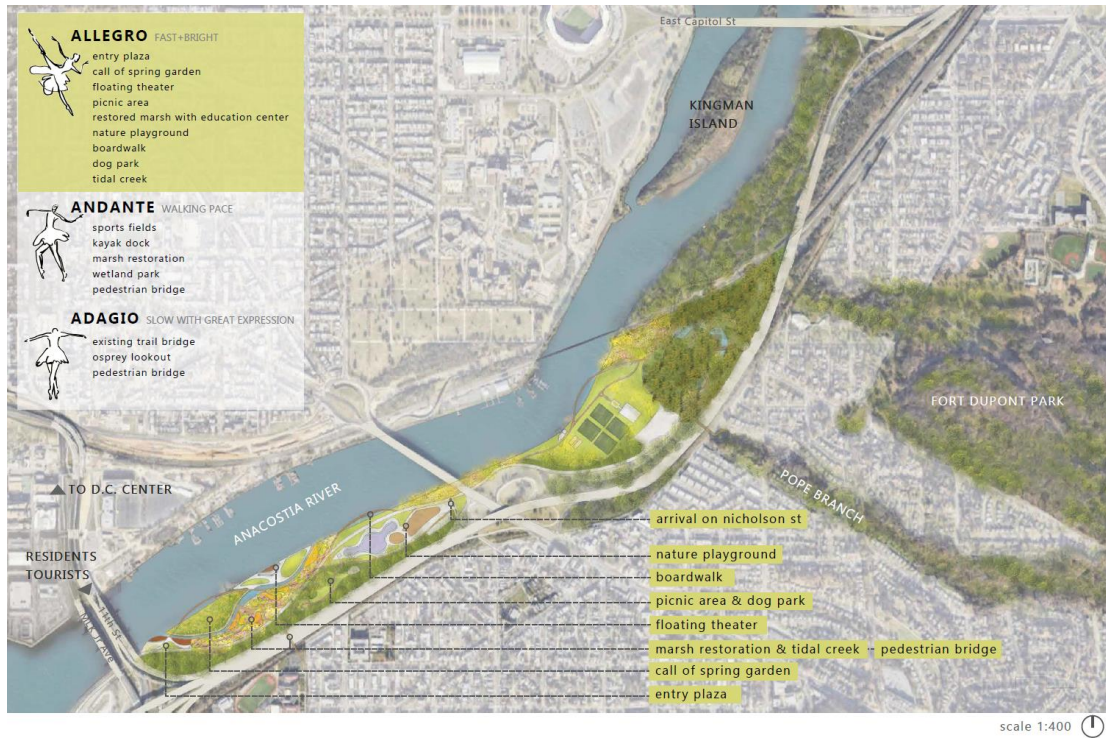


Figure 24: Allegro Section of Master Plan (Ren)



Figure 25: Andante Section of Master Plan (Ren)





Figure 26: Adagio Section of Master Plan (Ren)



Figure 27: Ecological Improvements in Master Plan (Ren)



Figure 28: Accessibility Improvements in Master Plan (Ren)

### *Applying Choreographic Principles*

Choreographic principles explained in Chapter 3 were used to create the program and design of the master plan. These principles helped organize space and movement at a large scale. The implementation of these principles increased experiential diversity by adding contrast and variety in the types of spaces, uses, environment, and movement.



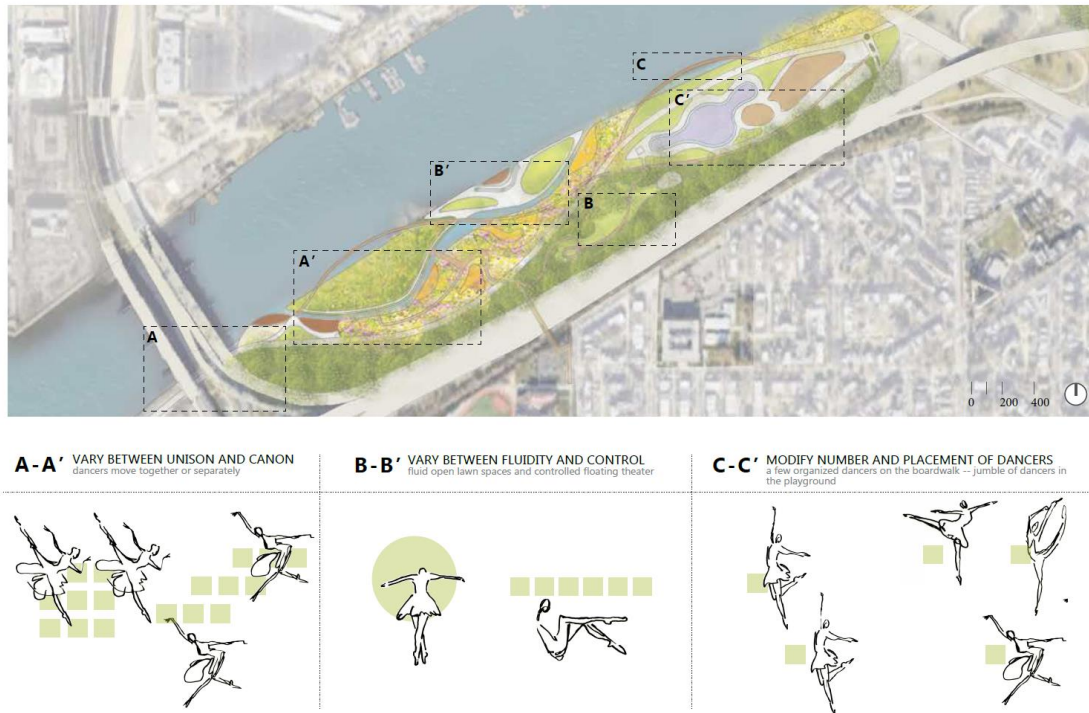


Figure 29: Applying Choreographic Principles 1 (Ren)

