City Infrastructure and Fractured Space: Creating Continuity in a Fractured Urban Fabric

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Abstract

“The changes in technology and cultures of mobility within dense North American cities have resulted in a space that intervenes between one thing and another which often generates seemingly uninhabitable zones and problematic discontinuities in the physical and social fabric.” Over time, the pattern of cities has changed; movement spaces have fractured the social spaces. The social dimension in the design of movement spaces has been neglected and thus these spaces have primarily become products of the functional dimension i.e., traffic flow, circulation, and access for vehicles. These approaches to developments and prioritizing the movement space over the social space have contributed to the creation of fractured people spaces in between the fabric of cities. This thesis proposes to reconnect the broken fabric of cities that are shaped as result of the juxtaposition of movement infrastructure. Furthermore, the research studies the methods by which such spaces can become transformed into successful people place through literature review of what constitutes a successful urban space. Case studies of successful places adjacent to roads, waterfronts, and in between the fabric of cities were studied to understand the methods by which underused, and fractured spaces were transformed to successful urban places. This thesis further implements the methods of place making into creating the new physical, visual, cognitive, and ecological connection between the fractured spaces.

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1. Introduction

After the Industrial Revolution, with the creation of new technology and new transportation methods, the patterns of cities have changed. Before the Industrial Revolution, walking was the main method of transportation; therefore, the patterns of cities were shaped in a way that made all spaces connected in the most beneficent way. With the innovation of cars, highways, and fast roads, the pattern of developments has changed, and this has resulted in creation of fractured spaces. Fractured spaces are spaces where the connection of the space is lost with the rest of the city. This connection can be a physical connection such as inaccessible spaces or it can be a visual and cognitive connection, which is the lack of sense of perceived connectivity with the rest of the city.

The main reason of creation of fractured spaces is prioritizing space for automobiles. Over time, developments have neglected the social dimension in design of movement spaces and the movement spaces have been transformed to fast access infrastructures to destination points. These approaches in development neglects the social dimension of spaces above, below, and adjacent to movement spaces, and results in creation of fractures within social connections in cities. These spaces lack a sense of connectivity and result in creation of underused spaces or uninhabitable spaces. These spaces should be rethought of as spaces worthy of design, and become transformed to multiple user spaces.

This thesis questions how to reconnect a fractured space as result of juxtaposition of movement space and transform it to a successful people place. The thesis studies methods of place making to understand main attributes of successful people place. Furthermore, the thesis researches case studies of successful places adjacent to roads, waterfronts, and in between fabric of city to understand the methods by which underused, and fractured spaces transform to successful urban places. This thesis further chooses a site that has the issue of fracturing as result of location of highways, and implements the methods of place making into creating the new physical, visual, cognitive, and ecological connection between the fractured space and the city.
2. Literature Review

2.1. Morphological changes after industrialization:
Before the Industrial Revolution, cities had limited transportation alternatives and most people walked. This limitation created a sense of continuity and stability within the physical settings of urban environment in traditional cities. In the 18th century, movement space of wheeled vehicles was separated from pedestrian space and sidewalks were created. During the 19th century and early 20th century, industrialization and advances in technology changed the development pattern within the cities to include a majority of private owners. With the growing number of cars, new networks of movement spaces were created that gave cars their own dedicated spaces. Rather than combining different modes of transportation, segregated automobile territory and pedestrian territory were created. The ideas of “highwayless towns,” and “townless highways” became the new trend in the modernist developments. However, this single use approach in the developments was not successful in making good cities because it created discontinuities in the physical and social fabric of the city.

2.2. Fractured space:
Introduction of highways in the 1950s has fragmented city networks and resulted in accidental, leftover spaces. These SLOAPs (space leftover after planning) evolved into the present condition of “unshaped anti-space.” These spaces lack meaningful purpose, and are merely accidental spaces between objects. Henri Lefebvre, 20th century French philosopher, states that the multiplication of fast roads sliced up, degraded, and eventually destroyed the urban space. They have resulted in creation of fractured spaces that lack connection with the rest of the city.

Phoebe Crisman, associate professor of architecture at the University of Virginia, in her article, Inhabiting the In-between, acknowledges that the fragmented conditions in contemporary urban spaces have been largely as result of changes of technology and mobility patterns. She states that the morphological discontinuity of the city shaped by the construction of highways and railways has created spaces that nobody cares to use or inhabit. She refers to them as “uninhabitable zones or spaces” that are the result of linear cuts through the continuity of the city. In fact, the abundance of car dominant spaces, create a barrier for pedestrian users of spaces. These spaces

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lack a sense of sociability and make the experience of moving along them to be only a movement experience. Crisman acknowledges that these spaces are worthy of design and can become places that people would use.

2.3. Automobile territory and creation of fractured space
David Engwicht, one of the world’s most inventive thinkers and writers on creating vibrant public spaces, in his book Street Reclaiming; creating livable streets and vibrant communities, states that “the more a city devotes space to movement, the more exchange space becomes diluted.” Exchange spaces are spaces that people get engaged with activities, and lead people to different destinations. Engwicht compares movement space with the design of a house; the house is designed in a way to reduce the corridors while maximizing the exchange space, and he later suggests that movement spaces should also provide exchange spaces to become a successful places. The problem that we have with the spaces above, around, and below highways today is they have become mainly a space for speed and vehicular safety; therefore, they rarely have qualities and cultural attributes of place, time, and human experience. These movement spaces fracture the continuity in the use of spaces in the urban landscape. Many city landscapes have become inaccessible to different users. Therefore, in the contemporary design there is a desire to create more pedestrian dominant places so these spaces become a combination of movement space and social space.

Car movement is mainly circulation while pedestrian movement is an opportunity for cultural, economical, and social exchange. The difference between a car movement and pedestrian movement is that the car movement is mainly single purpose movement to get to a destination while the pedestrian movement is about a journey of connections between destinations. In other words, when driving a car, the occupants only care to get to their final destination whereas a successful pedestrian space is the continuity of urban space. This continuity is created physically visually and cognitively through a journey between several destination places of pause and places of exchange that define the urban fabric.

