

ABSTRACT

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This thesis proposes the reconnection of Georgetown, Washington, DC to the Potomac River through an architectural promenade. As city planning is shifting towards the redesign of urban waterfront spaces, understanding the connection and access to these waterfronts is increasingly important. By studying the different layers of the city between the urban fabric and natural river landscape, a sequence of spaces linking the two can be established.

URBAN MOBILITY

By

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Chapter 1: Introduction

Georgetown is in a sense a microcosm of Washington, DC. The livelihood of the neighborhood is due in part to the merging of its many activities and land uses with a historical architectural charm. High end shopping establishments, as well as restaurants and bars make Georgetown a destination within the greater context of Washington, DC. Georgetown University is a leading private research university attracting a wide variety of students from diverse backgrounds. As you approach the western edge of Georgetown, the city reaches a junction between the urban and natural landscape where the natural banks of the Potomac River transitions into an urban edge.

This transition between the city and the landscape is marked by a particularly desolate and vacant site, littered with construction debris, bounded by mangled fences, and tagged with graffiti. Bordering the Potomac River to the south and a steep topographical incline leading up to M Street, the site is frequently traversed by visitors who engage in recreational activities along the water and connecting trails, as well as those on leisurely strolls. Additionally, the site is bounded and subdivided by various spatial sequences, each with their own independent yet interrelated histories and activities.

It is in this sense that the site can be viewed as being at a critical juncture, a threshold into the urban realm but also a gateway to the natural realm, where the city form meets the natural landscape. How can these two conditions fuse together, both in connecting people to the Potomac River and engaging the visitor in these intricately linked experiences?

This thesis will examine the history of the site, its various phases of development and how the site functions and is utilized today. The goal of this research is to reach an understanding of the history of the site, how the history might be made more manifest and how it might be integrated with uses appropriate today.

The different methods of movement in and around the site make the act of motion and its effect on the spatial experience of the site important. Chapter 4 will show how motion has an impact on a person's perception of the spaces they occupy, and ways in which design of future systems can address this.

Creating better connection across the site to the Potomac is desirable. Therefore, this study will explore the possibilities and benefits of reconnecting the city with the water through historical research, understanding the role of water in formation of cities and what the future holds for urban waterways.

Chapter 2: Historical Context

In colonial times, waterways provided the most efficient route for communication and trade with neighbors, villages, and coastal and overseas ports. Situated at the furthest point upstream of the Potomac River to which pre industrial ships could travel, Georgetown's waterway was once an important port prior to the creation of Washington, DC, and became an integral part of Washington's daily functions. Tracing the historical development of Georgetown will show how the city owes its existence to the river.

Native Settlement

Captain Henry Fleete, among the first to sail past the present site of Washington, describes the site of Georgetown, a Native American village named Tahogae at the time; "This place is without all question the most pleasant and healthful place in all this country, and most convenient for habitation, the air temperate in summer and not violent in winter. It aboundeth with all manner of fish. The Indians in one night will catch thirty sturgeons in a place where the river is not above twelve fathoms broad. As for deer, buffaloes, bears, turkeys, the woods do swarm with them, and the soil is exceedingly fertile."¹ Fleete's writing had a lasting effect, as it attracted further settlement into the region then occupied by Native American villages. The Native Americans that inhabited this area were from the Nacotchankes, or Anacostian tribe, belonging to the greater Algonquin nation. The tribe had developed farms along the Potomac River, from which they cultivated goods for both sustenance and trade. In addition, stone

¹ United States Commission of Fine Arts, 8

from quarries in the surrounding hills was manufactured into tools and weapons, also used in trade with surrounding tribes.²

Colonial Era

The area experienced gradual colonization through the 17th century. Cecilius Calvert attracted settlers to the new colony of Maryland north of the Potomac River. Large land holdings were allotted for an annual fee. Two of the earliest men to receive a patent for land in the area of present day Georgetown were Colonel Ninian Beall and George Gordon, who acquired in excess of one thousand acres.³ Gordon, who likely cultivated tobacco on his land, established a warehouse for the storage of tobacco and later an Inspection House at what became the nucleus of trade for Maryland's tobacco plantations. A petition presented in 1751 to the Maryland Assembly authorized the establishment of the "town of George" or George-Town.



Figure 1: View of the Suburbs of the City of Washington

² Ecker, 4-5

³ Ecker, 9

Trade and Production

The tobacco trade thrived during the 18th century in Maryland and Virginia. In Georgetown, warehouses, wharves, and taverns were built along the water's edge. As the closest tidal port to Maryland's interior plantations, public wharves were constructed to facilitate the export of the region's cash crop, or the "precious weed" as it was called, as well as other goods including flour and grain.⁴

After the American Revolution, which had seen a decline in all trade during the war, Georgetown ports continued to export tobacco and goods from an expanding flour industry. The milling industry found success in Georgetown, due to the increasing demand for more diverse exports and the supply of waterpower from the Potomac River and Rock Creek. Shipment of flour and grain was equivalent to the shipment of tobacco at the end of the 18th century.⁵ Another prominent port across the river in Alexandria began to absorb foreign trade, leaving primarily coastal trade for Georgetown.

Georgetown's role as a major colonial port in the area also led to involvement in the slave trade. Since its founding, Georgetown has had a prevalent African American population of both enslaved and freed residents. Life for African Americans in Georgetown "typified life in the towns of most antebellum border states, but the harsher aspects of the "peculiar institution" found in the Deep South were muted."⁶ Slaves were able to buy their freedom

⁴ Ecker, 13

⁵ United States Commission of Fine Arts, 15

⁶ Lesko, Babb, Gibbs, 3

and in some cases were granted freedom from their owners. Despite oppressive social conditions, some African Americans were able to excel in the community, notably Benjamin Banneker, who assisted Andrew Ellicott in surveying the land that would eventually become Washington, DC. As blacks grew tired of the segregated nature of other churches in Georgetown the community established a number of places for worship such as Mount Zion United Methodist Church.

It was in Georgetown that meetings concerning land deals to acquire land for the new city of Washington were held. Key figures in these meetings included George Washington and Benjamin Stoddart, who met regularly at Suter's Tavern and eventually reached an agreement on a land transfer deal of Georgetown to the federal government.⁷ Soon after the establishment of Washington as the federal capital of the United States, Georgetown was incorporated into the District of Columbia in 1871.

Chesapeake & Ohio Canal

The Chesapeake & Ohio canal was developed in the mid 1800s as a means to connect the Potomac River with the Ohio River in Pennsylvania. Preceding to the C&O Canal were a series of skirting canals proposed by George Washington and his Patowmack Company as a method of river improvement, intended to bypass navigational obstacles on the river such as Great Falls. Gondolas, 60' by 10' log rafts, and sharpers, boats 60' long by 7' wide with pointed ends and flat bottoms, transported goods from western Maryland to

⁷ Ecker, 52

Georgetown for 26 years, navigating the skirting canals developed by Washington.⁸

As the volume of trade intensified on the Potomac River, travel on the river called for an alternate method to facilitate trade west. Influenced by the success of the Erie Canal, construction on the C & O Canal began in 1828. However, the project fell short of the goal reaching the Ohio River, as problems with the terrain, rights of way, labor shortages, and lack of capital caused delays from the start. The 184.5-mile canal began in Georgetown, DC, reaching its western terminus in Cumberland, MD by 1850. Utilizing a series of lift locks, 74 in total, the canal navigated the 605-foot change in elevation between Georgetown and Cumberland.

The labor force working on the canal was primarily composed of Irish and German immigrants, who faced deplorable working conditions. They were paid extremely low wages and often faced the threat of epidemics and accidents digging the canal. The large influx of immigrant workers had a considerable impact on Georgetown in 1829 where many of these neglected workers were starving in the streets.⁹ As construction on the canal continued, labor disputes erupted over the hardships that workers faced. Without the efforts of the laborers, the canal, an amazing feat of engineering, would not exist today.

⁸ Kytte, 8

⁹ Kytte, 34



Figure 2: Map of the C & O Canal

At the same time that canal construction began, construction of the Baltimore and Ohio railroad introduced the train as a means of transportation west. By the end of the 19th century, most shipment west had been taken over by the railroad. During its profitable years, the canal helped the Georgetown waterfront maintain relevance, especially after the collapse of the tobacco trade in the mid-19th century. Coal shipments dominated canal trade and other goods included wholesale groceries, lumber, and building stone. The use of the canal also led to a change in the appearance of the Georgetown waterfront. The Aqueduct Bridge was opened in 1889 to link the canal and Georgetown with the Alexandria Canal system across the river. Elevated railways soon populated the riverfront, which transferred coal from canal barges to vessels on the river. Additionally, numerous milling operations relied on the canal as a source of waterpower. Already vulnerable due to the loss in trade to the railroad, two devastating floods, one in 1889 and the other in 1924 rendered the canal obsolete as the cost of repair was not economically justified. The B & O railroad assumed majority ownership of the canal to keep the right of way and fend off competition from the Western Maryland Railroad. The depression led to its sale to the federal government. After lying dormant for a period of time, in 1971 the canal was established by congress as the C & O Canal National Historic Park.



Figure 3: Georgetown flooding aerial 1 – 1936



Figure 4: Georgetown flooding aerial 2 – 1936

Post-Industrial Georgetown

With the lack of trade as a source of revenue, Georgetown began undergoing a negative transformation. Industries that had been established along the canal and waterfront were phased out. Those that remained adapted to their new surroundings drawing waterpower from what remained of the canal and establishing connections to rail lines.¹⁰ Aging residential structures and the undesirable nature of the industrial sections of the neighborhood spurred a migration of residents from Georgetown into developing neighborhoods across the district. With its incorporation into the District of Columbia in 1791, Georgetown had become part of larger urban entity, a change from where in its early years DC was reliant on Georgetown as a source of housing, services, and communications.

One institution that continued to grow in the Georgetown neighborhood was Georgetown University. Founded by a Jesuit bishop in 1791, the college established roots in upper Georgetown with the construction of its first building “Old South”.¹¹ The Civil War however, created a huge divide among the student population with some fighting for the Union Army and others the Confederates. The war impacted the makeup of Georgetown’s student body as more northern students enrolled. With the establishment of Patrick Francis Healy as president of the University in 1874, Georgetown underwent a vast expansion. Healy, the first African American president of a white university, sought to modernize the school’s curriculum, merge the various professional schools that had developed,

¹⁰ United States Commission of Fine Arts, 75

¹¹ O’neill and Williams, 2003

and increase concentration on higher education. Healy Hall, the school's historic main building, clearly shows the impact Healy had on the university and the neighborhood.

By the 1940s, Washington, DC began experiencing housing pressures, which led to a renewed interest in Georgetown. Old residences were rehabilitated and the industrial remnants converted into offices particularly for architects, city planners, designers, and other creative professions. This shift into Georgetown had dramatic impact on the African American community, as gentrification moved them from their homes.

Growing connections with Washington's city had other impacts on the fabric of Georgetown. The Francis Scott Key Bridge replaced the Aqueduct Bridge in 1923. The Whitehurst Freeway was constructed in 1949 to bypass small and narrow Georgetown streets as a link from Key Bridge to K Street and the center of Washington. The Whitehurst delayed interest in waterfront development and rehabilitation, as it seemingly cut the city off from the water. Its construction also caused the demolition of many of the industrial buildings that had formed along the waterfront.

A New Life for Georgetown

Recreational uses paralleled Industrial uses and can be traced to the late 1800s, where boathouses were developed along the river serving a number of local boat clubs. The Potomac Boat club was founded in 1869, "for the purposes of aquatic exercise and pleasure".¹² Georgetown University's Boat Club made a

¹² Potomac Boat Club

profound statement after the Civil War with the founding of its boat club in 1869, adopting blue and grey as the club colors. These colors, blue for the Union Army, and grey for the Confederates, expressed “unity between Northern and Southern boys” who were members of the club.¹³ Also of note were the establishments of Thompson’s Boat Club in 1890 and the Washington Canoe Club in 1904. During the second half of the 19th century, rowing competitions were held on the river. Each of these boathouses provided direct links to the Potomac River. Competitions and regattas held on the river also attracted spectators to the banks of the river.



Figure 5: Georgetown Crew on the Potomac

Georgetown, despite the decline of industry, manufacturing, and trade, has maintained its status as a major commercial district in Washington, DC. The Washington Harbor development was completed in June 1986, providing shops, residential units, restaurants, office space, and underground parking, with a popular waterfront promenade. More recently, the Georgetown Waterfront Park replaced a parking lot and introduced a passively designed landscape that helped bring people closer to the Potomac River. An essential framework of

¹³ Georgetown Crew, web

these initiatives was an understanding of the historical development of the city, which has helped to preserve the diverse character that the neighborhood still exhibits today.

Chapter 3: Site Context - Regional

Introduction

The District of Columbia was founded on July 16, 1790 to serve as the capital district of the United States. Its unique status as the nation's capital has helped the city become an important center of politics, business, and culture. In the present day, Washington, DC is a growing hub of culture, tourism, and jobs. This growth has led to the characterization of DC as a "high amenity city"¹⁴, with cultural arts destinations, and picturesque natural surroundings. Understanding the components that make up the city at a regional scale will help identify certain external forces that may impact the direction of this thesis.

Geography

Location was the primary factor in the siting of Washington, DC. Its political location in what was the center of the thirteen colonies, as well as the geography of the land at the confluence of the Potomac River and Anacostia River made for a strategic yet challenging planning issue.

The Potomac River occupies the lowest point of the city at sea level. From sea level the land rises to its highest point at 409 feet in upper northwest Washington. Located in the humid subtropical climate zone, Washington has hot and humid summers, mild winters, and warm spring and autumn seasons. This combined heat and humidity produces generous precipitation, averaging 39.74 inches of rain, including an average of 15.4 inches of snow annually.¹⁵ Occasionally excessive rainfall or winter storms known as "nor'easters" occur,

¹⁴ Carlyle, www.forbes.com

¹⁵ <http://www.nws.noaa.gov/>

occasionally leading to flooding in the district.