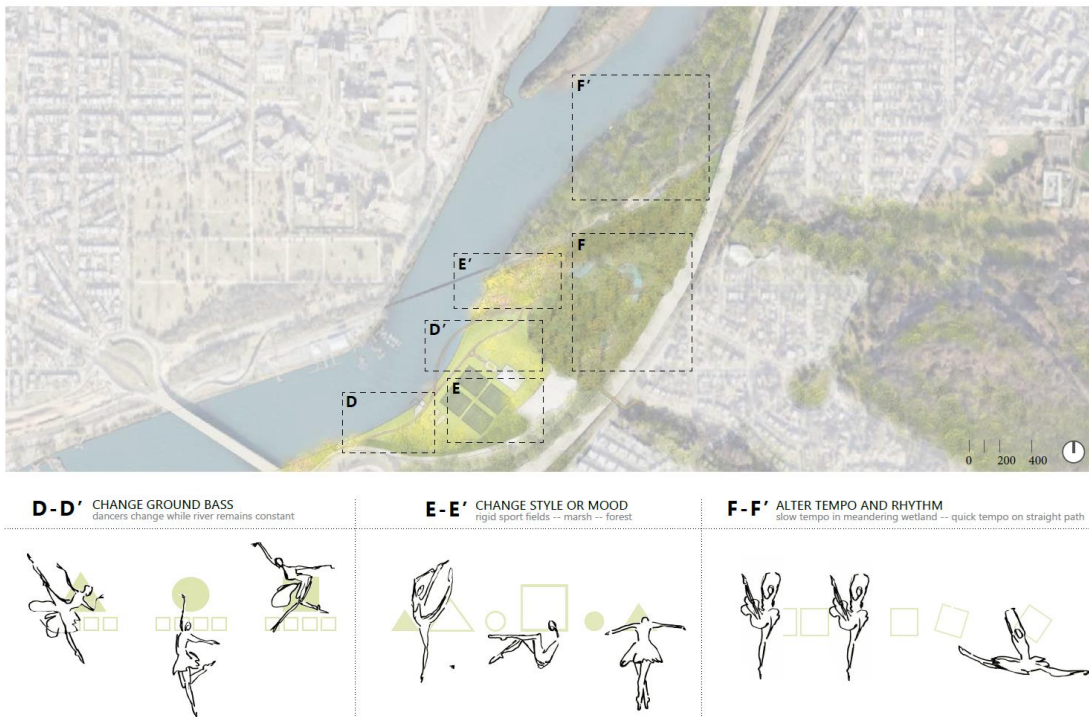


Figure 30: Applying Choreographic Principles 2 (Ren)

Their application can be seen in Figure 29 and 30 with the following explanations:

- a. *Altering between unison and canon* can be seen in at the entrance of the Allegro section. At first dancers move together as they walk under I-695 toward the entrance plaza. Continuing forward, the dancers separate as the path divides into three, one path moving toward the Anacostia River, one path moving along the canal, and the third path moving toward the marsh restoration.
- b. In order to *alter between fluidity and control*, open lawn spaces and a floating theater were placed near each other. The contrast between fluidity and control provide immediate diverse experiences. The open lawn spaces encourage fluid movement while the floating theater confined by water encourages controlled movement.
- c. In order to *modify the number and placement of dancers*, different spaces that accommodate different activities were used. A large group of dancers move chaotically in the playground while a few dancers move in an organized fashion along the boardwalk surrounded by the Anacostia River.
- d. In order to *change the ground bass formation*, programs and dancers change along the Anacostia River. Along the river, the Anacostia River remains a constant bass or backdrop while dancers change between kayakers, bikers, boaters, and pedestrians along the boardwalk.
- e. In order to *change the style or mood*, a variety of environments were created. In the Andante section, there are rigid sport fields, thick marsh, and wild

forest. All of these different environments create different moods and encourage different movement.

- f. In order to *alter between tempo and rhythm*, pathways were varied. In the wetland park, paths are meandering, encouraging a slow pace or tempo. In contrast, along the nature trail in the Adagio section, the path is straight, encouraging a quicker tempo.

### *Visualizing Choreography*

Visualizing the choreography of the master plan helped compare experiential diversity between the existing and proposed conditions. Visualizing the choreography also helps design active and engaging greenways by analyzing how people can move through the site, the transitions between spaces, and the sequences of activity. As previously mentioned, dance is a combination of movement and music. Movement can be visualized in terms of the amount of users, the speed at which peoples are moving, whether they are spreading out or condensing, and whether their movements are fluid or controlled. Music can be visualized in terms of volume and musical accents (Figure 31). The more complex each visualized component is the more diverse experiences are along the path.

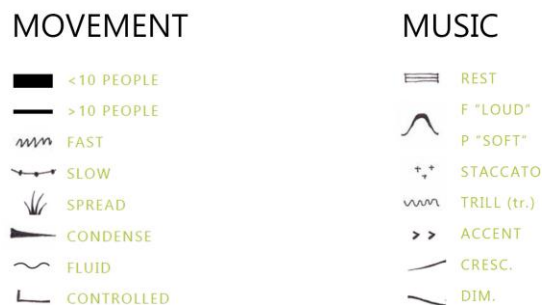


Figure 31: Key for Visualizing Choreography (Ren)

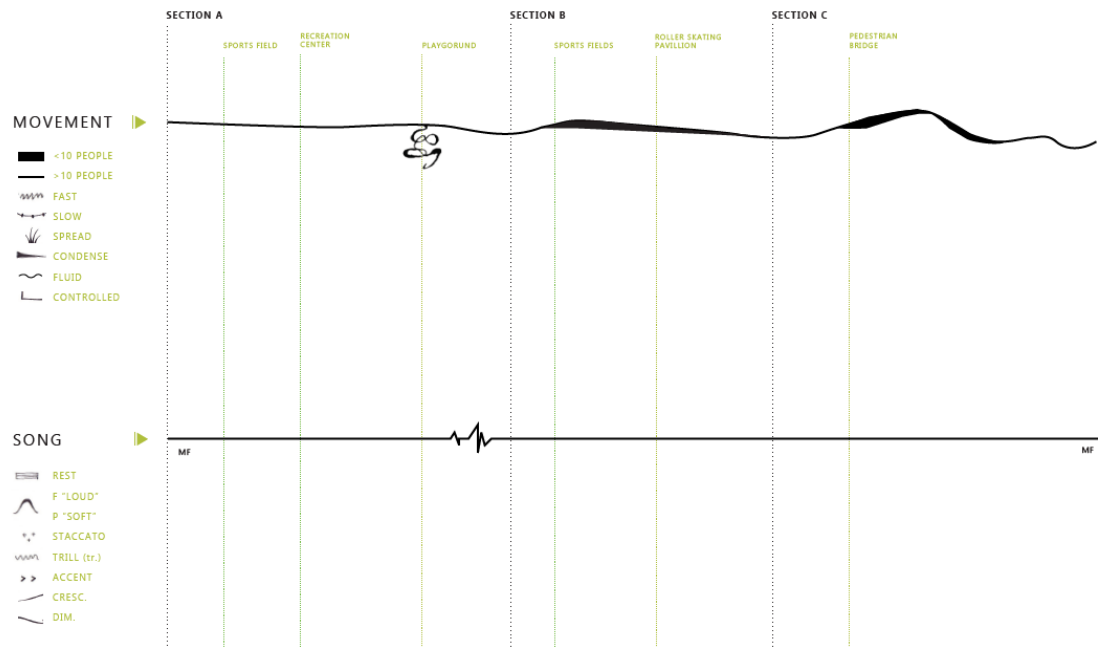


Figure 32: Choreography of Existing Conditions (Ren)