2.4. Place making as a method to reconnect fractured spaces
Place making can be used to regenerate fractured spaces in order to create a more connected urban fabric and create new successful places. Leaders of urban public space design have defined different categories of factors that contribute in shaping a place. Figures 1, 2, and 3 describe the various attributes that different leaders of urban design have categorized as the main attributes of successful place. John Montgomery, renowned planner and urbanist, defines physical setting of the built form, diversity of activities, and cognitive meaning of space as the three main attributes

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that define a sense of place (figure 1). Project for Public Spaces, nonprofit planning and design organization, has created a system of analyzing successful public based on four different attributes of the place: sociability, access and linkage, use and activity, and comfort and image (figure 2). Jan Gehl, global leader in people centered urban design, defines three main elements that a successful public place should provide: protection against unpleasant senses, comfort, and enjoyment (figure 3). Rachael Kaplan, a renowned environmental psychologist, describes a framework of important attributes that contribute in understanding environment by people. Her framework includes coherence, legibility, complexity, and mystery.\textsuperscript{11} The late Jane Jacob, a well-known urban design journalist, in the topic of successful street design cites these factors as important attributes of a successful street design: accessibility, ability to bring people together, publicness, livability, safety, comfort, ability for social participation, and social responsibility.\textsuperscript{12} All of the attributes defined by each author are categorized as sensory qualities which can be visual or perceptual, spatial qualities, functional qualities, and offer choice and opportunity. Table 1 on page 7 summarizes the different attributes that different authors have mentioned as elements of successful people place:

- Sensory qualities include sense of comfort and good image, protection, enjoyment, sociability, legibility, safety, and publicness.
- Spatial qualities include access and linkage, coherence, physical setting, openness, and flexibility.
- Functional qualities include use and activity, sociability, and complexity of use.
- Choice and opportunity includes having different use and activity, complexity, variety, flexibility, and creating sense of mystery for users so the space can be used in different ways.

Figure 1 - Sense of place attributes, adopted from John Montgomery. This diagram shows that physical components of the built form, the meaning or imageability (legibility, cultural associations, perceived functions and qualitative assessments), and the type of activities that take place in a space are three main elements that define a sense of place.
PPS has developed a place diagram that designers can use as a tool to assess the successful place attributes of a space. In their diagram, they have categorized four main attributes that successful places share: they are accessible; people are engaged in activities in them; they are comfortable, and provide a good image of a place; and they are sociable places where people get to meet and exchange information.

Figure 2 - Successful place attributes, adopted from Project for Public Spaces (PPS). PPS has developed a place diagram that designers can use as a tool to assess the successful place attributes of a space. In their diagram, they have categorized four main attributes that successful places share: they are accessible; people are engaged in activities in them; they are comfortable, and provide a good image of a place; and they are sociable places where people get to meet and exchange information.

Figure 3 - Successful public space attributes, adopted from Jan Gehl. As the diagram shows, Gehl defines the attributes of successful public place into three categories: protection, which would include protected space from traffic, crime, and unpleasant sensory experiences, comfort, which creates possibilities for different uses, standing sitting, walking, or getting involved in activities, and enjoyment, which is an attribute of the special qualities.

Table 1 - Summary of attributes of successful place; this table summarizes the criteria of successful people space based on different authors into sensory, spatial, functional qualities, and choice and opportunity.

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3. Case studies:

In the following case studies, I chose three successful parks that I have visited. I selected these case studies based on their different relation between the movement infrastructure and the park space. These projects include spaces beneath movement infrastructure (Georgetown Waterfront Park) and along movement infrastructures (Chamran Parkway), and in center of movement infrastructure (Canal Park). Each case study focused a park that was once an abandoned or underused space within the city that was disconnected from the rest of city due to prioritizing spaces for roads, cars, and parking spaces. They were later transformed to a successful park space that created new connections with the city. The relationship between people space and the movement space is later explored in order to understand the different methods these spaces co-exist and multiple way the people space and movement space connect. Furthermore, attributes of successful people space in these case studies are studied. In each case study the sensory, functional, spatial, and choice and opportunity qualities of the site were recorded in order to better understand various way place making can transform an underused space to a successful place, and create new network of connectivity within the space.

3.1. Chamran Boulevard
Shiraz, Iran

Chamran Boulevard, designed by Mehrdad Iravanian, is an example of how a linear leftover transportation space can become a people space. This boulevard currently runs next to seasonal river and along a mountain. Shiraz is a semi-dry city, and there is not much green space in the city. At one time, this area was covered with orchard gardens but as the city expanded, there was a desire to make a highway through the orchard gardens. The construction of the highway fractured the relation between river and the garden. The edge of mountain was designed as linear park space along the boulevard and is now used widely by people. This co-existence of park space and boulevard presents the issue of noise pollution, and Chamran Boulevard in its design has tried to use several water feature elements and threshold to become barrier of noise. As far as activity, the park is used both passively and actively. People also use the boulevard for gathering on special events happening in the city such as parades. The parkway is multi-layered program and includes open gym facilities, a skating rink, restaurants, open theatre spaces, art galleries, basketball court, water fountains, ponds, streams, decorative waterfalls, sitting walls, art works, and benches. People also use the park for picnicking and doing other outdoor activities such as jogging and bicycling. The drive through the boulevard has become a slower drive than a typical freeway due to the enhanced sense of place and locality that the corridor presents. At the same time, the walk through the boulevard has become a more enjoyable walk because the various sceneries and attraction centers that this linear walk has provided along the boulevard.
This case study shows how place making can turn an underused space along a parkway to multi-functional destination place for pedestrians. The design for Chamran Boulevard incorporates functional quality by providing both space for public and vehicles. This approach benefits the place on multiple levels, and encourages social interaction, physical interaction and accommodates vehicular movement and parking spaces. The project also incorporates sensory qualities by creating several destination places along the walk. Spatial qualities are resolved by creating physical connection and linkage along the park, there is coherency along the park that creates a cognitive connection through the park, and the context of the site. However, the project fails to create a strong physical connection between the park and the riverside. Even though there is desire of people going to the riverside, there are limited connection pass between the park and the river. The park is programmed in a way that provides choice for the users by creating shared space along the park that is used by bikes, people, and hikers. It also provides several destination places for pausing along the journey. People can choose to engage with activities that happen along the park or seat and enjoy various moments that the park provides.