Approximately 19% or 7,464 acres of Washington, DC's total area is comprised of parkland, the second highest percentage among major US cities.¹⁶ Much of this land is owned by the National Park Service whose budget constraints have led to a lack of care and maintenance of many parks across the district.

Planning the City

French born architect and planner Pierre Charles L'Enfant was commissioned by President George Washington in 1791 to plan the new capital city. The baroque design by L'Enfant addressed the natural contours of the site with major buildings, important monuments, and fountains occupying specific topographical sites. A series of diagonal avenues are superimposed over a grid system to form grand, tree lined streets and ceremonial spaces. These broad avenues were in some cases proposed by L'Enfant to be in excess of 130 feet wide and were meant to visually connect the important spaces throughout the city. What the ambitious plan of the city sought to achieve was to serve as a symbol of the American government to other nations and to provide a model for future city plans within the United States.

¹⁶ The Trust for Public Land, 10



Figure 6: Reproduction of L'Enfant plan for Washington, DC

In the early 1900's a plan for the development of a comprehensive system of parks was called for to beautify the monumental core of the city. The McMillan Plan re-envisioned the National Mall as a simple expanse of grass flanked by museums, memorials, and cultural institutions. The plan also proposed a comprehensive system of parks and recreational facilities, a municipal office complex at Pennsylvania and 15th streets, and a new railroad station north of the United States Capitol. Changes were made in earnest to the framework designed by L'Enfant during the city's formation, while at the same time exemplifying the ideals of the City Beautiful movement.

Regional Connectors

Washington, DC is at the center of a major metropolitan area that includes territories from Maryland and Virginia. Its physical location, in addition to its political boundary, has made it a principle city on the east coast, leading to the development of a number of regional connections into the city, both natural and man-made.

The siting of the city at the junction of the Potomac River and Anacostia has established connections with the eastern seaboard, as well as cities towards the outer reaches of both the Potomac and Eastern Branch. These waterways served as primary means of navigation both in and along the water. Some notable surface connectors that run along the river include the George Washington Parkway to the south and Canal Road to the north. Surrounding the city is Interstate 495, also known as “the beltway”. It connects DC to a large network of highways. These routes converging on the city have led to necessary linkages across the Potomac River and other geographical boundaries. Serving as gateways as well as being utilitarian, the bridges integrate the surrounding region and are linked to the city’s landscape.

The regional connections into DC have had major impacts on the city. They bring in a large number of commuters from the outer suburbs. With an approximate city resident population of 646,449 in 2013, during each workday it is estimated that commuters from surrounding suburbs in Maryland and Virginia raise this number to more than one million, a 79% increase.¹⁷ This statistic

¹⁷ US Census Bureau

demonstrates the added pressure being placed on transportation systems by the influx of people into the city each day.

To help alleviate the strain that the commuters place on the city's infrastructure network, alternative means of transit are being continuously introduced. These range from Metro expansion, streetcars, to improved bicycle infrastructure. The goal of these initiatives is to make access more efficient and to introduce sustainable modes of transit. According to data provided by the Washington Metropolitan Area Transit Authority, reduced auto usage in association with transit services has led to a decrease of about 260 tons of volatile organic compounds (VOC's), and 0.5 million tons of CO₂.¹⁸

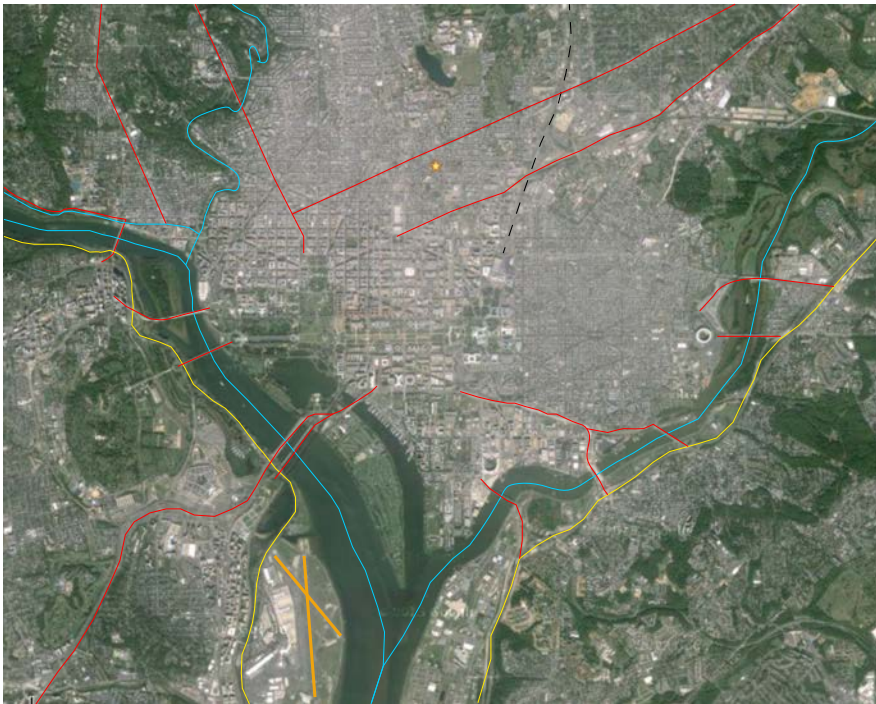


Figure 7: Diagram of Regional Connectors in DC

¹⁸ Washington Metropolitan Area Transit Authority

Waterfront Engagement

The Potomac River was once a driver of the cities economy. Over time however, it lost its ability to facilitate trade. Along with the decline of industry, the city had become detached from the Potomac River with former industrial lots scattering the edge between the urban and natural realm.

Efforts have been made in recent years to reconnect the city with the river through thoughtful developments. The Wharf development, planned by Perkins Eastman, is seeking to revitalize the rich history of the Southwest waterfront. Used as a commercial wharf since the early 1800s and having served military purposes during the Civil War, the Southwest waterfront is being used as a seafood market and marina today. The waterfront development will create “an active, mixed-use, urban riverfront that showcases distinctive cultural destinations and builds upon the existing, strong waterfront community”.¹⁹

The Yards development is yet another example in Washington, DC of the transformation of a formal industrial neighborhood and port. Along the Anacostia River, the award winning Yards Park has established a waterfront recreation area, performance space, and a boardwalk. Smaller scale, more localized projects are also beginning to take root. The recent publication of the Office of Metropolitan Architecture (OMA) and landscape architect OLIN’s winning entry for the 11th Street Bridge competition transforms the way one might view ‘waterfront’ development. The design proposal aims to transform the aging 11th Street Bridge, creating an elevated park and unique civic space on a structure

¹⁹ Hoffman Madison, web

that normally serves a utilitarian purpose.

Taking note of the attention being paid to reclaim the city's waterfront spaces, it is interesting to see how the edge between the water and city is seemingly creating a chain of public spaces along what was once a neglected and blighted zone.

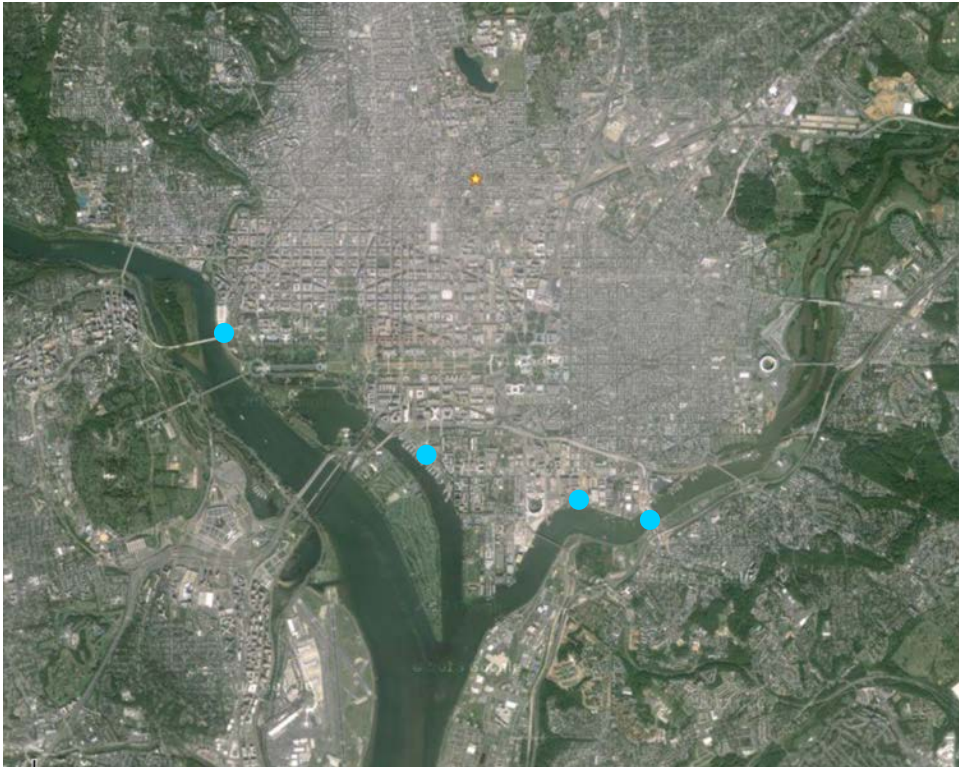


Figure 8: Waterfront Developments in Washington, DC

Growing Cultural Destination

The cultural landscape of Washington, DC brings millions of visitors to the city each year. Public spaces, institutions and memorials create a meaningful dialogue between people and history, art, and recreation. The National Mall provides a vast open space in the heart of the city where demonstrations, festivals, and recreation often take place. Surrounding the mall are a series of

memorials commemorating important figures in our nations history and museums maintained by the Smithsonian Institution that house a variety of cultural artifacts.

At a smaller scale city is undergoing a cultural renaissance of sorts. Existing and new institutions are capitalizing on missed or underutilized opportunities to improve its cultural landscape. Some instances of the changes being made include Art All Night: Nuit Blanche DC, an annual arts festival held in various neighborhoods throughout the city showcasing the work of the district's creative community. Founded in 2011, Washington, DC has become a part of the Nuit Blanche global network, which originated in Paris.²⁰ In DC, events held in five neighborhoods: Dupont Circle, Shaw, H Street, North Capitol, and Congress Heights have created an energetic dialogue between visitors and artists. Works have represented a diverse range of media including performances and live music in both indoor and outdoor venues. This seemingly opened a flow through public and private space where visitors could move in an out of different spaces, each providing unique experiences. Among these venues was the Wonder Bread Factory, a converted baking factory in the Shaw neighborhood. WeWork is transforming the building into a unique workspace for entrepreneurs while preserving its historic character. During the Art All Night events, the open buildings housed a wide variety of artworks and live music, creating an interesting dialogue between programs.

Conclusion

Having studied the regional context surrounding the site, several key

²⁰ <http://www.thedcarts.com>

patterns emerge and might be applied in a more local format.

Reconnecting to the cities waterfronts is key thread in development today. Therefore, new development along the Potomac River should explore strategies to connect the urban fabric to the water.

With such a large commuter population, stresses on the cities infrastructures call for enhancements to be made on both infrastructures to connect areas surrounding the city as well as routes within the city limits. New public transportation methods should be developed to reduce the burden on the cities roadways.

Capitalizing on the potential of Washington, DC's cultural economy can help draw visitors to the city. New developments should account for spaces that can act as cultural incubators.

Chapter 4: Site Context - Local

Introduction

The regional observations seem to manifest themselves at the local scale in Georgetown. Predating the establishment of Washington, DC by 40 years, Georgetown's planning differed from that of the nations capital.

The layout of Georgetown utilized 18th century English precedents from which it derived its simple rectangular grid pattern of streets and blocks, public space, and buildings. Less concerned with a grand gesture in planning the city, the organization of Georgetown was driven by economic, social, and survival concerns. Understanding matters of defense, access, transportation, and dwelling came before aesthetics.

Geography

Georgetown is located towards the western reaches of Washington, bordered by the Potomac River to the south, and separated from the city center to the east by Rock Creek Park. Parkland and green space surround the neighborhood and act as a buffer to development from bordering neighborhoods. These include Burleith and Glover Park to the north and Georgetown University to the west.

The topography of the area features generally steep grades running north-south, with large bluffs between Georgetown University and the river. Heavy rains, high tides, and excess snowmelt occasionally cause flooding in the area. In 2011, the Potomac River overflowed its banks by 10 to 12 feet, causing severe damage to the waterfront properties. Flood defenses that would have otherwise

contained the flooding had not been put into place.



Figure 9: Georgetown Topography – Two foot contours

Regional Connectors

Like Washington, DC, Georgetown has a number of connectors that link it to the surrounding region, sources of both frustration and opportunity. To the west, Canal Road is a principle artery. It brings commuter traffic from Maryland into the city. To the east, the Rock Creek Park and Parkway bordering Georgetown is an important vehicular route into Maryland. Wisconsin Avenue, another major artery, runs north from the Potomac River through the Washington neighborhoods, Bethesda, MD, and Rockville, MD. The Whitehurst Freeway and M Street both serve as connectors to the city center of DC, joining with K Street and Pennsylvania Avenue, respectively. The Key Bridge is probably the most

important of all of these connections, connecting the city of Rosslyn and surrounding Virginian suburb to Washington, DC through Georgetown. Slightly over ¼ miles, the Key Bridge also acts as a pedestrian and bicycle corridor between Georgetown and Rosslyn. Both waterways, the river and canal, extend from out from Georgetown, 184.5 miles west for the canal, and into estuaries and the Chesapeake Bay for the Potomac.