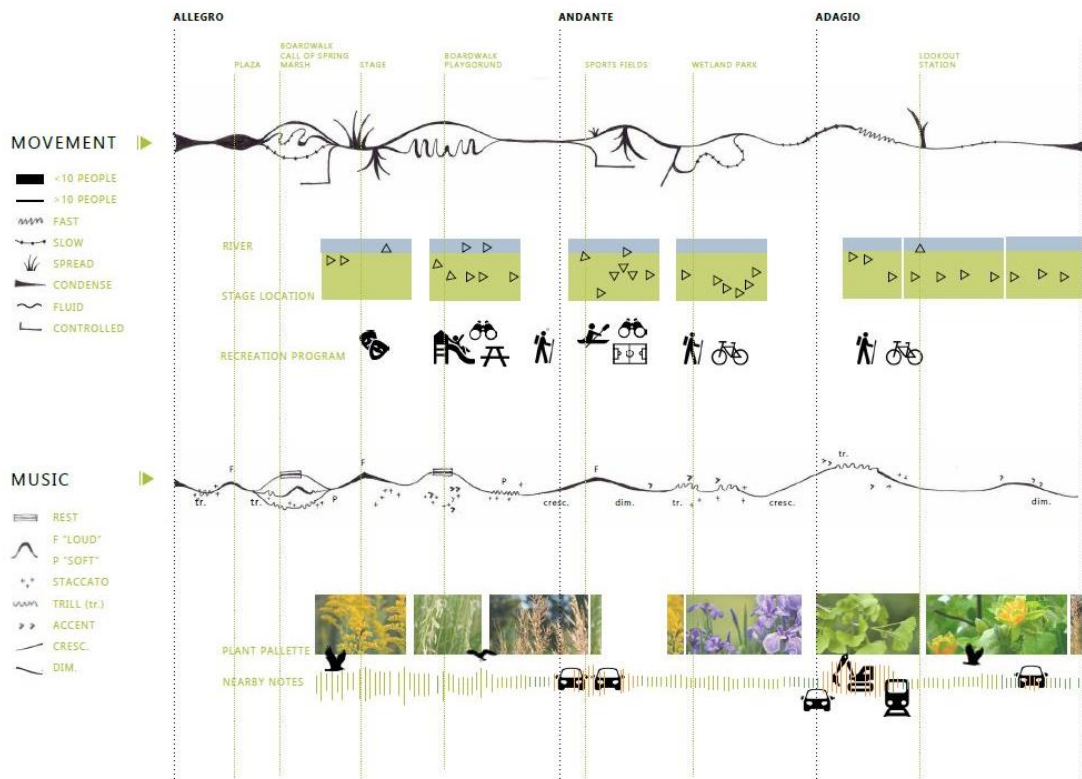


Figure 33: Choreography of Proposed Conditions (Ren)



There are stark differences when comparing the existing conditions (Figure 32) to the proposed (Figure 33). At the existing site, the movement is flat, with only a few nodes of activity such as the children's playground and the soccer fields. In the music, there is little change. Most of the sounds are mezzo-forte or "half loud.

On the other hand, in the proposed design (Figure 33), the visualized choreography is much more intricate. From the allegro section to the adagio section, there is a great variety of movement and music. People dance slowly through the marsh restoration area and wetland park. They dance in controlled movements across the pedestrian bridges and spread out onto the sports fields and floating theater. Supporting the movement is the stage location which indicates where visitors or "dancers" are in relation to the Anacostia River. The recreational program also influences the type of movement that occurs within the greenway park.

In the proposed park, the music is just as intricate as the movement. There are moments of forte near high-activity areas such as the plaza, stage, and sports fields. There are moments of piano near low-activity areas such as the marsh restoration areas and nature trail; and there are moments of complete rest on the peaceful boardwalks overlooking the Anacostia River. The plant palette and nearby notes support this musical composition by providing accents with nearby wildlife, traffic and construction noises.

#### 4.2 Choreography at the Site Scale



Figure 34: Call of Spring Site Location (Ren)

#### *Developing a Sequence of Scenes*

The design of the Call of Spring Garden within the Allegro section of the greenway park (Figure 34) explores the translation of dance into landscape design at the site scale. The garden was placed in this section because this area has the highest volume of visitors. A Chinese dance called “Call of Spring”<sup>1</sup> inspired the design of this garden. This dance was first performed in 2009 by the Shenyang Conservatory of Music Dance Academy and directed by Liu Yang, Ding Lili and Zhang Rui (Dance Library 2014). Since 2009, this dance has become extremely popular in the Chinese dance community, performed by many different Chinese dance troupes. In this choreographed dance, music illustrates the sounds of spring time with chirping birds and trickling water. Dancers represent nature beginning to blossom and bloom. This Call of Spring dance was translated into a garden because the Anacostia River had gone through a long winter of decline throughout its history but now the river has

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<sup>1</sup> Link to Call of Spring dance: <https://www.youtube.com/watch?v=lu8qsMla17s&t=282s>

begun its recovery –its arrival into spring (Figure 35). Water qualities are slowing improving with new initiatives to improve water quality and rebuild habitat. Issues of social justice are being addressed with the 11<sup>th</sup> Street Bridge Park that attempts to connect both sides of the Anacostia River. And connectivity issues are being addressed with initiatives such as the Anacostia Riverwalk trail that encouraged people to connect with the river.

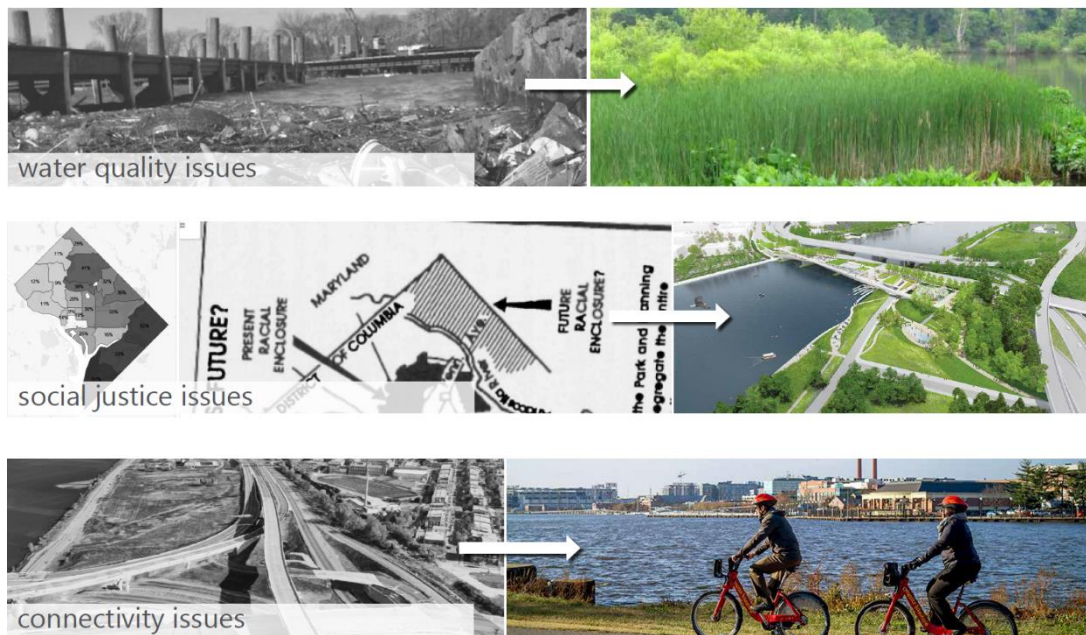
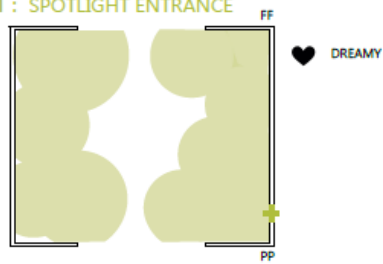
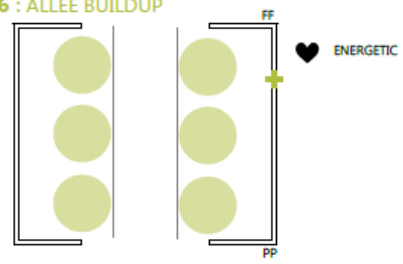