<table>
<thead>
<tr>
<th>Attributes of successful place</th>
<th>Sensory qualities</th>
<th>Spatial qualities</th>
<th>Functional qualities</th>
<th>Choice &amp; Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamran Boulevard</td>
<td>Enjoyment</td>
<td>Accessibility</td>
<td>Publicness</td>
<td>Flexibility</td>
</tr>
<tr>
<td></td>
<td>Comfort &amp; image</td>
<td>Physical setting</td>
<td>sociability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safety</td>
<td></td>
<td>Use &amp; activity</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Attributes of successful place studied in Chamran Boulevard
3.2. Canal Park
Washington, D.C.

Canal Park in Washington, D.C., was designed by OLIN Partnership. The project was completed by November 2012. The three-block park used to be part of Washington City Canal and connected to Anacostia River. In 1870, it was paved over and most recently served as a parking lot for school buses. Since 2012, the site serves as a vibrant social gathering neighborhood park.

The park has different amenities such as a café, outdoor seating, fountains, ice skating, performance areas, and sculptures by David Hess. Each of the park blocks has a unique quality. The northern section’s long lawn is used mostly passive. The middle block provides more benches and seating. The southern edge contains the café, ice skating, performance areas, and outdoor seating, and is used more actively. The sculpture installations in the park have created a sense of play and have resulted in an active engagement of people in different ages. The park hosts different events through the year such as movies, concerts, festivals, farmer markets, and art expositions. A linear rain garden crossing the three-block park serves as a storm water management, and evokes the history of the site as a Washington canal.

There is an advance ecological approach in park which is incorporated into the design. The result is a park becomes not only successful social place but also ecologically successful and beneficiary to the city. The park captures, restores, and treats almost all the wastewater of the park and neighborhood. The treated water is later used for the irrigation, fountains, toilets, and the ice skating rink during the winter.

The park is used by different categories of people due to variety of activities that the park provides such as active engagements with the fountains during summer, and passive engagement of sitting and people watching.

One of the interesting aspects of the park is the relation of the streets and the park. The streets run through the park, and divide the park to three sections. The coexistence with the roads and people space seems to be a clear intention of the design, the roads passes through the park, and the edges of park are only separated from the road with a curb and different pavement. The park has tried to create transitional zones between the road and the park to define the difference of the people space and the car space. However, there is a high amount of visual permeability between the road and the park. People can access the park pretty much from all points of the site, and there are no limits in the connection of park and the neighborhood.
Canal Park therefore uses attribute of place making in order to transform an underused parking space to a successful park space that has spatial qualities through its physical setting it has created an open and accessible neighborhood park. The park also has a multi-functional quality that corporates both socially and ecologically. The sensory qualities such as comfort, enjoyment, safety from vehicles makes the space become enjoyable. The park is also flexible for different uses, for example the sculptural element function both as an aesthetical object and also they become playful elements that people get engaged with activities with them.

<table>
<thead>
<tr>
<th>Attributes of successful place</th>
<th>Sensory qualities</th>
<th>Spatial qualities</th>
<th>Functional qualities</th>
<th>Choice &amp; Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal Park</td>
<td>Enjoyment</td>
<td>Flexible (multi-functional)</td>
<td>Publicness</td>
<td>Flexibility (for different users)</td>
</tr>
<tr>
<td>Comfort &amp; image</td>
<td>Physical setting</td>
<td>sociability</td>
<td>Used both ecologically and socially</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>Access and linkage</td>
<td>Use &amp; activity</td>
<td>Ecological use</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Varied program on different seasons</td>
<td></td>
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</tbody>
</table>
Figure 6 - Canal Park design analysis; Top left shows different circulation pattern, top right shows attributes of place making analysis, and the section on bottom shows topographic relation of park space and neighborhood.
3.3. Georgetown Waterfront Park
Washington, D.C.

Georgetown Waterfront Park is an example of a park on a lower level of a freeway. It was designed by WRT at Philadelphia, Pennsylvania, and was finished construction by 2011. The park used to be a parking lot and industrial site. The Georgetown neighborhood was disconnected to the waterfront because of the location of industrial site and parking lot. The aim of the design by WRT was to connect the contemporary residential and commercial part of Georgetown waterfront to the water.

The location of the park benefits from views to Roosevelt Island and Key Bridge views toward west, and Kennedy Center and Memorial Bridge toward east. The focus of the park is the river, and it has designed in a way to attract park visitors to the river. The eastern section of the park from 31st Street to Wisconsin Avenue has been designed more as an active use as compared to the western section. The Wisconsin Avenue part is designed as a main entrance and it invites the visitors with fountains and benches. A wide walkway continues along the river with benches and pergola and staircases for viewing the river. People can decide to choose the sheltered pergolas or the stairs to sit and watch the river. As you move from the eastern part of the park to the western part, the language of the park changes from active usage to more pastoral walkways and passive use. The views of the park also changes from east to the west. As we get closer to the west site, the Key Bridge obstructs the view of the park. The large open green areas and the paths provide vistas to the river, the Key Bridge, and panels that describe the history of the site, and the bridge. Inside the park, the vistas of the water is unobstructed whether you are sitting on a bench or walking on a walkway. The park boundary ends in 34th Street. The Capital Crescent Trail which runs along the park becomes very disconnected where the Key Bridge overpass, and the view of water becomes obstructed by the bridge.
The transformation of the site to the park has created connection between the city grids and the water. The location of Whitehurst Freeway next to the park makes the area near the freeway to be undesirable because of the noise pollution. However the park has tried to create a transitional zone to bury this noise and attract people to get close to the water. The furniture, benches, lighting, and the vegetation provide comfort, and sense of security, and the careful design of the mounded hills on the side create a calming and quiet nature of park, which separates the visitor
from the loud area under the Whitehurst Freeway. The park also features ecological functions by providing rain gardens to filter the runoff water before they enter the water.

Figure 8 - Georgetown waterfront's sense of image and comfort; Georgetown Waterfront Park uses vegetation and topography as an element to create a distance from the noise and create a better image of the space along the freeway.

The section drawing through the site (figure 9) shows how the park uses the topography and vegetation to create transition between the park space and K Street. A mounded land continues and slopes down gradually as it gets closer to water. The transition leads to the area where the focus becomes water and the views along the river and it creates a sense of comfort and separation from the hustle and bustle of the freeway.