Site

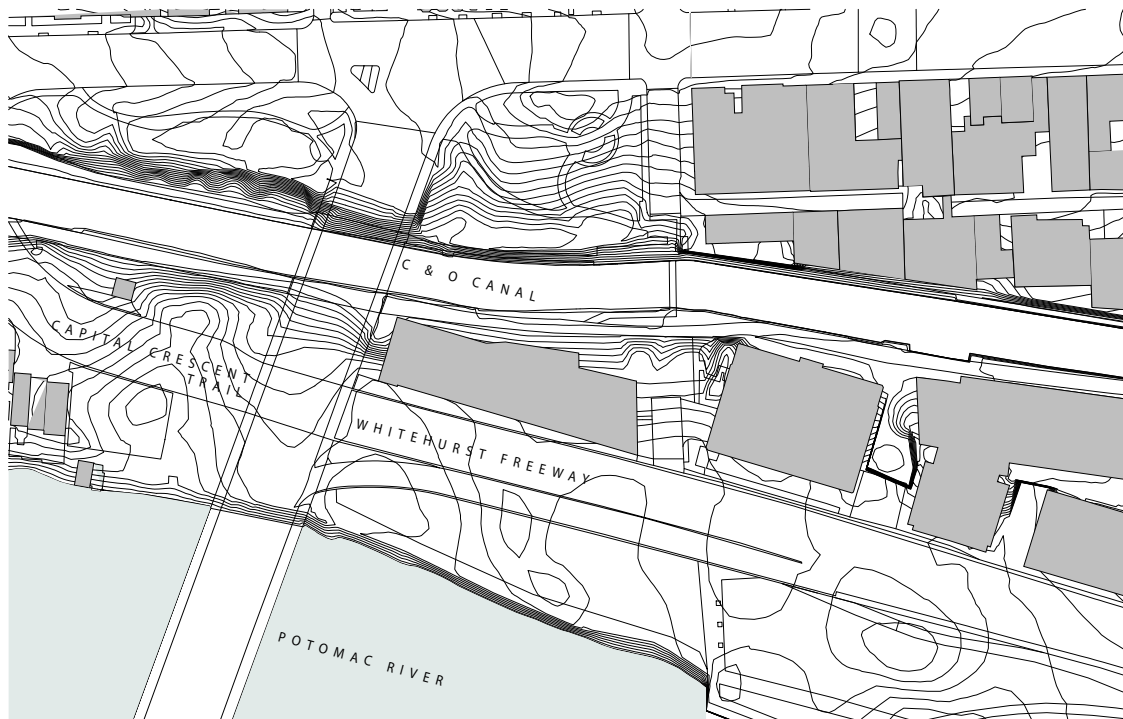


Figure 10: Site Plan

The chosen site for this thesis is located at the western edge of Georgetown. Various infrastructures and spaces subdivide and form the boundaries of the site. Often referred to as layers in this thesis, these include parts of Water Street and the Whitehurst Freeway, the C & O Canal, Francis Scott Key Park, M Street, and the Capital Crescent Trail. These layers seem to

lack continuity as you move through each space, regardless of which direction you are going.

As the layers of Georgetown intersect and divide the site, it is the intention of this thesis to explore the ways in which a proposed intervention on the site can in a sense serve as a catalyst to improve upon the experience of each layer.

Layers of Georgetown



Figure 11: Layers of Georgetown

Potomac River

The southernmost edge of the site is bordered by the Potomac River. The Potomac River extends to sources in the Allegheny Plateau, flowing southeast into the Chesapeake Bay. Around Georgetown, the Potomac River has strong currents, with shallow depths and rock outcroppings creating obstacles to navigation. Knowledge of these conditions is important, particularly because the river is an active recreational zone in the region. Race events and regattas are held on the river annually.

Water Street

Water Street is a surface street, approximately 60' in width connecting the lower parts of Georgetown to the K Street business corridor. Typical street sections through Water Street have one vehicular lane in each direction with parallel or angled parking at either side and with more informal parking patterns toward its western terminus. The road widens in some places to accommodate for turning lanes. Sidewalks are very narrow, not adequate to accommodate the volume of pedestrians that are common in the area on a regular basis. At the western end of Water Street the space below the Key Bridge and the supports of Whitehurst Freeway connecting ramp is currently being used as a DDOT staging site. Tour buses also use this end of Water Street while waiting for passengers to return.

Whitehurst Freeway

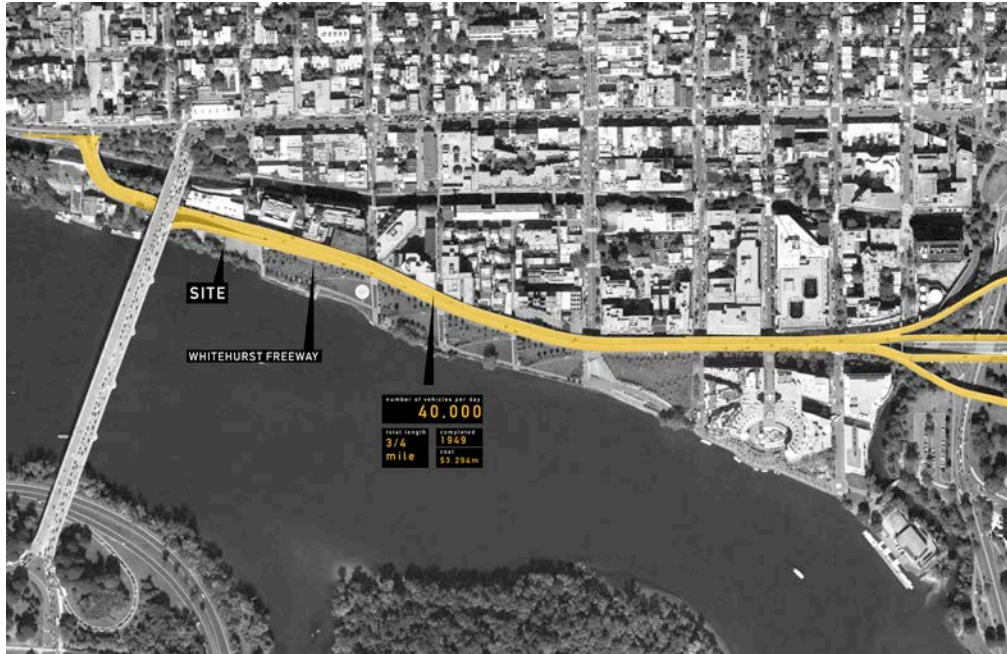


Figure 12: Whitehurst Freeway data graphic

The Whitehurst Freeway was built in the late 1940's as a link to connect Key Bridge to an unrealized proposal for a citywide freeway system or "Inner Loop". Referred to as an elevated arterial street, the Whitehurst is $\frac{3}{4}$ mile long with signals at each end and a posted speed limit of 35 miles per hour. A concrete barrier divides eastbound and westbound traffic, with two vehicular lanes on each side and little to no shoulder. Parking is prohibited. The construction of the freeway is made up of a concrete road deck, supported by a steel frame. A ramp connects Canal Road to the freeway, traveling underneath the Key Bridge. Another ramp moves northbound traffic from Key Bridge onto the freeway. It has been reported that on average, 43,000 vehicles traverse the Whitehurst Freeway per day.²¹ The structures of the freeway and its connecting on-ramps have an imposing effect on the site.

²¹ Whitehurst Freeway Deconstruction Feasibility Study

C & O Canal

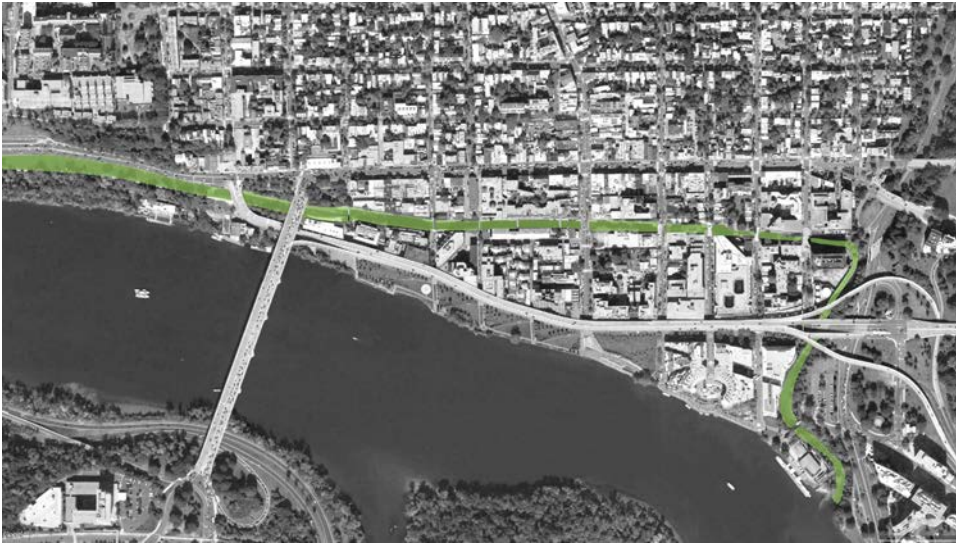


Figure 13: C & O Canal Graphic

Long removed from its past as a transportation artery and industrial corridor, the C & O Canal now exists as a national historic park where visitors utilize its cultural, natural, and recreational amenities. The towpath along the canal is mainly on the riverside but switches to the northern part of the canal in some instances because it was an obstacle to port activities. Vehicular and pedestrian bridges traverse the canal and connect the north and south towpaths. The 34th street bridge switches back to the riverside, which was initially developed as a crossing for mules. Recently decommissioned, the Georgetown canal boat sits in disuse along the canal. The Georgetown section of the canal features four locks, which navigate 35 vertical feet with minimal spacing. Locks measure 100 feet long by 16 feet wide, with lifts ranging from 6 to 8 feet. The lock walls are constructed of gabbro and mica schist stones that were extracted directly from the site.²²

²² Kytle



Figure 14: C & O Canal Crossings

The Chesapeake and Ohio National Historic Park is owned and operated by the National Park Service. The park is also listed on the National Register of Historic Places. Due to budget constraints, the National Park Service has difficulty maintaining the canal. No long-term restoration funds are planned.²³ The towpath is in poor condition with some erosion occurring along the banks of the canal. The towpath is also very narrow. This creates choke points in some places making it both difficult and dangerous to support a higher volume of traffic. The towpath is popular with joggers, walkers, and with activities such as bird watching, photography, and passive nature appreciation.²⁴

²³ NMBZ Feasibility Study

²⁴ NMBZ Feasibility Study

M Street

M Street serves as a vital transit and retail corridor running east-west through Georgetown. M Street begins at the Key Bridge and connects to the western terminus of Pennsylvania Avenue. Sidewalk widths are relatively narrow at 11 feet given the enormous pedestrian volumes and obstacles such as lampposts, planters, and garbage bins. A 60-foot, four-lane roadway is dominated by vehicular traffic with little to no room for bicycles. M Street carries heavy commuter traffic and is often congested, due in part to confusing interchanges at each end.

Georgetown's streetscape is unique, essentially creating a public room with building story heights slightly less than the width of the street. Most of the facades, rich in detail, form a continuous wall that shapes the streetscape.

Key Bridge

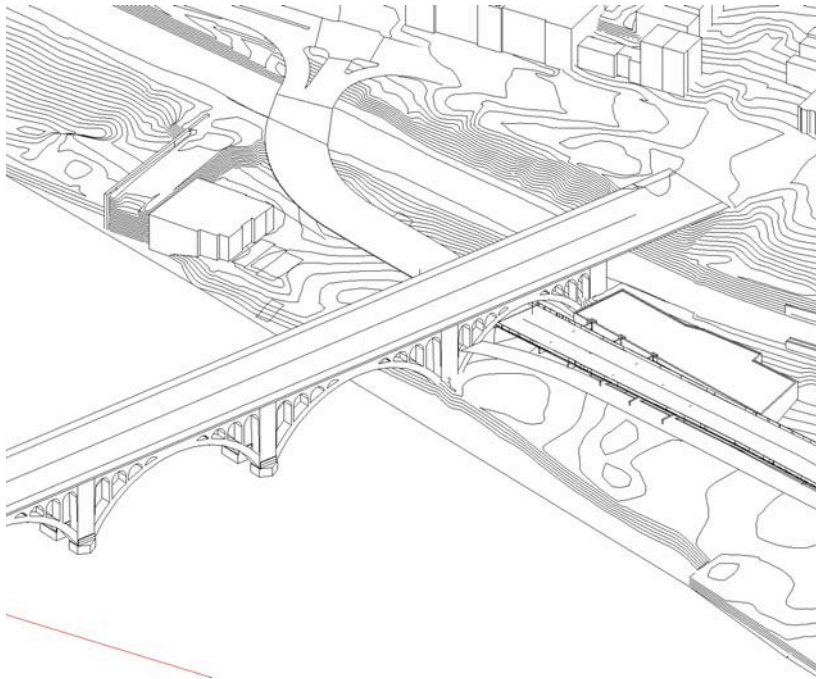


Figure 15: 3D axonometric of Key Bridge

Built in 1923 as a replacement to the Alexandria Aqueduct, which had fallen into disrepair, the Key Bridge linked Rosslyn and Virginia suburbs to Georgetown and Washington, DC. Designed by Nathan C. Wyeth along with the Army Corps of Engineers, the open spandrel, arched bridge has a dominating visual impact on the Georgetown waterfront. Constructed of steel and reinforced concrete, the bridge originally measured 1,450 feet in length, with a 75-foot wide road deck 85 feet above the typical water level. Construction of the bridge led to the demolition of the old Aqueduct Bridge, retaining only the bases of the piers left in place to protect the new bridge from ice floe damage.