Figure 35: Anacostia's Call of Spring (Ren)

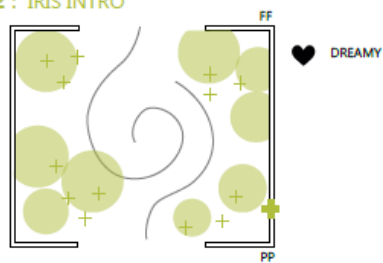
**SCENE 1 : SPOTLIGHT ENTRANCE**



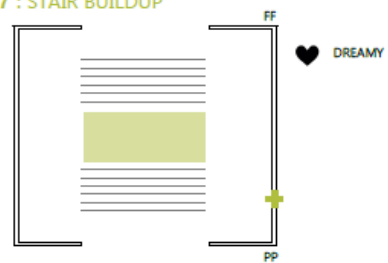
**SCENE 6 : ALLEE BUILDUP**



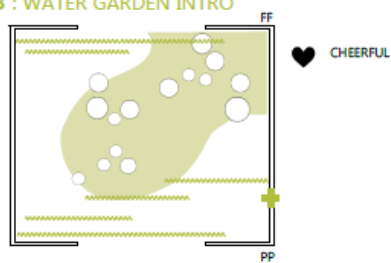
**SCENE 2 : IRIS INTRO**



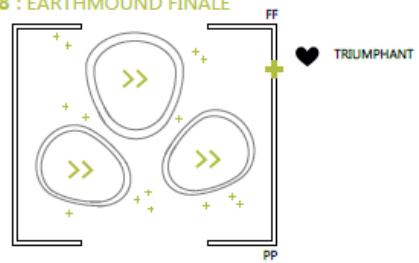
**SCENE 7 : STAIR BUILDUP**



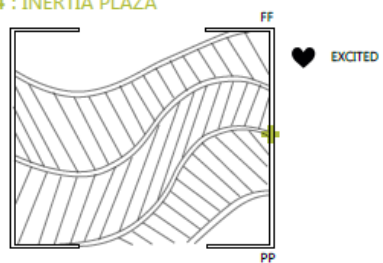
**SCENE 3 : WATER GARDEN INTRO**



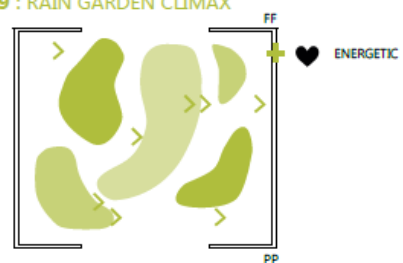
**SCENE 8 : EARTHMOUND FINALE**



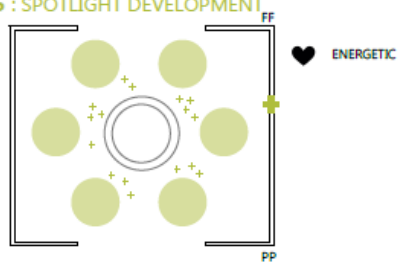
**SCENE 4 : INERTIA PLAZA**



**SCENE 9 : RAIN GARDEN CLIMAX**



**SCENE 5 : SPOTLIGHT DEVELOPMENT**



**SCENE 10 : WILLOW ENDING**

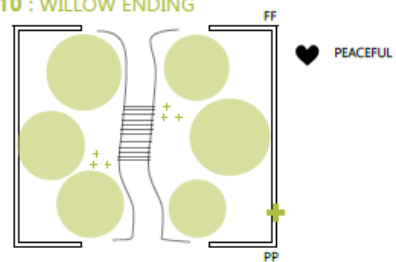


Figure 36: Call of Spring Scenes (Ren)

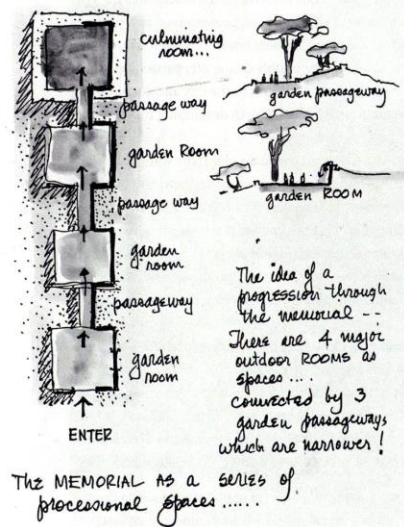


Figure 37: Lawrence Halprin's Sequences (Reprinted with permission from The Architectural Archives, University of Pennsylvania by the Gift of Lawrence Halprin)

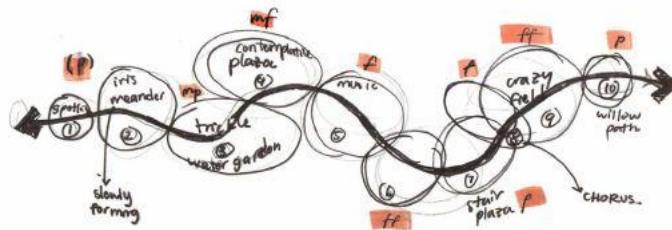


Figure 38: Call of Spring Sequence (Ren)

The Call of Spring dance was divided into ten scenes. Each scene has a distinct mood, music, and dance formation which was translated into an abstract site plan (Figure 36). Influenced by Lawrence Halprin's sketches of creating a sequence of experiences (Figure 37), the scenes were strung together into a sequence to create dance (Figure 38).

In order to create the mood, music, and encourage movement for each scene, the synthesized dance palette (Figure 27) was applied to each scene (Figure 39). For example, in order to create an energetic mood in scene 9, gravel hardscape, large

space, and bright-colored plants are added. In order to create a peaceful mood in scene 10, soft plants, small space and narrow path are added.