Georgetown Waterfront Park therefore uses place-making attributes to transform an underused parking lot space to a park space along the water. The functional qualities become mostly the passive social use and minor active use along the water fountains. Sensory qualities that the park provides include sense of comfort, safety, and relief from the highway. The design intends to take the attention toward water instead of the freeway. The park also provides rain gardens that function ecologically. The park also has spatial qualities; it provides new physical connections from streets to water. There is also visual connection along the park toward water.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Canal Park</td>
<td>Enjoyment</td>
<td>Access and linkage</td>
<td>Publicness</td>
<td>Used both socially and ecologically</td>
</tr>
<tr>
<td></td>
<td>Comfort &amp; image</td>
<td>Physical setting</td>
<td>Sociability</td>
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<tr>
<td></td>
<td>Safety</td>
<td></td>
<td>Use &amp; activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ecological use</td>
<td></td>
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</tbody>
</table>

Table 4 - Attributes of successful place studied in Georgetown Waterfront Park
Figure 9 - Georgetown Waterfront Park design analysis; The above maps show how the park uses attributes of place making in order to connect people coming from the streets to the waterfront. This connection is done through visual permeability, and physical access.
3.4. What I learned after the case studies:

Traditionally the vehicle and pedestrian spaces have separated along urban corridors. In the contemporary practice, the concept of vehicle and pedestrian separation is being rethought. The case studies show how the movement space and people place can co-exist, separate, or layer. In all the case studies, connectivity is different which also effects the use of the park. Canal Park functions as open neighborhood park, which works socially, as a space for activities of the neighborhood, and ecologically as a space that benefit the neighborhood. The connection in Georgetown waterfront is a physical connection from the Georgetown streets to waterfront edge. It is an invitation to get close to water to enjoy the sensory qualities of the waterfront edge. In Chamran Boulevard, the connection is done as a cognitive connection; it brings the sensory qualities of a people place to an edge of a car space.

The co-existence of movement space and social space cause variety of problems. One is that roads become an obstruction for pedestrians and break connectivity. Second is that the traffic noise create a frustration for the social corridors or roads. The other problem is that the traffic and roads create an unsafe image of the space that people would not want to use that space.

Each of the case studies has tried to deal with these issues in different way. In Chamran Parkway, they use the water elements in order to filter the noise of the road, in Georgetown waterfront the mounded vegetation is used as a noise barrier between freeway and the park. In Canal Park, there is slower traffic in the roads, and the design of the park has let the roads pass through the park. A careful design integrate the need of different form of movements and create a space which protects the social space from the impacts of movement space while also giving access from the movement space to the social space. 16 In other words, people connection to space involves circulation, destination places, or places to pause along the way that are much more about positive place experiences. The co-existence of movement space and people place can become successful by creating destination places, places to pause or get distracted from things that happen in a highway next to you.

Another main design element of these case studies was that they are providing multi-functional spaces that are designed and programed in a way that create different use and activities for people while also functioning ecologically. In case of Canal Park, for example the ecological function becomes an important character of the park. The park is not only a space that works well socially but it also functions ecologically. Therefore, even during the time that the park is not filled with people, the park is still benefiting the city ecologically.

<table>
<thead>
<tr>
<th>Attributes of successful place</th>
<th>Sensory qualities</th>
<th>Spatial qualities</th>
<th>Functional qualities</th>
<th>Choice &amp; Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyment and comfort</td>
<td>Providing connection (cognitive-physical-visual connection)</td>
<td>Multi-functional space (both socially and ecologically)</td>
<td>Used both socially and ecologically</td>
<td></td>
</tr>
<tr>
<td>By creating several destination places</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety for pedestrian</td>
<td>Physical setting and access and linkage</td>
<td>Publicness</td>
<td>Giving choice for different type of users</td>
<td></td>
</tr>
</tbody>
</table>

Table 5 - Attributes of successful place after analyzing all case studies
4. Applied Research

4.1. Design objective:
The spaces around movement infrastructures lacks a positive sense of place because the negative visual and cognitive image of the space, lack of safety, and lack of linkage and access by pedestrians to those spaces. These spaces can be rethought as spaces that can be used by multiple type of uses. Having studied the attributes of successful people space, I would like to choose a fractured space formed by addition of movement infrastructure and transform it through design to successful place. Specific design objectives are:

1. Reconnection of these spaces to fabric of city physically, visually, and cognitively.
2. Transforming these underused spaces to successful people space by using the criteria and attributes of public place.

4.2. Site Criteria:
Having analyzed the case study, Chamran Parkway, I became further interested to choose a site which was fractured by interstate highways and had lost its connection to water in Washington, D.C. area. These conditions defined the following criteria for my site selection:

1. Fractured space as result of location of interstate highway
2. Lack of cognitive, visual, and physical connection with rest of the city
3. Location near river with lack of connection with water
4. Desire to become more used by pedestrians
The boundary of Washington, D.C. waterfront is studied and the areas where the interstate highway crosses the water are highlighted in figure 10.
4.3. Analysis of the Fractures

The land use of the D.C. waterfront boundary was studied in figure 11. There are different neighborhoods along the waterfront. I determined that a busy commercial land use was a good neighborhood for my thesis. Because in a commercial neighborhood, there will be higher population in need of using the space, I decided to study the Georgetown neighborhood, and did some demographic studies. The charts in figure 12 show Georgetown site is more car dominant for transportation. The area is also highly populated and the population has grown 21% since 2000. Therefore, there is a great desire to make this area more, and this area became a good site for this thesis project.
The Georgetown area is a unique neighborhood in Washington, D.C. which benefits from its intimate urban scale and its diverse commercial and residential land use. Its historical buildings and unique character of the place has made the space to be one of the most visited places in D.C. Most of the attraction however is around the M Street where most of the commercial buildings are located. As you get further from M Street to the water, the amount of commercial zones decrease and the south of K Street lose the unique qualities of the M Street zone in Georgetown. I believe the location of K Street and Whitehurst Freeway has become a barrier for people to get attracted to go closer to waterfront. There have been attempts to the waterfront area to make it a better place since the completion of Georgetown Waterfront Park in 2011. Improvements around the Washington Harbor retail centers and the creation of dancing fountain and skating rink along waterfront attempts to attract people to the Georgetown waterfront.