Over the years, adjustments have been made to the bridge, notably a new post-tensioned concrete road deck put in place in 1987 to accommodate for

increased traffic volumes.²⁵ The roadway today is approximately 90 feet wide, accommodating 6 travel lanes and two 9' 10" wide pedestrian lanes on either side, separated from the roadway by short concrete barricades. The Key Bridge serves as a critical artery into the city, carrying U.S. Route 29 between Virginia and DC, and carrying approximately 62,000 vehicles each day.

An inspection was performed in 2011 to assess the structural integrity of the bridge. Corrosive deterioration to the underside of the concrete deck as well as cracks throughout the structural components of the bridge was found. This prompted a \$21 million rehabilitation project spanning two years. In April 2014, The Washington Post declared the Key Bridge one of the three "busiest deficient bridges" in Washington, DC.²⁶ Also of note is the listing of the Key Bridge in the National Register of Historic Places in 1996.

The Icehouse

A commercial structure built in 1937 occupies the area of the site between the canal and Water Street. In what was a former icehouse, the building has been repurposed to house a trendy restaurant, a bar and music venue, as well as a gym, all short-term leases. Support piers jutting out from the Whitehurst Freeway are embedded in the façade of the building. The structure is constructed of a mixture of whitewashed brick and concrete masonry units. Small windows punch openings into the wall facing Water Street. The building is embedded into the hillside due to the steep topographical incline from its base at Water Street to the canal. At the canal level the building reaches its top with a 6-foot wall, and

²⁵ Johnson, Mirmiran & Thompson, 2011

²⁶ Transportation for America

several window openings, some filled in with brick. The roof plane is approximately at the level of the Whitehurst Freeways road deck. The 1987 master plan for the Georgetown waterfront Park had called for the acquisition and demolition of this structure to form a gateway to and from a network of parkland around the Key Bridge.

Capital Crescent Trail



Figure 16: View of the CCT from the Aqueduct Bridge

The Capital Crescent Trail (CCT) was opened in 1990. It was converted to a trail from the former rail bed of the Georgetown Branch of the Baltimore & Ohio Railroad. A “Rails to Trails” project, the CCT is an 11-mile, public, shared-use trail originating at the western terminus of Water Street in Georgetown, DC and ending in Silver Spring, MD. For a three-mile stretch adjacent to the Potomac River, the CCT is within a natural, vegetated environment where visitors are able to enjoy the natural resources the area provides. The trail opens up onto Water

Street at the abutment of the Alexandria Aqueduct. People who use the trail can continue on to Water Street or connecting to the Georgetown Waterfront Park. This transitional zone has been called “The Mixing Bowl” and “no man’s land”, where pedestrians, cyclists and vehicular traffic move through and cross in this unmarked space.²⁷

Georgetown Waterfront Park

Completed in the fall of 2011, the Georgetown Waterfront Park, designed by the landscape architecture firm Wallace, Roberts and Todd, has transformed a once dreary, concrete filled parking area along the waters edge into a park for recreation and viewing of regattas held on the Potomac River.

²⁷ NMBZ Feasibility Study

Chapter 5: Site Context - Experiential

The many layers of the city slice through and divide the site, each having unique sets of experiences and narratives.

The constant flow in, around, and through the site makes the encounter of these linear narratives unavoidable. Whether traveling north to south, from street to river, east to west and vice versa, changing environments keep the visitor constantly engaged with their surroundings. In this case of narrating a spatial sequence, the path through the site will follow a north to south, transitional route, moving from the residential neighborhoods to the Potomac River.

Start – Georgetown Neighborhood



Figure 17: Start - Georgetown neighborhood

A walk through the northern residential neighborhood of Georgetown is an enriching experience. Quaint, tree lined streets; some paved with cobblestone,

and lined with well-kept federal style architecture, the visitor gets a glimpse into the historical past of Georgetown. The calmness of the residential district transforms however as you travel south on 34th Street towards M Street.

Transition 1 (Crossing M Street)



Figure 18: Transition 1 - Facing south towards M Street

M Street today is a bustling commercial corridor running through Georgetown. It is almost always filled with throngs of visitors and packed with vehicular traffic. Approaching the intersection of 34th and M Streets, this congestion is put on display with cars coming from all directions and merging between lanes as the sound of loud obnoxious car horns fill the air. Waiting for the signal to cross the street, a patch of a green landscape space can be noticed, seemingly serving as a respite from the chaos of streetlights, vehicular lanes, and dividers.

Transition 2 (34th street to canal bridge crossing)



Figure 19: Transition 2 - 34th Street bridge crossing

Once across M Street, a steep cobblestone street leads further south abruptly terminating at a steel barricade. A quiet “sanctuary” is identified as the Francis Scott Key Park. At its center curving, leaf-covered pergolas frame a sculpture of Francis Scott Key. Cascading from the level of M Street in a series of stepped terraces and a bike bath, the park provides a small place of rest and respite from the busy street, as well as a transitional space to the bottom of 34th Street. At the foot of 34th Street a narrow alleyway extends east into Cady’s Alley, a high end boutique retail street. Navigating around the steel barrier and down a short series of steps, the trees open up to a steel footbridge, painted red.

Transition 3 (bridge to canal, walk along canal)



Figure 20: Transition 3 - Facing east along canal towards bridge

Opening up onto the C and O canal Crossing are both pedestrians and those carrying bicycles, squeezing past one another, as the bridge width is relatively narrow. A ramp runs perpendicular to the bridge to account for the change in elevation from the bottom of 34th Street down to the level of the canal towpath, a vertical difference of approximately 18 feet. At the foot of the bridge a small sign points out the direction on the towpath to the canal visitor's center. Entering the pathway, the feeling and sound of gravel crunching beneath your feet is a welcome change from the horns and asphalt experienced before. Along the gravel towpath, patches of grass and sporadic vegetation line the edges along the canal. Joggers and bikers quickly edge past people walking at a slower pace. Looking further east, you can see industrial buildings start to abut the canal

and chimneys rise above the roofline. How are these historical remnants interpreted? Is there an understanding of their relation to the canal? For what purpose did the canal serve? These are some of the questions one might ask themselves as they walk along the canal.

Transition 4 (Canal to Water Street)



Figure 21: Transition 4 - 34th Street staircase

A staircase east of the bridge leads further downhill towards the river. Reaching the top of the staircase, an opening in the landscape once again emerges from a screen of trees. The southern part of the city becomes evident at this point, overlooking the Whitehurst Freeway, Water Street, and the Potomac River. An office building to the left and a former Icehouse to the right form the edges to this space.

Transition 5 (Underneath the Whitehurst)



Figure 22: Transition 5 - Underneath Whitehurst facing west

Underneath the Whitehurst Freeway lies a dark and bleak roadway. Water Street connects to K Street and terminates at the western edge of Georgetown. Whooshing sounds from vehicles flying down the freeway above can be heard. Strong, steel supports with hundreds of bolted connections hold up the freeway looming above and darkening the street.

At this western section of Water Street, Water Street becomes poorly defined eventually becoming an unmarked, confusing, and shared pedestrian, bicycle, and vehicular zone. Key Bridge soars above the freeway and Water Street and in a way demarcates the divide between the urban and natural landscapes.

Proceeding west beyond Key Bridge, Water Street's western terminus is a

series of boathouses that are actively used for water sports. It is also here that Capital crescent trail begins and extends westward, where the natural, pastoral character of the Potomac River Valley takes on a strong presence.

Transition 6 (Georgetown Waterfront Park)



Figure 23: Transition 6 - Georgetown Waterfront Park

Parallel to Whitehurst to the south is the Georgetown Waterfront Park. At this western edge, there is an air of calmness, with pedestrians, cyclists and joggers beginning or ending their journey along the park. Seating areas and fields of grass provide visitors a place to sit and observe their surroundings. Moving closer to the edge of the park, a series of floodwalls harden the edge along the river.

Potomac River – End



Figure 24: End - View of Key Bridge

At this juncture between the park and the water there is a visually arresting sight. The span of the Key Bridge tiptoes across the river to the west. To the south, the towering buildings of Rosslyn emerge. Looking east, one can trace the urban edge of the city from the Washington Harbor to the Watergate Buildings and ultimately to the Kennedy Center.

Railings and massive seawalls along this edge prohibit physical connections to the river. The river becomes accessible only at a series of intermittent docks that jut out into the water and at a tight series of steps that go down into the river.

Conclusion

This particular sequence is only one of many experiential routes that one might take through the site. Each transition provides changing environments, changing views and perspectives, and shifting ground plane which all impact a person's experience of a space.

Chapter 6: Movement and Spatial Sequence/Experience

Introduction

The movement of people through cities is an integral part of daily life. The act of motion through the urban environment, especially transitions between urban and natural realms can have a lasting effect on a person. The chosen site is in constant flux, with people moving at different paces and across a variety of modes. Understanding the spatial experience through the many layers of the site is important because of the impact it has on the visitor's perception of each space.

Le Corbusier's Promenade Architecturale

The basic concept behind Le Corbusier's *promenade architecturale* is the experience of walking through a building or space. The sequence of spaces and direction of movement help to develop the user experience along with constructed views and vistas. Corbusier references both the Acropolis in Athens and the English picturesque garden when describing the created views.

"You enter: the architectural spectacle at once offers itself to the eye. You follow an itinerary and the perspectives develop with great variety, developing a play of light on the walls or making pools of shadow...[to] learn at the end of the day to appreciate what is available."²⁸

²⁸ Samuel, 9

First seen in his description of the Villa Savoye at Poissy in 1928²⁹, Corbusier's use of the term promenade architectural supplants the term circulation. They are more than just circulation systems, rather complex movement systems that "elaborate key concepts about the building and the experience of space."³⁰ The design of the promenade also seeks to resensitize people with their surroundings towards realignment with nature. In the Unite d'Habitation, the promenade creates a public route from the ground level to the roof level causing a, "blurring of interior and exterior space, piling the exterior route into the house and up to the rooftop garden."³¹

Motion

"The inescapable attribute of our time is its runaway pace. Tidal waves of traffic pound us; sprawling cities and exploding populations squeeze us. Wildly erratic throbbing migrations – the daily shuttle from home to work...the weekend surge from city to country...toss us in an accelerating rhythm barely within our control. Streams of speeding objects...weave a rapidly changing fabric all around us with patterns of spiraling velocities."³²

In his influential text, *Nature and the Art of Motion*, Gyorgy Kepes critiques the outside world and its inner counterpart. The "runaway pace" of our time has impacted our inner world, where values, goals, and friendships are conceived with increasing rapidity. Kepes defines motion through two frameworks, one

²⁹ Samuel, 9

³⁰ Samuel, 9

³¹ Samuel, 10

³² Kepes, i

physical and the other social. In its physical sense, motion is “change of position with respect to a reference system of space coordinates” while the social definition is “change with respect to a reference system of basic human values.”³³ At the current pace of society today, with increasingly accelerating technological, economic, and social development, “The individual’s role seems meaningless, out of scale with the pace of happenings”.³⁴ Understanding and reconciling our inner and outer worlds to the pace of our time may help provide a bearing for creating dynamic images of order.³⁵

Motion, Sequence and the City

Due to its omnipresent and ephemeral nature, incorporating motion into the design of cities is difficult. Motion plays an important role in forming and communicating the image of a city, and “the effects motion may have on our awareness, mastery, and understanding of the city”³⁶ helps to develop this image.

Individuals see the environment in different ways, selecting and organizing their perception of the environment through the senses. This in turn helps to inform ones awareness of motion. Motion awareness is categorized four ways: self-motion, apparent motion, real motion, and signs of motion.

Self Motion: Through sensory clues such as vision, touch, sound, and kinesthetics, we are able to measure *self-motion* – velocity, direction, and distance. The pedestrian often relies on the kinesthetic sense, walking uphill

³³ Kepes, i

³⁴ Kepes, i

³⁵ Kepes, ii

³⁶ Appleyard, 176

causes fatigue for instance. Once in the automobile, the operator loses touch with some of these senses, restricted to the confines of the vehicle.

Apparent motion is the movement of mass, light, space, surface, and detail in relation to the observer in motion. Movement through space and the spatial definition of a path also shape this experience, in the way that the curving approach through rock formations into the Lincoln Tunnel towards New York City seemingly peels open a powerful view of the skyline. *Real Motion* is the differentiation of objects based on their movement. Drivers always have to pay attention to the movements of other vehicles on the roadway in case of sudden changes of direction. On a crowded sidewalk the pedestrian has to do the same thing. In urban spaces, this visual interaction is an important form of social interaction.

Signs of Motion: The drama of motion is enhanced by traces of its presence. Whether temporary in the form of jet trails, or the polished grip of a well-used door handle, the purposeful quality of movement is expressed through *signs of motion*.³⁷

Breathing Cities

Breaking down the various components of a city might help to understand the role movement has on urban life and form. A digital urban vision, created by animation-company Planet 9, in which all of the buildings in San Francisco are modeled in detail, is the subject of a critique by Nick Barley in the text *Breathing Cities*. Barley critiques the model as being at fault because there is no life to it,

³⁷ Kepes,iii

no people, no weather, and no vehicles to name a few. What Barley introduces is the opposite of this digital model, how a city would be constructed in the absence of buildings until all other elements were in place. The flow of people through the city, the cities consumption patterns, the fauna and geology of the land, as well as information and ideologies are what Barley believes to be integral components of the city, where “this city would feel much more real than the other, neutron-bombed version of San Francisco.”³⁸ In what should be considered as important as buildings and infrastructure, architects and planners should take into account how we move about in cities, because in an increasingly mobile and electronically connected world, the speed of movement and change rises dramatically.