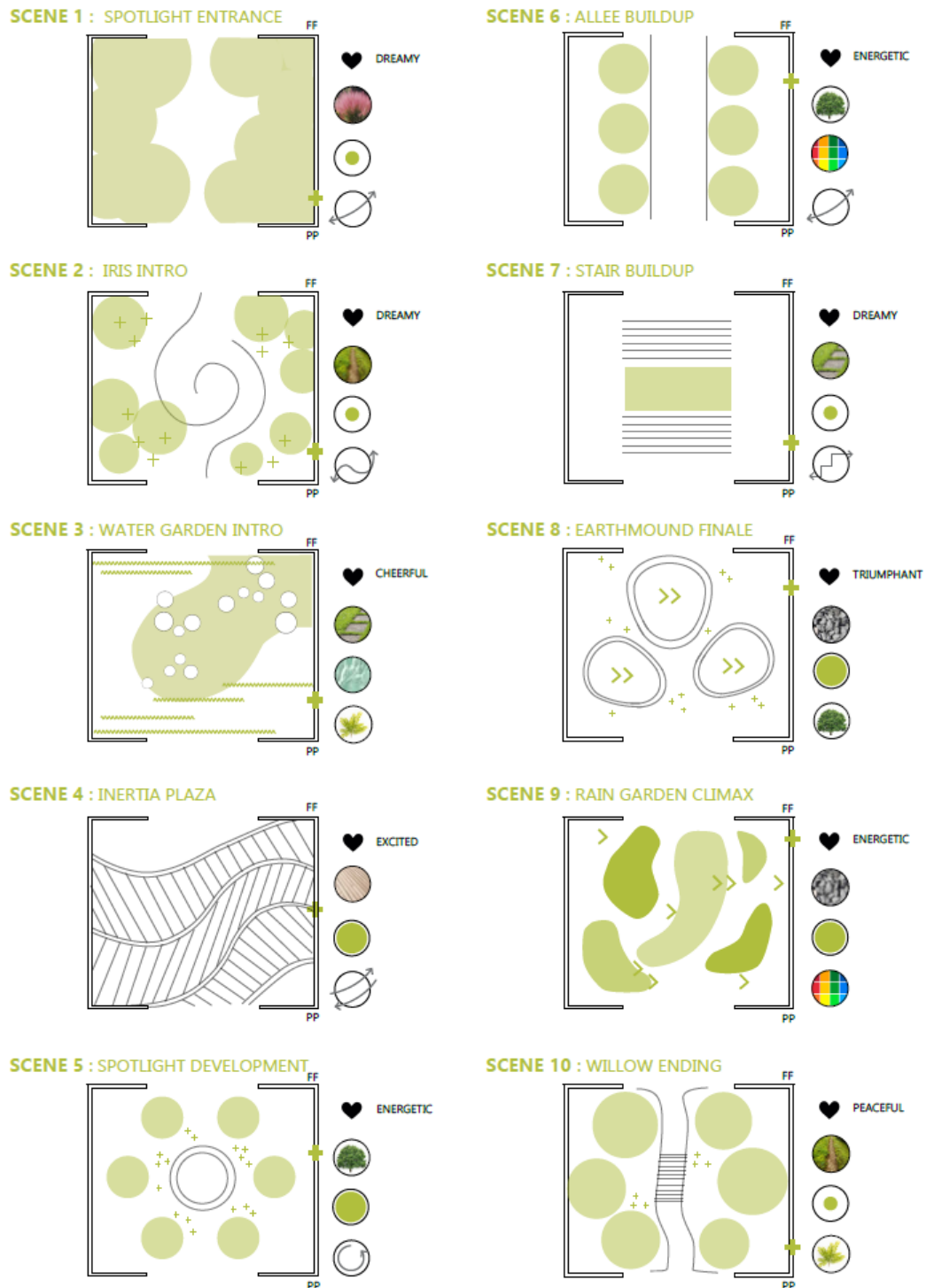


Figure 39: Applying Materials Palette to the Scenes (Ren)



### *Call of Spring Garden Site Plan*

The sequence of scenes was molded into the site so that visitors could transition seamlessly from scene to scene. Much like Halprin's idea of the garden as a processional experience, the Call of Spring garden is also designed to be experienced as procession (Figure 38). As visitors travel through the different scenes, they are able to engage in a variety of experiences, hearing different music, sensing different moods, and be encouraged to have different movements. The final site plan can be seen in Figure 40.



*Figure 40: Site Plan (Ren)*

## *Scene Walkthrough*

### *a. Scene 1: Spotlight Entrance (Figure 41)*

The dance begins with a dreamy atmosphere, soft music, and a spotlight on a few dancers. In the landscape, a clearing in a canopy of trees creates the spotlight. Soft plants such as muhly grass, soft rush, and New England aster create the soft music. Visitors walk from the main entrance plaza and across the canal bridge to the Call of Spring Garden. They know they are walking into a different environment once a dramatic spotlight pierces through the canopy and shines upon them.

### *b. Scene 2: Iris Introduction (Figure 42)*

The dance continues its dreamy atmosphere, but now the spotlight grows larger as dancers begin to twist and turn. As such, in the garden, the trees become more widely spaced so that more sunlight can pass through. The music crescendos and a soft trill, or hum, begins. A swath of iris versicolor now layers the ground plane, providing that trill as they rustle in the wind and their bright violet color provides a constant hum.

### *c. Scene 3: Water Garden Introduction (Figure 43)*

The dance now begins to pick up and the mood transitions from dreamy to more upbeat and cheerful. A new group of dancers enter from the corner of the stage. Similarly in the garden, a new path is introduced and joins with the main trail. A distinct cheerful trickle of water in the music is mimicked by the presence of water in the garden. To mimic the dancer's tip-toeing movements,



stepping stones are placed within the water garden. Native soft marsh grasses<sup>2</sup> such as soft rush and andropogon provide a soft musical backdrop.

*d. Scene 4: Inertia Plaza*

Now that all the dancers are introduced, a big plaza is needed to accommodate all the dancers. The dancer's weaving movements are mimicked in the paving patterns of the plaza. Here, visitors have unrestricted movement and are free to move about. This great space (22,000ft<sup>2</sup>) can accommodate large park events such as farmer's markets, outdoor exhibit space, and festivals.

*e. Scene 5: Spotlight Development*

In the next scene, a few dancers are under a spotlight dancing with high energy while background dancers move around them. In the garden, a raised platform accommodates the dancers in the spotlight. On the platform, visitors can experience a different emotion, perhaps energetic, as they stand higher in elevation. Neighborhood performances can perform on this 2,400 ft<sup>2</sup> platform. Around the raised platform are shaded seating areas that represent the background dancers. The high energy of the dance is mimicked in the gravel hardscape as gravel with its extra sound effects encouraging an energetic mood.

*f. Scene 6: Allee Buildup (Figure 44)*

Halfway through the Call of Spring dance, all of the dancers raise their arms rhythmically in unison. Similarly in the garden, an allee of trees provide the

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<sup>2</sup> These marsh grasses are part of a restorative marsh area and designed with ecological engineering's self-organization approach. Nature will take over as species competition will allow certain species to dominate. The creation of this marsh restoration will provide habitat for wildlife and treat stormwater runoff.

same effect. The raised arms and tree trunks are both vertical elements that produce a steady rhythm. As the music builds, so does the elevation as visitors walk from the bottom of the inertia plaza up toward the climax of the dance.

g. *Scene 7: Stair Buildup* (Figure 44)

Continuing the build up to the climax, the dancers move along the back of the stage. Their tempo of movements alternate between slow and fast. Situated at the edge of the garden just like the back of the stage, a series of specifically placed stairs and landings produce the same effect. People walking on stairs are much slower than when they walk on flat pavement. As such, the arrangement of stairs and landings create the same alternating tempo as the dancers in the dance.

h. *Scene 8: Earthmound Finale* (Figure 45)

From the allee and stair buildup, dancers arrive at the finale. Here, the dance has a triumphant mood, loud music, and there are three large groups of dancers. In the garden, representing the three large group of dancers are three large earth mounds. Dancers and visitors can climb a top these four-foot-tall mounds. They can feel a sense of triumph as they stand above the ground looking upon the rest of the garden.

i. *Scene 9: Raingarden Climax* (Figure 46)

At the climax, the dance is energetic, dancers are waving their colorful sleeves in a flurry of movements. In the garden, a permeable gravel surface<sup>3</sup> provides noise and energy. A series of raingardens capture and filter stormwater runoff

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<sup>3</sup> A permeable surface will increase stormwater infiltration.

but also the plantings brilliant color bring energy and loud music to the scene.