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Evaluation of Georgetown Waterfront Park revealed a disconnection between the Georgetown waterfront and the Capital Crescent Trail. The boundary of Georgetown waterfront ends in 34th Street and leaves the south of K Street between 34th Street and 36th Street with undefined transitional space. The bike path continues under the bridge but the space feel disconnected from the rest of the journey. The boathouse and the bridge obstruct the view of the water and when a person gets close to the Key Bridge, the parking lot becomes the prominent view. This transitional space, from a designed park to a new one, is not defined very well, and lacks a sense of place. The area is used by people doing different type of activities, however for one who is not familiar to the area it can be a dead-end point of an adventure because of its weak sense of place and visual continuity. I believe that there is potential for this site to develop and create a better connection between the two parks.

<table>
<thead>
<tr>
<th>Type of fragmentation</th>
<th>visual</th>
<th>cognitive</th>
<th>physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disconnection between space under Bridge with waterfront</td>
<td>Disconnection between Georgetown Waterfront Park and Capital Crescent Trail</td>
<td>Disconnection between different Infrastructures on the site (Key Bridge, Aqueduct, Canal, Whitehurst Freeway, K Street, Waterfront, river, and boathouse)</td>
<td></td>
</tr>
<tr>
<td>Disconnection between Georgetown Waterfront and M Street</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6 - Type of fragmentation discovered in the site
Figure 14 - Selected site boundary (base map adapted from Google Maps)

Figure 15 - Wild nature versus tamed nature, and the fractured space in between; location of Wilder nature trail on the west side and location of Georgetown waterfront on the east side of the Key Bridge (Image adapted from Bing Maps).
4.3.1. Historical analysis of the site:
Georgetown waterfront site has a long history since its settlement in 1703. The site was once used as tobacco port and public wharf. Several infrastructures were constructed in the site over time for transporting materials over the river to the wharf. Overtime there has been a pattern of different infrastructures getting abandoned on the site, the Canal, Aqueduct Bridge, Key Bridge, Capital Crescent Trail, Whitehurst Freeway, and boathouse. Table 7 and figure 16 provide a timeline of important events that happened in the Georgetown area since the area been settled. Each of the different infrastructures that appear on the site has created new connection and fractions in the context of the site. The current condition of the site lacks connection between various infrastructures on the site.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1703</td>
<td>settled</td>
</tr>
<tr>
<td>1745</td>
<td>used as tobacco port</td>
</tr>
<tr>
<td>1760</td>
<td>public wharf was built</td>
</tr>
<tr>
<td>1825</td>
<td>C &amp; O Canal constructed</td>
</tr>
<tr>
<td>1828</td>
<td>C &amp; O canal used as floating coal, lumber, grain, and other products to market</td>
</tr>
<tr>
<td>1833</td>
<td>Aqueduct Bridge built construction began (wood Structure) used for carrying boats</td>
</tr>
<tr>
<td>1843</td>
<td>Aqueduct Bridge built construction finished (wood structure)</td>
</tr>
<tr>
<td>1861 - 1865</td>
<td>civil war. C &amp; O Canal drained for military usage</td>
</tr>
<tr>
<td>1888</td>
<td>Aqueduct Bridge structure was replaced from wood to iron to operate a highway</td>
</tr>
<tr>
<td>1889</td>
<td>Georgetown Branch Rail Line started (used for carrying coal) the Part that passed water street was shuttle cargo and was not connected to the rest of railroads in Georgetown</td>
</tr>
<tr>
<td>1903</td>
<td>Key Bridge construction began</td>
</tr>
<tr>
<td>1910</td>
<td>B &amp; O railroad connected rail line to water street</td>
</tr>
<tr>
<td>1912</td>
<td>Power House to operate street car was built (Capital Traction)</td>
</tr>
<tr>
<td>1923</td>
<td>Key Bridge constructed</td>
</tr>
<tr>
<td>1924</td>
<td>C &amp; O Canal closed due to floods, winter freezes, and unable to compete with the speed of the railroad</td>
</tr>
<tr>
<td>1933</td>
<td>Capital Traction closed and switched to electric power company</td>
</tr>
<tr>
<td>1935</td>
<td>Electric street car became abundant and became replaced by Heating plant operated by GSA</td>
</tr>
<tr>
<td>1947 - 1949</td>
<td>Whitehurst Freeway construction</td>
</tr>
<tr>
<td>1960</td>
<td>movement to beautifying Georgetown and removal of industrial plants</td>
</tr>
<tr>
<td>1985</td>
<td>Georgetown Branch Rail Line became abundant</td>
</tr>
<tr>
<td>1996</td>
<td>The abandoned Rail Line transformed to Capital Crescent Trail</td>
</tr>
<tr>
<td>2007 - 2010</td>
<td>Georgetown waterfront park built</td>
</tr>
</tbody>
</table>

Table 7 - Timeline of important historical changes on the Georgetown waterfront


Figure 16 - Historical analysis of the site; this drawing translates the highlighted events in the timeline table in map of Georgetown. There has been pattern of new infrastructures been added and become obsolete in the site.
4.3.2. Analysis of cognitive, physical, and visual connectivity:
The issue of connectivity has been studied in the site as cognitive, physical, and visual issues.

In order to understand connectivity as a cognitive issue, studies of characteristics of Georgetown include understanding the use of exiting materials, main landmarks, and special characters of the site. These mappings identify possibilities to create new connections in the selected site in Georgetown waterfront with the rest of Georgetown.

Figure 17 - Spatially located material uses common to this area of Georgetown; Using materials such as paving, building, siding that are prevalently used in more inhabited places in Georgetown assist in people’s association of waterfront area and the rest of Georgetown.
Figure 18 - Iconic landmarks of Georgetown: Knowing iconic landmarks of Georgetown helped in understanding the elements in the site that people can associate cognitive relation with the Georgetown site.
Figure 19 - The topography of Georgetown’s waterfront presents significant obstacles and opportunities. There is consistent pattern of steep slopes and stairs in the site that becomes a significant character of the site. This character can be used in the design of new development in the site.
4.3.3. Analysis of future Proposals on Georgetown:
The master plan of Georgetown 2028 proposed by Georgetown Business Improvement District, suggests a new strategic approach to build a more sustainable Georgetown commercial district over the next 15 years.19 The goal of their proposal is to enhance Georgetown experience for visitors, residents, business owners, and people who work here.