Edge of a City

Introducing new spatial compositions, in particular at the periphery of a city, can help serve as a mediator or threshold between the urban realm and the natural environment. This brings about the invention of new programs, challenges, and landscapes that should be both cultivated and preserved, creating new visions of urban space. While maintaining an awareness of historical development, new architectures should, as William Faulkner states, “Create out of the materials of the human spirit, something that did not exist before”.³⁹

In Steven Holl’s *Edge of a City* projects, proposals juxtapose living, working, recreational, and cultural facilities in new pedestrian environments at the

³⁸ Barley

³⁹ Holl, 7

periphery of cities that weave throughout existing contexts. The projects each share “a “pre-theoretical ground” of psychological space, program, movement, light quality, and tactility.”⁴⁰ Delineating the boundary between the natural and urban realms becomes of particular importance in these zones. By mediating this zone, landscapes and ecosystems can be preserved and restored, while at the same time creating a new synthesis of urban life and form.

In these imaginative cities notions of space take on a psychological dimension, where physical spatial geometries merge with imaginative constructs. Additionally, exploring the phenomenological dimension of urban space, where sounds, spatial arrangements, scents, and textures can be imagined simultaneously has implications for program spaces as well as subject matter. As opposed to building that have a single function, hybrid buildings which can accommodate diverse programs opens the space it occupies to interpretation. With this added dimension, the viewer is able to perceive new orders and new relationships.

⁴⁰ Holl, 9

Chapter 7: Urban Waterways and Public Engagement

Introduction

What is it about water that fascinates us? Waterways can be full of power and energy one moment and calm the next. The flow of a body of water, the shape of its banks, and the effect it has on its surroundings makes each water body unique. Water is also the basic necessity in sustaining life, and its importance is widely intuitively understood.

Recognizing the significance of waterways on daily life and the role that they played in development of urban environments is key to this proposal. The Potomac River and C & O Canal are two water bodies that are themselves historically linked and directly engaged with the site. The history and development of Georgetown and particularly the site can be traced through the history of river and canal.

Historical Development

Since the beginning of civilization, cities have flourished and developed along rivers and other bodies of water. Each city's development and prosperity can be linked to its relationship with water. Water gave life, from drinking water, fertile soil, and food, to energy that could power machinery. Of primary importance was the navigability of these waterways and their presence along transport routes. Trade and industrial growth in many cities has been due to its location along these major routes and source of power.

Cities and their waterways have undergone both periods of neglect and

embrace. As cities have evolved, the “urban taming”⁴¹ of rivers and watercourses became necessary, supporting cultural development while also providing protection from the unpredictable and destructive nature of flooding.

Industrialization in cities led to a disconnect between citizens and waterfronts.

Industrial development along the waterfront took the form of rail lines, highways, and engineered ports. These took advantage of the waterway as a mode of transport. The uses transformed what were once natural borders into hard and straightened edges. Abandoned, such places have little appeal for citizens to utilize the waterfront, essentially turning their backs on what have been somewhat dramatically referred to as “pathetic emblems of hard labor”.⁴²

Urban Regeneration

As industry has relocated away from urban environments and issues with climate change have been brought into question, a renewed interest in the regeneration of waterfronts is transforming the look of urban waterways. Driven by social, economic, and ecological factors, these waterfront developments are taking advantage of the value of waterfront development as a catalyst for community growth. Additionally, the evolution of these waterfronts is not based solely on buildings that may occupy the space but also the critical role of the edge and the formation of these meaningful urban spaces.

Access

A common thread in waterfront development is access. The experience of a waterway depends on the availability and means of access to it. Promenades

⁴¹ Holzer

⁴² Holzer

and public squares are developed within a larger network in the urban environment, acting as “seams between the river and adjoining uses and form a multifaceted transitional area”.⁴³ These public spaces also serve as focal points of urban life along waterfronts. They draw adjoining neighborhoods towards the water. New waterfront structures, designed in appreciation of the river, also serve to generate interest in waterfronts. In places where waterfronts have been inaccessible in the past, particularly due to industrial uses and infrastructure, intuitive routes to the water that link and orient existing networks are important in providing access to waterfronts.

Leisure

A balance between the city and waterfront is critical in enhancing its recreational value and connection to its surroundings. Developing green spaces along waterfronts help serve recreational purposes and provide space for contemplation away from the more usual hard surfaces experienced in an urban environment. These spaces also can provide habitats for native flora and fauna and can act as natural retention basins for flood protection. Leisure also implies the tactile experience of water. Through physical contact, a heightened sensory experience is gained, establishing a direct relationship with the water. Improving water quality is also of particular importance in fostering the safe and pleasurable experience of a waterway.

Innovation

The design of waterfront space includes a unique interplay between

⁴³ Holzer

ecology, flood protection, and amenity. The dynamic processes of waterways and the desire for more connections to them have lead to the challenge of finding more space for plants and animals, people, and water.⁴⁴ Better integration of these challenges through innovative and previously established strategies should serve as the foundation for the design or urban waterfront spaces.

⁴⁴ Holzer



LONDON



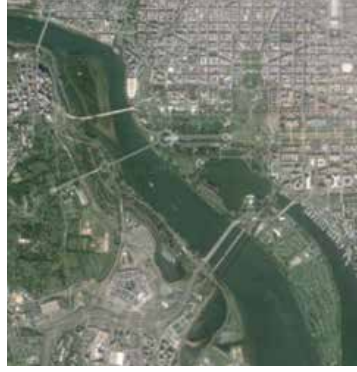
PARIS



ROME



BOSTON



WASHINGTON, DC



NEW YORK



AMSTERDAM



COLOGNE



PITTSBURGH

Figure 25: Waterfront comparison

Chapter 8: Urban Infrastructure

Introduction

The chosen thesis is located at an important interchange in Washington, DC's transport system. With the Key Bridge ferrying commuters across the Potomac River from Virginia into Washington, the Whitehurst Freeway creating an elevated bypass of Georgetown, the history of the canal as an integral system of transport, the Potomac River, and the numerous surface roadways in and around the site, it becomes obvious that among the approaches taken to any future design must take these various infrastructures into account.

Architecture, Mobility, and Landscape

The culture of mobility can be seen throughout the architecture and the engineering of our cities infrastructures today. The importance of infrastructural development today is made evident by the view of public authorities and the communities it shapes. Mobility and transport are viewed as essential components of both global and local environments. With the increasing urbanization of cities across the world, infrastructural developments are radically altering and transforming existing landscapes, while at the same time creating new ones. Rather than being perceived as isolated objects apart from their surroundings, what becomes important is the merging of infrastructure with their landscapes, treating their design as an integrated project. The integration of architecture, mobility, and landscape with infrastructure can help to create new forms of interaction in the public realm, healthier living environments, and enhanced urban settings. The perception of infrastructure and the impact it has

on the spatial environment can be viewed in four fundamental ways: mobility, physical presence, movement, and public character.⁴⁵

Mobility

The geographic dispersal of production and consumption activities in contemporary society has made economic success dependent on systems of mobility. Connections to surrounding transportation networks have impacted the structuring of the urban environment. This phenomenon has been termed the “space of flows.”⁴⁶ With growing resource scarcity, increasingly dense existing networks, and the presumed threat of climate change, more emphasis is being placed on finding efficient methods of transport. This takes the form of both enhancement of existing systems to accept newer flows, and the creation of newly built expansions to highway networks, waterways, ports, and railways. Once a system has reached its capacity, alternatives include doubling the capacity of the existing system or diverting to another transportation mode. Additionally, performance of networks can be improved by increasing transfer points creating multimodal interchanges, which act as visual markers on the landscape and provide space for social interaction. These networks create essential linkages between global and local features, initiating an exchange between two cultures, and in a sense help to strengthen the identity of a place.

⁴⁵ Shannon, Smets 14

⁴⁶ Shannon, Smets, 14

Physical Presence



Figure 26: Millau Viaduct over the River Tarn

Infrastructure systems impact the urban environment visually and physically. The scale and presence of some infrastructure systems stand out in their environments. In some cases these isolated systems create an interesting juxtaposition between infrastructure and the natural environment. Leo Marx touches upon this contrast with regard to the metaphoric machine in the garden, where technology and industrialization have a pervasive impact on the pastoral, utopian landscape of Henry David Thoreau's Walden Pond. The visual issues surrounding infrastructure systems can be resolved through strategic concealment through sectional and topographical manipulations, despite the paradoxical illusion of a favorable landscape when in reality much has been altered and removed to accommodate the constructed system. Blending these foreign objects into their surrounding contexts is another solution that has been

attempted. Another technique acknowledges the artificial construct that becomes detached from its context through special expression.

Effect of Motion on Perception of Space

Changing modes of transportation systems have had an affect on man's perception of his surrounding landscape. The speed and coverage of these newer systems has opened new worlds to be experienced. The relationship between sensory engagements with ones surroundings has become increasingly detached, making vision the primary sense in what are enclosed, limited, and framed views from vehicles. Aligning infrastructures with the natural contours and features of the landscape can succeed in accentuating the land it crosses. Inherently linked to the nature of infrastructure such as bridges and tunnels is the notion of a threshold, facilitating passage between places. By emphasizing these thresholds, points of transgression are created where the in-between space may foster dialogue between opposite spaces.⁴⁷

Public Space

The accessibility of infrastructure has led to its characterization as the "ultimate public space".⁴⁸ Places of transit have, since their earliest developments, established spaces that serve the public realm and extend it beyond a single space. Conversely, infrastructural development results in neglected space at its periphery. Enhancements to these blighted urban spaces help them to become amenities to surrounding neighborhoods. Converting abandoned systems such as railroads and elevated freeways has led to the

⁴⁷ Shannon, Smets, 184

⁴⁸ Shannon, Smets, 185

creation of new public spaces which had previously been rendered inaccessible by the infrastructures they replaced.

Chapter 9: Culture and the City

In 21st century there has been a paradigm shift in urban development, with culture and education now acting as catalysts for urban development.

Democratic societies that depend upon places of education, freedom, and cultural expression have seen public spaces and the arts become increasingly important. Alongside commerce, industry, the economy, politics, and religion, cultural institutions have become equally important in shaping urban dynamics, helping to form an identity of a place within public spaces. Neighborhood initiatives begin to acknowledge both urban and architectural form, as well as the social changes that these interventions bring about.

“that improvement of the soul which the latter attains not directly from within, as with the profundity that is the fruit of religion or with moral purity and primary creativity, but indirectly, by way of the intellectual achievements of the species, the products of its history: knowledge, lifestyles, art, the state, a man’s profession and the experience of life – these constitute the path of culture by which the subjective spirit returns to itself in a higher, improved state.”⁴⁹

New open public space allow for the participation of a wide range of residents. "This is a place where culture and community come together in a very natural and informal way...Museums shift from being elite monuments into popular places of social and cultural exchange set in the heart of the city”

⁴⁹ Culture:City



Figure 27: Art Installation underneath Manhattan Bridge



Figure 28: Tradgarden activity space underneath bridge



Figure 29: Tradgarden activity space alongside bridge

Chapter 10: Urban Theory

Landscape Urbanism

The main concept behind Landscape urbanism introduced by Charles Waldheim is that the organization of a city should be through the design of its landscape, rather than the design of its buildings. Techniques utilize landscape in a way that helps organize the surrounding buildings.

Event Cities

“If architecture is both concept and experience, space and use, structure and superficial image...then architecture should cease to separate these categories and instead merge them into unprecedented combinations of programs and spaces.”⁵⁰

The concept of event cities introduced by Bernard Tschumi utilizes the movement of bodies in space and resultant architecture as a backdrop for visualizing “flux animation”. These flows of movement utilize the strategic siting of transit infrastructure to act as a generator of urban form.

The design for the Flon Interchange bus and train station in Lausanne, Switzerland connects the historical city and Flon Valley with a series of “inhabited bridges”.⁵¹ Through cross programming and topological displacements, these connecting bridges combine transit oriented space with urban program. Core elements for public functions and a pedestrian deck level appropriate unpredictable urban events. Spaces of hybridization are created through flow

⁵⁰ Tschumi, 254

⁵¹ Shannon & Smets, 14

planning, organizing principles, and the spatial sequencing of program components.⁵²

⁵² Shannon & Smets, 14

Chapter 11: Precedent Studies

Waterfronts

East River Waterfront – ShoP Architects

The East River Waterfront project is transforming a once ignored and inaccessible piece of land along New York City's East River. The FDR Drive, a large elevated freeway traverses the site between the city and the waterfront esplanade. The goals of the project are to enhance waterfront access, and to preserve the history of the site while sustaining a creative environment.

The flexible plan for the waterfront calls for a new esplanade that will serve as a recreational zone along the river's edge, supporting outdoor activities with new furniture and landscaping. Pavilions are placed throughout the site and underneath the FDR Drive to provide for concentrated areas for recreation. Two new piers, Pier 15 and Pier 35 are opened to the public and provide spaces for community, recreational, and maritime activities.



Figure 30: East river Esplanade



Figure 31: Pier 15 – East River Esplanade

Promenade

Olympic Sculpture Park – Weiss Manfredi

The Olympic Sculpture Park in Seattle, WA is a relevant example of an innovative solution to a layered and challenging site. The architects, Weiss Manfredi, were tasked with designing an art park on what was a former 8.5-acre brownfield site. The site was traversed by a four lane road and railroad tracks. It is sited in downtown Seattle along its commercial waterfront with a 40-foot change in elevation to the waterfront from the top of the site.

The design is a Z-shaped series of ramps, elevating over the existing infrastructures and connecting to the waterfront with an urban pocket beach. In this particular case, the architects embraced the existing urban conditions by circumventing the roadway and train tracks, which are both still in operation.

The park is highly successful in its openness and thoughtful programming. It is frequented by both tourists visiting the sculpture park and everyday residents who jog, bike, picnic and gather, essentially treating it as another essential component part of the urban fabric rather than an elite destination.