Visitors can see and feel the energy in the climax of the dance.

j. *Scene 10: Willow Ending* (Figure 47)

The dance ends in a peaceful mood, with soft music, low light, and one solo dancer. In the garden, the peaceful dimly lit atmosphere is provided by a dense planting of willow trees, providing shade with their canopy and soft music with a rustle of their delicate branches. Now the path has narrowed down from the climax into a small foot path. A little footbridge over a dry creek<sup>4</sup> encourages the movement as a single jump that ends the dance.

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<sup>4</sup> The dry creek captures, treats, and conveys two sources of water to the rain gardens in scene 9. One source is redirected from the tidal channel. The other source is from stormwater runoff. Water velocity decreases through the dry creek allowing more time to infiltrate. Joe-pye weed (*Eutrochium purpureum*) and other plants help filter the water and uptake pollutants and excess nutrients.



**DAPPLED LIGHT = RELAXATION**  
using plants to create dappled light adds a relaxing atmosphere



Dappled Light

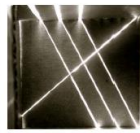


Dance Practice

**SPOTLIGHT = DRAMA**  
using plants to create a clearing in the canopy adds drama



Spotlight



Chiaroscuro test

**FULL SHADE = SERENITY**  
using plants to create fully shaded areas adds a serene atmosphere



Full Shade



Dance Practice

Figure 41: Scene 1- Spotlight Entrance (Ren)



**TWIRLING MOVEMENT = VINES**



Campsis radicans



Dance Practice

**MUSICAL ACCENT = IRIS**



Iris versicolor



Dance Practice

**SOFT MUSIC = GRASSES**



Sorghastrum nutans



Dance Practice

Figure 42: Scene 2- Iris Introduction (Ren)



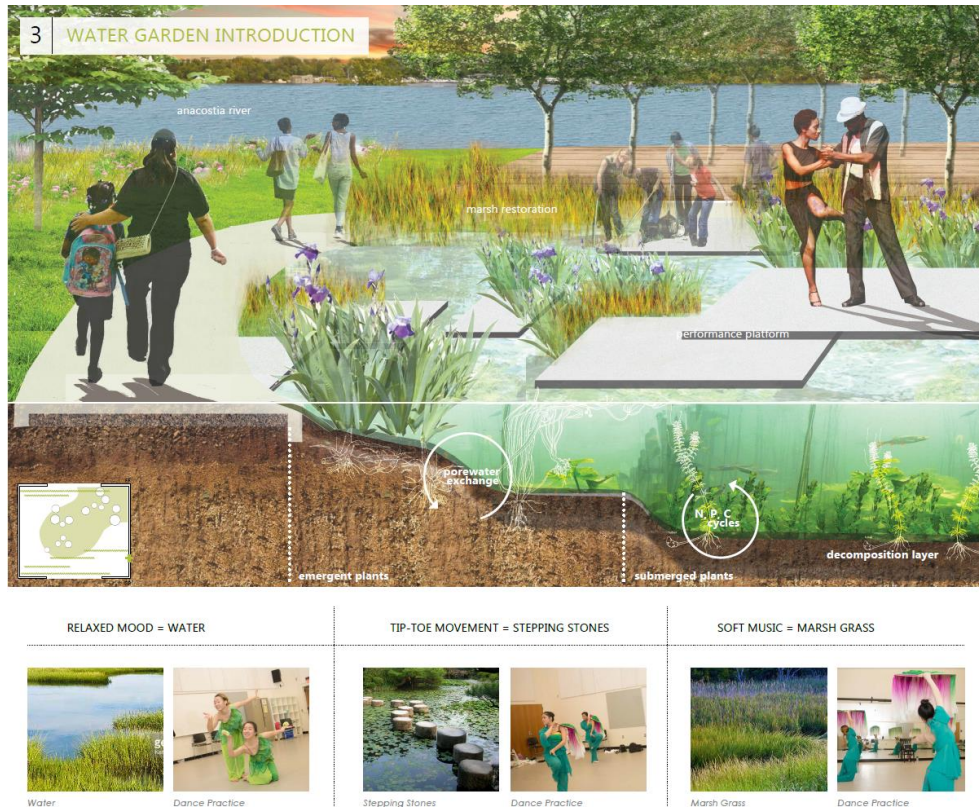


Figure 43: Scene 3- Water Garden Introduction (Ren)

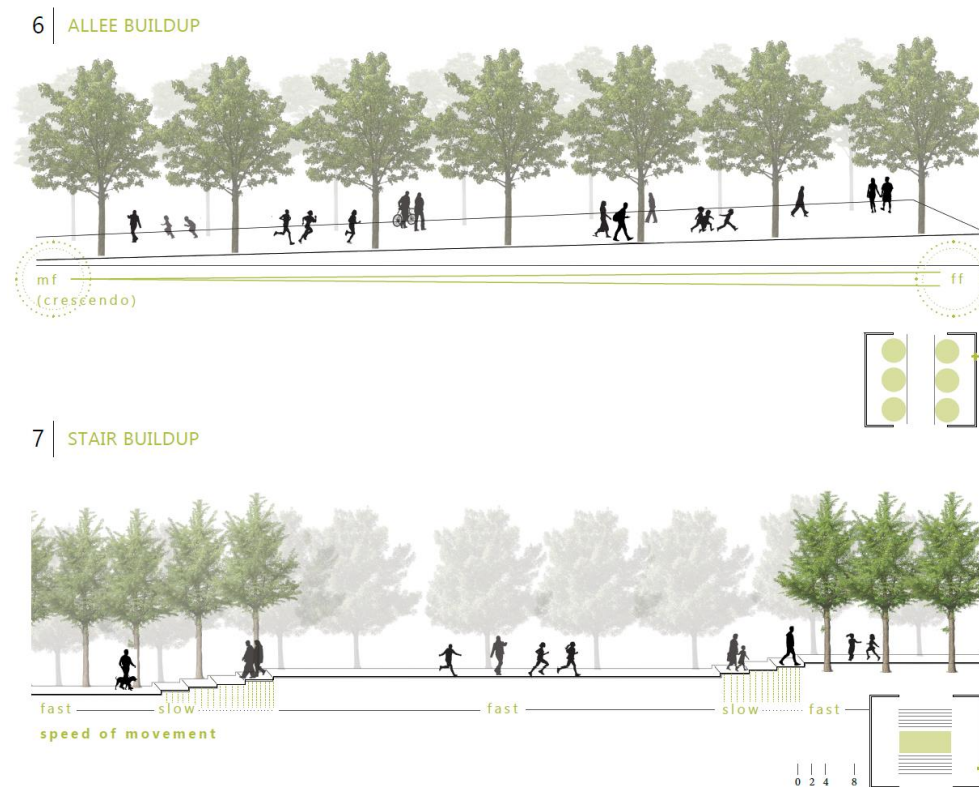


Figure 44: Scene 6- Allee Buildup and Scene 7- Stair Buildup (Ren)