The Georgetown 2028 proposal was studied to understand the future proposals for the site. These proposals all aim to create better connection between M street and K Street. The master plan proposes the following additions for the site:

- New Metro Station
- Street car connection to the waterfront
- New bridge connection to Roosevelt Island
- Gondola connection from Roslyn Metro Station toward the west of Key Bridge
- Extending greenery on K Street
- Extending the retail zone from M Street toward waterfront.
- Parklets along the perpendicular streets to M Street.
- Creating secondary connections from alleys from M Street to Canal, and from the Canal toward waterfront.

These proposals all aim to create better connection between M street and K Street.

Figure 20 - Design analysis of the future proposals on Georgetown; this map analysis the site based on the proposals of the Georgetown 2028. (Information adapted from Georgetown 2028 proposals by BID)
4.3.4. Analysis of ecological connection:
Georgetown waterfront is subjected to both minor and significant flood events. The ecology of water in the existing site were studied to understand the different levels of water during high tide and low tide, and also the level of water during different flood stages. The different levels of water in the site are listed below:\(^\text{20}\)

\[
\begin{align*}
\text{LAT} &= \text{Lowest Astronomical Tide: } -0.6 \\
\text{HAT} &= \text{Highest Astronomical Tide: } 3.8 \\
\text{Flood stage: } 6 & \quad \text{Moderate Flood stage: } 7 \\
\text{Major Flood stage: } 10 & \quad 100 \text{ year flood stage: } 16
\end{align*}
\]

The dynamics of the river was studied and discovered that the site is mainly in danger of flooding during 100-year flood. Therefore, controlling the 100-year flood became one of the objectives in the design process.

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4.3.5. List of Fragmentation in the site:
After measuring the different attributes of the site, the list below identifies the site’s current fragmentation:

- Lack of cognitive connection between the waterfront areas with the rest of Georgetown
- Lack of cognitive connection between the Capital Crescent Trail and Georgetown Waterfront Park
- Lack of physical connection with different infrastructures on the site: The Canal, Key Bridge, Aqueduct, K Street, boathouse, and Whitehurst Freeway
- Lack of connection between people and dynamics of river
4.4. Design Objective:

After looking more carefully at the existing condition of the site, the design objective became:

- Reconnecting the fractured space to the fabric of the city physically, visually, and cognitively by:
  
  - Creating better connection between waterfront and rest of Georgetown (cognitive and visual connection)
  - Creating better connection between Georgetown waterfront and the trail (cognitive and visual connection)
  - Connection with the river and dynamics of river, which storm water also becomes part of this connection (ecological/physical connection)
  - Creating new physical connections between different infrastructures on the site; the Key Bridge, Aqueduct, Capital Crescent Trail, Whitehurst Freeway, K Street, The river, and the boathouse

- Transforming these underused spaces to successful people space by using the criteria and attributes of public place by:
  
  1. Creating new destination places, or new places to pause along the way that are more about positive experience
  2. Creating sense of comfort and enjoyment
  3. Creating new activity and new social space
  4. Making the space flexible to be able to be used by different users; transforming the space under the bridge to a combination of movement and social space
  5. Creating a protective space against 100-year flood
  6. Creating a multi-functional space that works both socially, functionally, and ecologically
4.4.1. Preliminary design ideas:
Preliminary sense of place sketches used collages on the existing photos to illustrate the ideas. They propose a more pedestrian shared space under the Whitehurst Freeway with new activities, new centers, and an ecological connection of stormwater and river.

4.4.1.1. Ecological idea:
The ecological idea proposes a new ecological connection between dynamics of stormwater run-off on top of the Whitehurst Freeway with the site below the highway. The idea is that the run-off water from the freeway captures, filters, and the clean water go back to the river.

Figure 22 - Ecological concept; this drawing shows that the area under Whitehurst Freeway divided in three different path that each become different used by retail, hikers, and bikers, and people who use the park. The design also uses protective berms to cover the area.
4.4.1.2. Art and attraction idea:
The art and attraction idea is creating new centers of attraction below the highway to attract people coming from M Street to the waterfront. The idea is to use the bottom surface of the freeway as a screen for projecting lights from the landscape. Therefore, the light performance under the bridge attracts people coming from the M Street to come down toward the waterfront.

Figure 23 - Art and attraction concept; this drawing uses idea Art or performing Arts with lights under the highway to create new destination centers.
4.4.1.3. Recreational idea:
Analysis of Georgetown waterfront (figure 20) showed that most of the site is used as passive activity. The design proposes to add new recreational space between the boathouse and existing Georgetown Waterfront Park. This recreational space would provide a new center to bring people toward the reconnected space. It also expands the recreation from the limited passive use of the existing Georgetown Waterfront Park to more active programmable space. A skateboard park was chosen as the recreational program because it fits with the need of people who use that space, and has some cognitive connection with steep slope character of Georgetown. A temporary performance stage was also chosen as another recreational space under the Key Bridge. A performance stage was chosen because of the acoustic potential of the space under the Key Bridge structure.

Figure 24 - Recreational concept; this drawing suggests skateboarding as a new recreational activity for the site.
4.4.1.4. Study of integrating multifunctional floodwall in the design:
Analysis studies of the site revealed that the site is in danger of 100-year floods. Preliminary sections were drawn to study creative ways of integrating a floodwall into the design that become used both passively for places to sit and actively for skateboarding while also controlling the 100-year flood water.

Figure 25 - Study of the integrated floodwall in the design; the study explore the creative ways a floodwall can be designed in the landscape. The idea is that instead of traditional engineered floodwalls, these floodwalls become a playful part of the landscape, which can be programmed in multiple ways to create different type of activities during the time there is flood, and when the site is, dry. The perspective on right top explores ideas of how to filter the voice of Whitehurst Freeway and create a less noisy area under the bridge.
4.4.1.5. Study of connectivity with waterfront and integrated skateboard floodwall:
The idea of having the floodwall created issue of connectivity with river. The sections below studied how to remain the connection with river while also controlling the flood through the design.

The plan also studies how the floodwall can fit with the existing context of the site, and how it can create different zones for different connections, connection of biking hiking path, connection of retail to waterfront, and connection of the sidewalks, and streets.