The shifting perspectives of the park gives visitors a glimpse into a great deal of surrounding context, from the harbor, Olympic Mountains, and Mount Rainier, to the Space Needle and downtown skyscrapers. Mimi Gates, the former director of the Seattle Art Museum describes the impact of the views that the park provides, “We knew the view would be great. But it was only later that I realized how much it captures the character of Seattle, with that view of the

mountains and water, and also back to the skyline.”⁵³



Figure 32: Aerial view of Olympic Sculpture Park

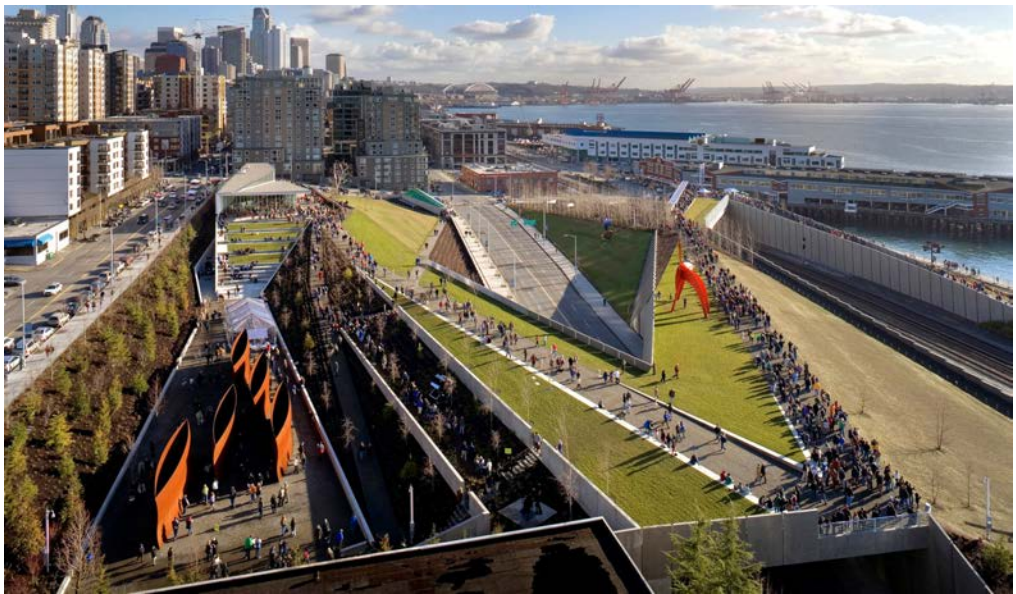


Figure 33: View across Olympic Sculpture Park

⁵³ Robbins

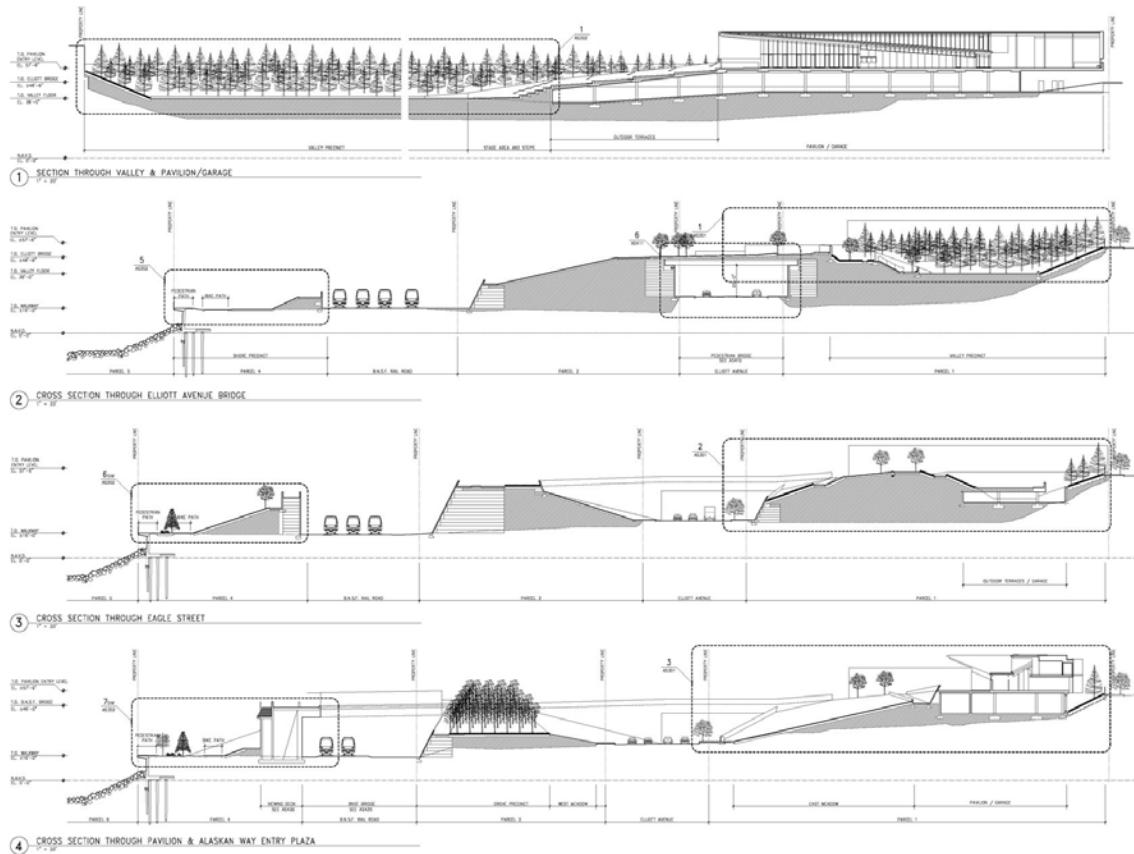


Figure 34: Sections through the Olympic Sculpture Park

Kunsthal – OMA

The Kunsthal in Rotterdam by Rem Koolhaas and OMA is a relevant example of how separate contexts can be linked through a dynamic sequence of spaces and a diverse program.

The museum is at a unique juncture in the city. In a way, the positioning of the museum serves as a gateway to the city's cultural amenities. To the south is Maasboulevard, a busy highway atop a dike. Rotterdam's Museumpark, borders the site to the north at a lower level than the highway. To address the dual conditions of the site, with the highway above and park below, the building takes the form of a square divided into four parts. A north / south route takes the form

of a pedestrian ramp connecting to the Museum park, while a road runs parallel to Maasboulevard along the east / west axis through the site.



Figure 35: View of Kunsthall from Maasboulevard

Original Circulation Diagram

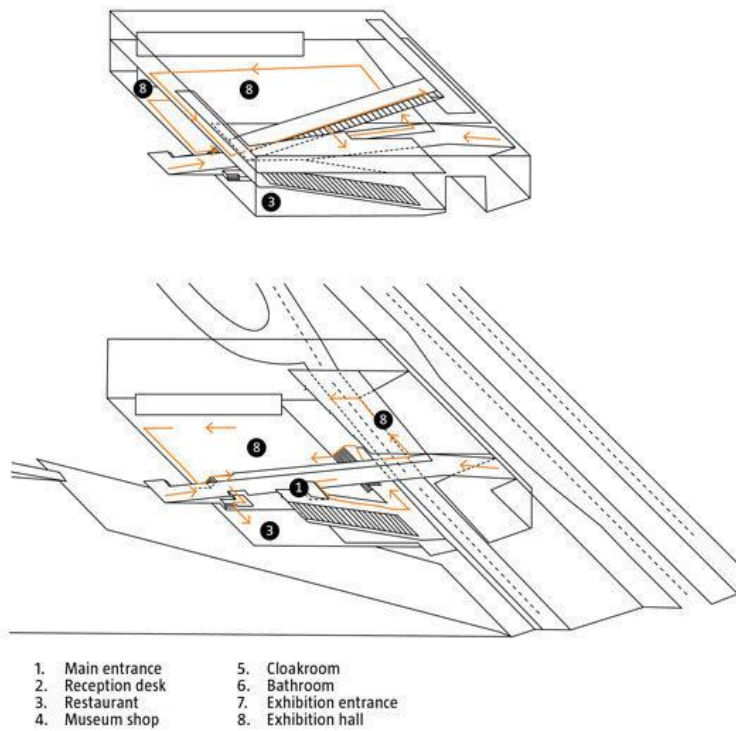


Figure 36: Kunsthall Circulation Diagram

Chapter 12: Design Approach

Introduction

The multi-layered site presents potential elements, issues, and opportunities that should be addressed in any new development. The conceptual frameworks of movement, urban waterways, infrastructure, culture, and urban theory are of particular relevance on the chosen site. A series of design approaches can be extrapolated and synthesized from these thematic studies.

Site Analysis

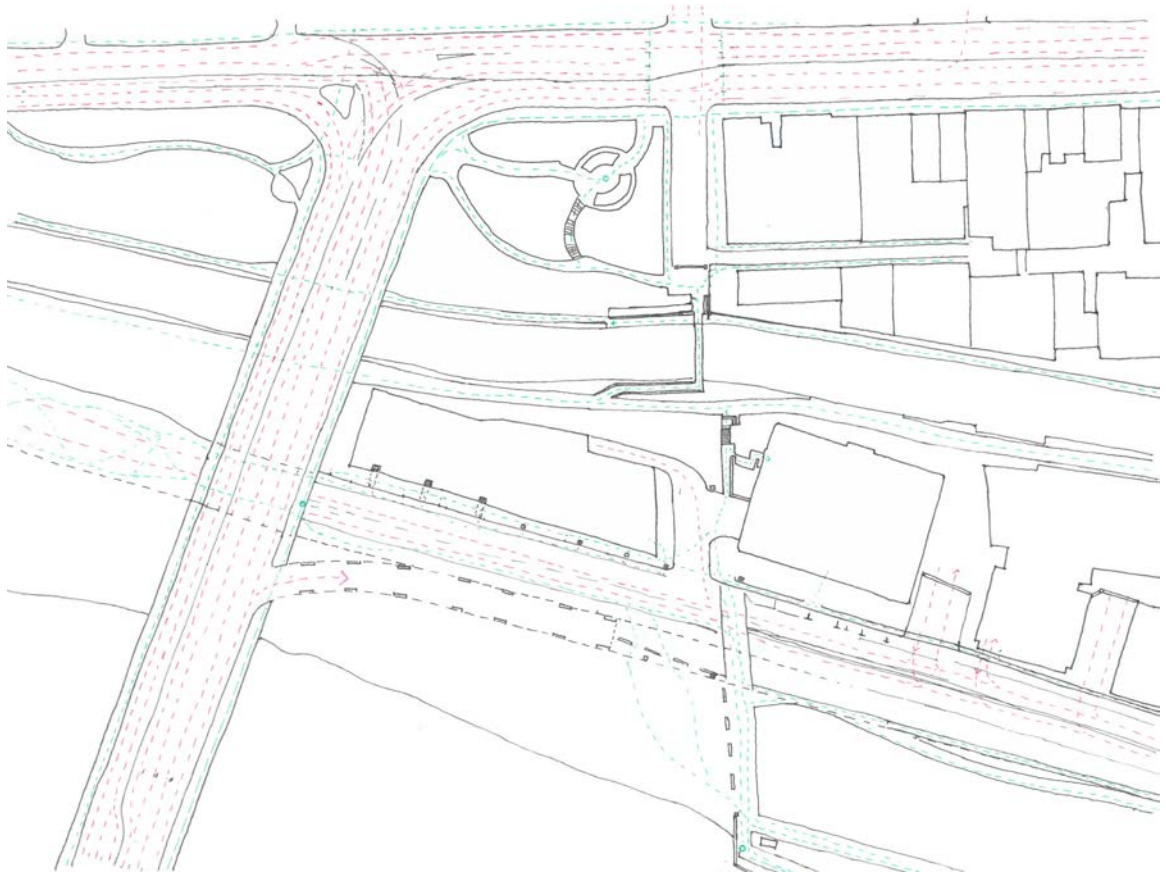


Figure 37: Flow Diagram

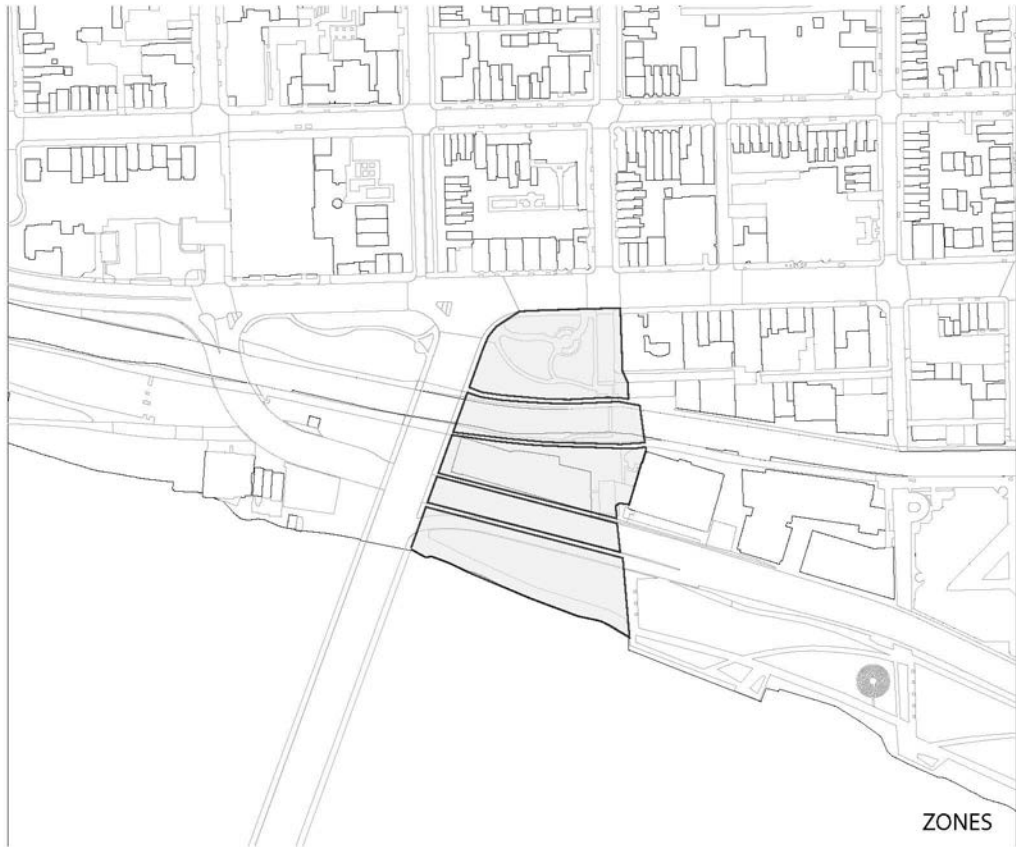


Figure 38: Zones Diagram

Transitions

The transitional nature of the site, in particular the spatial sequence through its experiential layers, makes movement an important element in any design. As mentioned, motion has a direct impact on our understanding, awareness, and mastery of urban spaces. Spatial conditions such as bridging, observing, occupying, recreating, transitioning, and dividing might help to mark these transitions.