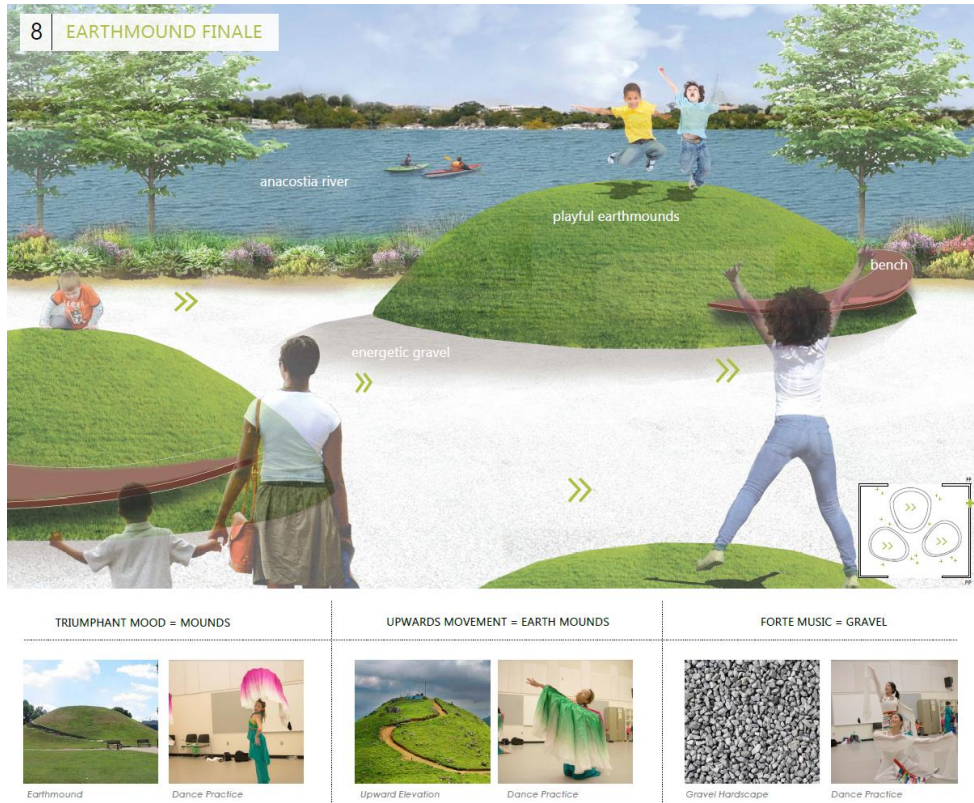


Figure 45: Scene 8- Earthmound Finale (Ren)

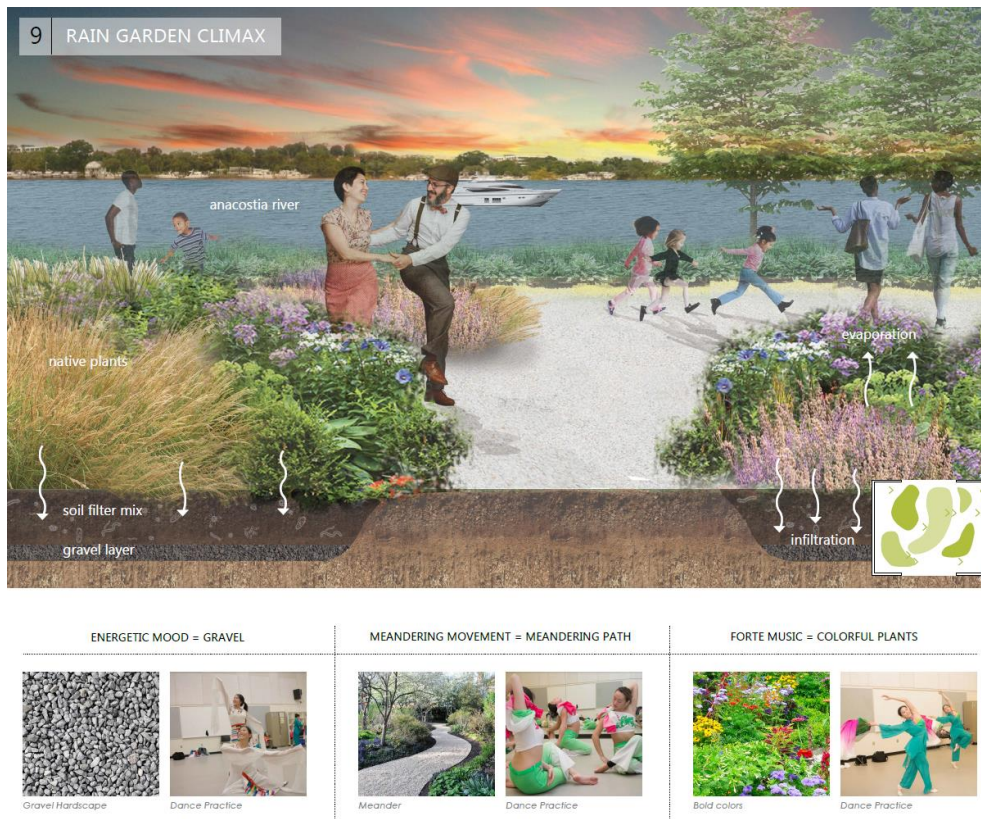
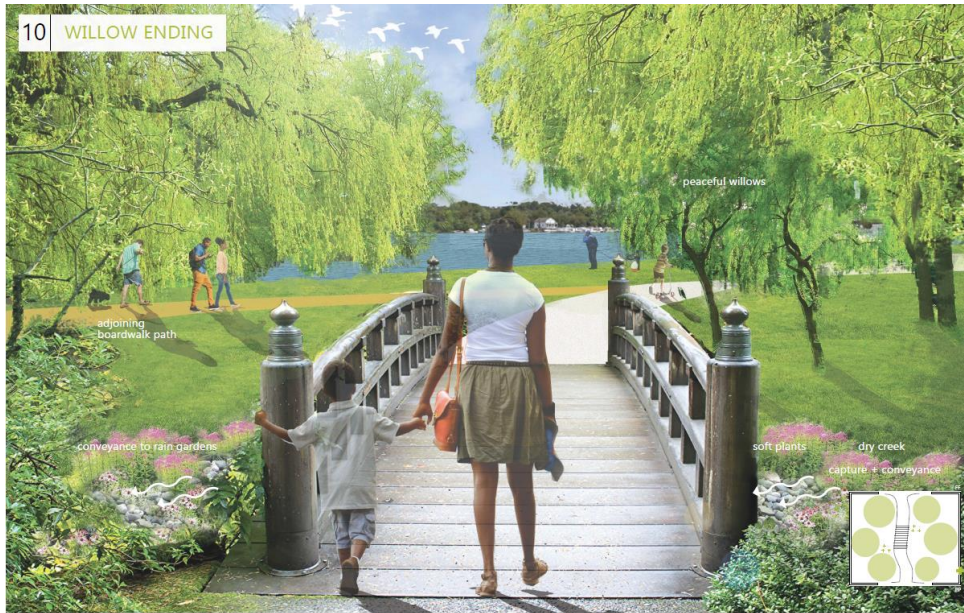