Figure 26 - Study of connectivity with waterfront and integrated skateboard floodwall; the plan on top studies the relation of the location flood wall, the pedestrian path along the skateboard park, the bike path, the road, and the retail pedestrian path. A new path provides a space for multiple users, and creates a better connection between the existing Capital Crescent Trail and Georgetown Waterfront Park trail. The sections study how the hydrological connection can function between the river and storm water runoff from highway. They also study how physical connection to waterfront can take place.
4.4.2. Final design proposal:

- Creation of a skateboard park as a new center activity that create a cognitive connection between the M Street and waterfront.
- Protective berms to control the 100-year flood. This proposal becomes a new connection between river and people who use the park.
- Redesigned boathouse parking courtyard and transforming it into a multi-use space that can function as both parking space and courtyard when there is no need for parking.
- Continuous biking hiking path all along the waterfront, which connects the Capital Crescent Trail to Georgetown waterfront. The path weaves along the edge of the Georgetown Waterfront Park and provides a different edge experience and visual pleasure along the path.
- Continuous path along water that runs along Georgetown Waterfront Park, the skateboard park, Key Bridge, and the boathouse.
- Temporary performance stage underneath key bridge; this space creates another center for passive and active use of performance and people watching under the Key Bridge.
- Storm water installations under the freeway, which store the run off, clean them, and send the water back to the river. This proposal creates a new ecological connection between the storm water and river and people.
- Planting: planting is designed as a way of fixing several ecological issues of the site. Remedial plants are used to clean the runoff water. Small shade tolerant trees were selected to for spaces under the highway. Large shade canopy trees were selected on sun exposed areas of the site. In addition, different types of ground covers are selected for the shade exposed, and sun exposed part of the berms.

Figure 27 - Key plan of the design; this drawing shows the location of the skateboard park, storm water installations (terraced pool), the continuous bike lane that connects Capital Crescent Trail to Georgetown waterfront, the protective floodwalls, temporary performance stage, courtyard space, the boathouse, and the restaurant.
4.4.2.1. Proposal plan:
Figure 28 shows more realistic render of the proposed plan. The design uses several water retention spaces under the Key Bridge, which are planted with remedial plants, and small shade tolerant plants. These plants function aesthetically and help with filtering the storm water runoff that comes from the Whitehurst Freeway on top. The courtyard space is planted with long canopy trees that follow the lines of the columns of the bridge. There is a terraced pool next to the courtyard that is vegetated with purifying water plants. The run off from the K Street is filtered as it passes through the terraced pool and gets clean when it gets back to the river. The berms along the skate park function as floodwalls during the 100-year flood and stop the water to get into the street. The design provides places along the walk next to the skate park that allows people to watch skateboarders and during the flood to watch the flood while standing on the protected dry side of the park. These berms are planted with sun tolerant ground covers toward the south and shade tolerant ground covers toward the north side of the park. Figure 28 provides more information about specific plants that were used in the design proposal.
Figure 28 - Proposed site redevelopment plan. The plantings were selected for each area based on the needs of the project. They clean the runoff from K Street and the freeway, provide shade on the dry part of the site, and provide visual pleasure.
Figure 29 - Axonometric view of the design shows the relation of different infrastructures in the design, and their relation to each other. The space under the freeway has storm water retentions that capture the water cleans them, and sends the clean water back to the river through series of remedial plants, and engineered soils. The skateboard park uses the columns of the bridge as a design element during skateboarding. Therefore, the design intends to use the existing infrastructure elements on the site, and create a new connection with those elements, so instead of the site feeling like a juxtaposition of several different elements on the site, it would feel as a whole connected piece. The space under Key Bridge is transformed to a temporary performance landscape. Trees are used as elements to provide shade during hot climate, and create visual pleasure.
4.4.2.2. Proposal master plan; creating cognitive and physical connection from M Street to waterfront:

Figure 30 shows the design in the larger scale of Georgetown waterfront. The master plan considers the future proposal for Georgetown and implements them in the design. There are multiple connection that take place in the site; connection from the M Street with the waterfront, new connection between the Capital Crescent Trail and the Georgetown Waterfront Park. There is new connection from the retail side of the waterfront toward the water. The area between Aqueduct Bridge and existing Georgetown Waterfront Park becomes a new transitional space that provides different destination places along this transition, the courtyard open plaza next to the boathouse, the terraced pool along the courtyard, the entertainment plaza under the Key Bridge, and the skateboard park. Each of these spaces provide space for new activities; passive activities such as sitting in the courtyard people watching or watching the performances under the key bridge, and active activities such as skate boarding biking and hiking. The design also functions ecologically by creating new connections between the flows of the storm water and the river.

Figure 30 - Master plan: this master plan shows the design within a larger scale of the Georgetown waterfront. The drawing has color coded different type of connections. The Aqueduct Bridge is defined as a threshold and a gateway to the waterfront park. There are multiple connection between M Street and waterfront. These connections are happening through creation of several different destination spots through the waterfront and under the freeway.
4.4.2.3. Multi-functional use of space as a method of place making:
Multi-functional use of space becomes an important element of the design. The design aims to bring a new system of program that can function both socially and ecologically. This system becomes a good solution for a fractured space within underused spaces along highways. These spaces are thought as spaces that can function socially, ecologically while also function the transportation need for different users.

The park propose storm water retentions along the space under the highway (figure 31) and captures, clean, and send the clean water back to the river. The design also propose protective flood berms along the skateboard park which stop the occasional 100-year flood, and create different zones that people can stand in dry zone and watch the flood. Figure 32 shows how these zones work on a dry condition and on a flood condition. Figure 33 shows how the grading is done in the design to create these dry and wet zones in the project.

![Figure 31](image_url) - Section through skateboard park and the storm water retention areas under the Whitehurst Freeway. Different levels of flow of river are shown in the section to show how the berms stop the 100-year floodwater. The berms while creating physical disconnection at some spots they still keep the visual connection between the retail sidewalk and the river.
Figure 32 - Perspective from the sidewalks looking into the skateboard park, when it is not flooded (a.), the park provides spots that people can stand and watch the skateboarders, and when it floods (b.), these zones can become the safe dry zones that people watch the flood.
Figure 33 - Grading plan; top drawing (a.) shows the plan when there is no flood and bottom-drawing (b.) shows the plan during 100-year flood. The grading is done in a way the part above the floodwall is protected from flood. It creates dry destination places to watch the flood during those occasional floods.
4.4.2.4. Reconnecting spaces by creating new destination places:
The design creates several destination places along the transitional space between the boathouse and existing Georgetown Waterfront Park. Some of these destination places can be seen in figure 34. The space under the Key Bridge for example becomes a new destination space that can be used for other temporary performances. The space creates terraced steps for people to sit and watch the skateboards or other performances. The terraced pool next to the courtyard becomes another destination spot that also functions ecologically in cleaning the run-off water from K Street. The design creates a multi-functional space, which serves both ecological and social purposes. The section over the terraced pool in figure 34 for example shows how remediated plants function in cleaning the runoff water. The pool also becomes a new social destination place for people.