Figure 39: Transitions Diagram

Infrastructures

Divided, crossed, and traversed, the site is at the confluence of a series of infrastructures. The Key Bridge, Whitehurst Freeway, M Street, Water Street, and even the C & O canal. Each of these serves a particular purpose and have dominating visual and physical impacts on the site.

Whitehurst Freeway

The Whitehurst Freeway has been under scrutiny in recent years, with plans calling for its demolition. A number of feasibility studies have been performed on the freeway, judging its current performance as well as the impact of the potential removal might have. A common thread has been to replace the freeway with an on grade boulevard.

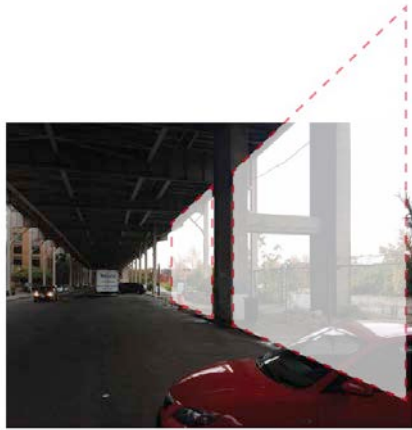
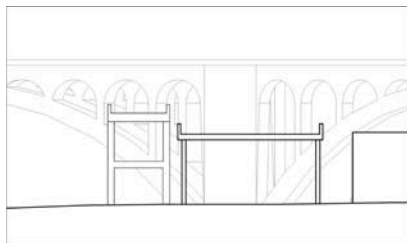
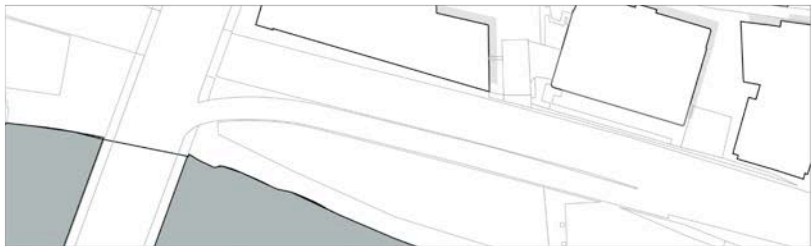
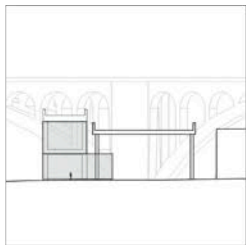


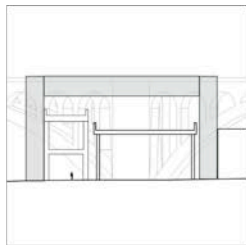
Figure 40: Freeway Engagement Strategies 1



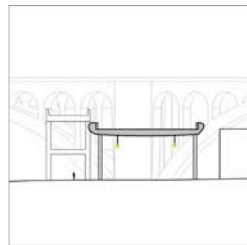
FREEWAY APPROACHES



ENGAGE



TRAVERSE



ENHANCE

Figure 41: Freeway Engagement Strategies 2

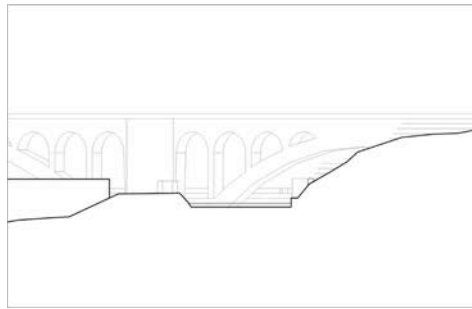
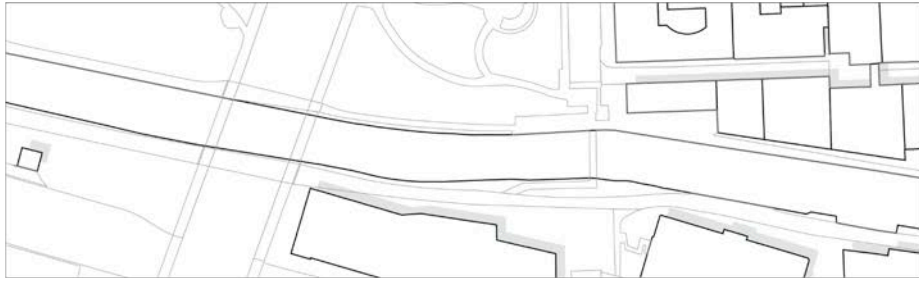
The Waterways

Potomac River

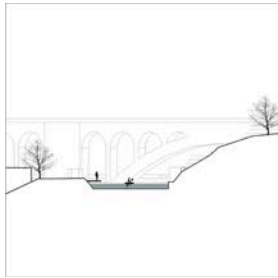
More user engagement to the river is important. This can take the form of a dock for non-motorized boating vessels, piers extending out over the water, promenades along the waterfront, and beaches or terracing to bring visitors closer to the water.

C & O Canal

The C & O Canal, despite its strong and unique historical character is another obstacle impacting the city's connection to the river. Exploring strategies to enhance the crossing of the canal should be looked at. Efforts to improve the canal water quality can also be looked at to promote more engagement by the visitor.



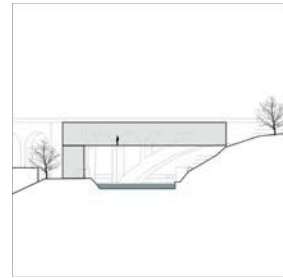
CANAL APPROACHES



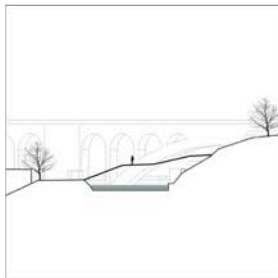
DOCK



ENGAGE



ENGAGE



ENGAGE

Figure 42: Canal Design Approaches

Chapter 13: Proposed Thesis Design

The Proposal seeks to introduce a new accessible architectural promenade in Georgetown from M Street to the Potomac River.

Site Design

The design of the site involves understanding the sites many contextual relationships. The edges created by existing infrastructures, as well as prominent axes through the site have been taken into account. The site is perceived in three zones. The northern zone lies between M Street and the C & O Canal; the central zone occupies the space between the retaining wall along the north side of the canal, the canal itself and Water Street, while the southern zone lies between Water Street and the Potomac River. Three structures occupy parts each of these zones with an aerial tram station, cultural center, and boathouse occupying portions of the north, central, and southern zones respectively. In each zone the built forms work to create adjacent public spaces.

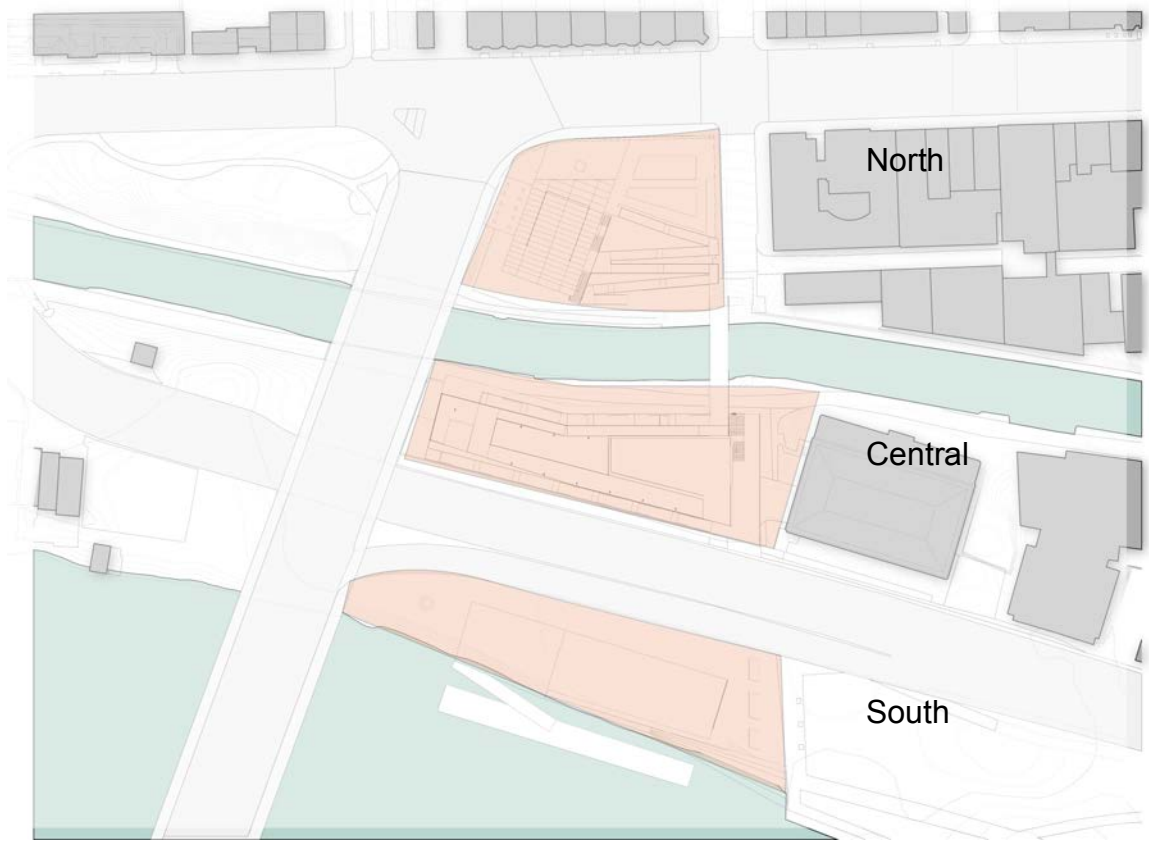


Figure 43: Zones Diagram - proposed

Contextual relationships, topography, and the need for an accessible and clear promenade through the site and each space informed the design. The Key Bridge, Whitehurst Freeway, 34th street and C & O Canal were among these external forces. The steep topographical change calls for the use of stairs, bridges, ramps, and elevators to navigate the grade change.

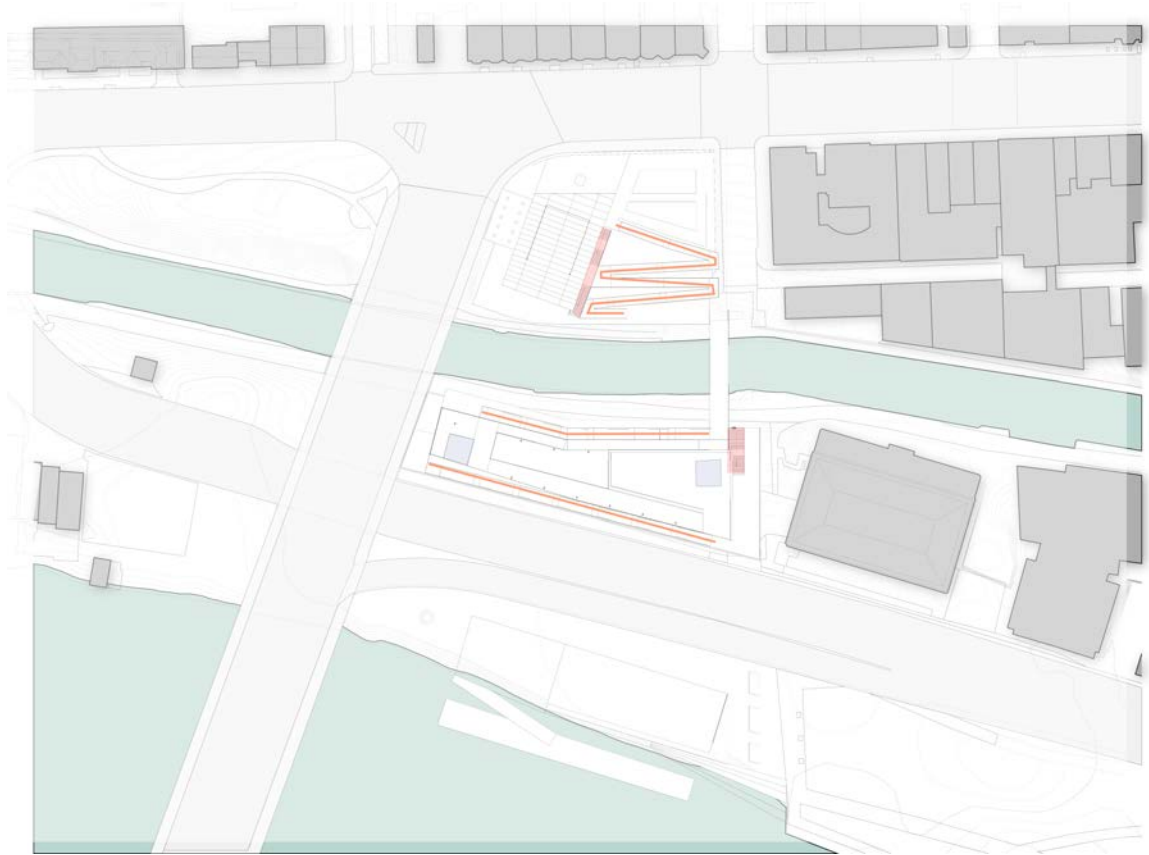


Figure 44: Ramp Circulation

Circulation towards the waterfront is a connective promenade through and within each of these zones, immersing the visitor in each space while at the same time providing a direct route to the waterfront.

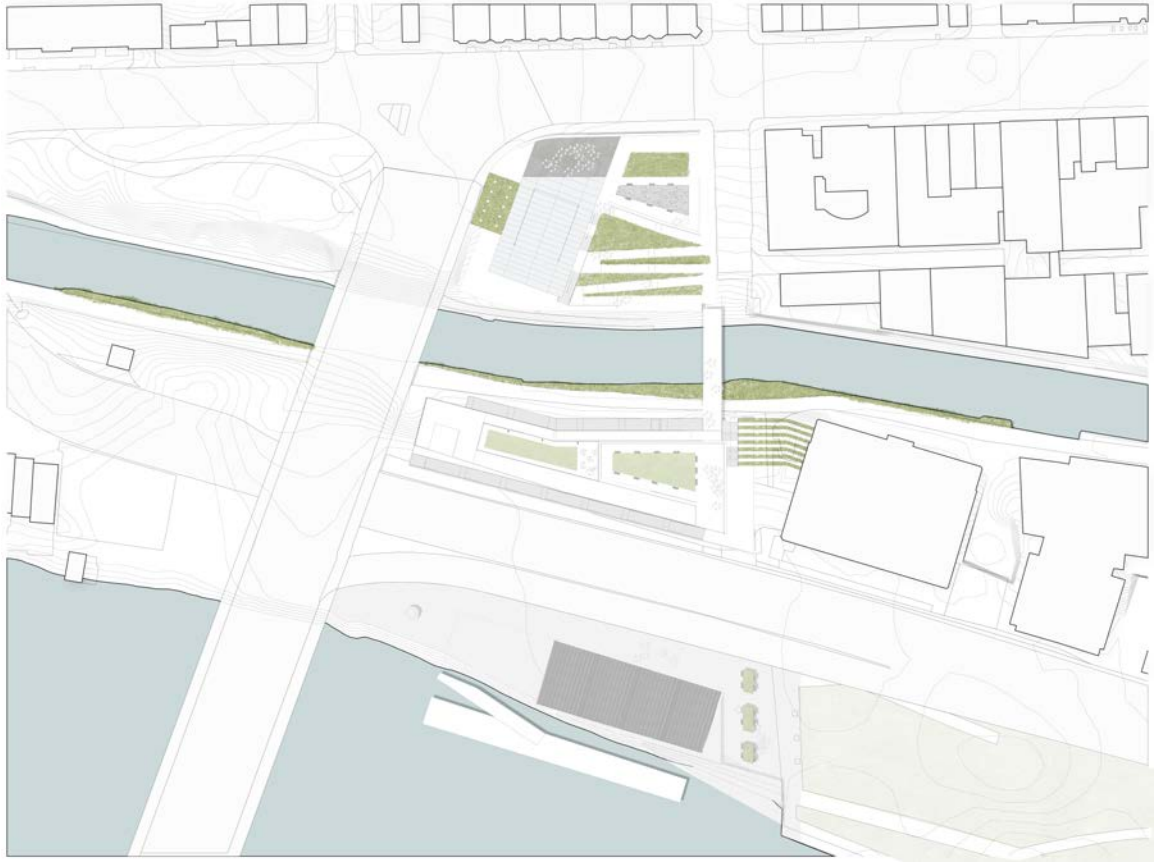


Figure 45: Proposed Site plan



Figure 46: North-South Site Section



Figure 47: Site Aerial to northwest

Architectural Promenade

An architectural promenade between M Street and the Potomac River would draw visitors coming from eastern Georgetown as well as Rosslyn via the Key Bridge or the proposed aerial tram. The aerial tram station is anchored at the northwest corner of the site where Key Bridge meets the Whitehurst freeway. The placement is intended to draw visitors to the adjacent Francis Scott Key Plaza and down ramps through a landscaped park towards the river. A stair placed at the east edge of the tram station as well as interior circulation zones bypass the ramped landscape to provide for a more direct route. All of these paths lead to a platform one level above the canal with access to a bridge spanning the canal.

Crossing the bridge from the northern zone, visitors approach a new cultural center in place of the former Icehouse. The promenade continues on a ramp from the bridge to the canal alongside the structure. This ramping strategy continues around the structure from the canal to the intersection of Water Street and 34th Street. Visitors are also given the opportunity to enter the Cultural Center.

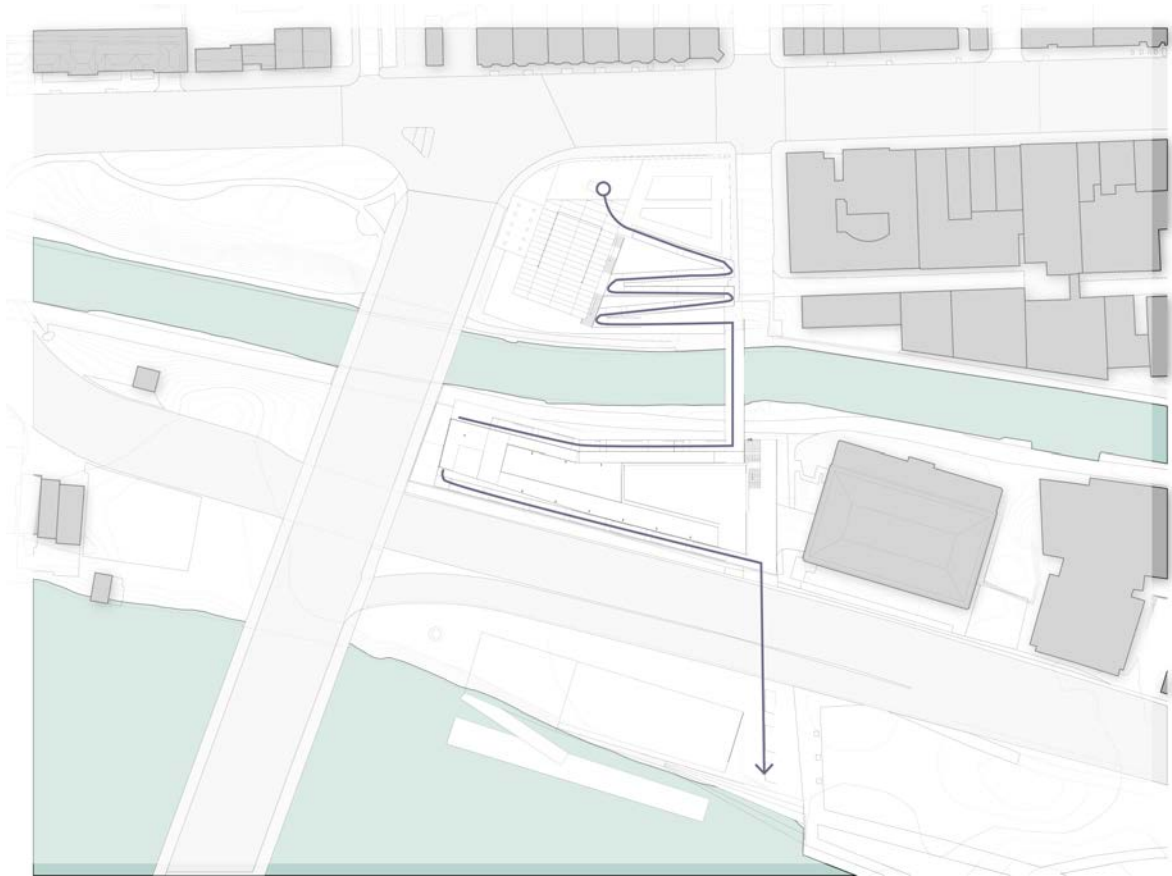


Figure 48: Circulation Diagram

The Cultural Center was based on several design principles; flexibility, transparency, orienting to views, as well as geography and climatic considerations. The goal is for the building to act as a platform for unlimited cultural interaction in both known and unforeseen ways.

The structural layout allows for a flexible and open interior space. A simple column and beam system allows for the allowance of open floor plates uninterrupted by central columns. This provides for spaces that can accommodate a number of events from lectures, seminars, exercise classes, receptions and even musical performances.



Figure 49: East-West Section Perspective

The ramping strategy employed on the site is also applied in the building. In addition to the ramps that wrap the exterior of the building, interior ramps guide the visitor through each level. By drawing visitors through the spaces of the center via the ramps, a much more transparent and engaging experience is achieved giving the visitor a much more rewarding and inspiring understanding of the space and the events unfolding inside of them.

In addition to the views from the ramps of the event spaces, the ramps are also oriented to capitalize on special views throughout the site: views of the C & O Canal, Potomac River, Georgetown, and a glimpse down the river of the Kennedy Center and downtown DC are all achieved.

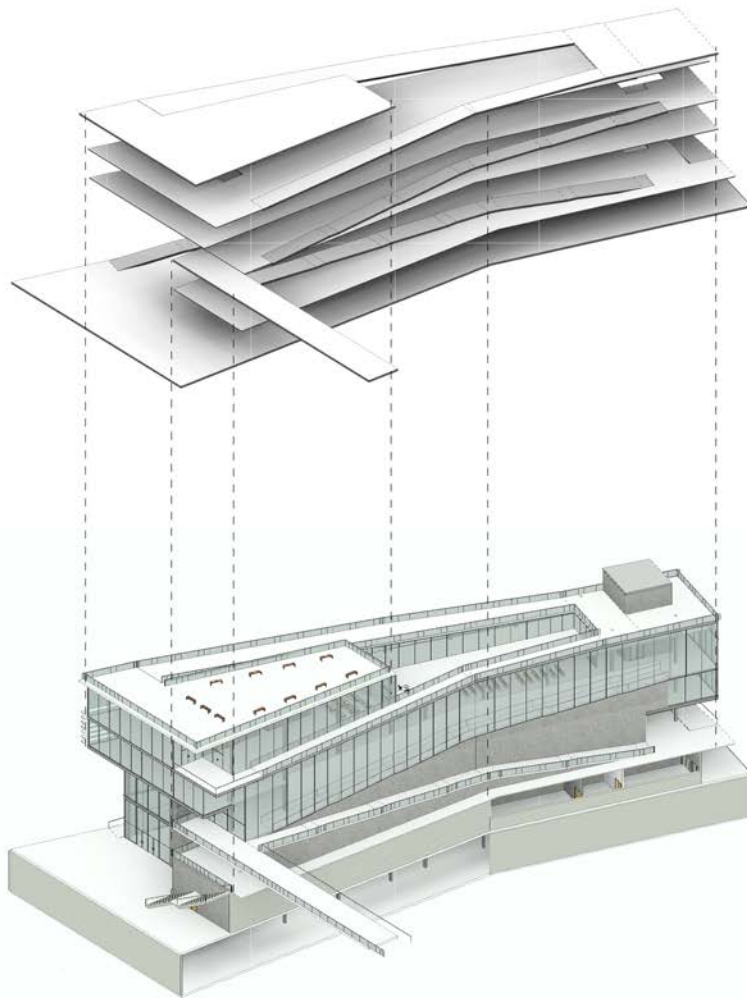


Figure 50: Ramps Diagram

The ramping strategy also gives the visitor a much better understanding of the topographical change that is being experienced throughout the site. The steep drop off to the canal resulted in a new, much wider bridge crossing, with an accessible ramp to both the canal level and to Water Street.

Since much of the building faces the south, harsh solar radiation was an

issue. A double skin façade with an inner layer of glazing and an exterior mechanized louver system help to reduce heat gain and glare into the interior spaces of the building. This façade also doubles as an acoustical barrier from the Whitehurst Freeway.

Continuing the promenade from the building to the southern zone, the visitor is reconnected to the 34th street axis. From here, crossing underneath the freeway the visitor is introduced to the southern zone featuring a new boathouse and a public waterfront plaza. Planting beds and seating reinforce the 34th street axis. At the southern terminus of the park, an angled series of steps draw visitors closer to the river. At this juncture the city is reconnected to the river through the designed architectural promenade.



Figure 51: Level 5 Interior Corridor Facing East



Figure 52: View of DC to the East



Figure 53: Ramp Perspective facing west



Figure 54: Canal Perspective Facing East



Figure 55: Atrium Perspective Facing East

Chapter 14: Conclusion

The proposed design and development of the chosen site and promenade involved a very deep understanding of the movement through and around the site today. The design took into account the shortfalls of the existing site and attempted to improve them through new forms and circulation patterns. A stronger edge and new circulation patterns make movement through the site more efficient and pleasurable.

During the defense of this thesis several important issues were raised. One question asked was how the building blends in with the existing character. The building might do a better job at reflecting more of the industrial and historical character of the site and Georgetown by being more selective of the views from the building. This might result in a different cladding system that would be more appropriate to the character of Georgetown's industrial district.

Another question raised was the distance of the building from Key Bridge. At a distance of 25 feet from the bridge structure the juxtaposition of the powerful yet graceful bridge alongside the delicate glazing of the building might be improved upon. Pulling the building back from the bridge might allow for more connections through the site to the water as well as a more direct engagement with the historically significant bridge.

One critic noted that the ramping circulation was only placed along the perimeter of the building. This was due in part to the structural system of outriggers that extended from the buildings column grid along the perimeter. A more flexible structural system might allow for more dynamic ramping strategies.

Overall, the project succeeded at creating a promenade through the site to create a new connection from Georgetown to the Potomac River.

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