Figure 46: Scene 9- Rain Garden Climax (Ren)



PEACEFUL MOOD = WILLOW TREES

SINGULAR MOVEMENT = FOOTBRIDGE

SOFT MUSIC = DELICATE PLANTS



Figure 47: Scene 10- Willow Ending (Ren)

## Chapter 5: Reflections

### 5.0 Reflections

This exploratory project presented many challenges but also many rewarding outcomes. A crucial initial step was to first become familiar with the dance vocabulary and then methodically break down the concept of dance into the two workable components. It was difficult to systematically dissect the concept of dance since dancing can be a very organic process influenced by feelings, a story, or music. In the end, the concept of dance was divided into two main components: movement and music. With these two components, movement and music were translated individually into landscape design. That being said, this systematic process is not perfect. At times during the design process, dance instincts were compromised in order to make the design more functional for daily visitors. For instance, in the rain garden climax, even though the energetic atmosphere called for a very bright lighting, trees still needed to be added to provide shade and comfort for visitors.

When designing with choreography, it was also challenging to create a design method that worked at multiple scales. How could a choreographed dance span two miles and how could that two-mile long dance become applicable at a smaller more personable scale? Ultimately, the solution was to use theoretical choreographic principles at the master planning level and detailed dance ideas at the site level.

### *Master Plan Structure*

When developing the structure of the master plan, many musical and choreographic structures were experimented with. The challenge of these structures



was that they did not necessarily fit with the Anacostia Park's site context. At first the structure of a musical sonata, a musical composition with three movements that contain an ABA structure where first and third movement are the same, was applied. This structure seemed fitting because the bridges that crossed the park naturally split into three sections. However upon further examination, repeating the same program and environment for the first and third section of the park did not fit the site context. The northern most section between East Capitol St and the CSX railroad bridge needed to be kept forested but it did not make sense to make the first section between 11<sup>th</sup> Street Bridge and Pennsylvania Ave to transform into a forest as well. The first section that would be seeing the highest volume of people should accommodate large events and a heavily forested area would not be the safest environment for that type of program. In other investigation, the master plan was re-organized to fit the dance structure of a story. A story structure has a temporal sequence of an introduction, development, climax, and resolution but that also did not exactly fit the context because the site could not be experienced from only one direction. People coming from the resolution end of the site would not understand the story progression.

Ultimately, the decision was to first program the park to fit the site context and then name the sections after appropriate musical tempos. High activity programs were placed between the southern-most section because 11<sup>th</sup> Street Bridge Park, the connections to other areas in Southwest and Southeast D.C., and future Poplar Point developments were in the surrounding area. Neighborhood activities were placed in the middle section between Pennsylvania Ave and the CSX railroad bridge because a

large residential community was nearby. The northern most section was kept forested so that visitors could enjoy this natural resource.

Applying choreographic principles at the master planning scale was an optimal way of addressing dance at a large scale. A choreographer can implement many tools and principles to create contrast and interest within a dance composition. These principles were also very applicable to landscape design and helped create variety and interest in the landscape as well.

#### *Site Scale*

Compared to translating dance into landscape design at a master planning scale, the site scale provided a much more detailed look at sensory experiences, sequences, and ultimately experiential diversity. It was rewarding to explore these translations because design could be examined from a new perspective—one that made paid attention to human experiences in greater detail and explored a new vocabulary to design space. In order to create different mood experiences, different materials were explored. A new vocabulary was explored by examining the musical capabilities of plants and how different planting schemes produced different sounds. Different elevations, spaces, paths, and ground materials could potentially influence how people moved and to an extent, how people emotionally felt in a space. Similar to scenes in a dance, scenes in the landscape were created with consideration to the transitions between each scene.

One caveat creating these different environments was that the manipulation of materials could only encourage certain moods, not definitively prescribe them. The

synthesized dance palette (Figure 22) helped determine specific materials to create a mood but ultimately, creating how people feel and move depends on the individual. In the movement and mood palette (Figure 20), different elevations, paths, and ground material only inspired certain types of mood.

Modeling a garden after an existing dance was very helpful. The Call of Spring dance was already professionally choreographed which provided great examples of dramatic and diverse scenes with seamless transitions and harmonious musical accompaniment. Initially, an attempt was made to create a dance without a source that was simply inspired by the site. However, the Call of Spring dance proved to fit perfectly with the context of the Anacostia River and show an optimal potential for the site.

Future restorations along the Anacostia Park should think about using dance in the design process because dance can be a powerful tool to create experiential diversity. This new methodology could also be adapted to different sites by using a dance that reflects a site's own culture and community customs. A traditional Chinese dance inspired the Call of Spring Garden, but perhaps future design projects on the Anacostia could use a local dance that connects better with the Anacostia region's culture. During future community design workshops, local musicians and dancers could also brainstorm to create their own dance and translate that dance into the landscape using this methodology. Using dance and music could become an engaging strategy in future community design workshops. Especially when the site is a well-used neighborhood amenity, this methodology will be more likely to provide a sense of local ownership and pride.

### 5.1 Final Thoughts

Experiential diversity is often omitted from the typical design of greenways. However, implementing this component can be vitally important in order to increase engagement and enhance people's outdoor experiences. It can activate green corridors and water quality treatment techniques by making them more interactive. This design also proposes a valuable approach to park design. While successful parks usually do provide diverse experiences, using choreographic dance techniques adds a new layer of artistry and attention to detail. By approaching park design as a choreographer of dance, a designer can focus on the human experiences, how materiality and environment influence movement, senses, and emotions. All landscapes have the potential to become beautifully poetic dances while also serving utilitarian functions.

This design contributes to the preservation of valuable park land in the urban environment. The waterfront property along the Anacostia River is extremely valuable and new development is quickly encroaching upon waterfront land. An active greenway that provides many economic, social, recreational, and environmental benefits creates a valid argument to keep the land undeveloped but highly utilized along the waterfront. Furthermore, by adding experiential diversity through choreographic dance techniques, people can become more engaged with the waterfront landscape. The diversity in their movement as well as their sensory and emotional experiences can create a composition that increases people's involvement with the landscape. This engagement can ultimately motivate visitors to care for the Anacostia River, a vital vein that pumps life in the Washington D.C. community. The

Anacostia River may have seen a cold and dreary winter, but now spring is calling its name.

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