Section through the skateboard park close to the Key Bridge (figure 34) shows how the design intends to create both visual and physical connection between the water and skateboard stage. The design proposes stairs toward the Canal and Top of Key Bridge to create a better physical connection between different infrastructures on the site. The design also proposes elevated decking underneath the Key Bridge to connect the path along the waterfront to the boathouse.

Figure 34 - Connection to water through destination places; top image section through the Key Bridge-bottom image section through the remediated terraced pool.
4.4.2.5. Temporary performance stage:
The space under Key Bridge is considered as a significant place that can function as a temporary performance stage. This performance space can be used by skateboarders or by occasional events that can happen in the site.

Figure 35 - Perspective from the performance stage under the Key Bridge; this perspective shows how the space under the Key Bridge can perform as a performing space for skateboarders and also as a performance space for other activities.
4.4.2.6. Courtyard and the terraced pool:
The drawing shows how the space next to boathouse can transform to a space that be used for different users, from people who use the boathouse to people who enjoy stroll along the courtyard and get views of water, to people who would like to use the space as a parking space. In fact, the space next to boathouse is looked at as a multi-purpose space for different social use. It also is looked at as space with ecological use by integrating the terraced pool that remediates stormwater that comes from the K Street.

Figure 36 - Perspective from the remediating water pool next to boathouse courtyard space; this drawing shows how the pool can function as both a new social space, and an ecological space.
4.4.2.7. Skateboard park as a new destination place:
The skateboard park is looked at as a new destination place to connect people toward the waterfront. The skateboard park is carefully designed and creates different path for different type of users as it is shown in plan (figure 38). It provides zones for people coming from the retail areas who are interested in watching the skateboarders from distance on the other side of the berms. It also provides paths that stroll around the skateboard park for people who are interested to get more involved with watching the skateboarders. The design of the skateboard park also tries to fit with the condition of the site and uses the elements of the site in a creative way in its design. For example, the design uses the columns of the bridge as obstruction for skateboarders.

Figure 37 - Perspective of the skateboard park next to bridge.
4.4.2.8. Design analysis:
Attributes of successful place making such as choice, sensory qualities, visual qualities and functional qualities are incorporated into the design. Choice is considered as important element of design. The design considers the needs of different type of users for example it incorporates different path in the skateboard park for different users: a retail user person, person who like to see the skateboarders while keeping the distance, and a path for strolling around the skateboard, and getting more engaged with the skateboarding activity.

Figure 38 shows how all these different visual, physical, and cognitive connections would happen in the site. The design tries to reconnect physically visually and cognitively. The issue of circulation is solved with multitude ways that circulation can be physically reconnect. Automobiles, bicyclists, and pedestrians are all physically connected through different paths and physical connections.

The disconnection between the retail area of Georgetown and waterfront is resolved through recreational use along the water. This connection is cognitive connection of Georgetown waterfront with M Street and upper Georgetown, which results in physical draw of people. Cognitive connection is a perceptual connection that a visitor makes with a place. In other words, this connection makes the visitor understand the cohesiveness of the space.

The co-existence of people and highway on top is solved through creating distraction place below the highway so when you are down the highway the things that happen on top would not distract you and your focus would be on the level of K Street.

The design also creates a new hydrological connection with the river and storm water. It integrates the water circulation into the design and creates a new connection with the water that come out of river on occasional floods (100-year flood). It also creates a connection with the surface water that comes out of the highway. The water on highway gets to the remediated plants, filters, and ultimately gets back to the river.
Figure 38 - Design analysis plan shows how new attraction centers are created to provide new destination along the way to pause. The diagram also shows the different physical connections that happen in the site, each color shows the different type of connection, and uses that happen in the site. The design also creates visual connection all around the park between the waterfront and the park. The plants, berms, and topography are all designed in a way that there will be consistent visual connection toward water. There is also ecological connection between dynamics of storm water and river that were described in the axonometric drawing and sections above.
5. Conclusion:

The juxtaposition of different infrastructures on the fabric of the city resulted in discontinuities in the physical social and cognitive relationship of the fabric of Georgetown Waterfront. The design proposes to reconnect this fractured space through place making and proposal of multi-purpose space below the highway, which creates new physical, visual, cognitive, and ecological connection between the fractures. Physical connection can happen through creating access and linkage. Cognitive connection can happen through making new destination places that are accessible, comfortable, enjoyable, or they provide new activities. The cognitive connection also happens through the coherency of the space.

The other main resolution in an underused space similar to this thesis site is creating the multi-use space that functions both ecologically and socially. The thesis proposes new connection through a program that not only reconnects the broken fabric of the city but also functions in multiple ways. Due to the various options and activities that the design provides, people are attracted to the site. The site would also function ecologically by controlling the flood and filtering the storm water. Choice and flexibility of the space becomes another main important attribute of a successful connection.

Ultimately, this thesis suggests that underused spaces above, below or along highways can be transformed into a cohesive space through different ways of connection. Attributes of successful place such as choice, sensory, spatial, and functional qualities can make this connection a strong
one. The multi-functional use of these spaces becomes an important solution for these spaces so that they benefit the city both socially and ecologically. Rather than single approach in development of the spaces for vehicles, these spaces should be thought as multi-use spaces for different modes of transportation, and activity. They can become transformed to spaces that are enjoyable, accessible, and usable to different type of users. These spaces should be thought both as social and ecological spaces. In other words, these spaces would still perform ecologically and benefit the surrounding even if people would not populate the site. These visual, sensory, spatial, and multi-functional characteristics can be applied as a solution to successful reconnection of fractured urban spaces.
References:


